AERMEC

air conditioning

R410A

RS485

CHILLERS- Technical manual - installation - maintenance

NRL

Multiscroll 2800-3600

° COMPACT
L COMPACT LOW NOISE
H STANDARD COMPACT HEAT PUMP
HL SILENCED COMPACT HEAT PUMP

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

EN

CE

INRLPY. 02.10 4086916_02

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

Summary

AERMEC S.p.A.
37040 Bevilacqua (VR) Italy – Via Roma, 996
Tel. (+39) 0442 633111
Telefax 0442 93730–(+39) 0442 93566
www .aermec. com - info @ aermec. com

NRL

SERIAL NUMBER	

CONFORMITY DECLARATION	We, the undersigned, declare on our own exclusive responsibility that the object in question, so defined:
NAME	**NRL**
TYPE	**AIR - WATER CHILLER/HEAT PUMP**
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	Round welding-free copper pipes for air conditioning and cooling
UNI EN 14276	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 33).
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.
-

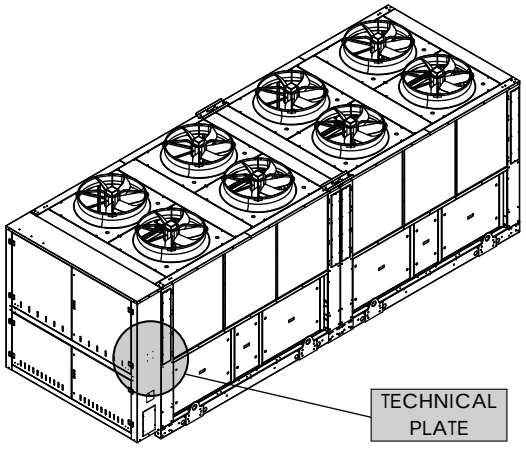
2. PRODUCT IDENTIFICATION

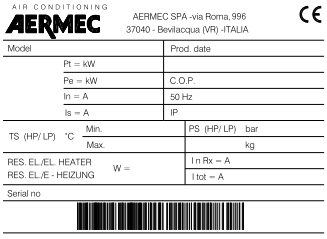
The NRL can be identified by the following:

- 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** is a set of devices designed to produce cold water for technological systems. ACCORDING TO the size of several several coolingand hydraulic circuits, and according to the version, they can have desuperheaters, total recovery, only pumping unit or accumulator with pumping unit.
The presence of more than one scroll type compressor allows the **NRL** chillers various capacity controls of the cooling capacity.
By means of a microprocessor, the electronic regulation controls and manages all the components and working parameters of the unit; an internal memory registers the working conditions in the moment when an alarm condition arises, in order to visualise it on the display.

3.1. VERSIONS AVAILABLE

- **"COOLING ONLY" (◦ - L)**
  maximum outside temperature allowed **46°C**;
- processed water temperature **18°C;**
- **"HEAT PUMP" (H - HL)**
  in cooling mode, the operating limits arrive at a maximum external air temperature of **42°C;**
- processed water temperature **18°C;**
- **in heating mode,** the operating limits arrive at a maximum external air temperature of **42°C;**
- processed water temperature **55°C;**
- **NRLH do not offer the following configurations:**
- YH (with processed water lower than **4°C**)
- HC (condensing heat pump)
-

3.2. VERSIONS AVAILABLE

HEAT RECOVERY UNITS
Desuperheater (D) inserted in series.

⚠ ***WARNING*:**
in the heat pump versions, the desuperheater must be intercepted during heat pump operation:
otherwise, the guarantee will no longer be considered valid.

Total heat recovery (T)
With plate-type exchanger inserted in parallel with the coils

Both versions (D - T) use:
a hot gas bypass device upstream from the evaporator
Water filter before the recovery exchanger.

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

The NRL - C condensing units are not available in the versions:
HC (condensing heat pump)
TC (condensing units with total recovery)
DC (condensing units with desuperheater)

Mechanical thermostatic valve (Y):
version Y: this is the version that allows you to produce chilled water below the standard value of **+4°C**, to a minimum of **-6°C**.

⚠ **For lower values, contact the company headquarters.**

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.

3.3. CONFIGURATOR

1.2.3	4.5.6	7	8	9	10	11	12	13	14	15, 16
NRL	**280**	**0**	**°**	**°**	**°**	**°**	**°**	**°**	**°**	**00**

field

1, 2, 3 Code NRL

4, 5, 6 Size 280, 300, 330, 360

7 Compressors
- 0 Standard compressor

8 Thermostatic valve
- ° Standard mechanical thermostatic valve (to +4°C)
- Y Low water temperature mechanical thermostatic valve (to -6°C)
- x Electronic thermostatic valve also for low water temperature (to -6°C)

9 Model
- ° Cooling only
- C Condenser unit
- H Heat pump

10 Heat recovery
- ° Without recovery units
- D Desuperheater
- T Total recovery

11 Version
- ° Compact version
- L Compact low noise version

12 Coils
- ° Made of aluminium
- R Made of copper
- S Tinned copper
- V Varnished

13 Fans
- ° Standard
- M Enlarged
- J Inverter

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

15, 16 Storage tank
- 00 Without storage tank
- 01 Low-head storage tank and single pump
- 02 Low-head storage tank and reserve pump
- 03 High-head storage tank and single pump
- 04 High-head storage tank and reserve pump
- 05 Water accumulator with holes for supplementary electric heater, low head and single pump
- 06 Water accumulator with holes for supplementary electric heater, low head and reserve pump
- 07 Water accumulator with holes for supplementary electric heater, high head and single pump
- 08 Water accumulator with holes for supplementary electric heater, high head and reserve pump
- 09 Double hydraulic ring
- 10 Double hydraulic ring with supplementary electric heater
- P1 Without storage tank, with low-head pump
- P2 Without storage tank, with low-head pump and reserve pump
- P3 Without storage tank, with high-head pump
- P4 Without storage tank, with high-head pump and reserve pump

WARNING
NB: for heat pump versions, M fans are not available, only ° and J.

4. 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.

LIQUID SEPARATOR
(HEAT PUMP ONLY)
Located on the suction point of the compressor, to protect against any flowback of liquid refrigerant, flooded start-ups, operation in the presence of liquid.

Liquid accumulation
(only for heat pumps and total recovery)
To compensate the difference in volume between the finned coil and the plate-type exchanger, holding back excess liquid.

Filter drier
Of the mechanical 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.

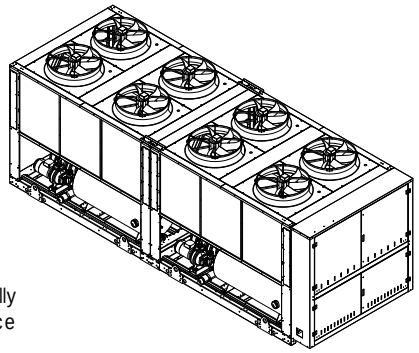
Electronic valve (optional)

Liquid and discharge taps
(cooling-only versions)
They allow the refrigerant to be cut off during extraordinary maintenance.

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

Bypass solenoid valve
(only for heat pumps)
To bypass the thermostat-controlled valve during the defrosting cycle.

Cycle reversing valve (heat pump only)
Inverts the flow of refrigerant when operation is switched between summer/ winter, and during defrosting cycles.



Non-return valve
Allows the flow of refrigerant in one direction only.

Desuperheater (only upon request)
Of the plate-type (AISI 316), externally insulated with closed cell material to reduce thermal dispersion.

Total recovery (only upon request)
Of the plate-type (AISI 316), externally insulated with closed cell material to reduce thermal dispersion.

4.1. FRAME AND FANS

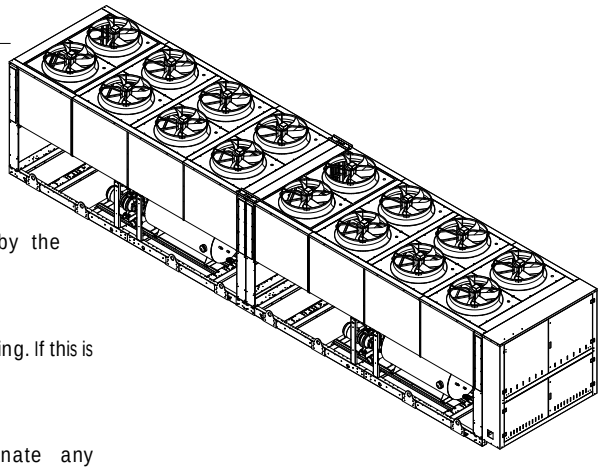
Fan unit
Screw type, statically and dynamically balanced. The electric fans are protected electrically with thermomagnetic switches and mechanically with metal anti-intrusion grilles, in accordance with the standard CEI EN 60335-2-40.

Enlarged fans (M)
These offer a useful head to overcome the pressure drops in the system

Inverter fans (J)

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

4.2. HYDRAULIC COMPONENTS



Circulation pump
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.

Flow switch (installed as standard)
This checks that the water is circulating. If this is not the case, it shuts down the unit.

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.

Accumulator 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.

Drain valve (all versions)
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.

Filling assembly
(versions with accumulator)
This has a pressure gauge showing the pressure in the system.

Expansion tank
(versions with accumulator)
Of the membrane type, with nitrogen pre-charge.

Hydraulic circuit safety valve
(only for versions with pump or with accumulator)
Calibrated to 6 bar and with ductable discharge, it releases overpressure in the event of abnormal working pressure levels.

4.3. SAFETY AND CONTROL COMPONENTS

Low pressure switch (BP)
– **Cooling-only (L)**
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 switch (AP)
– **Cooling-only (L)**
– **Heat pump (HL)**
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 transducers (TP2)
– **Cooling-only (L) "accessory"**
– **Heat pumps (HL) "standard"**
Placed on the high pressure side of the chiller circuit, it communicates to the control card the operating pressure, sending a pre-alarm in case of abnormal pressure.

High pressure transducer (TP3)
– **Standard for all the versions**
Placed on the high pressure side of the chiller circuit, it communicates to the control card the operating pressure, sending a pre-alarm in case of abnormal pressure.

Anti-freeze heater
(installed as standard)
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
- Calibrated at 30 bar on the BP branch (only for heat pumps)

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.

4.4. 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
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.

5. ACCESSORIES

AER485P1: Through this accessory it is possible to connect the unit with BMS supervision systems with electrical standard RS 485 and MODBUS type protocol.

AVX: Sprung anti-vibration supports. Select the model using the compatibility table.

GP: Protect the external coils from accidental knocks.

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.

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.

It allows to maintain a costant COSδ at 0.95 and also allows an input current reduction (about 10%)

DCPX: This accessory allows correct operation with outside temperatures below 10°C and down to -10°C.
It is made up of an electronic regulation card that varies the fan rpm on the basis of the condensation pressure (read by the high pressure transducer), to keep it sufficiently high for the proper functioning of the unit.
It also allows correct heating operation with outside temperatures greater than 30°C and up to 42°C.

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.

PRM1 - PRM2: 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.

6. COMPATIBILITY OF ACCESSORIES

MODELS **NRL ° - L - H - HL** from **2800** up to **3600**

MODELS	VERS.	2800	3000	3300	3600
AER485P1	**All**	•	•	•	•
		RIFNRL			
RIFNRL	**All**	**RIFNRL2800**	**RIFNRL3000**	**RIFNRL3300**	**RIFNRL3600**
		GP			
(1) GP 350 x 2	**All**	•	•	•	•
		PGS			
PGS	**All**	•	•	•	•
		DCPX			
(2) (3) DCPX	**°**	78	78	81	81
	H	78	78	82	82
	L - HL	**standard**			
(2) (3) DCPX (with Fans Enlarged M)	**°**	78	78	82	82
	L	**standard**			
		TRX 1			
TRX 1	**All**	•	•	•	•
		PRM 1			
PRM 1	**All**	•	-	-	-
		PRM 2			
PRM 2	**All**	-	•	•	•
		AVX			
AVX (00 - without storage tank)	**All**	785	791	791	791
AVX (01-02-03-04 - with storage tank and pumps)	**All**	786	792	792	792
AVX (P1-P2-P3-P4 - wtih pumps)	**All**	787	793	793	793

(1) ***Accessories can only be fitted in the factory***

(2) ***Standard for silenced version and with desuperheater***

(3) ***Fans Inverter (J): DCPX not necessary. The fans are already equipped with rpm regulator***

7. TECHNICAL DATA

TECHNICAL DATA VERSIONS [°-L]

COOLING	U.M.	VERS.	2800	3000	3300	3600
Cooling output	kW	°	676	750	824	898
		L	604	672	733	786
Total input power	kW	°	284	322	350	374
		L	314	354	384	416
Water flow rate	l/h	°	116270	129000	141730	154460
		L	103890	115580	125900	135190
Total pressure drops	kPa	°	73,0	78,6	59,5	58,8
		L	59,1	63,8	47,9	45,9
ENERGY INDICES						
EER	W/W	°	2,38	2,33	2,35	2,40
		L	1,92	1,90	1,90	1,89
ESEER	W/W	°	3,76	3,68	3,72	3,79
		L	3,65	3,61	3,62	3,59
DATI ELETTRICI						
Fuel feed	A	°	400V-3-50Hz			
		L				
Input current	A	°	498	572	610	638
		L	538	616	656	696
Maximum current	A	°	580	638	716	782
		L				
Peak current	A	°	789	847	984	1050
		L				
COMPRESSORS (SCROLL)						
Number/Circuit	n°/n°	°	10/4	12/4	12/4	12/4
		L				
FANS (AXIAL)						
Quantity	n°	°	8	8	12	12
		L				
Air flow rate	m³/h	°	154000	152000	216600	212400
		L	115400	121600	151620	148680
Input power	kW	°	10,0	10,0	15,0	15,0
		L	7,5	7,5	11,3	11,3
Input current	A	°	21,6	21,6	32,4	32,4
		L	16,2	16,2	24,3	24,3
FANS (ENLARGED M)						
Quantity	n°	°	8	8	12	12
		L				
Input power	kW	°	13,9	13,9	20,9	20,9
		L	-	-	-	-
Input current	A	°	29,6	29,6	44,4	44,4
		L	-	-	-	-
[(1)]Useful heads	kPa	°	45	45	40	40
		L	-	-	-	-
EVAPORATORS (PLATES)						
Quantity	no.	H	2	2	2	2
		HL				
[(2)]Water connections (IN/OUT)	diam	H	4"	4"	4"	4"
		HL				

(1) The useful heads refer to the nominal air flow rate
(2) The water connections are all of the Victaulic type

STORAGE TANK	U.M.	VERS.	2800	3000	3300	3600
Accumulator capacity	l	°	2 x 700			
		L				
Accumulator antifreeze heater	W	°	2 x 300			
		L				
Expansion tank capacity	n°/l	°	4 x 25			
		L				
LOW-HEAD CIRCULATION PUMP						
Input power	kW	°	9,6	9,6	13,0	13,0
		L	9,6	9,6	13,0	13,0
Input current	A	°	16,3	16,3	22,0	22,0
		L	16,3	16,3	22,0	22,0
Useful head	kPa	°	102	88	109	99
		L	133	116	134	130
HIGH-HEAD CIRCULATION PUMP						
Input power	kW	°	17,2	17,2	24,7	24,7
		L	17,2	17,2	24,7	24,7
Input current	A	°	29,2	29,2	42,4	42,4
		L	29,2	29,2	42,4	42,4
Useful head	kPa	°	246	220	246	237
		L	279	258	271	267
SOUND DATA						
[3] Sound power	dBA	°	93,5	93,5	95,0	95,0
		L	90,5	90,5	92,0	92,0
[4] Sound pressure	dBA	°	61,5	61,5	63,0	63,0
		L	58,5	58,5	60,0	60,0
DIMENSIONS						
Height	mm	°	2450	2450	2450	2450
		L				
Width	mm	°	2200	2200	2200	2200
		L				
Depth	mm	°	8100	8100	8100	8100
		L				
Weight when empty	Kg	°	5630	6020	6220	6420
		L				

[3] Sound power
Aermec determines the sound power value on the basis of measurements taken in accordance with standard 9614-2, in compliance with the Eurovent certification.

[4] 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.

NOMINAL REFERENCE CONDITIONS

- ***Inlet water temperature*** ***12°C***
- ***Outlet water temperature*** ***7°C***
- ***Outside air temperature d.b.*** ***35°C***
- ***Δt*** ***5°C***

8. TECHNICAL DATA

DATI TECNICI VERSIONI [H-HL]

COOLING	U.M.	VERS.	2800	3000	3300	3600
Cooling output	kW	H	666	734	846	908
		HL	604	664	746	794
Total input power	kW	H	280	318	332	358
		HL	308	348	374	408
Water flow rate	l/h	H	114550	126250	145510	156180
		HL	103890	114210	128310	136570
Total pressure drops	kPa	H	40,2	40,4	46,9	45,7
		HL	33,4	33,6	37,0	35,5
HEATING						
Heating capacity	kW	H	768	854	936	1006
		HL				
Total input power	kW	H	252	282	310	332
		HL				
Water flow rate on heating	l/h	H	132.100	146.890	160.990	173.030
		HL				
Total pressure drop on heating	kPa	H	53,7	55,4	58,8	57,8
		HL				
ENERGY INDICES						
EER	W/W	H	2,38	2,31	2,54	2,54
		HL	1,96	1,90	1,99	1,95
ESEER	W/W	H	3,57	3,50	3,53	3,60
		HL	3,47	3,43	3,44	3,41
COP	W/W	H	3,05	3,03	3,02	3,03
		HL				
ELECTRICAL DATA						
Fuel feed	A	H	400V-3-50Hz			
		HL				
Input current on cooling	A	H	482	551	592	618
		HL	521	594	641	673
Input current on heating	A	H	454	522	558	579
		HL				
Maximum current	A	H	588	646	730	796
		HL				
Peak current	A	H	797	855	998	1064
		HL				
COMPRESSORS (SCROLL)						
Number/Circuit	n°/n°	H	10/4	12/4	12/4	12/4
		HL				
FANS (AXIAL)						
Quantity	n°	H	8	8	12	12
		HL	12	12	16	16
Air flow rate, cooling only	m³/h	H	174800	173600	248400	244800
		HL	131000	138800	173800	171400
Heat pump air flow rate	m³/h	H	169800	168000	234600	229200
		HL				
Input power	kW	H	13,6	13,6	20,4	20,4
		HL	13,6	13,6	20,4	20,4
Input current	A	H	28,8	28,8	43,2	43,2
		HL	28,8	28,8	43,2	43,2
FANS (INVERTER J)						
Quantity	n°	H	8	8	12	12
		HL	-	-	-	-
Input power	kW	H	13,6	13,6	20,4	20,4
		HL	-	-	-	-
Input current	A	H	28,8	28,8	43,2	43,2
		HL	-	-	-	-
(1) Useful heads	Pa	H	55	54	47	45
		HL	-	-	-	-
EVAPORATORS (PLATES)						
Quantity	n°	H	2	2	2	2
		HL				
(2)Water connections (IN/OUT)	Ø	H	4"	4"	4"	4"
		HL				

*(1) **The useful heads refer to the nominal air flow rate***
*(2) **The water connections are all of the Victaulic type***

STORAGE TANK	U.M.	VERS.	2800	3000	3300	3600
Accumulator capacity	l	H	2 x 700			
		HL				
Accumulator antifreeze heater	W	H	2 x 300			
		HL				
Expansion tank capacity	n°/l	H	4 x 25			
		HL				
LOW-HEAD CIRCULATION PUMP						
Input power	KW	H	9,6	13,0	13,0	13,0
		HL				
Input current	A	H	16,3	22,0	22,0	22,0
		HL				
Useful head on cooling	KPa	H	149	142	122	115
		HL	167	157	145	141
Useful head on heating	KPa	H	104	104	88	77
		HL				
HIGH-HEAD CIRCULATION PUMP						
Input power	KW	H	17,2	17,2	24,7	24,7
		HL				
Input current	A	H	29,2	29,2	42,4	42,4
		HL				
Useful head on cooling	KPa	H	290	274	257	251
		HL	310	297	280	276
Useful head on heating	KPa	H	239	210	225	214
		HL				
SOUND DATA						
(3) Sound power	dBA	H	94,0	93,5	95,0	97,0
		HL	91,0	90,5	92,0	94,0
(4) Sound pressure	dBA	H	62,0	61,5	63,0	65,0
		HL	59,0	58,5	60,0	62,0
DIMENSIONS						
Height	mm	H	2450	2450	2450	2450
		HL				
Width	mm	H	2200	2200	2200	2200
		HL				
Depth	mm	H	8100	8100	8100	8100
		HL				
Weight when empty	Kg	H	6080	6490	6660	6880
		HL				

(3) Sound power

Aermec determines the sound power value on the basis of measurements taken in accordance with standard 9614-2, in compliance with the Eurovent certification.

(4) 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.

NOMINAL REFERENCE CONDITIONS

COOLING MODE

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

HEATING mode

- ***Inlet water temperature 40°C***
- ***Outlet water temperature 45°C***
- ***Outside air temperature 7/6°C***
- ***Δt 5°C***

9. TECHNICAL DATA

TECHNICAL DATA VERSIONS [C]

COOLING		U.M.	2800	3000	3300	3600
Cooling capacity:	kW	°	704	782	860	938
		L	630	702	766	820
Total input power	kW	°	294	332	364	388
		L	326	366	398	432
ENERGY INDICES						
EER	W/W	°	2.39	2.36	2.36	2.42
		L	1.93	1.92	1.92	1.90
ELECTRICAL DATA						
Fuel feed	A	°	400V-3-50Hz			
		L				
Input current	A	°	516	594	632	662
		L	558	638	680	722
Maximum current	A	°	580	638	716	782
		L				
Peak current	A	°	789	847	984	1050
		L				
COMPRESSORS (SCROLL)						
Number/Circuit	no./no.	°	10/4	12/4	12/4	12/4
		L				
FANS (AXIAL)						
Quantity	no.	°	8	8	12	12
		L				
Air flow rate	m^3/h	°	154000	152000	216600	212400
		L	115400	121600	151620	148680
Input power	kW	°	10.0	10.0	15.0	15.0
		L	7.5	7.5	11.3	11.3
Input current	A	°	22	22	32	32
		L	16	16	24	24
SOUND DATA						
(3) Sound power	dBA	°	93.5	93.5	95	95
		L	90.5	90.5	92	92
(4) Sound pressure	dBA	°	61.5	61.5	63	63
		L	58.5	58.5	60.0	60.0
DIMENSIONS						
Height	mm	H	2450	2450	2450	2450
		HL				
Width	mm	H	2200	2200	2200	2200
		HL				
Depth	mm	H	8100	8100	8100	8100
		HL				

(3) Sound power

Aermec determines the sound power value on the basis of measurements taken in accordance with standard 9614-2, in compliance with the Eurovent certification.

(4) 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.

10. OPERATING LIMITS

The devices in their standard configurations are not suitable for installation in salty environments. The maximum and minimum limits for the water flow rate to the exchanger are indicated by the curves of the pressure drop diagrams.
For the operating limits, refer to the diagrams below, valid for $\Delta t = 5°C$.

N.B.:
The unit can be activated with external air at 46°C and inlet water at 35°C in the summer function.
The unit can be activated with external air at -15°C and inlet water at 20°C in the winter function.

Under these conditions the unit function is possible only for a short time in order to bring the system up to right temperature.
To reduce the time of this operation a three-way valve allowing to by-pass the water from the supply to the system should be fitted, until the conditions enabling the unit to operate within the permitted operating limits are reached.

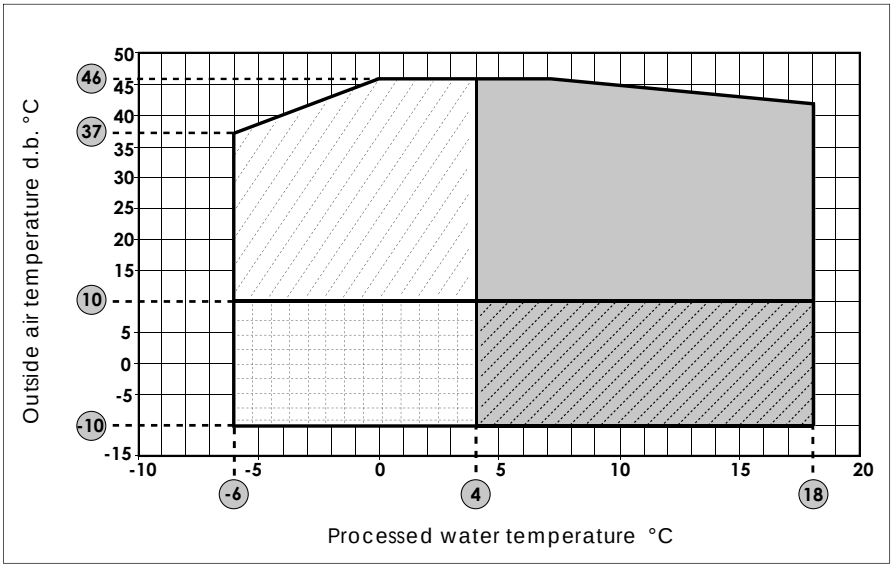
⚠ ***ATTENTION***
Cooling mode
In versions 09-10, the outlet water temperature from the storage tank (secondary circuit) is about 3° C above the temperature of the water produced by the unit (primary circuit).
The performance and operating limits refer to the temperature of the water produced by the unit (primary circuit).

Heating mode
In versions 09-10, the outlet water temperature from the storage tank (secondary circuit) is about 3° C under the temperature of the water produced by gland the unit (primary circuit).
The performance and operating limits refer to the temperature of the water produced by the unit (primary circuit).

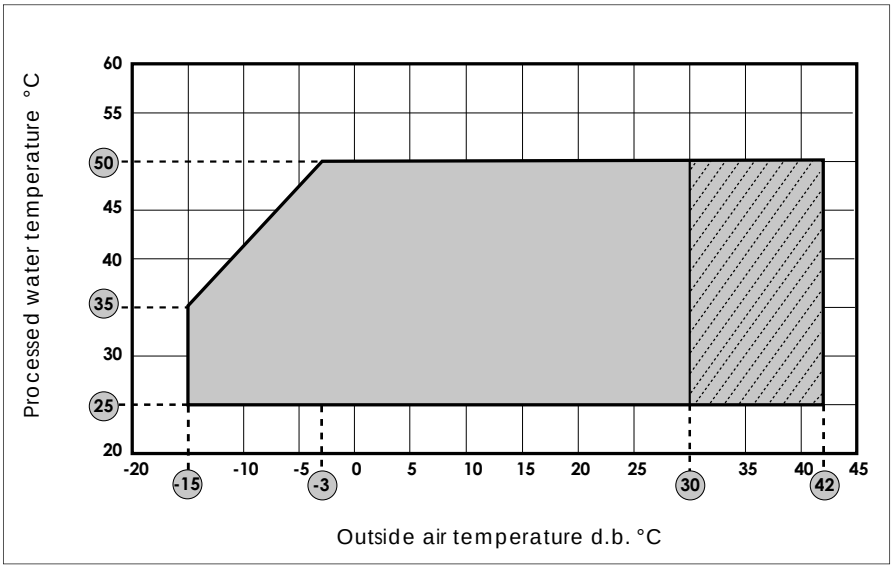
KEY:

- Operation with glycol
- Operation with glycol, with DCPX accessory
- Standard operation
- Standard operation with DCPX accessory

COOLING MODE

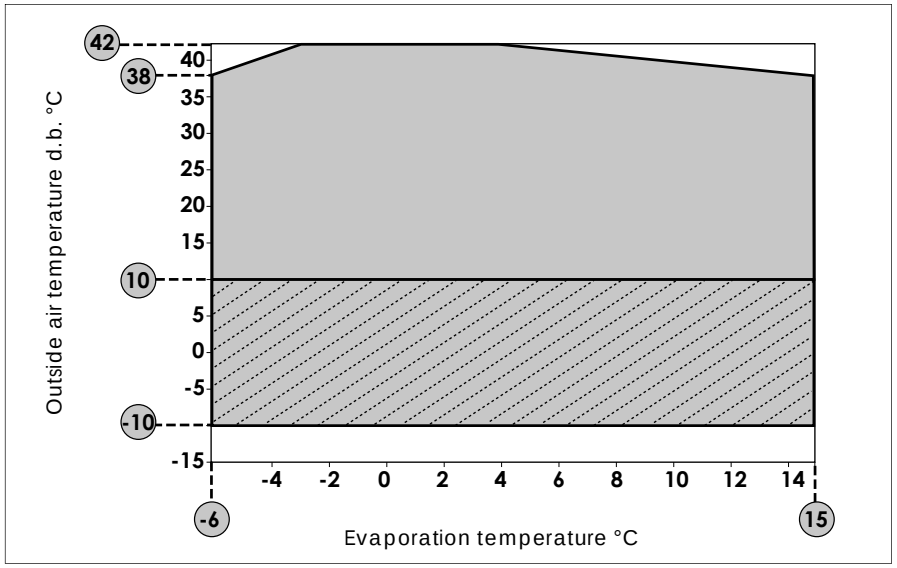


HEATING MODE



NB In the versions with accumulator (09-10) the operating limits in cold and warm modes are reduced to 3°C.

CONDENSER UNIT OPERATION



12. CORRECTION FACTORS

12.1. COOLING CAPACITY AND INPUT POWER

– **"STANDARD VERSIONS"**

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.

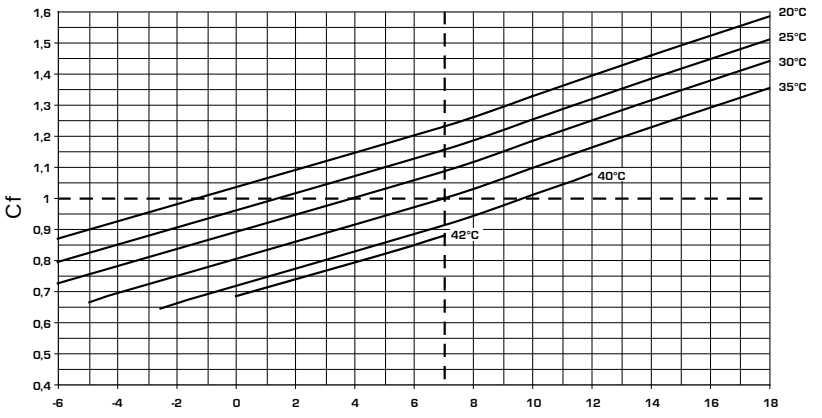
KEY

Cf: correction coefficient of the cooling capacity.

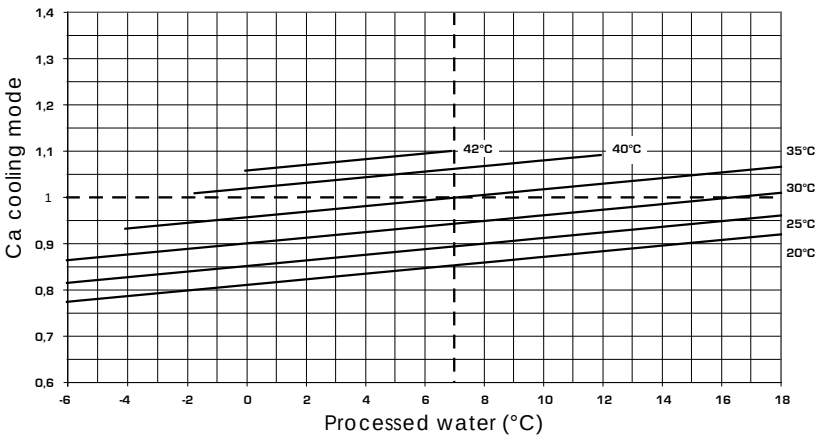
Ca: correction coefficient of the input power.

FOR Δt DIFFERENT FROM 5°C
For the evaporator, use **Tab. 9.3.1.** to obtain the corrective factors of the cooling and absorbed power.
To take into account the exchanger soiling, apply the relative fouling factors, **Tab. 9.4.1.**

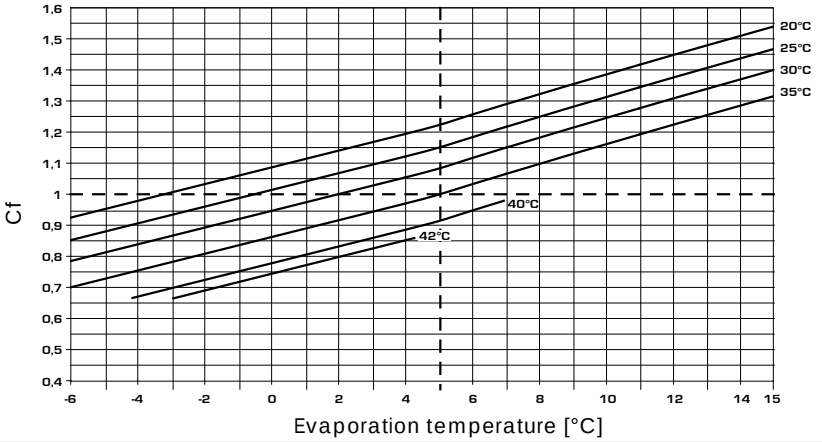
CORRECTION COEFFICIENTS OF THE COOLING CAPACITY



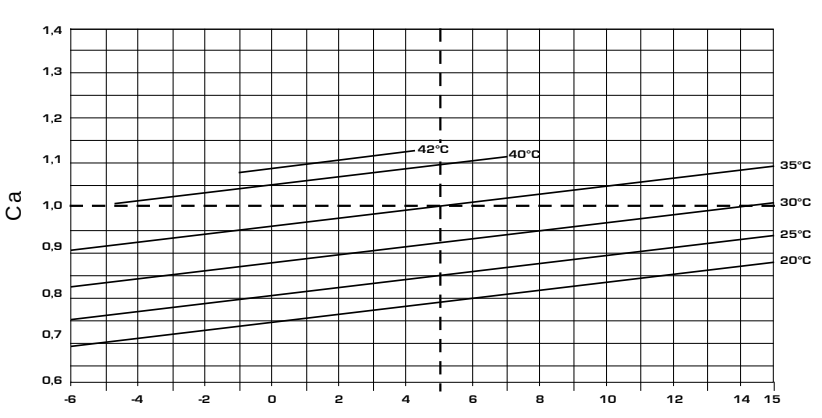
CORRECTION COEFFICIENTS OF THE INPUT POWER IN COOLING MODE



CORRECTIVE COEFFICIENT OF THE COOLING CAPACITY VERSION C



CORRECTIVE COEFFICIENTS OF INPUT POWER VERSION C



12.2. HEATING CAPACITY AND INPUT POWER

– **"HEAT PUMP VERSIONS"**

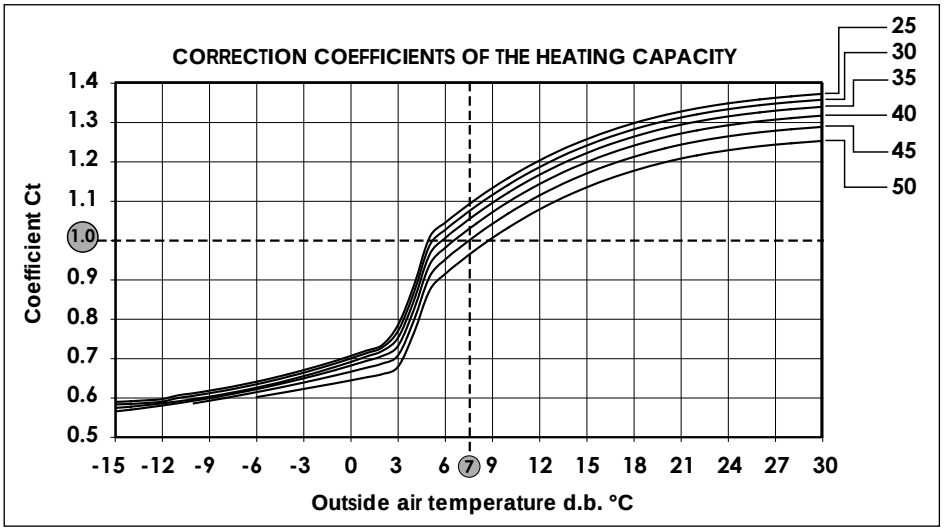
The heating capacity yielded and the input electrical capacity in conditions other than rated conditions are obtained by multiplying the rated values (Pt, Pa) by the respective correction coefficients (Ct, Ca). The diagram allows you to obtain the correction coefficients; in line with each curve you will see the hot processed water temperature to which it refers, assuming a difference of temperature between the condenser inlet and outlet water equal to 5°C.

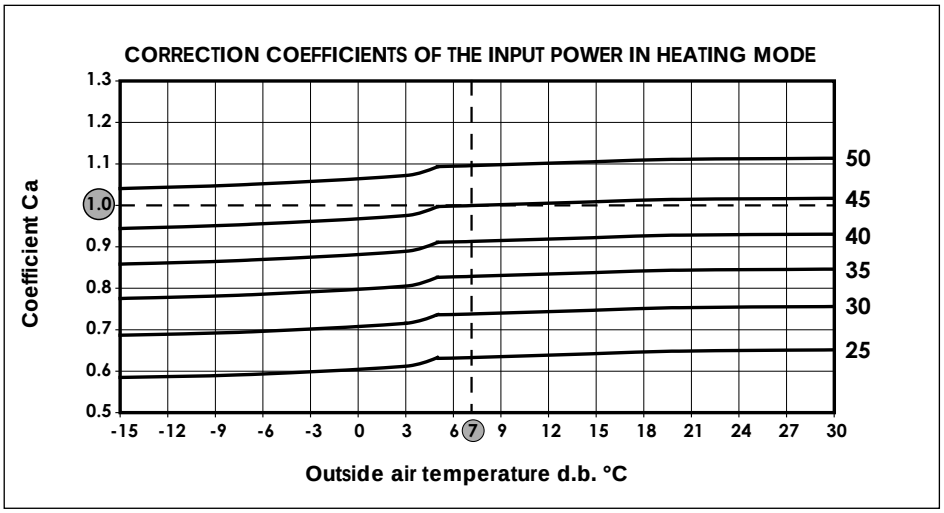
The outputs are intended as net of the defrosting cycles.

KEY

Ca: Correction coefficient of the input power.

Ct: correction coefficient of the heating capacity.





12.3. FOR ∆t DIFFERENT FROM THE RATED VALUE

For ∆t different than 5°C to the water consumption the Tab. 10.4.1. is used for the correction factors of the cooling and absorbed capacity.

CORRECTION FACTORS FOR ∆T DIFFERENT FROM THE CHILLER RATED VALUE

Evaporator Δt different to nominal	**3**	**5**	**8**	**10**
Correction factor cooling capacity	0,99	1	1,02	1,03
Correction factor input power	0,99	1	1,01	1,02
Correction factor heating capacity	0,99	1	1,02	1,03
Condenser Δt different to nominal	**3**	**5**	**8**	**10**
Correction factor heating capacity	0.9912	1	1.013	1.0227
Correction factor input power	1.0144	1	0.978	0.9633

12.3.1

12.4. FOULING FACTORS

The performance levels indicated in the table refer to conditions with clean tubes, with a fouling factor = 1. For other fouling factor values, multiply the data of performance table 10.4.2. by the coefficients given.

FOULING FACTOR

Fouling factor [K*m²]/[W]	**0,00001**	**0,00002**	**0,00005**
Correction factor cooling capacity	1	0,99	0,98
Correction factor input power	1	1	1
Correction factor heating capacity	1	1	0,99
Correction factor input power	1	1	1,02

12.4.1

13. PRESSURE DROPS

13.1. TOTAL PRESSURE DROPS (°-L)

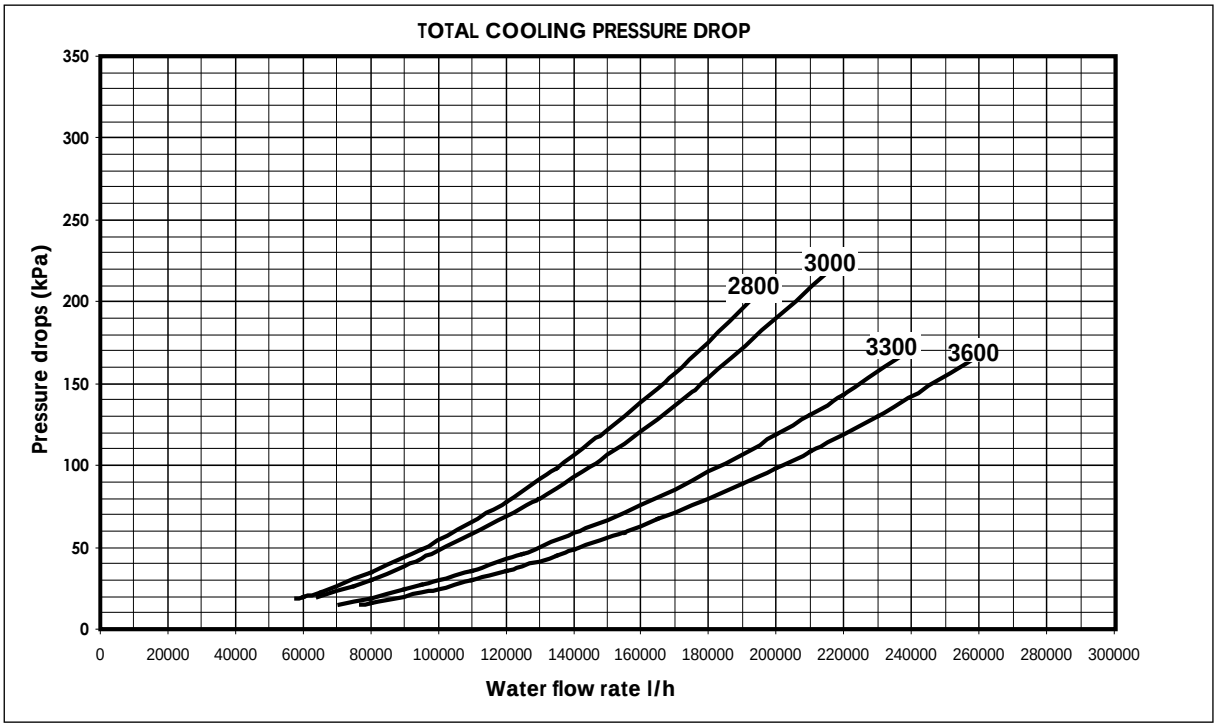
Standard NRL unit (° - L).

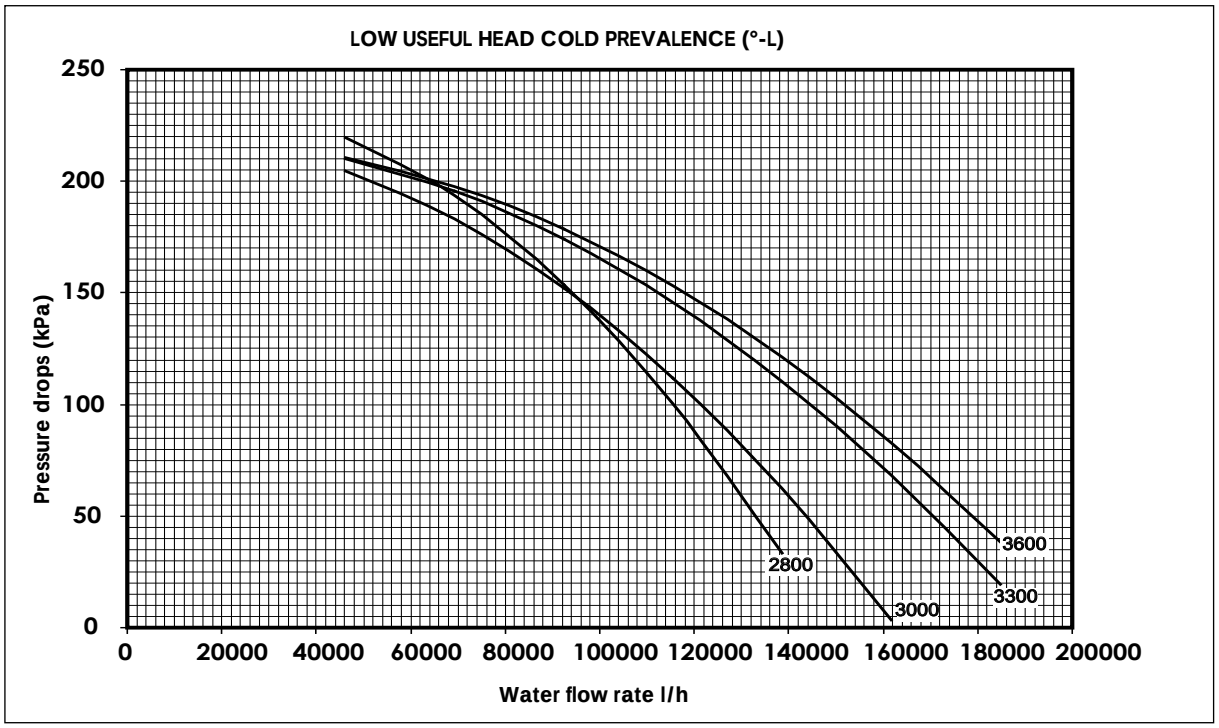
The pressure drops include:
- EVAPORATORS
- WATER FILTERS
- HYDRAULIC CIRCUITS

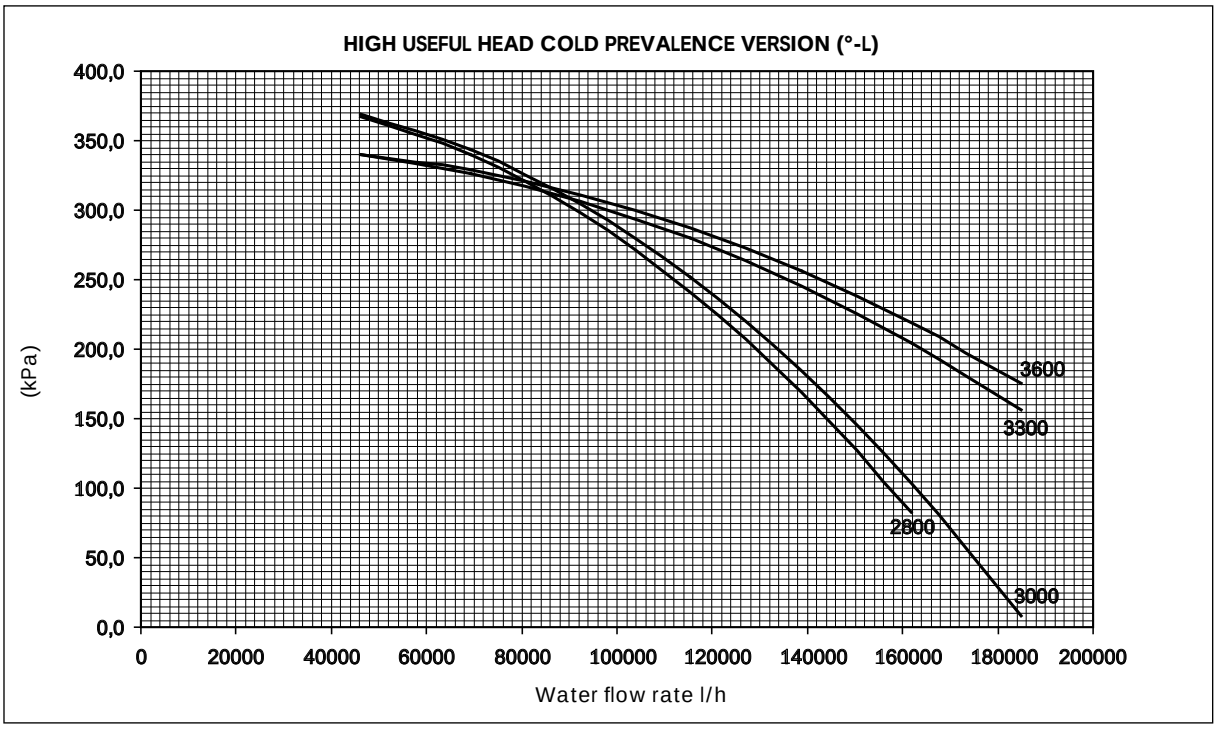
Diagrams pressure drops are related to an average water temperature of 10 °C. The following table shows the correction to apply to the pressure drops when the average water temperature varies

The chiller consists of two hydraulic circuits per module.
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 PERSON IN CHARGE.**

⚠ ***NOTE:***
The water outlet probe (SUW) 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.







13.2. TOTAL PRESSURE DROP (H-HL)

Standard NRL heat pump unit (H - HL).

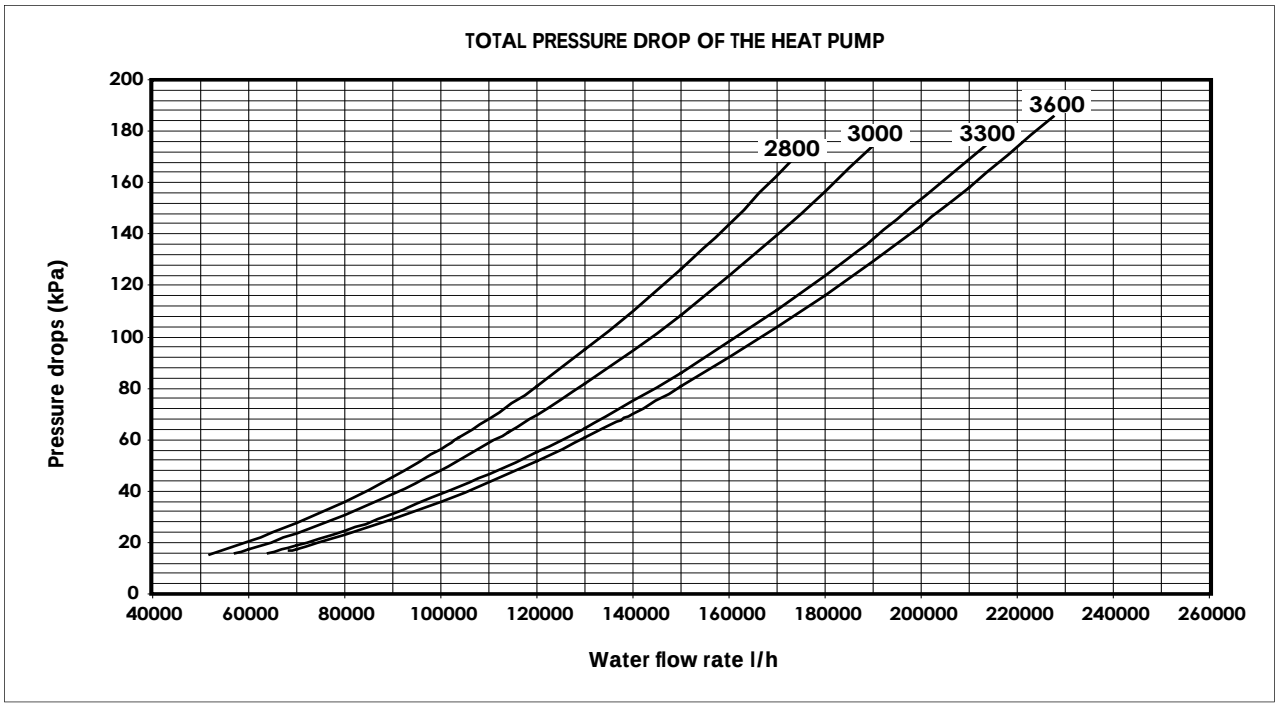
The pressure drops include:

- EVAPORATORS
- WATER FILTERS
- HYDRAULIC CIRCUITS

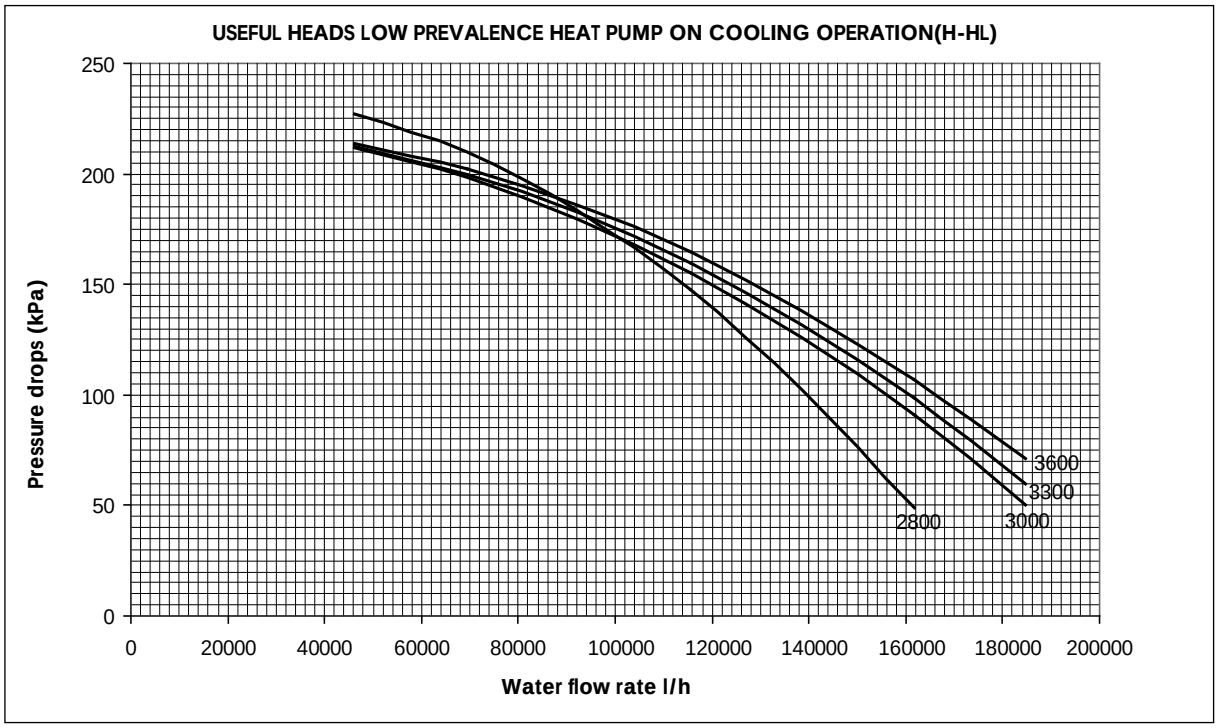
The diagram pressure drops are related to an average water temperature of 10 °C. The following table shows the correction to apply to the pressure drops when the average water temperature varies

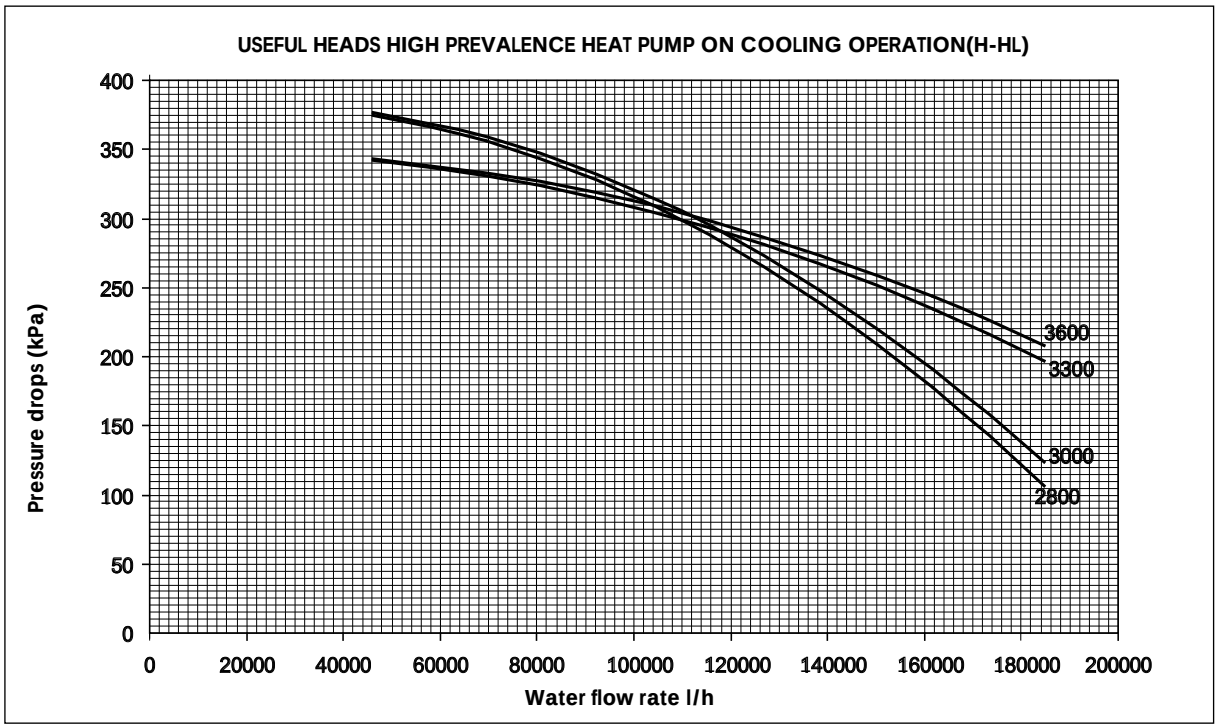
The chiller consists of two hydraulic circuits per module.
The pressure drops indicated in the graphics are relative to a single circuit.
⚠ **Since the hydraulic parallel is in charge of the customer or the or the person in charge.**

⚠ ***NOTE:***
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.



Cooling operation



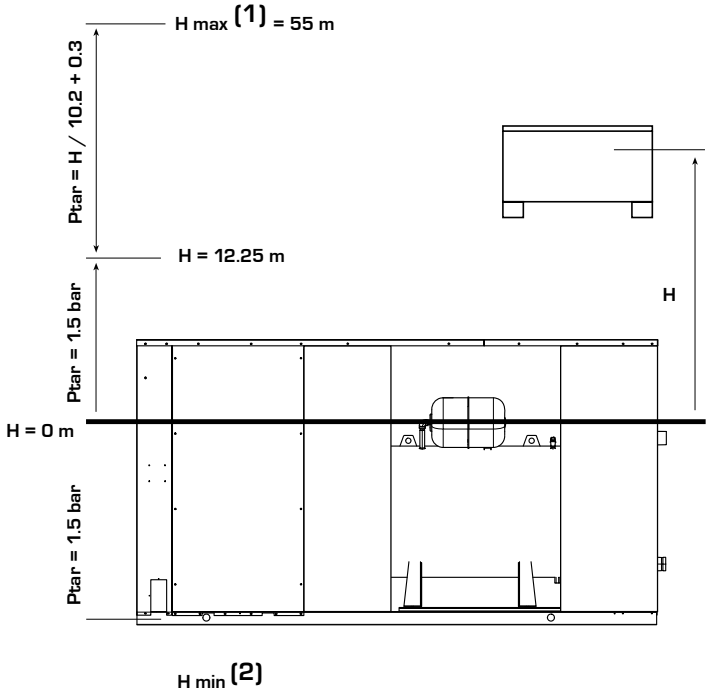


Corrective coefficients for heat pump on heating operation

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

14. 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.

15. MINIMUM WATER CONTENT

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

MIN. AND MAX. WATER CONTENT
(1) Minimum water content
(2) Minimum water content in the case of process applications or operation with low outside temperatures and low load.
-Adjusting the outlet water temperature.
-project Δt less than 5°C.

16. CAPACITY CONTROLS

(*) Cooling capacity %	Levels of power											
Versions	**1°**	**2°**	**3°**	**4°**	**5°**	**6°**	**7°**	**8°**	**9°**	**10°**	**11°**	**12°**
NRL 280	13	25	37	49	58	67	76	84	92	100		
NRL 300	10	19	28	37	46	55	63	71	78	86	93	100
NRL 330	10	19	28	37	46	55	63	71	78	86	93	100
NRL 360	10	19	28	37	46	55	63	71	78	86	93	100

(*) Input power %	Levels of power											
Versions	**1°**	**2°**	**3°**	**4°**	**5°**	**6°**	**7°**	**8°**	**9°**	**10°**	**11°**	**12°**
NRL 280	10	20	30	40	50	59	69	79	89	100		
NRL 300	7	15	22	30	38	46	55	63	72	81	91	100
NRL 330	7	15	22	30	38	46	55	63	72	81	91	100
NRL 360	7	15	22	30	38	46	55	63	72	81	91	100

(**) Heating capacity %	Levels of power											
Versions	**1°**	**2°**	**3°**	**4°**	**5°**	**6°**	**7°**	**8°**	**9°**	**10°**	**11°**	**12°**
NRL 280	12	24	36	48	57	66	75	83	92	100		
NRL 300	9	18	27	36	45	53	61	69	77	85	93	100
NRL 330	9	18	27	36	45	53	61	69	77	85	93	100
NRL 360	9	18	27	36	45	53	61	69	77	85	93	100

(*) Input power %	Levels of power											
Versions	**1°**	**2°**	**3°**	**4°**	**5°**	**6°**	**7°**	**8°**	**9°**	**10°**	**11°**	**12°**
NRL 280	10	20	30	40	50	59	69	79	89	100		
NRL 300	7	15	22	30	38	46	55	63	72	81	91	100
NRL 330	7	15	22	30	38	46	55	63	72	81	91	100
NRL 360	7	15	22	30	38	46	55	63	72	81	91	100

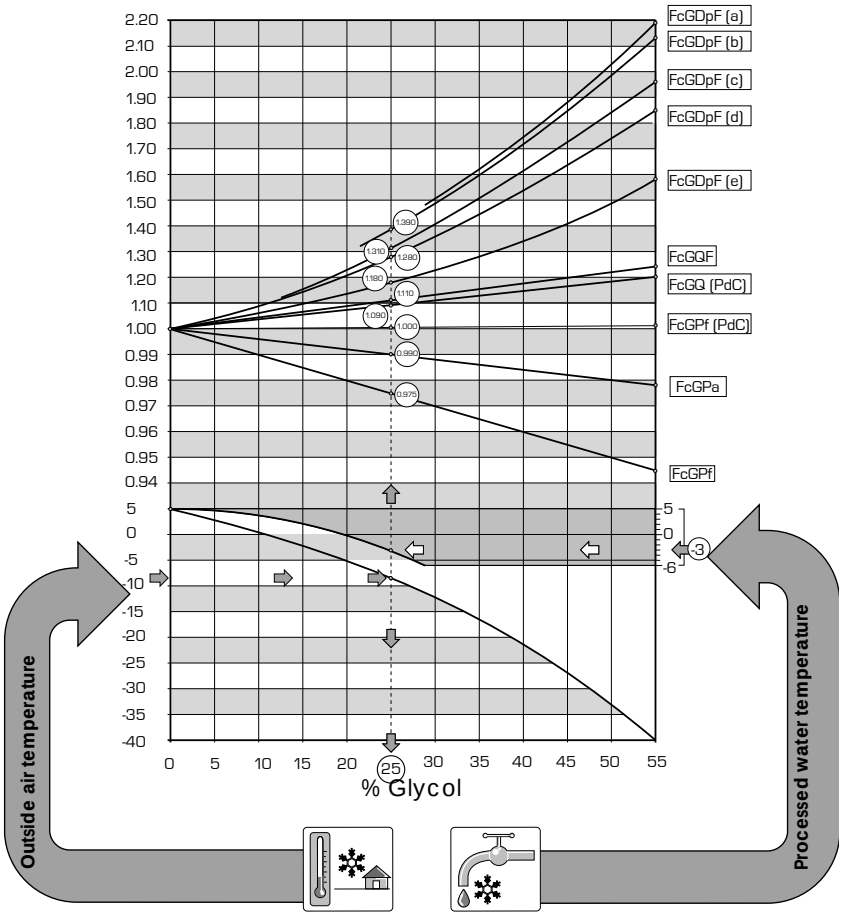
The performance values refer to the following conditions:
(*) processed water temperature = 7°C;
(*) outside air temperature = 35°C.

The performance values refer to the following conditions:
(*) processed water temperature = 50°C;
** external air temperature = 7°C D.B./6°C W.B

17. 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.



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.

17.1. HOW TO READ THE GLYCOL CURVES

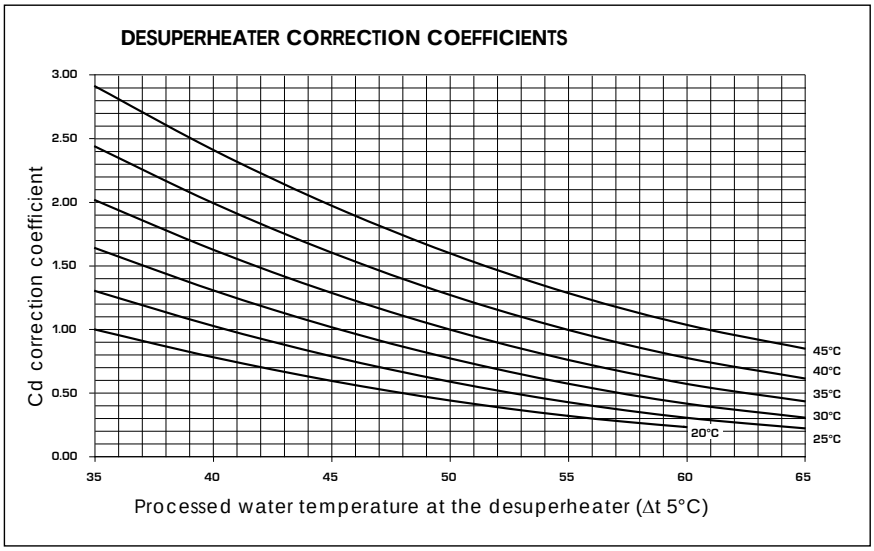
The curves shown in the figure summarise a notable quantity of data, each of which is represented by a specific curve. In order to use these curves correctly, it is necessary to make some initial considerations:

- 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.

18. DESUPERHEATER

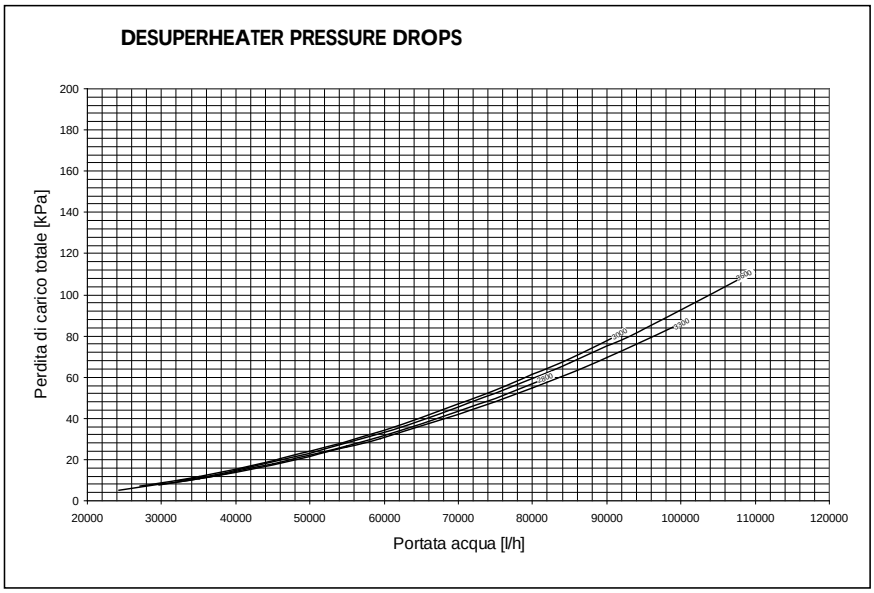
The heating capacity that can be obtained from the desuperheater is obtained by multiplying the nominal value (Pd) shown in table 15.1.1 by a suitable coefficient (Cd).
The diagrams will give you the correction coefficients to be used for the chillers in the various versions; next to each curve you can see the outside air temperature to which it refers.

In the heat pump versions, the desuperheater must be intercepted during heat pump operation: otherwise, the guarantee will no longer be considered valid.



18.1. PRESSURE DROPS

The NRL models with desuperheater, from size 2800 to 3600, have 4 desuperheaters (placed in parallel 2 to 2).
NB:
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 15.1.2.



The nominal value refers to:

- air temperature 35°C
- water at the desuperheate 45/50°C
- Δt 5°C

NOTES:

The units with desuperheater (D) not for versions:

- YD
- XD (only for temperatures lower than 4°C)

18.1.1. NRL (D)		280	300	330	360
Heat capacity recovered	kW	282	316	345	375
Desuperheater water flow rate	l/h	48430	54340	59420	64500
Desuperheater pressure drops	kPa	20.8	28.3	30.3	38.5

18.1.2. Correction of pressure drop when average water temperature varies.

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

19. TOTAL RECOVERY

In case of operation with total heat recovery, the machine performances do not depend on the external air temperature but on that of the hot water produced:the electrical input power and the recovery heating capacity are obtained by multiplying the values (Pa, Pr) shown in table 16.1.1 by the respective correction coefficients (Ca, Cr), that can be seen in the following diagrams. According to the temperature of the hot water produced referred to is shown assuming a difference of 5°C between the inlet to and outlet from the total heat recovery unit.
The cooling capacity (Cc) is obtained from the difference between recovery heating capacity (Cr) and input power (Ip).

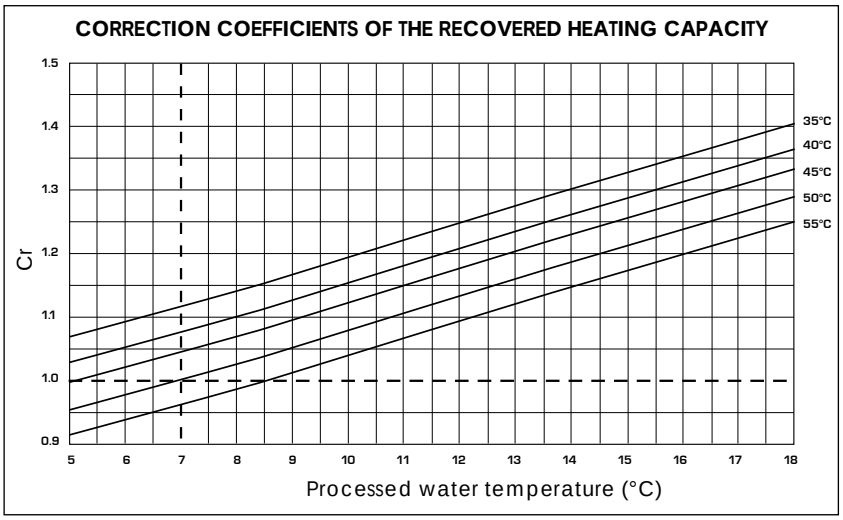
The nominal value refers to:

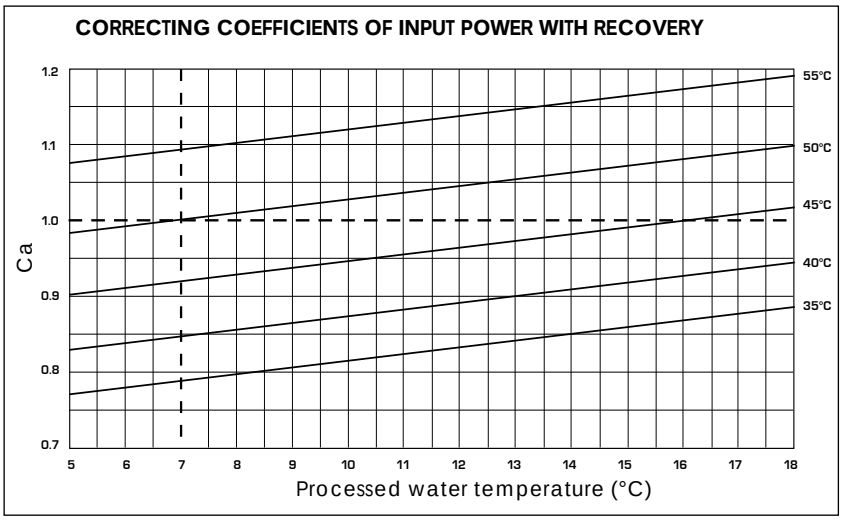
- air temperature 35°C
- water at the desuperheater 50°C
- Δt 5°C

NOTES:
Using total recovery is only allowed in the cooling operation.

The units with total recovery (T) are not available in the versions:

- YT
- XT (only for temperature lower than 4°C)



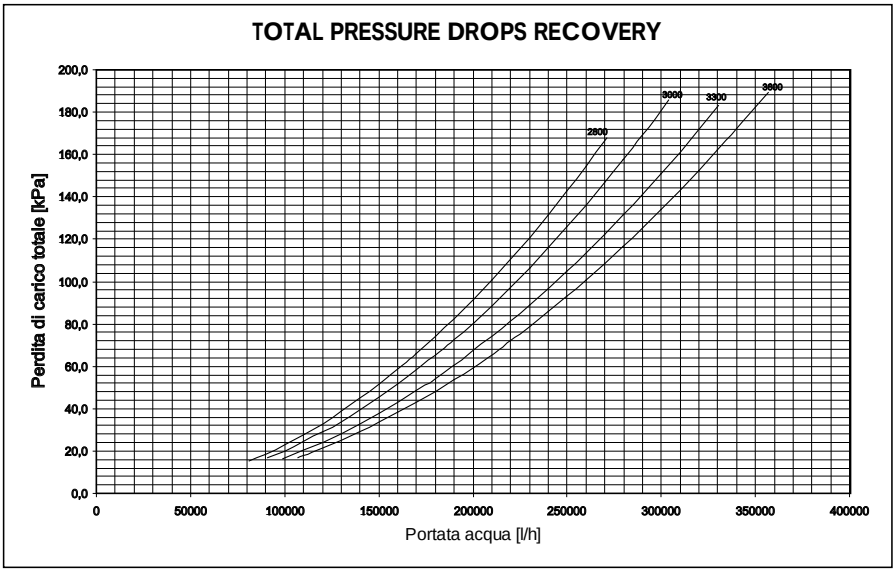


19.1.1. NRL (T)		280	300	330	360
Heat capacity recovered	kW	945	1060	1152	1244
Total input power	kW	263	295	320	345
Water flow rate recovery	l/h	162500	182320	198160	214010
Pressure drop recovery exchanger	kPa	60.4	66.9	65.9	68.2

19.1. PRESSURE DROP

The NRL models with total heat recovery always have 1 heat recovery unit.
The characteristics of the heat recovery units and the pressure drop curves are shown below; the filter leakage is not covered.

The pressure drops in the diagram refer to the average water temperature of 50 °C.
The table 16.2.1. shows the correction to be applied to the pressure drops when the average water temperature varies.



19.1.1. Correction of pressure drop when average water temperature varies.

Average water temperature °C	30	40	50
Multiplicational coefficient	1.04	1.02	1

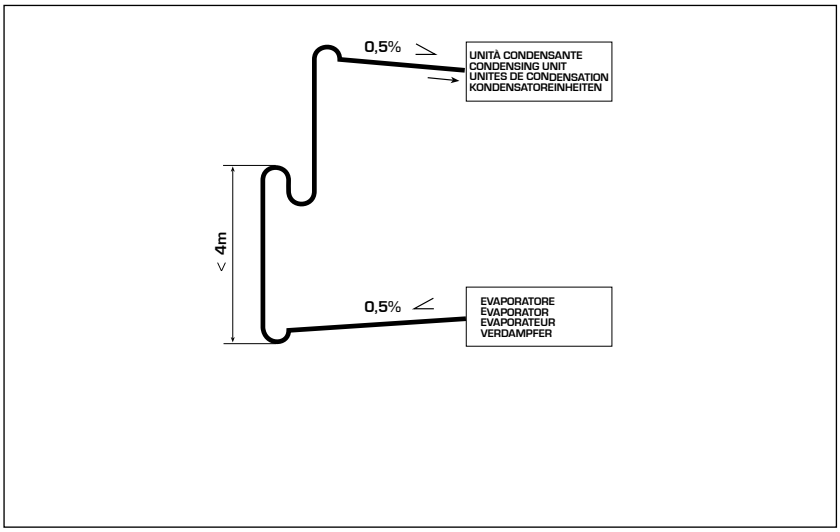
20. MEASUREMENTS OF THE CHILLERS LINES VERSIONS (C)

COOLING LINES							
Model	**Line length [m]**	**Suction line f [mm]**		**Liquid line f [mm]**		**Refrigerant R410A per metre of line [g/m]**	**Refrigerant R410A per metre of line [g/m]**
		C1/C3	**C2/C4**	**C1/C3**	**C2/C4**	**C1/C3**	**C2/C4**
NRL 2800C	0-10	54	(*)67	35	35	831	868
	10-20	54	(*)67	35	35	831	868
	20-30	54	(*)67	35	35	831	868
NRL 3000C	0-10	(*)67	(*)67	35	35	868	868
	10-20	(*)67	(*)67	35	35	868	868
	20-30	(*)67	(*)67	35	35	868	868
NRL 3300C	0-10	(*)67	(*)67	35	42	868	1237
	10-20	(*)67	(*)67	35	42	868	1237
	20-30	(*)67	(*)67	35	42	868	1237
NRL 3600C	0-10	(*)67	(*)67	42	42	1237	1237
	10-20	(*)67	(*)67	42	42	1237	1237
	20-30	(*)67	(*)67	42	42	1237	1237

(*) Parzializzazione minima 2 compressori ON

Key
C1 = Chiller circuit 1
C2 = Chiller circuit 2
C3 = Chiller circuit 3
C4 = Chiller circuit 4

If the evaporator is positioned lower than the condenser, drain-taps must be available on the suction line to draw the oil towards the compressor.
By "line length" we mean the distance between the units, measured on the liquid line. For further information, contact the head office.



21. SOUND DATA

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

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

NB:
The data refer to the version with standard fans.

The values refer to:

- water inlet temperature 12°C
- processed water temperature 7°C
- outside air temperature 35°C

NRL°/L	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]						
2800°	93.5	61.5	75.5	103.5	93.5	91.9	85.0	83.0	76.5	70.0
3000°	93.5	61.5	75.5	103.5	93.0	90.5	87.0	84.0	73.7	67.0
3300°	95.0	63.0	77.0	105.0	95.0	92.0	88.0	85.0	80.0	75.0
3600°	95.1	63.1	77.1	105.5	94.5	91.0	89.0	85.0	79.0	74.0
2800L	90.5	58.5	72.5	101.5	92.0	85.5	83.0	80.0	75.0	70.0
3000L	90.5	58.5	72.5	101.5	89.5	87.5	84.5	78.5	70.5	64.5
3300L	92.0	60.0	74.0	102.5	92.0	88.5	85.3	81.0	78.0	73.0
3600L	92.0	60.0	74.0	102.0	91.6	90.0	86.0	79.0	71.0	68.0

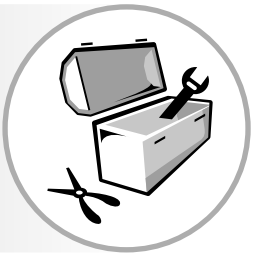
NRL H°/HL	Total sound levels			Octave band[Hz]						
	Pow. dB(A)	Pressure		125	250	500	1000	2000	4000	8000
		dB(A) 10m	dB(A) 1m	Sound power by central band frequency [dB]						
2800H	94.0	62.0	76.0	105.0	93.0	90.0	89.0	81.0	73.0	66.0
3000H	93.5	61.5	75.5	105.5	91.0	89.0	88.0	80.5	72.0	64.0
3300H	95.0	63.0	77.0	105.5	95.0	91.0	89.5	84.0	75.0	68.0
3600H	97.0	65.0	79.0	105.0	98.0	93.5	92.5	85.0	75.5	70.0
2800HL	91.0	59.0	73.0	102.5	89.0	88.0	85.5	76.0	65.0	59.0
3000HL	90.5	58.5	72.5	105.0	85.5	83.5	80.5	76.5	67.0	61.0
3300HL	92.0	60.0	74.0	104.0	91.0	88.0	85.0	81.0	71.0	65.0
3600HL	94.0	62.0	76.0	103.0	95.5	91.5	88.0	82.0	73.0	68.0

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	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)	39		39	
LOW PRESSURE TRANSDUCER				
TBP (bar)	2		2	
CHILLER CIRCUIT SAFETY VALVE				
AP (bar)	45		45	
BP (bar) only in heat pump	30		30	
FANS THERMOMAGNETIC SWITCHES [°] **The calibration is carried out on a thermomagnetic switch (single ventilation line)**				
Fans °/L	7A	7A	7A	7A
Fans H°/HL	9A	9A	9A	9A
FANS THERMOMAGNETIC SWITCHES [M] **The calibration is carried out on a thermomagnetic switch (single ventilation line)**				
Fans °/L	7A	7A	7A	7A
Fans H°/HL	9A	9A	9A	9A
NUMBER OF FANS				
No. fans °/L	4	4	4	4
No. fans H/HL	4	4	4	4

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)	39		39	
LOW PRESSURE TRANSDUCER				
TBP (bar)	2		2	
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)**				
Fans °/L	11A	11A	11A	11A
Fans H°/HL	13A	13A	13A	13A
FANS THERMOMAGNETIC SWITCHES [M] **The calibration is carried out on a thermomagnetic switch (single ventilation line)**				
Fans °/L	13A	13A	13A	13A
Fans H°/HL	18A	18A	18A	18A
NUMBER OF FANS				
No. fans °/L	13A	13A	13A	13A
No. fans H/HL	-	-	-	-

FOR THE INSTALLER



22. 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.

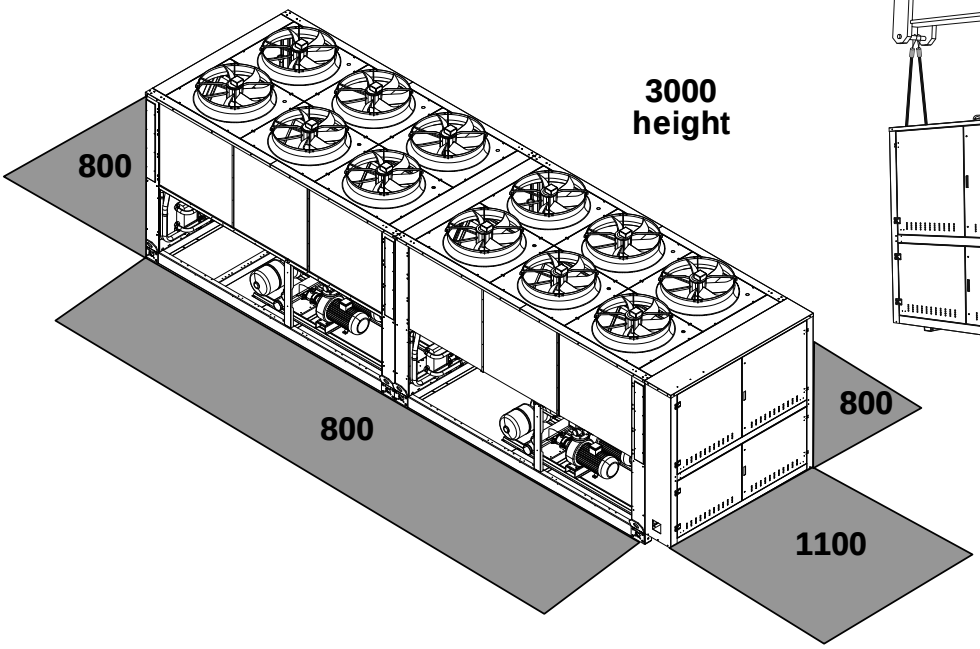
Before starting any kind of work, it is necessary TO READ CAREFULLY THE INSTRUCTIONS, AND TO PERFORM THE SAFETY CHECKS TO REDUCE ANY RISK TO A MINIMUM. All the personnel in charge must know the operations and possible risks that may arise when all the unit installation operations begin.

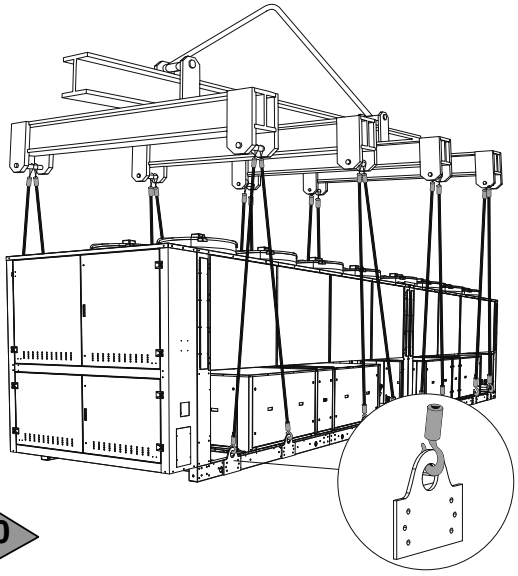
23. POSITIONING

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
- In order to avoid damaging the unit with the cables, insert protection elements between them and the machine. It is absolutely forbidden to stand beneath 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.

23.1. MINIMUM TECHNICAL SPACES (mm)

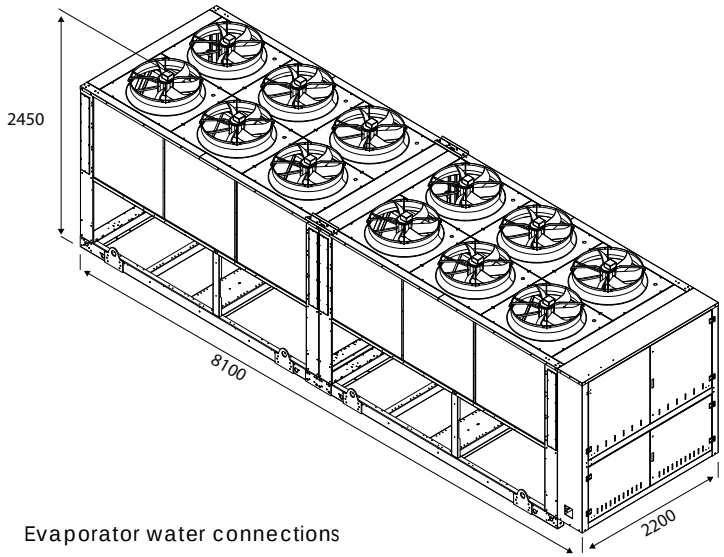




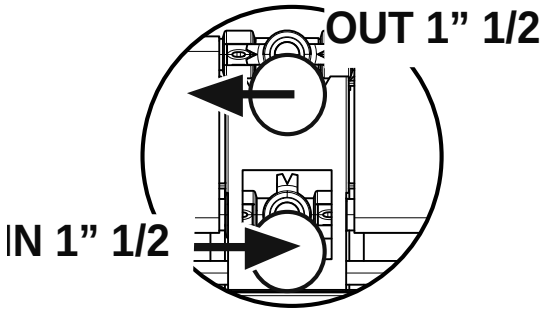
***WARNING**: ALWAYS USE ALL THE PROVIDED EYEBOLTS*

23.2. DIMENSIONAL TABLES

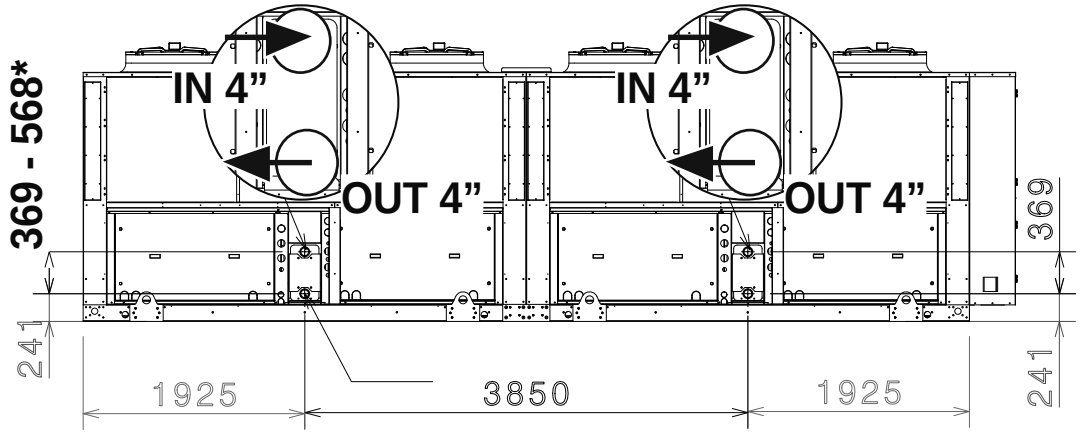
NRL 2800 - 3000 - 3300 - 3600 STANDARD



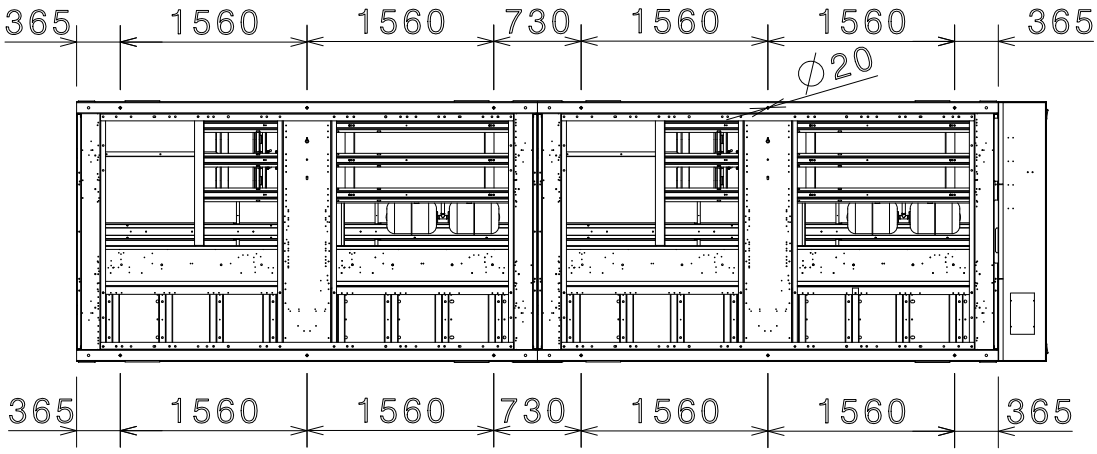
DESUPERHEATER water connections



Evaporator water connections

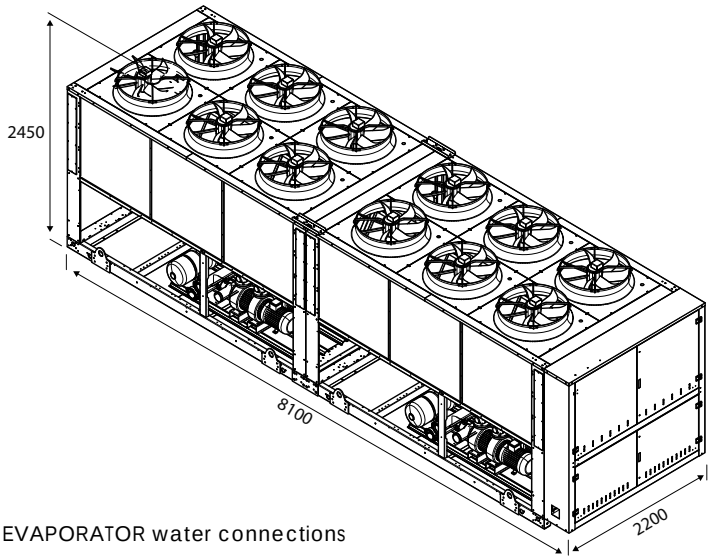


Position AVX

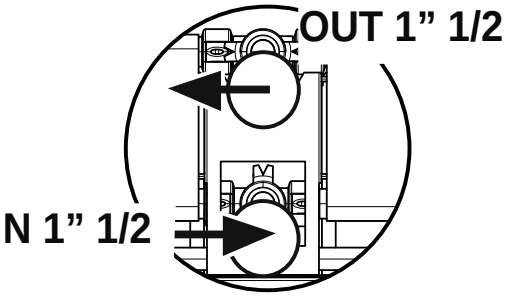


*NOTE:
The opposite table shows the variation of the position according to the exchanger type

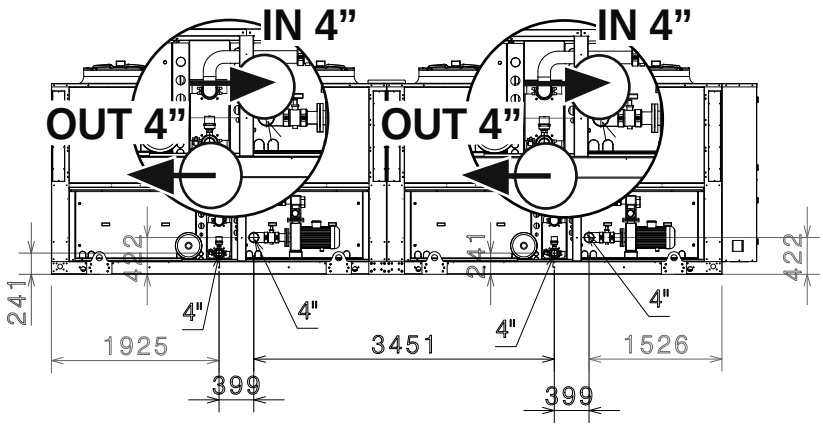
MODEL	POSITION
2800 °-L	369
3000 °-L	369
3300 °-L	568
3600 °-L	568
2800 H - HL	568
3000 H - HL	568
3300 H - HL	568
3600 H - HL	568



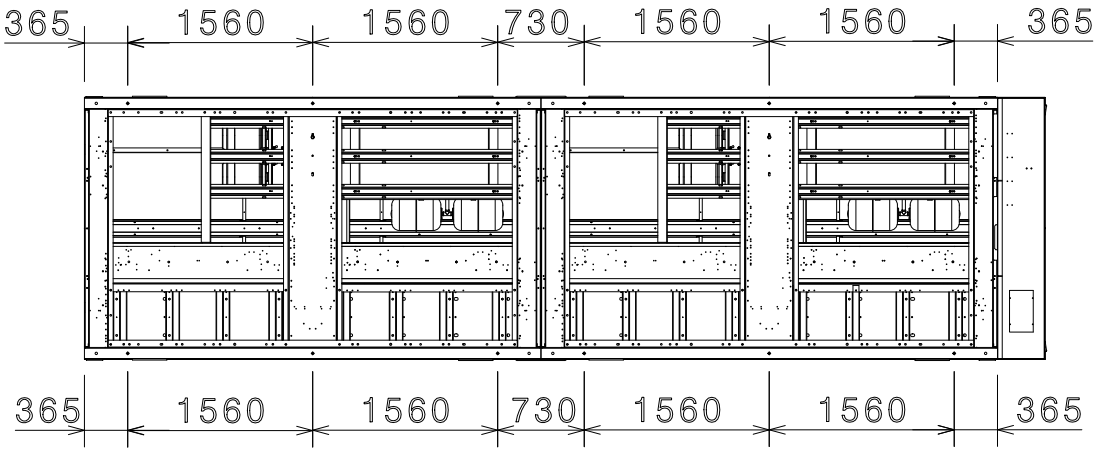
DESUPERHEATER water connections



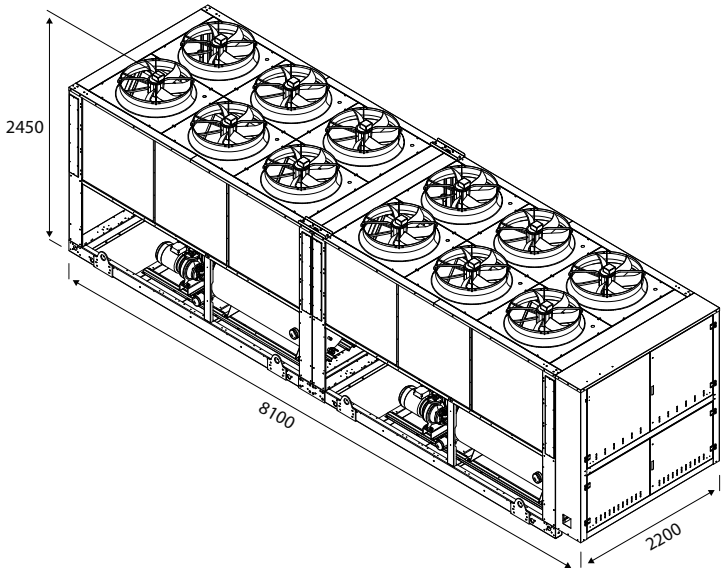
EVAPORATOR water connections



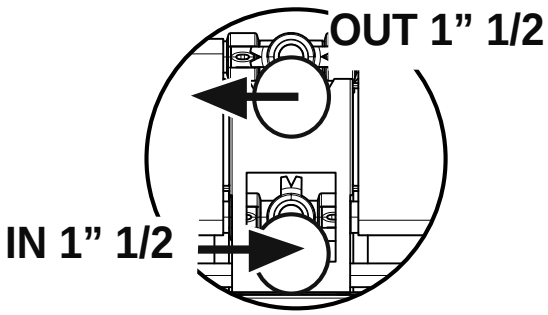
Position AVX



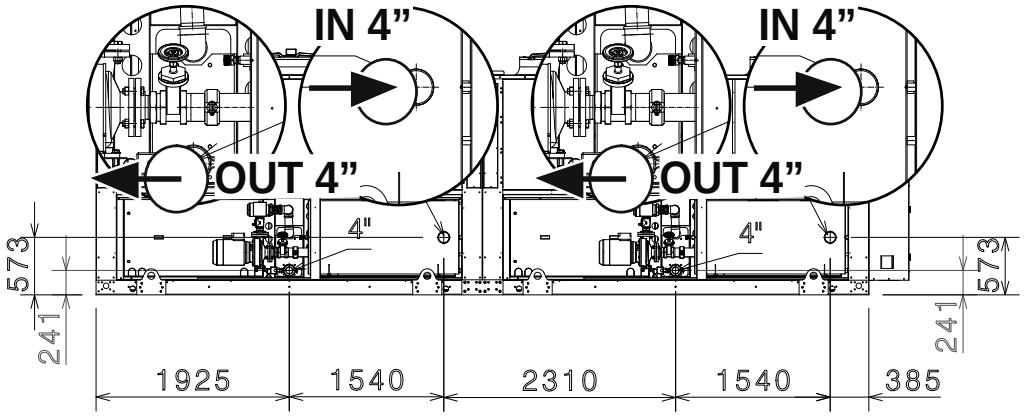
NRL 2800 - 3000 - 3300 - 3600 HYDRAULIC CONNECTIONS HYDRONIC UNIT



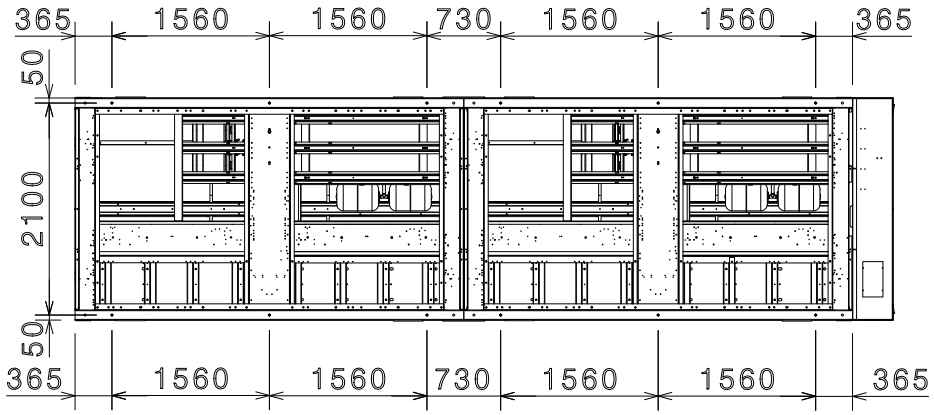
DESUPERHEATER water connections



EVAPORATOR water connections



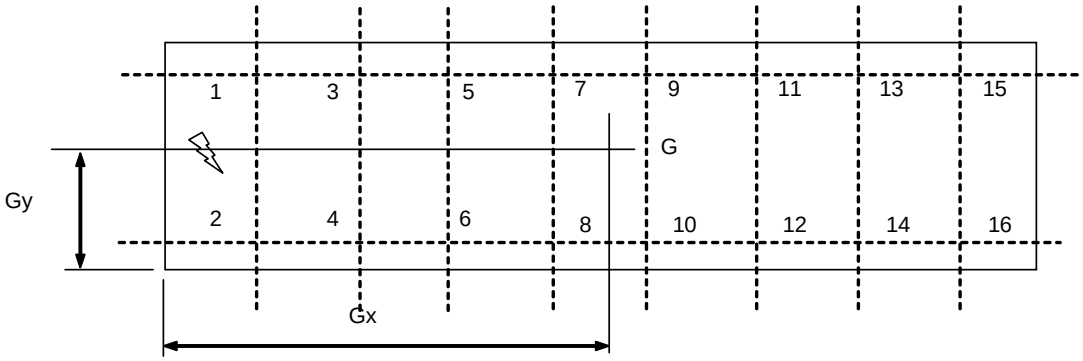
Position AVX



24. WEIGHT DISTRIBUTION AND CENTER OF GRAVITY

24.1. NRL ° - L 2800 - 3000 - 3300 -3600

MODEL		A VACUUM			RUNNING			
		CENTRE OF GRAVITY		WEIGHT	BARICENTRO		TOTAL WEIGHT	
		XG	YG	kg	XG	YG	kg	Water
NRL 2800 °/L	00	3952	781	5630	3954	783	5670	40
NRL 2800 °/L	01	3893	876	6280	3800	1032	7780	1500
NRL 2800 °/L	02	3886	888	6370	3795	1040	7870	1500
NRL 2800 °/L	03	3889	884	6340	3796	1037	7840	1500
NRL 2800 °/L	04	3877	903	6490	3789	1049	7990	1500
NRL 2800 °/L	P1	3957	828	5930	3961	854	6140	210
NRL 2800 °/L	P2	3958	841	6020	3962	866	6230	210
NRL 2800 °/L	P3	3958	836	5990	3962	862	6200	210
NRL 2800 °/L	P4	3959	852	6100	3963	876	6310	210
NRL 3000 °/L	00	3958	776	6020	3960	779	6070	50
NRL 3000 °/L	01	3897	874	6730	3808	1021	8240	1510
NRL 3000 °/L	02	3886	892	6880	3800	1034	8390	1510
NRL 3000 °/L	03	3897	874	6730	3808	1021	8240	1510
NRL 3000 °/L	04	3886	892	6880	3800	1034	8390	1510
NRL 3000 °/L	P1	3962	828	6380	3966	853	6600	220
NRL 3000 °/L	P2	3964	848	6530	3968	872	6750	220
NRL 3000 °/L	P3	3962	828	6380	3966	853	6600	220
NRL 3000 °/L	P4	3964	843	6490	3967	867	6710	220
NRL 3300 °/L	00	3977	767	6220	3979	770	6270	50
NRL 3300 °/L	01	3916	863	6930	3826	1009	8440	1510
NRL 3300 °/L	02	3905	880	7080	3818	1021	8590	1510
NRL 3300 °/L	03	3912	870	6990	3823	1014	8500	1510
NRL 3300 °/L	04	3896	894	7200	3812	1030	8710	1510
NRL 3300 °/L	P1	3980	818	6580	3984	842	6800	220
NRL 3300 °/L	P2	3982	838	6730	3985	861	6950	220
NRL 3300 °/L	P3	3981	826	6640	3985	850	6860	220
NRL 3300 °/L	P4	3983	848	6810	3986	870	7030	220
NRL 3600 °/L	00	3976	776	6420	3979	779	6480	60
NRL 3600 °/L	01	3917	868	7130	3829	1010	8650	1520
NRL 3600 °/L	02	3906	885	7280	3822	1022	8800	1520
NRL 3600 °/L	03	3913	875	7190	3826	1015	8710	1520
NRL 3600 °/L	04	3898	899	7400	3816	1031	8920	1520
NRL 3600 °/L	P1	3980	825	6780	3983	849	7010	230
NRL 3600 °/L	P2	3981	844	6930	3985	867	7160	230
NRL 3600 °/L	P3	3980	833	6840	3984	856	7070	230
NRL 3600 °/L	P4	3982	854	7010	3985	876	7240	230



Model		PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)												AVX
		1	2	3	4	5	6	7	8	9	10	11	12	
		%	%	%	%	%	%	%	%	%	%	%	%	
NRL 2800 °/L	00	7,4%	13,4%	7,6%	13,8%	4,6%	8,3%	4,6%	8,3%	6,3%	11,4%	5,1%	9,2%	785
NRL 2800 °/L	01	10,4%	11,8%	10,7%	12,1%	3,6%	4,0%	8,5%	9,6%	8,9%	10,1%	4,8%	5,4%	786
NRL 2800 °/L	02	10,5%	11,7%	10,8%	12,0%	3,5%	3,9%	8,7%	9,7%	9,0%	10,1%	4,8%	5,3%	786
NRL 2800 °/L	03	10,5%	11,8%	10,7%	12,0%	3,5%	4,0%	8,6%	9,7%	9,0%	10,1%	4,8%	5,4%	786
NRL 2800 °/L	04	10,6%	11,7%	10,9%	11,9%	3,5%	3,8%	8,8%	9,7%	9,1%	10,0%	4,7%	5,2%	786
NRL 2800 °/L	P1	7,6%	12,0%	9,0%	14,2%	4,4%	6,9%	5,0%	8,0%	7,6%	12,0%	5,1%	8,1%	787
NRL 2800 °/L	P2	7,6%	11,8%	9,3%	14,3%	4,4%	6,7%	5,1%	7,9%	7,8%	12,1%	5,1%	7,9%	787
NRL 2800 °/L	P3	7,6%	11,9%	9,2%	14,3%	4,4%	6,8%	5,1%	7,9%	7,7%	12,0%	5,1%	8,0%	787
NRL 2800 °/L	P4	7,7%	11,6%	9,5%	14,4%	4,3%	6,5%	5,2%	7,8%	8,0%	12,1%	5,1%	7,7%	787
NRL 3000 °/L	00	7,0%	12,9%	8,1%	14,8%	4,0%	7,4%	4,7%	8,6%	6,7%	12,3%	4,8%	8,7%	791
NRL 3000 °/L	01	10,0%	11,5%	11,0%	12,7%	3,1%	3,6%	8,5%	9,8%	9,3%	10,7%	4,5%	5,2%	792
NRL 3000 °/L	02	10,2%	11,5%	11,2%	12,6%	3,0%	3,4%	8,7%	9,8%	9,4%	10,6%	4,5%	5,0%	792
NRL 3000 °/L	03	10,0%	11,5%	11,0%	12,7%	3,1%	3,6%	8,5%	9,8%	9,3%	10,7%	4,5%	5,2%	792
NRL 3000 °/L	04	10,2%	11,5%	11,2%	12,6%	3,0%	3,4%	8,7%	9,8%	9,4%	10,6%	4,5%	5,0%	792
NRL 3000 °/L	P1	7,3%	11,5%	9,6%	15,1%	3,8%	6,1%	5,2%	8,2%	8,1%	12,8%	4,8%	7,6%	793
NRL 3000 °/L	P2	7,3%	11,2%	10,0%	15,2%	3,8%	5,8%	5,3%	8,1%	8,5%	12,9%	4,8%	7,3%	793
NRL 3000 °/L	P3	7,3%	11,5%	9,6%	15,1%	3,8%	6,1%	5,2%	8,2%	8,1%	12,8%	4,8%	7,6%	793
NRL 3000 °/L	P4	7,3%	11,2%	9,9%	15,2%	3,8%	5,8%	5,3%	8,1%	8,4%	12,9%	4,8%	7,4%	793
NRL 3300 °/L	00	6,6%	12,2%	8,2%	15,2%	4,1%	7,6%	4,5%	8,3%	7,0%	13,0%	4,7%	8,7%	791
NRL 3300 °/L	01	9,3%	11,3%	10,9%	13,2%	3,3%	4,0%	7,9%	9,6%	9,4%	11,3%	4,5%	5,4%	792
NRL 3300 °/L	02	9,5%	11,2%	11,1%	13,1%	3,2%	3,8%	8,1%	9,6%	9,5%	11,2%	4,5%	5,3%	792
NRL 3300 °/L	03	9,4%	11,2%	11,0%	13,1%	3,3%	3,9%	8,0%	9,6%	9,4%	11,3%	4,5%	5,4%	792
NRL 3300 °/L	04	9,6%	11,2%	11,2%	13,0%	3,2%	3,7%	8,3%	9,6%	9,6%	11,1%	4,4%	5,1%	792
NRL 3300 °/L	P1	6,8%	11,1%	9,5%	15,5%	3,9%	6,4%	4,9%	7,9%	8,2%	13,4%	4,7%	7,7%	793
NRL 3300 °/L	P2	6,9%	10,8%	9,9%	15,5%	3,9%	6,1%	5,0%	7,9%	8,6%	13,4%	4,7%	7,4%	793
NRL 3300 °/L	P3	6,8%	11,0%	9,7%	15,5%	3,9%	6,3%	4,9%	7,9%	8,4%	13,4%	4,7%	7,6%	793
NRL 3300 °/L	P4	6,9%	10,6%	10,1%	15,6%	3,8%	5,9%	5,1%	7,8%	8,7%	13,5%	4,7%	7,3%	793
NRL 3600 °/L	00	6,6%	12,1%	8,4%	15,2%	4,0%	7,3%	4,6%	8,4%	7,2%	13,1%	4,7%	8,5%	791
NRL 3600 °/L	01	9,3%	11,2%	11,0%	13,2%	3,2%	3,9%	8,0%	9,6%	9,5%	11,4%	4,5%	5,4%	792
NRL 3600 °/L	02	9,4%	11,1%	11,1%	13,1%	3,2%	3,7%	8,2%	9,6%	9,6%	11,3%	4,4%	5,2%	792
NRL 3600 °/L	03	9,3%	11,2%	11,1%	13,2%	3,2%	3,8%	8,1%	9,6%	9,5%	11,3%	4,4%	5,3%	792
NRL 3600 °/L	04	9,6%	11,1%	11,2%	13,0%	3,1%	3,6%	8,3%	9,7%	9,7%	11,2%	4,4%	5,1%	792
NRL 3600 °/L	P1	6,8%	11,0%	9,7%	15,5%	3,9%	6,2%	5,0%	8,0%	8,4%	13,4%	4,7%	7,5%	793
NRL 3600 °/L	P2	6,9%	10,7%	10,0%	15,5%	3,8%	5,9%	5,1%	8,0%	8,7%	13,5%	4,7%	7,3%	793
NRL 3600 °/L	P3	6,9%	10,9%	9,8%	15,5%	3,8%	6,1%	5,1%	8,0%	8,5%	13,4%	4,7%	7,4%	793
NRL 3600 °/L	P4	6,9%	10,5%	10,2%	15,6%	3,8%	5,8%	5,2%	7,9%	8,8%	13,5%	4,7%	7,2%	793

24.2. NRL ° - L - H 2800 - 3000 - 3300 -3600

MODEL		A VACUUM			RUNNING			
		CENTRE OF GRAVITY		WEIGHT	BARICENTRO		TOTAL WEIGHT	
		XG	YG	kg	XG	YG	kg	Water
NRL 2800 °/L (H)	00	3975	783	6080	3977	786	6140	60
NRL 2800 °/L (H)	01	3918	872	6730	3825	1020	8250	1520
NRL 2800 °/L (H)	02	3911	883	6820	3821	1027	8340	1520
NRL 2800 °/L (H)	03	3913	879	6790	3822	1025	8310	1520
NRL 2800 °/L (H)	04	3902	897	6940	3814	1037	8460	1520
NRL 2800 °/L (H)	P1	3978	827	6380	3982	851	6610	230
NRL 2800 °/L (H)	P2	3979	839	6470	3982	863	6700	230
NRL 2800 °/L (H)	P3	3978	835	6440	3982	859	6670	230
NRL 2800 °/L (H)	P4	3979	849	6550	3983	873	6780	230
NRL 3000 °/L (H)	00	3979	779	6490	3982	782	6550	60
NRL 3000 °/L (H)	01	3921	870	7200	3833	1010	8720	1520
NRL 3000 °/L (H)	02	3910	887	7350	3825	1022	8870	1520
NRL 3000 °/L (H)	03	3921	870	7200	3833	1010	8720	1520
NRL 3000 °/L (H)	04	3910	887	7350	3825	1022	8870	1520
NRL 3000 °/L (H)	P1	3983	828	6850	3986	851	7080	230
NRL 3000 °/L (H)	P2	3984	846	7000	3987	868	7230	230
NRL 3000 °/L (H)	P3	3983	828	6850	3986	851	7080	230
NRL 3000 °/L (H)	P4	3984	841	6960	3987	864	7190	230
NRL 3300 °/L (H)	00	3996	767	6660	3998	771	6720	60
NRL 3300 °/L (H)	01	3937	857	7370	3848	997	8890	1520
NRL 3300 °/L (H)	02	3926	874	7520	3840	1009	9040	1520
NRL 3300 °/L (H)	03	3932	864	7430	3845	1002	8950	1520
NRL 3300 °/L (H)	04	3917	887	7640	3834	1018	9160	1520
NRL 3300 °/L (H)	P1	3998	815	7020	4001	839	7250	230
NRL 3300 °/L (H)	P2	3999	834	7170	4002	856	7400	230
NRL 3300 °/L (H)	P3	3998	823	7080	4002	846	7310	230
NRL 3300 °/L (H)	P4	3999	843	7250	4002	865	7480	230
NRL 3600 °/L (H)	00	3995	776	6880	3998	780	6950	70
NRL 3600 °/L (H)	01	3938	863	7590	3852	999	9120	1530
NRL 3600 °/L (H)	02	3927	879	7740	3844	1010	9270	1530
NRL 3600 °/L (H)	03	3934	869	7650	3849	1003	9180	1530
NRL 3600 °/L (H)	04	3919	892	7860	3838	1019	9390	1530
NRL 3600 °/L (H)	P1	3997	822	7240	4001	845	7480	240
NRL 3600 °/L (H)	P2	3998	840	7390	4002	862	7630	240
NRL 3600 °/L (H)	P3	3998	829	7300	4001	852	7540	240
NRL 3600 °/L (H)	P4	3999	849	7470	4002	870	7710	240

Model		PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)												
		1	2	3	4	5	6	7	8	9	10	11	12	AVX
		%	%	%	%	%	%	%	%	%	%	%	%	
NRL 2800 °/L (H)	00	7,2%	12,9%	7,8%	14,1%	4,5%	8,2%	4,6%	8,2%	6,6%	11,9%	5,0%	9,0%	785
NRL 2800 °/L (H)	01	10,0%	11,6%	10,7%	12,4%	3,6%	4,2%	8,2%	9,5%	9,1%	10,5%	4,8%	5,5%	786
NRL 2800 °/L (H)	02	10,1%	11,5%	10,8%	12,3%	3,6%	4,1%	8,4%	9,5%	9,2%	10,5%	4,7%	5,4%	786
NRL 2800 °/L (H)	03	10,1%	11,5%	10,8%	12,3%	3,6%	4,1%	8,3%	9,5%	9,1%	10,5%	4,7%	5,4%	786
NRL 2800 °/L (H)	04	10,2%	11,5%	10,9%	12,2%	3,5%	3,9%	8,5%	9,6%	9,3%	10,4%	4,7%	5,3%	786
NRL 2800 °/L (H)	P1	7,4%	11,7%	9,1%	14,5%	4,4%	6,9%	5,0%	7,9%	7,8%	12,4%	5,1%	8,0%	787
NRL 2800 °/L (H)	P2	7,4%	11,4%	9,4%	14,5%	4,3%	6,7%	5,0%	7,8%	8,0%	12,4%	5,0%	7,8%	787
NRL 2800 °/L (H)	P3	7,4%	11,5%	9,3%	14,5%	4,3%	6,8%	5,0%	7,8%	7,9%	12,4%	5,0%	7,9%	787
NRL 2800 °/L (H)	P4	7,4%	11,3%	9,6%	14,6%	4,3%	6,5%	5,1%	7,8%	8,2%	12,5%	5,0%	7,7%	787
NRL 3000 °/L (H)	00	6,8%	12,4%	8,3%	15,0%	4,0%	7,3%	4,7%	8,4%	7,0%	12,7%	4,7%	8,6%	791
NRL 3000 °/L (H)	01	9,6%	11,3%	11,0%	13,0%	3,2%	3,7%	8,2%	9,7%	9,4%	11,1%	4,5%	5,3%	792
NRL 3000 °/L (H)	02	9,8%	11,2%	11,2%	12,9%	3,1%	3,6%	8,4%	9,7%	9,5%	11,0%	4,5%	5,1%	792
NRL 3000 °/L (H)	03	9,6%	11,3%	11,0%	13,0%	3,2%	3,7%	8,2%	9,7%	9,4%	11,1%	4,5%	5,3%	792
NRL 3000 °/L (H)	04	9,8%	11,2%	11,2%	12,9%	3,1%	3,6%	8,4%	9,7%	9,5%	11,0%	4,5%	5,1%	792
NRL 3000 °/L (H)	P1	7,0%	11,2%	9,7%	15,3%	3,9%	6,1%	5,1%	8,1%	8,3%	13,1%	4,7%	7,5%	793
NRL 3000 °/L (H)	P2	7,1%	10,9%	10,0%	15,4%	3,8%	5,8%	5,2%	8,0%	8,6%	13,2%	4,7%	7,3%	793
NRL 3000 °/L (H)	P3	7,0%	11,2%	9,7%	15,3%	3,9%	6,1%	5,1%	8,1%	8,3%	13,1%	4,7%	7,5%	793
NRL 3000 °/L (H)	P4	7,1%	10,9%	9,9%	15,4%	3,8%	5,9%	5,2%	8,0%	8,5%	13,2%	4,7%	7,3%	793
NRL 3300 °/L (H)	00	6,6%	12,2%	8,2%	15,2%	4,1%	7,6%	4,5%	8,3%	7,0%	13,0%	4,7%	8,7%	791
NRL 3300 °/L (H)	01	9,3%	11,3%	10,9%	13,2%	3,3%	4,0%	7,9%	9,6%	9,4%	11,3%	4,5%	5,4%	792
NRL 3300 °/L (H)	02	9,5%	11,2%	11,1%	13,1%	3,2%	3,8%	8,1%	9,6%	9,5%	11,2%	4,5%	5,3%	792
NRL 3300 °/L (H)	03	9,4%	11,2%	11,0%	13,1%	3,3%	3,9%	8,0%	9,6%	9,4%	11,3%	4,5%	5,4%	792
NRL 3300 °/L (H)	04	9,6%	11,2%	11,2%	13,0%	3,2%	3,7%	8,3%	9,6%	9,6%	11,1%	4,4%	5,1%	792
NRL 3300 °/L (H)	P1	6,8%	11,1%	9,5%	15,5%	3,9%	6,4%	4,9%	7,9%	8,2%	13,4%	4,7%	7,7%	793
NRL 3300 °/L (H)	P2	6,9%	10,8%	9,9%	15,5%	3,9%	6,1%	5,0%	7,9%	8,6%	13,4%	4,7%	7,4%	793
NRL 3300 °/L (H)	P3	6,8%	11,0%	9,7%	15,5%	3,9%	6,3%	4,9%	7,9%	8,4%	13,4%	4,7%	7,6%	793
NRL 3300 °/L (H)	P4	6,9%	10,6%	10,1%	15,6%	3,8%	5,9%	5,1%	7,8%	8,7%	13,5%	4,7%	7,3%	793
NRL 3600 °/L (H)	00	6,6%	12,1%	8,4%	15,2%	4,0%	7,3%	4,6%	8,4%	7,2%	13,1%	4,7%	8,5%	791
NRL 3600 °/L (H)	01	9,3%	11,2%	11,0%	13,2%	3,2%	3,9%	8,0%	9,6%	9,5%	11,4%	4,5%	5,4%	792
NRL 3600 °/L (H)	02	9,4%	11,1%	11,1%	13,1%	3,2%	3,7%	8,2%	9,6%	9,6%	11,3%	4,4%	5,2%	792
NRL 3600 °/L (H)	03	9,3%	11,2%	11,1%	13,2%	3,2%	3,8%	8,1%	9,6%	9,5%	11,3%	4,4%	5,3%	792
NRL 3600 °/L (H)	04	9,6%	11,1%	11,2%	13,0%	3,1%	3,6%	8,3%	9,7%	9,7%	11,2%	4,4%	5,1%	792
NRL 3600 °/L (H)	P1	6,8%	11,0%	9,7%	15,5%	3,9%	6,2%	5,0%	8,0%	8,4%	13,4%	4,7%	7,5%	793
NRL 3600 °/L (H)	P2	6,9%	10,7%	10,0%	15,5%	3,8%	5,9%	5,1%	8,0%	8,7%	13,5%	4,7%	7,3%	793
NRL 3600 °/L (H)	P3	6,9%	10,9%	9,8%	15,5%	3,8%	6,1%	5,1%	8,0%	8,5%	13,4%	4,7%	7,4%	793
NRL 3600 °/L (H)	P4	6,9%	10,5%	10,2%	15,6%	3,8%	5,8%	5,2%	7,9%	8,8%	13,5%	4,7%	7,2%	793

25. HYDRAULIC CIRCUIT

The NRL consists ofTWO 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 (SUW) 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.

25.1. 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 undirectional 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.

25.2. 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.

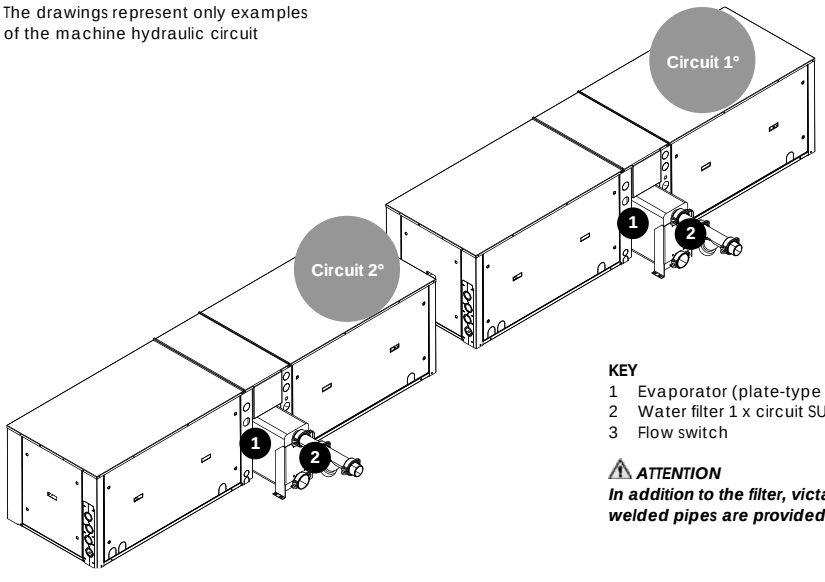
The system is loaded at a pressure between 1 and 2 bar.
It is advisable to repeat this operation once the machine has worked for some hours and to periodically check the system pressure, restoring if it drops below 1 bar. Check the hydraulic seal of the joints.

25.3. 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.
- **In case of prolonged shut-down of the unit during winter (if not added with glycol) or for other inconveniences, drain the chiller hydraulic circuit by the corresponding knobs (see fig.1 and fig.2)**

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.

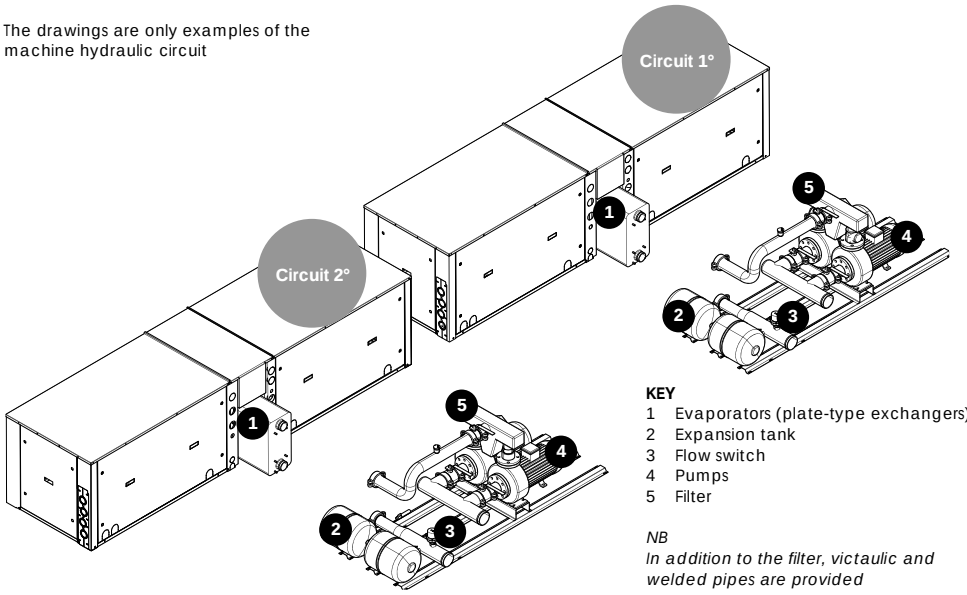
The drawings represent only examples of the machine hydraulic circuit



KEY
1 Evaporator (plate-type exchangers)
2 Water filter 1 x circuit SUPPLIED
3 Flow switch

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

The drawings are only examples of the machine hydraulic circuit

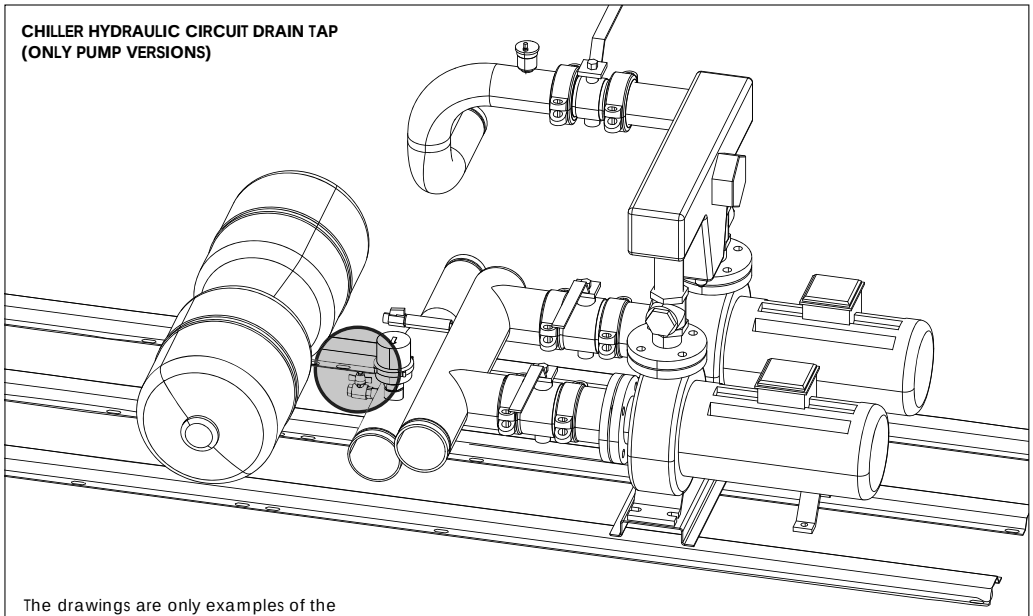


KEY

1 Evaporators (plate-type exchangers)
2 Expansion tank
3 Flow switch
4 Pumps
5 Filter

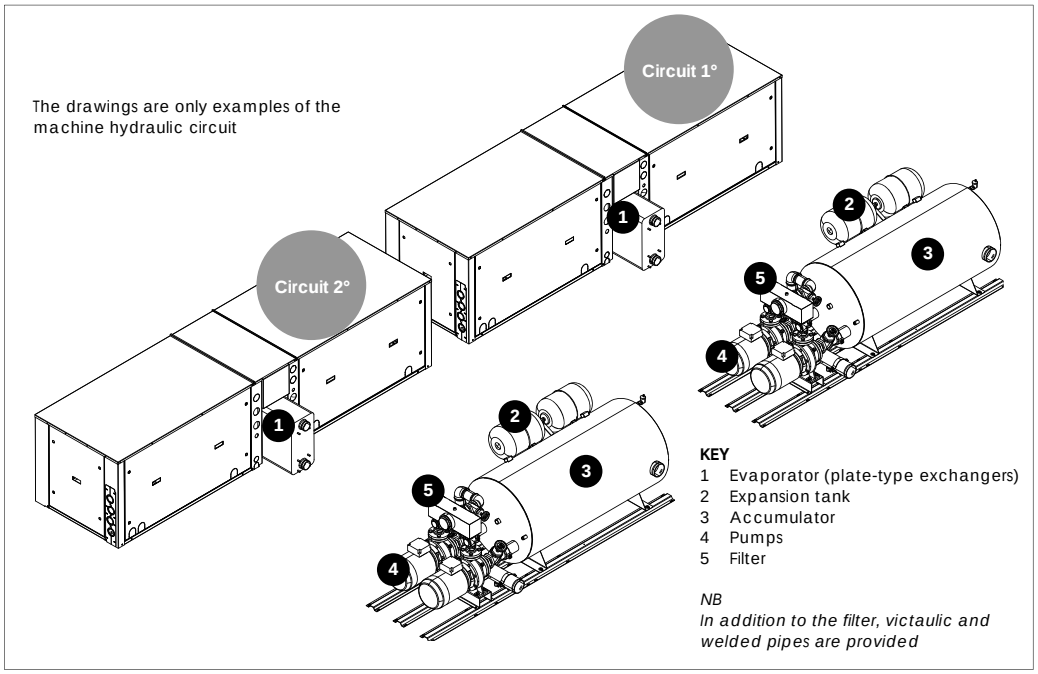
NB
In addition to the filter, victaulic and welded pipes are provided

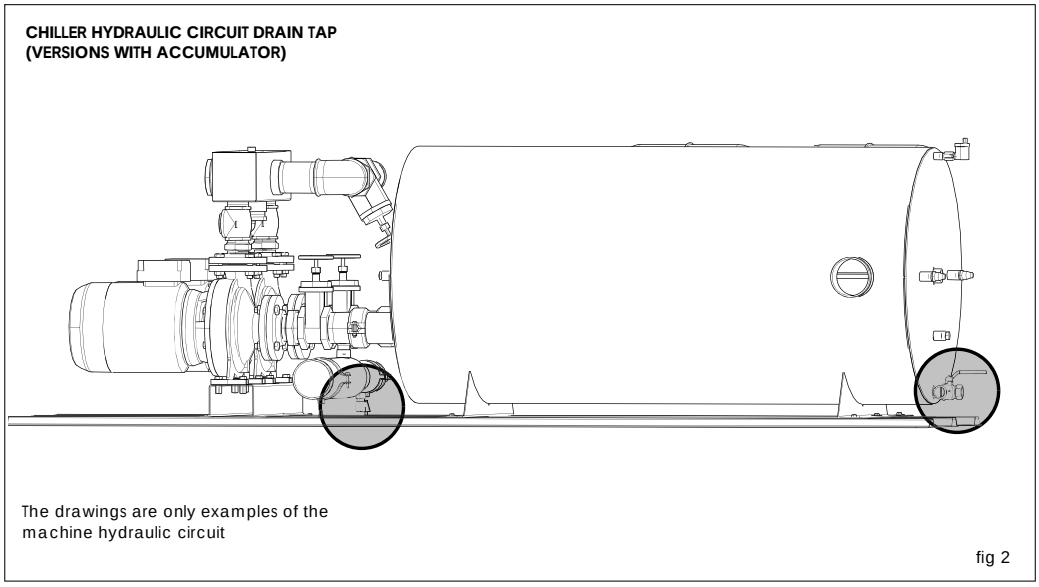
CHILLER HYDRAULIC CIRCUIT DRAIN TAP (ONLY PUMP VERSIONS)

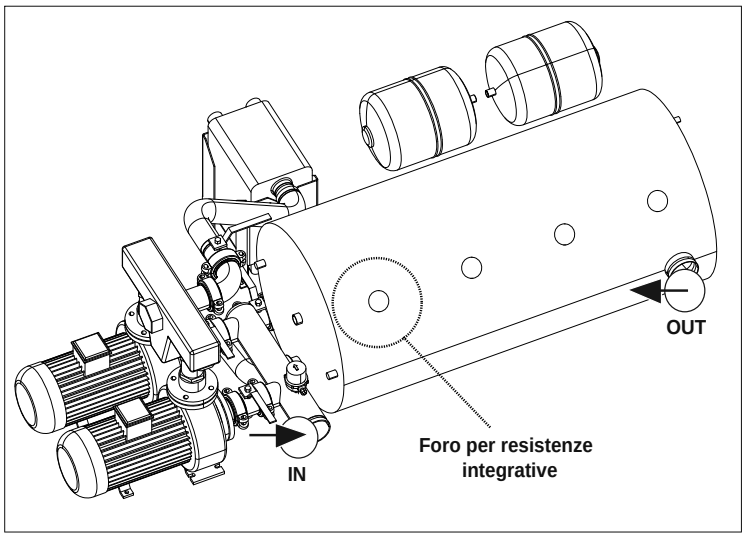


The drawings are only examples of the machine hydraulic circuit

fig 1







NB:
for all sizes, with the pre-installation of the additional resistance, the water flow will be reversed according to the standard version.
The tank is then set downstream of the heat exchanger (see fig.)

26. ELECTRICAL WIRINGS

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.

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.

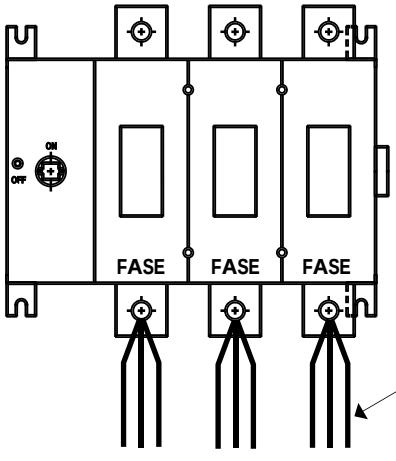
26.1. RECOMMENDED SECTION OF ELECTRIC CABLES

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

NRL	VERSIONS	POWER SUPPLIES	NO POWER SUPPLY	SEZIONE A				SEC. B mm²	Earth mm²	IL (A)
				no. cable for phase	sect. single cable mm²	total no. cables	no. phase			
2800	standard	400V-3-50Hz	1	3	240	9	3	1.5	70	250
3000			1	3	240	9	3	1.5	95	315
3300			1	4	185	12	3	1.5	120	315
3600			1	4	185	12	3	1.5	120	400
2800	with hydronic kit		1	3	240	9	3	1.5	185	630
3000			1	3	240	9	3	1.5	95	315
3300			1	4	185	12	3	1.5	120	315
3600			1	4	185	12	3	1.5	120	400

KEY

SECT.A	*Power supply*
SECT.B	*Remote panel*
EARTH	*Earth to bring to the machine*
IL	*Main switch*



Example of electrical connection

NS 2800 standard n° 3 phase
n° 3 cables for phase
240 mm² sez. single cable
n° 9 total cables

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.

26.2. CONNECTION TO THE POWER SUPPLY

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

26.2.1. 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

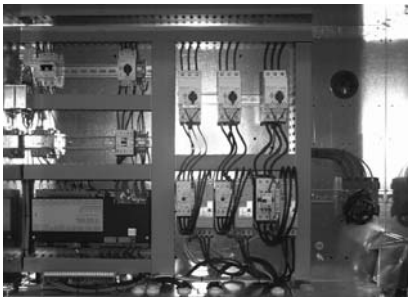


Fig.1

26.3. ELECTRICAL POWER CONNECTION

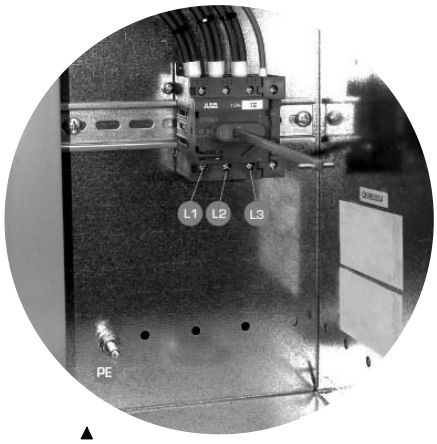
- For functional connection of the unit take the supply power cable to the electrical panel inside the unit fig.1 in the previous page and connect it to the knife switch terminals observing the phase, and the earth. fig.2

26.4. 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.

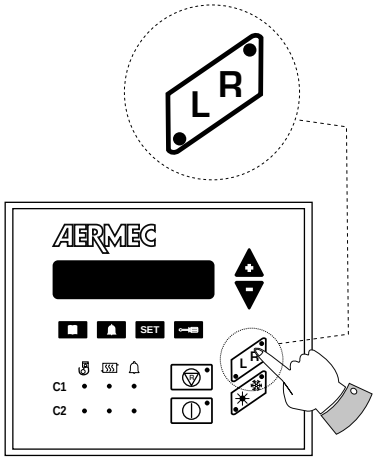
26.4.1. Auxiliary switch (IAD)

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



26.4.2. 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.

26.4.3. External alarm (EA)

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

26.4.4. Connection PR3 (standard)

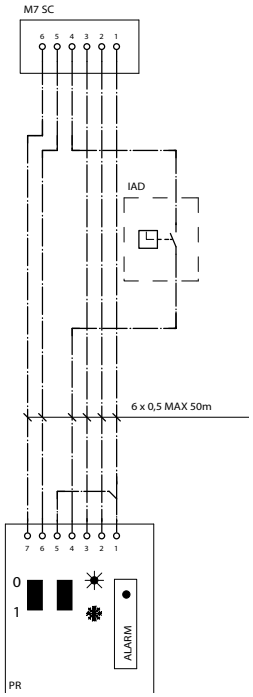
Connect the remote panel PR3 to the control board M7 SC (as shown below), remember that the maximum allowed distance is 50 m.

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.

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.

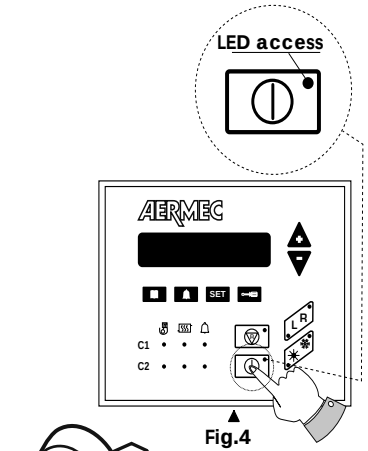


Fig.4

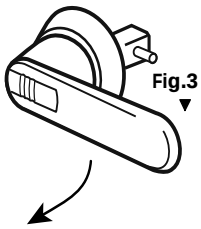


Fig.3

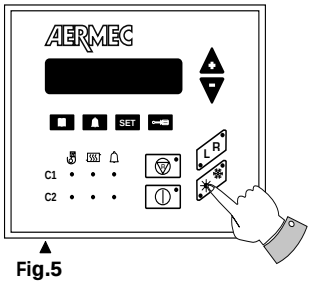
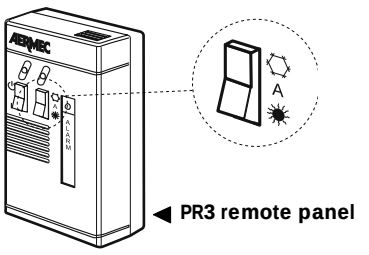


Fig.5



PR3 remote panel

27. CONTROL AND FIRST START-UP

27.1. 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.
-

27.2. 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.

27.3. 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%.

27.3.1. 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.

27.3.2. Season change of PR3

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

28. FUNCTIONING CHARACTERISTICS

28.1. COOLING SET POINT

(Default defined) = 7°C, Δt = 5°C.

28.2. 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.

28.3. 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.

28.4. 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).

28.5. 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

28.6. WATER FLOW RATE ALARM

The GR3 provides the management of a water flow rate alarm commanded from a flow switch standardly installed on the machine. This safety type can occur after the first 10 seconds of operation of the pump if the water flow rate is not sufficient. This alarm sets the block of the compressor and the pump.

29. REGULAR MAINTENANCE

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:

29.6.1. 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

29.6.2. Electric circuit

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

29.6.3. 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.

29.6.4. 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.

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.

30. 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 leaks, the refrigerant comes out and

It is advisable to keep a machine booklet (not supplied, but provided by the user), in order to keep trace of the operations carried out on the unit. In this way, it will be easier to organise the operations properly and facilitate failure prevention and troubleshooting in the machine.
In the booklet, write down date, type of operation carried out (routine maintenance, inspection or repair), description of the operation, measures taken...

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.

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.

30.6.1. 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.

AERMEC
air conditioning

37040 Bevilacqua (VR) - Italy
Via Roma, 996 - Tel. (+39) 0442 633111
Telefax (+39) 0442 93730 – (+39) 0442 93566
www .aermec. com

CE

carta reciclata
recycled paper
papier recyclé
recycled papier