



Installation Manual

Chiller
Air/Water
Indoor Installation

NLC
0750 A



EN



1606.4037360_00

Dear Customer,

Thank you for choosing an AERMEC product. This product is the result of many years of experience and in-depth engineering research, and it is built using top quality materials and advanced technologies. We constantly monitor the quality level, and as a result AERMEC products are synonymous with Safety, Quality, and Reliability.

Aermec reserves the right to make all modification deemed necessary for improving the product at any time with any modification of technical data.

Thank you again.
AERMEC S.p.A

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1. GENERAL WARNINGS FOR THE INSTALLER

The NLC AERMEC units are constructed according to the recognised technical standards and safety regulations. They have been designed for air conditioning and must be used for this purpose in accordance with their technical features. 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.

PRESERVATION OF 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 various countries.

The warranty of the device does not in any case cover costs incurred as a result of motorised ladders, scaffolding or any other lifting systems made necessary to carry out the operations under warranty.

Do not modify or tamper with the appliance as dangerous situations may be created and the manufacturer will not be liable for any damage caused. The warranty shall not be valid if the indications mentioned above are not observed.

SAFETY PRECAUTIONS AND INSTALLATION REGULATIONS

The appliance must be installed by an authorised and qualified technician, in compliance with the national legislation in force in the country of destination.

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 REDUCE ALL HAZARDS TO A MINIMUM. All the personnel in charge must be aware of the operations and the risks that may arise when all the unit installation operations begin.

WARRANTY

The warranty of the device does not cover costs incurred as a result of ladders, scaffolding or any other lifting systems made necessary to carry out operations under warranty.

Do not modify or tamper with the chiller as this may cause dangerous situations and the manufacturer will not be liable for any damage caused. The warranty shall not be valid if the indications mentioned above are not observed.

SAFETY PRECAUTIONS AND INSTALLATION REGULATIONS

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). AERMEC shall not be held responsible for any damage whatsoever resulting from the non-compliance with these instructions.

Before starting any 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 be aware of the operations and the risks that may arise when all the unit installation operations begin.

PRODUCT IDENTIFICATION

The units can be identified using:

PACKAGING LABEL

- that includes the product identification data

TECHNICAL LABEL

REGULATIONS RESPECTED IN DESIGNING AND CONSTRUCTING THE UNIT

Standards and Directives respected on designing and constructing the unit:

PROTECTION RATING
IP 20

ACOUSTIC PART:

1. ISO DIS 9614/2 (INTENSIMETRIC METHOD))
2. SOUND POWER (EN ISO 9614-2)
3. SOUND PRESSURE (EN ISO 3744)

REFRIGERANT GAS:

This unit contains fluoride gases with greenhouse effect covered by the Kyoto Protocol. Maintenance and disposal must only be performed by qualified staff.

STANDARD:

UL 1995
Heating and cooling equipment.
ANSI/NFPA
Standard 70 National Electrical code (N.E.C.).
CSA C.22.1.- C.22.2
Safety Standard Electrical Installation.

REFRIGERANT GAS

This unit contains fluorinated greenhouse gases covered by the Kyoto Protocol. Maintenance and disposal operations must be only carried out by qualified personnel in compliance with the standards in force.

WARNING

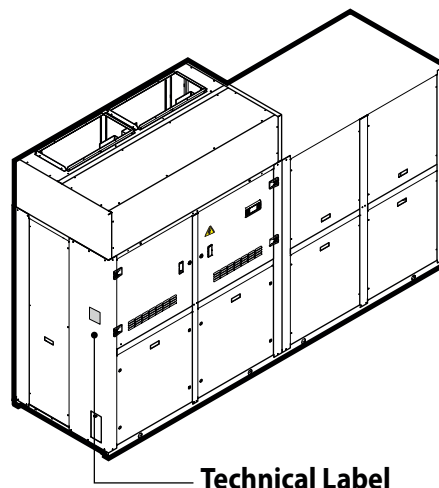
The refrigerant circuit is pressurised. Work on the appliance can be carried out only by an authorised ATS technician or by a qualified technician.

GAS R410A

The chiller is delivered with the necessary amount of R410A refrigerant for its operation. It is a chlorine-free refrigerant that does not damage the ozone layer. R410A is not flammable. However, all the maintenance operations must only be carried out by a specialised technician with the suitable protection equipment

RISK OF ELECTRIC DISCHARGE!

Before opening the chiller, the unit must be completely disconnected from the mains power supply.



2. SELECTION AND PLACE OF INSTALLATION

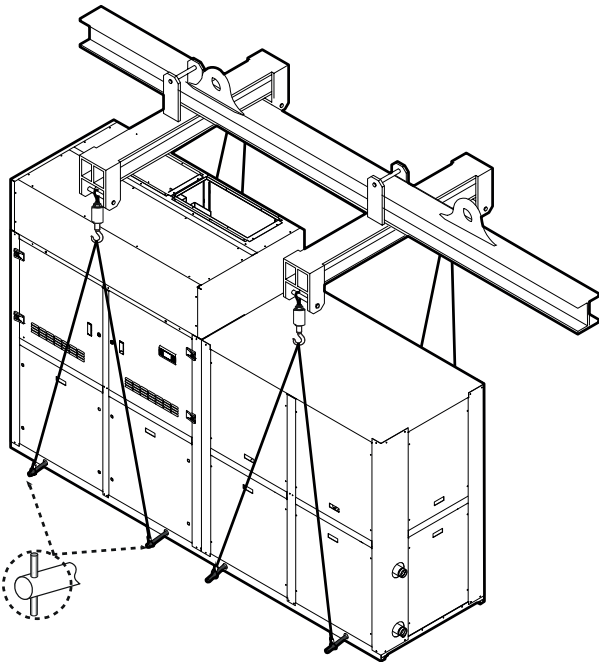
Before installing the unit, decide with the customer where it will be placed, while paying attention to the following points:

- 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.

3. POSITIONING

Before handling the unit, check the lifting capacity of the machines used, respecting the instructions on the packaging.

To handle the machine on horizontal surfaces, use a fork-lift or the like in the most appropriate way, paying attention to the distribution of the weight of the unit.

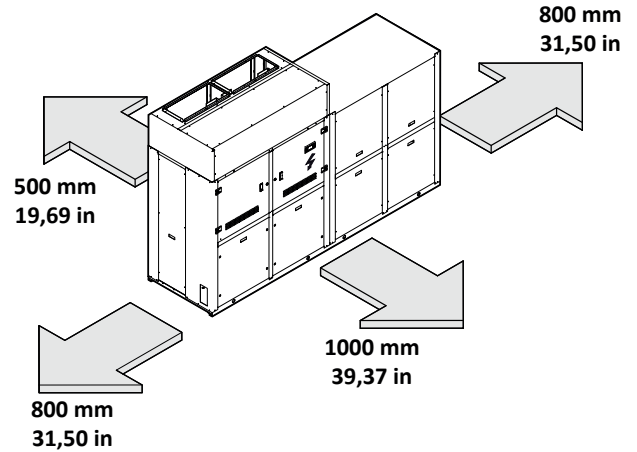


Position the unit in the place indicated by the customer, placing, between the base and the support, a rubber mattress (minimum 10 mm. thick) or anti-vibration dampers (ACCESSORIES).

For more information, see the tables regarding dimensions

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

4. MINIMUM TECHNICAL CLEARANCES



5. OPERATION OF THE NLC UNIT

The chillers and the heat pumps of the NLC range are air-cooled machines suitable for installing indoors. For this reason the air that crosses the coil needs to be expelled from the utility room using suitable piping connected to the machine itself.

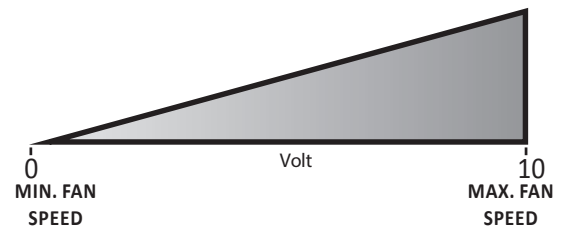
The presence of the piping involves pressure drops that will need to be overcome by the fan; the size of these losses depends on various factors like the length of the pipe, the dimensions, complexity of the pipes, etc.

The units of the NLC series are equipped with radial fans with inverter EC motor as standard, to immediately modulate the number of motor revs, thus adapting the static pressure supplied from the fan to the instantaneous drop of pressure in the tube.

⚠ When the machine is started for the first time, the installer should set (from the control panel) the number of revs of the fan capable of providing head equal to the total pressure drops of the piping.

The number of fan revs is generally less than the maximum number of revs the fan is capable of.

The number of revs is set indirectly through a parameter expressed in volts, which can vary from 0 to 10V:



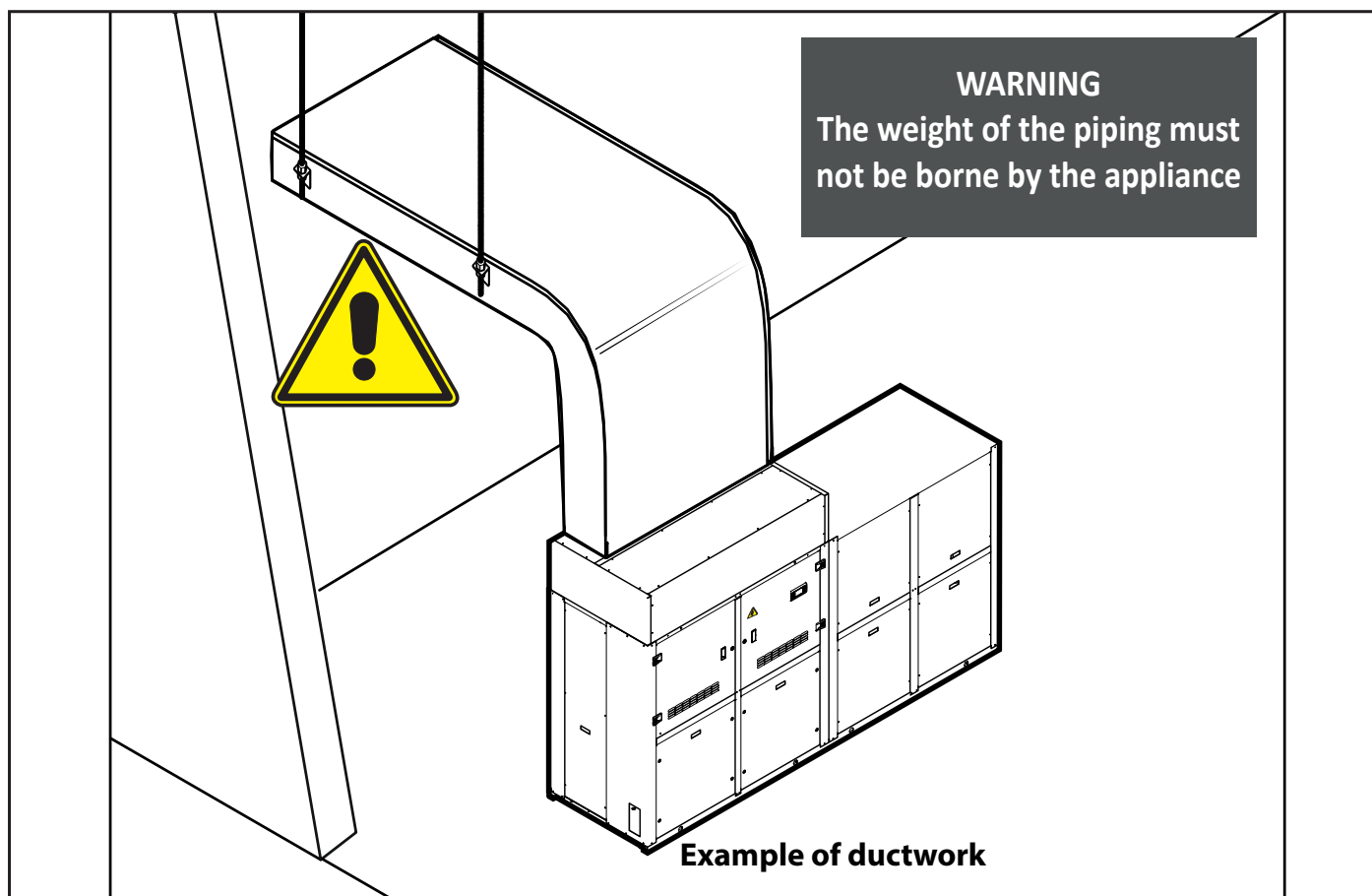
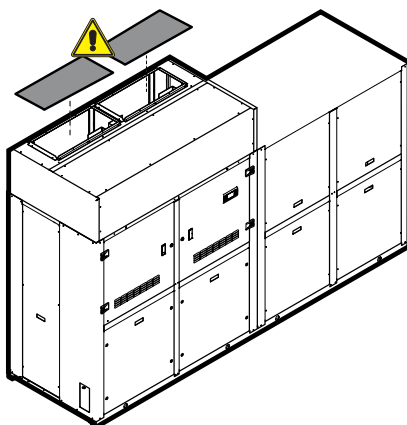
All the units are factory set for 0 Pa , to change the static useful pressure of the fans, follow the procedure set out in THE MANUAL USE - INSTALLER MENU

6. MAX STATIC USEFUL PRESSURE OF THE FANS

NLC A	Total air flow rate	Total air flow rate cfm	ESP [Pa]					Max ESP [Pa]
			0	100	200	300	400	
			Parameter fans max Volts [V]					
0750	69000	40611,866	6,6/8,3	7,5/8,7	8,3/9,2	9,2/9,6	10,0/10,0	400

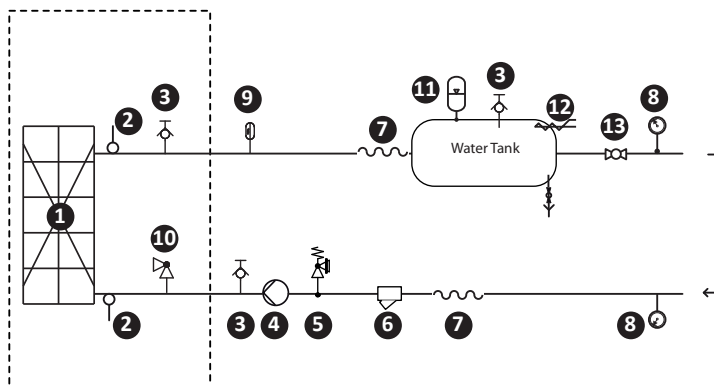


WARNING
Remove the safety protections
before carrying out the
connection to the air exhaust
ducts.



7. MAIN HYDRAULIC CIRCUITS

NLC 0750 A



COMPONENTS SUPPLIED AS STANDARD

1	Plate heat exchanger
2	Water temperature sensor (IN/OUT)
3	Air drain valve
10	Water drain cock

RECOMMENDED / OBLIGATORY COMPONENTS (NOT SUPPLIED) THAT ARE THE RESPONSIBILITY OF THE INSTALLER

3	Air drain valve
4	Pump
5	Safety valve (obligatory)
6	Water filter (obligatory)
7	Anti-vibration joints
8	Pressure gauge
9	Flow switch (obligatory)
10	Water drain cock
11	Expansion tank
12	Electric heater
13	Shut-off valve

Vers.	U.M.	750
Minimum water content		
A	l/kW	4
Minimum water content for process applications or operation with low outdoor temperatures and low load. Outlet water temperature adjustment. Design Δt less than 5°C / 41°F.		
A	l/kW	8
Minimum water content		
A	gal/ton	3,19
Minimum water content for process applications or operation with low outdoor temperatures and low load. Outlet water temperature adjustment. Design Δt less than 5°C / 41°F.		
A	gal/ton	6,39

Water features	
System: Chiller with plate heat exchanger	
PH	7,5-9
Electric conductivity	100-500 μ S/cm
Total hardness	4,5-8,5 dH
Temperature	< 65°C < 149°F
Oxygen content	< 0,1 ppm
Max. glycol amount	0,5
Phosphates (PO4)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,3 ppm
Alkalinity (HCO3)	70 - 300 ppm
Chloride ions (Cl-)	< 50 ppm
Sulphate ions (SO4)	< 50 ppm
Sulphide ion (S)	none
Ammonium ions (NH4)	none
Silica (SiO2)	< 30ppm

⚠ WARNING

The selection and installation of the components outside the appliance is assigned, due to his competence, to the installer who will have to operate according to the rules of good practice and in compliance with the regulations in force in the country of destination.

The hydraulic piping for connection to the appliance must be properly scaled for the actual water flow rate required by the system when operating. The water flow rate to the heat exchanger must always be constant.

Clean the system carefully before connecting the unit. This is done in order to eliminate possible residues such as welding spatter, waste, rust or any other impurity from the pipes. These substances could deposit inside and cause the appliance to malfunction. The connection pipes must be properly supported so as not to burden the appliance with their weight.

SYSTEM DRAINING

If the system is shut down during the winter, the water in the heat exchanger could freeze, causing irreparable damage to the exchanger itself.

To avoid the risk of freezing, there are three possible solutions:

- 1. Completely drain the water** from the appliance.
- 2. Operation with glycol water**, with a glycol percentage chosen on the basis of the minimum external temperature envisaged.
- 3. Use of heaters.**
In this case the heaters must always be powered for the entire winter period (machine in standby).



WARNING

Obligatory components (NOT SUPPLIED) that are the responsibility of the installer

• WATER FILTER

The **water filter** allows any impurities in the hydraulic circuits to be blocked and eliminated; impurities that could reach the heat exchanger and damage it.

It is **OBLIGATORY** to install the water filter (not supplied) at a maximum of 1 m from the cooling water inlet fitting.

The filter must have **at least the diameter of the units fittings.**

• FLOW SWITCH

The **flow switch** has the task of making sure that water is circulating in the unit.

If this is not the case, it shuts down the unit.

The unit does not start if the flow switch is not wired to the panel and should be **calibrated at 50% of the nominal capacity**

Aermec will not be responsible for any damage to the heat exchanger if there is no water filter and flow switch

8. ELECTRICAL WIRINGS

The NLC units are fully wired in the factory and only **require connection to the electrical mains and the wiring of the flow switch (see the wiring diagram supplied)**, downstream of a unit switch, as provided for by the regulations in force in the country of installation.

It is also suggested to check:

1. the characteristics of the electrical network are suitable for the absorptions indicated in the electric data table. The unit should only be powered when the installation work has finished (hydraulic and electric).
2. Respect the connection indications of the phase and earth wires.
3. The power supply line will have a relevant protection upstream against short circuits and dispersions to earth that isolate the system with respect to other utilities.
4. The voltage must be within a tolerance of $\pm 10\%$ of the nominal power supply voltage of the machine (for unbalanced three-phase unit max 3% between the phases). If these parameters are not respected, contact the energy supplier.
5. For electrical wirings use isolated double cables according to the standards in force in the different countries.

MANDATORY

1. 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.
2. It is necessary to carry out an efficient earth connection. The manufacturer can not be held responsible for any damage caused by the lack or ineffective earthing of the appliance.
3. For units with three-phase power supply check the correct connection of the phases.

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

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.

CONNECTION OF THE POWER SUPPLY TO THE MAINS

Before connecting the unit to the power supply mains, make sure that the isolating switch is open.

Open the front panel.

Use the holes in the bottom part of the framework for the main electric power supply cable and for the cables of the other external connections under the responsibility of the installer.

It is prohibited to access positions with electric cables not specifically indicated in this manual.

Avoid direct contact with the non-insulated copper piping and with the compressor.

Provide electrical connection as per wiring diagram supplied with the unit. Put back the inspection panels.

Make sure that all the protections removed for the electrical connection are put back before powering up the unit.

Set the master switch (on the outside of the appliance) to "ON".

WARNING

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, 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.

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.

It is forbidden to use the water pipes to earth the appliance.

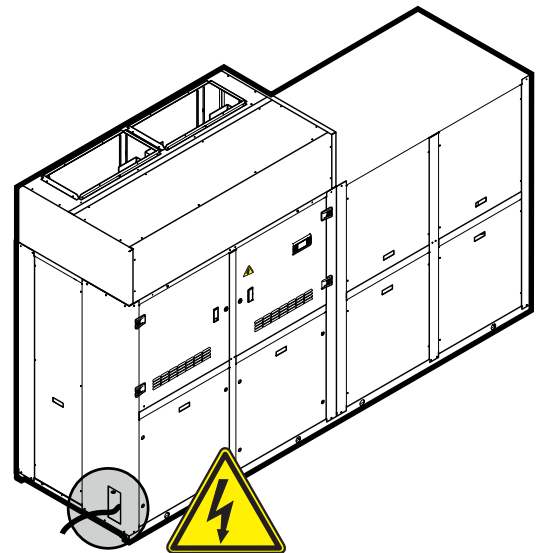
Check that all power cables are correctly secured to the terminals when switched on for the first time and after 30 days of use. Afterwards, check them every six months.

Slack terminals could cause the cables and components to overheat.



WARNING

Before carrying out any work, make sure the electricity supply is unplugged.

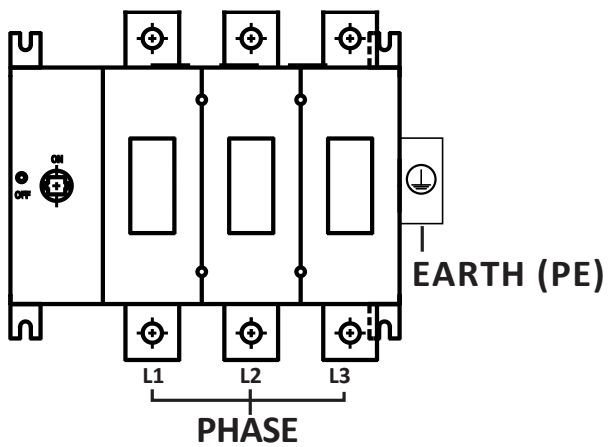


The voltage should be within a tolerance of $\pm 10\%$ of the rated supply voltage of the machine (for unbalanced three-phase units max 3% between the phases).

WIRING OF THE FLOW SWITCH IN THE ELECTRICAL PANEL

Connect the flow switch (accessory) to the J5 terminal board of the pCO5+ electronic regulation (refer to the wiring diagram supplied).

9. ELECTRICAL DATA TABLE

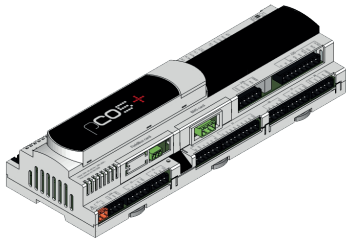


Model	Vers.*	Power	No. Compressors	No. Fans	Total absorption				Recommended cable sec. for Lmax = 50 m / 1 968,50 Inch				
					LRA	MCA	MOP	Fuse (recommended)	No. Phases	No. cables per phase	Sec. Phase	Sec. PE	IL
					[A]	[A]	[A]	[A]			[mm ²]	[mm ²]	[A]
NLC0750	A	575/3/60	4	6	223,7	121,6	145,3	125	3	1	50	25	200

10. ELECTRONIC REGULATION (PCO5)

START-UP CIRCULATING PUMP

1. Turn the unit on (ON)
2. Start Pump
3. Control water flow rate (20 seconds):
Flow switch or pressure switch (if provided)
4. Whenever alarms do not occur, the compressor starts.



ANTI-FREEZE ALARM

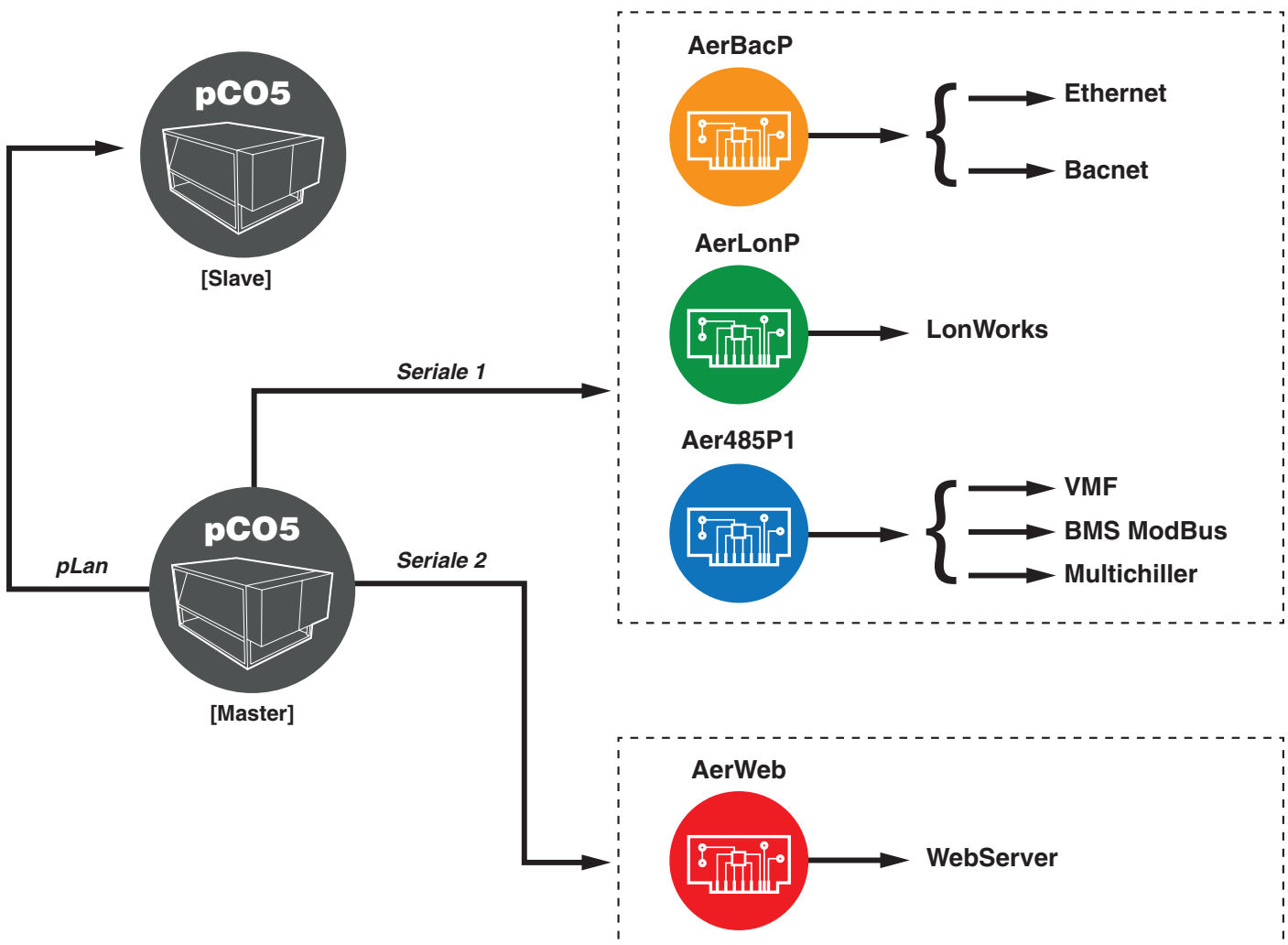
Reference parameters:

Compressor	BLOCK - OFF	ON
Temperature	3°C <	> 3°C
Max operations	n° 2	-
Cod. Anti-freeze alarm	See User Manual	
Restart	Manual	
Electical Heater	OFF	ON
Temperature	> 5°C	4°C <
Circulating Pump	OFF	ON
Temperature	> 5°C	4°C <
<i>Only for pure water (not added with glycol)</i>		

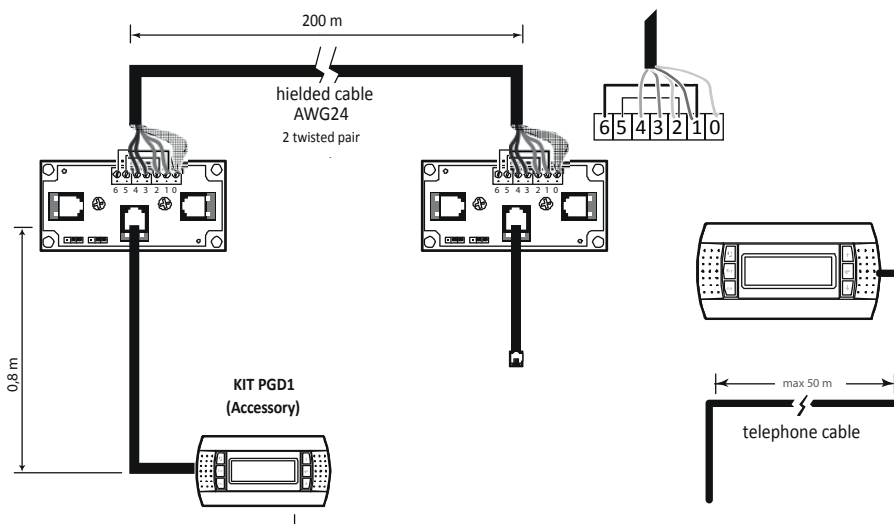
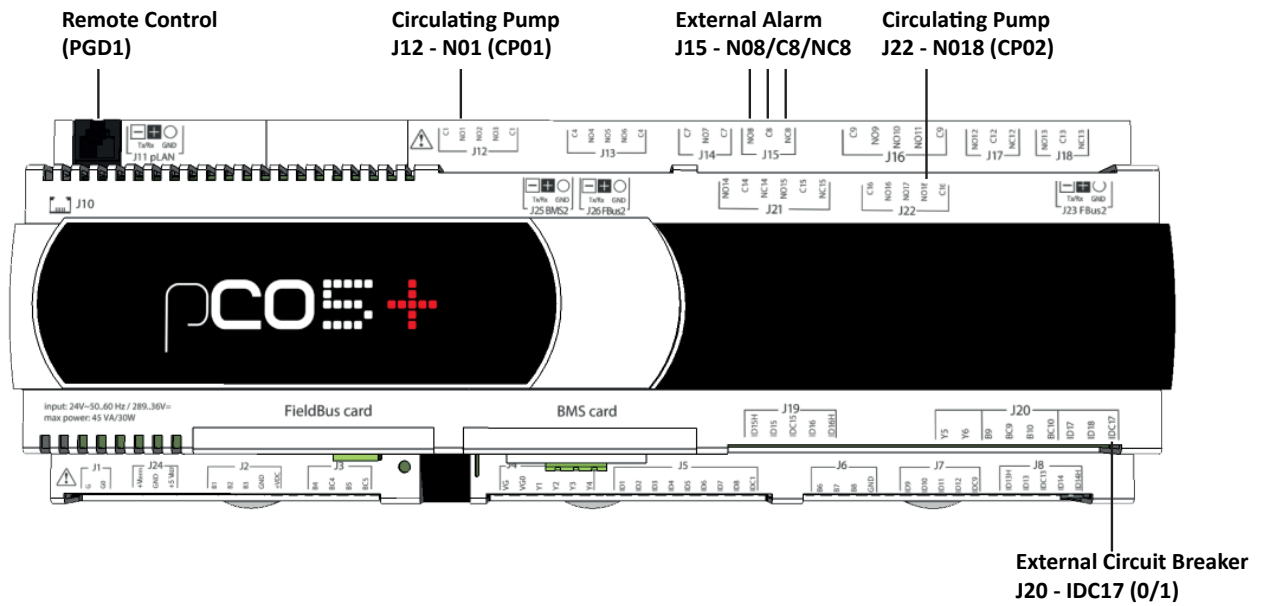
WATER FLOW ALARM

If the water flow rate is not sufficient, this safety stops the compressors and the pump

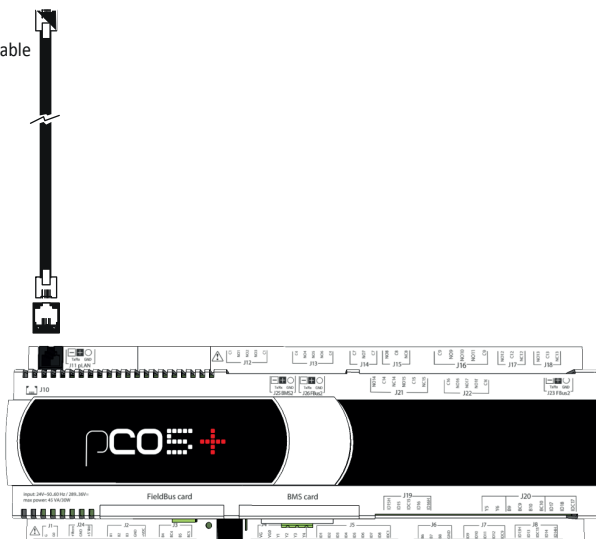
Water Pump	BLOCCO - OFF	ON
	Flow Switch or Pressure Switch (if provided)	
Water flow rate is not sufficient	>20 seconds Compressor not work	-
Cod. Alarm	See User Manual	-
Water flow rate is sufficient	-	>20 seconds Start Compressor



AUXILIARY CONNECTIONS (For Standard Version)



- The address to enable board panel is 32
- The address to enable remote panel is 31



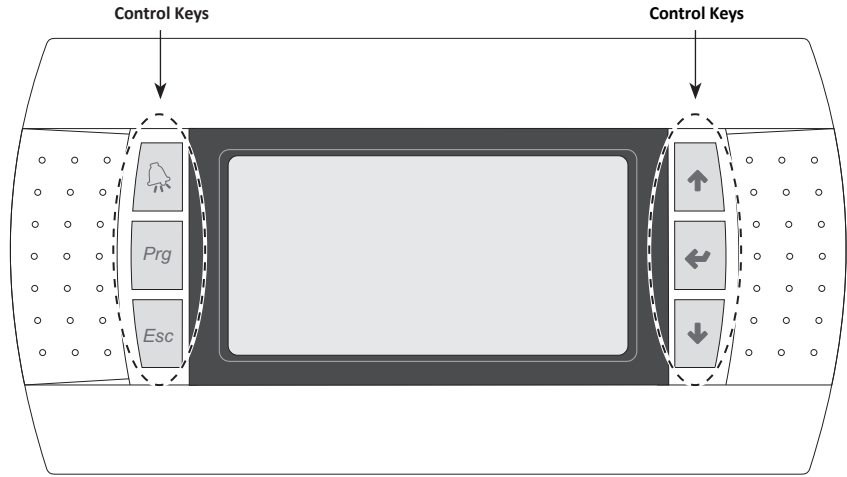
For more information, refer to the wiring diagrams in the selection program or site www.aermec.com







User Interface (PGD1)

The unit control panel allow the quick setting and display of the unit's operating parameters. The board memorises all the default settings and any modifications. By installing the remote control panel PGD1 it is possible to remotely replicate all the functions and the settings available on the unit. After a power failure the unit is capable of an automatic restart, retaining the original settings.

The user interface consists of a graphic display with six navigation keys; the display is arranged through a menu hierarchy, activated by pressing the navigation keys. The default display of these menus is the main screen. The navigation between the various parameters is by using the arrow keys located to the right of the display. These keys are also used for the modification of the selected parameter.

INTERFACE CONTROL KEYS



Key	Fucntion
	ALARM key Displays the list of active and historical alarms (red LED on = active alarm)
	MENU ACTIVATION key <ul style="list-style-type: none"> Pressing this key activates the navigation between menus (orange LED on = winter operating mode active)
	EXIT MENU key <ul style="list-style-type: none"> Pressing this key returns to the previous menu
	NAVIGATION (+) key <ul style="list-style-type: none"> Pressing this key when navigating between menu/parameters passes to the next menu/parameter Pressing this key when modifying a parameter increases the value of the selected parameter
	NAVIGATION (enter) key <ul style="list-style-type: none"> Pressing this key when navigating between menus allows entry to the selected menu Pressing this key when navigating between parameters allows selection of the parameter displayed to modify it Pressing the key when modifying a parameter confirms the modification of the parameter value selected
	NAVIGATION (-) key <ul style="list-style-type: none"> Pressing this key when navigating between menu/parameters passes to the previous menu/parameter Pressing this key when modifying a parameter decreases the value of the selected parameter

Start-up procedure

After having powered up the unit the control board will carry out preliminary operations before being ready for use. This initial procedure takes around 60 seconds to complete. During the initial loading procedure two screens are displayed: a start-up screen and a screen to

select the system language. These screens are detailed in the table below.

WARNING: The system language can be set on the screen displayed at the start-up or can be modified at

any time through the appropriate screen contained in the Installer menu.

Display on the unit	Index	Display/Parameter
	A	Remaining time for software loading: this value shows the remaining time to starting the software loaded on the unit, and passing the to system language selection
	B	System language: this parameter shows the current language set for the system. To change the language follow the instructions shown on the screen.
	C	Remaining time to select the language: this value shows the remaining time to modify the language. When the time elapses the display goes to the main screen (Main screen - General monitoring). WARNING: It is possible to modify the system language at any time using the appropriate screen contained in the Installer menu. (Menu password = 0000).
WARNING: It is possible to modify the system language at any time using the appropriate screen contained in the Installer menu. (Menu password = 0000).		

Menu structure and navigation

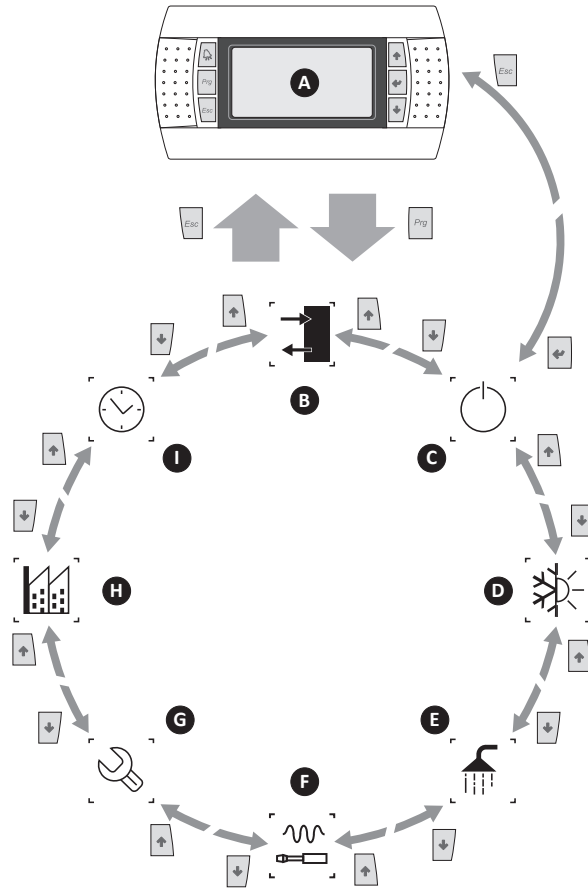
Both the functions to control the unit and the operating information are displayed on the unit mounted control panel. All the functions and information are arranged in screens which in turn are grouped into menus.

During the normal operation of the unit the main screen is displayed, from which it is possible to access the selection of the other operating menus.

The menus are displayed through the rotation of the icons that they represent. Once the desired icon is selected the chosen menu is entered, permitting the display or modification of the parameters that it is made up from. The procedure for navigating the menus, or changing parameters, is explained in detail in the chapter "User operating procedures".

The adjacent drawing shows the relation between the various menus and the navigation keys used.

The operating menus are arranged as in the following drawing:



⚠ WARNING: Improper selection of the parameters in the Installer menu may cause malfunctions of the unit. It is recommended that these parameters are only modified by personnel qualified in the installation and configuration of the unit.

Index	Icon	Menu	Menu function
A	---	MAIN	The screens in this menu display the current conditions of the unit (unit status, setpoints, circuit data, etc.)
B		IN/OUT	This menu contains advanced information on the unit operation
C		ON/OFF	This menu permits the unit to be enabled or disabled, and provides information on the status
D		SYSTEM	This menu permits the selection of the operating modes, the water setpoints and the time-clock for the system
E		RECOVERY	If the unit includes heat recovery, this menu permits the setting of the parameters associated with the heat recovery
F		INSTALLER	This menu contains the settings useful for the installer (enabling digital inputs, BMS configuration, control, pumps, etc.) WARNING: This menu is password protected. The password is: 0000
G		ASSISTANCE	This menu is only accessible to qualified personnel
H		FACTORY	This menu is only accessible to qualified personnel
I		CLOCK	This menu contains the clock settings for the system control (date, hour, calendar)

User operating procedures

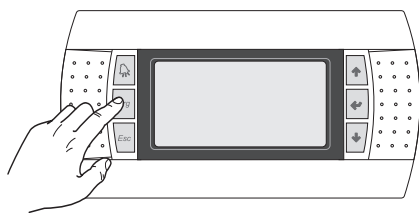
To check or modify the operating parameters of the unit it is necessary to use the interface of the control panel on the unit. The basic operations that the user must be capable of, for the correct use of the unit, are:

- (1) Moving from one menu to the next.
- (2) Selecting and modifying a parameter.

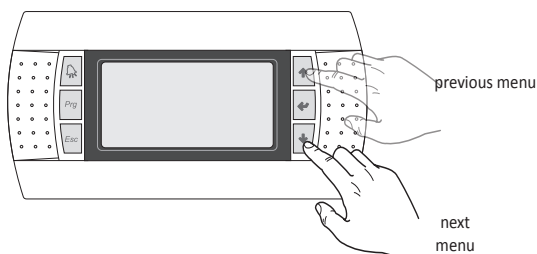
1

Moving between menus

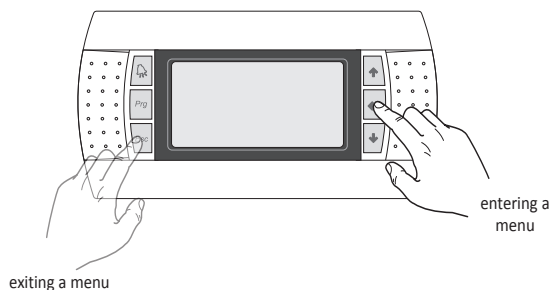
(a) To move between the menus, the order in which they are displayed is shown in the previous page, enter the menu selection mode by pressing the key (Prg).



(b) Once in the menu selection mode it is possible to move between menus using the arrow keys: the key (←) to move to the previous menu, and the key (→) to move to the next menu.



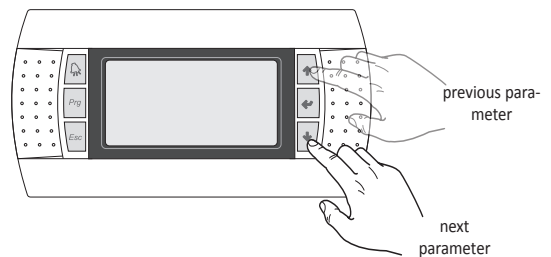
(c) When the desired menu is seen press the key (↵) to enter the menu. Press the key (Esc) to return to the menu selection mode.



2

Selecting and modifying a menu

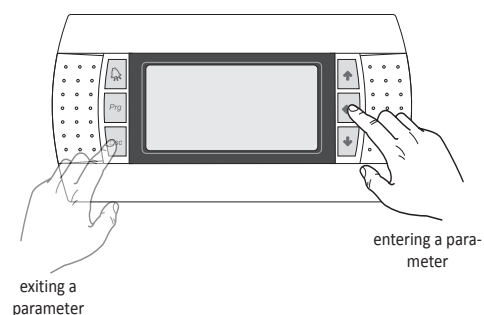
(a) Once in the menu selected, by following the procedure (1), it is possible to move between the screens using the arrow keys: the key (←) to move to the previous parameter, and the key (→) to move to the next parameter.



(c) When the desired parameter is seen press the key (↵) to enter the parameter. To exit the parameter and return to the parameter selection mode press the key (Esc).

WARNING: Once a parameter is selected by pressing the key (↵), the parameter selection mode is automatically accessed and in this mode the desired parameter values can be set with the following procedure:

- (1) Pressing the key (↵) causes a flashing cursor to appear on the first modifiable field of the parameter. If no modifiable fields are displayed then the cursor will not appear.
- (2) Pressing the key (←) or the key (→), the value of the field can be increased or decreased.
- (3) Pressing the key (↵) confirms the modification of the field value, saving it in memory. On the basis of the type of parameter selected the number of modifiable fields can change.



11. LOADING THE SYSTEM

Before starting the loading, set the unit's master switch to OFF

Check that the system discharge tap is closed

Open all the drain valves of the system and of the related terminals

Open the cut-off devices of the system.

Start the filling by slowly opening the water system filling tap on the outside of the appliance.

When water begins to flow from the drain valves of the terminals, close them and continue loading up to pressure value required for the system.

12. SYSTEM DISCHARGE

Before starting to empty, set the unit's master switch to OFF

Check that the water system load/restore tap is closed

Open the drain tap outside the machine and all the drain valves of the system and the corresponding terminals.

13. DRAINING THE MACHINE

WARNING

During the winter, if the system is shut down, the water in the heat exchanger could freeze, causing irreparable damage to the heat exchanger itself.

To avoid the risk of freezing, there are three possible solutions:

Completely drain the water from the appliance.

the operation with glycol water, with a glycol percentage chosen on the basis of the minimum outside temperature envisaged.

Use of heaters.

In this case the heaters must always be powered for the entire winter period (machine in STAND-BY).

Check the hydraulic seal of the joints.

It is recommended that this operation be repeated after the appliance has been running for some hours and periodically check the system pressure. The reintegration should be carried out with the machine off (pump OFF).

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.

14. CONTROL AND FIRST

START-UP

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 all the operations (electrical and hydraulic hook-ups, loading and venting of the air from the system) must be completed.

START-UP

PRELIMINARY OPERATIONS TO BE CARRIED OUT WHEN THERE IS NO VOLTAGE

Check:

All the safety conditions have been respected
The unit has been properly secured to the support base
The minimum technical spaces have been observed;
That the main power cables are of an appropriate section, capable of supporting the overall absorption of the unit. (see electric data section), and that the unit has been duly earthed.
That all the electrical connections are correctly fixed and that all the terminals adequately

THE FOLLOWING OPERATIONS MUST BE CARRIED OUT WHEN THE UNIT IS LIVE.

Power up the unit by turning the main switch to ON. The display will come on a few seconds after the machine is powered up, check that the operation status is at OFF (OFF BY KEYB at the bottom of the display).

Use a tester to check that the value of the supply voltage to the U.V.W. phases is equal to 400V ±10%, and also check that the unbalance between the phases does not exceed 3%.
Check that the connections made by the installer comply with the data in the documentation.
Check that the electric heater(s) of the compressor casing are working, by measuring the rise in the temperature in the oil sump. The resistance(s) must operate for at least 12 hours before the compressor start-up, and in any case the temperature of the oil sump must be 10-15°C higher than the room temperature.

Check and if necessary change the fan settings in order get the correct useful static pressure required by the system (Setting the fan's number of rpm from the control panel).

HYDRAULIC CIRCUIT

Check that all the hydraulic connections have been carried out correctly, that the information on the plates have been complied with and that a mechanical filter has been installed at the evaporator inlet. (Mandatory component

subject to the invalidation of the warranty).

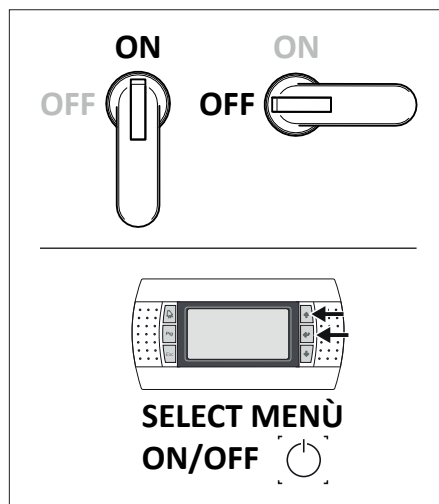
The flow switch must absolutely be installed, and should be wired to the electrical panel, calibrated and its intervention verified (Obligatory component subject to the invalidation of the warranty).

Check that the circulation pump(s) are working, and that the water flow rate is sufficient to close the flow switch contact.

Check the water flow rate, measuring the difference of pressure between the evaporator inlet and outlet, and then calculate the flow rate with the evaporator pressure drop diagram in the this documentation.

Make sure the flow switches are working correctly (installation mandatory); closing the cut-off valve at the heat exchanger outlet; the block should be displayed on the unit's control panel; finally open the valve again and rearm the block.

FIRST COMMISSIONING OF THE MACHINE



WITH THE MACHINE ON CHECK THE

REFRIGERANT CIRCUIT

CHECK:

- Check that the absorption current of the compressor is less than the maximum indicated in the technical data table.
- Check that in models with three-phase supply power the noise level of the compressor is not abnormal, symptom of reverse rotation and, if this is the case, invert a phase.
- Make sure that the voltage value is within the pre-fixed limits and that the unbalance between the three phases (three-phase supply power) does not go above 3%.
- Check for refrigerant gas leaks, especially near the pressure points of pressure gauges, pressure transducers and pressure switches; (vibrations during transport may have loosened the connections).

OVERHEATING

By comparing the temperature read with a contact thermostat placed on the compressor intake and the temperature shown on the low pressure gauge (saturation temperature corresponding to the evaporation pressure). The difference between these two temperatures gives the overheating value. Optimum values

are between 4 and 8°C.

DISCHARGE TEMPERATURE

If the sub-cooling and overheating values are correct, the temperature measured in the pressing line tube at the compressor outlet must be 30/40°C above the condensation temperature.

CONTROL AND SAFETY DEVICES

CHECK:

THE MANUAL RESET HIGH PRESSURE SWITCH

That stops the compressor and generates the respective alarm when the flow pressure exceeds the set value. To check it is operating correctly, close the air intake to the heat exchanger (cooling mode), and keeping an eye on the high pressure gauge, check it intervenes at the calibration setting. Warning: If the switch does not trip at the calibration value, stop the compressor immediately and check the causes. The reset is manual and can only take place when the pressure drops below the differential value. (For the set and differential values, see the technical manual).

ANTI-FREEZE CONTROL

The anti-freeze control, which is managed by electronic regulation and by the temperature probe at the evaporator outlet, has the function of preventing the formation of ice when the water flow rate is too low. Checking it is working correctly can be carried out by progressively increasing the anti-freeze set-point until it exceeds the outlet water temperature and keeping the water temperature under control with a high precision thermometer. Check that the unit switches off, setting off the respective alarm. After this operation take the anti-freeze set-point back to its original value.

15. CALIBRATION OF CONTROL AND SAFETY PARAMETERS

CALIBRATION OF CONTROL AND SAFETY PARAMETERS			
		°C	°F
Cooling setting	Min	4	39,2
	Max	18	64,4
	Def	7	44,6
Antifreeze intervention	Min	-15	5
	Max	4	39,2
	Def	3	37,4
Total differential	Min	3	37,4
	Max	10	50
	Def	5	41

NLC A		0750
Compressor magnetothermic switches calibrations		
MTC1	A	24
MTC1A	A	24
MTC2	A	27
MTC2A	A	27
Calibration fan thermomagnetic switch		
MTV1	A	4,8
MTV2	A	4,8
MTV2A	A	4,8
High pressure safety valves intervention		
VSIC AP	bar	45
	P.S.I.	652,67
High pressure switches with manual re-start		
AP	bar	41,8
	P.S.I.	606,26
High pressure transducer alarm		
TAP	bar	39
	P.S.I.	565,65
Low pressure transducer alarm		
TAB	bar	2,4
	P.S.I.	34,81

WARNING

The first start-up has to be carried out with the standard settings, only when the test is finished can the values of the operation Set Point be changed. Before proceeding with the start-up, power the unit for at least 12 hours by setting the thermomagnetic switch and the door lock isolation switch to ON. Make sure that the control panel is off.

16. ROUTINE MAINTENANCE

Any cleaning operations are forbidden until the unit has been disconnected from the electrical power supply mains¹

Make sure there is no 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:

HYDRAULIC CIRCUIT

CONTROL:

- Water circuit filling
- Water filter cleaning (NOT SUPPLIED)
- Flow switch control (NOT SUPPLIED)
- The absence of air in the circuit (bleeding)
- That the water flow rate to the evaporator is always constant
- The condition of the hydraulic piping thermal insulation
- Where applicable, the percentage of glycol

ELECTRIC CIRCUIT

CONTROL:

- The efficiency of safety devices
- The electrical power supply voltage
- The electrical power absorption
- The connections are tight
- The operation of the compressor casing resistance

CHILLER CIRCUIT

CONTROL:

- Compressor conditions
- Efficiency of the plate-type exchanger resistance
- Work pressure
- Leak test for checking the water tightness of the cooling circuit
- Operation of high and low pressure switches
- Carry out the necessary checks on the filter-drier to check its efficiency.

MECHANICAL CONTROLS

CONTROL:

- **The tightening of the screws**, the compressors and the electrical box, and the exterior panelling of the unit. If they are poorly tightened, they produce abnormal noise and vibrations

17. EXTRAORDINARY MAINTENANCE

The NLC units are filled with R410A gas and inspected in the factory. Under normal conditions, no Technical Assistance Service operation is needed for checking the refrigerant gas. Over time, however, small leaks of refrigerant may arise draining the circuit, causing the appliance to malfunction. In these cases, the refrigerant leakage points should be found and repaired, and the refrigerant load should be replenished, operating in compliance with Law 28 December 1993 no. 549.

DISPOSAL

The disposal of the unit should be carried out according to the rules in force in the various countries.

WARNING

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

WARNING

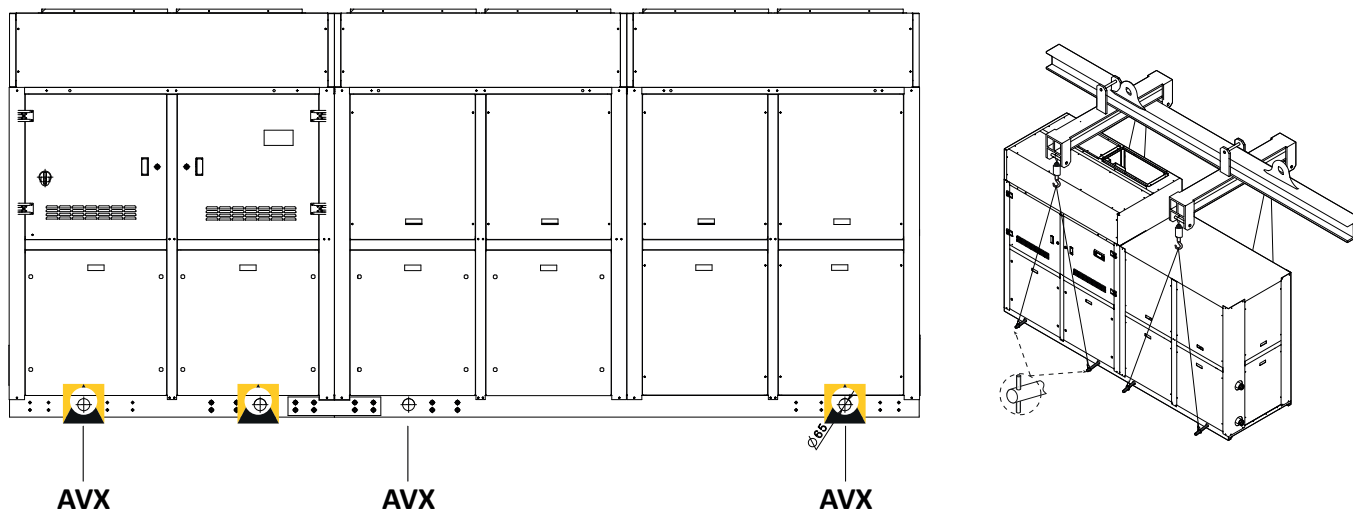
IT IS forbidden to FILL the refrigerant circuit with a refrigerant different from that indicated. Using a different refrigerant gas could seriously damage the unit.

18. TROUBLESHOOTING

IRREGULARITY	CAUSE	SOLUTION
The unit does not start	<ul style="list-style-type: none"> No electrical voltage 	<ul style="list-style-type: none"> Check for voltage Check the safety systems upstream of the appliance
	<ul style="list-style-type: none"> Master switch on OFF Remote switch on OFF (if present) Control panel on OFF Main switch on OFF Compressor thermomagnetic switch on OFF 	<ul style="list-style-type: none"> Set to ON
	<ul style="list-style-type: none"> The flow switch is not connected on the terminal board therefore the circuit is open 	<ul style="list-style-type: none"> Install and wire the flow switch NB. DO NOT bridge the contacts on the terminal board (otherwise the unit will not stop in the event of insufficient water and the exchanger would be to throw away!)
	<ul style="list-style-type: none"> Power supply voltage too low 	<ul style="list-style-type: none"> Check power supply line
	<ul style="list-style-type: none"> Coil of the compressor remote control switch is broken Electronic circuit board faulty Peak condenser faulty Compressor faulty 	<ul style="list-style-type: none"> Replace the component
Poor yield	<ul style="list-style-type: none"> No refrigerant Dirty coils Water filter clogged Appliance dimensioning Operating outside the operating limits 	<ul style="list-style-type: none"> Check the load and any leaks Clean the coils Clean the filter Check performance Check the operating limits using the graphics
Compressor noisy	<ul style="list-style-type: none"> Liquid return to the compressor Inadequate fixing 	<ul style="list-style-type: none"> Check
	<ul style="list-style-type: none"> Inverted phase 	<ul style="list-style-type: none"> Invert a phase
Noises and vibrations	<ul style="list-style-type: none"> Contact between metallic bodies 	<ul style="list-style-type: none"> Check
	<ul style="list-style-type: none"> Weak support 	<ul style="list-style-type: none"> Strengthen
	<ul style="list-style-type: none"> Loose screws 	<ul style="list-style-type: none"> Tighten the screws
The compressor stops due to the intervention of the protections	<ul style="list-style-type: none"> Excessive flow pressure Low intake pressure Low power supply voltage Electrical connections tightened badly Operation outside operating limits 	<ul style="list-style-type: none"> Check the operating limits using the graphics
	<ul style="list-style-type: none"> Pressure switch malfunctioning 	<ul style="list-style-type: none"> Replace the component
	<ul style="list-style-type: none"> Circuit breaker protection intervention 	<ul style="list-style-type: none"> Check the power supply voltage and calibrations Check the electrical isolation of the windings
	<ul style="list-style-type: none"> Flow switch intervention 	<ul style="list-style-type: none"> Check water flow rate
Compressor high discharge pressure	<ul style="list-style-type: none"> High external air temperature High utility inlet water temperature 	<ul style="list-style-type: none"> Check the operating limits using the graphics
	<ul style="list-style-type: none"> Insufficient air flow Insufficient water flow 	<ul style="list-style-type: none"> Control: <ol style="list-style-type: none"> operation of the fans Cleanliness of the coil Operation of the pump (speed) Cleanliness of the filter
	<ul style="list-style-type: none"> Anomalous operation adjusting the fans 	<ul style="list-style-type: none"> Check or replace if broken
	<ul style="list-style-type: none"> Air in the hydraulic system 	<ul style="list-style-type: none"> Vent the circuit
	<ul style="list-style-type: none"> Too much refrigerant gas charged 	<ul style="list-style-type: none"> Restore the correct charge
Low discharge pressure	<ul style="list-style-type: none"> Low outside air temperature Low water inlet temperature 	<ul style="list-style-type: none"> Check the operating limits using the graphics, as above
	<ul style="list-style-type: none"> Moisture in the refrigerant circuit 	<ul style="list-style-type: none"> Empty and restore the gas charge
	<ul style="list-style-type: none"> Air in the hydraulic system 	<ul style="list-style-type: none"> Bleed the circuit
	<ul style="list-style-type: none"> Insufficient gas load 	<ul style="list-style-type: none"> Restore the correct load
High intake pressure	<ul style="list-style-type: none"> High external air temperature High utility inlet water temperature Thermostatic expansion valve too open or damaged 	<ul style="list-style-type: none"> Check the operating limits using the graphics Adjust or replace if damaged
Low intake pressure	<ul style="list-style-type: none"> Utilities low inlet water temperature Low outside air temperature Thermostatic expansion valve damaged or blocked 	<ul style="list-style-type: none"> Check the operating limits using the graphics Adjust or replace if damaged
	<ul style="list-style-type: none"> Insufficient water flow Insufficient air flow 	<ul style="list-style-type: none"> Control: <ol style="list-style-type: none"> operation of the fans Cleanliness of the coil Pump operation (speed) Filter cleanliness

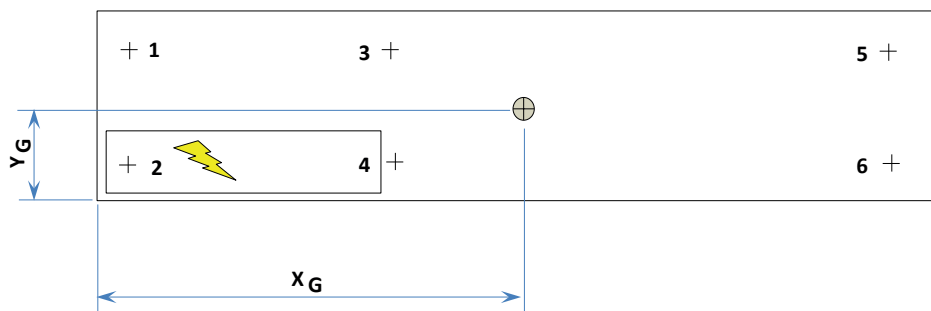
19. LIFTING POINTS AND ANTIVIBRANT POSITION

NLC 0750 A VERS.00



20. WEIGHT DISTRIBUTION AND PERCENTAGE ON THE SUPPORTS / NLC A

NLC 0750 A VERS.00



METRIC

MACHINE DATA WHEN EMPTY					1		2		3		4		5		6		AVX
NLC A	Vers.	Ptot [kg]	XG [mm]	YG [mm]	P	%	P	%	P	%	P	%	P	%	P	%	
0750	00	2156	2312	534	195	9%	207	10%	627	29%	664	31%	224	10%	238	11%	428

MACHINE WHEN OPERATING					1		2		3		4		5		6		AVX
NLC A	Vers.	Ptot [kg]	XG [mm]	YG [mm]	P	%	P	%	P	%	P	%	P	%	P	%	
0750	00	2177	2251	547	239	11%	242	11%	611	28%	617	28%	233	11%	235	11%	428

IMPERIAL

MACHINE DATA WHEN EMPTY					1		2		3		4		5		6		AVX
NLC A	Vers.	Ptot [lb]	XG [in]	YG [in]	P	%	P	%	P	%	P	%	P	%	P	%	
0750	00	4752	91	21	431	9%	456	10%	1383	29%	1464	31%	495	10%	524	11%	428

MACHINE WHEN OPERATING					1		2		3		4		5		6		AVX
NLC A	Vers.	Ptot [lb]	XG [in]	YG [in]	P	%	P	%	P	%	P	%	P	%	P	%	
0750	00	4799	89	22	528	11%	533	11%	1347	28%	1360	28%	514	11%	518	11%	428

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