



60Hz

R410A

AHRI



Installation and Maintenance Manual

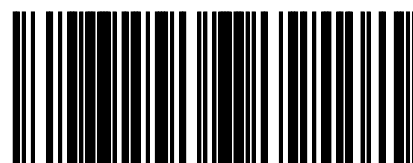
AIR/WATER CHILLERS WITH FREE-COOLING

- OUTDOOR INSTALLATION
- HIGH EFFICIENCY EVEN WITH PARTIAL LOADS
- MICRO-CHANNEL COIL
- NIGHT-TIME MODE

NRB FREE COOLING

0800÷3000

EN



Dear customer,

Thank you for choosing an AERMEC product. 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.

The quality level is being constantly monitored, so AERMEC products are synonymous with 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 once again.
AERMEC S.p.A

INDEX

GENERAL WARNINGS.....	6
RECEPTION.....	8
LIFTING	8
STORAGE.....	9
DIMENSIONS (in).....	10
MINIMUM TECHNICAL SPACES	11
WEIGHT DISTRIBUTION.....	13
HYDRAULIC CONNECTIONS.....	16
HYDRAULIC DIAGRAMS AND WATER FEATURES	17
ELECTRICAL CONNECTIONS	18
ELECTRICAL DATA	19
ELECTRICAL DATA 208V-3-60HZ - FAN J.....	19
ELECTRICAL DATA 230V-3-60HZ - FAN J.....	19
ELECTRICAL DATA 460V-3-60HZ - FAN J.....	20
ELECTRICAL DATA 575V-3-60HZ - FAN J.....	21
ELECTRIC POWER CONNECTION TO THE ELECTRICAL MAINS.....	22
CONNECTING THE AUXILIARY CONTROL BOARD	24
ACCESSORIES	27
COMPATIBILITY OF ACCESSORIES	27
COMMISSIONING - WARNINGS.....	28
MAINTENANCE	29
MAINTENANCE - LIST OF THE RECOMMENDED PERIODIC INTERVENTIONS....	32

GENERAL WARNINGS

This product is a complex machine. Things and persons may be exposed to risks during installation, operation, maintenance or repair, caused by certain conditions or components, such as for example, but not only, refrigerant, oils, moving mechanical parts pressure, heat sources, electricity.

This products and its documentation, including this manual, are intended for persons in possession of appropriate training to enable them to operate correctly and safely. Before performing any operation on this equipment, it is essential for the operating personnel to have read and understood all manuals and any other material of reference. They must also know and observe the standards applicable to the activities to be performed.

ATTENTION

Any intervention on the unit must be performed by authorised and qualified experienced technicians, in accordance with current regulations.

The unit shows the following risks:

- Risk of electric discharges.
- Risk of injuries due to rotating parts.
- Risk of injuries due to sharp edges and heavy weights.
- Risk of injuries due to high pressure gas.
- Risk of injuries due to high or low temperatures of components.
- Substances inside the water;
- Fire risk.
- In the event of the refrigerant catching fire, hazardous gases may be generated.

It is vital that all work on the unit is performed in compliance with the local standards. All work on the system must be performed to perfection

PRECAUTIONS AGAINST RESIDUAL RISKS

INSTRUCTIONS

- Install the unit according to the requirements herein
- **The personnel nearing the machine must be competent in the use of this refrigerant and observe the current regulations.**
- **Personnel that come into contact with the machine must be competent in the use of this refrigerant and respect regulations currently in force. Assess the procedures Aermec requires and local fire prevention regulations to prevent inconsistencies in our requirements and regulations currently in force.**
- Regularly perform all maintenance operations provided for in this manual
- Wear personal protective equipment (**gloves, eye protection, helmet, ...**) appropriate to the operations to be performed; do not wear clothes or accessories that may get caught or be sucked by the air flows; gather and tie your hair up before entering the unit
- The machine must be transported in compliance with current regulations, taking into account the features of the fluids inside and their characterisation described in the safety data sheet
- An inadequate transport may damage the machine, also generating refrigerant leaks. Before commissioning, check for leaks and make any necessary repairs.
- The installation must comply with the requirements of EN378-3 and the local current regulations. In particular, indoor installation must ensure adequate ventilation and provide refrigerant detectors when necessary.
- The machine must not be installed in environments with risk of explosion but in a suitable place. In particular, if intended for indoor use, it cannot be installed outdoors
- The machines must be installed in structures protected from lightning as provided by the applicable laws and technical standards
- The overall fire risk assessment at the place of installation (i.e. fire load calculation) is the responsibility of the user.
- Keep fire extinguishers near the machine suitable for putting out fires on electrical equipment and, for lubricant oil of the compressor and the refrigerant as provided by the relative safety data sheets (for example a CO₂ fire extinguisher)
- It is not permitted to walk or place other bodies on the machines
- Make the plant engineering connections to the unit according to the instructions in this manual
- It is mandatory to install a water filter on the evaporator, penalty invalidation of the warranty
- Do not bend or hit pipes containing under pressure fluids
Do not exceed the maximum allowable pressure (PS) of the unit's water circuit shown on the serial number plate
- Before removing elements along the under pressure water circuits, shut-off the pipe section involved and gradually drain the fluid until its pressure and that of the atmosphere are balanced.
- The unit contains under pressure refrigerant gas: no operation must be performed on under pressure equipment except during maintenance that must be carried out by competent and authorised personnel
- Perform brazing or welding only on empty pipes and clear of any lubricating oil residues; do not near flames or other heat sources to the pipes containing refrigerant fluid
- Do not work with naked flames near the unit
- In order to avoid an environmental risk, make sure that any fluid leaks are recovered in suitable devices in compliance with local regulations.
- Do not use your hands to control any refrigerant leaks
- An accidental release of refrigerant may cause risk of suffocation due to a lack of oxygen: install the machine in a well ventilated environment in accordance with EN 378-3 and local regulations currently in force. Those who come into contact with the machine must be equipped with a leak detector that is calibrated and validated to reveal any used refrigerant leaks.
- The unit is fitted out with overpressure relief devices (safety valves): in the event that these devices start, the refrigerant gas is released at high temperature and high velocity.
Prevent the gas flow from harming people or things; if necessary, channel the leak according to the EN 378-3 standard and local regulations currently in force, paying particular attention to channel



Warning;
Hot surface



Warning;
Electricity



Warning;
Moving parts



Warning;
Sharp element



Warning;
Biological hazard



Wear head
protection



Wear protective
gloves



Wear eye protection



Wear ear protection



Wear safety
footwear

fluids that pertain to safety groups other than A1 toward open and secure spaces.

- Keep all lubricants in properly marked containers do not keep flammable liquids near the plant
- Do not remove the protections from mobile elements while the unit is running
- Do not use cables with inadequate section or flying connections, not even for limited periods or emergencies
- Check the unit is properly earthed before starting it
- Before opening the electrical panel, disconnect the unit from the mains by means of the external isolator
- In case of units with shunt capacitors, wait 3 minutes from when power supply was disconnected from the unit before accessing inside the electrical panel
- If the unit is equipped with integrated inverter compressors, disconnect the power supply and wait at least 15 minutes before accessing for maintenance: the internal components remain live for this time, generating the risk of electrocution
- The safety devices must be maintained efficient and periodically checked as prescribed by current regulations
- In case a piece is disassembled, make sure it is correctly reassembled before restarting the unit
- Even with the unit off, prevent the fluid in contact with the heat exchangers exceed the temperature limits indicated in the documentation and freeze.
- Do not send the heat exchangers fluids other than water or its mixtures with ethylene glycol/propylene in a maximum concentration of 30%
- The machine must only be employed for the use for which it was made; any other use can be dangerous and void the warranty
- Install the unit at a distance enough from the exhaust wells, to ensure that the possible loss of gas may reach and pollute the aquifer

PREVENTIONS

- Make sure that the protections of mobile elements are correctly in place before restarting the unit

- Fans, motors and belt drives may be in motion: always wait for them to stop and take appropriate precautions to prevent their activation before accessing them
- the machine and the pipes have very hot and very cold surfaces that lead to risk of burns
- Before opening a machine panel, ascertain whether it is or not firmly connected to it by hinges
- Louvers of the heat exchangers, edges of the components and metal panels can generate cuts
- The installation must ensure that the temperature of the fluid entering the unit is maintained stable and within the provided limits; therefore, pay attention to the adjustment of any external thermal exchange and control devices (drycooler, evaporating towers, area valves, ...), to the adequate dimensioning of the mass of fluid circulating in the plant (in particular when plant areas are excluded) and to install systems for the recirculation of the necessary fluid flow rate so as to maintain the machine temperatures within the allowed limits (e.g. during the start-up phase).
- The material used for the machine protective packaging must always be kept out of the reach of children as it is a source of danger
- In units with compressors in parallel, do not disable the individual compressors for long periods.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and necessary knowledge if they are supervised or have received instructions concerning use of the appliance in a safe way and understand the hazards involved. Children should not play with the appliance. Cleaning and maintenance intended to be performed by the user should not be performed by children without supervision.

RECEPTION

TRANSPORT AND HANDLING

The unit must be handled by qualified personnel. Carefully follow the lifting instructions on the labels placed on the unit.

The unit must be lifted with extreme care to prevent knocks to the frame, panels, electrical panel, etc..

NOTE: Plastic elements can be used to protect the units against damage during transport. The machine is also wrapped in packaging. We recommend keeping this protection during all transport and lifting operations and not remove the plastic elements until commissioning.

If the unit has anti-vibration supports, they must be installed on the unit before final positioning.

Inspection upon receipt

Perform the following check upon receipt of the product.

- Check that the exterior has not been damaged in any way.
- Check that the lifting and transport devices are appropriate to the type of equipment and compliant with the transport and handling instructions attached to this manual.
- Check that the accessories required for on-site installation have been delivered and are operational.
- If the unit is provided pre-loaded with refrigerant, make sure there have been no leaks.
- Check that the equipment supplied corresponds to the order and delivery note

Product identification

The Aermec products can be identified by the **packaging label** bearing the identification data of the product and by the **technical plate** bearing the performance and technical data of your unit.

If the product is damaged, send a registered letter with the details of the problem to the shipping company within 48 working hours from delivery.

AERMEC SPA - VIA ROMA, 996 37040 - BEVILACQUA (VR) - ITALIA		CE
MODELLO XXXXXX		
VERSIONE / CORRETTA VERS. XX		XXXXXX XXXXX
MATERIALE / LOTTO XXXXXX XXXXX		
kg. XX		PERD. LUBRIF. - OROLOG. NEUTR. - ACCESSORI E/O TRASFORMAZIONI
CLIENTE		

Packaging label

AERMEC		AERMEC SPA - via Roma, 996 37040 - Bevilacqua (VR) - ITALIA		CE
		Prod. date		XXXX
50 Hz	Serial n.	IP		
30-35°C 7/6°C (DB/WB)	40-45°C 7/6°C (DB/WB)	*-55°C 7/6°C (DB/WB)	12-7°C 35°C	
P _H [kW]	P _H [kW]	P _H [kW]	P _C [kW]	
P _E [kW]	P _E [kW]	P _E [kW]	P _E [kW]	
COP [W/W]	COP [W/W]	COP [W/W]	EER [W/W]	
In [A]	In [A]	In [A]	In [A]	
RES. EL./EL. HEATER [kW]	Is [A]			
RES. EL./E - HEIZUNG Ir [A]	I tot [A] = In + Ir			
TS (HP/ LP) [°C]	Min	PS (HP/ LP) [bar]		
	Max	RXXXX [Kg]		

Technical plate

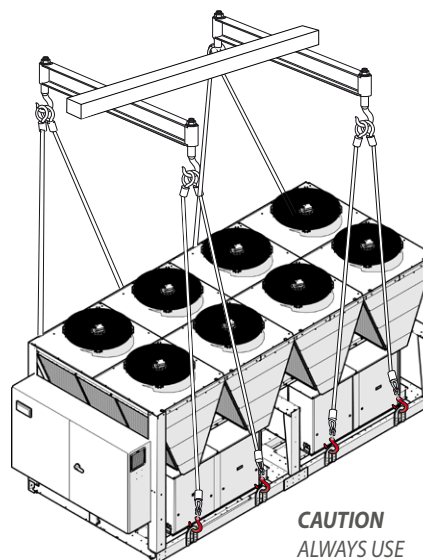
LIFTING

Before lifting the unit, place protections between the belts and the framework to prevent damage to the structure.

The units NRB are delivered with lifting eyebolts, for lifting use suitable straps, hook the lifting chains to the eyebolts provided.

- Follow all safety regulations and standards
- Wear protective goggles and work gloves
- Pay the utmost attention to heavy and bulky equipment during lifting and handling, and when placing it on the ground.
- All panels must be tightly fixed before moving the unit;
- Before lifting, check the specific weight on the technical plate.
- Use all, and only, the lifting points indicated;
- Use ropes in compliance with Standards and of equal length;
- Handle the unit with care and without sudden movements
- Do not stand under the unit during lifting
- The machine must be kept in a vertical position

Attention: the units cannot be stacked



CAUTION
ALWAYS USE
ALL THE UNIT
LIFTING POINTS
PROVIDED

STORAGE

It may happen that, after receipt, the units are not to be immediately installed and are kept in storage. In case of medium-long term storage, we recommend applying the following procedures:

- Make sure there is no water inside the hydraulic systems.
- Do not remove the protections from the heat exchanger.
- Do not remove the plastic protective films.
- Make sure that the electrical panels are closed.
- Before using the equipment, store all items provided in a dry and clean place so that they can be used in the future. We recommend storing the unit in a dry and sheltered place (especially for units intended for indoors).

NOTE The maximum storage temperature of the units depends on the type of refrigerant contained, see table. Beyond this limit, there is a risk of refrigerant leaking through the safety valves.

Maximum storage temperature			
Refrigerant	Type	Class	Max. Temp. (°C)
R134a	HFC	A1	<50°C
R410A	HFC	A1	<50°C
R1234ze	HFO	A2L	<50°C
R513A			<50°C

PLACEMENT AND INSTALLATION REQUIREMENTS

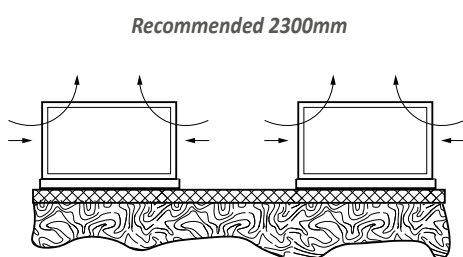
For unit installation it is important to perform the following preliminary preparation tasks:

- When installing, make sure that the atmospheric or environmental agents do not affect and corrode the cooling circuit components, causing the refrigerant to leak in the environment and, if so, make the appropriate adjustments.
- The air-cooled units with fans are designed for outdoor installation. Contact Aermec before making any type of installation.
- The water-cooled units are designed for indoor installation. Contact Aermec before making any type of installation.
- For the positioning of the air-cooled units for outdoor use, choose a place that is not exposed to excessive wind (install windbreaks if the wind speed exceeds 2.2 m/s).
- The soil under the unit must be flat, smooth and sufficiently strong to withstand the weight of the unit with a full refrigerant load, as well as the occasional presence of the normal maintenance equipment.
- In locations exposed to frost, if the unit is installed on soil, the support base must rest on concrete columns with a depth greater than the normal depth of frost of the soil. It is always advisable to build a support base separate from the main building to avoid the transmission of vibrations.
- For normal applications, the rigidity of the unit and the positioning of point loads allow for an installation that minimises vibrations. In the case of installations requiring particularly low vibration levels, you can use the anti-vibration supports.

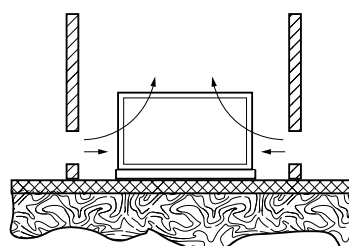
- The unit must be fixed to the anti-vibration supports and these firmly fixed to the concrete base, see chapter weight distribution and minimum technical spaces
- Check that the contact surfaces of the anti-vibration supports are levelled to the base. If necessary, use spacers or level the base but, in any case, make sure that the anti-vibration supports rest flat on the base surface.
- It is essential that the units are installed leaving sufficient space around them to allow easy access to the components for maintenance and repair purposes.

ATTENTION: It is important that the units are installed flat. The improper installation of the unit invalidates the warranty.

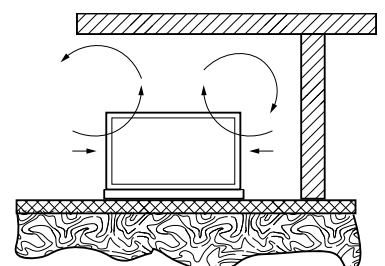
ATTENTION: The use of anti-vibration supports MUST be combined with the installation in the unit water piping of flexible couplings. The anti-vibration supports must be fixed to the unit BEFORE it is earthed. AERMEC is not responsible for the choice of capacity of the anti-vibration supports.



Recommended Installation

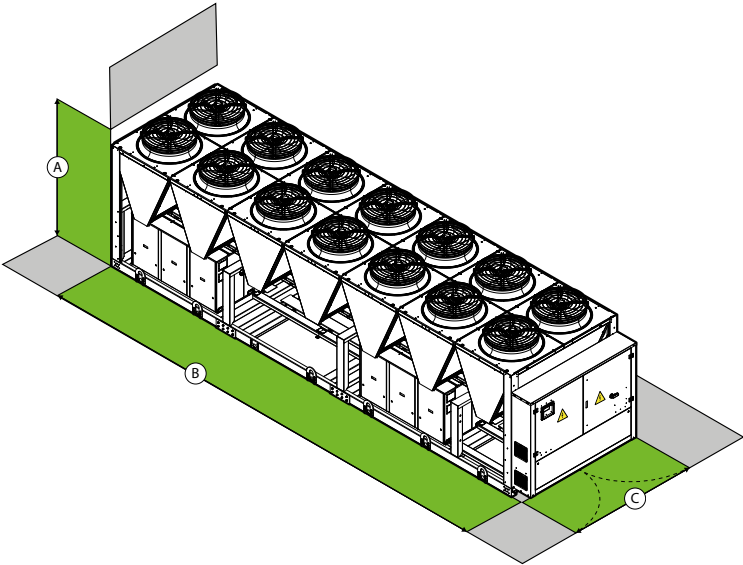


Windbreak
recommended with wind above 2,2 m/s



Installation not allowed

DIMENSIONS (in)



DIMENSIONS WITHOUT HYDRONIC KIT

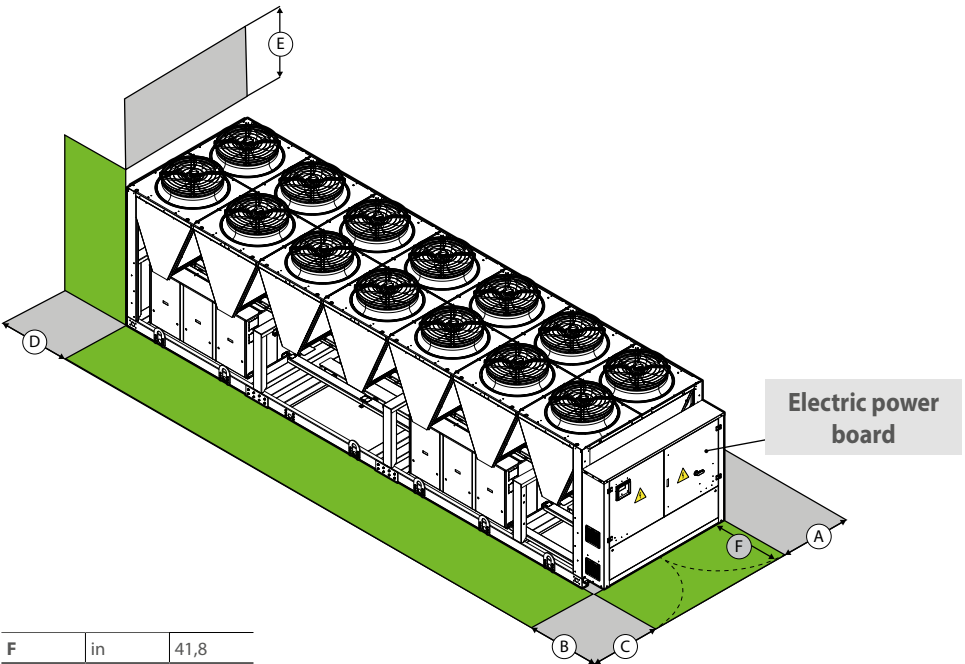
NRB-FC	vers.		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
A	All	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
	A	in	110*	110*	156	156	156	156	203	203	250	250	297	344	344	344
B	E	in	156	156	156	203	203	203	250	297	297	344	344	391	391	438
	U	in	156	156	156	203	203	203	250	297	297	344	344	391	391	438
	N	in	203	203	203	250	250	250	297	344	344	391	391	438	438	469
C	All	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87

* Depth (B) of models without hydronic kit or with pumps. For models with an accumulation tank, the depth (B) is 156 in.

MINIMUM TECHNICAL SPACES

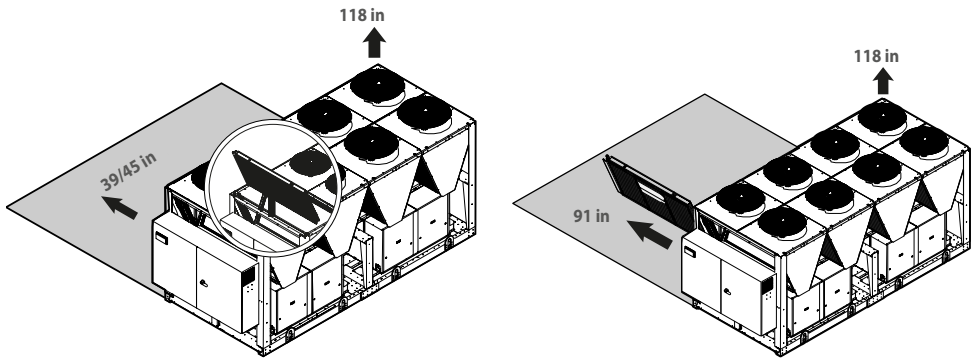
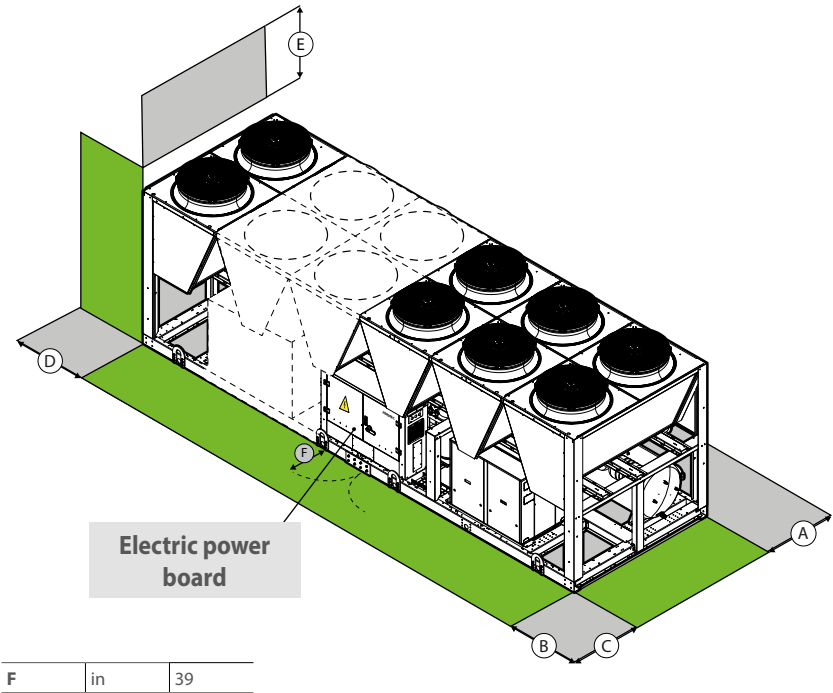
Panel type

1



2

NRB 3000 N



* Minimum technical space, to be ensured in order for the chiller to work properly and for possible maintenance.
ATTENTION with this space, the condenser coil can only be pulled out from above; to pull it out from the side you must leave at least 91 in.

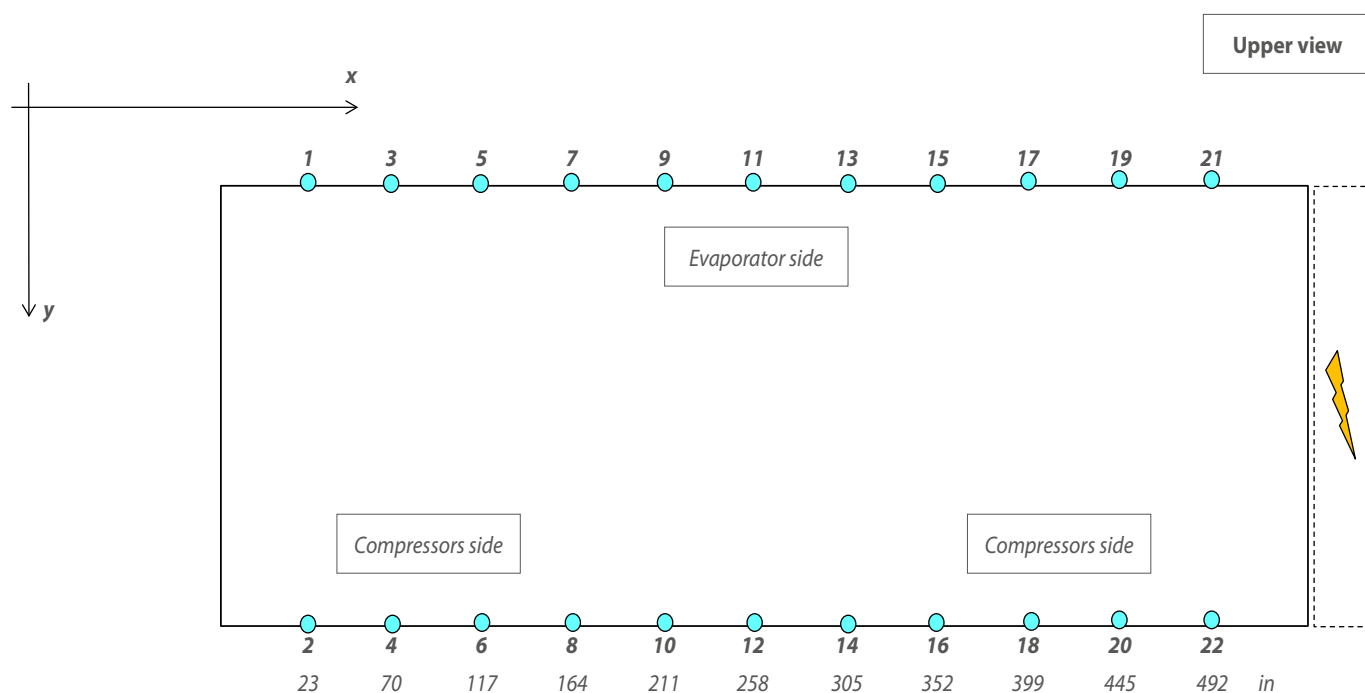
MINIMUM TECHNICAL SPACES

Unit	Vers.	V-blok	Fans	Panel type	A	B	C	D	E
NRB F		n°	n°		mm	mm	mm	mm	mm
800	A	2	4	1	39*	43	39*	32	118
900	A	2	4	1	39*	43	39*	32	118
1000	A	3	6	1	39*	43	39*	32	118
1100	A	3	6	1	39*	43	39*	32	118
1200	A	3	6	1	39*	43	39*	32	118
1400	A	3	6	1	39*	43	39*	32	118
1600	A	4	8	1	45*	43	45*	32	118
1800	A	4	8	1	45*	43	45*	32	118
2000	A	5	10	1	45*	43	45*	32	118
2200	A	5	10	1	45*	43	45*	32	118
2400	A	6	12	1	45*	43	45*	32	118
2600	A	7	14	1	45*	43	45*	32	118
2800	A	7	14	1	58*	43	58*	32	118
3000	A	7	14	1	58*	43	58*	32	118
800	E	4	8	1	39*	43	39*	32	118
900	E	4	8	1	39*	43	39*	32	118
1000	E	5	10	1	39*	43	39*	32	118
1100	E	6	12	1	45*	43	45*	32	118
1200	E	6	12	1	45*	43	45*	32	118
1400	E	7	14	1	45*	43	45*	32	118
1600	E	7	14	1	45*	43	45*	32	118
1800	E	8	16	1	45*	43	45*	32	118
2000	E	8	16	1	45*	43	45*	32	118
2200	E	8	18	1	45*	43	45*	32	118
2400	E	10	20	1	45*	43	45*	32	118
2600	E	10	20	1	45*	43	45*	32	118
2800	E	10	20	1	58*	43	58*	32	118
3000	E	9	18	1	58*	43	58*	32	118
800	U	4	8	1	39*	43	39*	32	118
900	U	4	8	1	39*	43	39*	32	118
1000	U	5	10	1	39*	43	39*	32	118
1100	U	6	12	1	45*	43	45*	32	118
1200	U	6	12	1	45*	43	45*	32	118
1400	U	7	14	1	45*	43	45*	32	118
1600	U	7	14	1	45*	43	45*	32	118
1800	U	8	16	1	45*	43	45*	32	118
2000	U	8	16	1	45*	43	45*	32	118
2200	U	9	18	1	45*	43	45*	32	118
2400	U	10	20	1	45*	43	45*	32	118
2600	U	10	20	1	45*	43	45*	32	118
2800	U	10	20	1	58*	43	58*	32	118
3000	U	9	18	1	58*	43	58*	32	118
800	N	5	10	1	45*	43	45*	32	118
900	N	5	10	1	45*	43	45*	32	118
1000	N	6	12	1	45*	43	45*	32	118
1100	N	7	14	1	45*	43	45*	32	118
1200	N	7	14	1	45*	43	45*	32	118
1400	N	8	16	1	45*	43	45*	32	118
1600	N	8	16	1	45*	43	45*	32	118
1800	N	9	18	1	45*	43	45*	32	118
2000	N	9	18	1	45*	43	45*	32	118
2200	N	10	20	1	45*	43	45*	32	118
2400	N	11	22	1	45*	43	45*	32	118
2600	N	11	22	1	45*	43	45*	32	118
2800	N	11	22	1	58*	43	58*	32	118
3000	N	10	20	2	58*	32	58*	32	118

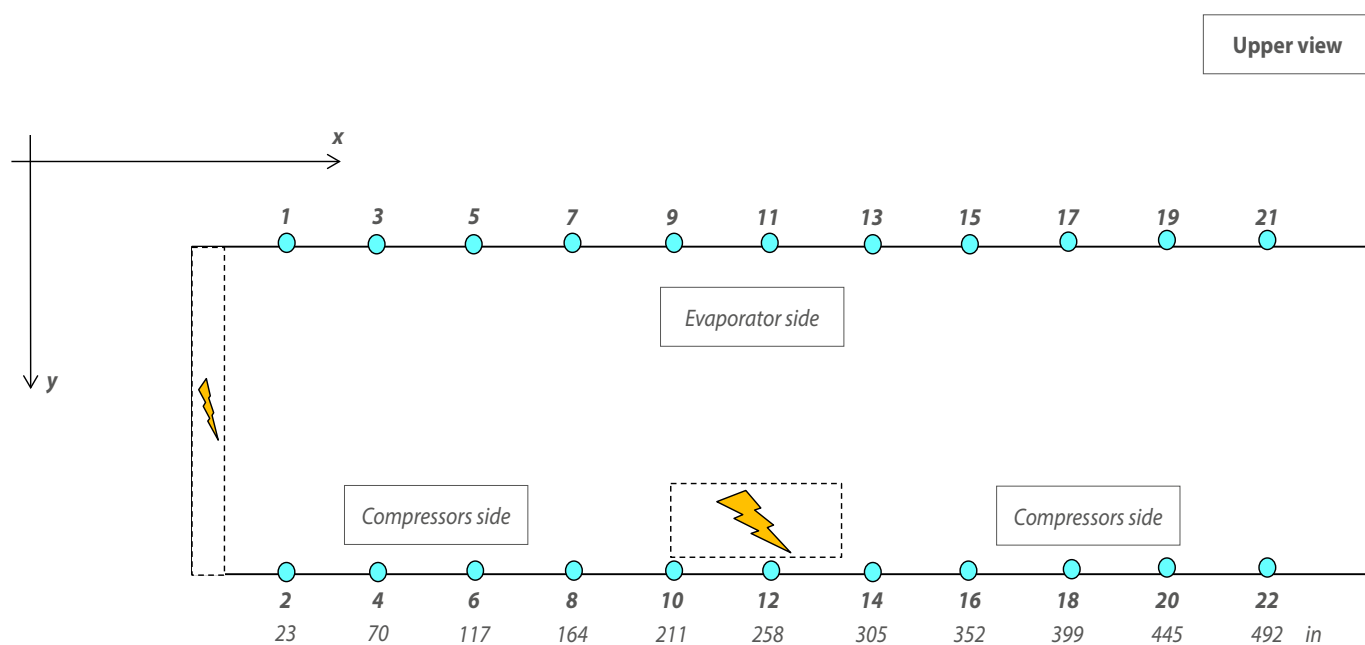
* Minimum technical space, to be ensured in order for the chiller to work properly and for possible maintenance. **ATTENTION:** with this space, the condenser coil can only be pulled out from above, see figures on the next page; to pull it out from the side you must leave at least 91 in.

WEIGHT DISTRIBUTION

NRB FC VERSION 00



VALID ONLY FOR NRB FC 3000 N VERSION



For DIMENSIONS and POSITION OF
HYDRAULIC CONNECTIONS refer to
the DWG file on site www.aermec.com
or selection program Magellano.

WEIGHT DISTRIBUTION

STANDARD UNIT WITHOUT HYDRONIC KIT

NRB FC	Versions	EMPTY WEIGHT	BARYCENTRE WEIGHT EMPTY		IN FUNCTION WEIGHT	BARYCENTRE WEIGHT IN FUNCTION		Weight distribution % on the support (Based on the weight in operation)								
		[lbs]	XG1 [in]	YG1 [in]	[lbs]	XG1 [in]	YG1 [in]	1	2	3	4	5	6	7	8	
800	A	5666	53	45	5970	53	44	18,3%	19,2%	30,5%	32,0%	-	-	-	-	
800	E	6790	81	46	7211	81	46	18,4%	20,6%	0,0%	0,0%	28,8%	32,2%	-	-	
800	U	6790	81	46	7211	81	46	18,4%	20,6%	0,0%	0,0%	28,8%	32,2%	-	-	
800	N	8289	94	46	8869	94	45	7,5%	8,1%	24,8%	26,7%	0,0%	0,0%	15,8%	17,1%	
900	A	5776	53	46	6091	53	45	18,0%	19,9%	29,5%	32,6%	-	-	-	-	
900	E	6900	81	48	7322	80	47	18,3%	20,9%	0,0%	0,0%	28,4%	32,4%	-	-	
900	U	6900	81	48	7322	80	47	18,3%	20,9%	0,0%	0,0%	28,4%	32,4%	-	-	
900	N	8378	93	47	8957	93	46	7,5%	8,4%	24,5%	27,5%	0,0%	0,0%	15,1%	17,0%	
1000	A	7187	80	49	7597	80	48	17,6%	22,0%	0,0%	0,0%	26,8%	33,6%	-	-	
1000	E	7253	80	49	7685	80	48	17,7%	22,1%	0,0%	0,0%	26,8%	33,5%	-	-	
1000	U	7253	80	49	7685	80	48	17,7%	22,1%	0,0%	0,0%	26,8%	33,5%	-	-	
1000	N	8730	92	48	9321	92	47	7,4%	8,8%	24,3%	28,8%	0,0%	0,0%	14,1%	16,7%	
1100	A	7341	80	49	7773	80	48	17,6%	22,2%	0,0%	0,0%	26,6%	33,5%			
1100	E	8796	92	48	9387	91	47	7,4%	8,9%	24,1%	28,8%	0,0%	0,0%	14,0%	16,7%	
1100	U	8796	92	48	9387	91	47	7,4%	8,9%	24,1%	28,8%	0,0%	0,0%	14,0%	16,7%	
1100	N	9987	106	48	10668	106	47	6,5%	7,6%	20,0%	23,3%	0,0%	0,0%	17,1%	19,9%	
1200	A	7430	80	49	7862	80	49	17,6%	22,4%	0,0%	0,0%	26,4%	33,6%	-	-	
1200	E	8951	91	48	9575	91	47	7,4%	8,9%	24,3%	29,2%	0,0%	0,0%	13,7%	16,5%	
1200	U	8951	91	48	9575	91	47	7,4%	8,9%	24,3%	29,2%	0,0%	0,0%	13,7%	16,5%	
1200	N	10163	106	48	10878	106	47	6,5%	7,6%	20,2%	23,6%	0,0%	0,0%	16,8%	19,7%	
1400	A	7540	80	50	8005	80	49	17,6%	22,6%	0,0%	0,0%	26,2%	33,6%	-	-	
1400	E	8995	91	49	9619	91	47	7,4%	9,0%	24,2%	29,4%	0,0%	0,0%	13,6%	16,5%	
1400	U	8995	91	49	9619	91	47	7,4%	9,0%	24,2%	29,4%	0,0%	0,0%	13,6%	16,5%	
1400	N	10207	105	48	10922	106	47	6,5%	7,7%	20,1%	23,8%	0,0%	0,0%	16,7%	19,8%	
1600	A	8995	91	49	9660	91	47	7,4%	8,9%	24,5%	29,6%	0,0%	0,0%	13,4%	16,2%	
1600	E	10274	104	48	11051	105	47	6,4%	7,5%	20,7%	24,3%	0,0%	0,0%	16,7%	19,6%	
1600	U	10274	104	48	11051	105	47	6,4%	7,5%	20,7%	24,3%	0,0%	0,0%	16,7%	19,6%	
1600	N	11376	146	45	12276	145	44	7,2%	7,5%	12,5%	12,9%	0,0%	0,0%	16,1%	16,7%	
1800	A	9281	90	49	9968	90	47	7,3%	8,9%	24,6%	29,8%	0,0%	0,0%	13,3%	16,1%	
1800	E	11574	146	45	12475	145	44	7,1%	7,4%	12,5%	13,0%	0,0%	0,0%	16,2%	16,8%	
1800	U	11574	146	45	12475	145	44	7,1%	7,4%	12,5%	13,0%	0,0%	0,0%	16,2%	16,8%	
1800	N	12875	166	45	13899	165	44	7,7%	7,9%	6,4%	6,6%	9,6%	9,8%	0,0%	0,0%	
2000	A	10692	120	46	11470	120	45	10,0%	10,7%	12,5%	13,4%	0,0%	0,0%	16,4%	17,6%	
2000	E	11861	146	45	12795	144	44	7,2%	7,4%	12,8%	13,2%	0,0%	0,0%	16,0%	16,6%	
2000	U	11861	146	45	12795	144	44	7,2%	7,4%	12,8%	13,2%	0,0%	0,0%	16,0%	16,6%	
2000	N	13162	165	45	14219	164	44	7,6%	7,8%	6,9%	7,0%	9,5%	9,7%	0,0%	0,0%	
2200	A	10957	125	47	11767	124	46	9,7%	10,8%	11,3%	12,5%	0,0%	0,0%	15,5%	17,2%	
2200	E	13625	166	45	14770	164	44	7,1%	7,3%	7,7%	8,0%	8,4%	8,7%	0,0%	0,0%	
2200	U	13625	166	45	14770	164	44	7,1%	7,3%	7,7%	8,0%	8,4%	8,7%	0,0%	0,0%	
2200	N	14815	197	45	16084	196	44	5,9%	6,0%	0,0%	0,0%	14,3%	14,7%	5,5%	5,7%	
2400	A	12258	145	47	13191	144	46	8,5%	9,6%	11,2%	12,6%	0,0%	0,0%	13,5%	15,2%	
2400	E	13845	160	46	14990	158	45	8,5%	9,2%	7,7%	8,3%	7,5%	8,1%	0,0%	0,0%	
2400	U	13845	160	46	14990	158	45	8,5%	9,2%	7,7%	8,3%	7,5%	8,1%	0,0%	0,0%	
2400	N	15036	192	46	16304	191	45	4,8%	5,1%	3,4%	3,6%	14,1%	15,0%	0,0%	0,0%	
2600	A	14484	159	46	15675	158	45	8,7%	9,2%	7,5%	7,9%	7,9%	8,3%	0,0%	0,0%	
2600	E	15675	192	46	16989	190	44	4,8%	5,1%	3,5%	3,6%	14,1%	14,8%	0,0%	0,0%	
2600	U	15675	192	46	16989	190	44	4,8%	5,1%	3,5%	3,6%	14,1%	14,8%	0,0%	0,0%	
2600	N	16843	214	45	18281	213	44	4,6%	4,8%	2,6%	2,6%	13,3%	13,8%	0,0%	0,0%	
2800	A	15036	159	46	16226	158	45	8,7%	9,2%	7,4%	7,8%	7,9%	8,4%	0,0%	0,0%	
2800	E	16226	192	46	17540	190	44	4,9%	5,1%	3,5%	3,7%	14,0%	14,7%	0,0%	0,0%	
2800	U	16226	192	46	17540	190	44	4,9%	5,1%	3,5%	3,7%	14,0%	14,7%	0,0%	0,0%	
2800	N	17394	214	45	18832	213	44	4,7%	4,8%	2,6%	2,7%	13,2%	13,7%	0,0%	0,0%	
3000	A	15366	159	46	16601	157	44	8,6%	9,0%	7,9%	8,3%	7,8%	8,2%	0,0%	0,0%	
3000	E	17725	214	45	19207	212	44	4,6%	4,8%	2,6%	2,6%	13,6%	14,0%	0,0%	0,0%	
3000	U	17725	214	45	19207	212	44	4,6%	4,8%	2,6%	2,6%	13,6%	14,0%	0,0%	0,0%	
3000	N	18739	205	45	20344	205	44	4,6%	4,7%	0,0%	0,0%	7,7%	7,9%	14,5%	14,8%	

WEIGHT DISTRIBUTION

STANDARD UNIT WITHOUT HYDRONIC KIT

			Weight distribution % on the support (Based on the weight in operation)														AVX KIT
	NRB FC	Versions	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
	800	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1082
	800	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1080
	800	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1095
	800	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1082
	900	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1080
	900	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1095
	900	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1082
	900	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1080
	1000	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1095
	1000	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1082
	1000	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1080
	1000	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1095
	1100	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1082
	1100	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1080
	1100	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1095
	1100	N	2,6%	3,1%	-	-	-	-	-	-	-	-	-	-	-	-	AVX1096
	1200	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1080
	1200	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1095
	1200	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1082
	1200	N	2,6%	3,0%	-	-	-	-	-	-	-	-	-	-	-	-	AVX1096
	1400	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1080
	1400	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1095
	1400	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1082
	1400	N	2,5%	2,9%	-	-	-	-	-	-	-	-	-	-	-	-	AVX1096
	1600	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1095
	1600	E	2,3%	2,6%	-	-	-	-	-	-	-	-	-	-	-	-	AVX1096
	1600	U	2,3%	2,6%	-	-	-	-	-	-	-	-	-	-	-	-	AVX1084
	1600	N	0,0%	0,0%	13,3%	13,7%	-	-	-	-	-	-	-	-	-	-	AVX1095
	1800	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AVX1084
	1800	E	0,0%	0,0%	13,3%	13,8%	-	-	-	-	-	-	-	-	-	-	AVX1094
	1800	U	0,0%	0,0%	13,3%	13,8%	-	-	-	-	-	-	-	-	-	-	AVX1086
	1800	N	15,5%	15,9%	0,0%	0,0%	10,1%	10,4%	-	-	-	-	-	-	-	-	AVX1084
	2000	A	9,4%	10,0%	-	-	-	-	-	-	-	-	-	-	-	-	AVX1094
	2000	E	0,0%	0,0%	13,2%	13,6%	-	-	-	-	-	-	-	-	-	-	AVX1086
	2000	U	0,0%	0,0%	13,2%	13,6%	-	-	-	-	-	-	-	-	-	-	AVX1084
	2000	N	15,5%	15,8%	0,0%	0,0%	10,0%	10,2%	-	-	-	-	-	-	-	-	AVX1094
	2200	A	11,0%	12,2%	-	-	-	-	-	-	-	-	-	-	-	-	AVX1086
	2200	E	16,2%	16,8%	0,0%	0,0%	9,7%	10,0%	-	-	-	-	-	-	-	-	AVX1094
	2200	U	16,2%	16,8%	0,0%	0,0%	9,7%	10,0%	-	-	-	-	-	-	-	-	AVX1097
	2200	N	0,0%	0,0%	14,8%	15,2%	0,0%	0,0%	8,9%	9,1%	-	-	-	-	-	-	AVX1084
	2400	A	0,0%	0,0%	13,8%	15,6%	-	-	-	-	-	-	-	-	-	-	AVX1094
	2400	E	15,3%	16,5%	0,0%	0,0%	9,1%	9,8%	-	-	-	-	-	-	-	-	AVX1088
	2400	U	15,3%	16,5%	0,0%	0,0%	9,1%	9,8%	-	-	-	-	-	-	-	-	AVX1094
	2400	N	10,3%	11,0%	0,0%	0,0%	11,0%	11,7%	4,9%	5,2%	-	-	-	-	-	-	AVX1088
	2600	A	15,5%	16,4%	0,0%	0,0%	9,0%	9,6%	-	-	-	-	-	-	-	-	AVX1094
	2600	E	10,6%	11,1%	0,0%	0,0%	11,0%	11,5%	4,9%	5,1%	-	-	-	-	-	-	AVX1088
	2600	U	10,6%	11,1%	0,0%	0,0%	11,0%	11,5%	4,9%	5,1%	-	-	-	-	-	-	AVX1098
	2600	N	9,1%	9,4%	0,0%	0,0%	11,7%	12,1%	0,0%	0,0%	7,9%	8,1%	-	-	-	-	AVX1094
	2800	A	15,5%	16,4%	0,0%	0,0%	9,1%	9,6%	-	-	-	-	-	-	-	-	AVX1088
	2800	E	10,6%	11,1%	0,0%	0,0%	10,9%	11,5%	4,9%	5,1%	-	-	-	-	-	-	AVX1098
	2800	U	10,6%	11,1%	0,0%	0,0%	10,9%	11,5%	4,9%	5,1%	-	-	-	-	-	-	AVX1094
	2800	N	9,1%	9,4%	0,0%	0,0%	11,7%	12,1%	0,0%	0,0%	7,9%	8,1%	-	-	-	-	AVX1088
	3000	A	15,4%	16,2%	0,0%	0,0%	9,0%	9,4%	-	-	-	-	-	-	-	-	AVX1094
	3000	E	9,1%	9,3%	0,0%	0,0%	11,6%	12,0%	0,0%	0,0%	7,8%	8,0%	-	-	-	-	AVX1098
	3000	U	9,1%	9,3%	0,0%	0,0%	11,6%	12,0%	0,0%	0,0%	7,8%	8,0%	-	-	-	-	AVX1098
	3000	N	0,0%	0,0%	8,8%	9,0%	0,0%	0,0%	10,0%	10,2%	0,0%	0,0%	3,9%	4,0%	-	-	AVX1093

HYDRAULIC CONNECTIONS

The units may be available with or without integrated hydronic kit, in any case:

ATTENTION *The choice and installation of components external to the unit is up to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.*

ATTENTION *The hydraulic connection pipes to the unit must be suitably dimensioned for the effective water flow rate requested by the system when running. The water flow rate to the heat exchanger must always be constant*

ATTENTION *Wash the system thoroughly before connecting the unit. This cleaning will eliminate any residues such as welding drips, scale, rust, or other impurities from the piping. These substances can also deposit inside and cause unit malfunctions. The connection piping must be adequately supported so that its weight does not rest on the appliance*

CONNECTIONS

Before starting the system, check that the hydraulic circuits are connected to the current exchangers (or, that the evaporator in the air/water units or evaporator and condenser in the water water units or the intake and flow fittings have not been reversed). The water circulation pump must preferably be installed upstream so that the evaporator/condenser is subject to a positive pressure. The water inlet and outlet connections are indicated in the dimension tables in this manual, or available on www.aermec.com

It is important to follow the recommendations (not complete) below:

- The water pipes must not transmit radial or axial forces or vibrations to the exchangers (use flexible hoses to reduce the transmitted vibrations)
- It is necessary to install manual or automatic vent valves in the highest points of the circuit; and also provide discharge fittings in the lowest points to allow emptying the entire circuit
- To maintain the pressure in the circuits, you must install an expansion tank and a safety valve
- Respect the water inlet and outlet connections shown on the unit
- Install manometer on the water inlet and outlet fittings.
- Install stop valve near the water inlet and outlet fittings.
- After performing a leak test, insulate the pipes to reduce heat loss and prevent the formation of condensation
- If the external water pipes are in an area where it is likely that the environment temperature drops below 0°C, insulate the pipes and provide an electric heater. As an option, you can also protect the pipes inside the unit.
- Check the continuity of the earthing.

ATTENTION *You must install the water filter supplied, in the hydraulic circuit upstream of the heat exchanger. FAILURE TO DO THIS INVALIDATES THE WARRANTY.*

ATTENTION *The charge or discharge of the heat exchange fluids must be made during installation by qualified technicians using the fittings provided on the hydraulic circuit. Never use the unit heat exchangers to top-up the heat exchanger fluid.*

DISCHARGING SYSTEM

In the event the system is stopped during winter, the water in the heat exchanger can freeze damaging the heat exchanger irreversibly. To prevent danger of freezing, three solutions are possible:

1. Full water discharge from the unit.
2. Using the resistances. In this case the resistances must always be supplied with electrical power for the entire period of possible freezing (machine in stand-by).
3. Operation with glycol/water fluid, with a percentage of glycol based on the minimum outdoor temperature expected.

ANTI-FREEZE PROTECTION

ATTENTION: *the addition of glycol is the only effective protection against freezing; the glycol/water solution must be sufficiently concentrated to ensure proper protection and prevent ice forming at minimum temperature provided for a given installation. Take the necessary precautions if using non-passivated anti-freeze solutions (monoethylene glycol or monopropylene glycol). Corrosion phenomena may occur with these anti-freeze solutions in contact with oxygen. However, always refer to the glycol supplier documentation to check its recommended concentration.*



Do not fill up the hydraulic system by glycol near the suction of the pump. High concentration of glycol could stuck the pump. Do not use the pump to mix water and glycol

HYDRAULIC DIAGRAMS AND WATER FEATURES

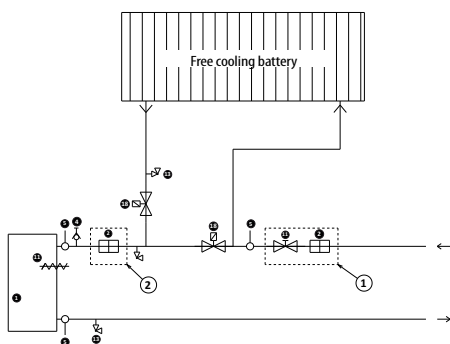
Series components supplied depending on the model and ons to load Installer:

- 1 Plate heat exchanger
- 2 Water filter:
 - Supplied complete in models without Hydronic Kit
 - Mounted on models with Hydronic Kit
- Always Mandatory installation, Pena Forfeiture of Warranty
- 3 Flow Switch Installation Always Mandatory, Pena Forfeiture of Warranty
- 4 Air vent valve
- 5 Water temperature probe
- 6 Flexible joints
- 7 Shut-off valve
- 8 Safety valve
- 9 Expansion vessel
- 10 Buffer Tank
- 11 Electrical heater
- 12 Pump
- 13 Drain tap
- 14 manometre
- 15 Pressure gauge
- 17 One-way valves
- 18 Water temperature probe

System: Chiller with plate heat exchanger

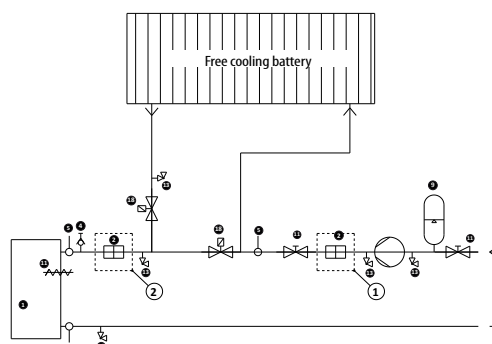
PH	7,5-9
Electric conductivity	100-500µS/cm
Total hardness	4,5-8,5°dH
Temperature	< 65°C
Oxygen content	< 0,1 ppm
Max. glycol amount	50%
Phosphates (PO4)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,3 ppm
Alkalinity (HCO3)	70 - 300 ppm
Chloride ions (Cl-)	< 50 ppm
Sulphate ions (SO4)	< 50 ppm
Sulphide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

Standard Circuit



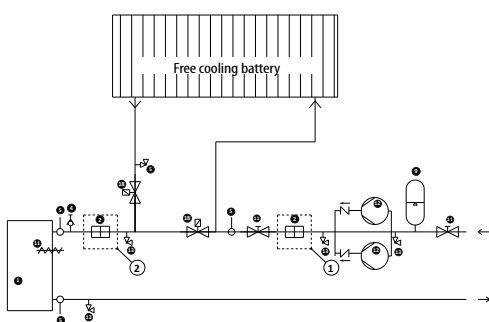
1	Position filter up to 4VB (from 0800 to 1800 FA; from 0800 to 1400 FU/FE; from 0800 to 1000 FN)
2	Position filter up to 5VB (all other sizes)

Circuit "P"



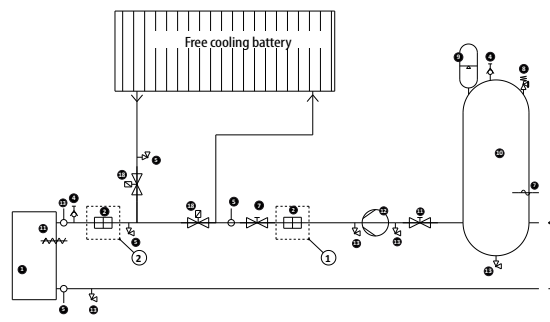
1	Position filter from size 0800 to 1800
2	Position filter from size 2000 to 3000

Circuit "D"



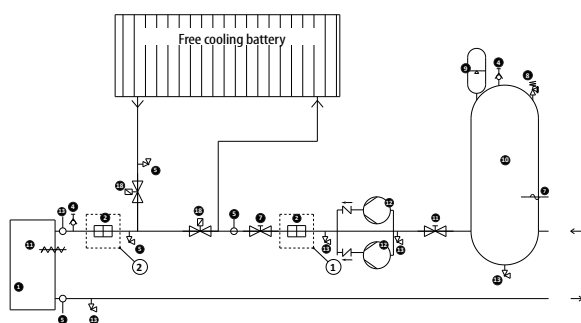
1	Position filter from size 0800 to 1800
2	Position filter from size 2000 to 3000

Circuit "A"



1	Position filter from size 0800 to 1800
2	Position filter from size 2000 to 3000

Circuit "B"



1	Position filter from size 0800 to 1800
2	Position filter from size 2000 to 3000



For DIMENSIONS and POSITION OF HYDRAULIC CONNECTIONS refer to the DWG file on site www.aermec.com or selection program Magellano.

ELECTRICAL CONNECTIONS

The units are completely wired at the factory and only require connection to the electric power supply mains, downstream from a unit switch, according to that envisioned by the Standards in force on this subject in the country of installation.

It is also advised to check that:

- The electrical mains features are suitable for the absorption values indicated in the electrical data table, also taking into consideration any other machines functioning at the same time.
- The unit is only powered when installation has been completed (hydraulic and electric).
- Respect the connection indications of the phase, and earth wires.
- The power supply line must have a relevant protection mounted upstream against short circuits and dispersions to earth, which isolates the system with respect to other utilities.
- 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). Whenever these parameters are not respected, contact the electric energy public body.
- For electric connections, use the cables with double isolation according to the Standards in force on this subject in the different countries.

it is mandatory:

- The use of an omnipolar magnet circuit breaker switch, in compliance with the current Standards (contact opening at least 3 mm), with suitable cut-off power and differential protection on the basis of the electric data table shown below, installed as near as possible to the appliance.
- To make an effective earth connection. The manufacturer cannot be considered responsible for any damage caused by the lack of or ineffective appliance earth connection.
- For units with three-phase power supply, check the correct connection of the phases.

ATTENTION

- **All the electrical operations must be carried out by personnel in possession of the necessary qualifications by law, suitably trained and informed on the risks related to these operations.**
- **The characteristics of the electrical lines and of the related components must be determined by staff qualified to design electrical systems, in compliance with the international and national regulations of the place of installation of the unit and in compliance with the regulations in force at the moment of installation**
- **For the installation requirements refer only to the wiring diagram supplied with the unit. - The wiring diagram along with the manuals must be kept in good condition and always available for any future servicing on the unit.**
- **IT IS mandatory to verify that the machine is watertight before making the electrical connections and it must only be powered up after the hydraulic and electrical works have been completed.**

ELECTRICAL DATA

The cable section shown in the table are recommended for maximum lengths of 50m. For longer lengths or different cable laying, it is up to the PLANNER to calculate the appropriate line switch, the power supply line as well as the connection to the earth wire and connection cables depending on:

- The length
- The type of cable
- The absorption of the unit and the physical location, and the ambient temperature.

ELECTRICAL DATA

ELECTRICAL DATA 208V-3-60HZ - FAN J

208V-3-60Hz - Fan J								
Units			Total consumption		MOP	Recommended fuse	Phases	
Mod.		Comp.	Fan	L.R.A.	F.L.A.			
NRB	Vers.	(n°)	(n°)	(A)	(A)	(A)	(A)	(n°)
0800	A	4	4	605	272	328	300	3
	E	4	6	620	287	343	300	3
	U	4	6	620	287	343	300	3
	N	4	8	635	302	358	350	3
0900	A	4	4	780	313	387	350	3
	E	4	6	795	328	402	400	3
	U	4	6	795	328	402	400	3
	N	4	8	810	343	417	400	3
1000	A	4	6	816	364	438	400	3
	E	4	6	816	364	438	400	3
	U	4	6	816	364	438	400	3
	N	4	8	831	379	453	450	3
1100	A	4	6	929	389	475	450	3
	E	4	8	944	404	490	450	3
	U	4	8	944	404	490	450	3
	N	4	10	959	419	505	500	3
1200	A	4	6	956	414	499	450	3
	E	4	8	971	429	514	500	3
	U	4	8	971	429	514	500	3
	N	4	10	986	444	529	500	3

ELECTRICAL DATA 230V-3-60HZ - FAN J

230V-3-60Hz - Fan J								
Units			Total consumption		MOP	Recommended fuse	Phases	
Mod.		Comp.	Fan	L.R.A.	F.L.A.			
NRB	Vers.	(n°)	(n°)	(A)	(A)	(A)	(A)	(n°)
0800	A	4	4	578	267	323	300	3
	E	4	6	593	282	338	300	3
	U	4	6	593	282	338	300	3
	N	4	8	608	297	353	350	3
0900	A	4	4	752	308	382	350	3
	E	4	6	767	323	397	350	3
	U	4	6	767	323	397	350	3
	N	4	8	782	338	412	400	3
1000	A	4	6	786	359	433	400	3
	E	4	6	786	359	433	400	3
	U	4	6	786	359	433	400	3
	N	4	8	801	374	448	400	3
1100	A	4	6	938	385	470	450	3
	E	4	8	953	400	485	450	3
	U	4	8	953	400	485	450	3
	N	4	10	968	415	500	450	3
1200	A	4	6	1042	407	493	450	3
	E	4	8	1057	422	508	500	3
	U	4	8	1057	422	508	500	3
	N	4	10	1072	437	523	500	3

L.R.A. Peak current from unit
F.L.A. Maximum current from unit
Earth Earth wire to connect to unit
IL Master switch

ELECTRICAL DATA 460V-3-60HZ - FAN J

460V-3-60Hz - Fan J								
Units				Total consumption				
Mod.		Comp.	Fan	L.R.A.	F.L.A.	MOP	Recommended fuse	Phases
NRB	Vers.	(n°)	(n°)	(A)	(A)	(A)	(n°)	(n°)
0800	A	4	4	291	129	156	150	3
	E	4	6	299	137	164	150	3
	U	4	6	299	137	164	150	3
	N	4	8	307	145	171	150	3
0900	A	4	4	341	139	169	150	3
	E	4	6	349	147	177	150	3
	U	4	6	349	147	177	150	3
	N	4	8	357	154	185	175	3
1000	A	4	6	357	155	185	175	3
	E	4	6	357	155	185	175	3
	U	4	6	357	155	185	175	3
	N	4	8	365	163	193	175	3
1100	A	4	6	413	181	223	200	3
	E	4	8	421	189	231	225	3
	U	4	8	421	189	231	225	3
	N	4	10	429	196	238	225	3
1200	A	4	6	432	204	246	225	3
	E	4	8	440	212	254	225	3
	U	4	8	440	212	254	225	3
	N	4	10	448	220	262	250	3
1400	A	4	6	484	233	287	250	3
	E	4	8	492	240	295	250	3
	U	4	8	492	240	295	250	3
	N	4	10	500	248	303	250	3
1600	A	4	8	521	266	320	300	3
	E	4	10	529	273	328	300	3
	U	4	10	529	273	328	300	3
	N	4	12	537	281	336	300	3
1800	A	4	8	632	307	380	350	3
	E	4	12	648	323	396	350	3
	U	4	12	648	323	396	350	3
	N	4	14	656	331	404	350	3
2000	A	4	10	666	352	425	400	3
	E	4	12	674	360	433	400	3
	U	4	12	674	360	433	400	3
	N	4	14	682	368	441	400	3
2200	A	5	10	699	370	443	400	3
	E	5	14	715	385	458	450	3
	U	5	14	715	385	458	450	3
	N	5	16	723	393	466	450	3
2400	A	6	12	655	390	445	400	3
	E	6	14	663	398	452	400	3
	U	6	14	663	398	452	400	3
	N	6	16	671	406	460	450	3
2600	A	6	14	774	440	513	500	3
	E	6	16	782	447	520	500	3
	U	6	16	782	447	520	500	3
	N	6	18	790	455	528	500	3
2800	A	6	14	800	477	550	500	3
	E	6	16	808	485	558	500	3
	U	6	16	808	485	558	500	3
	N	6	18	816	492	565	500	3
3000	A	6	14	826	514	587	500	3
	E	6	18	842	529	602	500	3
	U	6	18	842	529	602	500	3
	N	6	20	849	537	610	600	3

L.R.A. Peak current from unit
F.L.A. Maximum current from unit
Earth Earth wire to connect to unit
IL Master switch

ELECTRICAL DATA 575V-3-60HZ - FAN J

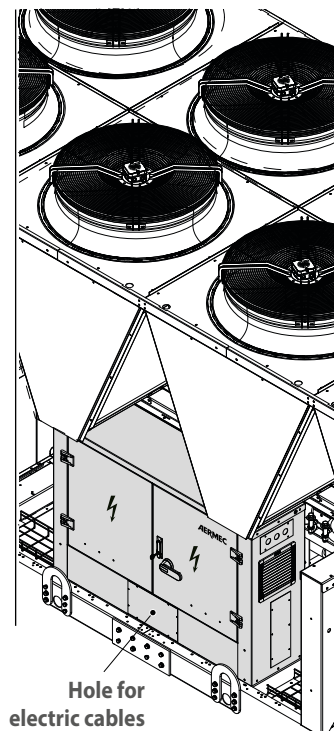
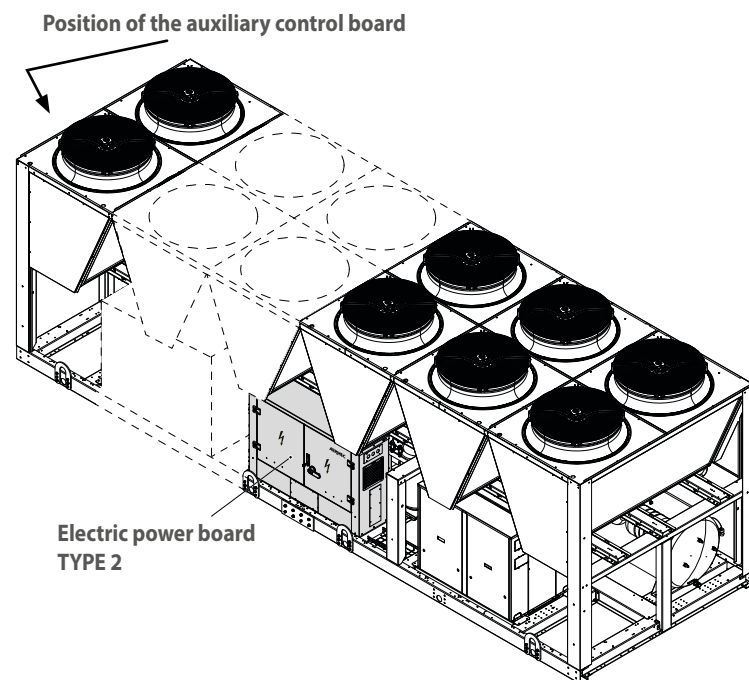
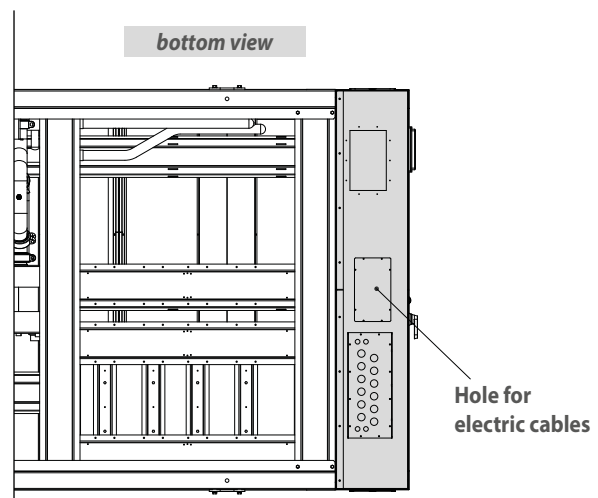
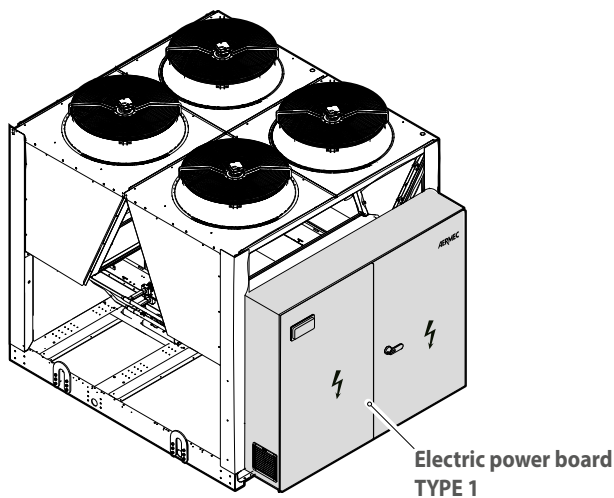
575V-3-60Hz - Fan J								
Units				Total consumption				
Mod.		Comp.	Fan	L.R.A.	F.L.A.	MOP	Recommended fuse	Phases
NRB	Vers.	(n°)	(n°)	(A)	(A)	(A)	(n°)	(n°)
0800	A	4	4	219	115	139	125	3
	E	4	6	225	121	145	125	3
	U	4	6	225	121	145	125	3
	N	4	8	231	128	151	125	3
0900	A	4	4	270	117	142	125	3
	E	4	6	276	123	148	125	3
	U	4	6	276	123	148	125	3
	N	4	8	282	130	154	125	3
1000	A	4	6	283	125	150	125	3
	E	4	6	283	125	150	125	3
	U	4	6	283	125	150	125	3
	N	4	8	289	131	156	150	3
1100	A	4	6	348	148	183	175	3
	E	4	8	354	154	189	175	3
	U	4	8	354	154	189	175	3
	N	4	10	360	160	195	175	3
1200	A	4	6	362	169	203	175	3
	E	4	8	368	175	210	200	3
	U	4	8	368	175	210	200	3
	N	4	10	374	181	216	200	3
1400	A	4	6	374	202	251	225	3
	E	4	8	380	208	257	250	3
	U	4	8	380	208	257	250	3
	N	4	10	387	214	263	250	3
1600	A	4	8	403	237	286	250	3
	E	4	10	409	243	293	250	3
	U	4	10	409	243	293	250	3
	N	4	12	415	249	299	250	3
1800	A	4	8	549	243	294	250	3
	E	4	12	561	255	307	300	3
	U	4	12	561	255	307	300	3
	N	4	14	567	261	313	300	3
2000	A	4	10	575	254	306	250	3
	E	4	12	581	260	312	300	3
	U	4	12	581	260	312	300	3
	N	4	14	587	266	318	300	3
2200	A	5	10	600	298	350	300	3
	E	5	14	613	311	363	350	3
	U	5	14	613	311	363	350	3
	N	5	16	619	317	369	300	3
2400	A	6	12	506	348	398	350	3
	E	6	14	512	354	404	350	3
	U	6	14	512	354	404	350	3
	N	6	16	519	361	410	400	3
2600	A	6	14	658	360	412	400	3
	E	6	16	665	366	418	400	3
	U	6	16	665	366	418	400	3
	N	6	18	671	373	424	400	3
2800	A	6	14	679	365	417	400	3
	E	6	16	685	371	423	400	3
	U	6	16	685	371	423	400	3
	N	6	18	691	378	429	400	3
3000	A	6	14	699	370	422	400	3
	E	6	18	711	383	434	400	3
	U	6	18	711	383	434	400	3
	N	6	20	717	389	441	400	3

L.R.A. Peak current from unit
F.L.A. Maximum current from unit
Earth Earth wire to connect to unit
IL Master switch

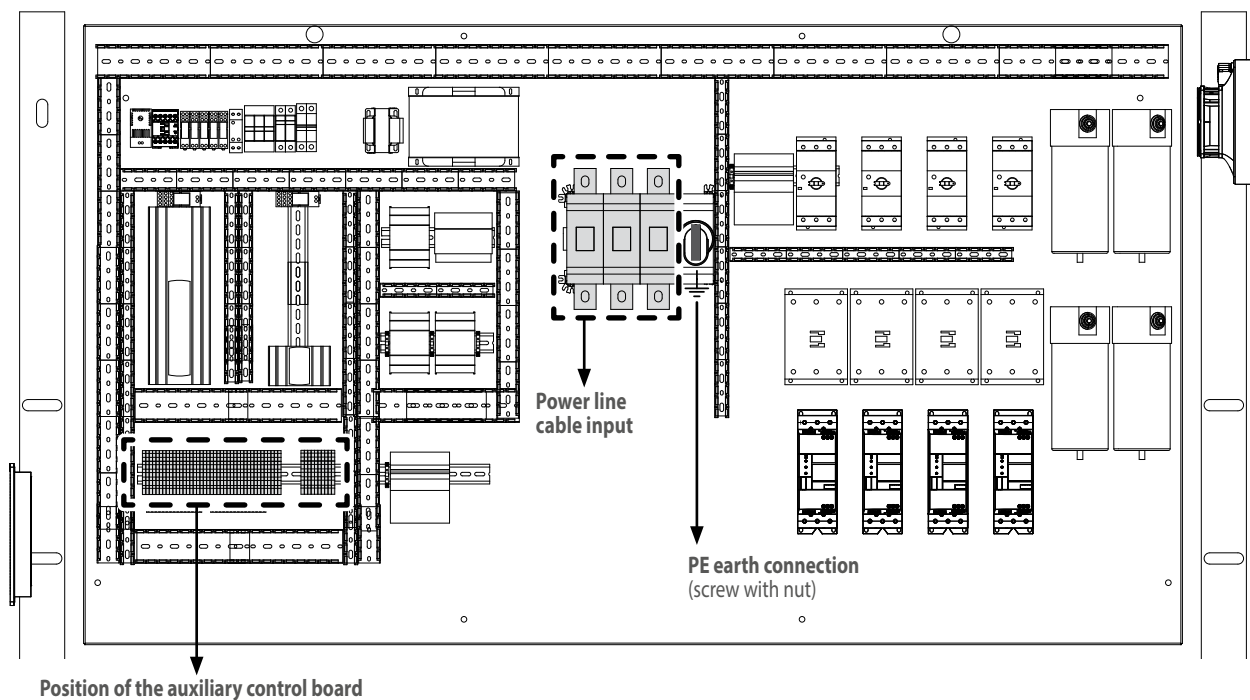
ELECTRIC POWER CONNECTION TO THE ELECTRICAL MAINS

- Open the external covering panels (if present)
- Make sure that the switch is at "OFF" before opening the electric control board for the connection of the unit to the power supply.
- Use the plates/holes to pass the main electric power supply cable and the cables of the other external connections under the responsibility of the installer.
- It is prohibited to access positions not specifically envisioned in this manual with electric cables.
- Avoid direct contact with non-insulated copper piping and with the compressor.
- Identify the clamps for the electric connection and always refer exclusively to the wiring diagram supplied with the unit.
- Remove any protections from the cable fixing points..
- For the functional connection of the unit, take the power supply cable to the electric control board inside the unit and connect it to clamps. L1-L2-L3, N (if present), and PE respecting the polarities L1-L2-L3 and N as phases, and PE as grounding
- Ensure that all protections removed for the electric connection have been restored before powering the unit electrically.
- Close all the opened panels.
- Turn the switch at "ON" position.
- Position the system master switch (outside the appliance) at "ON".

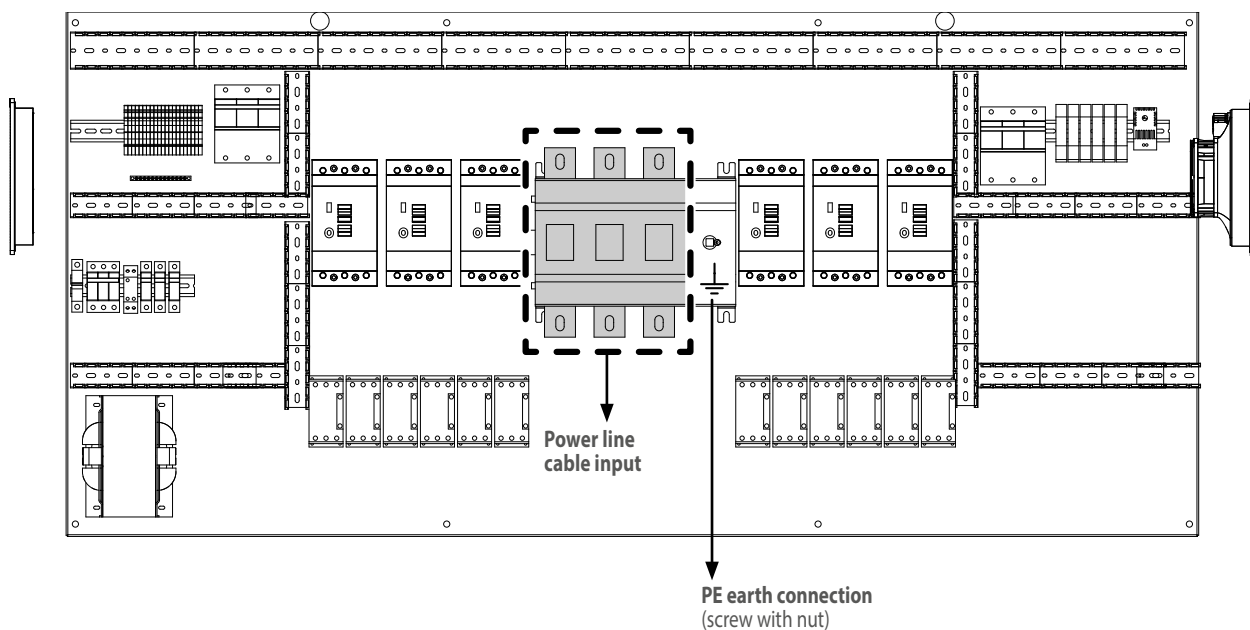
For auxiliary connection please refer to the wiring diagrams supplied with the unit,



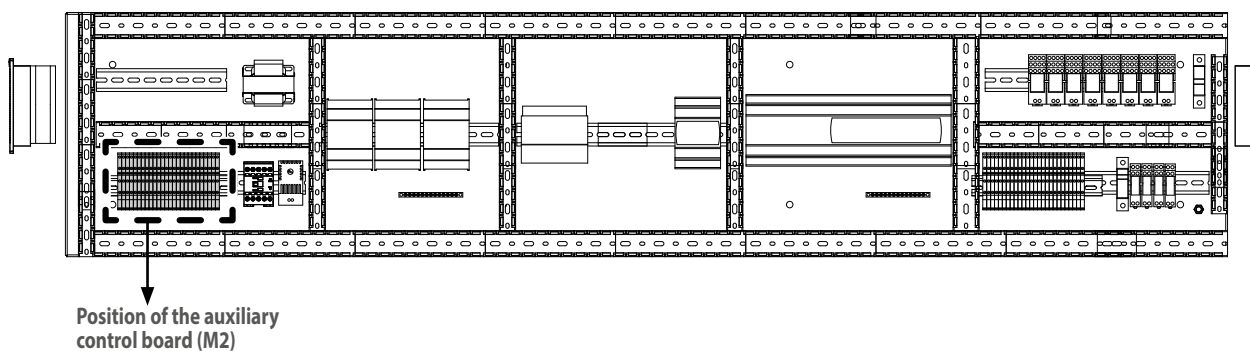
Electric power board TYPE 1 - Example layout of NRB with 2 and 3 V BLOCK



Electric power board TYPE 2 - Example layout of NRB starting from 4 V BLOCK



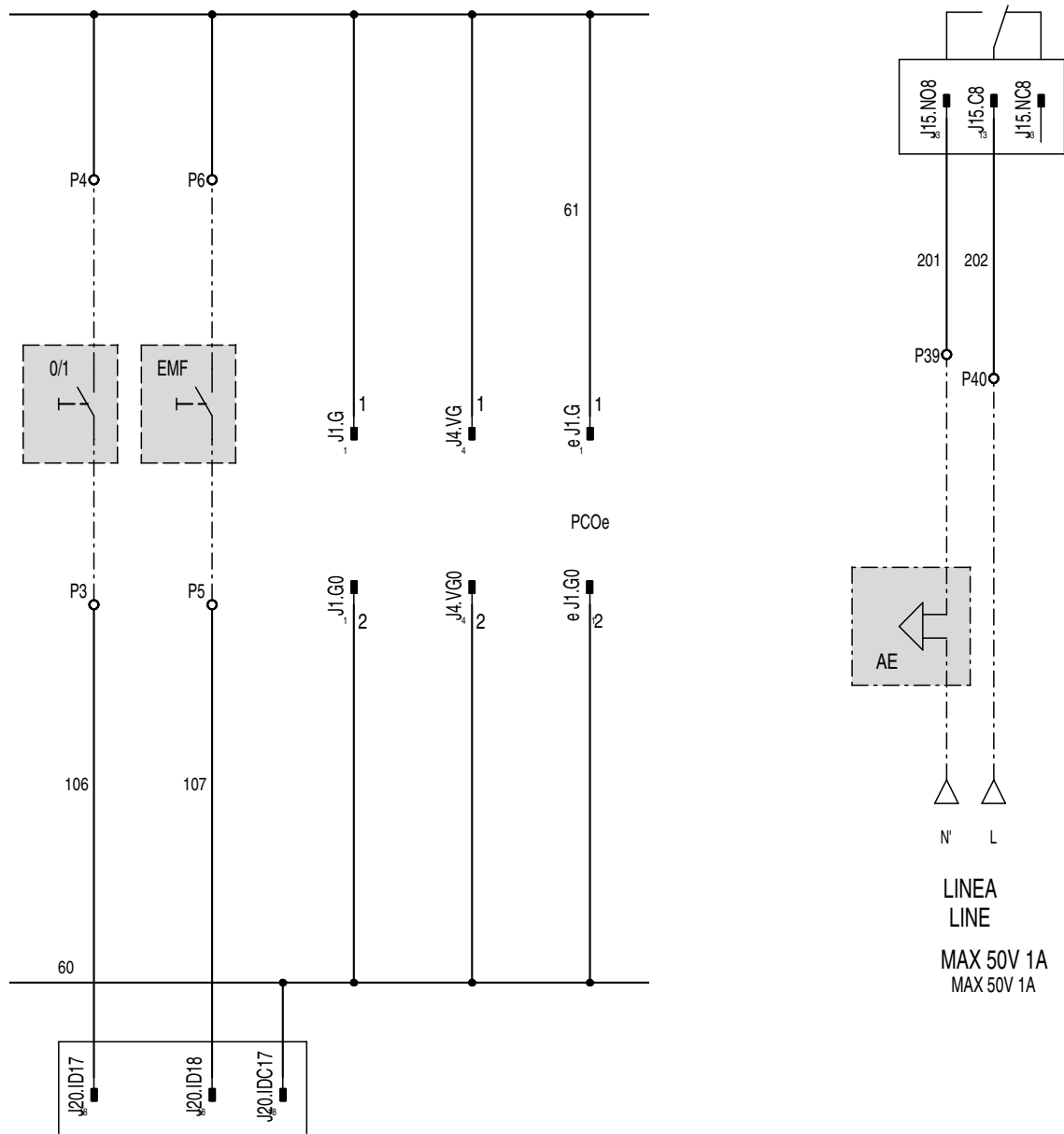
Auxiliary control board



CONNECTING THE AUXILIARY CONTROL BOARD

N° MORS. N° FILO USCENTE					
1	1			C/F	
3	3			0/1	
5	5			EMF	
7	7			2° SET	
9	8			FL	
11	93	RESISTENZA CP		RC1	
13	95			RC1A	
15	97			RC2	
17	99			RC2A	
19	101			MP1	
21	103			MP1A	
23	105			MP2	
25	107			MP2A	
27	155			VSL1	
29	2				
31	165			VSL2	
33	2				
35	2				
37					
39				AE	
41	24			AP1	
43	27			AP2	
45		RESISTENZA ANTIGELO		RE	
47		RES. DESURR.		RRC	
49		RESISTENZA ACCUMULO		RACC	
51	63A				
53	109			MP1	
55	111			MP1A	
57	68A				
59	113			MP2	
61	115			MP2A	
63	157			VIC1	
65	173			VSBY1	
67	171			VIC2	
69	169			VSBY2	
71				MTP1	
73				MTP2	
75				CPO1	

2	2			C/F	
4	4			0/1	
6	6			EMF	
8	8			2° SET	
10	7			FL	
12	92	RESISTENZA CP		RC1	
14	94			RC1A	
16	96			RC2	
18	98			RC2A	
20	100			MP1	
22	102			MP1A	
24	104			MP2	
26	106			MP2A	
28	154			VSL1	
30	1				
32	164			VSL2	
34	1				
36	1				
38					
40					
42	23			AP1	
44	26			AP2	
46		RESISTENZA ANTIGELO		RE	
48		RES. DESURR.		RRC	
50		RESISTENZA ACCUMULO		RACC	
52	63				
54	108			MP1	
56	110			MP1A	
58	68				
60	112			MP2	
62	114			MP2A	
64	156			VIC1	
66	172			VSBY1	
68	170			VIC2	
70	168			VSBY2	
72				MTP1	
74				MTP2	
76				CPO1	



Key:

the auxiliary control board points highlighted are the ones that the installer can use.

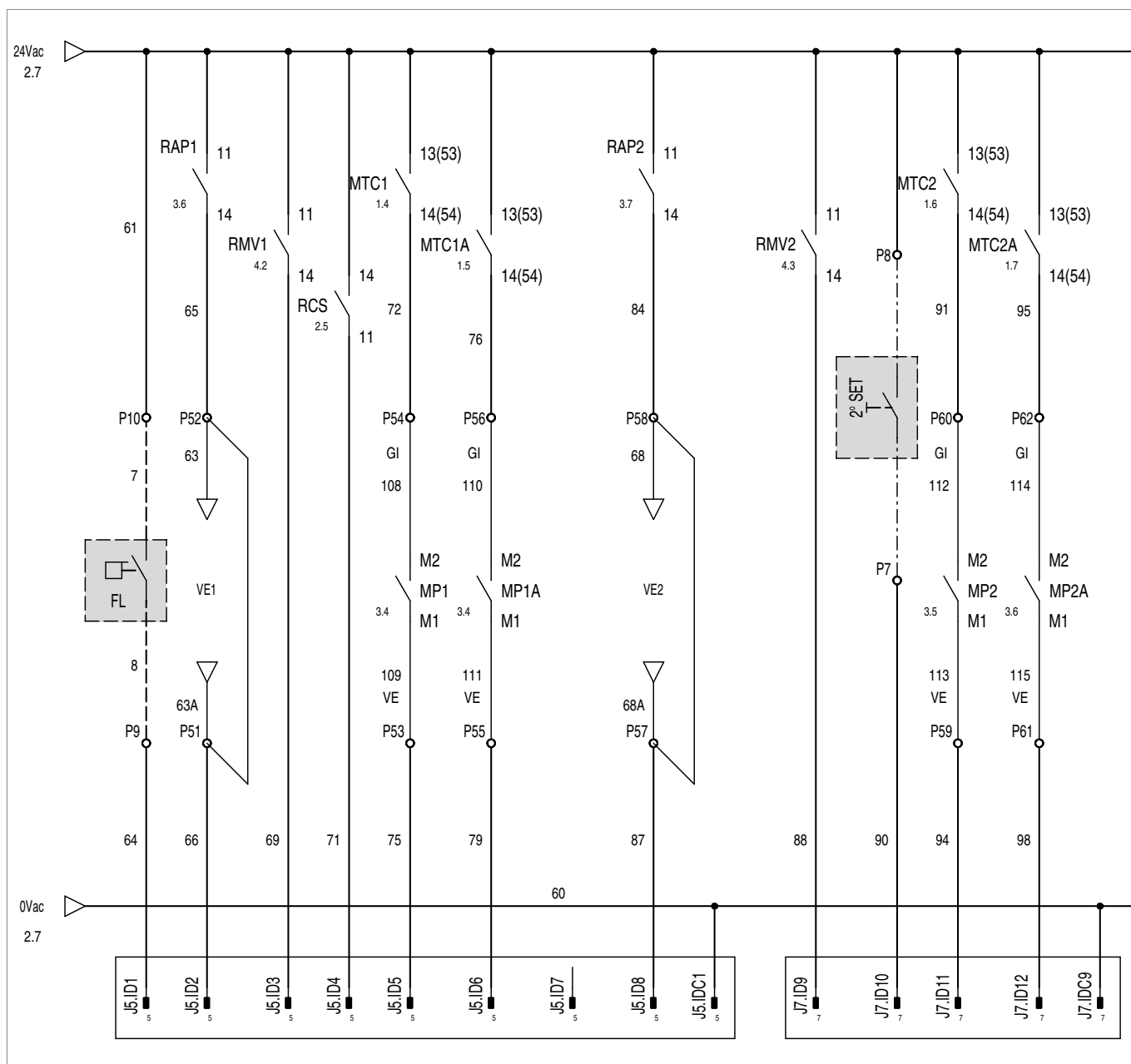
0/1 remote ON/OFF

EMF Multi-purpose input (**just the enabling**)

- chiller power limiting
- setpoint (heating/cooling) variation

AE alarm summary

NB: for any other details, refer to the complete electric diagram on the machine.



Key:

the auxiliary control board points highlighted are the ones that the installer can use.

FL Evaporator flow switch

2° SET selection 2nd set point

NB: for any other details, refer to the complete electric diagram on the machine.

ACCESSORIES

AER485P1

RS-485 interface for supervision systems with MODBUS protocol.

AERNET

The device allows the control, the management and the remote monitoring of a Chiller with a PC, smartphone or tablet using Cloud connection. AERNET works as Master while every unit connected is configured as Slave (max. 6 unit); also, with a simple click is possible to save a log file with all the connected unit datas in the personal terminal for post analysis.

PGD1

This allows chiller command operations to be implemented from a distance.

MULTICHILLER_EVO

Control, switch-on and switch-off system of the single chillers where multiple units are installed in parallel, always ensuring constant flow rate to the exchangers.

FL-UL Flow switch.

Warning: the flow switch and water filter must be fitted. Otherwise, the warranty will be considered null.

Air filters (shipped to the package including packaging)

Filter to protect the micro-channel coils. Formed of a frame and a composite baffle in micro-expanded aluminium mesh, with particularly low pressure drops.

AVX

Anti-vibration spring supports.

Accessories installed in the factory

DRENRB

Electronic device for reducing the rated starting current.

RIFNRB

Current phase advancer. When connected to the motor in parallel, the input current is reduced (by about 10%).

GP

Anti-intrusion grille.

Air filters filter to protect the micro-channel coils.

Formed of a frame and a composite baffle in micro-expanded aluminium mesh, with particularly low pressure drops.

COMPATIBILITY OF ACCESSORIES

NRB-FC	vers.	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
AER485P1		*	*	*	*	*	*	*	*	*	*	*	*	*	*
AERNET		*	*	*	*	*	*	*	*	*	*	*	*	*	*
PGD1		*	*	*	*	*	*	*	*	*	*	*	*	*	*
MULTICHILLER_EVO		*	*	*	*	*	*	*	*	*	*	*	*	*	*
FL-UL		*	*	*	*	*	*	*	*	*	*	*	*	*	*
Air filters	FA	FB2M	FB2M	FB3M	FB3M	FB3M	FB3M	FB2M (2x)	FB2M (2x)	FB2M + FB3M	FB2M + FB3M	FB3M (2x)	FB2M (2x) + FB3M	FB2M (2x) + FB3M	FB2M (2x) + FB3M
	FE	FB3M	FB3M	FB3M	FB2M (2x)	FB2M (2x)	FB2M (2x)	FB2M + FB3M	FB3M (2x)	FB3M (2x)	FB2M (2x) + FB3M	FB2M (2x) + FB3M	FB2M + FB3M (2x)	FB2M + FB3M (2x)	FB3M (3x)
	FU	FB3M	FB3M	FB3M	FB2M (2x)	FB2M (2x)	FB2M (2x)	FB2M + FB3M	FB3M (2x)	FB3M (2x)	FB2M (2x) + FB3M	FB2M (2x) + FB3M	FB2M + FB3M (2x)	FB2M + FB3M (2x)	FB3M (3x)
	FN	FB2M (2x)	FB2M (2x)	FB2M (2x)	FB2M + FB3M	FB2M + FB3M	FB2M + FB3M	FB3M (2x)	FB2M (2x) + FB3M	FB2M (2x) + FB3M	FB2M + FB3M (2x)	FB2M + FB3M (2x)	FB3M (3x)	FB3M (3x)	FB2M (2x) + FB3M (2x)
AVX	FA	AVX1082	AVX1082	AVX1080	AVX1080	AVX1080	AVX1080	AVX1095	AVX1095	AVX1086	AVX1086	AVX1084	AVX1094	AVX1094	AVX1094
	FE	AVX1080	AVX1080	AVX1080	AVX1095	AVX1095	AVX1095	AVX1096	AVX1084	AVX1084	AVX1094	AVX1094	AVX1088	AVX1088	AVX1098
	FU	AVX1080	AVX1080	AVX1080	AVX1095	AVX1095	AVX1095	AVX1096	AVX1084	AVX1084	AVX1094	AVX1094	AVX1088	AVX1088	AVX1098
	FN	AVX1095	AVX1095	AVX1095	AVX1096	AVX1096	AVX1096	AVX1084	AVX1094	AVX1094	AVX1097	AVX1088	AVX1098	AVX1098	AVX1093
ACCESSORIES INSTALLED IN THE FACTORY															
DRENRB		*	*	*	*	*	*	*	*	*	*	*	*	*	*
RIFNRB		*	*	*	*	*	*	*	*	*	*	*	*	*	*
GP (1)	FA	2VN	2VN	3VN	3VN	3VN	3VN	4VN	4VN	5VN	5VN	6V	7V	7V	7V
	FE	3VN	3VN	3VN	4VN	4VN	4VN	5VN	6V	6V	7V	7V	8V	8V	9VN
	FU	3VN	3VN	3VN	4VN	4VN	4VN	5VN	6V	6V	7V	7V	8V	8V	9VN
	FN	4VN	4VN	4VN	5VN	5VN	5VN	6V	7V	7V	8V	8V	9VN	9VN	10V
Air filters	FA	FB1 (2x)	FB1 (2x)	FB1 (3x)	FB1 (3x)	FB1 (3x)	FB1 (3x)	FB1 (4x)	FB1 (4x)	FB1 (5x)	FB1 (5x)	FB1 (6x)	FB1 (7x)	FB1 (7x)	FB1 (7x)
	FE	FB1 (3x)	FB1 (3x)	FB1 (3x)	FB1 (4x)	FB1 (4x)	FB1 (4x)	FB1 (5x)	FB1 (6x)	FB1 (6x)	FB1 (7x)	FB1 (7x)	FB1 (8x)	FB1 (8x)	FB1 (9x)
	FU	FB1 (3x)	FB1 (3x)	FB1 (3x)	FB1 (4x)	FB1 (4x)	FB1 (4x)	FB1 (5x)	FB1 (6x)	FB1 (6x)	FB1 (7x)	FB1 (7x)	FB1 (8x)	FB1 (8x)	FB1 (9x)
	FN	FB1 (4x)	FB1 (4x)	FB1 (4x)	FB1 (5x)	FB1 (5x)	FB1 (5x)	FB1 (6x)	FB1 (7x)	FB1 (7x)	FB1 (8x)	FB1 (8x)	FB1 (9x)	FB1 (9x)	FB1 (10x)

(1) 2VN models become 2VNA for configuration with Ax and Bx hydronic kits

Note: For installation please refer to the dedicated documentation

COMMISSIONING - WARNINGS

Please note that, on request by the Aermec customer or the legitimate owner of the machine, the units in this series can be started up by the AERMEC After-Sales Service in your area (valid only on ITALIAN territory). The start of operation must be scheduled in advance based on the time frame for the completion of works for the system. Prior to the intervention, all other works (electrical and hydraulic hook-ups, priming and bleeding of air from the system) must have been completed.

START-UP

OPERATIONS TO BE PERFORMED WITH NO VOLTAGE PRESENT

ATTENTION

the unit is not working:

Check:

- All safety conditions have been respected
- The unit is correctly fixed to the support surface
- The minimum technical spaces have been respected
- That the main power supply cables have appropriate cross-section, which can support the total consumption of the unit. (see electric data sections) and that the unit has been duly connected to the ground.
- That all the electrical connections have been made correctly and all the terminals adequately tightened.

OPERATIONS TO BE PERFORMED WITH THE UNIT LIVE

ATTENTION

the unit is still not working:

- Supply power to the unit by turning the master switch to the ON position.
- Use a tester to verify that the value of the power supply voltage to the phases is equal to $400V \pm 10\%$; also verify that the unbalance between phases is no greater than 3%.
- Check that the connections made by the installer are in compliance with the documentation.
- Verify that the resistor of the compressor sump is working by measuring the increase in temperature of the oil pan. The resistance/s must function for at least 12 hours before start-up of the compressor and in any event, the temperature of the oil pan must be 10-15°C higher than room temperature.

HYDRAULIC CIRCUIT CONTROLS

- Check that all hydraulic connections are made correctly, that the plate indications are complied with and that a mechanical filter has been installed in each inlet heat exchanger. **(Mandatory component for warranty to be valid).**
- Make sure that the circulation pump/s is operating and that the water flow rate is sufficient to close the contact of the flow switch, if installed.
- Check the water flow rate, measuring the pressure difference between inlet and outlet of the evaporator and calculate the flow rate using the evaporator pressure drop tables present in this manual.
- Check the correct functioning of the flow meters if installed. Closing the cut-off valve at the output of the heat exchanger; the unit control panel must show the block. Finally re-open the valve and rearm the block

COMMISSIONING

- Once all the aforementioned checks have been carried out, the unit can be commissioned
- Close the door of the electrical panel.
- Set the unit main switch to ON, the unit will start after a few minutes

OPERATIONS TO BE PERFORMED WITH MACHINE ON

ATTENTION

the unit is working:

Check:

- That the compressor input current is lower than the maximum indicated in the electrical data table.
- Before starting the unit, check that the compressor rotates in the correct direction through a three-phase protection. The spiral compressors compress in one direction of rotation only. Therefore, it is essential for the phase of the three-phase spiral compressors to be correctly connected (the correct direction of rotation can be controlled when the pressure on the intake side decreases and that on the flow side increases with the compressor in operation). If the connection is incorrect, the direction of rotation is reversed: this causes a loud noise and the reduction of current consumption. In this case, the protection system inside the compressor activated turning off the unit. To solve the problem, disconnect and swap the wires between two of the phases, then connect the three-phases again.
- That the voltage value lies within the pre-fixed limits and that unbalance between the three phases (three-phase power supply) is not above 3%.
- If having to take measurements and perform checks that require the machine to run, you must:
- make sure that any remote control systems are disconnected; however, keep in mind that the PLC on the machine controls its functions and can enable and disable the components creating hazardous situations (e.g. power and rotate the fans and their mechanical drive systems).
- Operate with the electrical board open the shortest time possible
- Close the electrical board as soon as the single measurement or control is performed

ATTENTION

The anti-freeze set temperature can only be varied by an authorised after-sales centre and only after having checked that there is a suitable % of anti-freeze solution in the water circuit.

Whenever this alarm intervenes, call the nearest authorised after-sales service immediately

- Control of the water flow rate alarm, the unit provides for the management of a flow rate alarm controlled by a differential pressure switch or flow switch if provided. This type of safety device intervenes after the first 30 seconds of pump functioning, if the water flow rate is not sufficient. The intervention stops the compressor and the pump itself.

MAINTENANCE

ATTENTION

Any cleaning, inspection, control, routine and extraordinary maintenance must be performed by experienced, authorised personnel and qualified to perform the above tasks. These tasks must be performed to perfection as prescribed by M.D. 37/2008.

During the execution of

- Risks of electric discharges;
- Risk of injuries due to the presence of rotating parts;
- Risk of injuries due to the presence of sharp edges and heavy weights;
- Risks of injuries due to the presence of components containing high pressure gas;
- Risks of injuries due to high or low temperature components.
- Noise-related risks of the machine functioning;
- Risks related to the presence of harmful substances in hydronic circuits.

These tasks must be performed using the appropriate personal protective equipment, see figure below

Maintenance operations are essential to maintain the refrigerant unit efficient, from a purely functional point of view and with regard to energy and safety.

In the absence of specific regulations regarding HFO refrigerants, the manufacturer prescribes the application of and compliance with that indicated in the:

- Regulation (EC) No.842/2006- art.3 concerning the "leakage containment"
- Regulation (EC) No.1516/2007 concerning the "standard leakage checking requirements" and related national laws implementing the above European regulations.

ATTENTION

For the unit, the user must provide a system booklet which he must ensure, or its designee authorised to service the machine, will contain all required records in order to have a historical documentation of the unit functioning. The absence of records in the booklet may count as evidence of lack of maintenance..

PRECAUTIONS TO BE OBSERVED DURING MAINTENANCE

ATTENTION

Maintenance operations can only be performed by authorised technicians

PRECAUTIONS AGAINST RESIDUAL RISKS

MECHANICAL RISKS

- Before opening a machine panel, ascertain whether it is or not firmly connected to it by hinges;
- In case a piece is disassembled, make sure it is correctly reassembled before restarting the unit;
- Louvers of the heat exchangers, edges of the components and panels, screws can generate cuts;
- Do not remove the protections from mobile elements while the unit is running;
- Make sure that the protections of mobile elements are correctly in place before restarting the unit;
- It is not permitted to walk or place other bodies on the machine;
- Fans, motors and belt drives may be in motion, always wait for them

to stop and take appropriate precautions to prevent their activation before accessing them;

- Isolate the unit from the mains by means of the external isolator provided for the insertion of padlocks (up to 3) for blocking in "open" position.
- Place a sign reading "Do not turn on - maintenance in progress" on the open isolator
- Equip yourself with the appropriate personal protective equipment (helmet, insulated gloves, protective goggles, accident-prevention shoes, etc.)
- Equip yourself with tools in good condition and make sure to have fully understood the instructions before using them
- For outdoor units, do not perform interventions in dangerous weather conditions such as rain, snow, fog, etc.
- The cooling circuit contains under pressure refrigerant gas: any operation must be performed by competent personnel in possession of the authorisations and qualifications required by current laws

ATTENTION

it is forbidden to LOAD the cooling circuit with a refrigerant gas different from that indicated. Using different refrigerant gas can severely damage the unit

- never disperse the fluid contained in the cooling circuit in the environment
- never keep the cooling circuit open, because the oil absorbs humidity and degrades
- during venting protect yourself against any leakage of fluids at dangerous temperatures and/or pressures
- always use appropriate equipment (extractor, antistatic bracelet, etc.) when replacing electronic boards
- if replacing a motor, compressor, evaporator, condensing coils or any other heavy element, make sure that the lifting devices are compatible with the weight to be handled
- in air units with independent compressor compartment, do not access the fan compartment without having first disconnected the machine through the isolator on the board and having placed a sign reading "Do not turn on - maintenance in progress"
- contact the company if changes must be made to the refrigerant, hydraulic or electric diagram of the unit, as well as its control logic

PREVENTION OF CHEMICAL / FIRE / ENVIRONMENTAL RISKS

- Any intervention on the machine must be performed with "NO SMOKING";
- The water circuit may contain harmful substances. Prevent the contents coming into contact with skin, eyes and clothing. Use the prescribed personal protective equipment. (chemical risk);
- If there is a need to perform a braze-welding, so with the use of special torch with naked flame, the same flame must only be activated if in the absence of freon gas in the environment and on the cooling circuit pipes. Inside piping must be "washed" and contain nitrogen type inert gas. The presence of flame and freon gas decomposes the same, forming lethal and carcinogenic compounds.
- Hot works require the availability of a Carbon Dioxide (CO₂) fire extinguisher. DO NOT USE WATER, leachates could be hazardous for the discharges; if using water, provide a containment tank.

PREVENTION AGAINST RESIDUAL RISKS DUE TO PRESSURE OR HIGH/LOW TEMPERATURE

- The unit contains under pressure gas: no operation must be performed on under pressure equipment except during maintenance that

- must be carried out by competent and authorised personnel;
- Perform brazing or welding only on empty pipes and clear of any lubricating oil residues; do not near flames or other heat sources to the pipes containing under pressure fluids;
- Do not work with naked flames near the unit;
- Do not bend or hit pipes containing under pressure fluids;
- The unit is equipped with overpressure release devices (safety valve): if these devices intervene, the refrigerant gas is released at high temperature and speed;
- The machine and the pipes have very hot or very cold surfaces that lead to risk of burns by contact;
- Do not use your hands to control any refrigerant leaks;
- Before removing elements along the under pressure hydronic circuits, shut-off the pipe section involved and gradually drain the fluid until its pressure and that of the atmosphere are balanced.

PREVENTION AGAINST RESIDUAL ELECTRICAL RISKS

- Before opening the electrical panel, disconnect the unit from the mains by means of the external isolator;
- Wait the time indicated on the machine plate from when the power supply was disconnected from the unit before accessing inside the electrical panel;
- If the unit is equipped with integrated inverter type compressors, disconnect the power supply and wait at least 5 minutes before accessing for maintenance: the internal components remain live for this time, generating the risk of electrocution.
- If the power supply cable is damaged, it must be replaced by the manufacturer, After Sales Service or by another similarly qualified person, to avoid dangerous situations.

CLEANING THE MACHINE

The machine must be turned off and electrically disconnected when being cleaned.

INSPECTION AND CONTROL

The machine must be turned off and electrically disconnected during its inspection and leak check.

ROUTINE AND EXTRAORDINARY MAINTENANCE

The machine must be turned off and electrically disconnected during its maintenance (with possible replacement of components). In particular:

- Before any intervention, isolate the unit from the mains by means of the external isolator provided for the insertion of padlocks (up to 3) for blocking in "open" position;
- Place a sign reading "Do not turn on – maintenance in progress" on the open isolator;
- Equip yourself with tools in good condition and make sure to have fully understood the instructions before using them;
- Equip yourself with the appropriate personal protective equipment as indicated in paragraph 1 of this report;
- For outdoor units, do not perform interventions in dangerous weather conditions such as rain, snow, fog, thunderstorms, etc;
- The cooling circuit components must be replaced after draining the refrigerant gas contained in the circuit;
- During venting protect yourself against any leakage of fluids at dangerous temperatures and/or pressures;
- Always use appropriate equipment (extractor, antistatic bracelet etc) when replacing electronic boards;
- If replacing a motor, compressor, evaporator, condensing coil or any

other heavy element, make sure that the lifting devices are compatible with the weight to be handled;

- In air units with independent compressor compartment, do not access the fan compartment without having first disconnected the machine through the isolator on the board and having placed a sign reading "Do not turn on – maintenance in progress";
- Always and only use original spare parts purchased directly from Aermec or from official dealers. Contact Aermec should it be necessary to move the unit one year after its positioning on-site or it must be dismantled;
- It is not permitted to change the refrigerant, hydraulic or electric layout of the unit, or its control logic unless expressly authorised by Aermec;
- The machine must be loaded with the refrigerant in the feature label and in the required quantity;
- Make sure to have removed all tools, electrical cables or other loose object and having perfectly connected the machine to the system before closing it and starting it;
- The inspections and measurements necessary to establish the correct functioning of the machine to be run with the machine in operation, must be performed with the machine closed (framework fixed on the machine), reading the measurements collected by the control board and viewable in the control panel of the same. In the case of machines with cooling circuit compartment open, stand in front of the control panel of the electrical panel remaining distant and not exposed to the under pressure parts of the cooling circuit

ATTENTION

When having to take measurements with the machine on and the electrical panel and cooling circuit open, be careful since the machine is live, the cooling circuit contains high pressure gas, the pipes may be hot or cold, some parts may be in motion.

Any absorption measurements of the compressors, compressor casings, pumps and fans as well as the power supply measurements, must be taken as follows:

- With machine off, access its panel;
- Connect the measuring instruments such as current clamps (to measure the current) and multimeters (to measure the voltage). These instruments must be fitted with appropriate terminals/clamps that allow to remotely control the measurement;
- Access the machine and read the measurements made by the instruments, keeping AWAY from live electrical parts;
- As soon as the measurements are taken, turn off the machine, remove the instruments and close the electrical panel.

The measurements of the compressor inlet and outlet temperature and pressure to determine the overheating and subcooling of the machine, must be carried out as follows:

- With machine off, access its cooling circuit;
- Connect the necessary instruments,
 - Pressure gauges connected through appropriate extensions to the compressor inlet and outlet pressure plugs;
 - Thermometers connected to thermocouple probes that are fixed to the compressor inlet and outlet pipes. Avoid using metratat that require the operator to near the machine cooling circuit;
- Access the machines **and acquire the measurements, keeping AWAY from the under pressure parts of the cooling circuit;**
- As soon as the measurements are taken, turn off the machine, remo-

ve the instruments and close the cooling circuit compartment.

The high/low pressure switch, where present must be tested with the machine “closed”, reading the high pressure circuit pressure on the machine control panel.

In case of machines with the cooling circuit compartment not closed by framework, the high/low pressure switch must be tested by standing in front of the machine panel where the control panel is located, remaining distant and not exposed to the under pressure parts of the cooling circuit.



CLEANING COIL MICRO-CHANNEL

Keep surfaces clean battery micro-channel is critical to maintaining the refrigeration systems at optimum performance levels. Dirt, grease, oil, and other foreign material must be removed periodically from the surface of the battery according to the following recommendations.

REQUIRED ELEMENTS:

- **Personal protective equipment**
- **Hot water**
- **High-pressure washing**

PROCEDURE:

- Use a detergent-type aqueous / spray- with a basic pH of less than 10.5 when mixed at the concentration recommended by the detergent manufacturer. Silicified formulations are preferred. The use of inadequate detergents can damage the surface of the battery.
- Mix the detergent with warm water according to manufacturer's instructions. For best results, the temperature of the detergent mixed must be 120°F.
- Use a high-pressure washer with a large cast and enough force to remove all foreign material. minimizing cleaning time. Proceed with care to avoid damage and possible wear of the fins.
- Leave the cleanser on the batteries to the amount of time prescribed by the manufacturer's instructions.
- Rinse thoroughly with water all the cleaning material from the battery and surrounding equipment, including the fan and carpentry.
- Dispose of rinse water in accordance with local laws and regulations.

MAINTENANCE - LIST OF THE RECOMMENDED PERIODIC INTERVENTIONS

RECOMMENDED PERIODIC MAINTENANCE INTERVENTIONS					
DESCRIPTION	FREQUENCY				
	3/4 months	6 months	12 months	24 months	functioning hours
GENERAL INTERVENTIONS					
Check of any refrigerant leaks (this must be done respecting the deadlines recommended by the current European regulations)	•				
Check of the unit power supply voltage	•				
Check of the compressors' power supply voltage	•				
Check of the fan power supply voltage	•				
Check of the solenoid valves	•				
Functioning and calibration check of the pressure switches, if and where present	•				
Replacement of the safety valve				•	
Check and reading of the pressure/temperature probes	•				
Check and possible replacement of the dehydrating fans			•		
Check of compressors contactors	•				
Check of fans contactors, where present			•		
Exchanger coils cleaning		•			
Check and cleaning of shell and tube heat exchangers if necessary where present (1)			•		
Check of electric resistances of the heat exchangers		•			
Check for rust and corrosion in components, paying particular attention to under pressure containers. In this case replace them of intervene with specific products			•		
General cleaning of the unit			•		
Bleed the hydraulic circuit and the heat exchangers, the simultaneous presence of air and water reduces yield and can benefit the arising of rust					
INTERVENTIONS TO COOLING CIRCUIT Functioning at full load					
Overheating temperature measurement		•			
Subcooling temperature measurement		•			
Exhaust gas temperature measurement		•			
Fans absorption measurement		•			
Compressors absorption measurement		•			
COMPRESSOR CHECKS					
Check oil level	•				
Check oil acidity			•		
Check the proper functioning of the casing resistance		•			
Check oil level sensor, if any		•			
CHECKS ON HYDRAULIC CIRCUIT					
Pumps absorption measurement		•			
Check the pump rotor gasket	•				
Check the flexible joints	•				
Check the seal of the shell and tube heat exchanger heads, where present		•			
Check the proper functioning and calibration of the flow switch, where present	•				
Check the proper functioning of the differential pressure switch, where present	•				
Check the concentration of glycol solution, if provided	3 months*				
Cleaning the water filter	•				

* To replace the glycol, refer to the documentation provided by the supplier.

The frequency of the operations described herein is a guideline one and they may vary depending on how the unit is used and the type of system where it is installed. However, if the unit is installed in harsh environments, we recommend reducing the time of intervention

1 we do not recommend swabbing as it can ruin the inner lining of the pipes, we recommend using appropriate chemicals

MAINTENANCE - LIST OF THE RECOMMENDED PERIODIC INTERVENTIONS

RECOMMENDED PERIODIC MAINTENANCE INTERVENTIONS TO UNITS WITH CENTRIFUGAL COMPRESSORS

DESCRIPTION	FREQUENCY		
	6 months	12 months	other
GENERAL CHECKS			
Check that the compressor is not damaged	•		
Check that there are no excessive vibrations induced by other operating components	•		
CHECKS ON ELECTRICAL PARTS			
Check the power supply voltage	•		
Check the proper fastening of the compressor power supply cables		•	
Check the good condition of the electrical cables	•		
Check that the electric current value (A) is that specified in the technical plate	•		
Check the voltage value (A) on the storage tank capacitors	•		
Replace the storage tank condensers			every 5 years
Check the correct functioning of the safety system (alarms)		•	
CHECKS ON ELECTRONIC PARTS			
Check that all communication cables between the compressor and its components are firmly fastened	•		
Check that all electronic devices are firmly in their seat	•		
Visually check that the electronic boards are have no burns or are damaged		•	
Check that the reading of the pressure/temperature sensors is correct			
CHECKS ON THE COOLING CIRCUIT PARTS			
Check the proper functioning of the thermostatic valve		•	
Check the charge of refrigerant gas (1)	•		
Check the proper functioning of the solenoid valves	•		

DECOMMISSIONING AND DISPOSAL OF THE MACHINE COMPONENTS

ATTENTION

The unit contains greenhouse effect fluoride gases covered by the Kyoto Protocol. The law prohibits its dispersion in the environment and requires its recovery and delivery to the dealer or collection centre.

When components are removed to be replaced or when the entire unit reaches the end of its life and it must be removed from the installation, in order to minimise the environmental impact, respect the following disposal requirements:

- The refrigerant gas must be fully recovered in special containers and brought to collection centres by specialised personnel having the necessary qualification;
- The lubricating oil in the compressors and cooling circuit must be recovered and brought to collection centres;
- The structure, electric and electronic equipment and components must be separated according to their type and construction material and brought to collection centres;
- If the water circuit contains mixtures with anti-freeze, the content must be collected and brought to collection centres;
- Observe the current national laws



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