



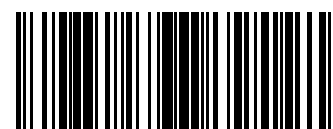
INSTALLATION MANUAL

CHILLER

- EXTERNAL UNITS
- HIGH EFFICIENCY
- POWER SUPPLY 60Hz

NRL free-cooling 800-1800

EN



Dear Customer,

Thank you for choosing AERMEC. It is the fruit of many years of experience and special design studies and has been made of the highest grade materials and with cutting edge technology.

In addition, all our products bear the EC mark indicating that they meet the requirements of the European Machine Directive regarding safety. The standard of quality is permanently being monitored and AERMEC products are therefore a synonym for Safety, Quality and Reliability.

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

Thank you again.
AERMEC S.p.A

AERMEC S.p.A. reserves the right at all times to make any modification for the improvement of its product and is not obliged to add these modification to machines of previous manufacture that have already been delivered or are being built.

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Standards and Directives respected on designing and constructing the unit:

PROTECTION RATING

1. IP 24

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.

1. DESCRIPTION AND CHOICE OF UNIT

The NRL Free-cooling series appliances are water chillers equipped with an external air cooling capacity recovery system called "free-cooling".

The water free-cooling system consists in integrating and eventually completely replacing the cooling capacity delivered by the compressors through an additional water coil that exploits the low temperature of the external air to cool the system's return water.

Maximum reliability

The presence of several scroll compressors allows NRL chillers various partialisations of the cooling capacity.

OPERATING MODE:

FREE-COOLING ONLY:

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

MIXED FREE-COOLING + COMPRESSORS:

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

COMPRESSORS ONLY:

when the external air temperature is greater than the return temperature of the system water.

Models:

1. **NRL "F" free-cooling**

The versions can be in different set-ups at the same time in order to satisfy a wide range of plant engineering solutions:

1. **"A" HIGH EFFICIENCY**
2. **"E" SILENCED HIGH EFFICIENCY**
3. **"D" WITH DESUPERHEATER**

The units with desuperheater (D) are not available in the versions:

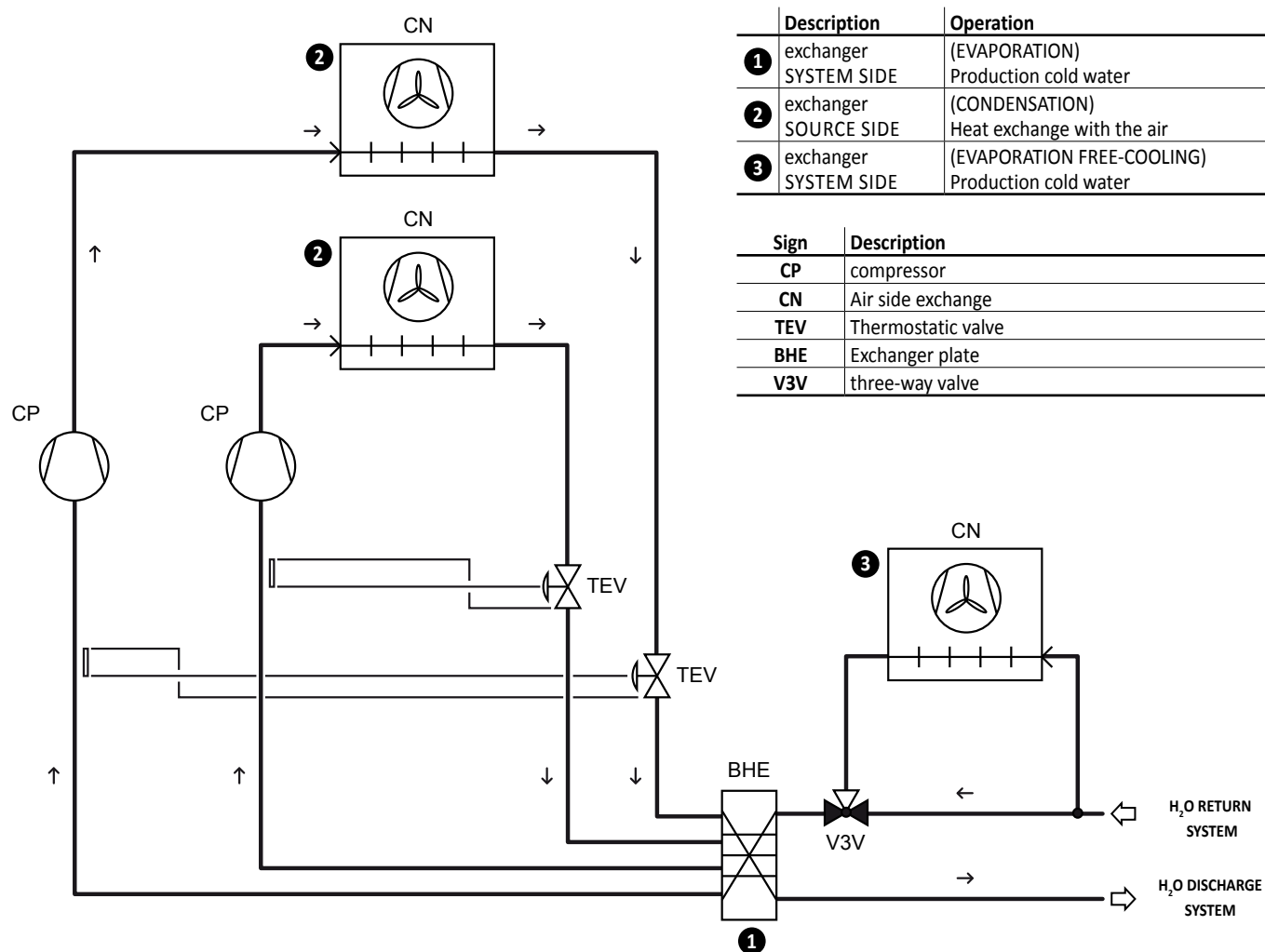
1. YD
2. XD

2. CHECK LIST

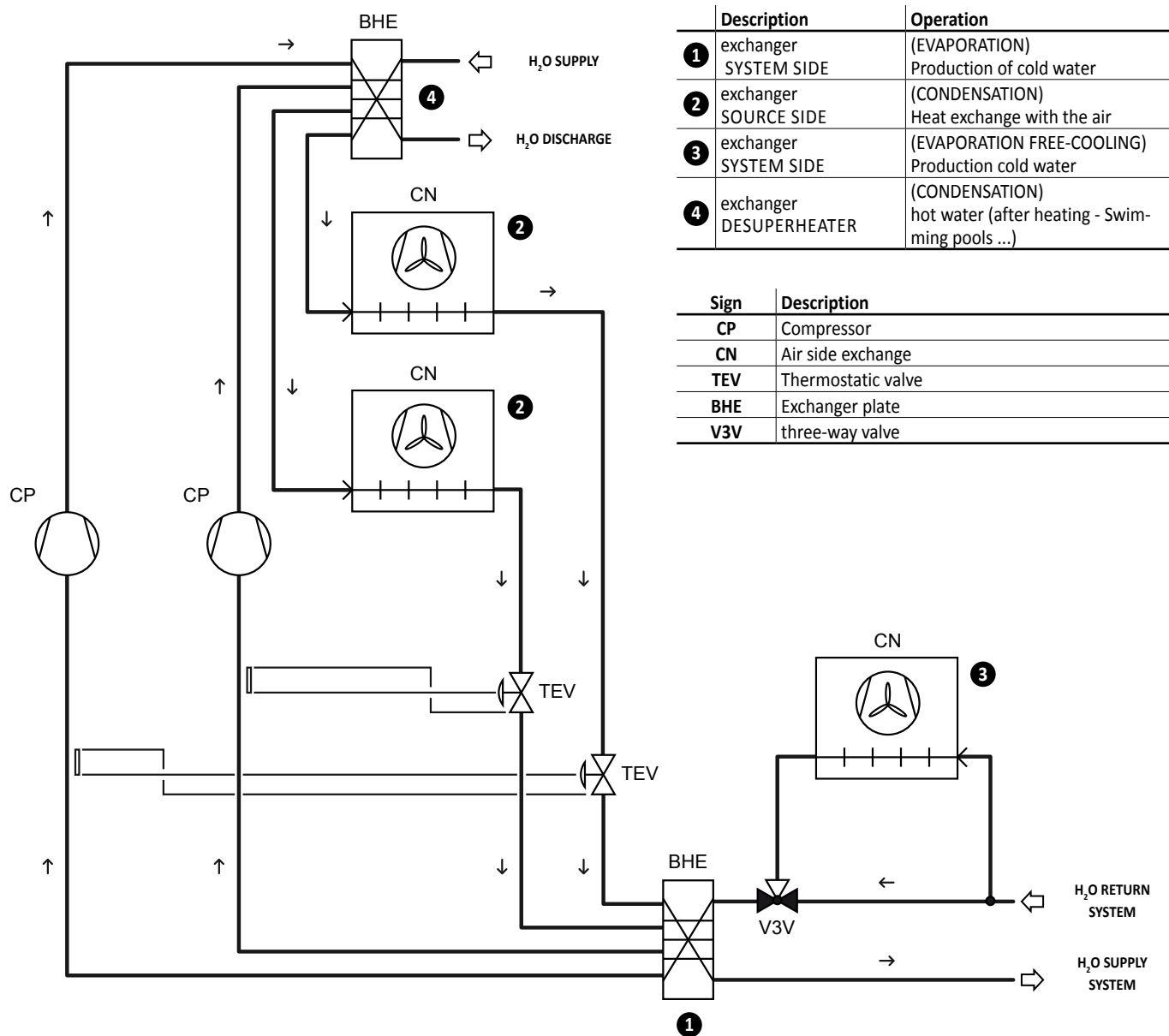
Circuit		Components							
Cooling circuit	Model	F		with D					
Resistance carter compressor		yes		yes					
High pressure switch		yes		yes					
Low pressure switch		no		no					
High pressure trasducer		yes		yes					
Low pressure trasducer		yes		yes					
Solenoid valve of hot gas injecton		no		yes					
By-pass valve of hot gas		yes		yes					
Exchanger (EV- EV/CN)		yes		yes					
Exchanger (desuperheater)		no		yes					
Exchanger (glycol free)		no		no					
Cock the liquid and discharge		yes		yes					
hydraulic circuit	Version "F 00"	800	900	1000	1250	1400	1500	1650	1800
Water filter		yes	yes	yes	yes	yes	yes	yes	yes
Flow switch		yes	yes	yes	yes	yes	yes	yes	yes
Air vent		yes	yes	yes	yes	yes	yes	yes	yes
hydraulic circuit	Version "P3...P4"	800	900	1000	1250	1400	1500	1650	1800
Water filter		yes	yes	yes	yes	yes	yes	yes	yes
Flow switch		yes	yes	yes	yes	yes	yes	yes	yes
Safety valve		yes	yes	yes	yes	yes	yes	yes	yes
Air vent		yes	yes	yes	yes	yes	yes	yes	yes
Pump		yes	yes	yes	yes	yes	yes	yes	yes
Expansion tank		yes	yes	yes	yes	yes	yes	yes	yes
hydraulic circuit	Version "03...04"	800	900	1000	1250	1400	1500	1650	1800
Water filter		yes	yes	yes	yes	yes	yes	yes	yes
Flow switch		yes	yes	yes	yes	yes	yes	yes	yes
Safety valve		yes	yes	yes	yes	yes	yes	yes	yes
Air vent		yes	yes	yes	yes	yes	yes	yes	yes
Pump		yes	yes	yes	yes	yes	yes	yes	yes
Expansion tank		yes	yes	yes	yes	yes	yes	yes	yes
Storage tank		yes	yes	yes	yes	yes	yes	yes	yes
Version with DESUPERHEATER "D"									
hydraulic circuit	Version "F with D"	800	900	1000	1250	1400	1500	1650	1800
Water filter		no	no	no	no	no	no	no	no
Differential pressure switch		no	no	no	no	no	no	no	no
Flow switch		no	no	no	no	no	no	no	no
Exchanger (desuperheater)		yes	yes	yes	yes	yes	yes	yes	yes
hydraulic circuit	"storage thank with D"	800	900	1000	1250	1400	1500	1650	1800
Water filter (desuperheater)		no	no	no	no	no	no	no	no
Differential pressure switch (desuperheater)		no	no	no	no	no	no	no	no
Flow switch (desuperheater)		no	no	no	no	no	no	no	no
Exchanger (desuperheater)		yes	yes	yes	yes	yes	yes	yes	yes
Safety valve		yes	yes	yes	yes	yes	yes	yes	yes
Air vent		yes	yes	yes	yes	yes	yes	yes	yes
Pump		yes	yes	yes	yes	yes	yes	yes	yes
Expansion tank		yes	yes	yes	yes	yes	yes	yes	yes
Storage tank		yes	yes	yes	yes	yes	yes	yes	yes

3. PRINCIPLE OF OPERATION SCHEMES

3.1. PRODUCTION OF COLD WATER ONLY THE SYSTEM



3.2. COLD WATER PRODUCTION AND THE SYSTEM RECOVERY (DESUPERHEATER)



4. SELECTION AND PLACE OF INSTALLATION

Before beginning installation consent with client and pay attention to the following recommendations:

1. The support surface must be capable of supporting the unit weight;
2. The safety differences between the unit and ther appliances or structures must be scrupulously respected so that the inlet and outlet AIR from the fans is free to circulate;
3. The unit must be installed by an enabled technician in compliance with the national legislation in force in the country of destination, respecting the minimum technical spaces in order to allow maintenance.

4.1. POSITIONING

The machine is delivered from the factory wrapped in estincoil. Before moving the unit, check the lifting capacity of the machines used.

Once the packaging has been removed, the unit must be handled by qualified personnel with the suitable equipment. To handle the machine: see figure hook up the lifting belts to the provided eyebolts (as indicated in figure).

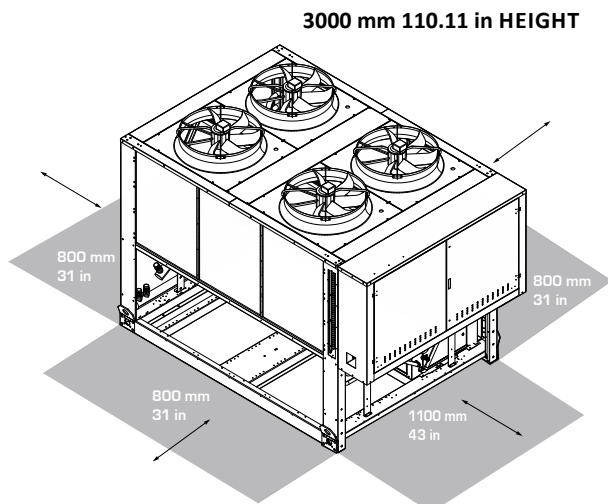
WARNING: ALWAYS USE ALL THE PROVIDED EYEBOLTS

Interpose protections between the straps and the machine to prevent the structure of the unit being damaged by the straps. It is absolutely forbidden to stand under the unit.

Take into account that when the chiller is working, vibrations may be generated; it is therefore advisable to install anti-vibration supports (AVX accessories), fitting them to the holes in the base according to the assembly diagram.

It is compulsory to provide the necessary technical spaces, to allow REGULAR AND EXTRAORDINARY MAINTENANCE INTERVENTIONS Fasten the unit by checking carefully that its on the same level; check that easy access to the hydraulic and electric part is allowed.

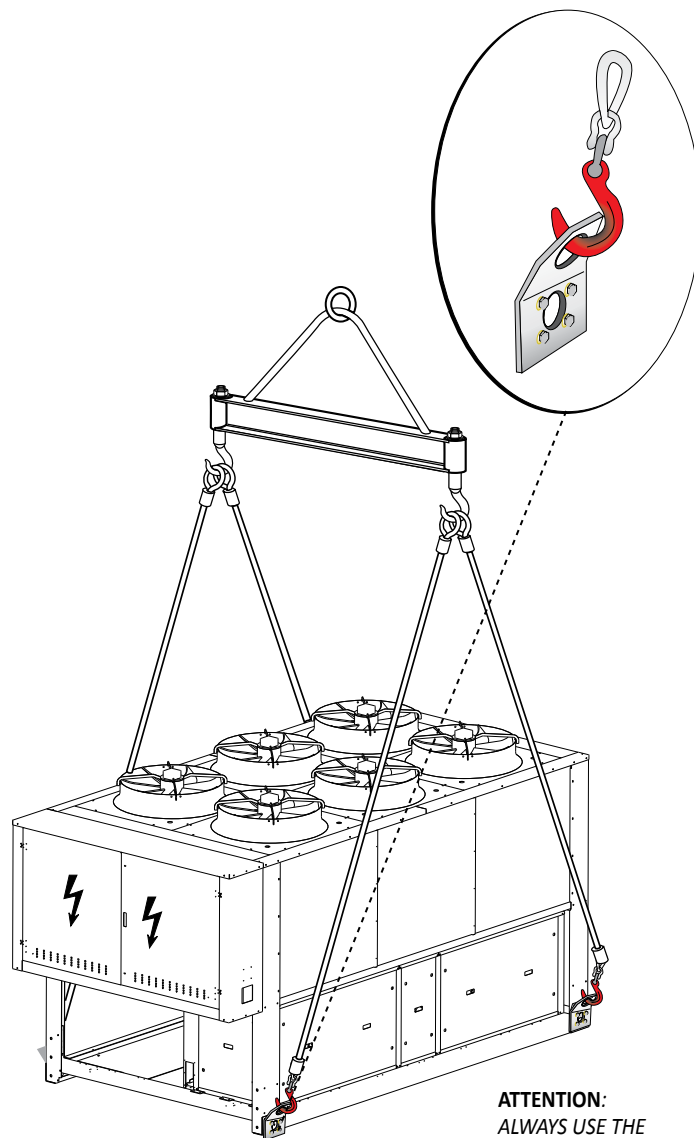
4.2. MINIMUM TECHNICAL SPACES



The unit must be installed by a qualified and suitably trained technician, in compliance with the national legislation in force in the country of destination (Ministerial Decree 329/2004). AERMEC will not assume any responsibility for damage due to failure to follow these instructions.



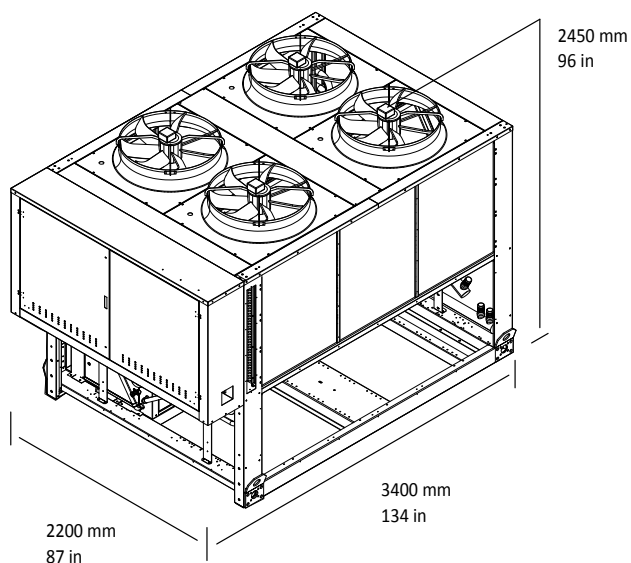
Before beginning any operation, READ THESE INSTRUCTIONS CAREFULLY AND CARRY OUT THE SAFETY CHECKS TO REDUCE ALL RISK OF DANGER TO A MINIMUM. All the staff involved must have thorough knowledge of the operations and any dangers that may arise at the moment in which the installation operations are carried out.



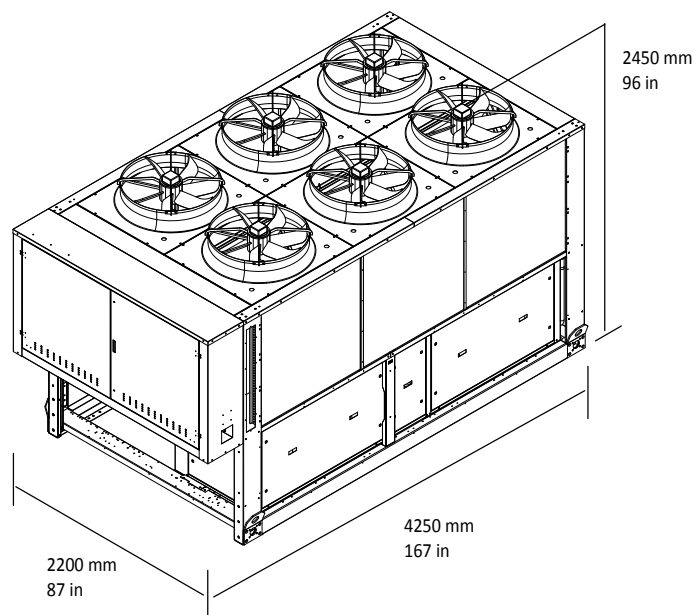
ATTENTION:
ALWAYS USE THE
RELEVANT EYE-
BOLTS

5. DIMENSIONS

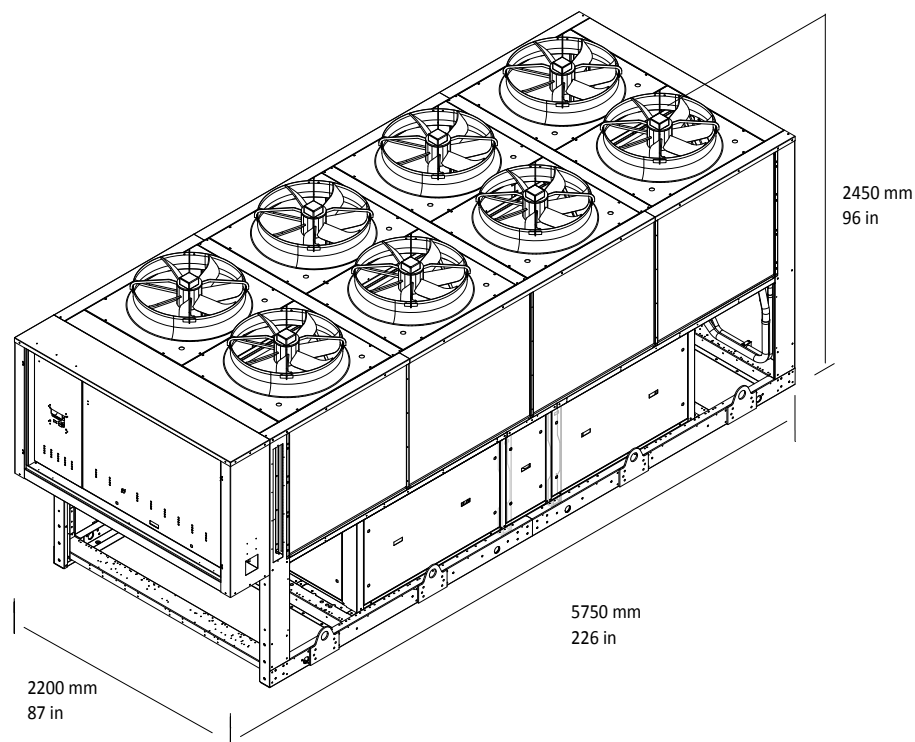
5.1. NRL 800 - 900 - 1000 F



5.2. NRL 1250 - 1400 - 1500 F

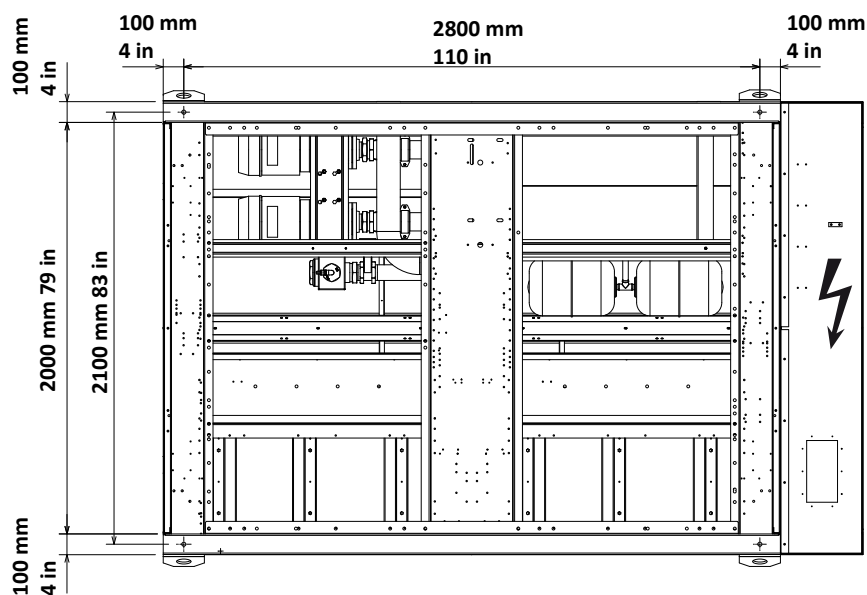


5.3. NRL 1650 - 1800 F

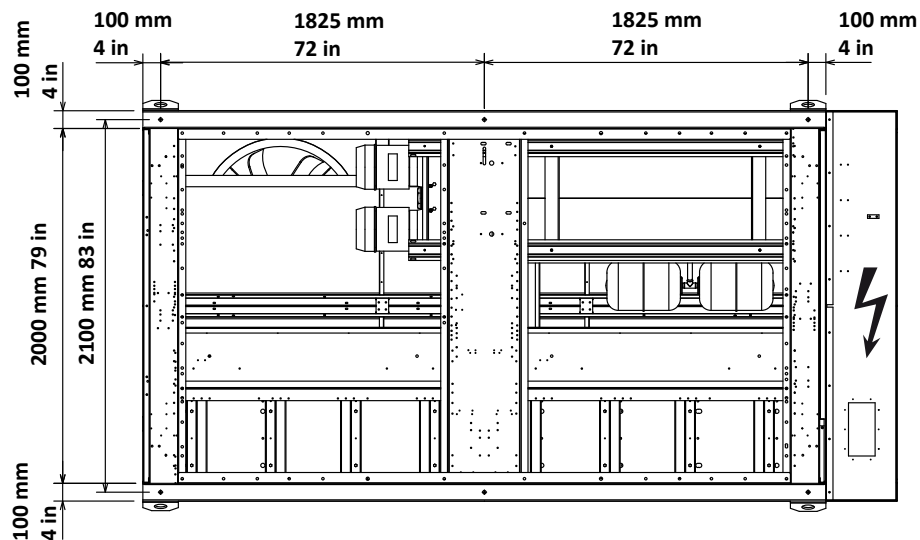


7. ANTIVIBRATION POSITIONING

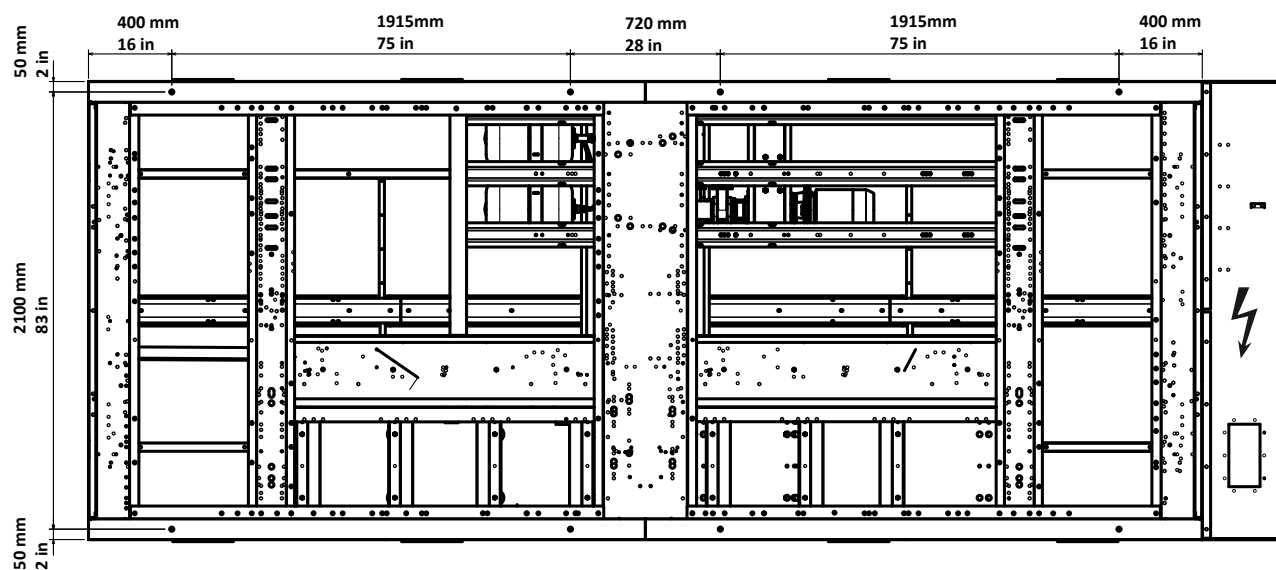
7.1. NRL 800 - 900 - 1000 F



7.2. NRL 1250 - 1400 - 1500 F

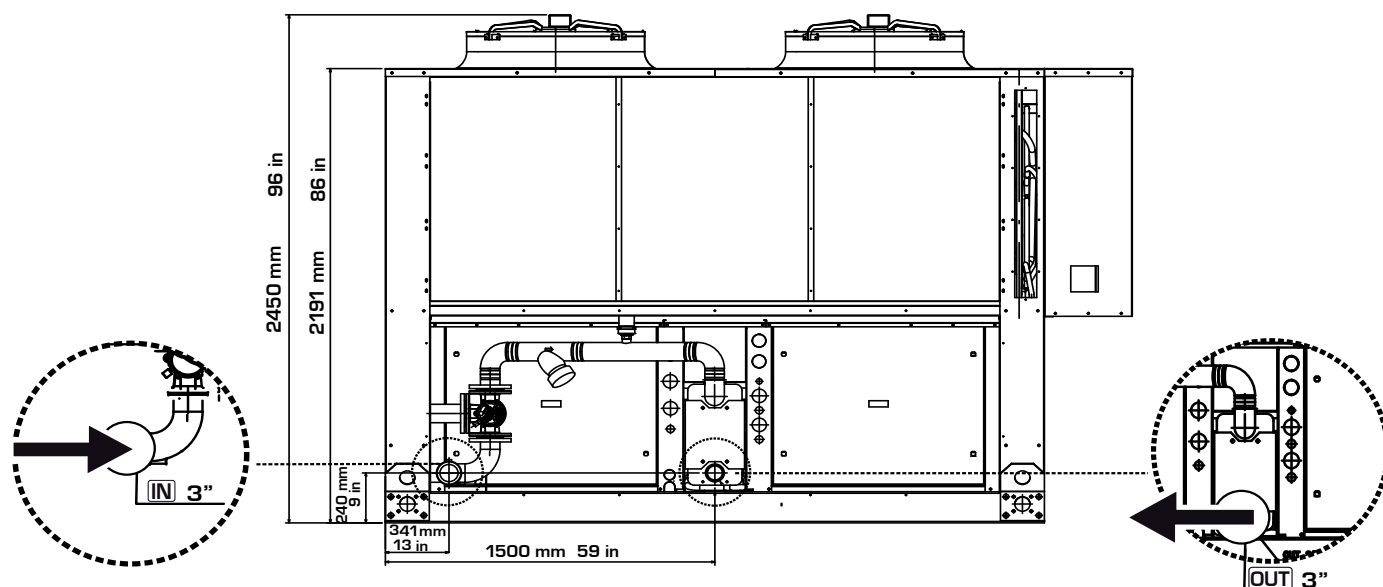


7.3. NRL 1650 - 1800 F

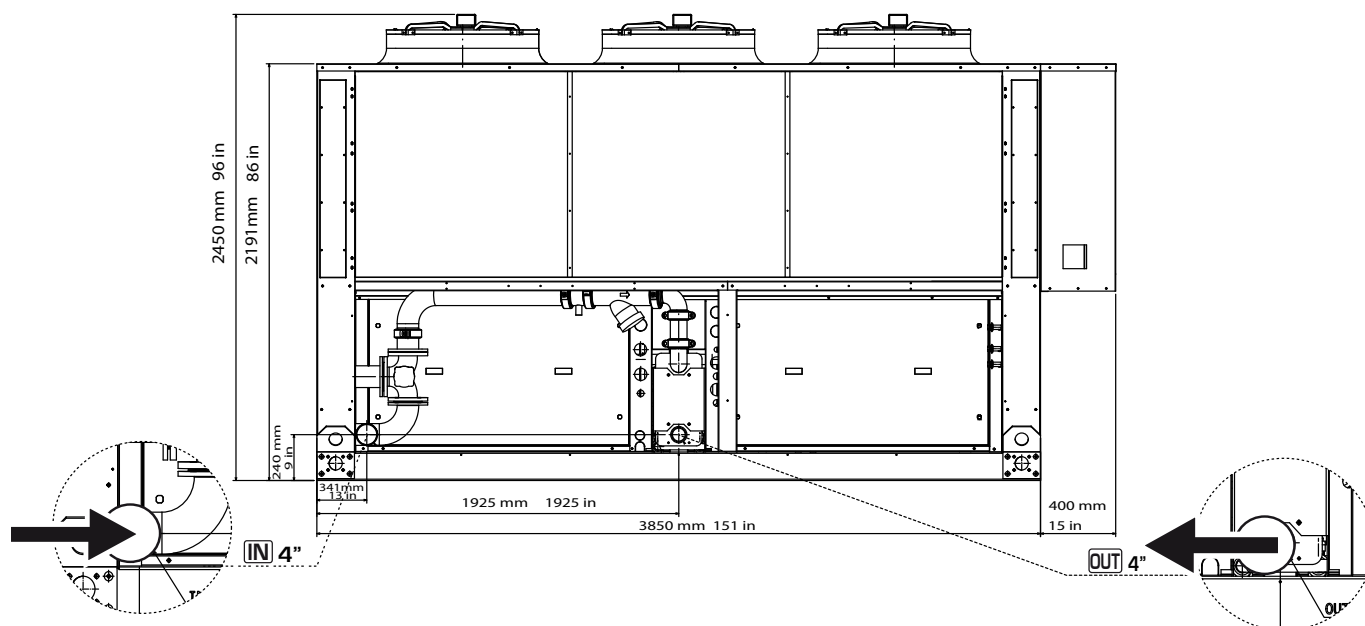


8. HYDRAULIC CONNECTION

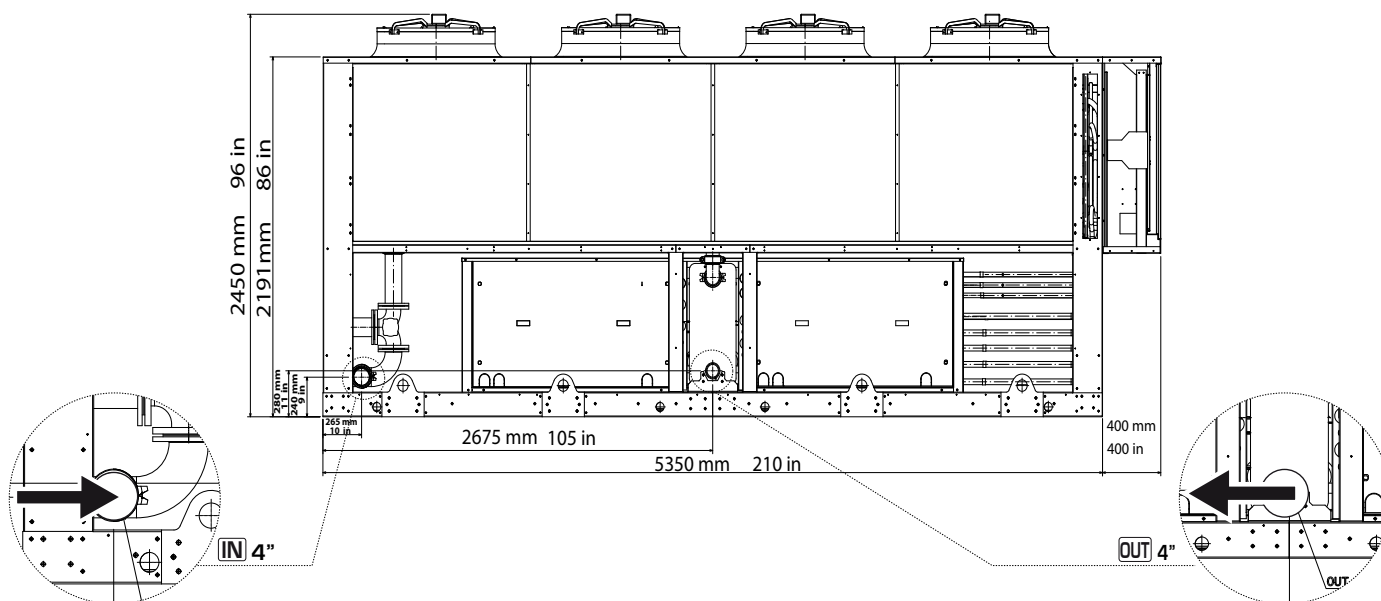
8.1. NRL 800 - 900 - 1000 F

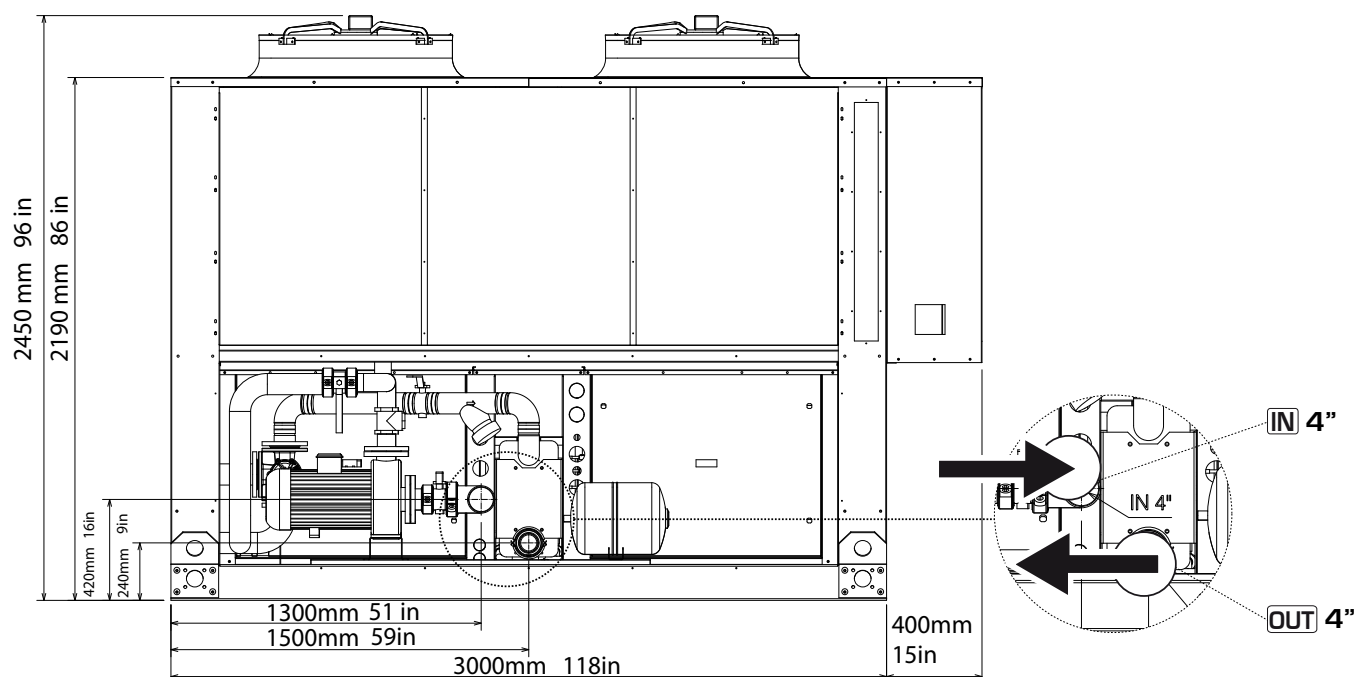
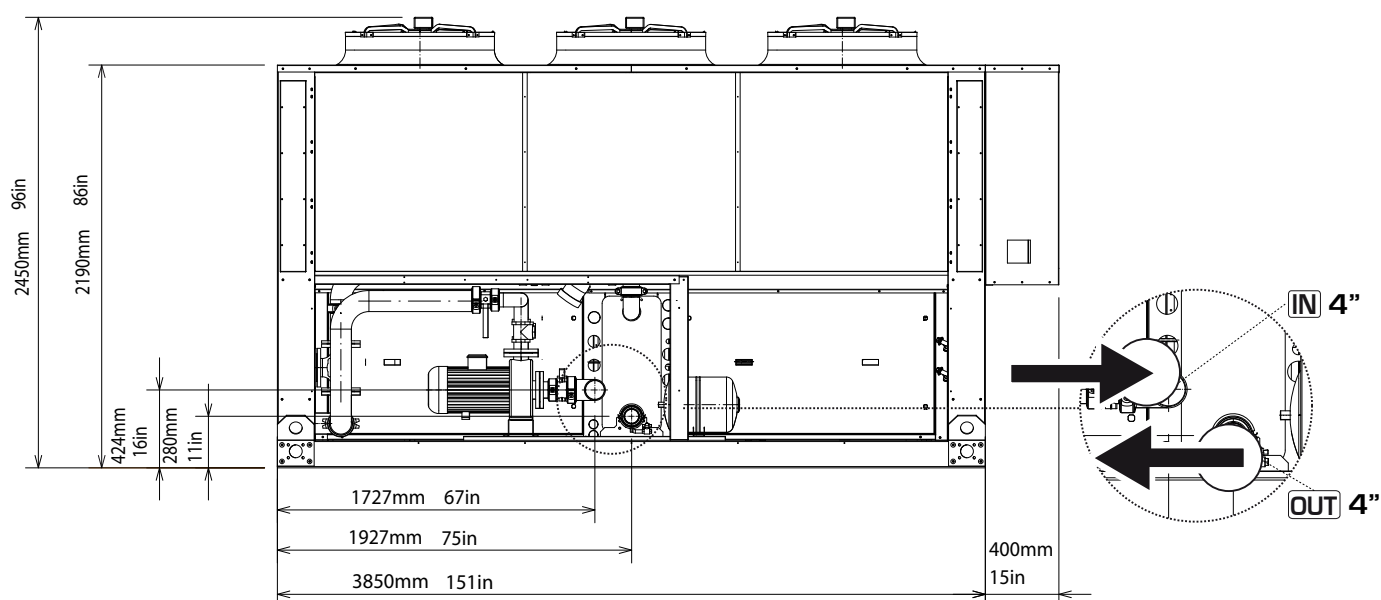


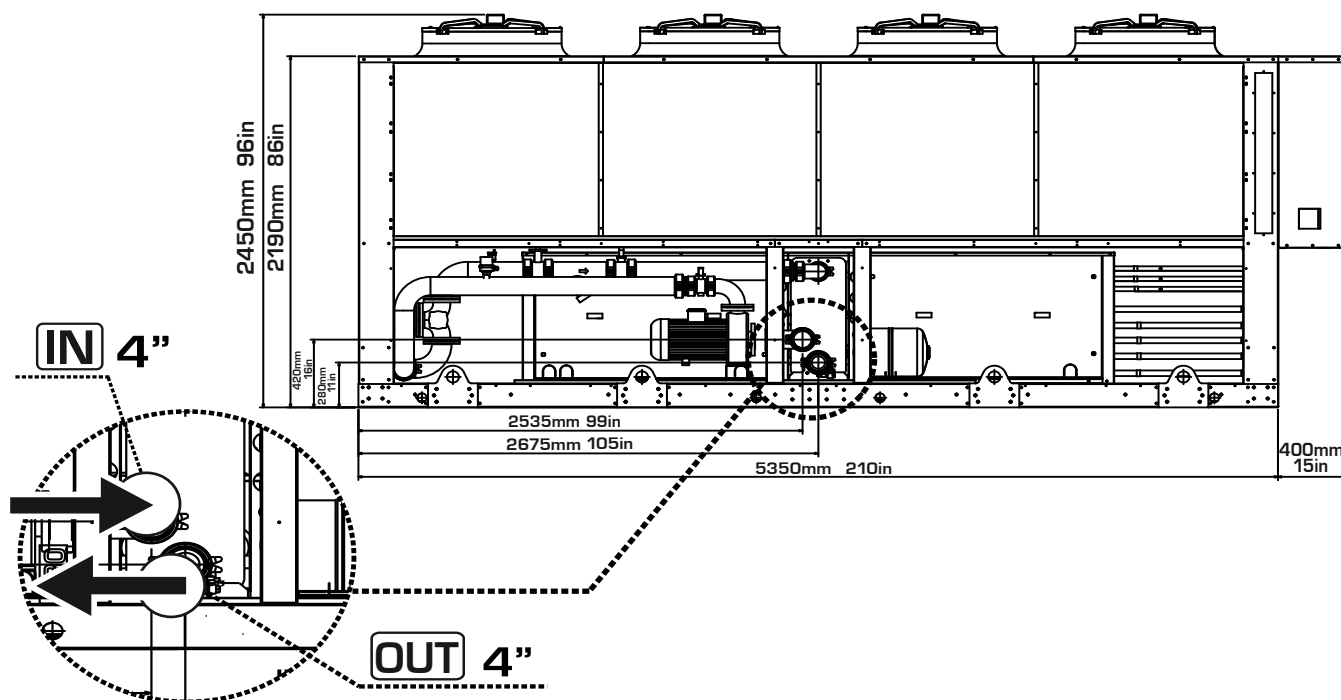
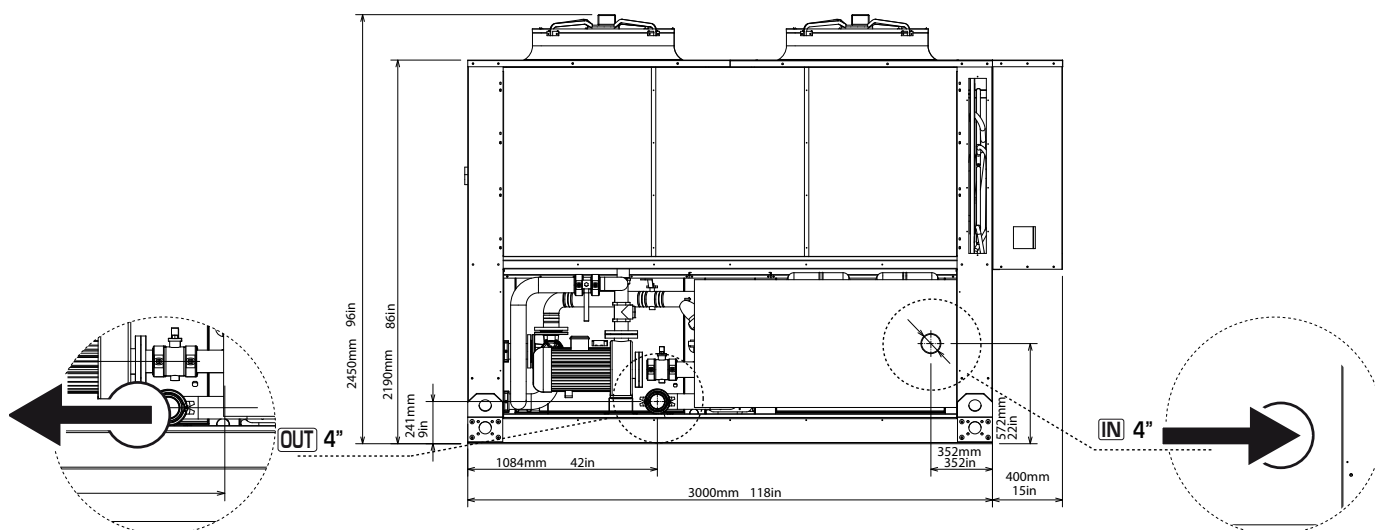
8.2. NRL 1250 - 1400 - 1500 F

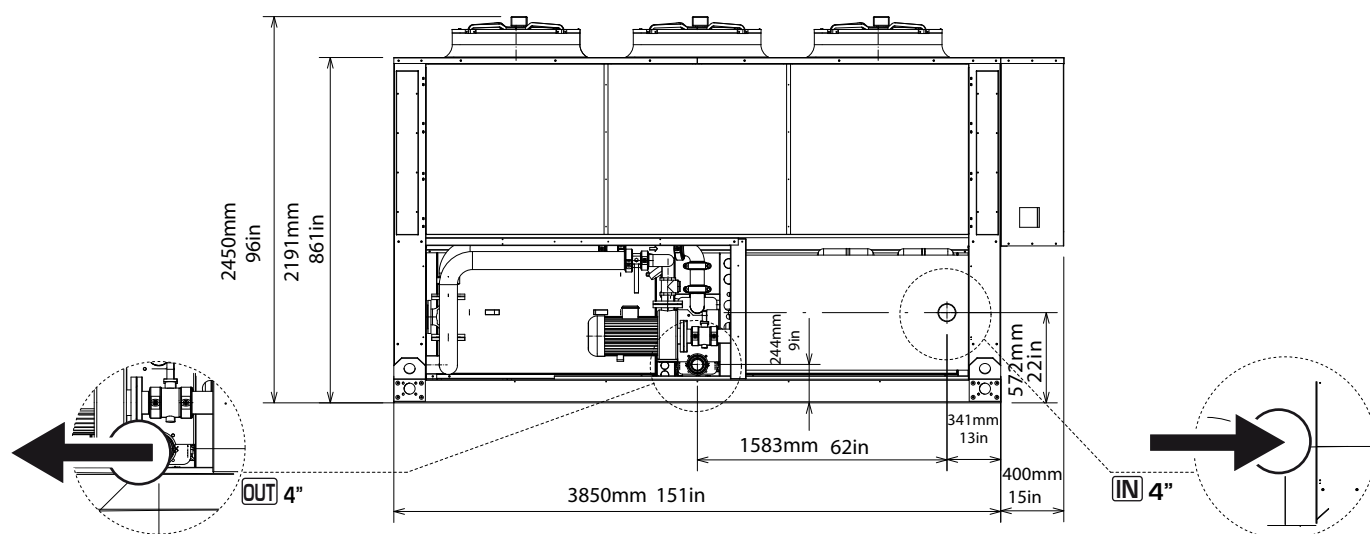
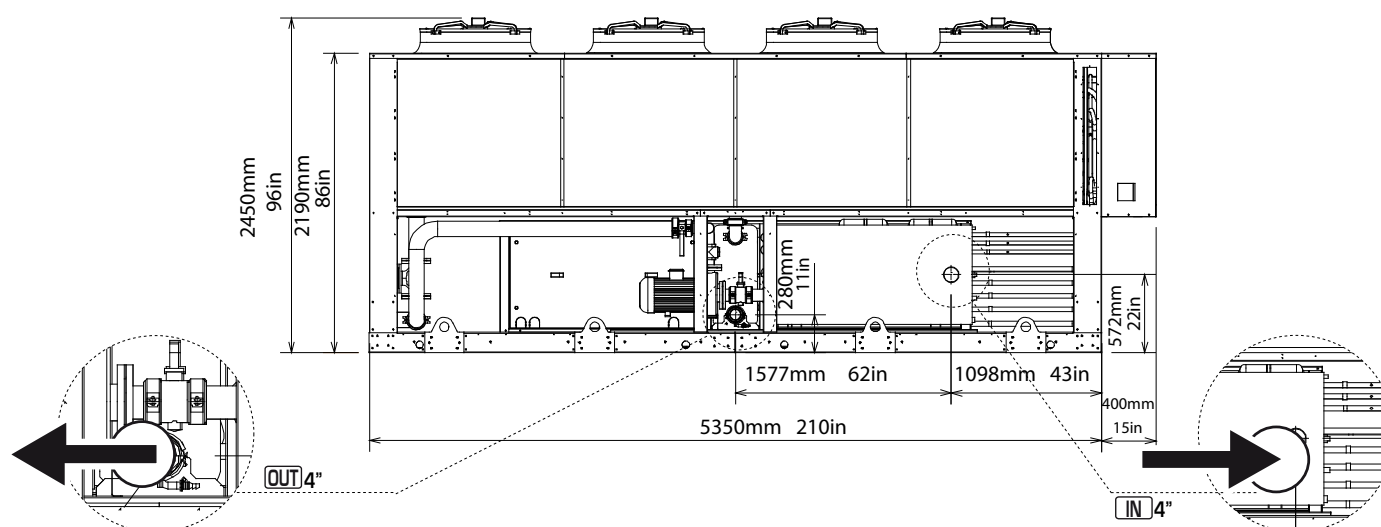


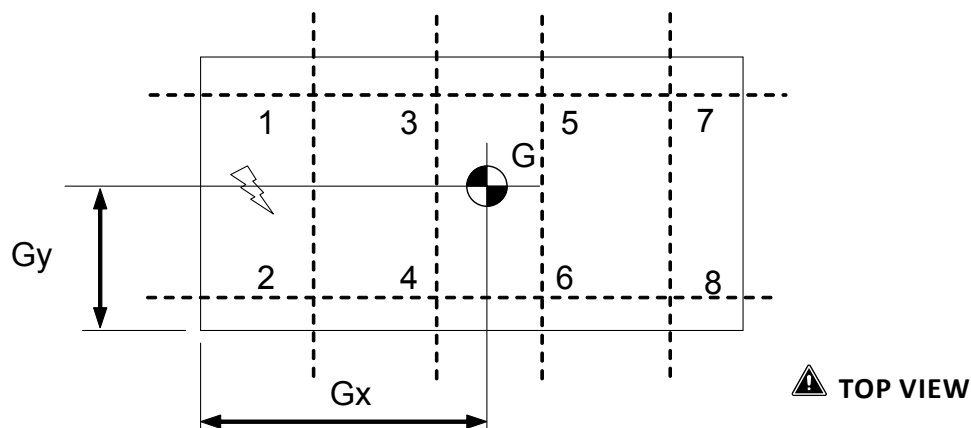
8.3. NRL 1650 - 1800 F



8.3.1. NRL 0800 - 0900 - 1000 [P3 - P4] FC8.3.2. NRL 1250 - 1400 - 1500 [P3 - P4] FC

8.3.3. NRL 1650-1800 [P3 - P4] FC8.3.4. NRL 0800-0900-1000 [03-04] FC

8.3.6. NRL 1250-1400-1500 [03-04] FC8.3.5. NRL1650-1800 [03-04] FC



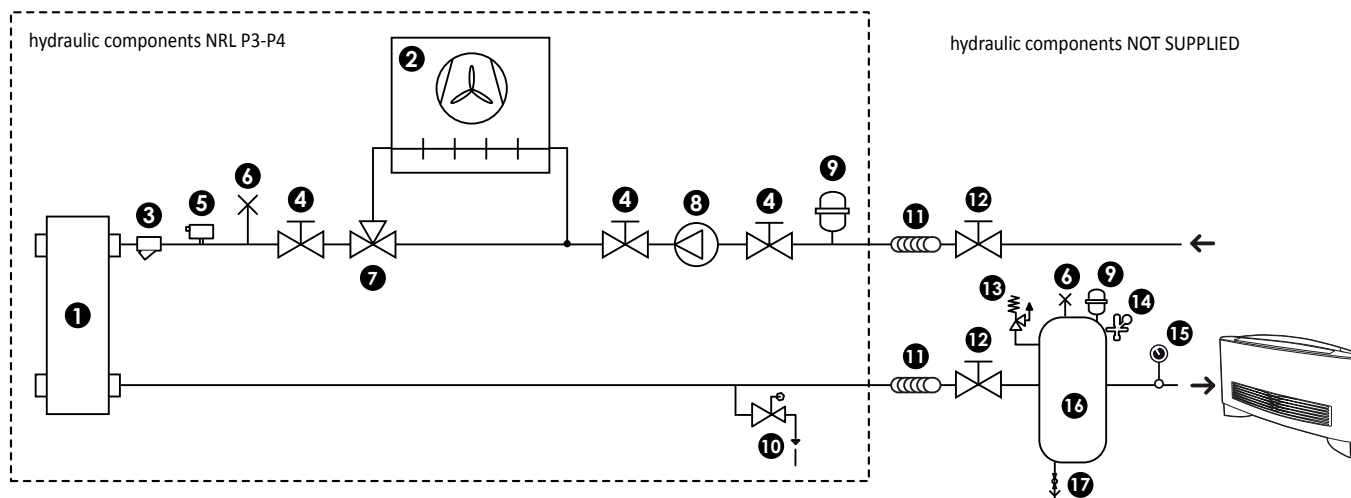
NRL FREECOOLING 800 - 1800

MODEL	Version	Hydronic kit	EMPTY					RUNNING					KIT AVX	
			WEIGHT	CENTRE OF GRAVITY				TOTAL WEIGHT	WATER	CENTRE OF GRAVITY				
				lbs	XG mm	XG in	YG mm			YG in	lbs	XG mm		XG in
NRL 800	FA	00	5225	1382	54	1314	52	5534	309	1410	55	1302	51	AVX 739
		03	5952	1362	54	1202	47	7871	1918	1353	53	1034	41	AVX 740
		04	6063	1360	54	1188	47	7981	1918	1351	53	1025	40	AVX 740
		P3	5556	1346	53	1258	50	6063	507	1356	53	1223	48	AVX 741
		P4	5666	1336	53	1241	49	6173	507	1346	53	1208	48	AVX 741
NRL 900	FA	00	5512	1421	56	1299	51	5864	353	1446	57	1281	50	AVX 739
		03	6261	1397	55	1191	47	8223	1962	1381	54	1028	40	AVX 743
		04	6393	1394	55	1175	46	8356	1962	1378	54	1019	40	AVX 743
		P3	5886	1383	54	1243	49	6415	529	1390	55	1206	47	AVX 744
		P4	6019	1370	54	1224	48	6548	529	1378	54	1189	47	AVX 744
NRL 1000	FA	00	5820	1406	55	1332	52	6217	397	1430	56	1317	52	AVX 745
		03	6570	1385	55	1226	48	8576	2006	1373	54	1065	42	AVX 746
		04	6702	1381	54	1210	48	8708	2006	1370	54	1055	42	AVX 746
		P3	6195	1370	54	1278	50	6768	573	1379	54	1243	49	AVX 747
		P4	6327	1358	53	1259	50	6900	573	1368	54	1226	48	AVX 747
NRL 1250	FA	00	7121	1824	72	1350	53	7496	375	1849	73	1337	53	AVX 748
		03	7915	1751	69	1254	49	9899	1984	1667	66	1110	44	AVX 749
		04	8091	1737	68	1236	49	10075	1984	1658	65	1097	43	AVX 749
		P3	7540	1785	70	1298	51	8091	551	1794	71	1268	50	AVX 750
		P4	7716	1769	70	1278	50	8267	551	1779	70	1250	49	AVX 750
NRL 1400	FA	00	7430	1799	71	1320	52	7871	441	1825	72	1303	51	AVX 752
		03	8223	1731	68	1231	48	10274	2050	1655	65	1091	43	AVX 753
		04	8400	1718	68	1214	48	10450	2050	1646	65	1080	43	AVX 753
		P3	7848	1763	69	1272	50	8466	617	1774	70	1239	49	AVX 754
		P4	8025	1748	69	1253	49	8642	617	1760	69	1222	48	AVX 754
NRL 1500	FA	00	7672	1828	72	1343	53	8157	485	1853	73	1328	52	AVX 757
		03	8488	1757	69	1251	49	10604	2116	1680	66	1114	44	AVX 753
		04	8708	1741	69	1231	48	10604	1896	1680	66	1114	44	AVX 753
		P3	8113	1788	70	1292	51	8796	683	1799	71	1261	50	AVX 758
		P4	8311	1771	70	1269	50	8995	683	1782	70	1241	49	AVX 758
1650	FA	00	9348	2478	98	1305	51	9899	551	2465	97	1277	50	AVX 761
		03	10185	2455	97	1231	48	12346	2161	2411	95	1104	43	AVX 762
		04	10384	2449	96	1215	48	12544	2161	2408	95	1092	43	AVX 762
		P3	9789	2465	97	1264	50	10538	750	2449	96	1225	48	AVX 763
		P4	10009	2459	97	1246	49	10737	728	2444	96	1209	48	AVX 763
1800	FA	00	9877	2481	98	1317	52	10516	639	2470	97	1294	51	AVX 766
		03	10692	2459	97	1246	49	12941	2249	2418	95	1126	44	AVX 762
		04	10913	2454	97	1229	48	13162	2249	2414	95	1114	44	AVX 762
		P3	10318	2469	97	1277	50	11133	816	2455	97	1243	49	AVX 763
		P4	10516	2463	97	1260	50	11354	838	2450	96	1228	48	AVX 763

NRL FREECOOLING 800 - 1800

MODEL	Version	Hydronic kit	PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)							
			1	2	3	4	5	6	7	8
			%	%	%	%	%	%	%	%
NRL 800	FA	00	11,5%	16,7%	20,4%	29,6%	8,9%	12,9%	-	-
		03	16,8%	14,9%	24,9%	22,1%	11,3%	10,0%	-	-
		04	17,0%	14,8%	25,0%	21,9%	11,3%	9,9%	-	-
		P3	13,4%	16,8%	22,2%	27,8%	8,8%	11,1%	-	-
		P4	13,8%	16,8%	22,5%	27,4%	8,8%	10,7%	-	-
NRL 900	FA	00	11,0%	15,4%	21,3%	29,7%	9,4%	13,1%	-	-
		03	16,2%	14,2%	25,5%	22,4%	11,6%	10,2%	-	-
		04	16,4%	14,1%	25,6%	22,1%	11,7%	10,1%	-	-
		P3	12,9%	15,6%	23,0%	27,9%	9,3%	11,3%	-	-
		P4	13,3%	15,6%	23,4%	27,5%	9,3%	10,9%	-	-
NRL 1000	FA	00	10,7%	16,0%	20,7%	30,9%	8,7%	13,0%	-	-
		03	15,6%	14,7%	25,0%	23,5%	11,0%	10,3%	-	-
		04	15,9%	14,6%	25,1%	23,2%	11,0%	10,2%	-	-
		P3	12,4%	16,1%	22,4%	29,1%	8,7%	11,3%	-	-
		P4	12,8%	16,2%	22,8%	28,7%	8,6%	10,9%	-	-
NRL 1250	FA	00	10,4%	16,1%	20,1%	31,1%	8,8%	13,6%	-	-
		03	15,7%	16,0%	25,1%	25,6%	8,7%	8,9%	-	-
		04	16,0%	16,0%	25,4%	25,3%	8,7%	8,6%	-	-
		P3	11,9%	16,2%	21,6%	29,4%	8,9%	12,0%	-	-
		P4	12,3%	16,2%	22,0%	29,0%	8,9%	11,7%	-	-
NRL 1400	FA	00	10,7%	15,5%	21,7%	31,5%	8,4%	12,2%	-	-
		03	15,7%	15,5%	26,3%	25,9%	8,3%	8,2%	-	-
		04	16,1%	15,5%	26,6%	25,6%	8,3%	8,0%	-	-
		P3	12,1%	15,6%	23,1%	29,8%	8,5%	10,9%	-	-
		P4	12,5%	15,6%	23,5%	29,4%	8,5%	10,6%	-	-
NRL 1500	FA	00	9,6%	14,7%	21,9%	33,4%	8,1%	12,3%	-	-
		03	14,7%	15,1%	26,6%	27,3%	8,0%	8,3%	-	-
		04	14,7%	15,1%	26,6%	27,3%	8,0%	8,3%	-	-
		P3	11,1%	14,9%	23,4%	31,5%	8,1%	10,9%	-	-
		P4	11,6%	15,0%	23,9%	30,9%	8,1%	10,6%	-	-
1650	FA	00	11,3%	15,7%	12,7%	17,6%	10,1%	13,9%	7,9%	10,9%
		03	12,2%	12,3%	18,2%	18,3%	12,0%	12,0%	7,4%	7,5%
		04	12,3%	12,1%	18,6%	18,3%	12,1%	11,9%	7,4%	7,3%
		P3	11,6%	14,6%	14,2%	17,9%	10,6%	13,4%	7,8%	9,8%
		P4	11,7%	14,3%	14,7%	18,0%	10,8%	13,2%	7,8%	9,5%
1800	FA	00	11,1%	15,9%	12,5%	17,9%	9,7%	13,8%	7,9%	11,2%
		03	12,1%	12,6%	17,7%	18,6%	11,5%	12,1%	7,5%	7,9%
		04	12,1%	12,4%	18,1%	18,6%	11,7%	12,0%	7,5%	7,7%
		P3	11,4%	14,9%	14,0%	18,2%	10,2%	13,3%	7,8%	10,2%
		P4	11,5%	14,6%	14,5%	18,3%	10,4%	13,1%	7,8%	9,9%

8.4. HYDRAULIC CIRCUIT (VERSIONS P3-P4)



STANDARD COMPONENT

1	Exchanger plate
2	Free-cooling coil
3	Water filter
4	Ball stop
5	Flow switch
6	Air Vent
7	3-way valve
8	Pump
9	Expansion tank
10	Ball stop drain

RECOMMENDED COMPONENTS NOT SUPPLIED
(CHARGED TO THE INSTALLER)

11	Anti-vibration couplings
12	Ball stop
13	Safety valve
14	Charging unit
15	Manometer
16	Storage tank
17	Storage tank ball stop drain

PH	6-8
Electric conductivity	less than 200 mV/cm (25°C/77°F)
Chloride ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0.3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 50 ppm
Sulphur ions	none
ammonia ions	none
Silicone ions	less than 30 ppm



ATTENTION

The choice and the installation of components external to the NRL 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 pipes connecting to the machine must be properly sized to the actual flow of water required by the system in operation. The water flow to the exchanger must always be constant.



ATTENTION

Carefully wash the plant, before connecting the unit. This allows cleaning to remove any residue such as weld spatter, slag, rust or other impurities from the pipes. These substances may otherwise accumulate in and cause a machine malfunction. The connecting pipes should be supported so as not to weigh, with their weight on the unit.



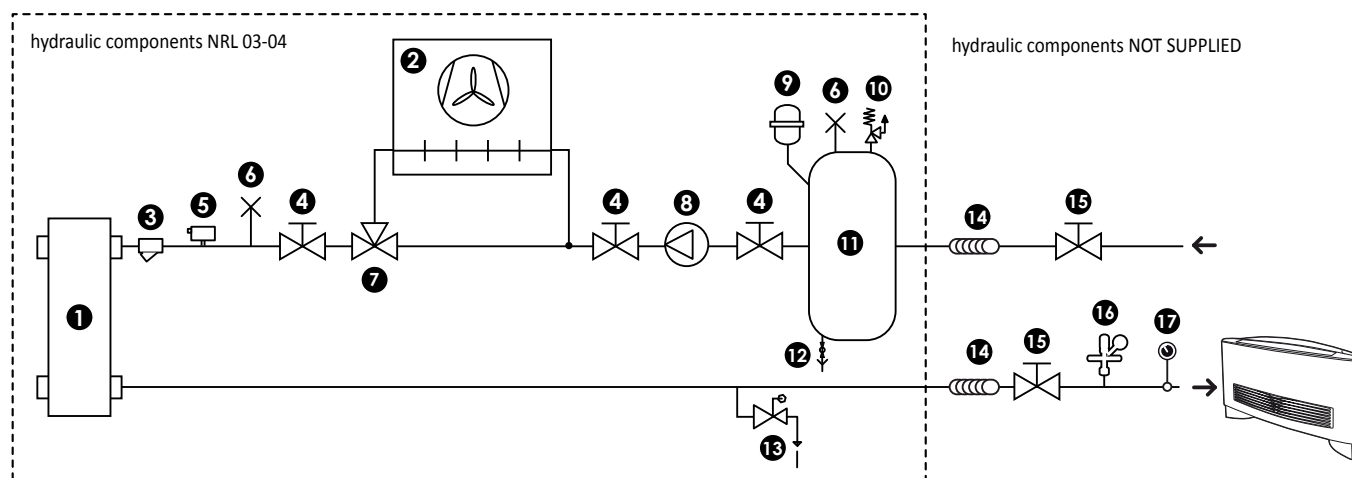
ATTENTION

The hydraulic parallel is in charge of the installer.

NOTE

The drawings are only examples of the hydraulic circuit.

8.5. HYDRAULIC CIRCUIT (VERSIONS 03-04)



	STANDARD COMPONENT
1	Exchanger plate
2	Free-cooling coil
3	Water filter
4	Ball stop
5	Flow switch
6	Air Vent
7	3-way valve
8	Pump
9	Expansion tank
10	Safety valve
11	Storage tank
12	Storage tank ball stop drain
13	Ball stop drain

	RECOMMENDED COMPONENTS NOT SUPPLIED (CHARGED TO THE INSTALLER)
14	Anti-vibration couplings
15	Ball stop
16	Charging unit
17	Manometer

PH	6-8
Electric conductivity	less than 200 mV/cm (25°C/77°F)
Chloride ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0.3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 50 ppm
Sulphur ions	none
ammonia ions	none
Silicone ions	less than 30 ppm

**ATTENTION**

The choice and the installation of components external to the NRL 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 pipes connecting to the machine must be properly sized to the actual flow of water required by the system in operation. The water flow to the exchanger must always be constant.

**ATTENTION**

Carefully wash the plant, before connecting the unit. This allows cleaning to remove any residue such as weld spatter, slag, rust or other impurities from the pipes. These substances may otherwise accumulate in and cause a machine malfunction. The connecting pipes should be supported so as not to weigh, with their weight on the unit.

**ATTENTION**

The hydraulic parallel is in charge of the installer.

NOTE

The drawings are only examples of the hydraulic circuit.

**ATTENTION**

In case of version with pumping unit, without standby pump, it is recommended to install unidirectional valves to the delivery of each module.

So water reflow is avoided in the circuit of the pump/s from the other circuit.

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

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

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

8.6. SYSTEM LOAD

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

The system is loaded at a pressure between 1 and 2 bar.

It is advisable to repeat this operation once the machine has worked for some hours and to periodically check the system pressure, restoring it if it drops below 1 bar.

Check the hydraulic seal of the joints.

8.7. EMPTYING THE SYSTEM

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

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

9. ELECTRICAL WIRINGS

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

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

damage caused by the failure and ineffective earthing of the machine.

- For units with Three-phase power check the correct connection of the phases.

WARNING

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

9.1. RECOMMENDED SECTION OF ELECTRIC CABLES

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.

WARNING:

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



ATTENTION

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.



ATTENTION

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.



ATTENTION

For installation requirements, the wiring layout supplied with the unit must be compulsory referred to. The wiring layout together with the manuals must be kept in good conditions and readily accessible for future operations on the unit.



ATTENTION

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.

ELECTRICAL DATA MODELS WITHOUT PUMP + "ON" ON/OFF FAN											
			800	900	1000	1250	1400	1500	1650	1800	
COMPRESSOR			n°	4	4	4	4	4	4	5	6
FANS			n°	4	4	4	6	6	6	8	8
Total input current	230V	A	216.10	-	-	-	-	-	-	-	
	460V	A	110.20	131.20	151.90	193.00	212.90	240.90	256.20	292.40	
	575V	A	90.00	106.30	122.40	156.10	172.00	202.50	206.60	236.20	
Alimentation 208/3/60Hz											
MODELS WITHOUT PUMP	LRA	A	537,3	720,4	756,7	905,8	954,5	972,8	1054,7	1091,3	
	MCA	A	267,0	307,8	344,1	407,3	462,1	510,9	562,4	592,9	
	MOP	A	322,8	381,7	418,0	492,6	571,8	620,5	672,0	678,1	
	Recom FUSE	A	300	350	400	450	500	600	600	600	
MODELS WITH LOW PUMP	LRA	A	547,3	733,6	769,9	924,2	972,9	994,8	1076,7	1113,3	
	MCA	A	277,0	321,0	357,3	425,7	480,5	532,9	584,4	614,9	
	MOP calc	A	332,8	394,9	431,2	511,0	590,2	642,5	694,0	700,1	
	Recom FUSE	A	300	350	400	500	500	600	600	700	
ELECTRICAL DATA MODELS WITHOUT PUMP + "I" EC INVERTER FAN											
Alimentation 230/3/60Hz											
MODELS WITHOUT PUMP	LRA	A	537,3	720,4	756,7	905,8	954,5	972,8	1054,7	1091,3	
	MCA	A	267,0	307,8	344,1	407,3	462,1	510,9	562,4	592,9	
	MOP	A	322,8	381,7	418,0	492,6	571,8	620,5	672,0	678,1	
	Recom FUSE	A	300	350	400	450	500	600	600	600	
MODELS WITH LOW PUMP	LRA	A	547,3	733,6	769,9	924,2	972,9	994,8	1076,7	1113,3	
	MCA	A	277,0	321,0	357,3	425,7	480,5	532,9	584,4	614,9	
	MOP calc	A	332,8	394,9	431,2	511,0	590,2	642,5	694,0	700,1	
	Recom FUSE	A	300	350	400	500	500	600	600	700	
Alimentation 460/3/60Hz											
MODELS WITHOUT PUMP	LRA	A	276,9	327,1	336,3	425,6	476,1	501,3	525,9	517,2	
	MCA	A	130,8	140,2	149,4	206,0	234,2	259,4	284,0	297,6	
	MOP	A	157,1	170,6	179,9	247,9	288,7	313,9	338,5	339,5	
	Recom FUSE	A	150	150	175	250	250	300	300	300	
MODELS WITH LOW PUMP	LRA	A	281,9	333,7	342,9	434,8	485,3	512,3	536,9	528,2	
	MCA	A	135,8	146,8	156,0	215,2	243,4	270,4	295,0	308,6	
	MOP calc	A	162,1	177,2	186,5	257,1	297,9	324,9	349,5	350,5	
	Recom FUSE	A	150	175	175	250	250	300	300	350	
Alimentation 575/3/60Hz											
MODELS WITHOUT PUMP	LRA	A	218,4	267,3	269,8	364,5	380,1	409,3	421,0	440,2	
	MCA	A	116,1	118,1	120,6	169,9	202,8	232,0	243,7	245,6	
	MOP	A	139,8	142,7	145,2	204,6	252,1	281,4	293,1	280,4	
	Recom FUSE	A	125	125	125	200	250	250	250	250	
MODELS WITH LOW PUMP	LRA	A	222,4	272,6	275,1	371,8	387,4	418,1	429,8	449,0	
	MCA	A	120,1	123,4	125,9	177,2	210,1	240,8	252,5	254,4	
	MOP	A	143,8	148,0	150,5	212,0	259,5	290,2	301,9	289,2	
	Recom FUSE	A	125	125	150	200	250	250	300	250	



NOTE

Field wiring by others which complies to the National Electrical Code & Local Codes.

KEY

- L.R.A.: Peak current
M.C.A.: Maximum current
M.O.P.: Maximum overcurrent protection

9.2. CONNECTION TO THE POWER SUPPLY

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

9.3. TO ACCESS THE ELECTRIC BOX:

- Turn ¼ the screws of the electrical panel in counter-clockwise direction.
- Turn the handle of the door lock knife switch to OFF (see figure 1) In this way, there is access to the electrical panel.

9.4. ELECTRICAL POWER CONNECTION

For functional connection of the unit take the supply power cable to the electrical panel inside the unit fig.2 in the previous page and connect it to the knife switch terminals observing the phase, and the earth. fig.3



Fig.1

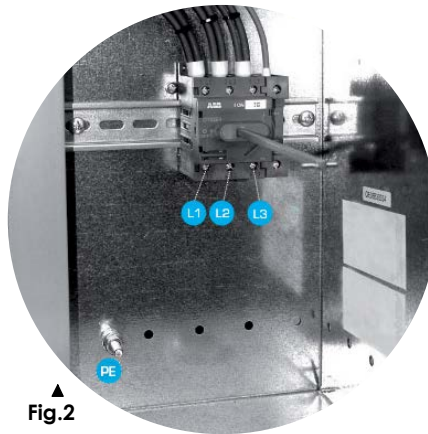


Fig.2

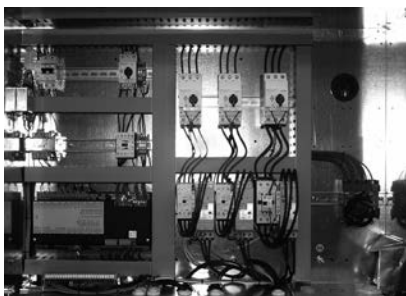
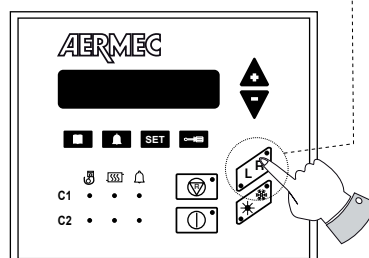
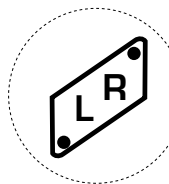


Fig.3

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



9.5. AUXILIARY CONNECTIONS AT THE USER/INSTALLER EXPENSE

The terminals indicated in future explanations are part of the GR3 control boards. For installation requirements, refer to the wiring diagram supplied with the unit. The wiring diagram together with the manuals must be kept in good conditions and readily accessible for future operations on the unit.

9.6. AUXILIARY SWITCH (IAD)

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

9.7. PUMP CONTACTOR (CP01 - CP02)

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

9.8. EXTERNAL ALARM (EA)

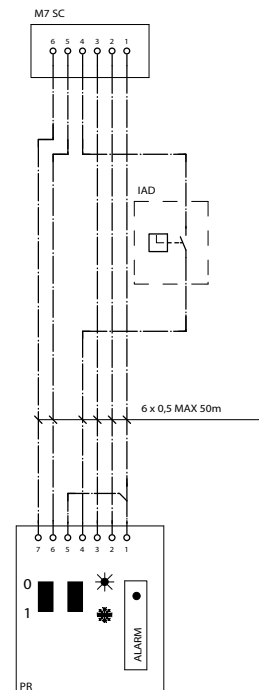
To prepare an external alarm device, connect the device contact to the clamp 1 and 2 of the control board M17.

9.9. CONNECTION PR3

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

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

CONNECTION REMOTE PANEL - PR3



ENABLING REMOTE PANEL - PR3

To enable the remote panel PR3:

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

10. CONTROL AND FIRST START-UP

10.1. PREPARATION FOR COMMISSIONING

Bear in mind that a free start-up service is offered by the Aermec Technical Service for the unit of this series, at the request of Aermec customers or legitimate owners and in ITALY only.

The start-up must be previously agreed on the basis of the system implementation times. Before the intervention of the AERMEC After Sales Service, all the operations (electrical and hydraulic hook ups, loading and breather from the system) must be completed.

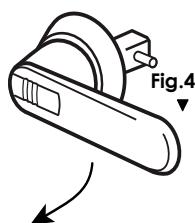
Before starting the unit make sure that:

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

10.2. FIRST COMMISSIONING OF THE MACHINE

Before activating the unit:

- Close the electric panel lid.
- Position the door lock knife switch of the machine on ON, turning the handle down. (fig4)
- Press the key ON to start the machine (fig 5),
- when the access LED appears the unit is ready for the operation.



10.3. SEASON CHANGEOVER

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

10.3.1. SEASON CHANGE OF THE PANEL ON THE MACHINE

To activate the season change, just press the indicated key in (fig. 6). To ensure that the operation is successful, machine must be active as remote or local. For further information refer to the USE manual.

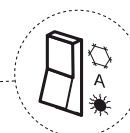
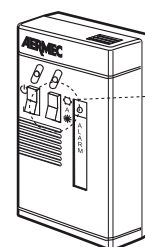
10.3.2. SEASON CHANGE OF PR3

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



ATTENTION

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



PR3 remote panel

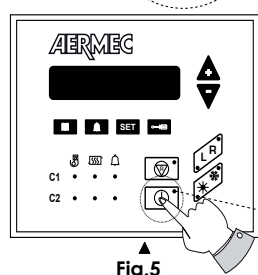
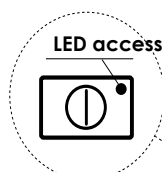


Fig.5

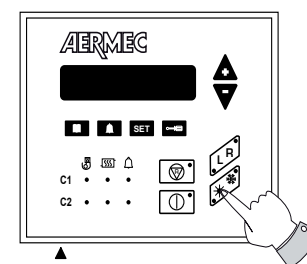


Fig.6

11. FUNCTIONING CHARACTERISTICS

11.1. COOLING SET POINT

(Default defined) = 44.6°F/7°C, $\Delta t = 10.01^\circ\text{F}/5^\circ\text{C}$.

11.2. COMPRESSOR START DELAY

To prevent the compressor start too close to each other, two functions have been arranged.

- Minimum time from last turn-off 60 seconds.
- Minimum time from last start 300 seconds.

11.3. CIRCULATION PUMP

The electronic board provides an output to manage the circulation pump.

After the first 10 seconds of the pump operation, when the water flow rate is running, activate the function of water flow rate alarm (flow switch).

11.4. ANTI-FREEZE ALARM

The anti-freeze alarm is active as if the machine is turned-off or if the machine is in standby mode. In order to prevent breakage of the plate-type exchanger due to freezing water contained, the compressor is locked (if the machine is turned on under 39.2°F/4°C) and the resistance starts up (if standby below 41°F/5°C). If the temperature detected by the probe in the exchanger output and in the chiller input is below 39.2°F/4°C.

WARNING:

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

The intervention of this alarm sets the compressor block and not of the pump, which remains active, and the resistance starts-up if installed.

For the restoration of the normal functions of the temperature of the water output have to come back over 39.2°F/4°C, the reset is manual.

WARNING:

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

11.5. WATER FLOW RATE ALARM

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

This alarm sets the block of the compressor and the pump.



ATTENTION

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



ATTENTION

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



ATTENTION

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

12. REGULAR MAINTENANCE

Any cleaning operation is forbidden before disconnecting the unit from the power supply.

Check for voltage before operating.

Periodic maintenance is essential to maintain the unit in perfect working order under the functional as well as the energetic aspect.

Therefore it is essential to provide yearly controls for the:

12.1. HYDRAULIC CIRCUIT

Control:

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

12.2. ELECTRIC CIRCUIT

Control:

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

12.3. CHILLER CIRCUIT

Control:

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

12.4. MECHANICAL CONTROLS

Control:

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

13. EXTRAORDINARY MAINTENANCE

The NRL are loaded with R410A gas and tested in the factory. In normal conditions, no Technical Assistance Service operation is needed for the refrigerant gas check. Along time, however, small leaks from the joints may be generated. Due to these leaks, the refrigerant comes out and the circuit is drained, causing the unit malfunction. In these cases, the refrigerant leakage points are found and repaired, and the cooling circuit is recharged, operating in compliance with Law 28 December 1993 no. 549.

13.1. LOADING PROCEDURE

The loading procedure is as follows:

- Empty and dehydrated the entire refrigeration circuit using a vacuum pump connected to the low grip as to the high grip of high pressure till the vacuum gauge reading up to about 10 Pa. Wait some minutes and check that this value does not goes back again over 50 Pa.
- Connect the refrigerant gas bomb or a load cylinder

to the grip on the low-pressure line.

- Charge the amount of refrigerant gas indicated on the characteristics plate of the machine.
- After any operation control that the liquid indicator indicates a dry circuit (dry-green) In case of partial loss the circuit has to be emptied completely before reloading it.
- The refrigerant R410A has to be loaded only in liquid phase.
- Different operating conditions from the normal can result in different values.
- Leak testing or leaking research must be carried out only by using refrigerant gas R410A by checking with a suitable leak detection.
- It is prohibited to use in the refrigeration circuit, oxygen or acetylene or other flammable or poisonous gas because they can cause explosions or intoxication.



ATTENTION

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



ATTENTION

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



ATTENTION

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



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The technical data on the following documents are not binding. Aermec reserves the right to make any changes at any time deemed necessary for product improvement.
