AERMEC

Installation and Maintenance Manual

INTERTEK CERTIFICATION | AHRI CERTIFICATION | R410A GAS | FREE-COOLING | SCROLL COMPRESSOR | AXIAL FAN | PLATE EXCHANGER | 60Hz FREQUENCY

CHILLER

- **HIGH EFFICENCY**
- **POWER SUPPLY 60Hz**

NRL FC 028-075

EN

CE

21.05 5641250_04

TRANSLATION FROM ORIGINAL

Dear Customer, Thank you for choosing an AERMEC product. This product is the result of many years of experience and in-depth engineering research, and it is built using top quality materials and advanced technologies. In addition, the CE mark guarantees that our appliances fully comply with the requirements of the European Machinery Directive in terms of safety. We constantly monitor the quality level of our products, and as a result they are synonymous with Safety, Quality, and Reliability. Product data may be subject to modifications deemed necessary for improving the product without the obligation to give prior notice.

Thank you again.
AERMEC S.p.A

1. DESCRIPTION AND CHOCE 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

Ciruit	Components		
Cooling circuit Model	**F**	**B**	**with D**
Resistance carter compressor	yes	yes	yes
High pressure switch	yes	yes	yes
Low pressure switch	no	no	no
High pressure trasducer	yes	yes	yes
Low pressure trasducer	yes	yes	yes
Solenoid valve of hot gas injecton	yes	yes	yes
By-pass valve of hot gas	no	no	yes
Exchanger (EV- EV/CN)	yes	yes	yes
Exchanger (desuperheater)	no	yes	yes
Exchanger (glycol free)	no	yes	/

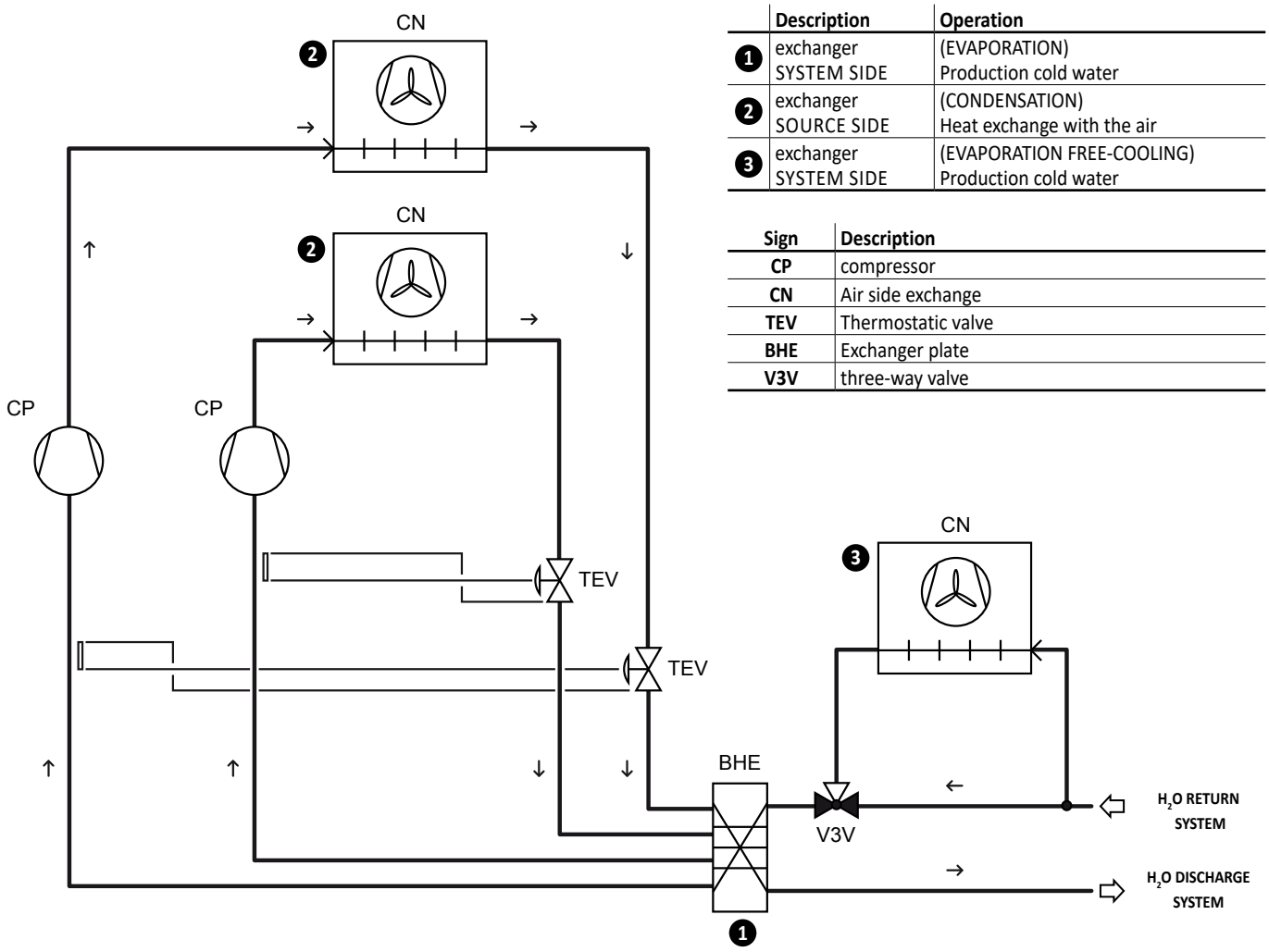
"F" VERSION										
Hydraulic circuit Version "F 00"	**0280**	**0300**	**0330**	**0350**	**0500**	**0550**	**0600**	**0650**	**0700**	**0750**
Water filter	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Flow switch	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Air vent	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Hydraulic circuit Version "P1...P4"	**0280**	**0300**	**0330**	**0350**	**0500**	**0550**	**0600**	**0650**	**0700**	**0750**
Water filter	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Flow switch	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Safety valve	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Air vent	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Pump	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Expansion tank	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Hydraulic circuit Version "01...04"	**0280**	**0300**	**0330**	**0350**	**0500**	**0550**	**0600**	**0650**	**0700**	**0750**
Water filter	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Flow switch	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Safety valve	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Air vent	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Pump	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Expansion tank	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Storage tank	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

3. PRINCIPLE OF OPERATION SCHEMES

3.1. PRODUCTION OF COLD WATER ONLY THE SYSTEM



	Description	Operation
1	exchanger SYSTEM SIDE	(EVAPORATION) Production cold water
2	exchanger SOURCE SIDE	(CONDENSATION) Heat exchange with the air
3	exchanger SYSTEM SIDE	(EVAPORATION FREE-COOLING) Production cold water

Sign	Description
CP	compressor
CN	Air side exchange
TEV	Thermostatic valve
BHE	Exchanger plate
V3V	three-way valve

4. SELECTION AND PLACE OF INSTALLATION

Prima di procedere all'installazione dell'unità concordare con il cliente la posizione dove andrà collocata, ponendo attenzione ai punti seguenti:

- The support surface must be capable of supporting the unit weight.
- The safety differences between the unit and other appliances or structures must be scrupulously respected so that the inlet and outlet air from the fans is free to circulate.
- 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.

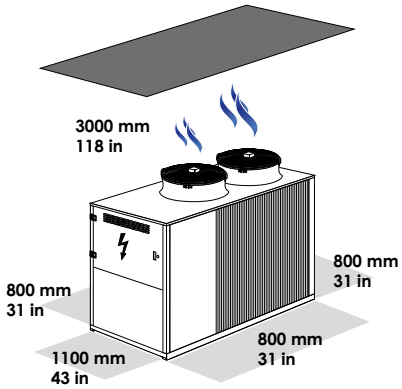
5. POSITIONING

The machine is delivered from the factory wrapped in estincoil. Before handling the unit, verify the lifting capacity of the machines used. After removal of packaging, movement of apparatus must be carried out by qualified and adequately equipped personnel.

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.

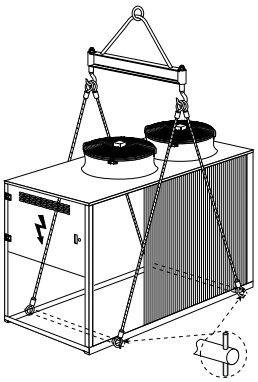
Before beginning any operation, READ THESE INSTRUCTIONS CAREFULLY AND CARRY OUT THE SAFETY CHECKS TO REDUCE ALL RISK OF DANGER TO A MINIMUM. All the staff involved must have thorough knowledge of the operations and any dangers that may arise at the moment in which the installation operations are carried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

4.1. MINIMUM TECHNICAL



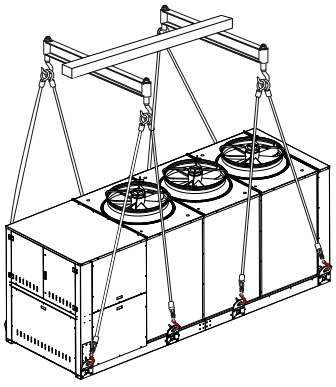
ATTENTION:
The drawings are only examples.

EXAMPLE 1
"OF THE LIFTING"
Size 0280-0700.
Insert pipes (NOT SUPPLIED) in holes on the base with length such to allow positioning of the belts used for lifting.
To prevent the unit structure being damaged by the belts place protections between the latter and the machine.
It is prohibited to stop under the unit.



NOTE:
The appliance warranty does not cover the costs for ladders, scaffolding, or other elevation systems that may become necessary for carrying out servicing under warranty.

EXAMPLE 2
"OF THE LIFTING"
NRL 0750 (always use all the provided eyebolts)
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, using the appropriate equipment.
To handle the machine:
"IN THE EVENT OF LIFTING", hook the lifting cables to the special eyebolts In order to avoid damaging the unit with the cables, insert protection elements between them and the machine. Is it absolutely forbidden to stand beneath the unit.

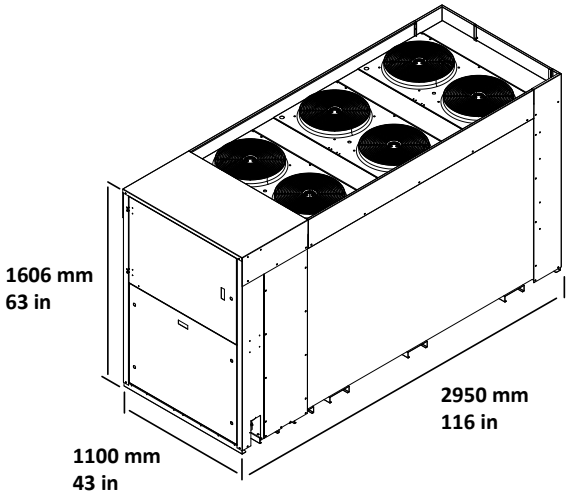


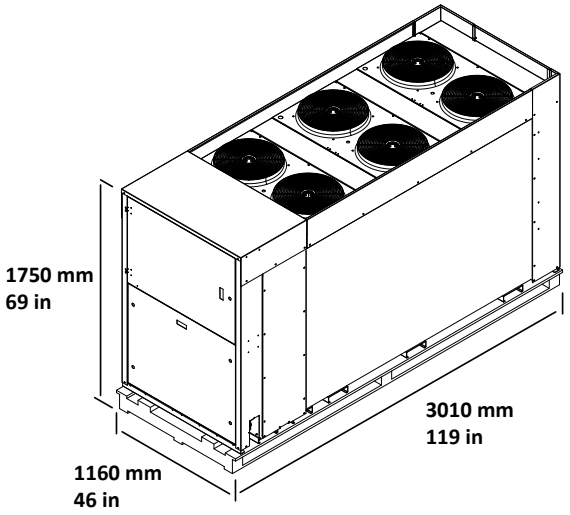
ATTENTION
L'unità viene fornita fissata su di un pallet, per la movimentazione con carri elevatori e cinghie prevedere dei pali (NON FORNITI).

ATTENTION
Always use all the provided eyebolts.

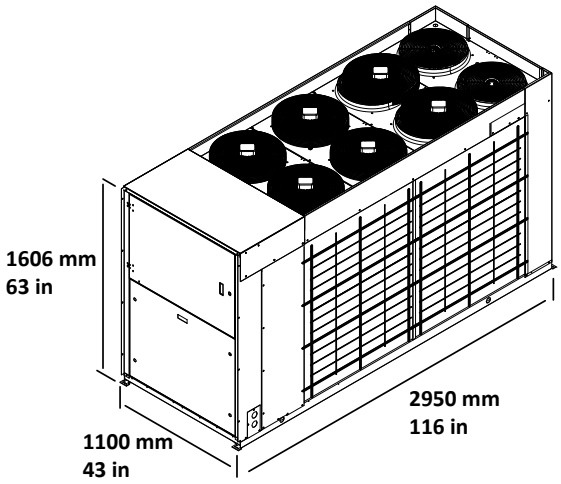
6. DIMENSION

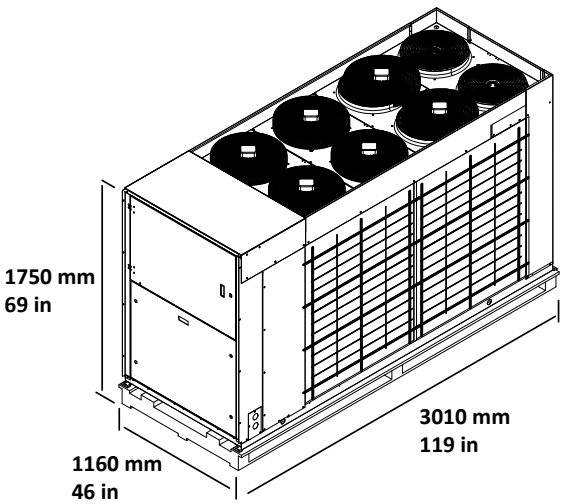
6.1. NRL 0280 - 0300 FE



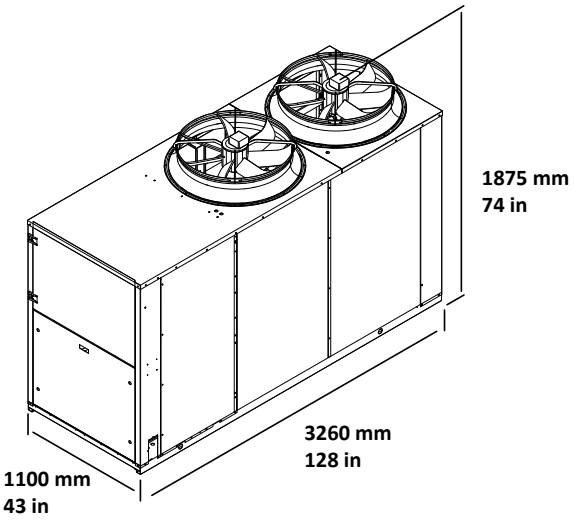


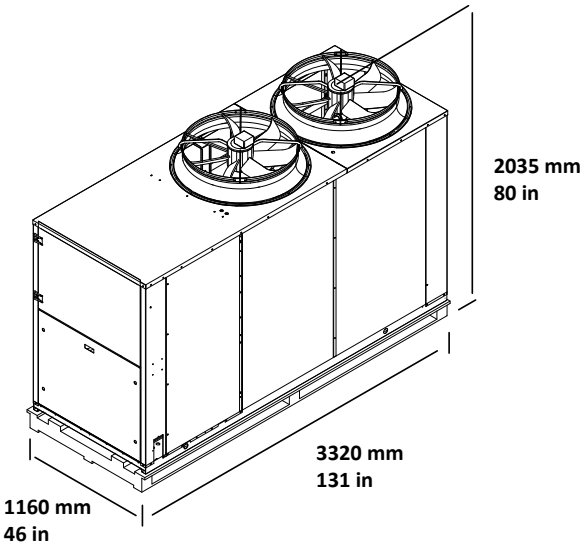
6.2. NRL 0330 - 0350 FE



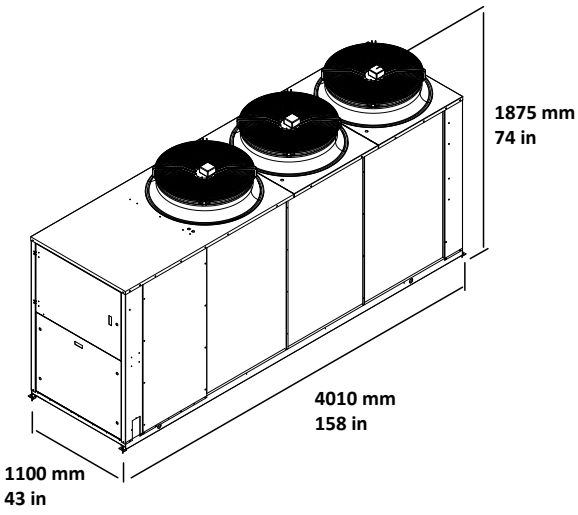


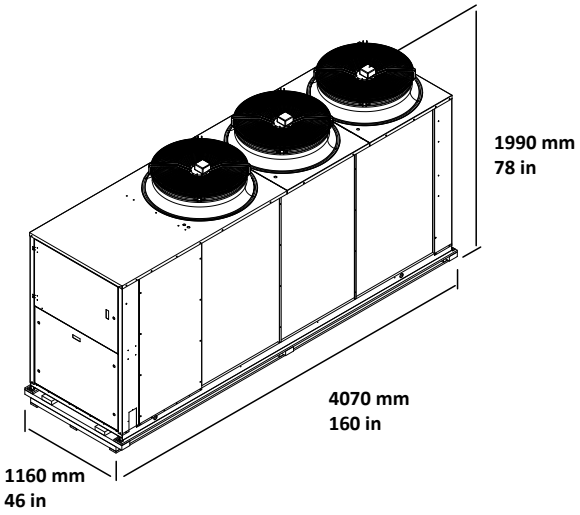
6.3. NRL 0500 - 0550 FA



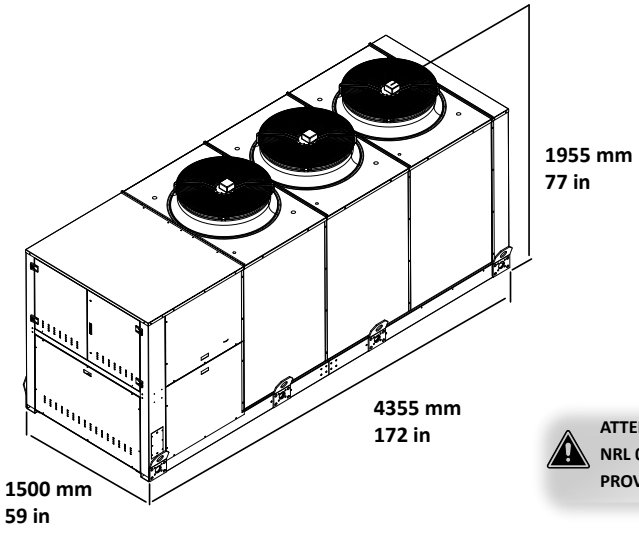


6.4. NRL 0600 - 0650 - 0700 FA





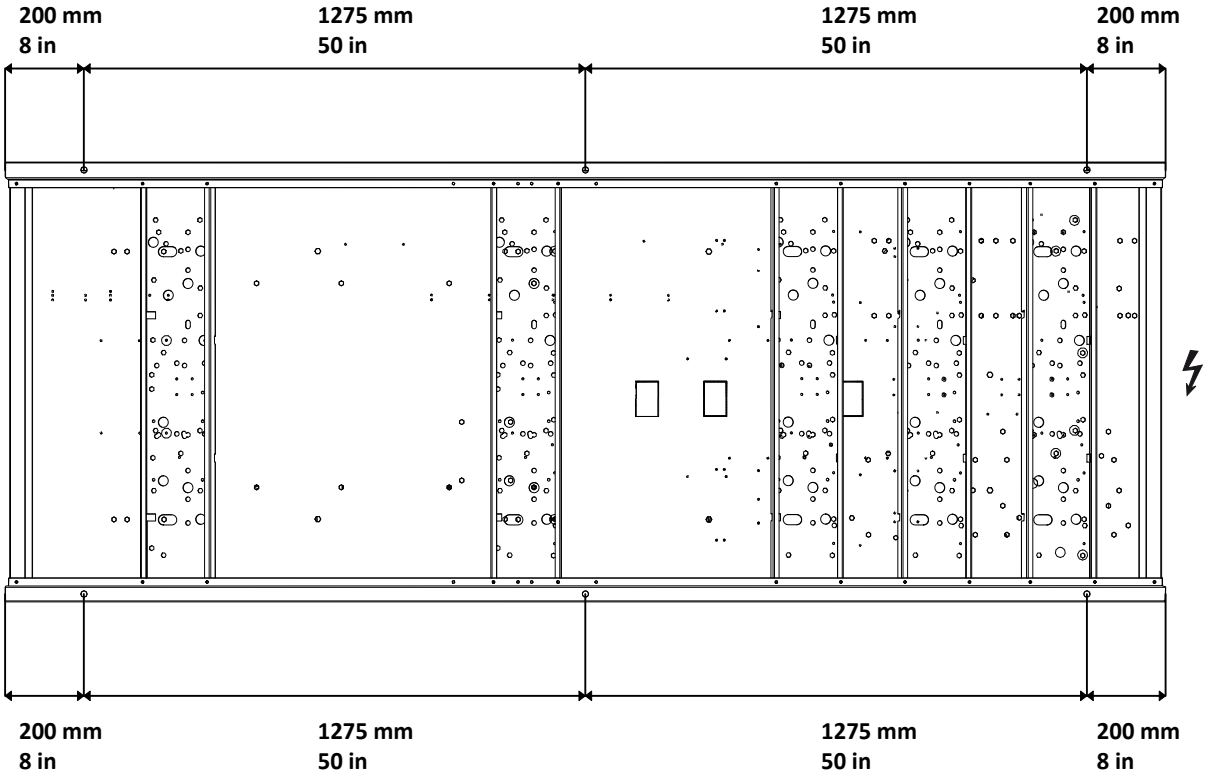
6.5. NRL 0750 FA



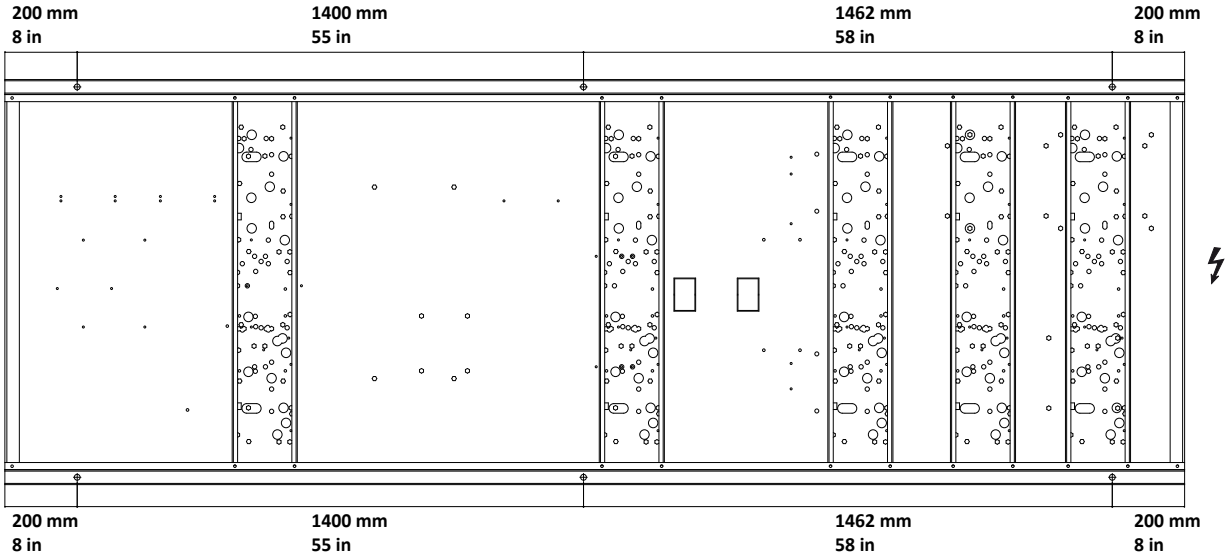
ATTENTION:
NRL 0750 FA ALWAYS USE ALL THE PROVIDED EYEBOLTS.

7. ANTIVIBRATION POSITIONING

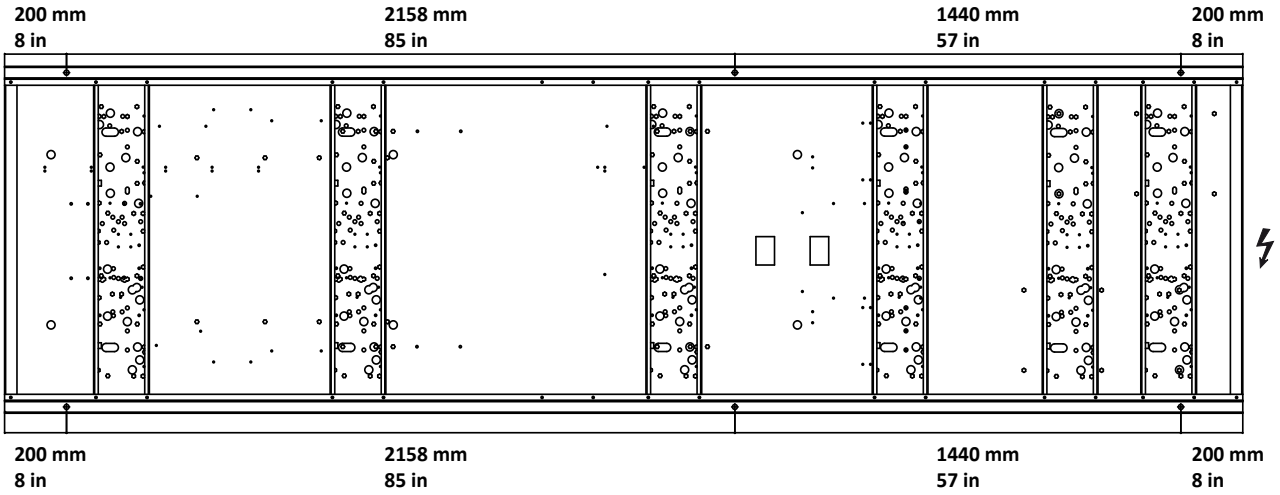
7.1. NRL 0280 - 0300 - 330 - 350 FE



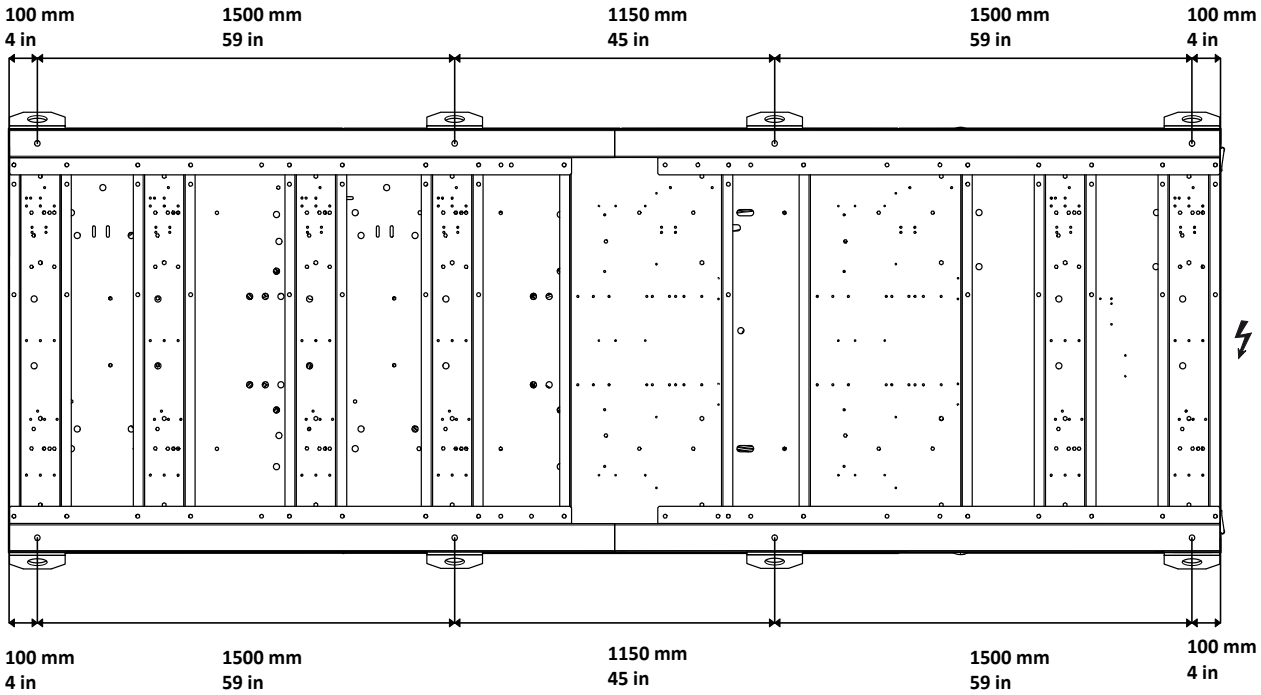
7.2. NRL 0500 - 0550 FE FA



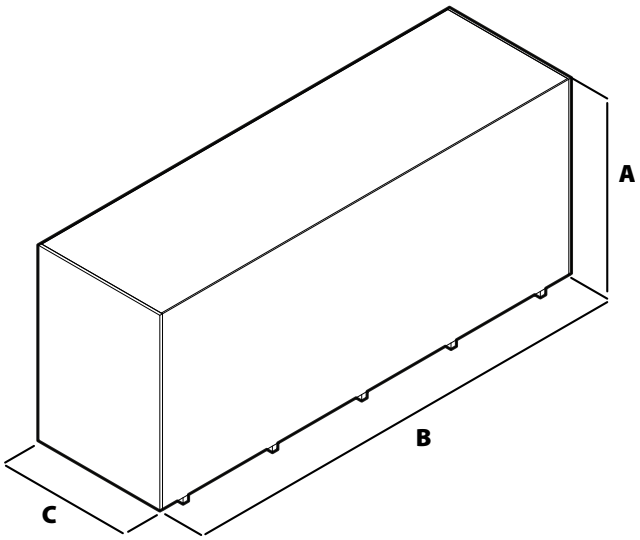
7.3. NRL 0600 - 0650 - 0700 FA



7.4. NRL 0750 FA



8. CRATE: SPECIAL WOOD COVER FOR TRANSPORT (ACCESSORY)

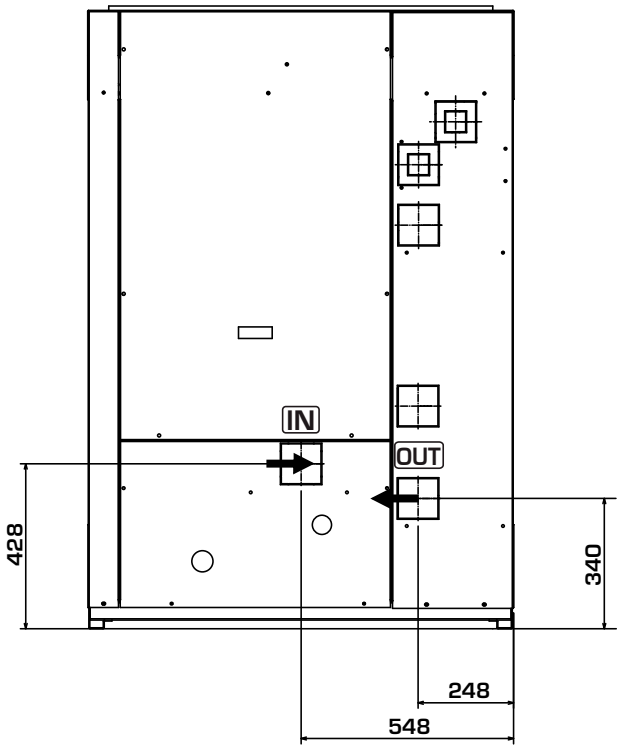


CRATE	A (in)	B (in)	C (in)
CRATE02	87.9	138.7	50.4
CRATE03	87.9	180.1	50.4
CRATE04	95.7	184.0	66.2

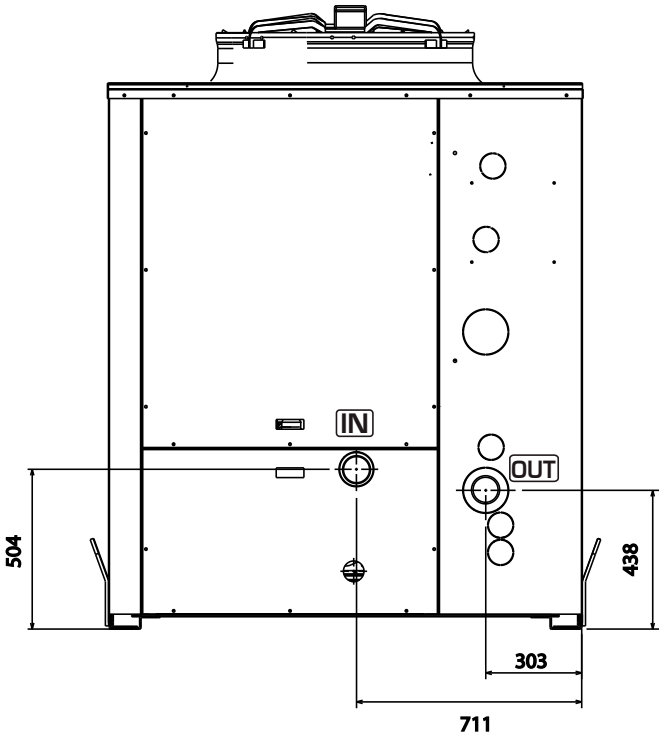
NRL	MODELS	CRATE
0280	FA-FE	02
0300	FA-FE	02
0330	FA-FE	02
0350	FA-FE	02
0500	FA-FE	02
0550	FA-FE	02
0600	FA-FE	03
0650	FA-FE	03
0700	FA-FE	03
0750	FA-FE	04

9. HYDRAULIC CONNECTION

9.1. HYDRAULIC CONNECTION NRL 0280-0350 FA

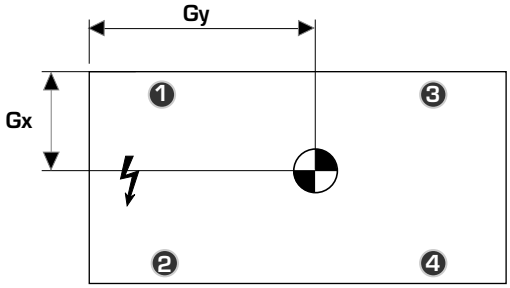


9.2. HYDRAULIC CONNECTION NRL 0500 - 0750 FA



WARNING:
Clean the system carefully before connecting the unit. Cleaning will eliminate any residues suck as drops of solder, waste, rust or other impurities from the piping. These substances could deposit inside and cause the machine to malfunction.
The connection pipes must be suitably supported so as not to burden the apparatus with their weight.

10. DISTRIBUTION OF PERCENTAGE WEIGHTS ON SUPPORTINGPOINTS



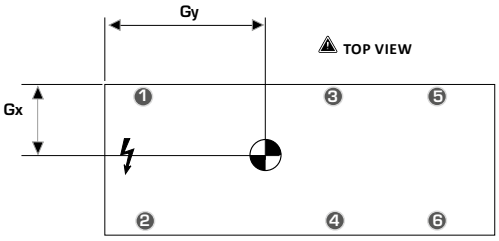
⚠ TOP VIEW

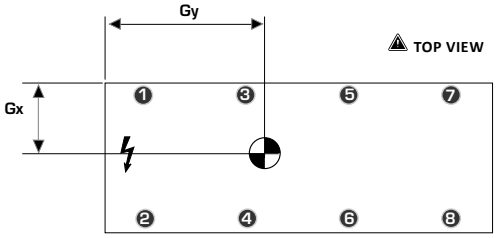
WEIGHT OF EMPTY UNITS											
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)				KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	
NRL0280F	00	1847	556	219	1312	517	23%	25%	24%	27%	VT 17
NRL0280F	04	2255	555	219	1395	549	22%	24%	26%	29%	VT 13
NRL0280F	03	2178	555	219	1368	539	22%	24%	26%	28%	VT 13
NRL0280F	P4	2001	556	219	1376	542	22%	24%	26%	28%	VT 17
NRL0280F	P3	1924	556	219	1346	530	22%	25%	25%	28%	VT 17
NRL0300F	00	2001	556	219	1345	530	22%	25%	25%	28%	VT 17
NRL0300F	04	2409	555	219	1417	558	21%	23%	26%	29%	VT 13
NRL0300F	03	2332	555	219	1393	548	22%	24%	26%	29%	VT 13
NRL0300F	P4	2156	556	219	1403	552	21%	24%	26%	29%	VT 17
NRL0300F	P3	2078	556	219	1375	541	22%	24%	26%	28%	VT 17
NRL0330F	00	2036	556	219	1347	530	22%	25%	25%	28%	VT 17
NRL0330F	04	2444	555	219	1417	558	21%	23%	26%	29%	VT 13
NRL0330F	03	2367	555	219	1393	549	22%	24%	26%	29%	VT 13
NRL0330F	P4	2191	556	219	1403	552	21%	24%	26%	29%	VT 17
NRL0330F	P3	2114	556	219	1376	542	22%	24%	26%	28%	VT 17
NRL0350F	00	2065	557	219	1333	525	23%	25%	25%	27%	VT 17
NRL0350F	04	2473	556	219	1405	553	21%	24%	26%	29%	VT 13
NRL0350F	03	2396	556	219	1381	544	22%	24%	26%	28%	VT 13
NRL0350F	P4	2219	556	219	1390	547	22%	24%	26%	29%	VT 17
NRL0350F	P3	2142	556	219	1362	536	22%	24%	25%	28%	VT 17
NRL0500F	00	2449	538	212	1409	555	27%	26%	24%	23%	VT 13
NRL0500F	04	2907	540	213	1660	653	30%	28%	21%	21%	VT 10
NRL0500F	03	2821	540	212	1624	639	30%	29%	21%	20%	VT 10
NRL0500F	P4	2621	539	212	1628	641	30%	29%	21%	20%	VT 13
NRL0500F	P3	2535	538	212	1588	625	31%	29%	21%	20%	VT 13
NRL0550F	00	2466	536	211	1401	552	27%	26%	24%	23%	VT 13
NRL0550F	04	2925	538	212	1651	650	30%	28%	21%	20%	VT 10
NRL0550F	03	2839	538	212	1616	636	30%	29%	21%	20%	VT 10
NRL0550F	P4	2638	537	211	1620	638	30%	29%	21%	20%	VT 13
NRL0550F	P3	2552	537	211	1579	622	31%	29%	20%	19%	VT 13

WEIGHT OF RUNNING UNITS											
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)				KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	
NRL0280F	00	1946	550	217	1338	527	23%	25%	25%	27%	VT 17
NRL0280F	04	3015	550	217	1441	567	21%	23%	27%	29%	VT 13
NRL0280F	03	2938	547	215	1422	560	21%	23%	27%	29%	VT 13
NRL0280F	P4	2100	546	215	1397	550	22%	23%	27%	28%	VT 17
NRL0280F	P3	2023	546	215	1369	539	22%	24%	26%	28%	VT 17
NRL0300F	00	2103	550	217	1368	538	22%	24%	26%	28%	VT 17
NRL0300F	04	3172	550	217	1455	573	21%	22%	27%	30%	VT 13
NRL0300F	03	3094	547	215	1438	566	21%	23%	27%	29%	VT 13
NRL0300F	P4	2257	546	215	1421	559	21%	23%	27%	29%	VT 17
NRL0300F	P3	2180	546	215	1395	549	22%	23%	27%	28%	VT 17
NRL0330F	00	2138	551	217	1369	539	22%	24%	26%	28%	VT 17
NRL0330F	04	3207	551	217	1455	573	21%	22%	27%	30%	VT 13
NRL0330F	03	3130	551	217	1438	566	21%	23%	27%	29%	VT 13
NRL0330F	P4	2292	551	217	1421	559	21%	23%	27%	29%	VT 17
NRL0330F	P3	2215	551	217	1396	550	22%	24%	26%	28%	VT 17
NRL0350F	00	2167	551	217	1355	534	22%	24%	26%	28%	VT 17
NRL0350F	04	3235	551	217	1445	569	21%	23%	27%	29%	VT 13
NRL0350F	03	3158	551	217	1428	562	21%	23%	27%	29%	VT 13
NRL0350F	P4	2321	551	217	1408	554	21%	23%	27%	29%	VT 17
NRL0350F	P3	2244	551	217	1383	544	22%	24%	26%	28%	VT 17
NRL0500F	00	2605	533	210	1442	568	26%	25%	25%	24%	VT 13
NRL0500F	04	4166	540	212	1746	688	28%	27%	23%	22%	VT 10
NRL0500F	03	4080	539	212	1724	679	29%	28%	22%	21%	VT 10
NRL0500F	P4	2777	534	210	1647	648	30%	28%	21%	20%	VT 13
NRL0500F	P3	2691	534	210	1610	634	31%	29%	21%	20%	VT 13
NRL0550F	00	2623	531	209	1435	565	27%	25%	25%	23%	VT 13
NRL0550F	04	4183	538	212	1740	685	29%	27%	22%	22%	VT 10
NRL0550F	03	4097	538	212	1718	676	29%	28%	22%	21%	VT 10
NRL0550F	P4	2795	533	210	1639	645	30%	28%	21%	20%	VT 13
NRL0550F	P3	2709	532	209	1601	630	31%	29%	21%	20%	VT 13

WEIGHT OF EMPTY UNITS													
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)						KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	
NRL0600F	00	3019	552	217	1701	670	8,0%	8,0%	32,8%	33,0%	9,1%	9,1%	VT 22
NRL0600F	04	3526	474	187	1461	575	9,1%	6,9%	37,4%	28,4%	10,4%	7,9%	VT 22
NRL0600F	03	3416	489	193	1506	593	8,9%	7,1%	36,6%	29,3%	10,1%	8,1%	VT 22
NRL0600F	P4	3240	516	203	1590	626	8,5%	7,5%	34,9%	30,9%	9,7%	8,5%	VT 22
NRL0600F	P3	3130	534	210	1644	647	8,2%	7,8%	33,9%	31,9%	9,4%	8,8%	VT 22
NRL0650F	00	3196	550	217	1723	679	7,7%	7,7%	33,0%	33,1%	9,2%	9,2%	VT 22
NRL0650F	04	3703	476	187	1491	587	8,8%	6,7%	37,5%	28,6%	10,4%	8,0%	VT 22
NRL0650F	03	3593	490	193	1535	604	8,6%	6,9%	36,6%	29,5%	10,2%	8,2%	VT 22
NRL0650F	P4	3416	516	203	1616	636	8,2%	7,3%	35,1%	31,0%	9,8%	8,6%	VT 22
NRL0650F	P3	3306	533	210	1668	657	8,0%	7,5%	34,1%	32,0%	9,5%	8,9%	VT 22
NRL0700F	00	3240	552	217	1713	674	7,9%	7,9%	32,8%	33,1%	9,1%	9,2%	VT 22
NRL0700F	04	3725	479	188	1484	584	8,9%	6,9%	37,2%	28,7%	10,3%	8,0%	VT 22
NRL0700F	03	3615	493	194	1528	601	8,7%	7,1%	36,4%	29,5%	10,1%	8,2%	VT 22
NRL0700F	P4	3438	518	204	1608	633	8,3%	7,4%	34,9%	31,1%	9,7%	8,6%	VT 22
NRL0700F	P3	3328	535	211	1659	653	8,1%	7,7%	33,9%	32,1%	9,4%	8,9%	VT 22

WEIGHT OF RUNNING UNITS													
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)						KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	
NRL0600F	00	3196	548	216	1737	684	7,5%	7,5%	33,3%	33,1%	9,3%	9,2%	VT 22
NRL0600F	04	4342	402	158	1274	502	9,5%	5,5%	42,2%	24,3%	11,8%	6,8%	VT 22
NRL0600F	03	4254	412	162	1306	514	9,4%	5,6%	41,6%	24,9%	11,6%	6,9%	VT 22
NRL0600F	P4	3394	514	202	1629	641	8,0%	7,0%	35,4%	31,0%	9,9%	8,7%	VT 22
NRL0600F	P3	3306	530	209	1681	662	7,8%	7,2%	34,4%	32,0%	9,6%	8,9%	VT 22
NRL0650F	00	3416	546	215	1768	696	7,2%	7,1%	33,7%	33,2%	9,5%	9,4%	VT 22
NRL0650F	04	4584	408	161	1321	520	8,9%	5,3%	42,1%	24,8%	11,9%	7,0%	VT 22
NRL0650F	03	4474	418	164	1352	532	8,8%	5,4%	41,5%	25,4%	11,7%	7,2%	VT 22
NRL0650F	P4	3637	514	203	1665	656	7,6%	6,7%	35,6%	31,3%	10,0%	8,8%	VT 22
NRL0650F	P3	3526	530	209	1715	675	7,4%	6,9%	34,7%	32,2%	9,8%	9,1%	VT 22
NRL0700F	00	3460	548	216	1758	692	7,3%	7,2%	33,5%	33,3%	9,4%	9,3%	VT 22
NRL0700F	04	4628	411	162	1317	518	9,1%	5,4%	41,8%	24,9%	11,7%	7,0%	VT 22
NRL0700F	03	4518	420	165	1348	531	9,0%	5,6%	41,3%	25,5%	11,6%	7,1%	VT 22
NRL0700F	P4	3681	517	203	1657	652	7,7%	6,8%	35,4%	31,3%	9,9%	8,8%	VT 22
NRL0700F	P3	3570	532	209	1706	672	7,5%	7,0%	34,5%	32,3%	9,7%	9,0%	VT 22



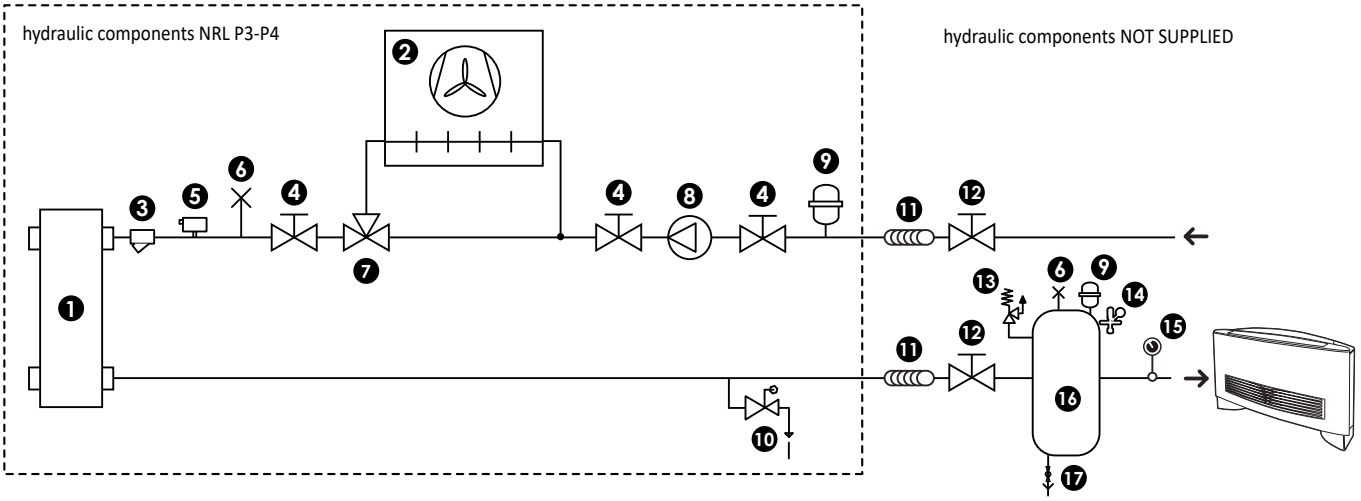


WEIGHT OF EMPTY UNITS															
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)								KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	7	8	
NRL0750F	00	3945	754	297	2069	815	8,2%	8,3%	12,7%	12,9%	26,0%	26,3%	2,7%	2,8%	VT 32
NRL0750F	04	4430	670	264	1837	723	9,1%	7,4%	14,2%	11,4%	29,0%	23,4%	3,1%	2,5%	VT 32
NRL0750F	03	4342	686	270	1882	741	9,0%	7,5%	13,9%	11,7%	28,4%	23,9%	3,0%	2,5%	VT 32
NRL0750F	P4	4144	716	282	1964	773	8,6%	7,9%	13,4%	12,2%	27,4%	25,0%	2,9%	2,6%	VT 32
NRL0750F	P3	4055	734	289	2015	793	8,4%	8,1%	13,1%	12,5%	26,7%	25,6%	2,8%	2,7%	VT 32

WEIGHT OF RUNNING UNITS															
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)								KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	7	8	
NRL0750F	00	4188	747	294	2105	829	8,0%	7,9%	12,4%	12,3%	27,1%	26,9%	2,7%	2,7%	VT 32
NRL0750F	04	5797	540	213	1523	599	10,2%	5,7%	15,8%	8,9%	34,5%	19,4%	3,5%	2,0%	VT 32
NRL0750F	03	5686	550	217	1551	611	10,1%	5,8%	15,6%	9,1%	34,2%	19,8%	3,4%	2,0%	VT 32
NRL0750F	P4	4408	711	280	2003	789	8,4%	7,6%	13,0%	11,7%	28,4%	25,6%	2,9%	2,6%	VT 32
NRL0750F	P3	4298	728	287	2053	808	8,2%	7,7%	12,7%	12,0%	27,8%	26,2%	2,8%	2,6%	VT 32

11. HYDRAULIC CIRCUIT

11.1. 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.

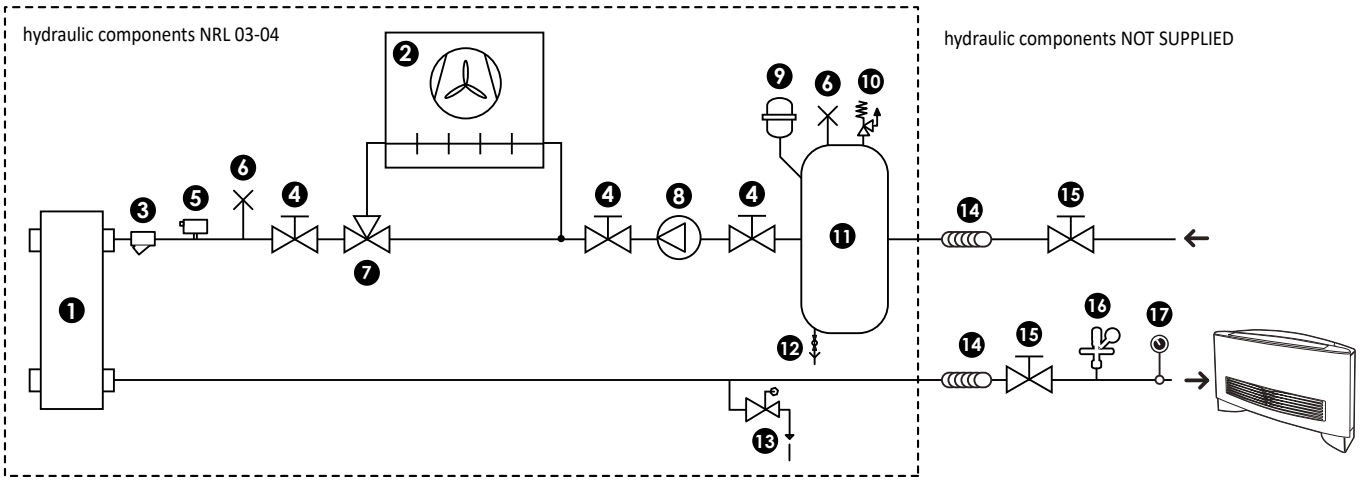
ATTENTION
The hydraulic pipes connecting to the machine must be properly sized to the actual flow of water required by the system in operation. The water flow to the exchanger must always be constant.

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.

11.2. 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.

11.3. SYSTEM LOAD

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

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

11.4. 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.

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.

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.

12. ELECTRICAL WIRINGS

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

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

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

12.1. 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.

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

***=DATA NOT AVAILABLE - CONTACT HOME**

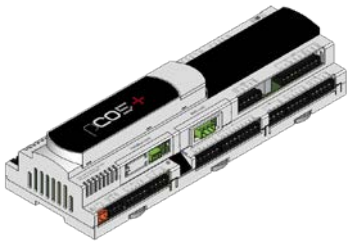
Model				028	030	033	035	050	055	060	065	070	075
Alimentation 208/3/60Hz													
MODEL WITHOUT PUMP - "I" EC INVERTER FAN													
LRA	FA	208V	A	-	-	-	-	385	407	398	469	489	546
	FE			243	291	307	378	-	-	-	-	-	-
MCA	FA	208V		-	-	-	-	150	150	175	225	250	300
	FE			90	90	100	150	-	-	-	-	-	-
MOP	FA	208V		-	-	-	-	175	200	200	250	250	300
	FE			100	110	125	175	-	-	-	-	-	-
MODEL WITH HIGH HEAD PUMP (P3-P4-03-04) - "I" EC INVERTER FAN													
LRA	FA	208V	A	-	-	-	-	393	415	406	483	503	560
	FE			251	299	315	386	-	-	-	-	-	-
MCA	FA	208V		-	-	-	-	150	175	200	225	300	300
	FE			90	100	110	150	-	-	-	-	-	-
MOP	FA	208V		-	-	-	-	175	200	200	250	300	300
	FE			110	125	125	175	-	-	-	-	-	-
Alimentation 230/3/60Hz													
MODEL WITHOUT PUMP - "I" EC INVERTER FAN													
LRA	FA	230V	A	-	-	-	-	374	394	380	450	468	524
	FE			234	282	296	366	-	-	-	-	-	-
MCA	FA	230V		-	-	-	-	150	150	175	225	250	300
	FE			75	90	100	150	-	-	-	-	-	-
MOP	FA	230V		-	-	-	-	175	175	175	250	250	300
	FE			100	110	125	175	-	-	-	-	-	-
MODEL WITH HIGH HEAD PUMP (P3-P4-03-04) - "I" EC INVERTER FAN													
LRA	FA	230V	A	-	-	-	-	382	402	388	463	481	537
	FE			242	290	304	374	-	-	-	-	-	-
MCA	FA	230V		-	-	-	-	150	175	175	225	300	300
	FE			90	90	110	150	-	-	-	-	-	-
MOP	FA	230V		-	-	-	-	175	200	200	250	300	300
	FE			110	110	125	175	-	-	-	-	-	-
Alimentation 460/3/60Hz													
MODEL WITHOUT PUMP - "I" EC INVERTER FAN													
LRA	FA	460V	A	-	-	-	-	186	195	192	221	229	265
	FE			127	156	163	192	-	-	-	-	-	-
MCA	FA	460V		-	-	-	-	70	75	90	100	110	125
	FE			45	60	60	70	-	-	-	-	-	-
MOP	FA	460V		-	-	-	-	80	90	100	110	125	125
	FE			50	70	75	90	-	-	-	-	-	-
MODEL WITH HIGH HEAD PUMP (P3-P4-03-04) - "I" EC INVERTER FAN													
LRA	FA	460V	A	-	-	-	-	190	199	196	227	235	272
	FE			131	160	167	196	-	-	-	-	-	-
MCA	FA	460V		-	-	-	-	70	80	100	110	125	125
	FE			50	60	70	75	-	-	-	-	-	-
MOP	FA	460V		-	-	-	-	80	100	110	125	125	150
	FE			50	75	80	90	-	-	-	-	-	-
Alimentation 575/3/60Hz													
MODEL WITHOUT PUMP - "I" EC INVERTER FAN													
LRA	FA	575V	A	-	-	-	-	137	144	132	164	170	199
	FE			99	104	109	142	-	-	-	-	-	-
MCA	FA	575V		-	-	-	-	60	60	70	90	100	110
	FE			35	40	45	60	-	-	-	-	-	-
MOP	FA	575V		-	-	-	-	70	75	75	100	110	125
	FE			40	50	50	80	-	-	-	-	-	-
MODEL WITH HIGH HEAD PUMP (P3-P4-03-04) - "I" EC INVERTER FAN													
LRA	FA	575V	A	-	-	-	-	140	147	135	169	175	204
	FE			102	107	113	145	-	-	-	-	-	-
MCA	FA	575V		-	-	-	-	60	70	70	90	100	110
	FE			40	45	50	70	-	-	-	-	-	-
MOP	FA	575V		-	-	-	-	70	80	80	100	110	125
	FE			45	50	60	80	-	-	-	-	-	-

LRA: Peak current
MCA: Minimum circuit amperage
MOP: Maximum overcurrent permitted by the protection device

13. ELECTRONIC CONTROL(PCO[5])

START-UP CIRCULATING PUMP

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



ANTI-FREEZE ALARM

Reference parameters:

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

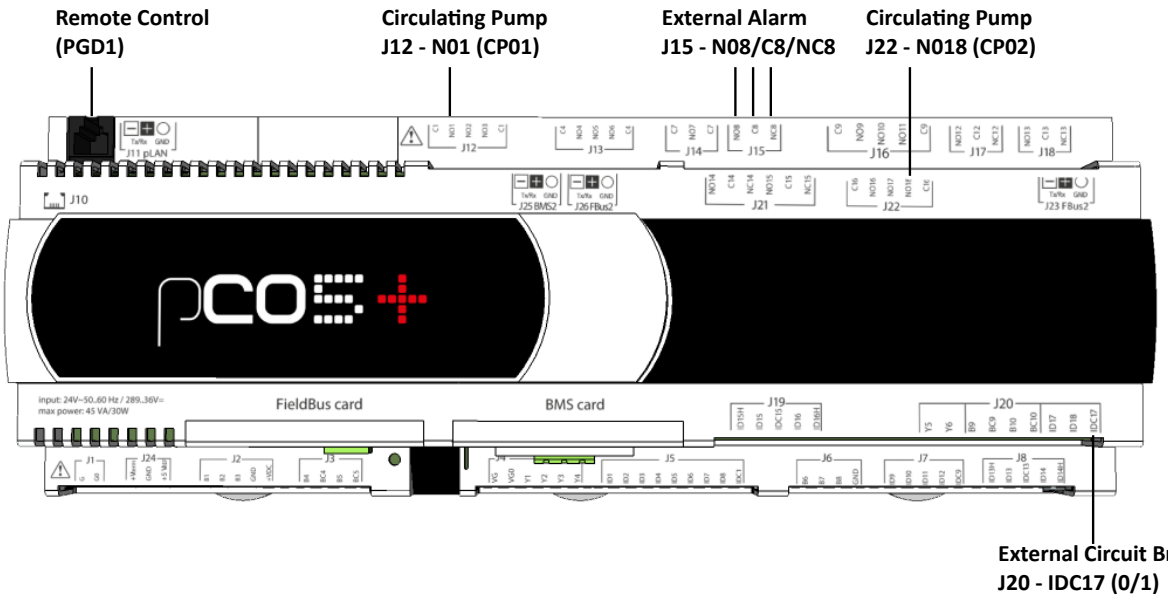
WATER FLOW ALARM

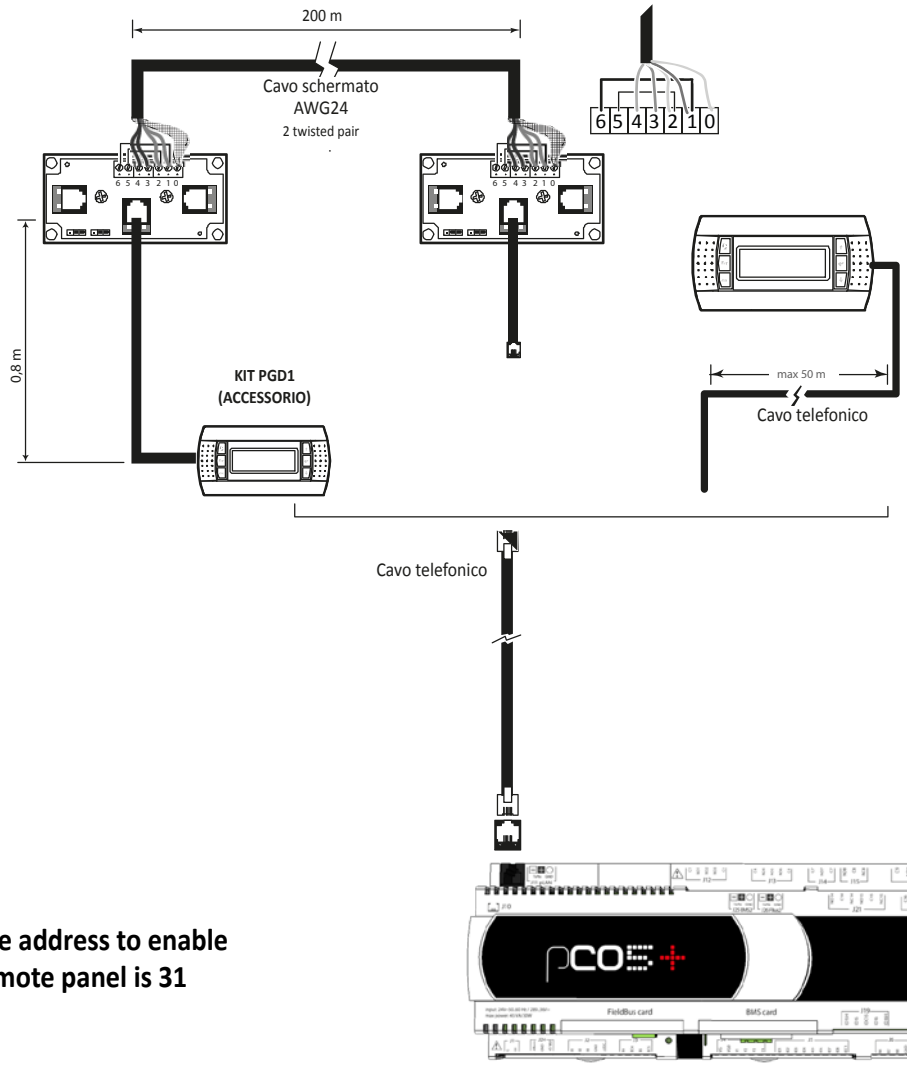
If the water flow rate is not sufficient, this safety stops the compressors and the pump

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

Water flow rate is sufficient	-	>20 seconds
		Start Compressor

AUXILIARY CONNECTIONS
(For Standard Version)





- **The address to enable remote panel is 31**

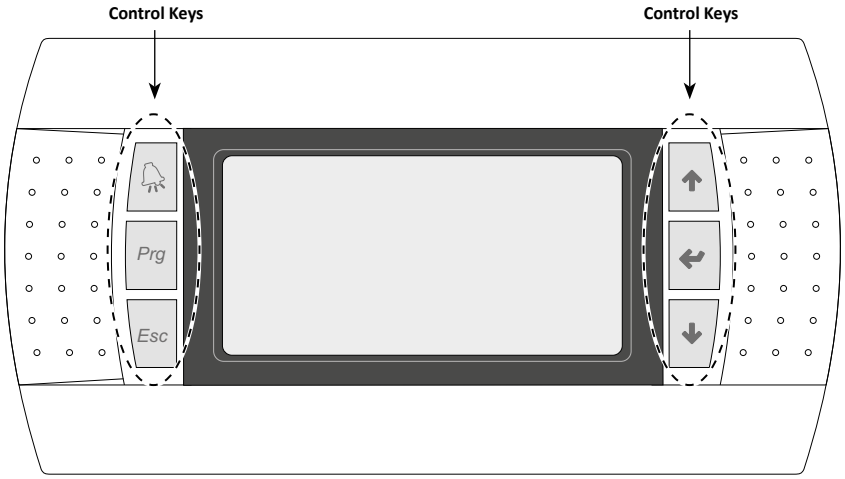
For more information, refer to the wiring diagrams in the selection program or site www.aermec.com

14. USER INTERFACE (PGD1)

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

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

INTERFACE CONTROL KEYS

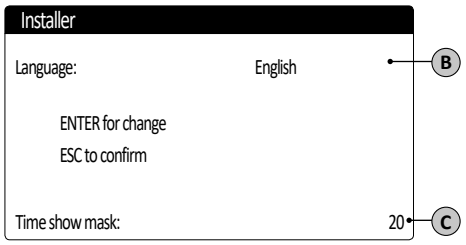


Key	Fucntion
	**ALARM key** Displays the list of active and historical alarms (red LED on = active alarm)
	**MENU ACTIVATION key** • Pressing this key activates the navigation between menus (orange LED on = winter operating mode active)
	**EXIT MENU key** • Pressing this key returns to the previous menu
	**NAVIGATION (+) key** • Pressing this key when navigating between menu/parameters passes to the next menu/parameter • Pressing this key when modifying a parameter increases the value of the selected parameter
	**NAVIGATION (enter) key** • Pressing this key when navigating between menus allows entry to the selected menu • Pressing this key when navigating between parameters allows selection of the parameter displayed to modify it • Pressing the key when modifying a parameter confirms the modification of the parameter value selected
	**NAVIGATION (-) key** • Pressing this key when navigating between menu/parameters passes to the previous menu/parameter • Pressing this key when modifying a parameter decreases the value of the selected parameter

15. START-UP PROCEDURE

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

WARNING: The system language can be set on the screen displayed at the start-up or can be modified at any time through the appropriate screen contained in the Installer menu.

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

WARNING: It is possible to modify the system language at any time using the appropriate screen contained in the Installer menu. (Menu password = 0000).

16. MENU STRUCTURE AND NAVIGATION

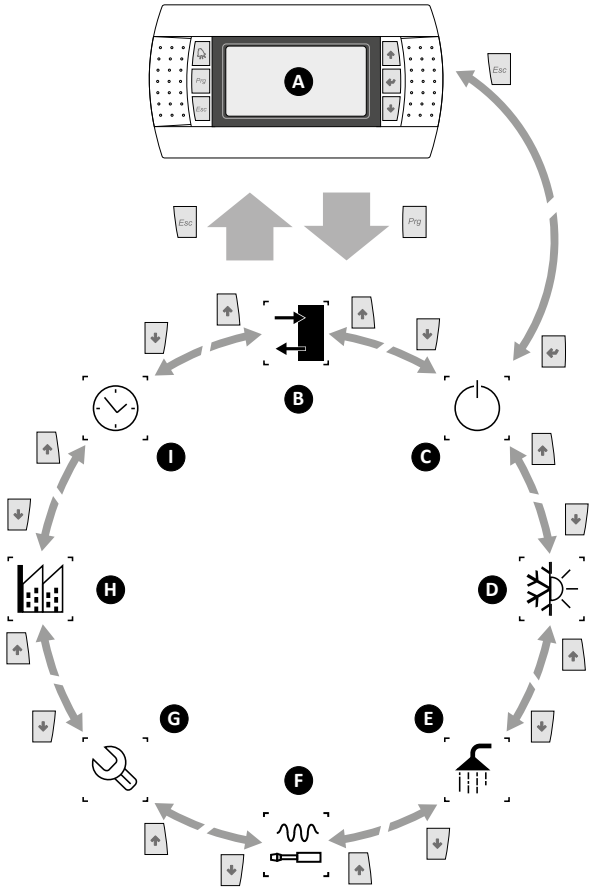
Both the functions to control the unit and the operating information are displayed on the unit mounted control panel. All the functions and information are arranged in screens which in turn are grouped into menus.

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

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

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

The operating menus are arranged as in the following drawing:



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

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

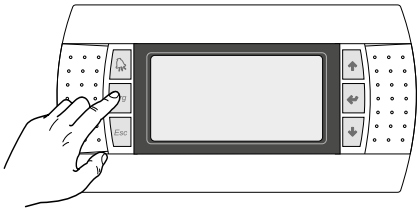
17. USER OPERATING PROCEDURES

To check or modify the operating parameters of the unit it is necessary to use the interface of the control panel on the unit. The basic operations that the user must be capable of, for the correct use of the unit, are:
(1) Moving from one menu to the next.
(2) Selecting and modifying a parameter.

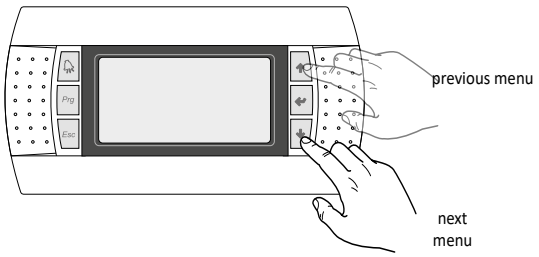
1

Moving between menus

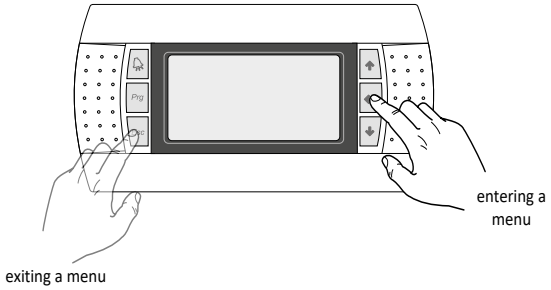
(a) To move between the menus, the order in which they are displayed is shown in the previous page, enter the menu selection mode by pressing the key (Prg).



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



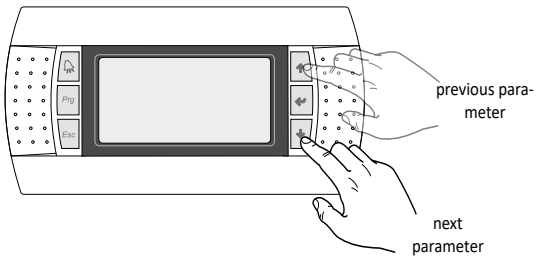
(c) When the desired menu is shown press the key (↵)to enter the menu. Press the key(Esc) to return to the menu selection mode.



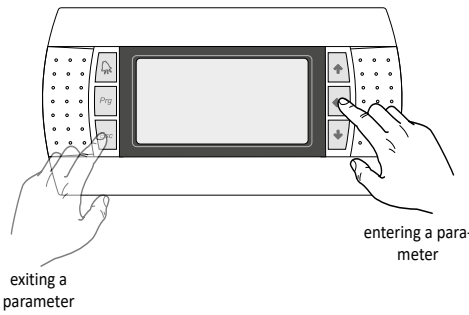
2

Selecting and modifying a menu

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



(c) When the desired parameter is shown press the key (↵) to enter the parameter. To exit the parameter and return to the parameter selection mode press the key (Esc).
WARNING: Once a parameter is selected by pressing the key (↵), the parameter selection mode is automatically accessed and in this mode the desired parameter values can be set with the following procedure:
(1) Pressing the key (↵) causes a flashing cursor to appear on the first modifiable field of the parameter. If no modifiable fields are displayed then the cursor will not appear.
(2) Pressing the key (↑) or the key (↓), the value of the field can be increased or decreased.
(3) Pressing the key (↵) confirms the modification of the field value, saving it in memory. On the basis of the type of parameter selected the number of modifiable fields can change.



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