AERMEC

air conditioning

R410A

CHILLERS / AIR COOLED - Installation Manual

CHILLERS

- EXTERNAL UNITS
- HIGH EFFICIENCY

ANL
290-650

AERMEC
COMPANY QUALITY SYSTEM
ICIM
ISO 9001:2008 - Cert. n° 0128
CISQ IQNet
AERMEC S.P.A.

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

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CE

EN

IANLUY. 1204. 5719210_00

Dear Customer,
Thank you for choosing an AERMEC product. This product is the result of many years of experience and in-depth research, and it is built using top quality material and advanced technologies.
Moreover, 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 obligation to give prior notice.

Thank you again.
AERMEC S.p.A

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

ANL

SERIAL NUMBER	

CE DECLARATION OF CONFORMITY

We, the undersigned, declare under our exclusive responsibility that the assembly defined as:

NAME	ANL
TYPE	CHILLER AIR/WATER
MODEL	

To which this declaration refers and conforms with the following harmonised standards:

IEC EN 60335-2-40	Safety standard regarding electrical heat pumps, air conditioners and dehumidifiers
IEC EN 61000-6-1 **IEC EN 61000-6-3**	Electromagnetic emissions and immunity for residential environments
IEC EN 61000-6-2 **IEC EN 61000-6-4**	Electromagnetic emissions and immunity for industrial environments
EN378	Refrigerating system and heat pumps - Safety and environmental requirements
EN12735	Copper and copper alloys - Seamless round copper tubes for air conditioning and refrigeration
UNI 12735	Seamless round copper tubes for air conditioning and refrigeration
UNI 14276	Pressure equipment for cooling systems and heat pumps

Satisfy the essential requirements of the following directives:

- LVD Directive: 2006/95/CE

- Electromagnetic compatibility directive 2004/108/CE

- Machinery directive 2006/42/CE

- PED directive regarding pressurised devices 97/23/CE

The product, in accordance with directive 97/23/CE, satisfied the Total quality Guarantee (form H) with certificate n.06/270-QT3664 Rev.6 issued by the notified body n.1131 CEC via Pisacane 46 Legnano (MI) - Italy

The person authorised to construct the technical document is: Massimiliano Sfragara - 37040 Bevilacqua (VR) Italy - via Roma,996

Bevilacqua 05/04/2012

Commercial Director
Signature

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Standard applied in the DESIGN and MANUFACTURE of the unit:
SAFETY

1. Machinery directive 2006/42/CE
2. Low voltage directive LVD 2006/95/CE
3. Electromagnetic compatibility directive EMC 2004/108/CE
4. Pressure vessel directive PED 97/23/CE, EN 378,
5. UNI12735, UNI14276

ELECTRICAL

1. IEC EN 60335-2-40,
2. IEC EN 61000-6-1/2/3/4

ACOUSTICAL

1. ISO DIS 9614/2 (intensity method)

PROTECTIVE RATING
IP24

CERTIFICATION

1. **EUROVENT**

REFRIGERANT
This unit contains fluoride gases with greenhouse effect covered by the Kyoto Protocol. Maintenance and disposal must only be carried out by qualified staff, in accordance with local regulations.

1. GENERAL INSTRUCTIONS FOR THE INSTALLER

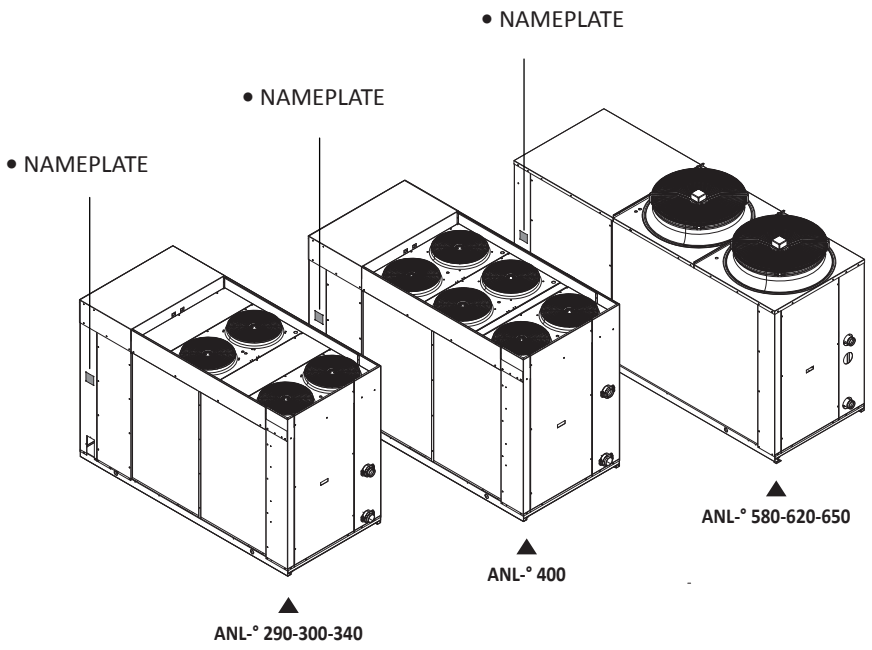
The EXTERNAL air cooled chillers of the ANL series with R410a have been designed and manufactured to meet the cooling needs of small and medium systems in residential or commercial buildings.

1.1. CONSERVATION OF DOCUMENTATION

1. Submit the manual with all supplementary documentation to the system user who will be responsible for the conservation of documents so that they can be available when needed.
2. Read this manual fully: all works must be carried out by qualified personnel, in accordance with any applicable current local regulations.
3. The equipment warranty does not cover any costs associated with lifting or access equipment necessary for warranty procedures.
4. Do not modify or tamper with the equipment as this could result in accidents for which the manufacturer will not be held responsible. The warranty will be voided if the above mentioned warnings are not respected..

1.2. SAFETY INSTRUCTIONS AND INSTALLATION STANDARDS

1. The equipment must be installed by a competent and qualified technician, in compliance with the applicable national legislation of the country of destination. AERMEC assumes no responsibility for any losses incurred by not observing these instructions.
2. Before commencing any works it is necessary to **CAREFULLY READ THE INSTRUCTIONS AND MINIMISE ANY RISKS BY TAKING APPROPRIATE SAFETY PRECAUTIONS**. All relevant personnel must be made aware of the procedures and possible risks that may arise at the time of installation of the unit.



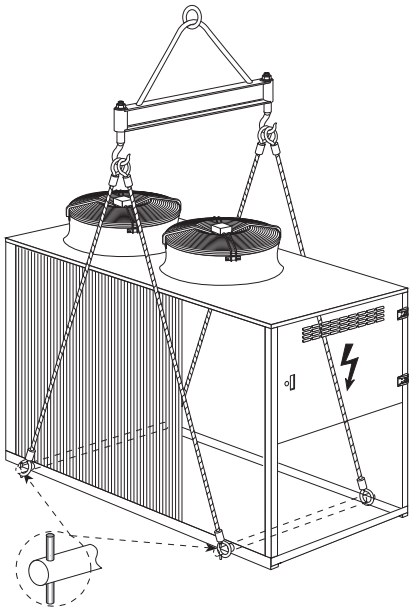
2. LOCATION OF INSTALLATION

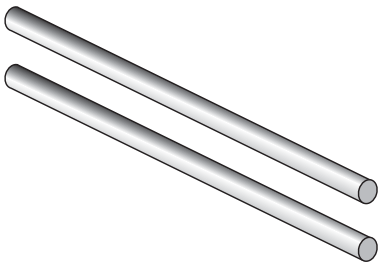
Before proceeding with the installation of the equipment agree the location with the client, taking into account the following points:

1. The base must be able to support the weight of the unit,
2. The safe distances between the unit and other equipment or structures must be strictly respected to ensure the intake and outlet air is free to circulate,
3. The equipment must be installed by a competent and qualified technician, in compliance with the applicable national legislation of the country of destination, respecting the required minimum maintenance access spaces.

3. POSITIONING

- Before lifting the unit verify the lifting capability of the equipment being used, taking into account the information provided with the packaging.
- When lifting insert through the unit's base holes lifting bars (NOT PROVIDED) of sufficient length to locate the lifting chains and safety lugs.
- Position the unit in the place indicated by the client, inserting between the unit's base and the base support a rubber pad (minimum 10 mm thick) or anti-vibration mounts. For further information refer to the dimensional tables.
- Secure the unit and ensure it is level; check that sufficient access is provided for hydraulic and electrical connections.
- In the case of installation where gusts of wind may occur adequately secure the unit using appropriate ties.





ATTENTION:
lifting bars are NOT provided.

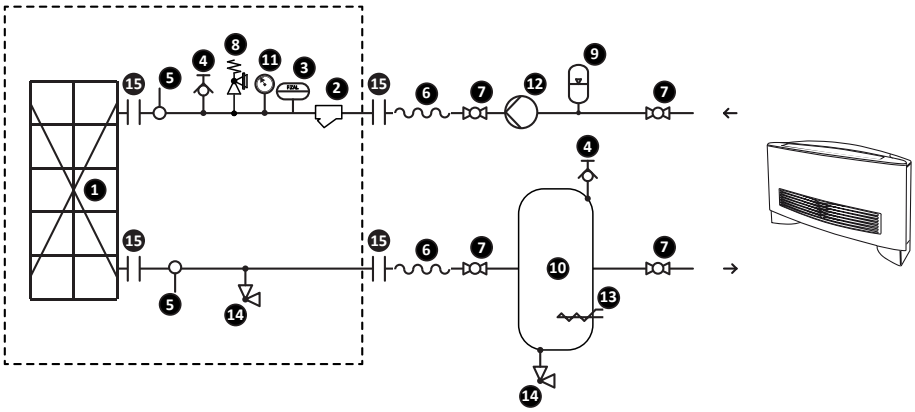
WARNING:
If the unit is installed in particularly windy locations the provision of wind barriers may be necessary to avoid malfunctions.

4. TYPICAL HYDRAULIC CIRCUITS

4.1. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT ANL 00

INTERNAL HYDRAULIC COMPONENTS ANL

RECOMMENDED HYDRAULIC COMPONENTS EXTERNAL TO THE UNIT



	COMPONENTS PROVIDED AS STANDARD
1.	Plate heat exchanger
2.	Water filter
3.	Flow switch
4.	Air vent
5.	Water temperature sensors (IN/OUT)
8.	Safety valve
11.	Gauge
14.	Drain valve

	COMPONENTS NOT PROVIDED AND RESPONSIBILITY OF THE INSTALLER
4.	Air vent
6.	Anti-vibration joints
7.	Isolating valves
9.	Expansion tank
10.	System buffer tank (installation recommended if the total system water content is less than that indicated in the table below)
12.	Pump
13.	Electric heater
14.	Drain valve
15.	Victaulic connections

MINIMUM WATER CONTENT	Unit	290	300	340	400	580	620	650
Number of compressors	n°	2	2	2	2	2	2	2
Recommended minimum water content	l/kW	4	4	4	4	4	4	4

PH	6-8
Electrical conductivity	Less than 200 mV/cm (25°C)
Chloride ions	Less than 50 ppm
Sulphuric acid ions	Less than 50 ppm
Total iron	Less than 0.3 ppm
Alcalinity M	Less than 50 ppm
Total hardness	Less than 50 ppm
Sulphur ions	None
Ammonia ions	None
Silicone ions	Less than 30 ppm

WARNING
The selection and installation of components external to the unit are the responsibility of the installer and must be carried out in accordance with good working practices and applicable standards of the country of destination.

WARNING
The hydraulic piping to the unit must be adequately sized for the required flow rate. The water flow rate through the heat exchanger must always be constant.

WARNING
Carefully clean the system prior to connection to the unit. This cleaning eliminates welding slag, dirt, rust or any other impurities from the piping. These impurities may otherwise be deposited within the unit and cause a malfunction
The connecting piping must be adequately supported so as not to impose any weight onto the unit.

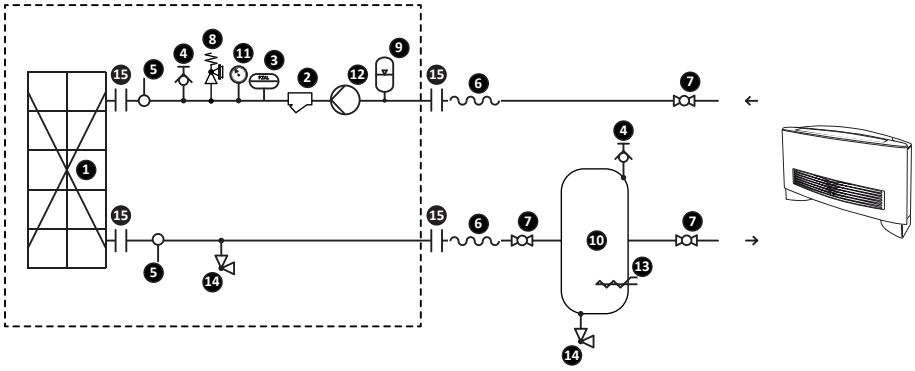
WARNING
SYSTEM DRAINING
During the winter period the water in the heat exchanger may freeze when the system is off, causing irreversible damage to the heat exchanger.
There are three solutions to avoid the risk of freezing:

1. **Complete draining of water** from the unit.
2. **Operating with glycol,** with a percentage of glycol selected in accordance with the minimum anticipated external temperature.
3. **Use of electric heaters.** In such cases the electric heaters must always have power available for the whole period of possible freezing (unit in stand-by).

4.2. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT ANL P1-P3

INTERNAL HYDRAULIC COMPONENTS ANL

RECOMMENDED HYDRAULIC COMPONENTS EXTERNAL TO THE UNIT



	COMPONENTS PROVIDED AS STANDARD
1.	Plate heat exchanger
2.	Water filter
3.	Flow switch
4.	Air vent
5.	Water temperature sensors (IN/OUT)
8.	Safety valve
9.	Expansion tank
11.	Gauge
12.	Pump
14.	Drain valve

	COMPONENTS NOT PROVIDED AND RESPONSIBILITY OF THE INSTALLER
4.	Air vent
6.	Anti-vibration joints
7.	Isolating valves
10.	System buffer tank (installation recommended if the total system water content is less than that indicated in the table below)
13.	Electric heater
14.	Drain valve
15.	Victaulic connections

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Sulphuric acid ions	Less than 50 ppm
Total iron	Less than 0.3 ppm
Alcalinity M	Less than 50 ppm
Total hardness	Less than 50 ppm
Sulphur ions	None
Ammonia ions	None
Silicone ions	Less than 30 ppm

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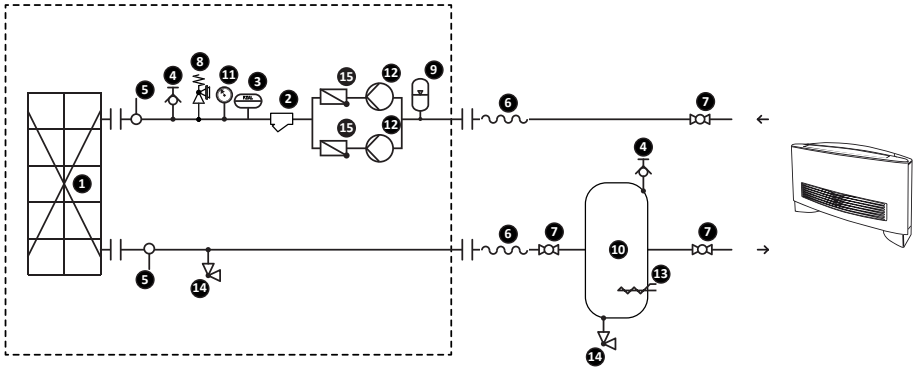
4.3. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT ANL P2-P4

INTERNAL HYDRAULIC COMPONENTS ANL

RECOMMENDED HYDRAULIC COMPONENTS EXTERNAL TO THE UNIT



	COMPONENTS PROVIDED AS STANDARD
1.	Plate heat exchanger
2.	Water filter
3.	Flow switch
4.	Air vent
5.	Water temperature sensors (IN/OUT)
8.	Safety valve
9.	Expansion tank
11.	Gauge
12.	Pump
14.	Drain valve
15.	Non-return valve

	COMPONENTS NOT PROVIDED AND RESPONSIBILITY OF THE INSTALLER
4.	Air vent
6.	Anti-vibration joints
7.	Isolating valves
10.	System buffer tank (installation recommended if the total system water content is less than that indicated in the table below)
13.	Electric heater
14.	Drain valve
15.	Victaulic connections

MINIMUM WATER CONTENT	Unit	290	300	340	400	580	620	650
Number of compressors	n°	2	2	2	2	2	2	2
Recommended minimum water content	l/kW	4	4	4	4	4	4	4

PH	6-8
Electrical conductivity	Less than 200 mV/cm (25°C)
Chloride ions	Less than 50 ppm
Sulphuric acid ions	Less than 50 ppm
Total iron	Less than 0.3 ppm
Alcalinity M	Less than 50 ppm
Total hardness	Less than 50 ppm
Sulphur ions	None
Ammonia ions	None
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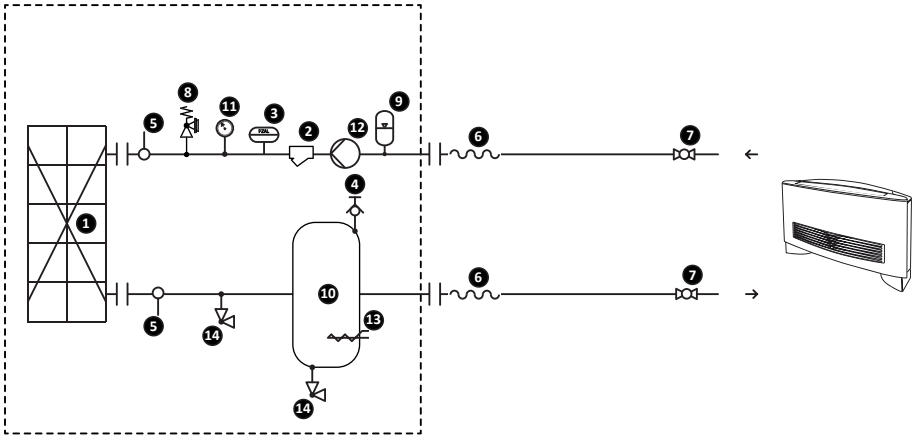
4.4. INTERNAL AND EXTERNAL HYDRAULIC CIRCUITS ANL 01-03

INTERNAL HYDRAULIC COMPONENTS ANL

RECOMMENDED HYDRAULIC COMPONENTS EXTERNAL TO THE UNIT



	COMPONENTS PROVIDED AS STANDARD
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2.	Water filter
3.	Flow switch
4.	Air vent
5.	Water temperature sensors (IN/OUT)
8.	Safety valve
9.	Expansion tank
10.	System buffer tank
11.	Gauge
12.	Pump
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14.	Drain valve

	COMPONENTS NOT PROVIDED AND RESPONSIBILITY OF THE INSTALLER
6.	Anti-vibration joints
7.	Isolating valves

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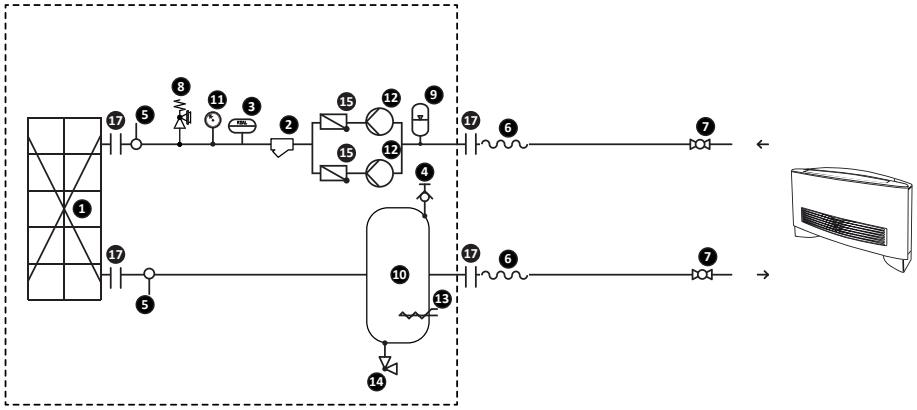
4.5. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT ANL 02-04

INTERNAL HYDRAULIC COMPONENTS ANL

RECOMMENDED HYDRAULIC COMPONENTS EXTERNAL TO THE UNIT



	COMPONENTS PROVIDED AS STANDARD
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5.	Water temperature sensors (IN/OUT)
8.	Safety valve
9.	Expansion tank
10.	System buffer tank
11.	Gauge
12.	Pump
13.	Electric heater
14.	Drain valve
15.	Non-return valve

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AWARNING
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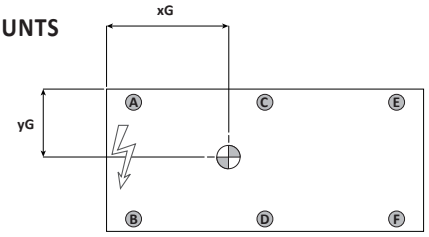
5. POSITIONS OF CENTRE OF GRAVITY AND ANTI-VIBRATION MOUNTS

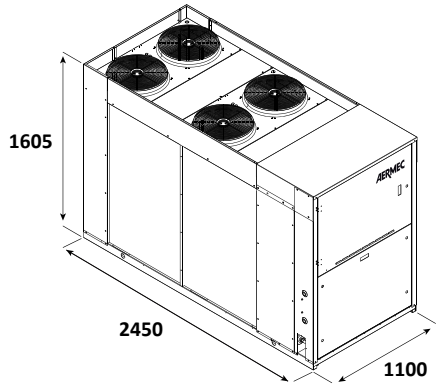
5.1. POSITION OF ANTI-VIBRATION MOUNTS



SELECTION				TRANSPORT			FUNZIONAMENTO																		
SIGLA	SIZE	MODEL	IDR	WEIGHT EMPTY	Xg (empty)	Yg (empty)	WATER	Weight (oper)	Xg (oper)	Yg (oper)	A (%)	A (kg)	B (%)	B (kg)	C (%)	C (kg)	D (%)	D (kg)	E (%)	E (kg)	F (%)	F (kg)	VT	DES	WATER
ANL	290	°	00	671	968	542	18	646	980	551	30,0%	194,1	29,9%	193,3	-	-	-	-	20,0%	129,5	20,0%	129,0		12,0	0,6
ANL	290	°	01	856	1140	528	339	1151	1307	520	22,0%	253,8	24,6%	283,2	-	-	-	-	25,2%	290,4	28,1%	324,0		12,0	0,6
ANL	290	°	02	879	1156	527	345	1180	1318	519	21,8%	257,4	24,4%	288,2	-	-	-	-	25,4%	299,5	28,4%	335,4		12,0	0,6
ANL	290	°	03	860	1143	528	339	1155	1309	520	22,0%	254,3	24,6%	283,9	-	-	-	-	25,2%	291,6	28,2%	325,6		12,0	0,6
ANL	290	°	04	887	1161	526	345	1188	1320	519	21,7%	258,4	24,4%	289,6	-	-	-	-	25,4%	302,0	28,5%	338,5		12,0	0,6
ANL	290	°	P1	736	1039	536	39	731	1068	543	27,8%	203,6	28,6%	209,1	-	-	-	-	21,5%	157,2	22,1%	161,4		12,0	0,6
ANL	290	°	P2	759	1061	534	45	760	1093	540	27,2%	207,0	28,2%	214,3	-	-	-	-	21,9%	166,6	22,7%	172,5		12,0	0,6
ANL	290	°	P3	740	1043	536	39	735	1071	542	27,8%	204,1	28,5%	209,8	-	-	-	-	21,6%	158,5	22,2%	163,0		12,0	0,6
ANL	290	°	P4	767	1068	534	42	765	1097	540	27,1%	207,5	28,1%	215,2	-	-	-	-	22,0%	168,2	22,8%	174,4		12,0	0,6
ANL	300	°	00	679	974	542	18	654	986	551	29,9%	195,8	29,8%	195,0	-	-	-	-	20,2%	131,8	20,1%	131,3		12,0	0,6
ANL	300	°	01	864	1142	528	339	1159	1308	520	22,0%	255,5	24,6%	284,9	-	-	-	-	25,2%	292,6	28,1%	326,3		12,0	0,6
ANL	300	°	02	887	1158	527	345	1188	1318	519	21,8%	259,1	24,4%	289,9	-	-	-	-	25,4%	301,7	28,4%	337,7		12,0	0,6
ANL	300	°	03	868	1145	528	339	1163	1309	520	22,0%	256,0	24,5%	285,6	-	-	-	-	25,3%	293,9	28,2%	327,9		12,0	0,6
ANL	300	°	04	895	1164	526	345	1196	1321	519	21,7%	260,1	24,3%	291,3	-	-	-	-	25,4%	304,2	28,5%	340,8		12,0	0,6
ANL	300	°	P1	744	1043	536	39	739	1071	543	27,8%	205,4	28,5%	210,8	-	-	-	-	21,6%	159,5	22,1%	163,7		12,0	0,6
ANL	300	°	P2	767	1064	535	45	768	1096	540	27,2%	208,7	28,1%	216,0	-	-	-	-	22,0%	168,9	22,8%	174,8		12,0	0,6
ANL	300	°	P3	748	1047	536	39	743	1075	543	27,7%	205,8	28,5%	211,5	-	-	-	-	21,6%	160,8	22,2%	165,3		12,0	0,6
ANL	300	°	P4	775	1072	534	45	776	1102	540	27,0%	209,6	28,0%	217,5	-	-	-	-	22,1%	171,4	22,9%	177,9		12,0	0,6
ANL	340	°	00	691	960	539	18	666	973	548	30,0%	200,0	30,3%	201,5	-	-	-	-	19,8%	131,7	19,9%	132,6		12,0	0,6
ANL	340	°	01	876	1130	526	339	1171	1297	519	22,2%	259,9	24,9%	291,3	-	-	-	-	25,0%	292,4	28,0%	327,8		12,0	0,6
ANL	340	°	02	899	1146	525	345	1200	1308	518	21,9%	263,4	24,7%	296,3	-	-	-	-	25,1%	301,5	28,3%	339,1		12,0	0,6
ANL	340	°	03	880	1133	526	339	1175	1299	519	22,2%	260,4	24,8%	292,0	-	-	-	-	25,0%	293,7	28,0%	329,4		12,0	0,6
ANL	340	°	04	907	1151	524	345	1208	1310	517	21,9%	264,4	24,6%	297,7	-	-	-	-	25,2%	304,0	28,3%	342,3		12,0	0,6
ANL	340	°	P1	756	1030	534	39	751	1058	540	27,9%	209,7	28,9%	217,2	-	-	-	-	21,2%	159,4	22,0%	165,1		12,0	0,6
ANL	340	°	P2	779	1051	532	45	780	1083	538	27,3%	213,0	28,5%	222,5	-	-	-	-	21,6%	168,7	22,6%	176,2		12,0	0,6
ANL	340	°	P3	760	1033	533	39	755	1062	540	27,8%	210,1	28,9%	217,9	-	-	-	-	21,3%	160,7	22,1%	166,7		12,0	0,6
ANL	340	°	P4	787	1059	532	45	788	1089	537	27,1%	213,9	28,4%	223,9	-	-	-	-	21,7%	171,3	22,7%	179,3		12,0	0,6
ANL	400	°	00	709	961	543	19	685	972	552	30,3%	207,7	30,0%	205,8	-	-	-	-	19,9%	136,6	19,7%	135,3		12,0	0,6
ANL	400	°	01	894	1126	530	340	1191	1292	522	22,4%	267,1	24,9%	296,0	-	-	-	-	25,0%	297,8	27,7%	330,1		12,0	0,6
ANL	400	°	02	917	1142	528	346	1220	1302	521	22,2%	270,6	24,7%	301,0	-	-	-	-	25,2%	306,9	28,0%	341,4		12,0	0,6
ANL	400	°	03	898	1129	529	340	1195	1293	522	22,4%	267,6	24,8%	296,7	-	-	-	-	25,0%	299,0	27,8%	331,6		12,0	0,6
ANL	400	°	04	925	1147	528	346	1228	1305	520	22,1%	271,6	24,6%	302,4	-	-	-	-	25,2%	309,4	28,1%	344,5		12,0	0,6
ANL	400	°	P1	774	1028	538	40	771	1055	544	28,2%	217,2	28,7%	221,6	-	-	-	-	21,3%	164,4	21,8%	167,7		12,0	0,6
ANL	400	°	P2	797	1049	536	46	800	1080	542	27,6%	220,5	28,4%	226,9	-	-	-	-	21,7%	173,7	22,4%	178,8		12,0	0,6
ANL	400	°	P3	778	1032	537	40	775	1059	544	28,1%	217,6	28,7%	222,3	-	-	-	-	21,4%	165,7	21,8%	169,3		12,0	0,6
ANL	400	°	P4	805	1056	535	46	808	1086	542	27,4%	221,4	28,3%	228,3	-	-	-	-	21,8%	176,3	22,5%	181,8		12,0	0,6
ANL	580	°	00	905	1354	508	22	876	1372	517	21,8%	191,5	24,9%	218,3	18,1%	158,3	20,6%	180,5	6,8%	59,8	7,8%	68,1		13,0	1,0
ANL	580	°	01	1110	1551	503	465	1524	1798	502	13,1%	199,6	14,1%	215,2	23,2%	353,7	25,0%	381,4	11,8%	180,0	12,7%	194,1		13,0	1,0
ANL	580	°	02	1138	1572	502	472	1559	1811	501	12,8%	199,7	13,8%	215,0	23,4%	364,4	25,2%	392,3	12,0%	186,6	12,9%	200,9		13,0	1,0
ANL	580	°	03	1110	1551	503	465	1524	1798	502	13,1%	199,6	14,1%	215,2	23,2%	353,7	25,0%	381,4	11,8%	180,0	12,7%	194,1		13,0	1,0
ANL	580	°	04	1138	1572	502	472	1559	1811	501	12,8%	199,7	13,8%	215,0	23,4%	364,4	25,2%	392,3	12,0%	186,6	12,9%	200,9		13,0	1,0
ANL	580	°	P1	978	1434	506	45	972	1470	514	19,5%	189,7	22,0%	213,4	18,4%	178,5	20,7%	200,7	9,2%	89,2	10,3%	100,3		13,0	1,0
ANL	580	°	P2	1006	1461	505	52	1007	1502	513	18,9%	190,0	21,1%	212,9	18,4%	185,7	20,7%	208,2	9,8%	99,1	11,0%	111,0		13,0	1,0
ANL	580	°	P3	978	1434	506	45	972	1470	514	19,5%	189,7	22,0%	213,4	18,4%	178,5	20,7%	200,7	9,2%	89,2	10,3%	100,3		13,0	1,0
ANL	580	°	P4	1006	1461	505	52	1007	1502	513	18,9%	190,0	21,1%	212,9	18,4%	185,7	20,7%	208,2	9,8%	99,1	11,0%	111,0		13,0	1,0
ANL	620	°	00	976	1329	505	24	949	1346	514	23,3%	220,7	25,3%	239,8	18,3%	173,7	19,9%	188,7	6,4%	60,4	6,9%	65,7		13,0	1,0
ANL	620	°	01	1181	1518	501	467	1597	1763	500	22,9%	365,2	26,0%	414,3	17,9%	285,0	20,3%	323,3	6,1%	97,7	6,9%	110,9		13,0	1,0
ANL	620	°	02	1209	1539	500	474	1632	1776	500	13,2%	214,9	14,2%	231,6	25,7%	419,1	27,7%	451,8	9,3%	151,1	10,0%	162,9		13,0	1,0
ANL	620	°	03	1181	1518	501	467	1597	1763	500	12,8%	205,1	13,8%	220,7	26,0%	414,3	27,9%	445,9	9,4%	149,5	10,1%	160,9		13,0	1,0
ANL	620	°	04	1209	1539	500	474	1632	1776	500	13,2%	214,9	14,2%	231,6	25,7%	419,1	27,7%	451,8	9,3%	151,1	10,0%	162,9		13,0	1,0
ANL	620	°	P1	1049	1405	504	47	1045	1440	511	12,8%	134,2	13,8%	144,4	26,0%	271,1	27,9%	291,7	9,4%	97,8	10,1%	105,3		13,0	1,0
ANL	620	°	P2	1077	1431	503	54	1080	1470	510	20,6%	222,0	23,1%	248,8	19,5%	210,4	21,8%	235,8	7,1%	76,6	8,0%	85,9		13,0	1,0
ANL	620	°	P3	1049	1405	504	47	1045	1440	511	19,9%	208,0	22,2%	232,3	19,9%	208,4	22,3%	232,8	7,4%	77,0	8,2%	86,0		13,0	1,0
ANL	620	°	P4	1077	1431	503	54	1080	1470	510	20,6%	222,0	23,1%	248,8	19,5%	210,4	21,8%	235,8	7,1%	76,6	8,0%	85,9		13,0	1,0
ANL	650	°	00	1021	1282	496	24	994	1299	505	23,4%	232,2	27,4%	272,3	17,0%	168,6	19,9%	197,7	5,7%	56,7	6,7%	66,4		13,0	1,0
ANL	650	°	01	1226	1472	493	467	1642	1724	495	14,6%	240,3	16,1%	264,4	22,2%	364,3	24,4%	400,8	10,8%	177,0	11,9%	194,7		13,0	1,0
ANL	650	°	02	1254	1493	493	474	1677	1737	495	14,5%	242,7	15,9%	266,8	22,3%	373,7	24,5%	410,6	10,9%	182,3	12,0%	200,4		13,0	1,0
ANL	650	°	03	1226	1472	493	467	1642	1724	495	14,6%	240,3	16,1%	264,4	22,2%	364,3	24,4%	400,8	10,8%	177,0	11,9%	194,7		13,0	1,0
ANL	650	°	04	1254	1493	493	474	1677	1737	495	14,5%	242,7	15,9%	266,8	22,3%	373,7	24,5%	410,6	10,9%	182,3	12,0%	200,4		13,0	1,0
ANL	650	°	P1	1094	1358	495	47	1090	1393	503	21,2%	230,9	24,5%	266,8	17,3%	188,8	20,0%	218,1	7,9%	85,8	9,1%	99,1		13,0	1,0
ANL	650	°	P2	1122	1384	495	54	1125	1424	502	20,6%	231,3	23,7%	266,3	17,4%	196,0	20,1%	225,5	8,5%	95,5	9,8%	109,9		13,0	1,0
ANL	650	°	P3	1094	1358	495	47	1090	1393	503	21,2%	230,9	24,5%	266,8	17,3%	188,8	20,0%	218,1	7,9%	85,8	9,1%	99,1		13,0	1,0
ANL	650	°	P4	1122	1384	495	54	1125	1424	502	20,6%	231,3	23,7%	266,3	17,4%	196,0	20,1%	225,5	8,5%	95,5	9,8%	109,9		13,0	1,0

6. DIMENSIONS (mm) / POSITION OF HYDRAULIC CONNECTIONS

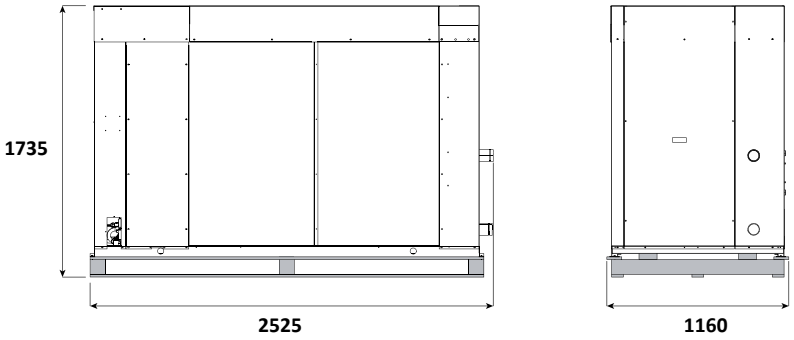
6.1. DIMENSIONS ANL [°] 290-300-340 (mm)



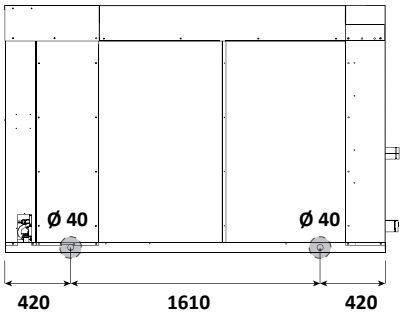
WARNING
The unit is supplied mounted on a pallet. To lift with a forklift or chains utilise **lifting bars (NOT PROVIDED)**.

WARNING
The units cannot be stacked.

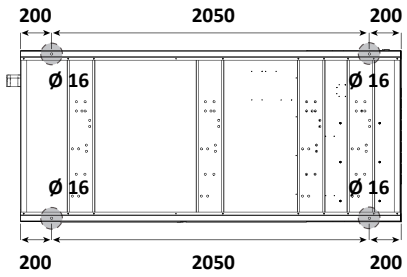
6.1.1. MAXIMUM OVERALL (mm)



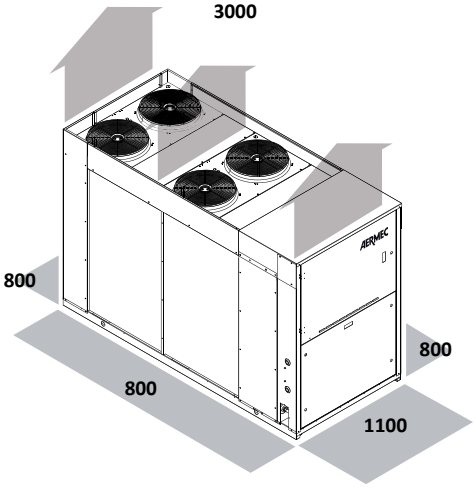
6.1.2. LIFTING POINTS (mm)



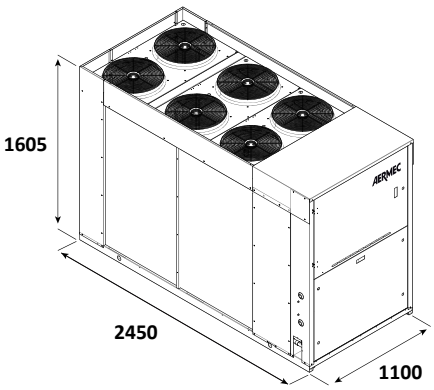
6.1.3. POSITION ANTI-VIBRATION MOUNTS (mm)



6.1.4. MINIMUM CLEARANCE SPACE (mm)



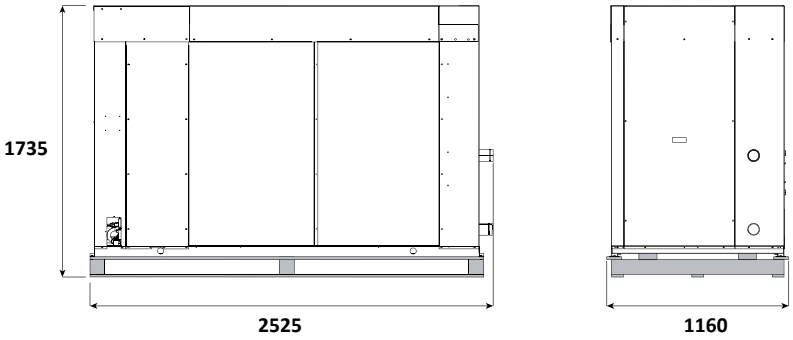
6.2. DIMENSIONS ANL [°] 400 (mm)



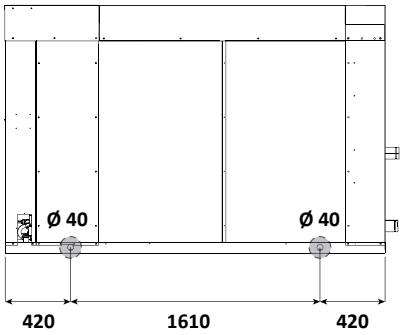
WARNING
The unit is supplied mounted on a pallet. To lift with a forklift or chains utilise **lifting bars (NOT PROVIDED)**.

WARNING
The units cannot be stacked.

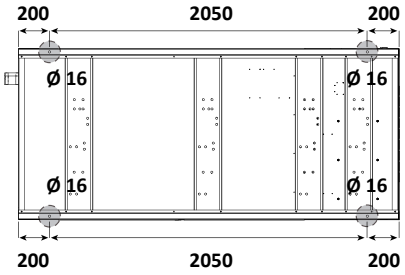
6.2.1. MAXIMUM OVERALL (mm)



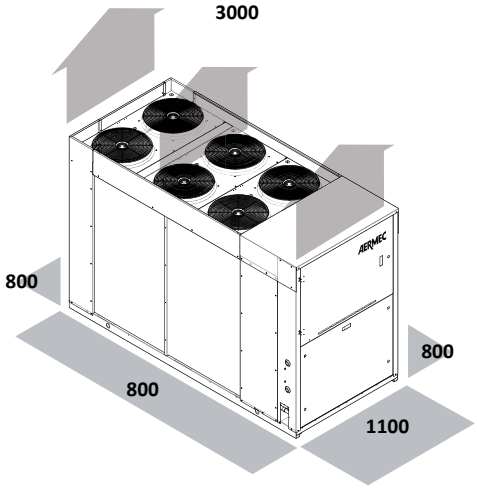
6.2.2. LIFTING POINTS (mm)



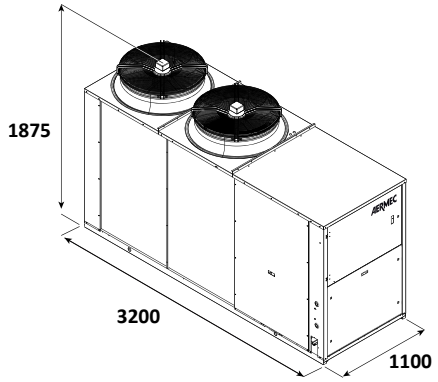
6.2.3. POSITION ANTI-VIBRATION MOUNTS (mm)



6.2.4. MINIMUM CLEARANCE SPACE (mm)



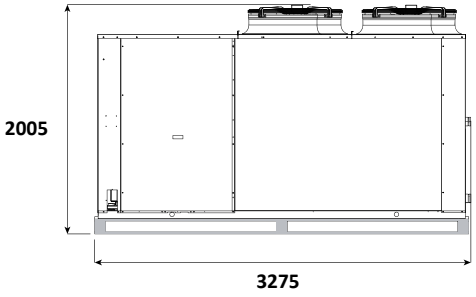
6.3. DIMENSIONS ANL [°] 580-620-650 (mm)

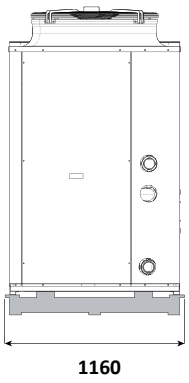


WARNING
The unit is supplied mounted on a pallet. To lift with a forklift or chains utilise **lifting bars (NOT PROVIDED)**.

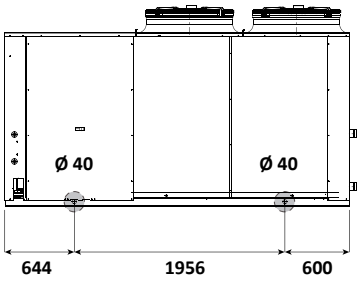
WARNING
The units cannot be stacked.

6.3.1. MAXIMUM OVERALL (mm)

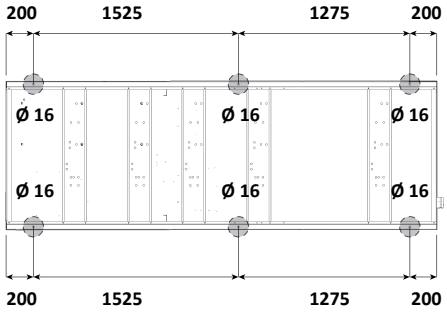




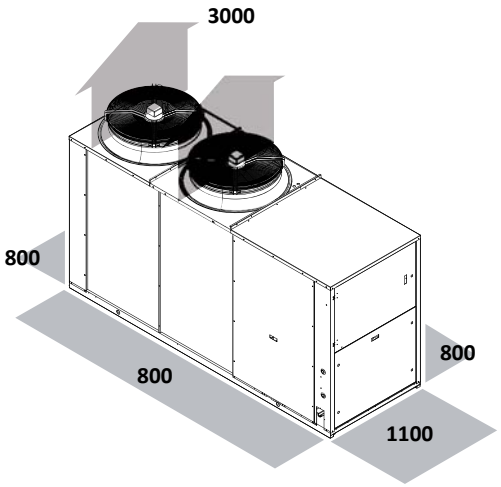
6.3.2. LIFTING POINTS (mm)



6.3.3. POSITION ANTI-VIBRATION MOUNTS (mm)



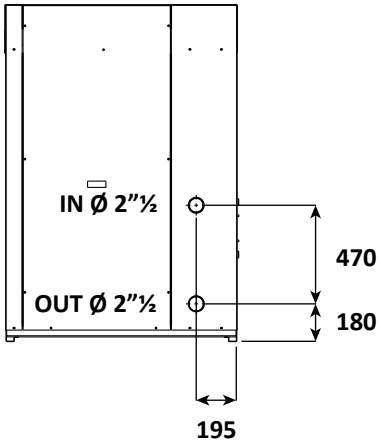
6.3.4. MINIMUM CLEARANCE SPACE (mm)



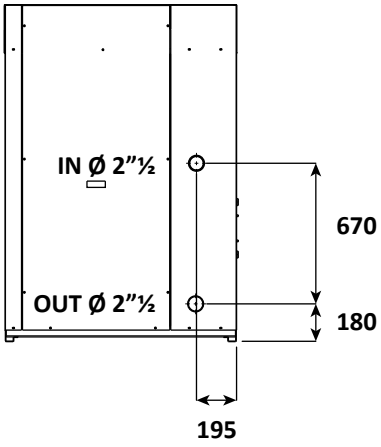
6.4. POSITION OF HYDRAULIC CONNECTIONS (mm)

6.4.1. ANL [°] 290-300-340-400 (mm)

ANL [°] 290-300-340-400
VERSION 00

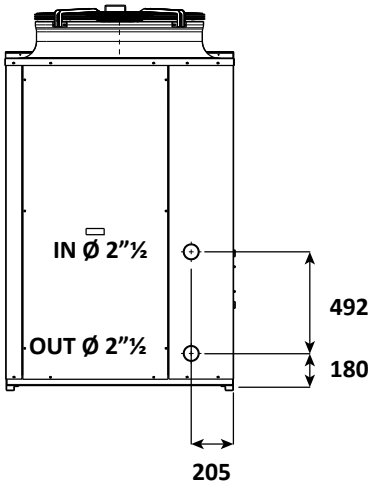


ANL [°] 290-300-340-400
VERSION 01-02-03-04 / P1-P2-P3-P4

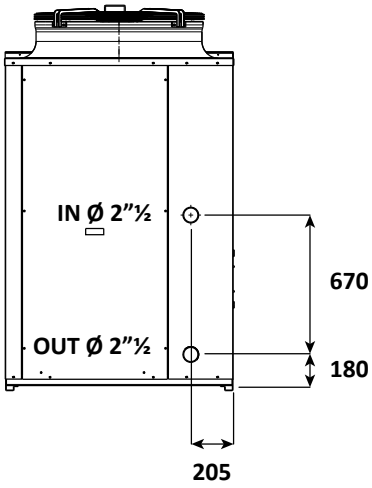


6.4.2. ANL [°] 580-620-650 (mm)

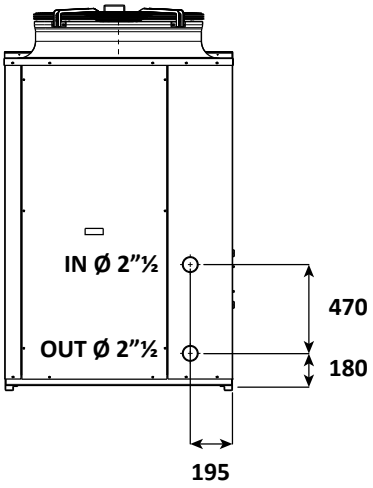
ANL [°] 620-650
VERSION 00



ANL [°] 580-620-650
VERSION 01-02-03-04 / P1-P2-P3-P4

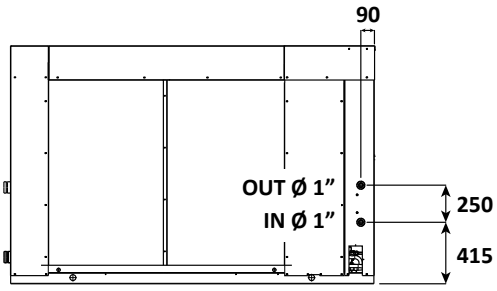


ANL [°] 580
VERSION 00

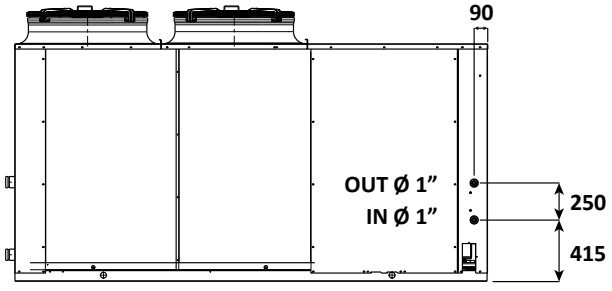


6.4.3. ANL [D] 290-300-340-400-580-620-650 (mm)

ANL [D] 280-300-340-400



ANL [D] 580-620-650



7. ELECTRICAL CONNECTIONS

The ANL units are fully factory wired and only require connection to the power supply network, downstream of an isolator, in accordance with the applicable wiring standards of the country of installation.
It is recommended to check the following items:

1. The electrical network is capable of meeting the electrical input data shown in the table below.
2. The unit is only powered up on completion of any hydraulic and electrical works.
3. Comply with the indicated phasing and earth requirements.
4. The power supply cable must have the appropriate protection against short circuits, residual current and earth leakage with suitable isolation.
5. The tolerance on the power supply voltage is ±10% of the nominal voltage rating of the unit (for three phase units a maximum imbalance of 3% between phases is permitted). If these values are not met please contact the power supply company.
6. For the electrical connections use double insulated cables in accordance with any applicable wiring standards.

MANDATORY REQUIREMENTS

1. A magneto-thermal circuit breaker conforming to IEC-EN standards (contact aperture minimum 3 mm) is required, with adequate protection in accordance with the data provided in the following table, to be installed as close as possible to the unit.
2. An effective earth connection is required. The manufacturer cannot be held responsible for any damages caused by lack of, or inadequate, earthing of the unit.
3. For three phase units check the correct cable phasing.

The cable cross sections shown in the following cable are the recommended values based on a maximum 50 m cable length.
For longer cable lengths or different types of cable installations, the designer is responsible for correctly sizing the isolator, circuit breaker, earthing protection and cable sizes, based on:

- Length
- Type of cable
- Electrical input of the unit, distance and operating ambients.

7.1. ELECTRICAL POWER SUPPLY CONNECTIONS

1. Before making the electrical connections ensure that the isolator is open.
2. Open the front control panel.
3. Use the holes provided in the lower part of the cabinet for the electrical power supply and for other external wiring connections.
4. Enter cables into the control panel only through the apertures provided.
5. Avoid direct contact with un-insulated copper tubes and compressors.
6. Identify the terminals for electrical connection with reference to the wiring diagram provided loose with the unit.
7. Take the power cable into the control panel and connect to terminals U-N and PE with respect

All electrical works must be carried out by PERSONNEL WITH THE APPROPRIATE LEGAL QUALIFICATIONS, trained and aware of the risks relating to such works.

The design of the cabling and related components must be carried out by PERSONNEL WITH APPROPRIATE QUALIFICATIONS TO DESIGN ELECTRICAL INSTALLATIONS, following international and national standards of the location the unit is installed in accordance with current legal requirements.

For installation details refer to the electrical wiring schematics supplied with the unit. The electrical wiring schematic together with the manuals must be conserved with care and MADE AVAILABLE FOR FUTURE REFERENCE.

The weatherproof seals of the equipment must be checked before making electrical connections and the unit most only be powered on completion of all electrical and hydraulic works.

WARNING:
Using the water piping to earth the unit is not permitted.

WARNING:
Verify that all terminals are tight on power carrying conductors before first start-up and 30 days after putting into service. Afterwards check twice yearly.
Loose terminals can result in overheating of cables and components.

400V/3N/50Hz

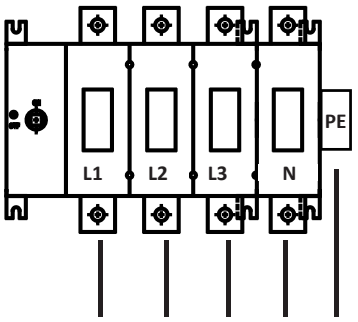
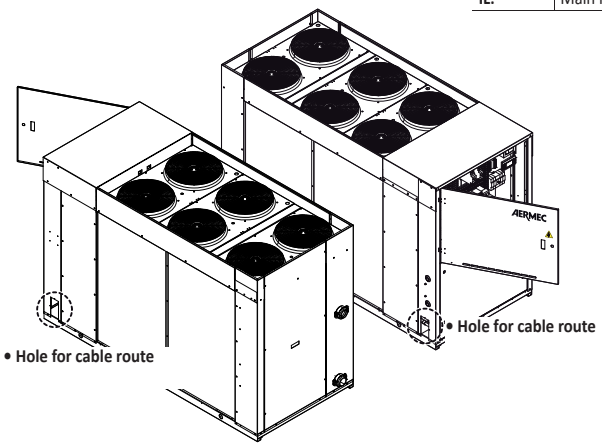


TABLE OF ELECTRICAL DATA

SIZE ANL°	Power supply	Compressors [n°]	Fans [n°]	TOTAL INPUT			RECOMMENDED CABLE CROSS SECTION for 50 m max length						
				L.R.A.	L.R.A. (Soft Start)	F.L.A. (Without pumps)	SEZ. A				SEZ. B	EARTH (PE)	IL
				[A]	[A]	[A]	phases [n°]	cables for each phase [n°]	cable cross section [mm²]	total cables [n°]	[mm²]	[mm²]	[A]
290	400V/3N/50Hz	2	4	130	99	47,1	3+N	1	10	5	1	10	63
300	400V/3N/50Hz	2	4	131	101	50,3	3+N	1	10	5	1	10	63
340	400V/3N/50Hz	2	4	162	123	56,0	3+N	1	16	5	1	16	80
400	400V/3N/50Hz	2	6	183	140	65,9	3+N	1	16	5	1	16	100
580	400V/3N/50Hz	2	2	262	198	84,8	3+N	1	25	5	1	16	125
620	400V/3N/50Hz	2	2	308	230	99,1	3+N	1	35	5	1	16	125
650	400V/3N/50Hz	2	2	320	242	111,7	3+N	1	35	5	1	16	160

LEGEND:

F.L.A.:	Maximum current input
L.R.A.:	Starting current
Sez A:	Power supply connection
3+N:	3 phase + neutral
Sez B:	Control + safeties connection
EARTH:	Earth connection to the unit
IL:	Main isolator



to (U) phase, (N) neutral, (PE) earth in the case of single phase units (230V/50Hz),
8. U-V-W for phases, N for neutral and PE for earth in the case of three phase units (400V/3N/50Hz).
9. Replace the inspection panels.
10. Ensure that all protection removed for the electrical connection are replaced before powering the unit.
11. Place the main isolator (external to the unit) to "ON".

8. CHECKS AND FIRST START-UP

8.1. PREPARING FOR FIRST START-UP

It is reminded that for units of this series, if requested by the Aermec client or the legal owner and only on ITALIAN territory, free start-up is provided by the regional Aermec technical service assistance. The start-up must be previously agreed based on the intended time of completion of installation. Before the start-up all the works (electrical and hydraulic connections, filling and venting of air in the system) must be completed.

8.2. START-UP

8.2.1. PRELIMINARY CHECKS BEFORE POWERING UP

Check:
1. All safety precautions have been followed.
2. The unit has been appropriately fixed to the support base.
3. Minimum clearance spaces have been observed.
4. Power supply cables are correctly sized and capable of supporting the electrical requirements of the unit (see section on electrical data) and that the unit is correctly earthed.
5. All electrical connections are correctly terminated and tightened.

8.2.2. CHECKS TO BE DONE WHEN POWERED UP

1. Apply power to the unit by turning the main isolator to the ON position. The display will power up after several seconds after applying power, check that the operating status is on OFF (OFF BY KEYB on the lower part of the display).
2. Check with a tester that the power supply voltages on the phases U-V-W are 400V ±10%, check that the phase imbalance is not greater than 3%.
3. Check that the connections made by the installer comply with the documentation.
4. Check that the compressor crank case heater(s) are operating by measuring the increase of oil sump temperature. The heater(s) must be in operation for at least 24 hours before starting the compressor, and in all cases the sump oil temperature must be 10-15 K above ambient temperature.

HYDRAULIC CIRCUIT

1. Check that all hydraulic connections have been correctly installed, that the instructions on the labels have been followed, and that a mechanical filter has been installed on the inlet to the evaporator. (Mandatory component otherwise the warranty will be voided).
2. Confirm that the pump(s) are operating and that the flow rate is sufficient to make the contact on the flow switch.
3. Check the water flow rate by measuring the differential pressure across the evaporator inlet and outlet and calculating the flow from the evaporator pressure drop diagram provided in the documentation.
4. Check the correct functioning of any flow switch installed; close the isolating valve on the evaporator outlet and observe the result on the unit display panel; open the valve and reset the flow trip alarm.

8.3. FIRST START-UP

After having rigorously followed the above checks it is possible to start the unit:
1. Close the electrical panel.
2. Turn the main isolator to ON.
3. Press the key ON ⏻ for 3 seconds to start the unit.
   Pressing the key ON ⏻ displays the water temperature and the operating mode of the unit. Check the operating setpoint parameters and reset any alarms present . After a few minutes the unit will start.

8.3.1. CHECKS WITH THE UNIT RUNNING

REFRIGERANT CIRCUIT

Check:
- That the compressor input current of the compressors is less than that indicated in the table of electrical data.
- That in three phase models the compressor noise is not abnormal, indicating a reverse rotation. In this case reverse one of the phases.
- That the voltage values are within the determined limits and that the phase imbalance (three phase power) is less than 3%.
- Presence of any refrigerant leaks, in particular from connections to gauges, pressure transducers and pressostats. (Vibrations during transportation may have loosened connections).
- Superheat
  Compare the compressor suction temperature with a contact temperature sensor reading with the temperature of the low pressure gauge (saturated suction temperature corresponding to the evaporating pressure). The difference between these two temperatures is the superheat value. The optimal values are between 4 and 8 K.
- Discharge temperature
  If the values of sub-cooling and superheat are normal the temperature measured in the discharge line from the compressor must be 30/40 K above the condensing temperature.

SAFETY AND CONTROL DEVICES

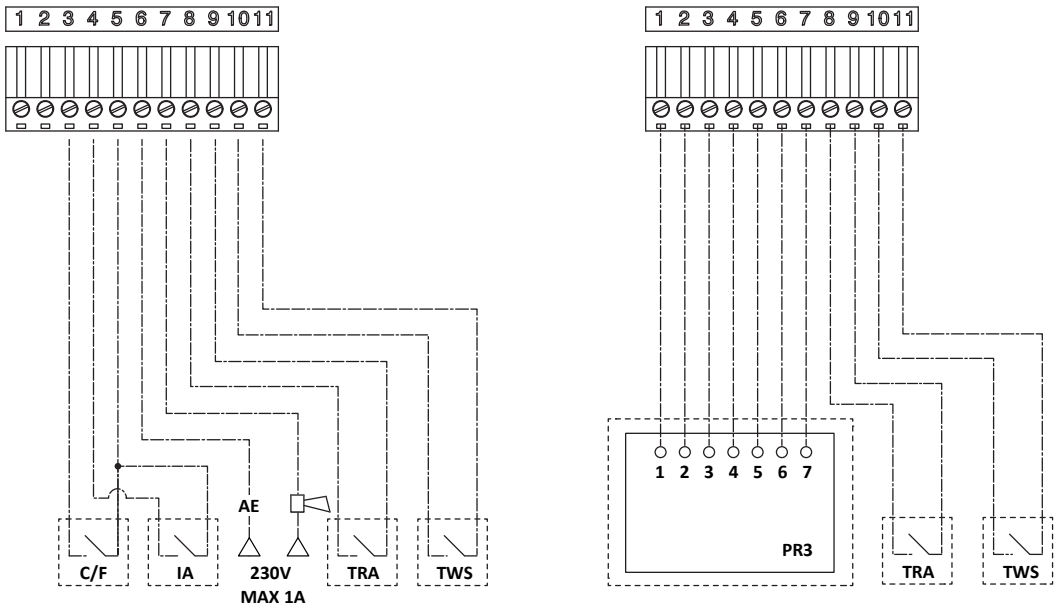
Check:
- The manual high pressure pressostat, which stops the compressor and generates and alarm when the discharge pressure exceeds the preset value. The correct operation is checked by closing the refrigerant isolating valve to the heat exchanger (in cooling mode) and keeping a check on the high pressure gauge, verify the operation corresponds to the rated value. Warning: in the event the pressostat does not operate at the rated value immediately stop the compressor and investigate the cause. Reset is manual but can only be done when the pressure drops below the differential setting. (For the values of the trip and differential setting refer to the technical manual).

- Anti-freeze protection
  The electronic control of the anti-freeze protection is from the water temperature sensor leaving the evaporator prevents freezing of water when the temperature is too low. The operation of the anti-freeze protection can be checked by increasing the setpoint value until it is above the temperature of leaving water and checking the water temperature with a high precision sensor. Confirm that the unit stops and generates the responding alarm. After this check reset the anti-freeze setpoint to the original value.

(fig.1)

WARNING
The first start-up must be made with standard settings; only after commissioning vary the operating setpoints.
Before commencing with the start-up power up the unit for at least 12 hours placing the circuit breaker and the door interlocked isolator in the ON position. Ensure that the control panel is off.

8.4. AUXILIARY CONNECTIONS BY THE INSTALLER



LEGEND:	
C/F	Heat (C) / Cool (F) control
IA	Auxiliary switch
AE	External alarm
TRA	Ambient thermostat
TWS	Domestic hot water thermostat
PR3	Remote control panel (Accessory)

WARNING
For the installation refer to the electrical wiring schematics provide with the unit. The electrical wiring schematic and manuals must be carefully conserved and made AVAILABLE FOR FUTURE REFERENCE.

9. OPERATING CHARACTERISTICS

9.1. COOLING SETPOINT

(Factory set) = 7°C, Δt = 5 K.

9.2. COMPRESSOR DELAY TIMERS

To avoid excessive compressor starts two functions are provided.

- Minimum time compressor is OFF 180 seconds.
- Minimum time compressor is ON 120 seconds.

9.3. CIRCULATING PUMPS

The wiring schematic provides outputs to control the circulating pumps. The system pump starts immediately and after 40 seconds of operation, when the water flow is stabilised, the pressure differential/flow switch control function is enabled. If no alarms are present the unit will start.

9.4. ANTI-FREEZE ALARM

The alarm [11] is always active even in standby mode. To prevent damage to the plate heat exchanger by freezing of the water within the unit is stopped and an alarm raised if the water temperature drops below the minimum anti-freeze setpoint of 3°C. The unit can only re-start after a manual reset and if the anti-freeze sensor reads a water temperature above 4°C [12]. With the unit in off mode and with a water temperature below 4°C the factory fitted electric heaters on the heat exchanger are turned on, and turned off when the water temperature exceeds 5°C. The water pump always remains active.

9.5. WATER FLOW ALARM

The unit has a low water flow rate alarm using a factory fitted differential pressure switch or flow switch.

This safety activates after the first 40 seconds of pump operation if the water flow rate is not sufficient. The operation of this alarm stops the compressors and the pump.

WARNING

[11] The anti-freeze setpoint can only be adjusted by an authorised service centre and only after verifying that the hydraulic circuit has the correct % of anti-freeze solution.

[12] If this alarm occurs immediately call the authorised technical service assistance.

WARNING
We recommend a service log book is provided for the unit (responsibility of the user) to keep records of any works on the unit, which will aid maintenance and repair works. Note in the service log book date, type of works (routine maintenance, inspection or repair), describing the event and the measures taken.

WARNING
It is **FORBIDDEN** to charge with refrigerant circuit with a refrigerant type different to that indicated. Using a different refrigerant can cause serious damage to the unit.

10. ROUTINE MAINTENANCE

It is forbidden to carry out any cleaning operation before isolating from the power supply [1].
Confirm no voltage is present before commencing works.
Periodic maintenance is a fundamental requirement to ensure efficient unit operation both in terms of operation and energy efficiency.

The fundamental required annual checks are:

10.1. HYDRAULIC CIRCUIT

CHECK:
1. Water circuit is filled.
2. Water filter is clean.
3. Operation of the differential pressure or flow switch.
4. Absence of air in the system (vent).
5. Water flow rate is always constant through the evaporator.
6. Condition of the hydraulic piping insulation.
7. The percentage of anti-freeze liquid, as may be required.

10.2. ELECTRIC CIRCUIT

CHECK:
8. Operation of safeties.
9. Power supply voltage.
10. Electrical input.
11. Tightness of connections and terminals.
12. Operation of the compressor crank case heater.

10.3. REFRIGERANT CIRCUIT

CHECK:
13. State of compressors.
14. Efficiency of the plate heat exchanger.
15. Operating pressures.
16. Leaks to confirm the correct operating refrigerant charge.
17. Operation of the high and low pressure pressostats
18. Efficient operation of the filter drier.

10.4. MECHANICAL CHECKS

CHECK:
1. **Tightness of screws,** of compressors and electrical panel and external panelling of the unit. Poor fixings cause noise and abnormal vibrations.
2. The state of the unit structure.
   Treat any parts showing signs of corrosion with the appropriate paints to reduce or eliminate rust.

11. SPECIAL MAINTENANCE

The ANL units are factory charged with R410a and tested. In normal operation they therefore do not require any intervention from the technical assistance service in relation to the refrigerant charge. Over time some small leaks can appear, causing discharging the circuit and causing a malfunction of the unit. In this case the leaks have to be found and repaired and the unit recharged in accordance and as required under current legislation and good working practices.

12. DISPOSAL

Ensure that the disposal of the unit is carried out in accordance with the current legal requirements.

13. PROCEDURE FOR SELECTION OF SYSTEM TYPE

Several parameters of the MODUCONTROL board have to be set, based on the type of system the unit is installed.
These changes of parameters are summarised in the table below to permit the installer to make the appropriate selections.

13.1. HOW TO MODIFY A USER MENU PARAMETER

To access the **USER** setting press the key and confirm the password 000 pressing the key . The display will show the parameters of the **USER** index as three identifying characters; the index remains displayed for a second and then is replaced by the value of the parameter it relates to.
To move to the following parameter use the arrow keys . To modify a parameter press the key , modify the value using the arrow keys and confirm the modification pressing the key . To exit the menu press the key .

13.2. HOW TO MODIFY AN INSTALLER MENU PARAMETER

To enter and modify the **INSTALLER** menu follow the same procedure as the USER menu above.

Password INSTALLER menu: 030

QUESTION	ANSWER	WHAT TO DO
(1) What type of terminals are installed in the heating circuit?	• The unit is a cooling only model	• Go to question 2
	• Radiant panels	• Enter in parameter **StC** (index 3 menu USER) with the value of 35 °C
	• Fan coil units or low temperature radiators	• Enter in parameter **StC** (index 3 menu USER) with the value of 45 °C (default value)
	• Other applications	• Enter in parameter **StC** (index 3 menu USER) with the value of 55 °C
(2) Is the remote control accessory panel installed (PR3)?	• Not installed	• Go to question 2
	• Installed	• Enter in parameter **PAN** (index 9 menu INSTALLER) with the appropriate value: **Value (1):** • Season selection controlled from the chiller circuit board • ON/OFF control from the PR3 **Value (2):** • Season selection controlled from the PR3 • ON/OFF control from the chiller circuit board **Value (3):** • Season selection controlled from the PR3 • ON/OFF control from the PR3
(3) Is domestic hot water production present?	• Not present	• Go to question 5
	• Present	• Enter in parameter **ASA** (menu INSTALLER) with the value (1)
(4) In the domestic hot water circuit is a three way diverting valve present?	• Not present	• Go to question 5
	• Present	• Enter in parameter **AAS** (index C menu INSTALLER) with the appropriate value (in seconds): this parameter shows the reversing time for the three way diverting valve in the circuit for the production of domestic hot water
(5) Is an ambient thermostat present?	• Not present	• No function
	• Present	• This parameter enables a digital contact **ID** (shown on the electrical schematic with the reference **TRA**) onto which to connect an ambient thermostat with which to disable the compressors and electric heaters. Enter in parameter **trA (index D menu INSTALLER)**, with the appropriate value selecting from: **1. Value (1 or 2): ENABLED** **2. Value (0 or 3): DISABLED** **3. It is reminded that the OPEN state of the contact represents:** • stops compressors and heaters if the parameter value is set to 1 • stops compressors, pump and heaters if the parameter value is set to 2 • pump alarm (as in the previous software version), if the parameter value is set to 3

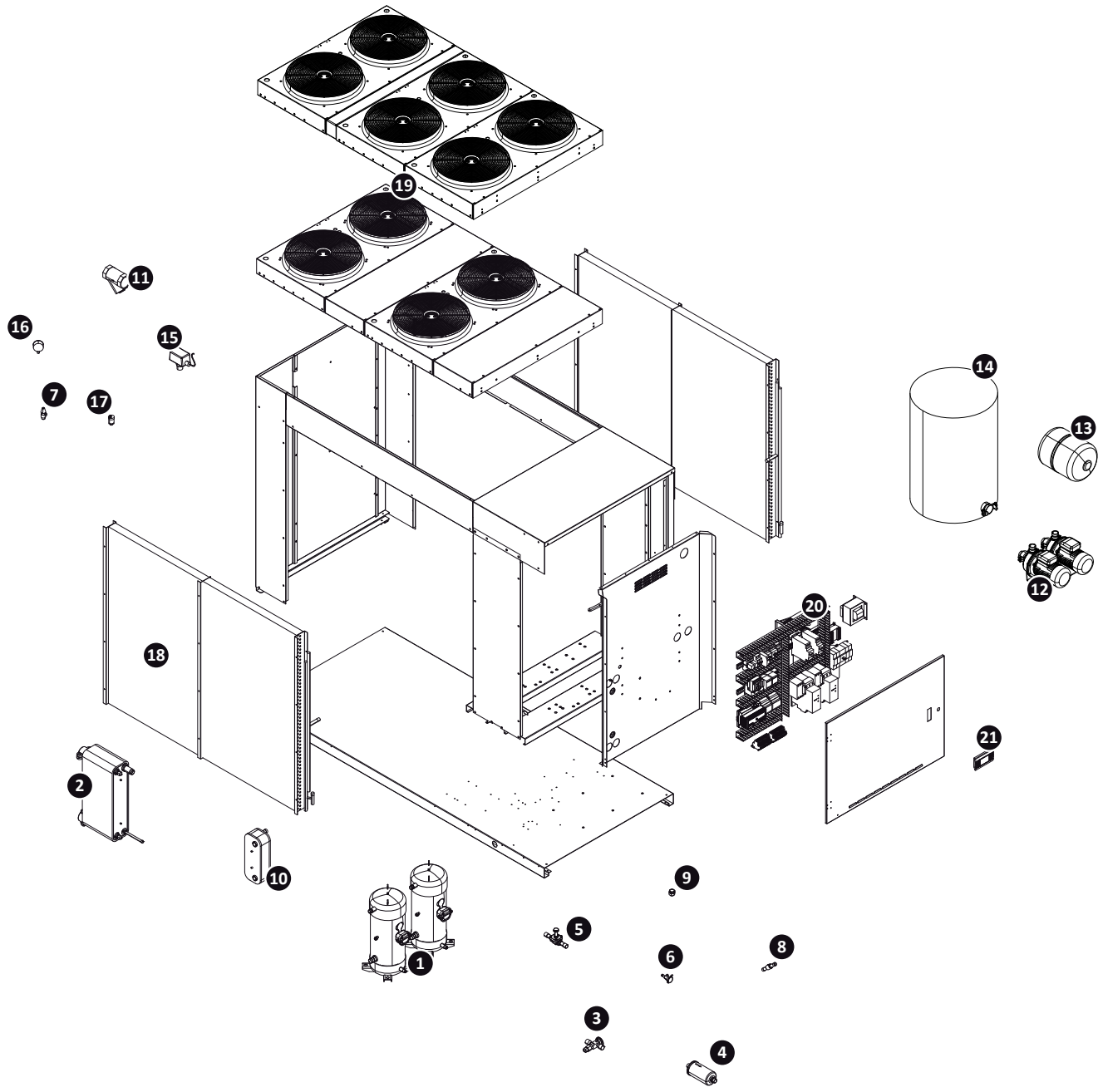
ATTENTION
For more information refer to the **USER manual** provided with the unit and available on the website **www .aermec. com**

14. FAULTS AND REMEDIES

FAULT	CAUSE	REMEDY
Unit does not start	• Lack of electrical voltage	• Check electrical voltage is present • Check the upstream safety devices providing power to the unit
	• General isolator is OFF • Remote contact is OFF (if present) • Control panel is OFF • Main isolator is OFF • Compressor circuit breaker is OFF	• Place in ON
	• Power supply voltage too low	• Check power supply
	• Compressor contactor coil faulty • Electronic board faulty • Starting capacitor faulty • Compressor faulty	• Replace the component
Low capacity output	• Lack of refrigerant charge • Condenser coil dirty • Water filter clogged • Unit location • Operating outside of limits	• Check charge and for leaks • Clean condenser coil • Clean water filter • Check performance • Check against operating limit charts
Compressor noisy	• Liquid refrigerant return to compressor • Inadequate fixing down	• Check and correct
	• Phase reversal	• Reverse one phase (400V/3N/50Hz only)
Noise and vibrations	• Contact between metal components	• Check and correct
	• Weak base support	• Improve base support
	• Loose fixings	• Tighten fixings
Compressor stops on safeties	• Discharge pressure too high • Suction pressure too low • Power supply voltage too low • Electrical connections loose • Operating outside of limits	• Check against operating limits chart
	• Pressostat faulty	• Replace the component
	• Thermal cut-out operates	• Check voltage and settings • Check insulation of windings
Compressor discharge pressure high	• External air temperature high • System water inlet temperature high	• Check against operating limits chart
	• Insufficient air flow • Insufficient water flow	• Check: 1. fan operation 2. condenser coil clean 3. pump operation (and speed) 4. water filter clean
	• Faulty fan control	• Check and replace if faulty
	• Air in water circuit	• Vent circuit
	• Refrigerant charge too high	• Check charge and adjust
Discharge pressure low	• External air temperature low • System water inlet temperature low	• Check against operating limits chart
	• Moisture in refrigerant circuit	• Remove charge and replace
	• Air in water circuit	• Vent circuit
	• Refrigerant charge too low	• Check charge and adjust
Suction pressure high	• External air temperature high • System water inlet temperature high • Thermostatic expansion valve too open or faulty	• Check against operating limits chart • Adjust or replace if faulty
Suction pressure low	• System water inlet temperature low • External air temperature low • Thermostatic expansion valve faulty or obstructed	• Check against operating limits chart • Adjust or replace if faulty
	• Insufficient water flow • Insufficient air flow	• Check: 1. fan operation 2. condenser coil clean 3. pump operation (and speed) 4. water filter clean

15. SPARE PARTS

ANL 290-300-340-400 COOLING ONLY

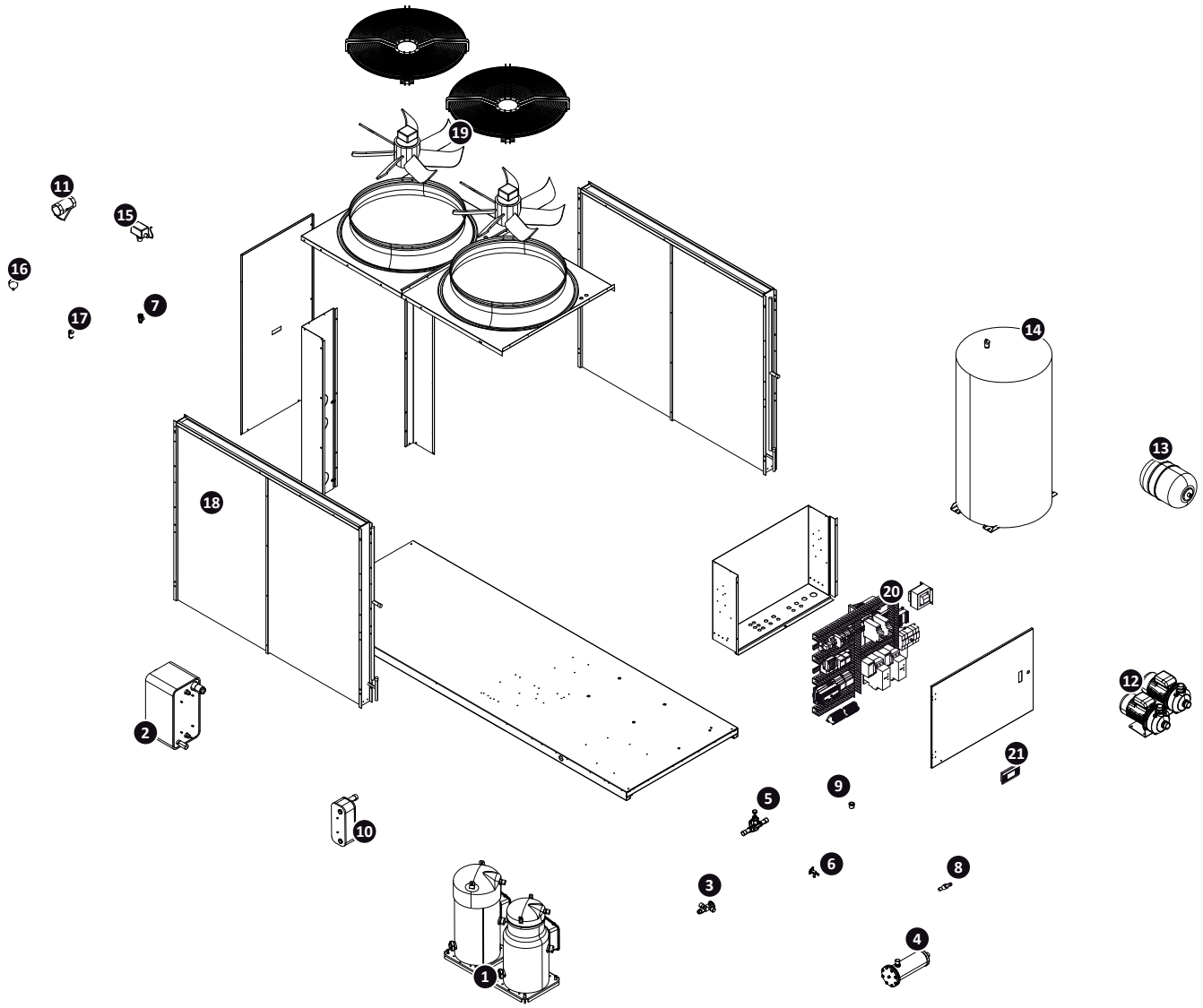


	LEGEND
1.	Compressor
2.	Plate heat exchanger
3.	Thermostatic expansion valve
4.	Filter drier
5.	Solenoid valve
6.	Hot gas injection valve
7.	Safety valve
8.	Unidirectional valve only for versions (02-04 / P2-P4)
9.	Liquid sight glass
10.	Desuperheater (optional)

11.	Water filter
12.	Pump(s) (optional)
13.	Expansion tank (standard with hydronic modules)
14.	Buffer tank (optional)
15.	Flow switch
16.	Gauge
17.	Air vent
18.	Finned condenser coil
19.	Fan assembly
20.	Electrical panel
21.	MODU_CONTROL interface

⚠ ATTENTION:
19. Fan assembly:
- ANL 290-300-340 (4 fans)
- ANL 400 (6 fans)

ANL 580-650 COOLING ONLY



	LEGEND
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10.	Desuperheater (optional)

11.	Water filter
12.	Pump(s) (optional)
13.	Expansion tank (standard with hydronic modules)
14.	Buffer tank (optional)
15.	Flow switch
16.	Gauge
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18.	Finned condenser coil
19.	Fan assembly
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21.	MODU_CONTROL interface

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