



MULTIPURPOSE UNITS FOR 2|4-PIPE SYSTEMS - Technical manual

REVERSIBLE HEAT PUMPS

- OUTDOOR UNIT
- HIGH EFFICIENCIES

NRP 0200-0750

EN



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 EC 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

AERMEC S.p.A. reserves the right to make any modifications considered necessary to improve its products at any moment and is not obliged to add these modifications to machines that have already been fabricated, delivered or are under construction.

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NRP

SERIAL NUMBER

DECLARATION OF CONFORMITY

We, the undersigned, hereby declare under our own responsibility that the assembly in question, defined as follows:

NAME NRP
TYPE MULTIPURPOSE AIR/WATER UNITS
MODEL

To which this declaration refers, complies 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	Immunity and electromagnetic emissions for residential environments.
IEC EN 61000-6-3	
IEC EN 61000-6-2	Immunity and electromagnetic emissions for industrial environments.
IEC EN 61000-6-4	
EN378	Refrigerating system and heat pumps - Safety and environmental requirements.
UNI EN 12735	Seamless, round copper tubes for air conditioning and refrigeration.
UNI EN 14276	Pressure equipment for cooling systems and heat pumps.

Thereby, compliant with the essential requirements of the following directives:

- LVD Directive: 2006/95/EC.
- Electromagnetic Compatibility Directive 2004/108/EC.
- Machinery directive 2006/42/EC.
- PED Directive regarding pressurised devices 97/23/EC

The product, in agreement with Directive 97/23/EC, satisfies the Total quality Guarantee procedure (form H) with certificate no. 06/270-QT3664 Rev. 6 issued by the notified body n.1131 CEC via Pisacane 46 Legnano (MI) - Italy

The person authorised to constitute the technical file is: Massimiliano Sfragara - 37040 Bavilacqua (VR) Italy - Roma, 996

Bevilacqua

09/01/2012

Marketing Manager
Signature

**Standards complied with
WHEN DESIGNING and
CONSTRUCTING the unit:
SAFETY**

1. Machinery directive 2006/42/EC
2. Low voltage directive LVD 2006/95/EC
3. Electromagnetic compatibility directive EMC 2004/108/EC
4. Directive regarding pressurised devices PED 97/23/EC, EN 378, UNI12735, UNI14276
5. UNI12735, UNI14276

ELECTRIC PART

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

ACOUSTIC PART

1. ISO DIS 9614/2
(intensimetric method)

**PROTECTION RATING
IP24**

REFRIGERANT GAS

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

1. DESCRIPTION OF THE UNIT

Multipurpose **OUTDOOR** units for 2 or 4 pipe systems, especially designed for simultaneous production of **cold** and **hot** water and fully independent.

AVAILABLE VERSIONS

1.1. FOR 2-PIPE SYSTEMS

The multipurpose 2-pipe units have been made for applications with 2 pipe terminals, e.g. hotels, where there is a cold/hot water and DHW demand throughout the year.

The operating modes are:

SUMMER FUNCTIONING

1. Cold water production to system.
2. Production of domestic hot water with use of total recovery (**NO ANTI-LEGIONELLA CYCLE**).

WINTER FUNCTIONING

3. Heat pump supplying the system.
4. Service heat pump of DHW.

1.2. FOR 4-PIPE SYSTEMS

The multipurpose 4-pipe units have been made for applications with 4 pipe terminals, e.g. shopping centres, offices or facilities with large windows where there can be the simultaneous demand for hot and cold water with a system which does not require season changeover and therefore is a valid alternative to traditional systems based on the chiller-boiler combination.

The microprocessor control logic ensures perfectly satisfying heat and cooling loads.

The operating modes are:

PRODUCTION OF COOLED WATER ONLY

The multipurpose unit acts as a classical refrigerator: cool water to the system and condensation heat disposal outside through finned coils.

PRODUCTION OF HOT WATER ONLY

The multipurpose unit acts as a heat pump, exploiting the heat of the outside air, through the finned coil (evaporator) it raises the temperature of the water to be sent to the system through a plate heat exchanger (condenser). The main difference from traditional cycle reverse heat pumps is that the heated water is produced in different heat exchanger from the one used to produce cold water. This separates the two hot-cold sections required for 4-pipe systems.

COMBINED PRODUCTION

If the utility requires simultaneous hot and cold water, the unit acts as a water heat pump, controlling condensation and evaporation on two distinct plate heat exchangers associated to circulation of cold and hot water in the system.

It automatically changes from one configuration to another (managed by on-board microprocessor) to optimise the spent energy depending on the demand by the utility.

Maximum reliability

Multi-circuit unit designed to provide the maximum efficiency both with full load and partial loads, guaranteeing operating continuity should one of the circuits stop to facilitate maintenance. Having several compressors and circuits ensures control of more steps of power yielded in both modes.

Built-in hydronic kit

Encloses the main hydraulic components; available in several configurations with high or low static pressure single pump or reserve pump (see configurator).

2. CONFIGURATOR

	Description
1,2,3	NRP
4,5,6	SIZE
	020 - 024 - 028 - 030 - 033 - 035 - 050 - 055 - 060 - 065 - 070 - 075
7	COMPRESSOR
	0
8	VERSION
A	High efficiency
E	Silenced high efficiency
9	TYPE OF SYSTEM
2	Two pipes
4	Four pipes
10	COILS
°	Aluminium
R	Copper
S	Tinned copper
V	In painted aluminium-copper (epoxy powders)
11	FANS ¹
°	Standard
M	Increased (only 020-035)
J	Larger inverters (only available from 050 to 075)
12	POWER SUPPLY ¹
°	400V/3N/50Hz with magnet circuit breakers
1	230V/3 50Hz with magnet circuit breakers
2	500V/3/50Hz with magnet circuit breakers
13,14	SYSTEM SIDE HYDRONIC KIT
00	Without storage tank
01	Storage tank low static pressure pump system side
02	Storage tank low static pressure pump reserve pump system side
03	Storage tank high static pressure pump system side
04	Storage tank high static pressure pump reserve pump system side
05	Storage tank with holes for integrative resistance low static pressure pump system side
06	Storage tank with holes for integrative resistance low static pressure pump reserve pump system side
07	Storage tank with holes for integrative resistance high static pressure pump system side
08	Storage tank with holes for integrative resistance high static pressure pump reserve pump system side
P1	Low static pressure pump system side
P2	Low static pressure pump reserve pump system side
P3	High static pressure pump system side
P4	High static pressure pump reserve pump system side
15,16	DHW SIDE HYDRONIC KIT ²
00	Without Pumps
R1	Low static pressure pump DHW side
R2	Low static pressure pump reserve pump DHW side
R3	High static pressure pump DHW side
R4	High static pressure pump reserve pump DHW side

POSSIBLE CONFIGURATIONS BETWEEN HYDRONIC KITS
recovery hydronic unit

	°	R1	R2	R3	R4
°	ok	ok	ok	ok	ok
01	ok	nd	nd	nd	nd
02	ok	nd	nd	nd	nd
03	ok	nd	nd	nd	nd
04	ok	nd	nd	nd	nd
05	ok	nd	nd	nd	nd
06	ok	nd	nd	nd	nd
07	ok	nd	nd	nd	nd
08	ok	nd	nd	nd	nd
P1	ok	ok	ok	ok	ok
P2	ok	ok	ok	ok	ok
P3	ok	ok	ok	ok	ok
P4	ok	ok	ok	ok	ok

nd = not available

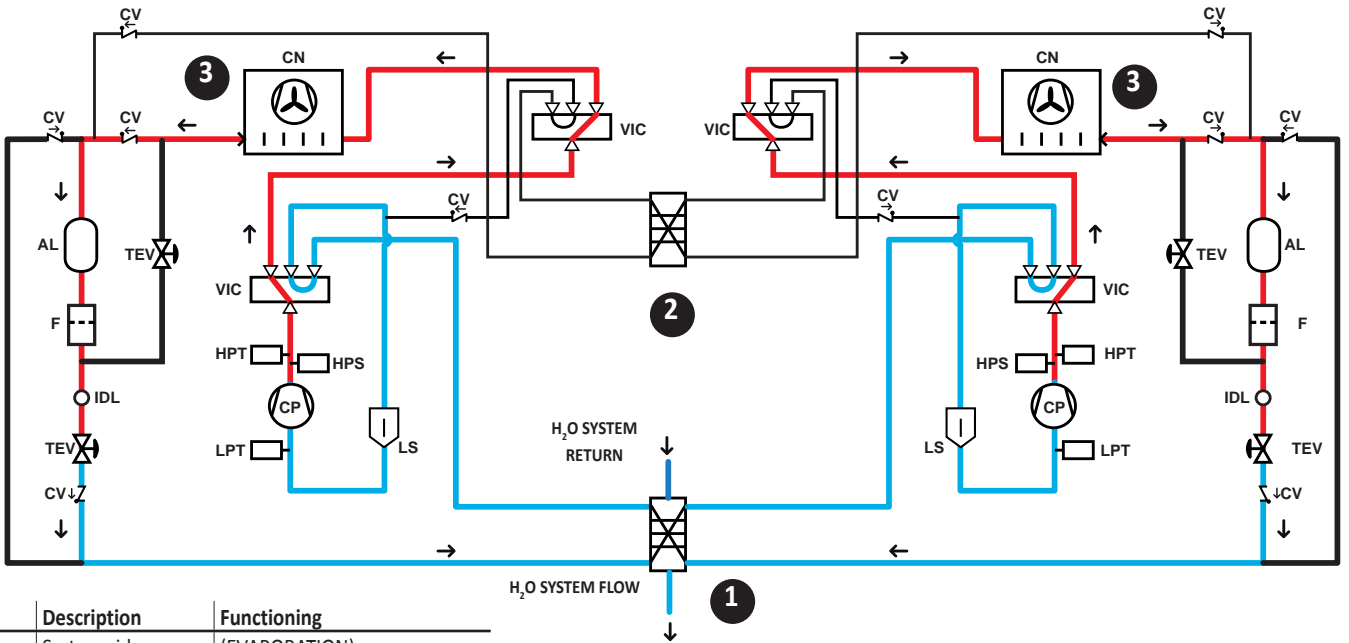
2 DHW SIDE/SYSTEM SIDE

DHW side, production of domestic hot water, in 2-pipe systems.
System side, production of hot water, in 4-pipe systems.

1	Description	0200	0240	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
11	FANS												
°		•	•	•	•	•	•	•	•	•	•	•	•
M		•	•	•	•	•	•	No	No	No	No	No	no
J		No	No	No	No	No	No	•	•	•	•	•	•
12	POWER SUPPLY												
°	400V/3N/50Hz	•	•	•	•	•	•	•	•	•	•	•	•
1	230V/3/50Hz	No	No	•	•	•	•	•	•	•	•	•	No
2	500V/3/50Hz	No	No	•	•	•	No	No	No	•	•	No	No

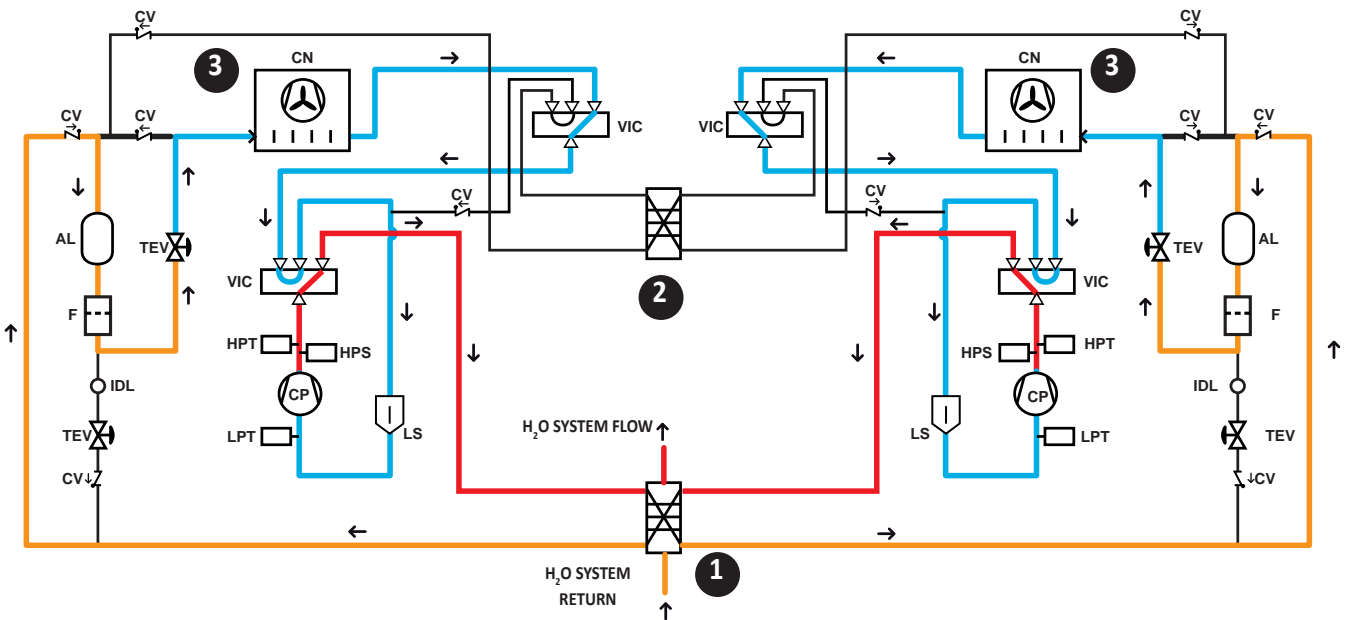
3. BASIC OPERATING LAYOUTS FOR 2-PIPE SYSTEM

3.1. COLD WATER PRODUCTION ONLY TO SYSTEM



Description	Functioning
1 System side HEAT EXCHANGER	(EVAPORATION) Cold water production
2 DHW side HEAT EXCHANGER	Not running
3 Source side HEAT EXCHANGER	(CONDENSATION) Heat exchange with air

3.2. HOT WATER PRODUCTION ONLY TO SYSTEM

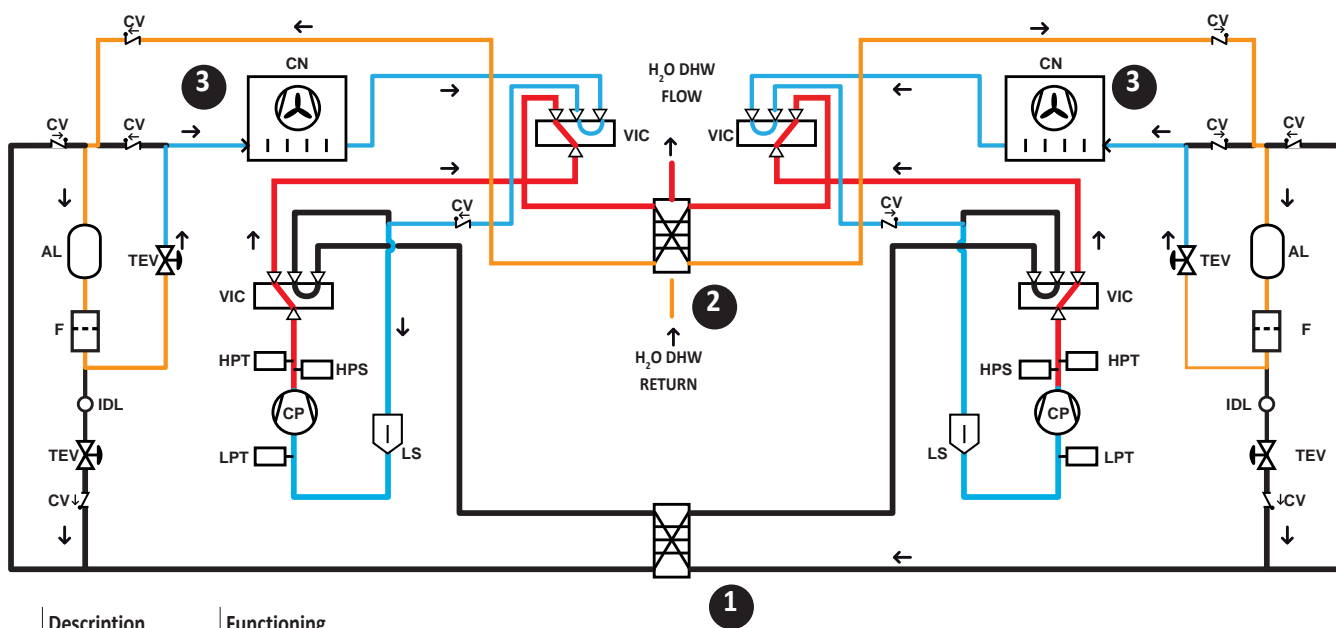


Description	Functioning
1 System side HEAT EXCHANGER	(CONDENSATION) Hot water production
2 DHW side HEAT EXCHANGER	Not running
3 Source side HEAT EXCHANGER	(EVAPORATION) Heat exchange with air

Key	
1	System side heat exchanger
2	DHW side heat exchanger
3	Source side heat exchanger
AL	Liquid storage tank
CV	One-way valve
F	Dehydrator filter

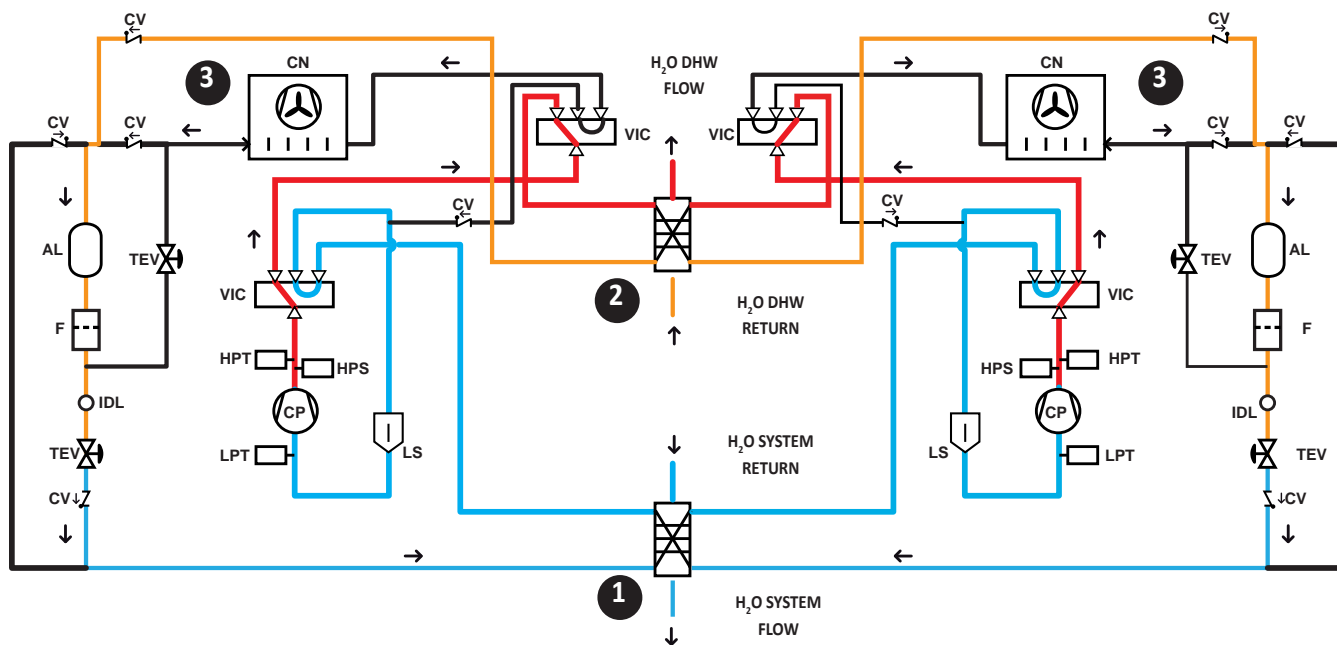
IDL	Liquid indicator
HPT	High pressure transducer
HPS	High pressure pressure switch
LPT	Low pressure transducer
LS	Liquid separator
TEV	Thermostatic valves
VIC	Cycle reversing valve

3.3. 2 CIRCUITS TO PRODUCE HOT WATER ONLY TO DHW



	Description	Functioning
1	System side HEAT EXCHANGER	Not running
2	DHW side HEAT EXCHANGER	(CONDENSATION) DHW production
3	Source side HEAT EXCHANGER	(EVAPORATION) Heat exchange with air

3.4. 2 CIRCUITS TO PRODUCE COLD WATER TO SYSTEM AND HOT WATER TO DHW



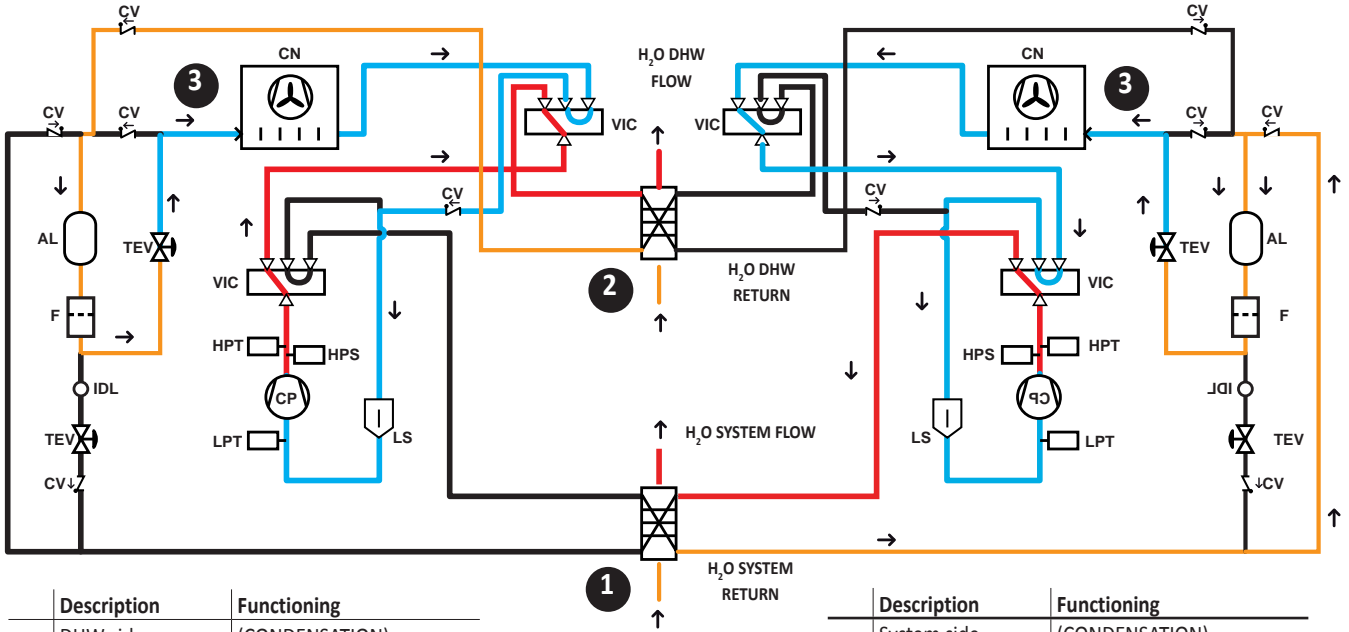
	Description	Functioning
1	System side HEAT EXCHANGER	(EVAPORATION) Cold water production
2	DHW side HEAT EXCHANGER	(CONDENSATION) DHW production
3	Source side HEAT EXCHANGER	Not running

Key	
1	System side heat exchanger
2	DHW side heat exchanger
3	Source side heat exchanger
AL	Liquid storage tank
CV	One-way valve
F	Dehydrator filter
IDL	Liquid indicator
HPT	High pressure transducer
HPS	High pressure pressure switch
LPT	Low pressure transducer
LS	Liquid separator
TEV	Thermostatic valves
VIC	Cycle reversing valve

3.5. CIRCUIT FOR PRODUCING HOT WATER TO SYSTEM | CIRCUIT FOR PRODUCING HOT WATER TO DHW

2-PIPE SYSTEM

4-PIPE SYSTEM



Description	Functioning
2 DHW side HEAT EXCHANGER	(CONDENSATION) DHW production
3 Source side HEAT EXCHANGER	(EVAPORATION) Heat exchange with air

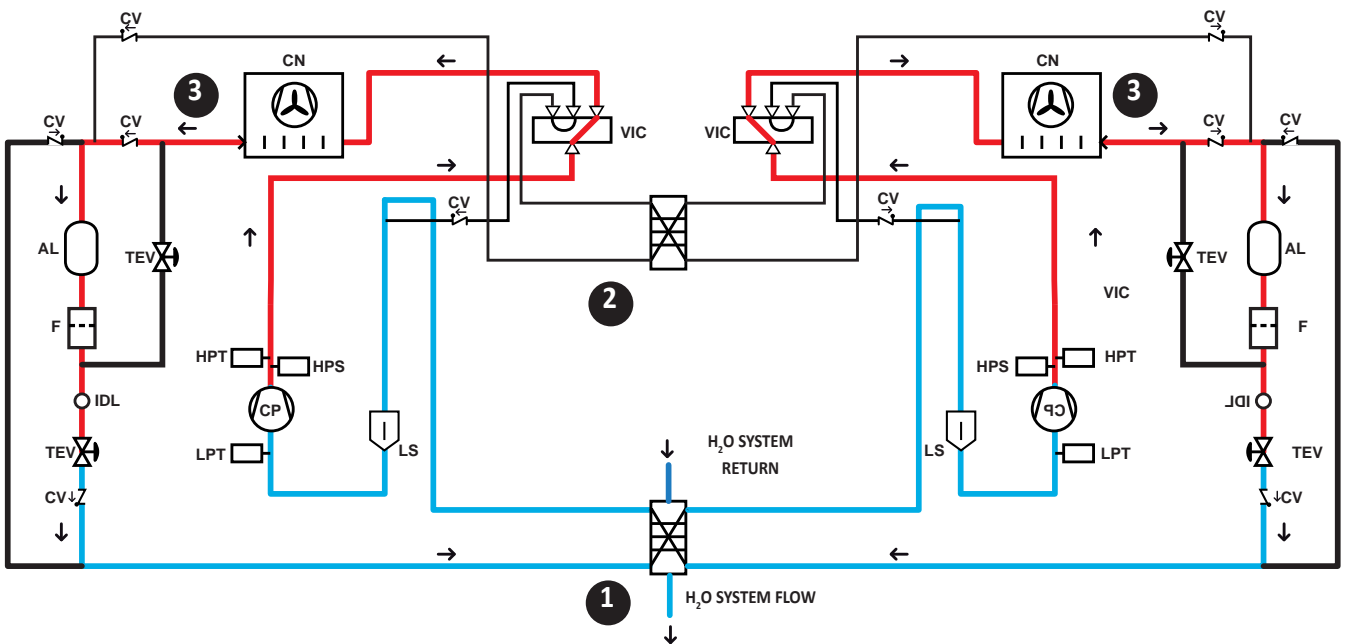
Description	Functioning
1 System side HEAT EXCHANGER	(CONDENSATION) Hot water production
3 Source side HEAT EXCHANGER	(EVAPORATION) Heat exchange with air

4. BASIC OPERATING LAYOUTS FOR 4-PIPE SYSTEM

4.1. COLD WATER PRODUCTION ONLY TO SYSTEM

2-PIPE SYSTEM

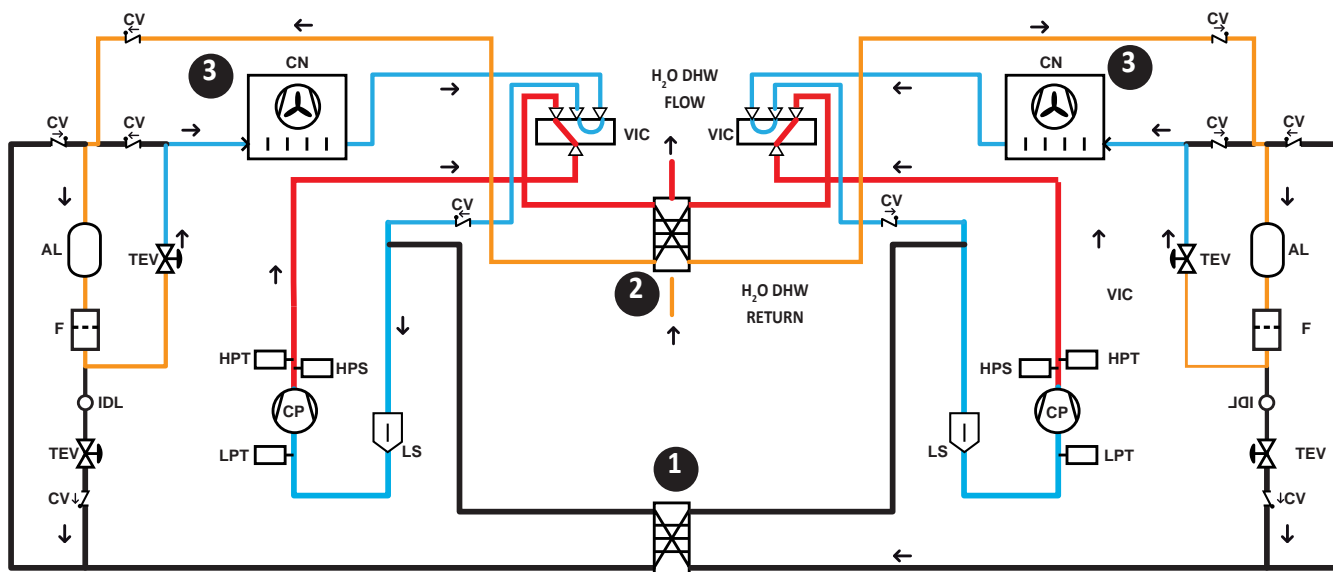
4-PIPE SYSTEM



Description	Functioning
1 System side HEAT EXCHANGER	(EVAPORATION) Cold water production
2 DHW side HEAT EXCHANGER	Not running
3 Source side HEAT EXCHANGER	(CONDENSATION) Heat exchange with air

Key	
1	System side heat exchanger
2	DHW side heat exchanger
3	Source side heat exchanger
AL	Liquid storage tank
CV	One-way valve
F	Dehydrator filter
IDL	Liquid indicator
HPT	High pressure transducer
HPS	High pressure pressure switch
LPT	Low pressure transducer
LS	Liquid separator
TEV	Thermostatic valves
VIC	Cycle reversing valve

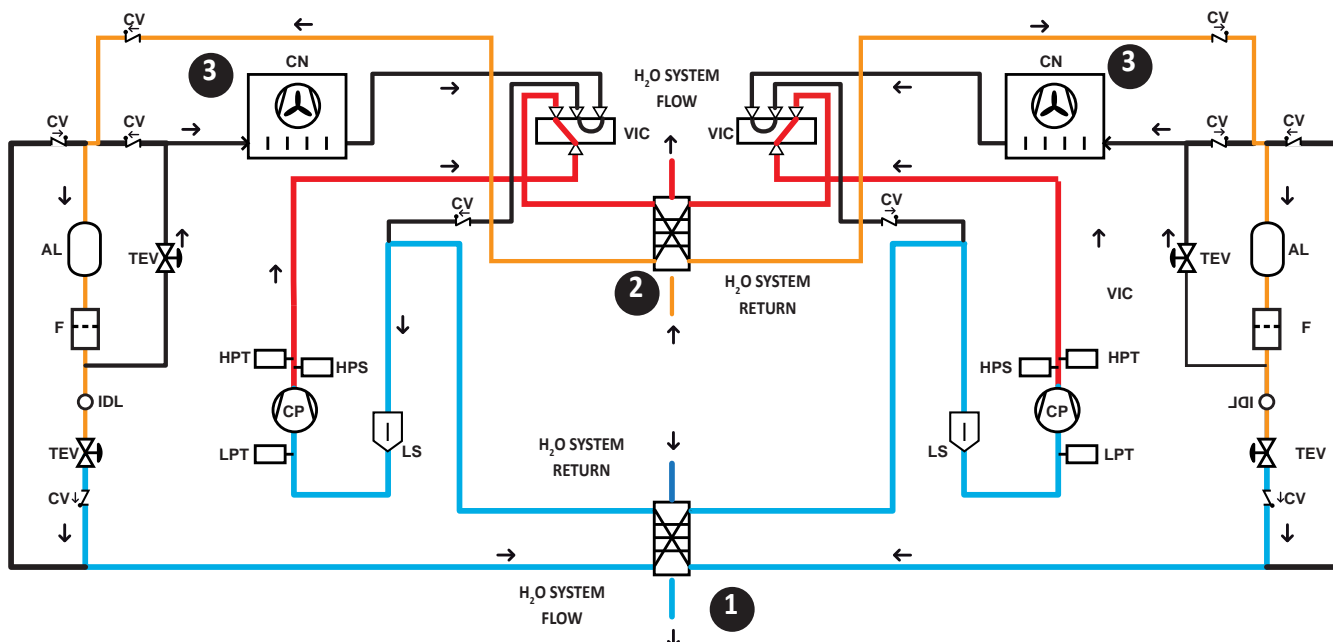
4.2. HOT WATER PRODUCTION ONLY TO SYSTEM



2-PIPE SYSTEM
4-PIPE SYSTEM

	Description	Functioning
1	Cooling side EXCHANGER	Not running
2	Heating side EXCHANGER	(CONDENSATION) Hot water production
3	Source side HEAT EXCHANGER	(EVAPORATION) Heat exchange with air

4.3. SIMULTANEOUS HOT AND COLD WATER PRODUCTION TO SYSTEM



	Description	Functioning
1	Cooling side EXCHANGER	(EVAPORATION) Cold water production
2	Heating side EXCHANGER	(CONDENSATION) Hot water production
3	Source side HEAT EXCHANGER	Not running

Key			
1	System side heat exchanger	IDL	Liquid indicator
2	DHW side heat exchanger	HPT	High pressure transducer
3	Source side heat exchanger	HPS	High pressure pressure switch
		LPT	Low pressure transducer
		AL	Liquid storage tank
		LS	Liquid separator
		CV	One-way valve
		TEV	Thermostatic valves
		F	Dehydrator filter
		VIC	Cycle reversing valve

5. DESCRIPTION OF COMPONENTS

5.1. COOLING CIRCUIT

SCROLL COMPRESSORS

Hermetic scroll rotary compressors. All compressors come with casing resistance, electronic thermal protection with centralised manual resetting and two-pole electric motor.

COOLING/HEATING EXCHANGER SYSTEM SIDE

Braze welded AISI 316 steel plate heat exchanger, insulated externally with closed cell neoprene anti-condensation material. When the unit is not running, it is protected against formation of ice inside by an electric resistance.

5.1.1. WATER FEATURES

PH	6-8
Electric 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
Alkalinity M	Less than 50 ppm
Total hardness	Less than 50 ppm
Sulphur ions	None
Ammonia ions	None
Silicone ions	Less than 30 ppm

DHW SIDE HEAT EXCHANGER (2 pipes)

HEATING SIDE SYSTEM (4 pipes)

Braze welded AISI 316 steel plate heat exchanger, insulated externally with closed cell neoprene anti-condensation material. When the unit is not running, it is protected against formation of ice inside by an electric resistance.

SOURCE SIDE HEAT EXCHANGER

Finned pack heat exchanger made with copper pipes and aluminium fins adequately spaced to ensure better heat exchange performance.

CYCLE REVERSING VALVE

4-way cycle reversing valve. Inverts the flow of refrigerant gas.

LIQUID STORAGE TANK

(always passed by)

Compensates the difference in volume between finned coil and plate exchanger, retaining excess liquid.

DEHYDRATOR FILTER

Hermetic-mechanical with cartridges made of ceramic and hygroscopic material, able to withhold impurities and any traces of humidity present in the cooling circuit.

NON-RETURN VALVES

Allows one-way flow of the refrigerant.

THERMOSTATIC VALVES

Mechanical valves, with external equaliser positioned at evaporator outlet, modulates the flow of gas to the evaporator, depending on the heat load, in order to ensure a correct heating level of the intake gas.

SOLENOID VALVES

The valve closes when the compressor switches off, blocking the flow of refrigerant gas to the evaporator, recovery and the coil.

INDICATOR FOR LIQUID

Used to check presence of humidity in cooling circuit.

5.2. STRUCTURE AND FANS

SUPPORT STRUCTURE

Structure made of hot-dipped galvanised steel sheets, painted with polyester powders, built to guarantee easy accessibility for service and maintenance.

STANDARD FANS

Axial fans with IP 54 degree of protection, external rotor, helical blades, housed in nozzles, complete with accident-prevention protective screen. 6-pole electric motor with built-in circuit breaker.

LARGER FANS

(only for NRP sizes 0200 to 0350).

LARGER INVERTER FANS

(available only from size 0500 to 0750).

POSSIBLE CONFIGURATIONS BETWEEN HYDRONIC KITS

recovery hydronic unit

	°	R1	R2	R3	R4
°	ok	ok	ok	ok	ok
01	ok	nd	nd	nd	nd
02	ok	nd	nd	nd	nd
03	ok	nd	nd	nd	nd
04	ok	nd	nd	nd	nd
05	ok	nd	nd	nd	nd
06	ok	nd	nd	nd	nd
07	ok	nd	nd	nd	nd
08	ok	nd	nd	nd	nd
P1	ok	ok	ok	ok	ok
P2	ok	ok	ok	ok	ok
P3	ok	ok	ok	ok	ok
P4	ok	ok	ok	ok	ok

	2-pipe system		4-pipe system	
	System	Domestic hot water	Cooling side	Heat side
STANDARD HYDRAULIC CIRCUIT				
Filter	As per standard	As per standard	As per standard	As per standard
Flow switch	As per standard	As per standard	As per standard	As per standard
Air vent valve	As per standard	As per standard	As per standard	As per standard
CONFIGURABLE HYDRAULIC CIRCUIT				
VERSIONS WITH SYSTEM STORAGE TANK AND PUMPS (the more complete versions are described)				
Expansion vessel	As per standard	No	As per standard	No
System storage tank and pump/s	As per standard	No	As per standard	No
Unload	As per standard	No	As per standard	No
Safety valve	as per standard	No	As per standard	No
VERSIONS WITH PUMPS ONLY (the more complete versions are described)				
Pump/s	As per standard	As per standard	As per standard	As per standard
Expansion vessel	As per standard	As per standard	As per standard	As per standard
Safety valve	As per standard	As per standard	As per standard	As per standard
Valvola di sicurezza	di serie	di serie	di serie	di serie

5.3. STANDARD HYDRAULIC CIRCUIT

WATER FILTERS

Equipped with steel filtering mesh, prevents the heat exchangers both of the system side and the DHW/heating system side from clogging.

FLOW SWITCHES

They have the task of controlling that there is water circulation inside the heat exchangers; if this is not the case, they block the unit.

AIR VENT VALVE

Mounted on the top of the hydraulic system; they discharge possible air pockets.

5.3.1. COMPONENTS OF HYDRAULIC CIRCUIT IN CONFIGURABLE VERSIONS ¹

PUMPS

High or low static pressure.

EXPANSION VESSEL

With nitrogen pre-load membrane.

SAFETY VALVE

Equipped with a piped discharger, intervenes by discharging the over pressure in case of anomalous pressures.

SYSTEM STORAGE TANK ¹

Made of steel to reduce heat loss and to eliminate the formation of condensation, insulated by thick polyurethane.

Supplied as per standard with 300W electric anti-freeze resistance (as low as -20°C outside temperature - 5°C tank water temperature) controlled by anti-freeze probe inserted in tank.

5.4. SAFETY AND CONTROL COMPONENTS

MANUALLY RESET HIGH PRESSURE SWITCH

With fixed calibration, placed on high pressure side of cooling circuit, inhibits functioning of compressor if abnormal work pressure occurs.

LOW PRESSURE TRANSDUCER

Placed on the low pressure side of the cooling circuit, it signals the work pressure to the control board generating a pre-warning in the case of anomalous pressures.

HIGH PRESSURE TRANSDUCER

Placed on the high pressure side of the cooling circuit, it signals the work pressure to the control board generating a pre-warning in the case of anomalous pressures.

COOLING CIRCUIT SAFETY VALVES

They intervene by discharging the overpressure in the case of anomalous pressures.

- Calibrated at 45 bar on HP branch.
- Calibrated at 30 bar on LP branch.

DCPX CONDENSATION PRESSURE CONTROLLER

This accessory allows correct functioning with external

temperatures lower than 10°C and as low as - 10°C. It consists of an adjustment circuit board that varies the number of fan revs according to the condensation pressure read by the high pressure transducer, in order to keep it sufficiently high for correct unit functioning. It also allows correct functioning in heating mode with external temperatures exceeding 30°C and up to 42°C.

5.5. ELECTRIC CONTROL AND POWER BOARD

Electric board in compliance with standards EN 60204-1/IEC 204-1, complete with:

- transformer for the control circuit,
- door lock main isolating switch,
- fuses and contactors for compressors and fans,
- terminals for REMOTE PANEL,
- spring type control circuit terminal board,
- outdoor electric board with double door and gaskets,
- electronic controller,
- evaporator pump and recovery pump control consent relay (only for versions without pump units),
- all numbered cables.

DOOR-LOCK ISOLATING SWITCH

The electric control board can be accessed by removing the voltage. Act on the opening lever of the control board itself. This lever can be locked using one or more padlocks during maintenance interventions to prevent the machine being powered up accidentally.

CONTROL BOARD

Allows the complete control of the appliance. For a more in-depth description please refer to the user manual.



ATTENTION

- (1) For questions of space, in configurations with storage tank and built-in pump/s on the system side, no pumps can be available on the recovery side!

6. ACCESSORIES

6.1. MECHANICAL ACCESSORIES



VT ANTI-VIBRATION MOUNTS

Group of anti-vibration mounts.

GP PROTECTION GRIDS

Protect the external coil from blows and prevent access to the underlying area where the compressors and the chiller circuit are housed. Every kit includes two grids.

TRX1

The storage tanks with holes and integrative resistances are delivered from the factory with plastic protective caps.

Before the system is loaded, the plastic caps must be replaced with the specific TRX1 if installation of one or all the resistances is not foreseen.



PGD1

Graphical display, which allows complete management of the unit like the one on board the machine. Can be controlled up to 50 m away with a telephone cable, 200 m with a shielded AWG 24 cable.

DRE

Initial starting current reduction electronic device, 26% in dual circuit. Available only with 400V power supply. Can only be applied in the factory.

RIF

Current rephaser. Connected in parallel to the motor, it allows a reduction of the input current (approx. 10%). It can only be installed in the factory and so must be requested on ordering.

6.2. ELECTRIC ACCESSORIES

AER485P1

RS-485 interface for supervising systems with MODBUS protocol.

AERWEB300

Accessory AERWEB allows remote control of a chiller through a common PC and an ethernet connection over a common browser; 4 versions available:

AERWEB300-6: Web server to monitor and remote control max. 6 units in RS485 network;

AERWEB300-18: Web server to monitor and remote control max. 18 units in RS485 network;

AERWEB300-6G: Web server to monitor and remote control max. 6 units in RS485 network with integrated GPRS modem;

AERWEB300-18G: Web server to monitor and remote control max. 18 units in RS485 network with integrated GPRS modem;

NRP		0200	0240	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
VT	00-P1-P2-P3-P4	17	17	17	17	17	17	13	13	13	13	22	23
	01...08	13	13	13	13	13	13	10	10	10	10	22	23
	P1 R1...P4 R4	17	17	17	17	17	17	13	13	13	13	22	23
GP	HA	-	-	-	-	-	-	GP2x2	GP2x2	GP2x2	GP2x2	GP2x3	GP10x3
	HE	GP3	GP3	GP3	GP4	GP4	GP4	GP2x2	GP2x2	GP2x2	GP2x2	GP2x3	GP10x3
TRX1	ALL	•	•	•	•	•	•	•	•	•	•	•	•

ELECTRIC ACCESSORIES

DRE	ALL	281	281	281	301	331	351	501	551	601	651	701	751
RIF	ALL	54	54	50	50	50	51	52	52	53	53	53	53
AER485P1	ALL	•	•	•	•	•	•	•	•	•	•	•	•
PGD1	ALL	•	•	•	•	•	•	•	•	•	•	•	•
AERWEB300-6	TUTTE	•	•	•	•	•	•	•	•	•	•	•	•
AERWEB300-18	TUTTE	•	•	•	•	•	•	•	•	•	•	•	•
AERWEB300-6G	TUTTE	•	•	•	•	•	•	•	•	•	•	•	•
AERWEB300-18G	TUTTE	•	•	•	•	•	•	•	•	•	•	•	•

7. TECHNICAL DATA

Model			0200	0240	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
Cooling capacity	HA	kW	43	50	56	64	68	80	100	104	124	141	160	185
	HE	kW							95	99	116	131	153	179
Input power	HA	kW	13,8	16,3	18,7	20,6	23,0	26,7	32,0	35,5	43,6	49,8	54,3	63,5
	HE	kW							34,8	38,5	47,9	54,9	61,1	69,6
Water flow rate	HA	l/h	7400	8600	9549	10956	11711	13776	17118	17949	21269	24211	27556	31749
	HE	l/h							16390	17051	19874	22457	26270	30867
Total pressure drops SYSTEM SIDE	HA	kPa	26	37	22	29	22	31	37	39	37	48	56	67
	HE	kPa							34	35	32	41	51	63
Available static pressure Low static pressure pump	HA	kPa	132	120	135	126	128	120	141	133	124	95	113	104
	HE	kPa							147	140	135	114	125	110
Available static pressure High static pressure pump	HA	kPa	172	160	175	165	166	159	181	173	211	181	177	224
	HE	kPa							186	180	223	200	192	231

Heating capacity	HA	kW	46	53	60	75	80	84	106	112	137	152	173	205
	HE	kW							106	112	137	152	173	205
Input power	HA	kW	13,1	15,3	17,5	22,0	23,6	25,3	32,1	34,5	40,6	44,9	52,8	61,4
	HE	kW							32,1	34,5	40,6	44,9	52,8	61,4
Water flow rate	HA	l/h	7912	9116	10236	12833	13732	14526	18242	19290	23507	26146	29796	35340
	HE	l/h							18242	19290	23507	26146	29796	35340
Pressure drops SYSTEM SIDE VERS. 2 PIPES	HA HE	kPa	31	42	25	39	31	34	42	45	45	56	66	83
Pressure drops DHW SIDE/SYSTEM SIDE '1	HA HE	kPa	13	17	21	33	38	19	31	34	51	49	35	50

ENERGY INDEX														
EER	HA		3,12	3,06	2,96	3,10	2,97	3,00	3,11	2,94	2,83	2,83	2,95	2,91
	HE								2,74	2,58	2,41	2,38	2,50	2,58
COP	HA		3,50	3,46	3,41	3,40	3,38	3,33	3,30	3,25	3,37	3,39	3,28	3,34
	HE								3,30	3,25	3,37	3,39	3,28	3,34

TOTAL RECOVERY														
Cooling capacity	HA	kW	45	52	58	68	73	86	102	110	132	147	167	200
	HE	kW							102	110	132	147	167	200
Recovered power	HA	kW	58	67	75	88	95	111	132	142	174	193	218	261
	HE	kW							132	142	174	193	218	261
Total input power	HA	kW	13,0	15,2	17,5	20,0	22,0	25,0	30,0	32,0	42,0	46,5	51,0	61,0
	HE	kW							30,0	32,0	42,0	46,5	51,0	61,0
TER - Total Efficiency Ratio		W/W	7,92	7,82	7,57	7,80	7,64	7,88	7,80	7,88	7,29	7,30	7,55	7,56
Rate of water evaporation	HA	l/h	7740	8944	9890	11696	12556	14792	17544	18920	22704	25198	28724	34400
	HE	l/h							17544	18920	22704	25198	28724	34400
Evaporator pressure drops SYSTEM SIDE	HA	kPa	30	40	24	33	26	36	39	43	42	52	61	78
	HE	kPa							39	43	42	52	61	78
Recovery water flow rate	HA	L/h	9976	11520	12900	15136	16340	19092	22704	24424	29928	33196	37496	44892
	HE	l/h							22704	24424	29928	33196	37496	44892
Recovery pressure drops DHW SIDE/SYSTEM SIDE '1	HA	kPa	20	27	33	46	54	33	47	55	82	78	56	80
	HE	kPa							47	55	82	78	56	80
Available static pressure Low static pressure pump		kPa	138	129	120	102	126	138	146	131	70	93	90	100
Available static pressure High static pressure pump		kPa	176	166	157	138	166	178	201	185	122	135	135	172

PROTECTION RATING OF THE UNIT														
IP			24	24	24	24	24	24	24	24	24	24	24	24

① COOLING

Evaporator inlet water temperature	12°C
Evaporator outlet water temperature	7°C
External air temperature	35°C
Δt water	5°C

② HEATING

Condenser inlet water temperature	40°C
Condenser outlet water temperature	45°C
External air temperature	7°C d.b. 6°C w.b.
Δt water	5°C

③ COOLING with RECOVERY

Recovery outlet water temperature	45°C
Evaporator outlet water temperature	7°C
Δt water	5°C

1 DHW SIDE/SYSTEM SIDE

DHW side, production of domestic hot water, in 2-pipe systems.
System side, production of hot water, in 4-pipe systems.

Model			0200	0240	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
ELECTRICAL DATA														
Power supply	V/ph/Hz		400V/3N/50Hz											
Total input current	HA	A	-	-	-	-	-	-	55	59	72	82	88	113
	HE	A	28	33	38	41	45	52	60	64	79	91	99	120
Maximum current (FLA)		A	36	41	46	53	58	63	76	81	100	112	122	144
Initial starting current (LRA)		A	119	150	155	184	190	200	214	220	232	243	261	320
SCROLL COMPRESSORS														
Quantity/circuit		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	3/2	3/2	4/2	4/2	4/2	4/2
SYSTEM SIDE HEAT EXCHANGER														
Water content		l	5,0	5,0	6,5	6,5	8,4	8,4	10,8	10,8	15,6	15,6	18,0	12,3
Hydraulic connections (victaulic)		∅	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	3"
HYDRONIC KIT SYSTEM SIDE (2 AND 4 PIPES)														
STORAGE														
Storage tank		l	300	300	300	300	300	300	500	500	500	500	500	700
Storage tank resistances		n°/W	1/300	1/300	1/300	1/300	1/300	1/300	1/300	1/300	1/300	1/300	1/300	2/300
EXPANSION VESSEL														
Expansion vessel		n°/l	1/24	1/24	1/24	1/24	1/24	1/24	1/24	1/24	1/24	1/24	1/24	2/24
Expansion vessel calibration		bar	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
LOW STATIC PRESSURE PUMP														
Input power		kW	1,1	1,1	1,1	1,1	1,1	1,1	1,5	1,5	1,5	1,5	1,9	3
Input current		A	2,7	2,7	2,7	2,7	2,7	2,7	3,6	3,6	3,6	3,6	5	6,2
HIGH STATIC PRESSURE PUMP														
Input power		kW	1,5	1,5	1,5	1,5	1,5	1,5	1,9	1,9	3	3	3	5,5
Input current		A	3,6	3,6	3,6	3,6	3,6	3,6	5	5	6,2	6,2	6,2	11
SAFETY VALVE														
Safety valve		n°/bar	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6
DHW/SYSTEM SIDE HEAT EXCHANGER														
Water content	C1	l	2,4	2,4	2,4	2,4	2,4	4,1	4,1	4,1	4,1	5,2	9,5	9,5
	C2	l	2,4	2,4	2,4	2,4	2,4	4,1	4,1	4,1	4,1	5,2	9,5	9,5
Hydraulic connections (victaulic)		∅	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	2"1/2	3"
HYDRONIC KIT DHW SIDE (2 PIPES) - HEATING SYSTEM SIDE (4 PIPES)														
EXPANSION VESSEL														
Expansion vessel		n°/l	1/24	1/24	1/24	1/24	1/24	1/24	1/24	1/24	1/24	1/24	1/24	2/24
Expansion vessel calibration		bar	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
LOW STATIC PRESSURE PUMP														
Input power		kW	1,1	1,1	1,1	1,1	1,5	1,5	1,9	1,9	1,9	3	3	4
Input current		A	2,7	2,7	2,7	2,7	3,6	3,6	5	5	5	6,2	6,2	8,1
HIGH STATIC PRESSURE PUMP														
Input power		kW	1,5	1,5	1,5	1,5	1,9	1,9	3	3	3	4	4	5,5
Input current		A	3,6	3,6	3,6	3,6	5	5	6,2	6,2	6,2	8,1	8,1	11
SAFETY VALVE														
Safety valve		n°/bar	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6

Model			0200	0240	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
STANDARD AXIAL FANS														
Quantity	HA	n°	6	6	6	8	8	8	2	2	2	2	3	3
	HE	n°							2	2	2	2	3	3
Air flow rate when cold	HA	m³/h	20000	20000	20000	26000	26000	26000	37000	37000	36500	36500	58000	48000
	HE	m³/h							20200	21100	21400	22400	31900	34600
Air flow rate when hot	HA	m³/h	20000	20000	20000	26000	26000	26000	37000	37000	36500	36500	58000	48000
	HE	m³/h							37000	37000	36500	36500	58000	48000
Input current when cold	HA	A	3,9	3,9	3,9	5,2	5,2	5,2	7,2	7,2	7,2	7,2	10,8	10,8
	HE	A							4,7	4,7	4,7	4,7	7,0	7,0
Input current when hot	HA	A	3,9	3,9	3,9	5,2	5,2	5,2	7,2	7,2	7,2	7,2	10,8	10,8
	HE	A							7,2	7,2	7,2	7,2	10,8	10,8
Input power when cold	HA	kW	0,9	0,9	0,9	1,2	1,2	1,2	3,4	3,4	3,4	3,4	5,1	5,1
	HE	kW							2,2	2,2	2,2	2,2	3,3	3,3
Input power when hot	HA	kW	3,9	3,9	3,9	5,2	5,2	5,2	7,2	7,2	7,2	7,2	10,8	10,8
	HE	kW							7,2	7,2	7,2	7,2	10,8	10,8
LARGER AXIAL FANS -M-														
Static pressure		Pa	50	50	50	50	50	50						
INVERTER AXIAL FANS -J-														
Static pressure		Pa							80	80	80	80	80	80
SOUND DATA ¹														
COOLING MODE FUNCTIONING														
Sound pressure	HA	dB(A)	42	42	42	43	43	44	50	50	50	51	53	53
	HE	dB(A)							42	42	42	43	45	45
Sound power	HA	dB(A)	74	74	74	75	75	76	82	82	82	83	85	85
	HE	dB(A)							74	74	74	75	77	77
FUNCTIONING IN HEATING MODE														
Sound pressure		dB(A)	42	42	42	43	43	44	50	50	50	51	53	53
Sound power		dB(A)	74	74	74	75	75	76	82	82	82	83	85	85
LOADS (The declared data can be amended any time Aermec considers it necessary)														
R410A refrigerant (C1 C2)	C1	kg	8	8	8	10	10	10	18	18	20	20	24	36
	C2	kg	8	8	8	10	10	10	15	15	20	20	24	36
Oil (C1 C2)	C1	kg	3	3,3	3,3	3,3	3,3	3,6	3,3+3,3	3,3+3,3	3,3+3,3	3,3+3,3	3,6+3,6	3,6+3,6
	C2	kg	3	3	3,3	3,3	3,3	3,6	3,6	3,6	3,3+3,3	3,3+3,3	3,6+3,6	6,7+6,7
DIMENSIONS - WEIGHTS														
Height	mm	1606	1606	1606	1606	1606	1606	1606	1875	1875	1875	1875	1875	1975
Width	mm	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1500
Depth	mm	2700	2700	2700	3200	3200	3200	3200	3280	3280	3280	3280	4280	4350
Empty weight	kg	788	790	792	862	872	894	1233	1237	1359	1378	1591	1939	

Sound power

Aermec determines sound power values in agreement with the EN ISO 9614-2 Standard, in compliance with that requested by Eurovent certification.

Sound pressure

Sound pressure measured in free field conditions with reflective surface (directivity factor Q=2) at 10mt distance from external surface of unit, in compliance with EN ISO 3744 regulations.

1. Cooling mode – The 'HE' version is low noise with temperature 12/7°C -35°C
Heating mode – The 'HE' version is low noise with temperature > 25°

8. OPERATIONAL LIMITS

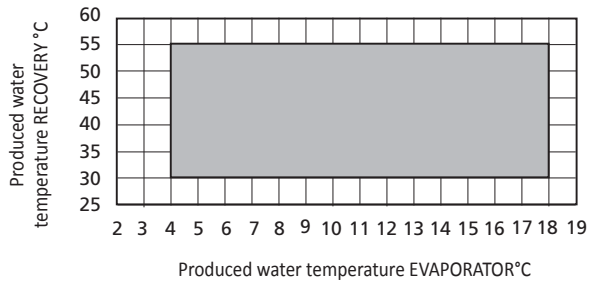
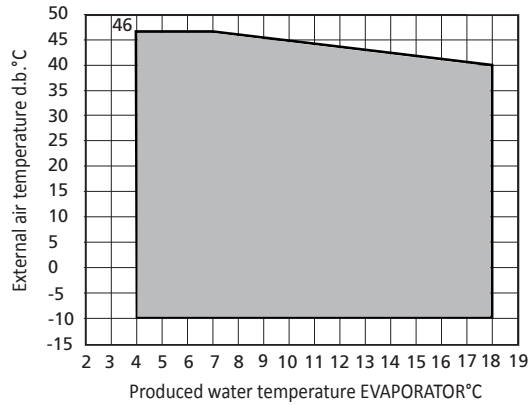
8.1. COOLING MODE¹

The units, in standard configuration, are not suitable for installation in salty environments. For functioning limits, please refer to the diagrams, valid for $\Delta t = 5^\circ\text{C}$.

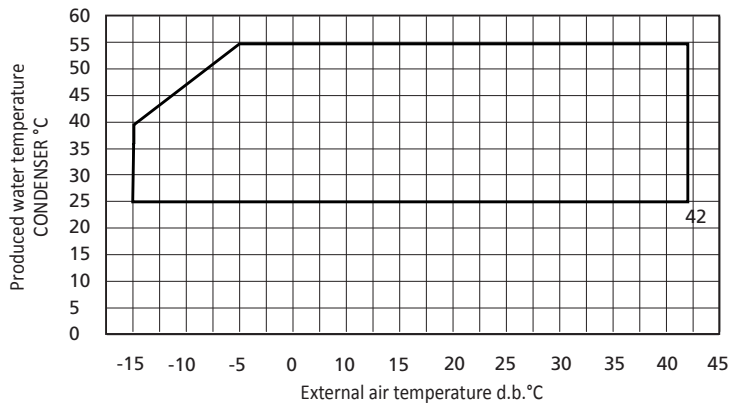


ATTENTION

In windy areas, for correct operation of DCPX it is recommended to install a windbreak barrier. It should be installed if wind velocity is beyond 2.5 m/s.



8.2. HEATING MODE¹



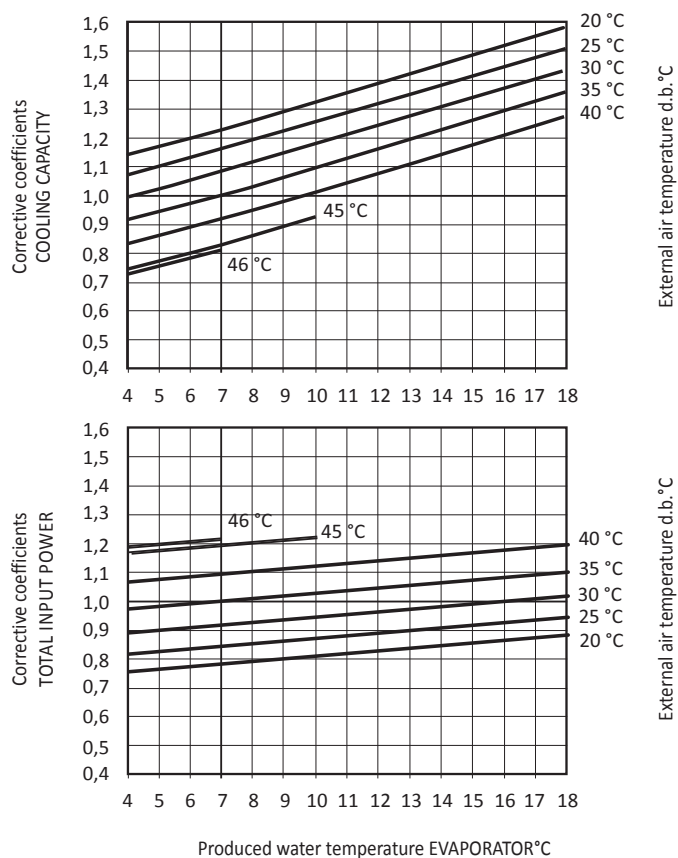
Note:

- 1 In SUMMER mode, the unit can be started with external air 46°C and inlet water 35°C. In WINTER AND RECOVERY MODE, the unit can be started with external air -15°C and inlet water 20°C. In these conditions, operation is only allowed for

a short amount of time and to bring the system to the proper temperature. To shorten this operation, it is recommended to install a three-way valve which makes it possible to bypass the water from the utilities to the plant, until achieving conditions which allow the unit to work within the allowed operating limits.

9. CORRECTIVE FACTORS FOR DATA DIFFERENT THAN NOMINAL IN COOLING MODE

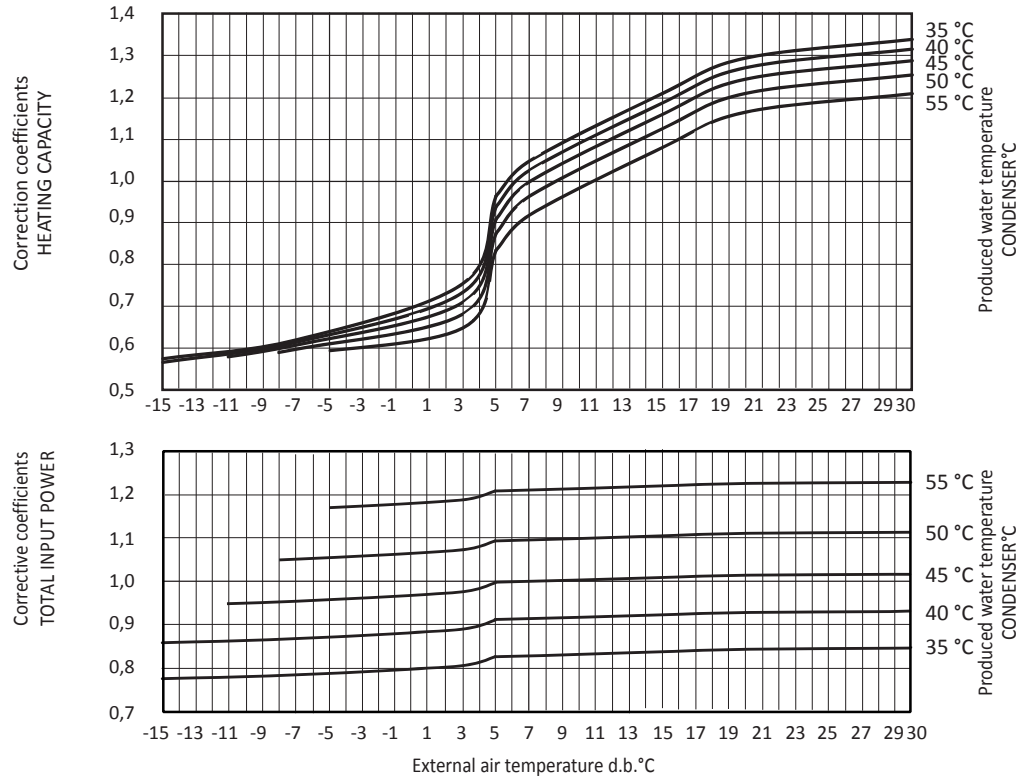
9.1. YIELDS AND ABSORPTION DIFFERENT THAN NOMINAL



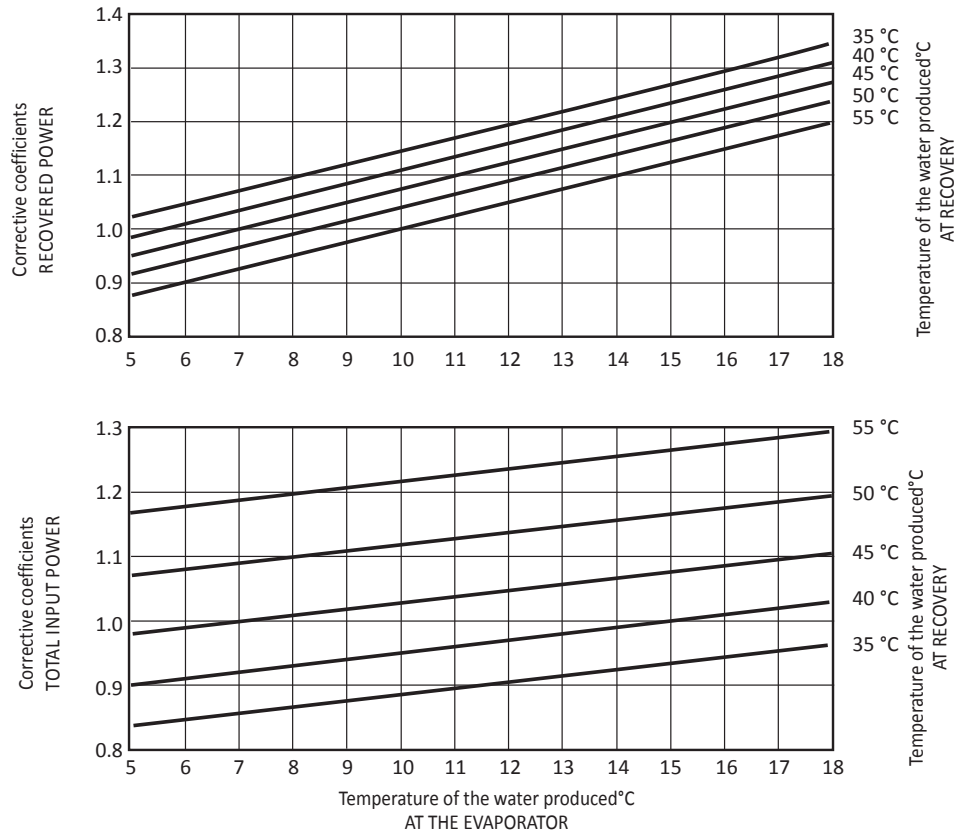
ΔT WATER DIFFERENT THAN NOMINAL (ΔT 5°C)	3	5	8	10
Cooling capacity correction factors	0,99	1	1,02	1,03
Input power correction factors	0,99	1	1,01	1,02

DEPOSIT FACTORS	[K*m2]/[W]	0.00005	0.0001	0.0002
Cooling capacity correction factors		1	0.98	0.94
Input power correction factors		1	0.98	0.95

10. CORRECTIVE FACTORS FOR DATA DIFFERENT THAN NOMINAL IN HEATING MODE



11. CORRECTIVE COEFFICIENTS OF RECOVERED HEATING CAPACITY



ΔT WATER DIFFERENT THAN NOMINAL (ΔT 5°C)	3	5	8	10
Heating capacity correction factors	0,99	1	1,01	1,02
Input power correction factors	1,01	1	0,98	0,96

12. TOTAL PRESSURE DROPS 2|4 PIPE UNITS

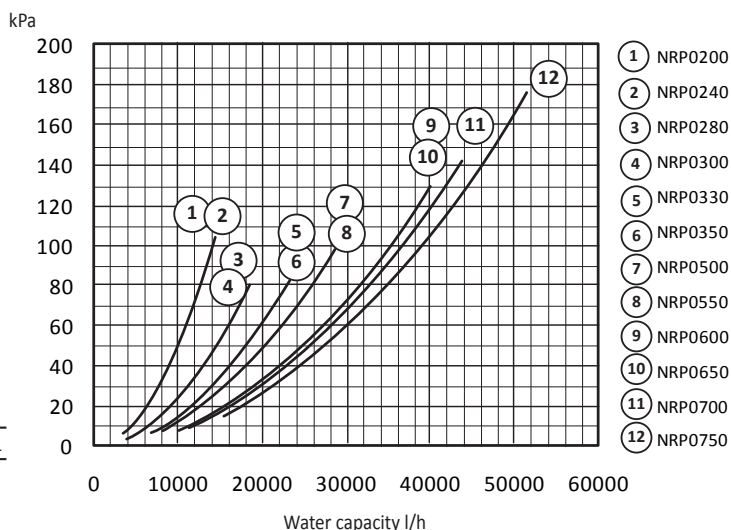
12.1. SYSTEM SIDE COLD WATER PRODUCTION (2 PIPES)

Evaporator inlet water temperature 7°C
 Evaporator outlet water temperature 12°C
 External air temperature 35°C

Average water temperature 10°C

For temperatures other than 10°C, use the corrective factors table.

Average water temperature	5	10	15	20	30	40	50
Multiplicative coefficients	1.02	1	0.98	0.97	0.95	0.93	0.91



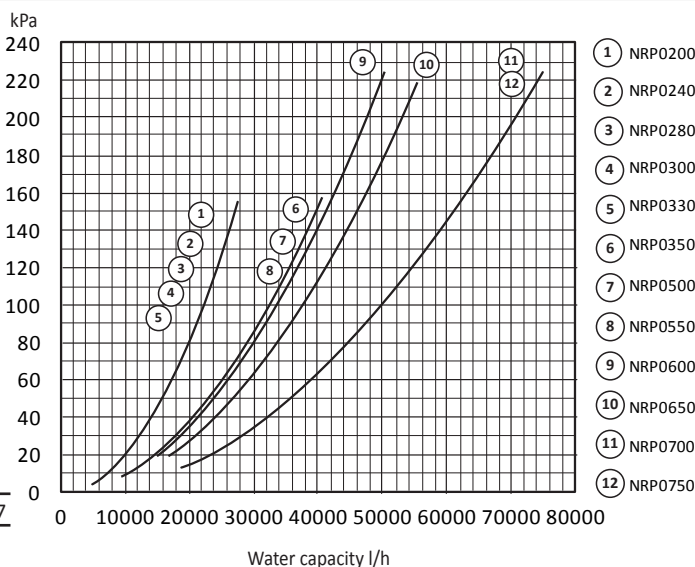
12.2. IN FUNCTIONING MODE WITH DHW SIDE RECOVERY (2 PIPES) | HOT WATER PRODUCTION SYSTEM SIDE (4 PIPES)

Recovery inlet water temperature 40°C
 Recovery outlet water temperature 45°C

Average water temperature 43°C

For temperatures other than 43°C, use the corrective factors table.

Average water temperature	23	28	33	38	43	48	53	58
Multiplicative coefficients	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97



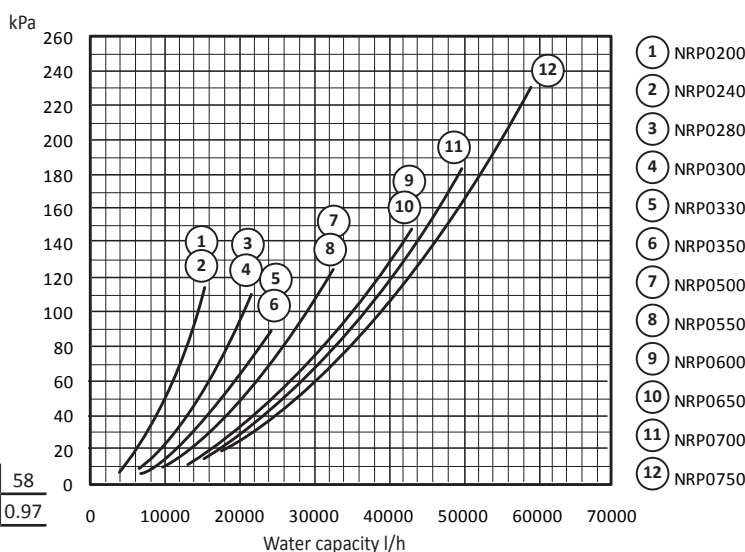
12.3. HOT WATER PRODUCTION SYSTEM INSIDE (2 PIPES)

Condenser inlet water temperature 40°C
 Condenser outlet water temperature 45°C
 External air temperature 7°C d.b. 6°C w.b.

Average water temperature 43°C

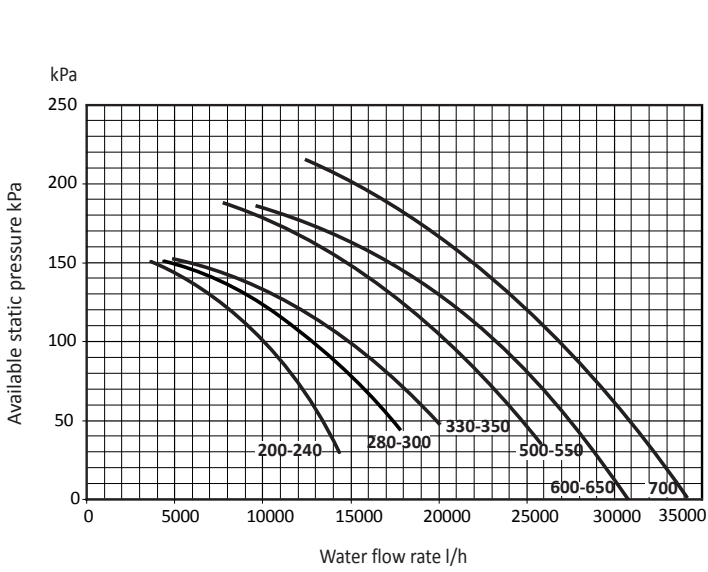
For temperatures other than 43°C, use the corrective factors table.

Average water temperature	23	28	33	38	43	48	53	58
Multiplicative coefficients	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97

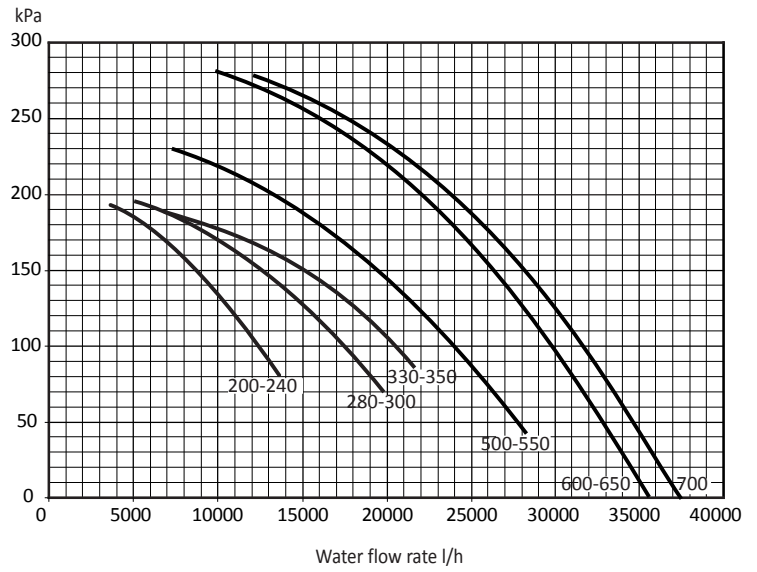


13. USEFUL STATIC PRESSURES 2|4-PIPE SYSTEM

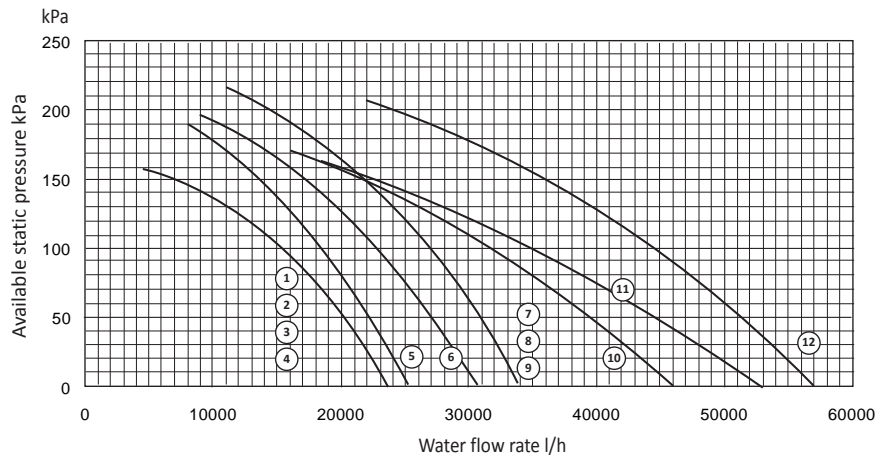
13.1. LOW STATIC PRESSURE PUMPS IN COOLING MODE (SYSTEM SIDE)



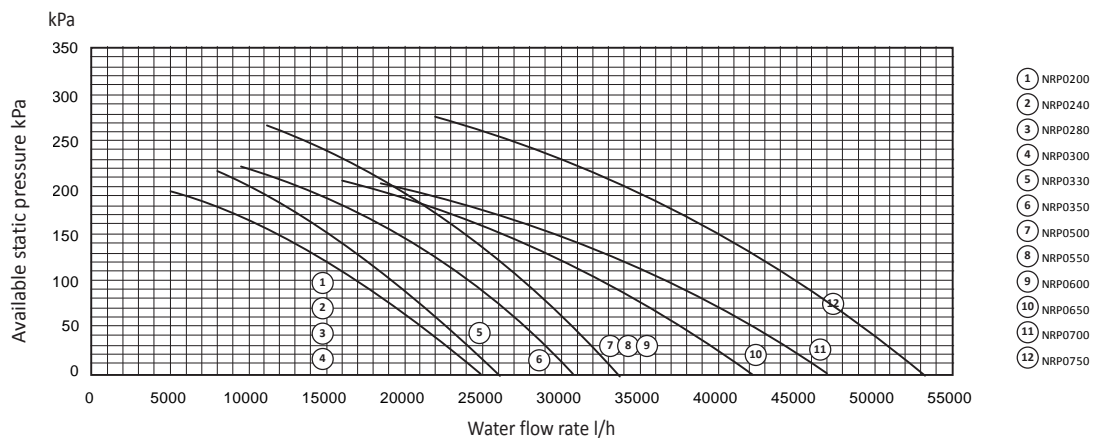
13.2. HIGH STATIC PRESSURE PUMPS IN COOLING MODE (SYSTEM SIDE)



13.3. LOW STATIC PRESSURE PUMPS DHW SIDE (2 PIPES) | HEATING SIDE (4 PIPES)



13.4. HIGH STATIC PRESSURE PUMPS DHW SIDE (2 PIPES) | HEATING SIDE (4 PIPES)



14. ETHYLENE GLYCOL SOLUTIONS

- The corrective factors of cooling capacity and input power take into account the presence of glycol and the difference in evaporation temperatures.
- The pressure drop correction factor considers the different flow rate resulting from the application of the water flow rate correction factor.
- The water flow rate correction factor is calculated to keep the same Δt that would be present with the absence of glycol.

NOTE:

On the following page an example is given to help graph reading.

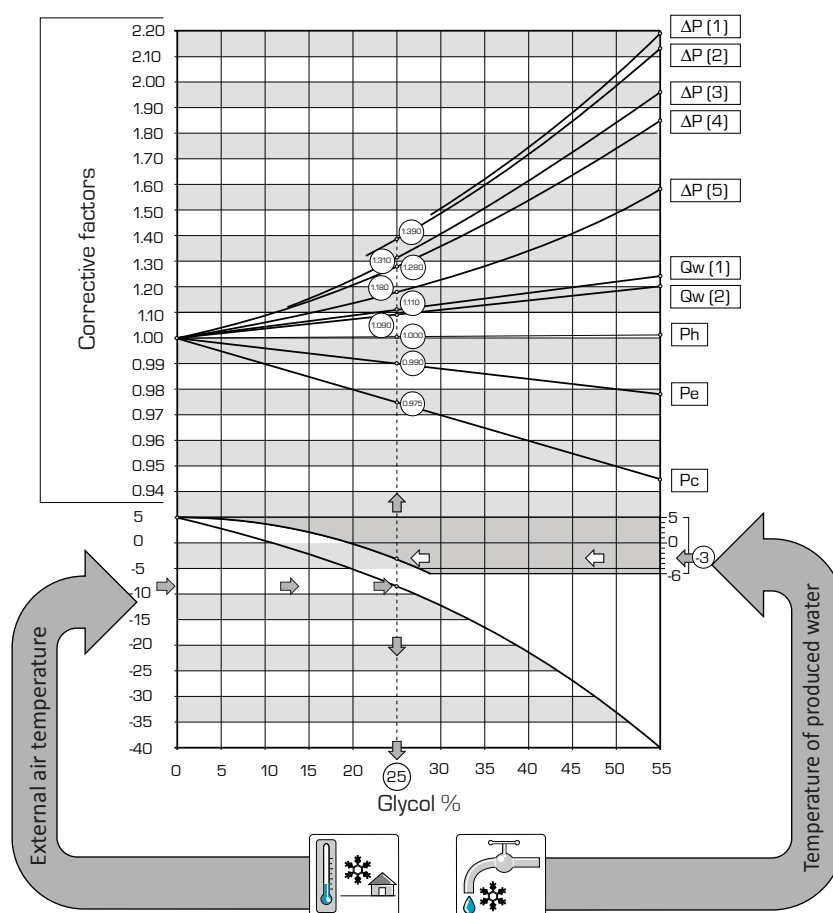
To determine the percentage of glycol required, see diagram below; this percentage calculation can take into consideration one of the following factors.

Depending on which fluid is considered (water or air), the graph is interpreted by the right or left side at the crossing point on the curves with the external temperature line or the water produced line. A point from which the vertical line will pass is obtained and this will distinguish both glycol percentage and relative correction coefficients.

14.1. HOW TO INTERPRET GLYCOL CURVES

The curves shown in the diagram summarise a significant number of data, each of which is represented by a specific curve. In order to use these curves correctly it is first necessary to make some initial reflections.

- If you wish to calculate the percentage of glycol on the basis of the external air temperature, enter from the left axis and on reaching the curve draw a vertical line, which in turn will intercept all the other curves; the points obtained from the upper curves represent the coefficients for the correction of the cooling capacity and input power, the flow rates and the pressure drops (remember that these coefficients must be multiplied by the nominal value of the size in question); while the glycol percentage value recommended to produce desired water temperature is on the lower axis.
- If you wish to calculate the percentage of glycol on the basis of the temperature of the water produced, enter from the right axis and on reaching the curve draw a vertical line, which in turn will intercept all the other curves; the points obtained from the upper curves represent the coefficients for the correction of the cooling capacity and input power, the flow rates and the pressure drops (remember that these coefficients must be multiplied by the nominal value of the size in question); while the lower axis recommends the glycol percentage value necessary to produce water at the desired temperature.
- **Initial rates for "EXTERNAL AIR TEMPERATURE" and "TEMPERATURE OF PRODUCED WATER", are not directly related, therefore it is not possible to refer to the curve of one of these rates to obtain corresponding point on the curve of the other rate.**



KEY:

- Pc Corrective factors for cooling capacity
- Pe Corrective factors of the input power
- Ph Corrective factor for heating capacity
- ΔP (1) Corrective factor for pressure drops with an average fluid temp. = -3.5°C
- ΔP (2) Corrective factor for pressure drops with an average fluid temp. = 0.5°C
- ΔP (3) Corrective factor for pressure drops with an average fluid temp. = 5.5°C
- ΔP (4) Corrective factor for pressure drops with an average fluid temp. = 9.5°C
- ΔP (5) Corrective factor for pressure drops with an average fluid temp. = 47.5°C
- Qw (1) Corrective factor for pressure drops (evap) with an average fluid temp. = 9.5°C
- Qw (2) Corrective factor of flow rates (condenser) with an average fluid temp. = 47.5°C

NOTE

Although the graph shows a max external air temperature of -40°C , the unit operational limits must be complied with.

15. EXPANSION VESSEL CALIBRATION

15.1.1. EXPANSION VESSEL CALIBRATION

Standard pre-load pressure value of the expansion vessel is 1.5 bar, whereas volume is 24 litres.

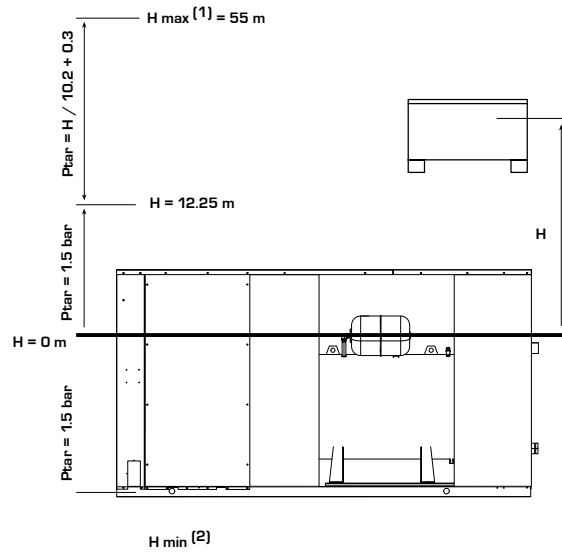
Maximum pressure 6 bar.

Calibration of the vessel must be regulated using the maximum level difference (H) of the user (see diagram) by using the following formula:

$$p \text{ (calibration) [bar]} = H \text{ [m]} / 10.2 + 0.3.$$

For example: if level difference (H) is equal to 20 m, the calibration value of the vessel will be 2.3 bar.

If calibration value obtained from formula is less than 1.5 bar (that is for $H < 12.25$), keep calibration as standard.



KEY

- (1) Check that highest installation is not higher than 55 metres.
- (2) Ensure that lowest installation can withstand global pressure in that position.

16. MINIMUM WATER CONTENT

NRP		0200	0240	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
Number of compressors	n°	2	2	2	2	2	2	3	3	4	4	4	4
Minimum water content admitted COLD SIDE	l/kW	7	7	7	7	7	7	7	7	7	7	7	7
Minimum water content admitted the HOT SIDE	l/kW	10	10	10	10	10	10	10	10	10	10	10	10
Recommended water content COOLING SIDE HEATING SIDE	l/kW	14	14	14	14	14	14	14	14	14	14	14	14



ATTENTION

It is recommended to design systems with high water content (minimum recommended values shown in table), to limit:

1. The hourly number of inversions between functioning modes.
2. Decrease in water temperature during winter defrost cycles.

17. PARTIALISATIONS

COOLING

Evaporator inlet water temperature	7°C
Evaporator outlet water temperature	12°C
Condenser air temperature	35°C
Δt water	5°C

HEATING ONLY FOR 4-PIPE VERSIONS ????

Condenser inlet water temperature	40°C
Condenser outlet water temperature	45°C
Evaporator air temperature	7°C d.b. 6°C w.b.
Δt water	5°C

	Power steps			
	1 st	2 nd	3 rd	4 th
COOLING CAPACITY %				
0200	55	100		
0240	55	100		
0280	55	100		
0300	55	100		
0330	55	100		
0350	55	100		
0500	40	75	100	
0550	36	68	100	
0600	25	50	75	100
0650	25	50	75	100
0700	25	50	75	100
0750	27	53	77	100
INPUT POWER %				
0200	45	100		
0240	45	100		
0280	45	100		
0300	45	100		
0330	45	100		
0350	45	100		
0500	30	65	100	
0550	26	58	100	
0600	20	45	70	100
0650	20	45	70	100
0700	20	45	70	100
0750	23	47	73	100
HEATING CAPACITY %				
0200	50	100		
0240	50	100		
0280	50	100		
0300	50	100		
0330	50	100		
0350	50	100		
0500	35	70	100	
0550	31	63	100	
0600	23	48	73	100
0650	23	48	73	100
0700	23	48	73	100
0750	27	52	73	100
INPUT POWER %				
0200	45	100		
0240	45	100		
0280	45	100		
0300	45	100		
0330	45	100		
0350	45	100		
0500	30	65	100	
0550	26	58	100	
0600	20	45	70	100
0650	20	45	70	100
0700	20	45	70	100
0750	23	47	73	100

18. SOUND DATA

**ATTENTION**

The sound data is calculated with STANDARD fans!

Sound power

Aermec determines sound power values in agreement with the 9614-2 Standard, in compliance with that requested by Eurovent certification.

Sound pressure

Sound pressure measured in free field conditions with reflective surface (directivity factor Q=2) in compliance with ISO 3744 Standard.

Cooling mode – The 'HE' version is low noise with temperature 12/7°C -35°C

Heating mode – The 'HE' version is low noise with temperature > 25°

NRP	VERS	Total sound levels			Octave band [Hz]						
		Pow. dB(A)	Pressure.		125	250	500	1000	2000	4000	8000
			dB(A) 10 m	dB(A) 1 m							
COOLING MODE FUNCTIONING											
0200	HE	74	42	57	72.2	61.1	66.4	63.5	61.0	50.0	43.7
0240	HE	74	42	57	72.2	61.1	66.4	63.5	61.0	50.0	43.7
0280	HE	74	42	57	72.2	61.1	66.4	63.5	61.0	50.0	43.7
0300	HE	75	43	57	73.1	62.2	67.1	64.3	62.0	51.0	44.5
0330	HE	75	43	57	73.1	62.0	67.1	64.3	62.1	51.3	44.8
0350	HE	76	44	58	74.1	63.0	68.1	65.6	62.6	53.0	45.1
0500	HE	74	42	56	60.9	63.9	66.9	68.8	67.1	63.3	56.9
0550	HE	74	42	56	61.4	64.6	68.1	68.8	67.2	63.3	56.9
0600	HE	74	42	56	61.6	65.1	68.2	68.9	67.2	63.5	57.4
0650	HE	75	43	57	62.1	65.1	68.5	69.1	68.4	65.5	61.5
0700	HE	77	45	58	65.7	67.6	68.6	69.8	71.4	65.7	62.0
0750	HE	77	45	58	65.9	67.9	68.8	69.8	71.2	65.5	61.9
FUNCTIONING IN HEATING MODE											
0500	HA	82	50	64	68.1	69.8	74.0	76.7	76.5	74.1	63.8
0550	HA	82	50	64	68.1	69.9	75.0	77.5	76.5	72.0	61.0
0600	HA	82	50	64	68.9	71.4	74.8	77.7	76.4	72.0	59.9
0650	HA	83	51	65	69.4	70.6	75.1	77.9	78.0	74.6	64.1
0700	HA	85	53	66	72.9	73.2	78.0	78.3	80.0	76.6	65.2
0750	HA	85	53	66	72.8	73.3	78.1	78.5	80.0	76.2	65.2
FUNCTIONING IN HEATING MODE											
0200	HE	74	42	57	72.2	61.1	66.4	63.5	61.0	50.0	43.7
0240	HE	74	42	57	72.2	61.1	66.4	63.5	61.0	50.0	43.7
0280	HE	74	42	57	72.2	61.1	66.4	63.5	61.0	50.0	43.7
0300	HE	75	43	57	73.1	62.2	67.1	64.3	62.0	51.0	44.5
0330	HE	75	43	57	73.1	62.0	67.1	64.3	62.1	51.3	44.8
0350	HE	76	44	58	74.1	63.0	68.1	65.6	62.6	53.0	45.1
0500	HE	82	50	64	68.1	69.8	74.0	76.7	76.5	74.1	63.8
0550	HE	82	50	64	68.1	69.9	75.0	77.5	76.5	72.0	61.0
0600	HE	82	50	64	68.9	71.4	74.8	77.7	76.4	72.0	59.9
0650	HE	83	51	65	69.4	70.6	75.1	77.9	78.0	74.6	64.1
0700	HE	85	53	66	72.9	73.2	78.0	78.3	80.0	76.6	65.2
0750	HE	85	53	66	72.8	73.3	78.1	78.5	80.0	76.2	65.2
0500	HA	82	50	64	68.1	69.8	74.0	76.7	76.5	74.1	63.8
0550	HA	82	50	64	68.1	69.9	75.0	77.5	76.5	72.0	61.0
0600	HA	82	50	64	68.9	71.4	74.8	77.7	76.4	72.0	59.9
0650	HA	83	51	65	69.4	70.6	75.1	77.9	78.0	74.6	64.1
0700	HA	85	53	66	72.9	73.2	78.0	78.3	80.0	76.6	65.2
0750	HA	85	53	66	72.8	73.3	78.1	78.5	80.0	76.2	65.2

19. CALIBRATIONS OF SAFETY AND CONTROL PARAMETERS

COOLING SET	min	max	default
Water inlet temperature (cooling mode)	-10°C	20°C	7°C
HEATING SET			
Water inlet temperature (heating mode)	30°C	55°C	50°C
ANTI-FREEZE ALARM INTERVENTION			
Intervention temperature on EVAPORATOR side	-15°C	4°C	3°C
TOTAL DIFFERENTIAL			
Proportional temperature band within which the compressors are activated and deactivated	3°C	10°C	5°C

COMPRESSOR MAGNET CIRCUIT BREAKERS		0200	0240	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
MTC1	A	17	17	23	28	28	29	23	28	28	28	29	29
MTC1A	A	-	-	-	-	-	-	23	23	23	28	29	29
MTC2	A	17	23	23	23	28	29	28	29	28	28	29	40
MTC2A	A	-	-	-	-	-	-			23	28	29	40
MANUALLY RESET HIGH PRESSURE SWITCH													
PA	bar	40	40	40	40	40	40	40	40	40	40	40	40
HIGH PRESSURE TRANSDUCER													
TAP	bar	39	39	39	39	39	39	39	39	39	39	39	39
LOW PRESSURE TRANSDUCER													
TBP	bar	2	2	2	2	2	2	2	2	2	2	2	2
COOLING CIRCUIT SAFETY VALVES													
HP	bar	45	45	45	45	45	45	45	45	45	45	45	45
LP	bar	30	30	30	30	30	30	30	30	30	30	30	30
MAGNETOTHERMIC FANS													
HE VERSIONS	A	4	4	6	8	8	8	2	2	2	2	3	14

**Standards complied with
WHEN DESIGNING and
CONSTRUCTING the unit:
SAFETY**

1. Machinery directive 2006/42/EC
2. Low voltage directive LVD 2006/95/EC
3. Electromagnetic compatibility directive EMC 2004/108/EC
4. Directive regarding pressurised devices PED 97/23/EC, EN 378, UNI12735, UNI14276

ELECTRIC PART

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

ACOUSTIC PART

1. ISO DIS 9614/2
(intensimetric method)

**PROTECTION RATING
IP24**

REFRIGERANT GAS

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



ATTENTION

Tampering, removal, lack of the identification plate or anything else does not allow the sure identification of the product and will make any installation or maintenance operation to be performed difficult.

20. GENERAL WARNINGS

AERMEC NRP heat pumps are constructed according to the recognised technical standards and safety regulations. They are designed for summer and winter conditioning and the production of domestic hot water. Any contractual or extracontractual liability of the Company is excluded for injury/damage to persons, animals or objects owing to installation, regulation and maintenance errors or improper use. All uses not expressly indicated in this manual are prohibited.

20.1. PRESERVATION OF THE DOCUMENTATION

The instructions along with all the related documentation must be given to the user of the system, who assumes the responsibility to conserve the instructions so that they are always at hand in case of need.

Read this sheet carefully; the execution of all works must be performed by qualified staff, according to Standards in force on this subject in different countries.

20.2. INSTALLATION

The unit must be installed in such a way that maintenance and/or repairs can be carried out.

20.3. WARRANTY

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.

Do not modify or tamper with the heat pump as dangerous situations can be created and the manufacturer will not be liable for any damage caused. The validity of the warranty shall be void in the event of failure to comply with the above-mentioned indications.

20.4. WARNINGS REGARDING SAFETY AND INSTALLATION STANDARDS

The heat pump must be installed by a qualified and suitably trained technician, in compliance with the national legislation in force in the country of destination.

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 AVOID ALL RISKS.** 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.

21. PRODUCT IDENTIFICATION

The NRP multipurpose appliances can be identified through:

PACKING LABEL

which shows the product identification data.

TECHNICAL PLATE

22. RECEIPT OF THE PRODUCT AND INSTALLATION

22.1. RECEIPT AND HANDLING

The machine is sent from the factory wrapped with estincoil placed on a pallet.

Before handling the unit, verify the lifting capacity of the machines used.

Handling must be performed by qualified, suitably equipped staff.

22.2. HANDLING THE MACHINE:

Whenever the machine must be lifted using belts, place protections between the belts and the framework to prevent damage to the structure. Insert pipes (NOT SUPPLIED) in the pre-arranged holes (NRP 0200 - 0700) long enough to allow fixing of lifting belts.

NRP 0750 units are supplied with eyebolts; they must be lifted using suitable belts hooked to all the installed eyebolts.

22.2.1. LIFTING STANDARDS

1. All panels must be tightly fixed before moving the unit;
2. before lifting, check the specific weight on the technical plate;
3. use all, and only, the lifting points indicated;
4. use ropes in compliance with Standards and of equal length;
5. use a spacer beam in compliance with Standards (not included);
6. handle the unit with care and without sudden movements.

It is prohibited to stop under the unit during lifting operations.

- **The machine must always be kept in a vertical position.**

- **The instructions found on the machine are an integral part of the same. They must be read and kept carefully.**

- **ATTENTION: The units CANNOT be stacked.**

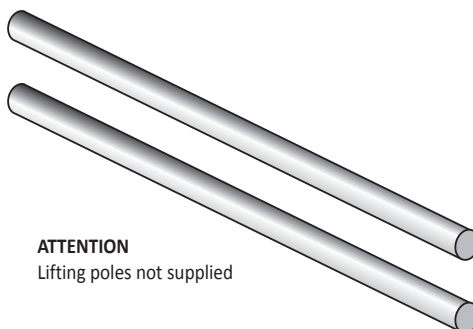
22.3. SELECTION AND PLACE OF INSTALLATION

The NRP air/water OUTDOOR heat pump with gas side conversion (R410A) is sent from the factory already inspected and only requires electric and hydraulic connections in the place of installation.

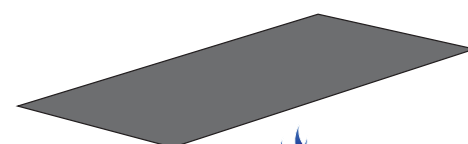
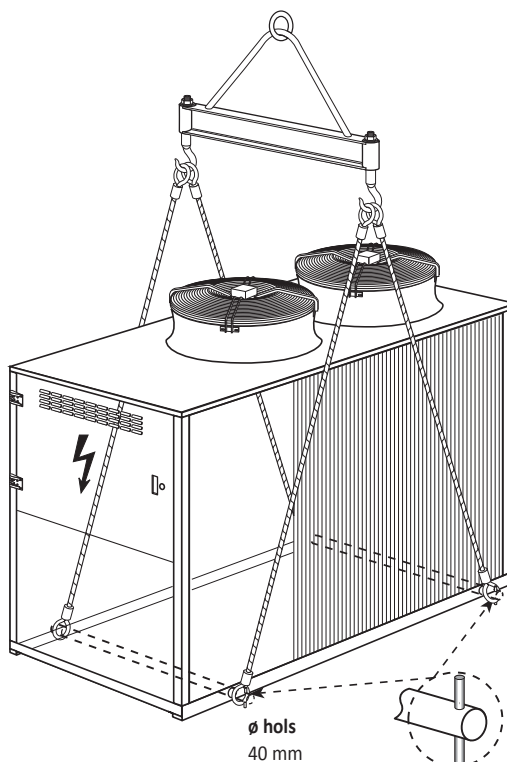
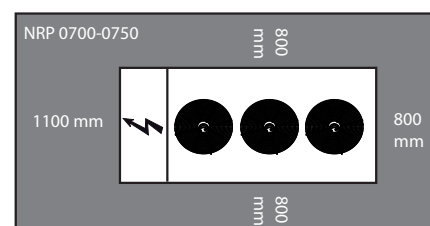
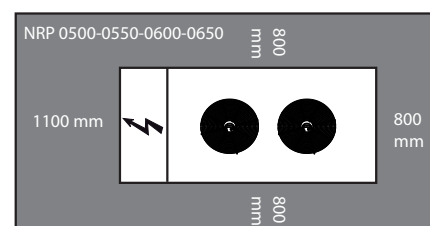
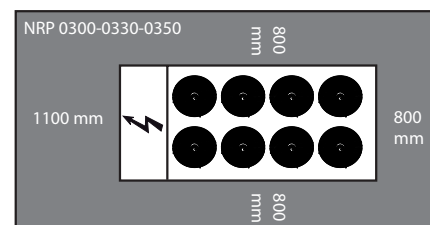
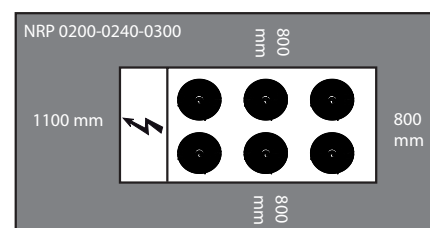
Before beginning the installation process, decide with the client where the unit is to be installed, whilst paying attention to the following:

1. The support surface must be capable of supporting the unit weight.
2. The safety distances between the units and other appliances or structures must be scrupulously respected.
3. The unit must be installed by a qualified technician in compliance with national laws in the country of destination.
4. It is mandatory to foresee to the necessary technical space in order to allow ROUTINE AND EXTRAORDINARY MAINTENANCE interventions.

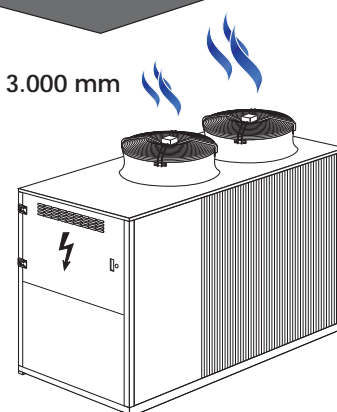
5. Remember that during operation, the chiller can cause vibrations; therefore "VT" anti-vibration mounts (ACCESSORIES) are recommended, fixed on the base according to the assembly layout.
6. Fix the unit checking that it is level.



ATTENTION
Lifting poles not supplied

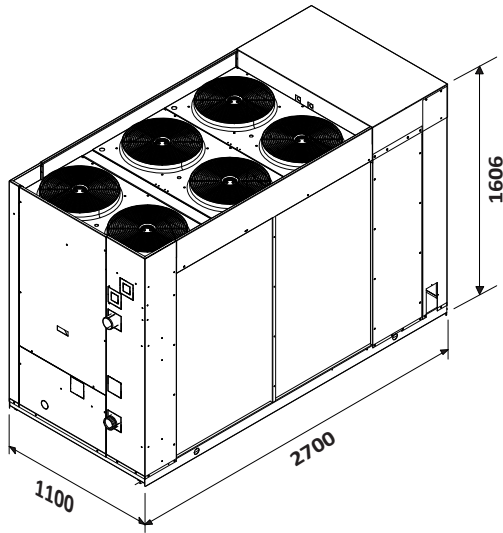


3.000 mm



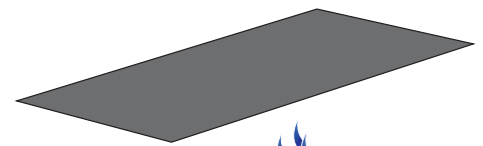
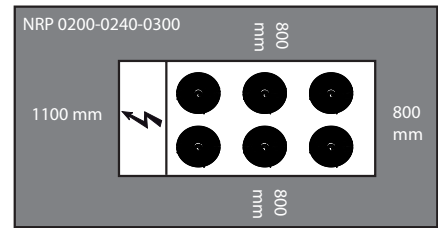
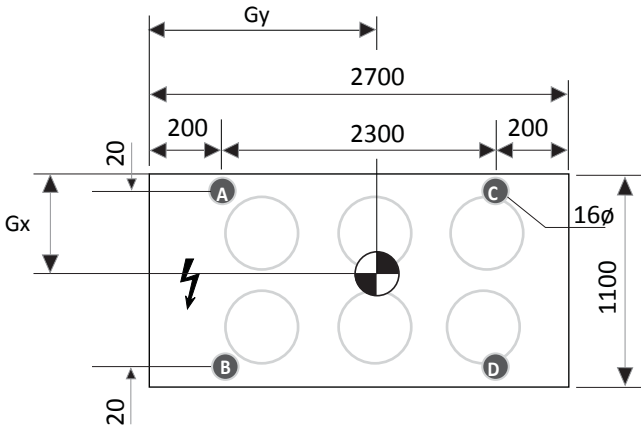
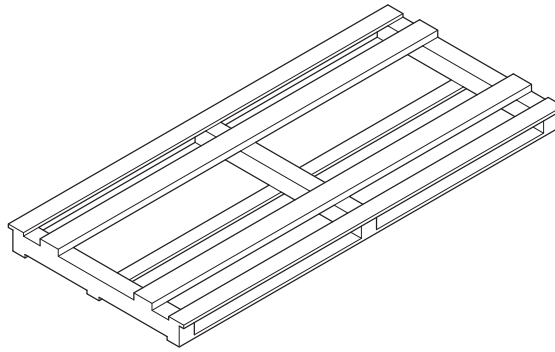
23. DIMENSIONS

23.1. NRP0200 ÷ 0280

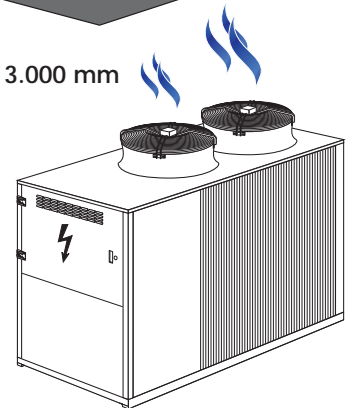


ATTENTION

The unit is supplied fastened to a pallet; use poles (not supplied) for handling with forklift trucks and belts.



3.000 mm



WEIGHT OF UNITS WHEN EMPTY

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				VT KIT
				Gx	Gy	A	B	C	D	
NRP0200	00	788	31	557	1007	24%	27%	23%	26%	
NRP0240	00	790	31	557	1005	24%	27%	23%	26%	
NRP0280	00	792	31	557	1003	24%	27%	23%	26%	17

WEIGHT OF UNITS WHEN RUNNING

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				
				Gx	Gy	A	B	C	D	
NRP0200	00	818		556	1017	24%	26%	24%	26%	
NRP0240	00	820		556	1015	24%	27%	24%	26%	
NRP0280	00	823		557	1013	24%	27%	23%	26%	17

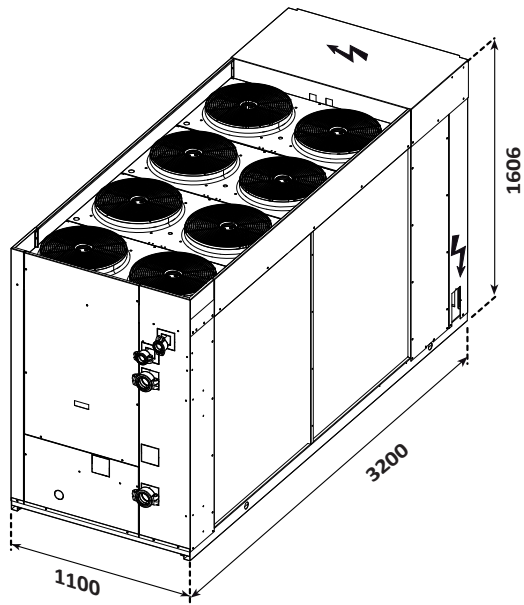
WEIGHT OF UNITS WHEN EMPTY

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				VT KIT
				Gx	Gy	A	B	C	D	
NRP0200	01-03	918	31	556	1092	22%	24%	25%	28%	
NRP0200	02-04	933	31	556	1109	22%	24%	26%	28%	
NRP0200	1 pump	813	31	556	1042	23%	26%	24%	27%	
NRP0200	2 pumps	828	31	556	1062	23%	25%	25%	27%	
NRP0200	3 pumps	843	31	556	1081	22%	25%	25%	28%	
NRP0200	4 pumps	858	31	556	1100	22%	24%	26%	28%	
NRP0240	01-03	920	31	556	1090	22%	25%	25%	28%	
NRP0240	02-04	935	31	556	1107	22%	24%	26%	28%	
NRP0240	1 pump	815	31	557	1040	23%	26%	24%	27%	
NRP0240	2 pumps	830	31	556	1060	23%	25%	25%	27%	
NRP0240	3 pumps	845	31	556	1079	23%	25%	25%	28%	
NRP0240	4 pumps	860	31	556	1098	22%	24%	25%	28%	
NRP0280	01-03	922	31	556	1089	22%	25%	25%	28%	13
NRP0280	02-04	937	31	556	1105	22%	24%	26%	28%	13
NRP0280	1 pump	817	31	557	1038	23%	26%	24%	27%	17
NRP0280	2 pumps	832	31	556	1058	23%	25%	25%	27%	17
NRP0280	3 pumps	847	31	556	1077	23%	25%	25%	28%	17
NRP0280	4 pumps	862	31	556	1096	22%	24%	25%	28%	17

WEIGHT OF UNITS WHEN RUNNING

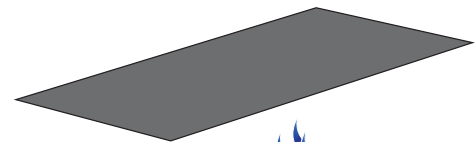
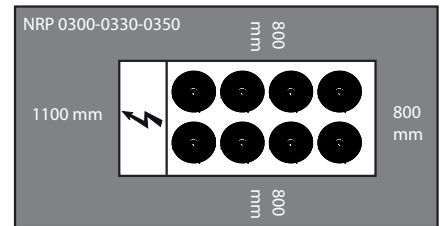
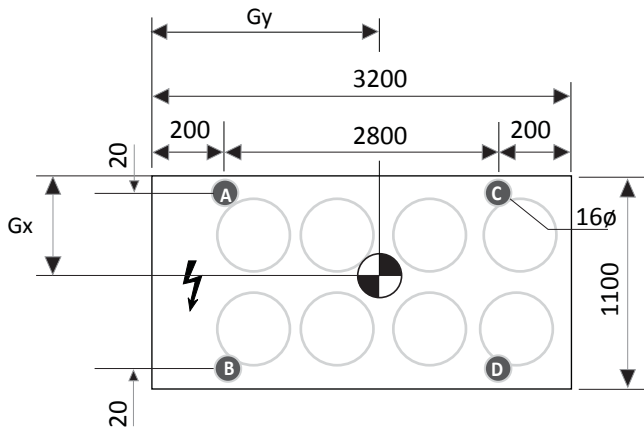
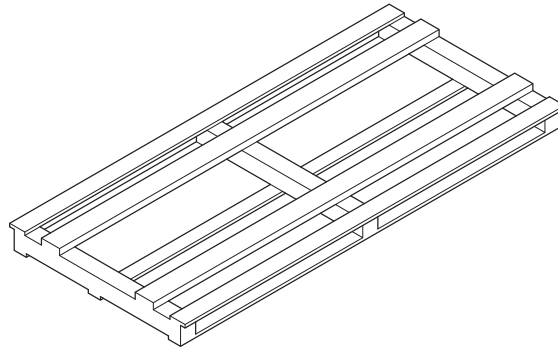
	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				VT KIT
				Gx	Gy	A	B	C	D	
NRP0200	01-03	1248		554	1204	20%	22%	28%	31%	
NRP0200	02-04	1263		554	1216	19%	21%	28%	31%	
NRP0200	1 pump	853		556	1056	23%	25%	24%	27%	
NRP0200	2 pumps	868		556	1075	23%	25%	25%	28%	
NRP0200	3 pumps	883		556	1093	22%	24%	25%	28%	
NRP0200	4 pumps	898		556	1111	22%	24%	26%	28%	
NRP0240	01-03	1250		554	1203	20%	22%	28%	31%	
NRP0240	02-04	1265		554	1214	19%	21%	28%	31%	
NRP0240	1 pump	855		556	1054	23%	25%	24%	27%	
NRP0240	2 pumps	870		556	1073	23%	25%	25%	27%	
NRP0240	3 pumps	885		556	1091	22%	25%	25%	28%	
NRP0240	4 pumps	900		556	1109	22%	24%	26%	28%	
NRP0280	01-03	1273		554	1206	20%	22%	28%	31%	13
NRP0280	02-04	1288		554	1217	19%	21%	28%	31%	13
NRP0280	1 pump	858		556	1052	23%	26%	24%	27%	17
NRP0280	2 pumps	873		556	1070	23%	25%	25%	27%	17
NRP0280	3 pumps	888		556	1089	22%	25%	25%	28%	17
NRP0280	4 pumps	903		556	1106	22%	24%	26%	28%	17

23.2. NRP0300 - 0330 - 0350

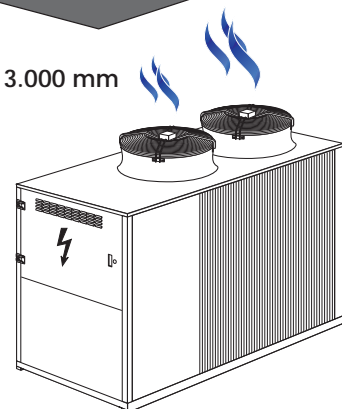


ATTENTION

The unit is supplied fastened to a pallet; use poles (not supplied) for handling with forklift trucks and belts.



3.000 mm



WEIGHT OF UNITS WHEN EMPTY

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				VT KIT
				Gx	Gy	A	B	C	D	
NRP0300	00	862	31	556	1163	21%	23%	27%	30%	17
NRP0330	00	872	31	557	1156	21%	23%	27%	30%	17
NRP0350	00	894	31	557	1143	21%	23%	26%	29%	17

WEIGHT OF UNITS WHEN RUNNING

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				
				Gx	Gy	A	B	C	D	
NRP0300	00	893		556	1167	20%	23%	27%	30%	17
NRP0330	00	905		556	1167	20%	23%	27%	30%	17
NRP0350	00	930		556	1144	21%	23%	27%	29%	17

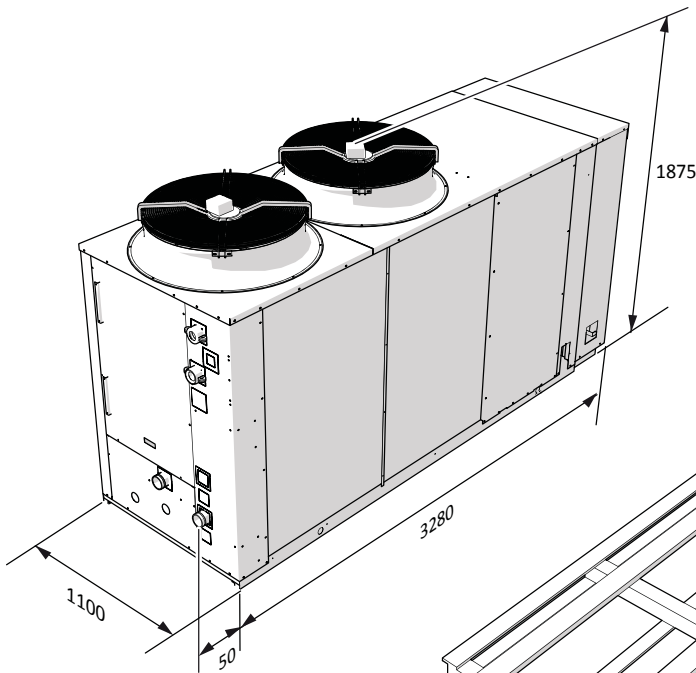
WEIGHT OF UNITS WHEN EMPTY

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				VT KIT
				Gx	Gy	A	B	C	D	
				NRP0300	01-03	992	31	556	1109	
NRP0300	02-04	1007	31	556	1236	19%	21%	29%	32%	13
NRP0300	1 pump	887	31	556	1065	23%	25%	25%	27%	17
NRP0300	2 pumps	902	31	556	1083	22%	25%	25%	28%	17
NRP0300	3 pumps	917	31	556	1100	22%	24%	26%	28%	17
NRP0300	4 pumps	932	31	556	1117	22%	24%	26%	29%	17
NRP0330	01-03	1002	31	556	1104	22%	24%	26%	28%	13
NRP0330	02-04	1017	31	556	1229	19%	21%	29%	31%	13
NRP0330	1 pump	897	31	556	1059	23%	25%	25%	27%	17
NRP0330	2 pumps	912	31	556	1077	23%	25%	25%	28%	17
NRP0330	3 pumps	927	31	556	1094	22%	24%	25%	28%	17
NRP0330	4 pumps	942	31	556	1111	22%	24%	26%	28%	17
NRP0350	01-03	1024	31	556	1093	22%	24%	25%	28%	13
NRP0350	02-04	1039	31	556	1215	19%	21%	28%	31%	13
NRP0350	1 pump	919	31	557	1048	23%	26%	24%	27%	17
NRP0350	2 pumps	934	31	556	1066	23%	25%	25%	27%	17
NRP0350	3 pumps	949	31	556	1083	22%	25%	25%	28%	17
NRP0350	4 pumps	964	31	556	1099	22%	24%	25%	28%	17

WEIGHT OF UNITS WHEN RUNNING

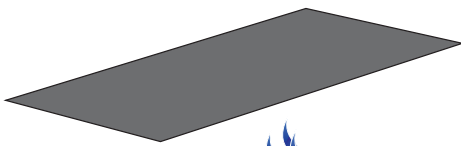
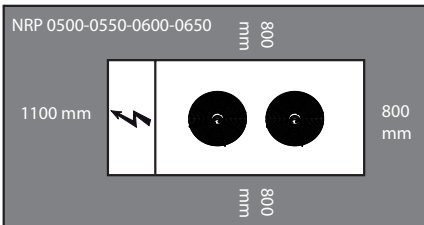
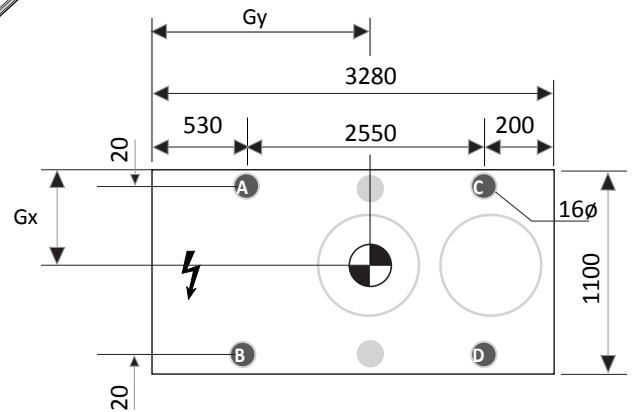
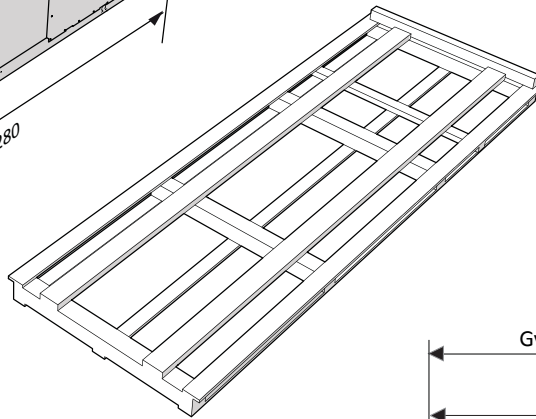
	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				VT KIT
				Gx	Gy	A	B	C	D	
				NRP0300	01-03	893		554	1210	
NRP0300	02-04	1323		554	1304	17%	19%	30%	33%	13
NRP0300	1 pump	1338		556	1076	23%	25%	25%	28%	17
NRP0300	2 pumps	928		556	1093	22%	24%	25%	28%	17
NRP0300	3 pumps	943		556	1110	22%	24%	26%	28%	17
NRP0300	4 pumps	958		556	1126	21%	24%	26%	29%	17
NRP0330	01-03	1335		554	1205	20%	22%	28%	31%	13
NRP0330	02-04	1350		554	1298	18%	19%	30%	33%	13
NRP0330	1 pump	940		556	1070	23%	25%	25%	27%	17
NRP0330	2 pumps	955		556	1087	22%	25%	25%	28%	17
NRP0330	3 pumps	970		556	1103	22%	24%	26%	28%	17
NRP0330	4 pumps	985		556	1119	22%	24%	26%	29%	17
NRP0350	01-03	1360		554	1194	20%	22%	28%	30%	13
NRP0350	02-04	1375		554	1285	18%	20%	30%	33%	13
NRP0350	1 pump	965		556	1058	23%	25%	25%	27%	17
NRP0350	2 pumps	980		556	1075	23%	25%	25%	28%	17
NRP0350	3 pumps	995		556	1091	22%	25%	25%	28%	17
NRP0350	4 pumps	1010		556	1107	22%	24%	26%	28%	17

23.3. NRP 0500 - 0550 - 0600 - 0650

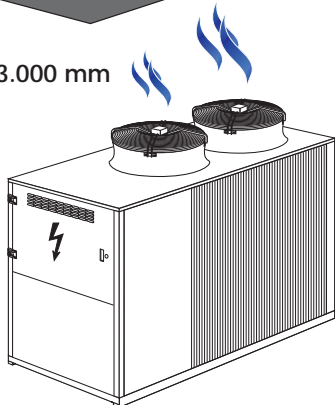


ATTENTION

The unit is supplied fastened to a pallet; use poles (not supplied) for handling with forklift trucks and belts.



3.000 mm



WEIGHT OF UNITS WHEN EMPTY

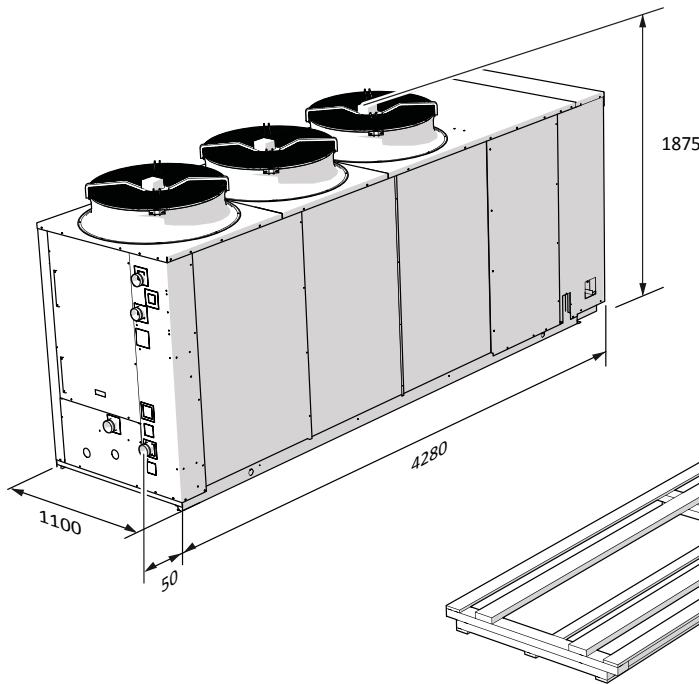
	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				VT KIT
				Gx	Gy	A	B	C	D	
NRP0500	00	1233	37	526	1521	28%	26%	24%	22%	13
NRP0550	00	1237	37	525	1518	28%	26%	24%	22%	13
NRP0600	00	1359	37	551	1490	27%	27%	23%	23%	13
NRP0650	00	1378	37	551	1485	27%	27%	23%	23%	13

WEIGHT OF UNITS WHEN RUNNING

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				
				Gx	Gy	A	B	C	D	
NRP0500	00	1282		526	1537	28%	25%	24%	22%	13
NRP0550	00	1286		526	1534	28%	25%	24%	22%	13
NRP0600	00	1412		551	1505	27%	27%	23%	23%	13
NRP0650	00	1434		551	1499	27%	27%	23%	23%	13

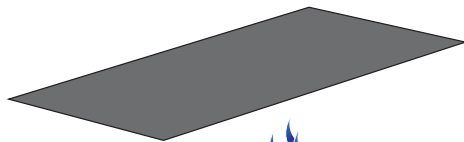
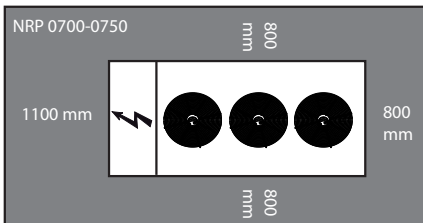
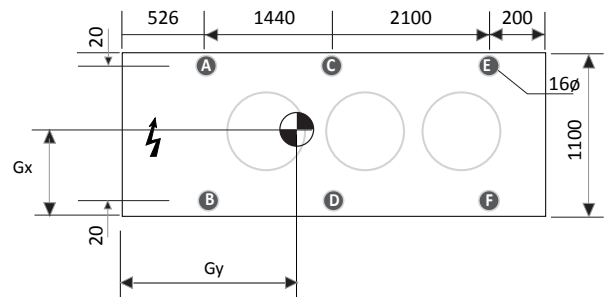
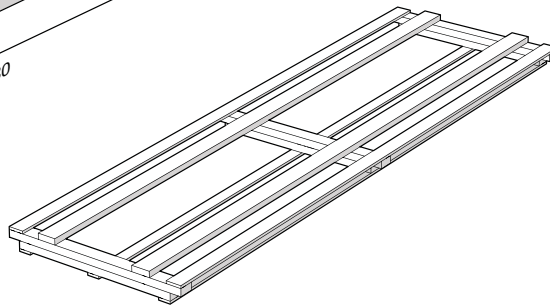
WEIGHT OF UNITS WHEN EMPTY										
	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				VT KIT
				Gx	Gy	A	B	C	D	
				NRP0500	01-03	1381	37	528	1613	
NRP0500	02-04	1399	37	528	1633	26%	24%	26%	24%	10
NRP0500	1 pump	1261	37	526	1557	27%	25%	25%	23%	13
NRP0500	2 pumps	1279	37	526	1580	27%	25%	25%	23%	13
NRP0500	3 pumps	1297	37	527	1602	27%	24%	25%	23%	13
NRP0500	4 pumps	1315	37	527	1623	26%	24%	26%	24%	13
NRP0550	01-03	1385	37	527	1611	26%	24%	26%	24%	10
NRP0550	02-04	1403	37	528	1630	26%	24%	26%	24%	10
NRP0550	1 pump	1265	37	525	1555	27%	25%	25%	23%	13
NRP0550	2 pumps	1283	37	526	1577	27%	25%	25%	23%	13
NRP0550	3 pumps	1301	37	526	1599	27%	25%	25%	23%	13
NRP0550	4 pumps	1319	37	526	1620	26%	24%	26%	24%	13
NRP0600	01-03	1507	37	551	1578	26%	26%	24%	24%	10
NRP0600	02-04	1525	37	551	1596	26%	26%	24%	24%	10
NRP0600	1 pump	1387	37	551	1524	27%	27%	23%	23%	13
NRP0600	2 pumps	1405	37	551	1545	26%	26%	24%	24%	13
NRP0600	3 pumps	1423	37	551	1565	26%	26%	24%	24%	13
NRP0600	4 pumps	1441	37	551	1585	26%	26%	24%	24%	13
NRP0650	01-03	1441	37	551	1585	26%	26%	24%	24%	10
NRP0650	02-04	1423	37	551	1565	26%	26%	24%	24%	10
NRP0650	1 pump	1405	37	551	1545	26%	26%	24%	24%	13
NRP0650	2 pumps	1387	37	551	1524	27%	27%	23%	23%	13
NRP0650	3 pumps	1525	37	553	1598	25%	26%	24%	24%	13
NRP0650	4 pumps	1507	37	551	1578	26%	26%	24%	24%	13
WEIGHT OF UNITS WHEN RUNNING										
	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)				VT KIT
				Gx	Gy	A	B	C	D	
				NRP0500	01-03	1900		534	1785	
NRP0500	02-04	1918		534	1798	23%	22%	28%	27%	10
NRP0500	1 pump	1320		527	1577	27%	25%	25%	23%	13
NRP0500	2 pumps	1338		527	1598	27%	25%	25%	23%	13
NRP0500	3 pumps	1356		528	1619	26%	24%	26%	24%	13
NRP0500	4 pumps	1374		528	1639	26%	24%	26%	24%	13
NRP0550	01-03	1904		534	1783	24%	22%	28%	26%	10
NRP0550	02-04	1922		534	1796	23%	22%	28%	27%	10
NRP0550	1 pump	1324		526	1574	27%	25%	25%	23%	13
NRP0550	2 pumps	1342		527	1595	27%	25%	25%	23%	13
NRP0550	3 pumps	1360		527	1616	26%	24%	26%	24%	13
NRP0550	4 pumps	1378		527	1636	26%	24%	26%	24%	13
NRP0600	01-03	2030		551	1747	23%	23%	27%	27%	10
NRP0600	02-04	2048		551	1760	23%	23%	27%	27%	10
NRP0600	1 pump	1450		551	1542	26%	27%	23%	24%	13
NRP0600	2 pumps	1468		551	1562	26%	26%	24%	24%	13
NRP0600	3 pumps	1486		551	1582	26%	26%	24%	24%	13
NRP0600	4 pumps	1504		551	1600	26%	26%	24%	24%	13
NRP0650	01-03	2044		551	1745	23%	23%	27%	27%	10
NRP0650	02-04	2062		552	1759	23%	23%	27%	27%	10
NRP0650	1 pump	1464		551	1541	26%	27%	23%	24%	13
NRP0650	2 pumps	1482		551	1561	26%	26%	24%	24%	13
NRP0650	3 pumps	1500		551	1580	26%	26%	24%	24%	13
NRP0650	4 pumps	1518		551	1598	26%	26%	24%	24%	13

23.4. NRP 0700

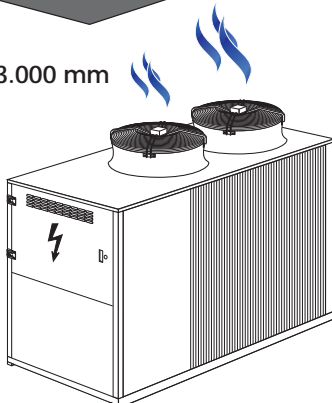


ATTENTION

The unit is supplied fastened to a pallet; use poles (not supplied) for handling with forklift trucks and belts.



3.000 mm



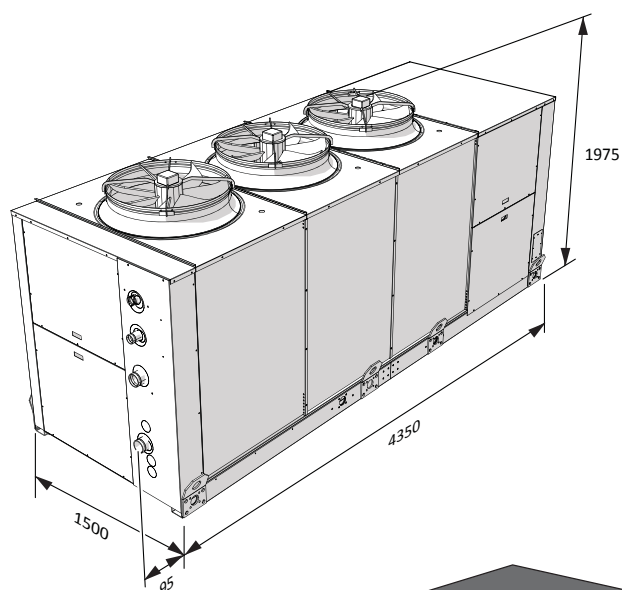
WEIGHT OF UNITS WHEN EMPTY

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)						VT KIT
				Gx	Gy	A	B	C	D	E	F	
NRP0700	00	1591	50	552	1928	8%	8%	31%	31%	11%	11%	22
NRP0700	01-03	1739	50	552	2005	7%	7%	32%	32%	12%	12%	22
NRP0700	02-04	1757	50	552	2021	6%	7%	32%	32%	12%	12%	22
NRP0700	1 pump	1643	50	552	1981	7%	8%	31%	31%	11%	12%	22
NRP0700	2 pumps	1685	50	552	2021	7%	7%	31%	31%	12%	12%	22
NRP0700	3 pumps	1727	50	552	2060	8%	8%	31%	30%	12%	12%	22
NRP0700	4 pumps	1769	50	552	2096	8%	8%	31%	30%	12%	12%	22

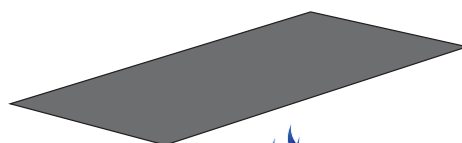
WEIGHT OF UNITS WHEN RUNNING

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)						VT KIT
				Gx	Gy	A	B	C	D	E	F	
NRP0700	00	1658		552	1936	8%	8%	31%	32%	10%	10%	22
NRP0700	01-03	2276		552	2156	5%	5%	34%	34%	11%	11%	22
NRP0700	02-04	2294		552	2167	5%	5%	34%	34%	11%	11%	22
NRP0700	1 pump	1720		552	1991	8%	8%	31%	31%	11%	11%	22
NRP0700	2 pumps	1762		552	2029	8%	8%	31%	31%	12%	12%	22
NRP0700	3 pumps	1804		552	2066	8%	8%	31%	31%	12%	12%	22
NRP0700	4 pumps	1846		552	2100	7%	7%	31%	31%	12%	12%	22

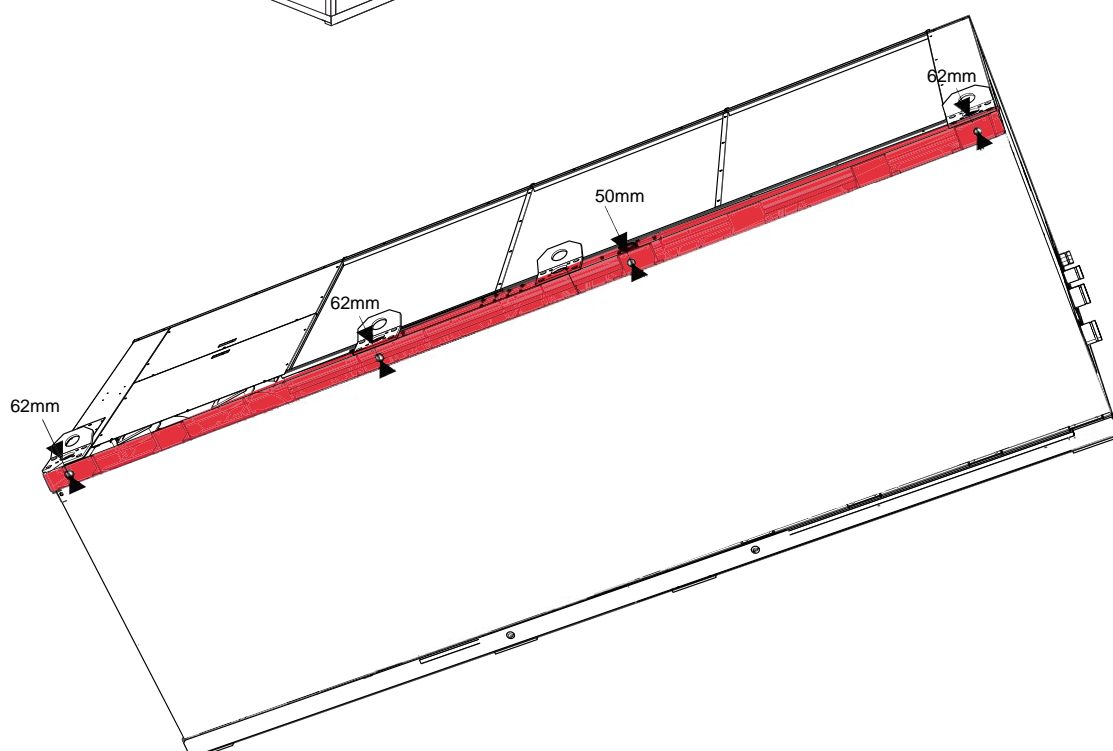
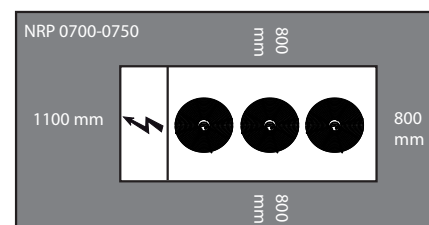
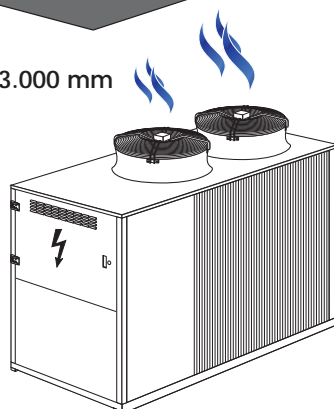
23.5. NRP 0750

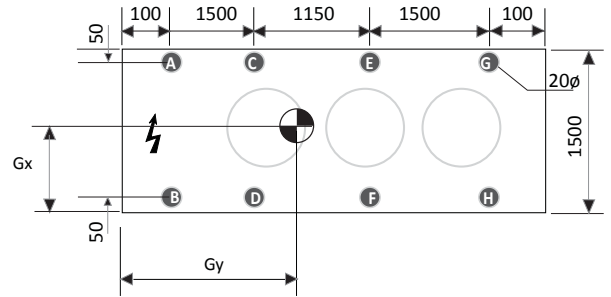
**ATTENTION**

The unit is supplied wrapped in estincoil; it must be lifted using suitable belts hooked to all the installed eyebolts.



3.000 mm





WEIGHT OF UNITS WHEN EMPTY

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)								VT KIT
				Gx	Gy	A	B	C	D	E	F	G	H	
				NRP0750	00	1939	50	758	1767	10%	10%	16%	17%	
NRP0750	01-03	2149	50	757	1852	9%	10%	16%	16%	22%	23%	2%	3%	23
NRP0750	02-04	2209	50	757	1891	9%	9%	15%	16%	22%	23%	3%	3%	23
NRP0750	1 pompa	1999	50	758	1812	10%	10%	16%	16%	21%	22%	3%	3%	23
NRP0750	2 pompa	2059	50	758	1855	9%	10%	15%	16%	21%	23%	3%	3%	23
NRP0750	3 pompe	2119	50	757	1895	9%	10%	15%	15%	22%	23%	3%	3%	23
NRP0750	4 pompe	2179	50	757	1932	9%	10%	14%	15%	22%	24%	3%	3%	23

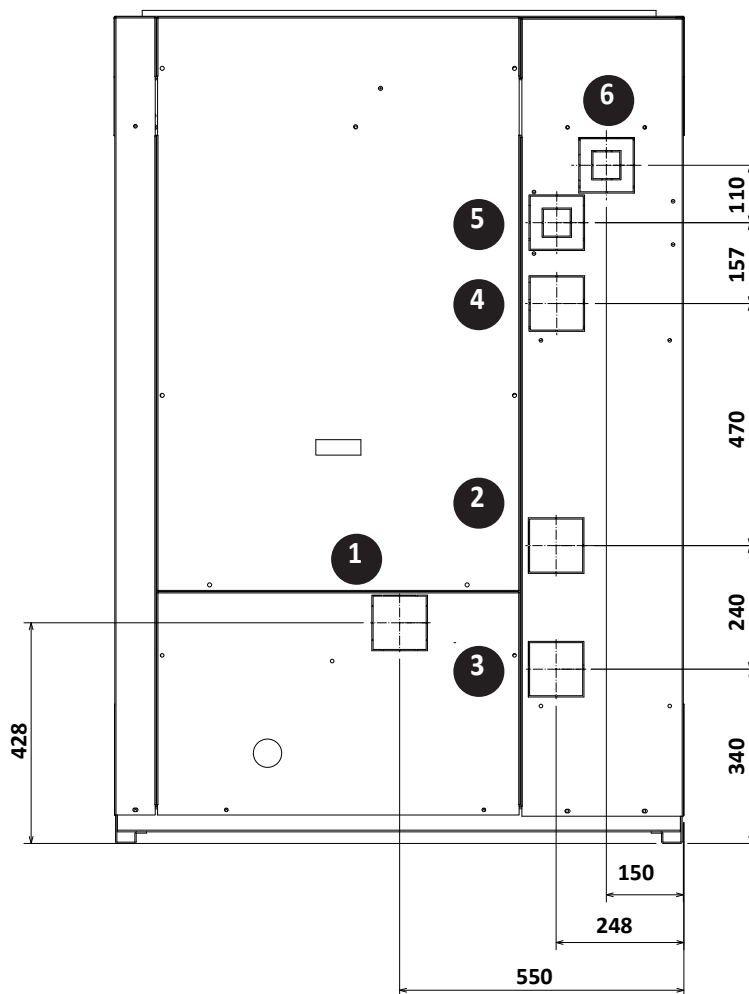
WEIGHT OF UNITS WHEN RUNNING

	HYDRONIC KIT	WEIGHT UNIT	WEIGHT PALLET	BARYCENTRE (mm)		WEIGHT DISTRIBUTION ON SUPPORTS (%)								VT KIT
				Gx	Gy	A	B	C	D	E	F	G	H	
				NRP0750	00	2006	50	755	1758	10%	10%	17%	17%	
NRP0750	01-03	2256	50	754	1922	9%	10%	14%	15%	22%	23%	3%	3%	23
NRP0750	02-04	2196	50	754	1885	9%	10%	14%	15%	22%	23%	3%	3%	23
NRP0750	1 pompa	2136	50	754	1846	9%	10%	15%	16%	21%	22%	3%	3%	23
NRP0750	2 pompa	2058	50	754	1810	10%	10%	16%	17%	21%	22%	3%	3%	23
NRP0750	3 pompe	2946	50	753	1996	7%	7%	16%	16%	25%	26%	2%	2%	23
NRP0750	4 pompe	2886	50	753	1969	7%	7%	16%	16%	25%	26%	2%	2%	23

24. POSITION OF HYDRAULIC CONNECTIONS

POSSIBLE CONFIGURATIONS BETWEEN HYDRONIC KITS

		recovery hydronic unit				
		°	R1	R2	R3	R4
system hydronic unit	°	ok	ok	ok	ok	ok
	01	ok	na	na	na	na
	02	ok	na	na	na	na
	03	ok	na	na	na	na
	04	ok	na	na	na	na
	05	ok	na	na	na	na
	06	ok	na	na	na	na
	07	ok	na	na	na	na
	08	ok	na	na	na	na
	P1	ok	ok	ok	ok	ok
	P2	ok	ok	ok	ok	ok
	P3	ok	ok	ok	ok	ok
	P4	ok	ok	ok	ok	ok



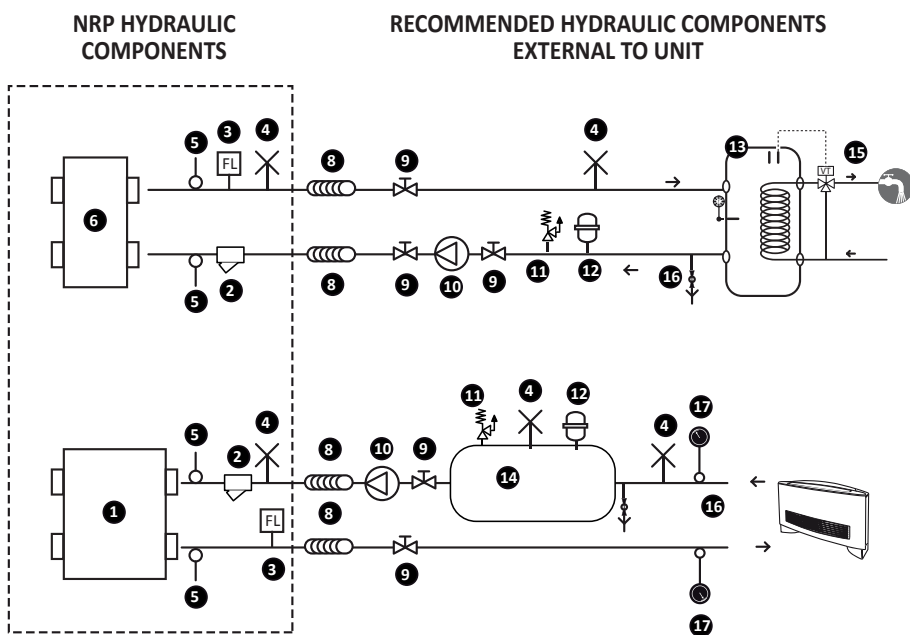
2 and 4- pipe system KEY			0200	0240	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
1	Return from system (vers. P1-P2-P3-P4)	∅	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	3"½
2	Return from system (vers. °)	∅	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	3"½
3	Flow to system (vers. ° 01...08)	∅	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	3"½
4	Return from system (vers. 01...08)	∅	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	3"½
5	Return from DHW system heating system side	∅	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	3"½
6	Flow to DHW system heating system side	∅	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	3"½

25. BASIC 2-PIPE SYSTEM HYDRAULIC CIRCUITS

25.1. CIRCUITO IDRAULICO INTERNO ED ESTERNO AD NRP "00" (standard)

2-PIPE SYSTEM

4-PIPE SYSTEM



STANDARD NRP COMPONENTS FOR 2-PIPE SYSTEMS

1	Plate heat exchanger (SYSTEM SIDE)
2	Water filter (mounted)
3	Flow switches (mounted)
4	Air vent valve
5	Water IN/OUT temperature probes
6	Total recovery (DHW SIDE)

RECOMMENDED COMPONENTS NOT SUPPLIED FOR WHICH INSTALLER IS RESPONSIBLE

8	Anti-vibration joints
9	Cutoff cocks
10	Pump
11	Safety valve
12	Expansion vessel
13	Domestic hot water storage tank (DHW)
14	System Storage Tank
15	Thermostatic valve
16	Drain cock
17	Manometer

TAB1		200	240	280	300	330	350	500	550	600	650	700	750
Number of compressors	n°	2	2	2	2	2	2	3	3	4	4	4	4
Minimum water content admitted COLD SIDE	l/kW	7	7	7	7	7	7	7	7	7	7	7	7
Minimum water content admitted the HOT SIDE	l/kW	10	10	10	10	10	10	10	10	10	10	10	10
Recommended water content cooling side heating side	l/kW	14	14	14	14	14	14	14	14	14	14	14	14

WATER FEATURES

PH	6-8
Electric 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
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 installation of components outside the NRP unit is the installer's responsibility, who must operate according to the code of practice and in compliance with the Standard in force in the country of destination.



ATTENTION

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



ATTENTION

Wash the system thoroughly before connecting the unit. This cleaning operation will eliminate any residues such as welding drips, scale, rust, or other impurities from the piping. These substances can also deposit inside and cause machine malfunctioning. The connection piping must be adequately supported so that its weight is not borne by the appliance.



ATTENTION

An appropriate load/reintegration system must be prepared, which is engaged on the return line, along with a drain cock in the lowest part of the system. Water disconnectors must be used in systems loaded with anti-freeze or where particular legal provisions apply.



ATTENTION

Particular supply/reintegration waters must be conditioned with appropriate treatment systems. The "water features" provided in the table can be used as a reference.



ATTENTION

It is prohibited to release water-glycol mixtures into the environment.

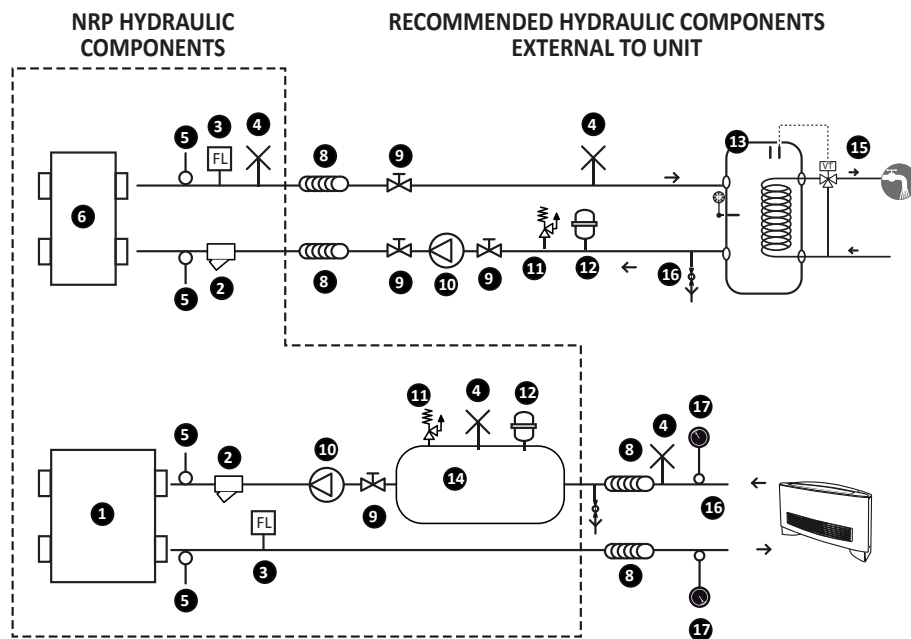


ATTENTION

It is recommended to design systems with high water content (minimum recommended values shown in TAB 1), in order to limit:

1. The hourly number of inversions between operating modes.
2. Drop in water temperature during winter defrost cycles.

25.2. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT TO NRP "01...08" (with system storage tank only)



STANDARD NRP COMPONENTS FOR 2-PIPE SYSTEMS

1	Plate heat exchanger (SYSTEM SIDE)
2	Water filter (mounted)
3	Flow switches (mounted)
4	Air vent valve
5	Water IN/OUT temperature probes
6	Total recovery (DHW SIDE)
9	Cutoff cocks
10	Pump
11	Safety valve
12	Expansion vessel
14	System Storage Tank

RECOMMENDED COMPONENTS NOT SUPPLIED FOR WHICH INSTALLER IS RESPONSIBLE

8	Anti-vibration joints
9	Cutoff cocks
10	Pump
11	Safety valve
12	Expansion vessel
13	Domestic hot water storage tank (DHW)
15	Thermostatic valve
16	Drain cock
17	Manometer

TAB1		200	240	280	300	330	350	500	550	600	650	700	750
Number of compressors	n°	2	2	2	2	2	2	3	3	4	4	4	4
Minimum water content admitted COLD SIDE	l/kW	7	7	7	7	7	7	7	7	7	7	7	7
Minimum water content admitted the HOT SIDE	l/kW	10	10	10	10	10	10	10	10	10	10	10	10
Recommended water content cooling side heating side	l/kW	14	14	14	14	14	14	14	14	14	14	14	14

WATER FEATURES

PH	6-8
Electric 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

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 installation of components outside the NRP unit is the installer's responsibility, who must operate according to the code of practice and in compliance with the Standard in force in the country of destination.

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

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

ATTENTION
An appropriate load/reintegration system must be prepared, which is engaged on the return line, along with a drain cock in the lowest part of the system. Water disconnectors must be used in systems loaded with anti-freeze or where particular legal provisions apply.

ATTENTION
Particular supply/reintegration waters must be conditioned with appropriate treatment systems. The "water features" provided in the table can be used as a reference.

ATTENTION
It is prohibited to release water-glycol mixtures into the environment.

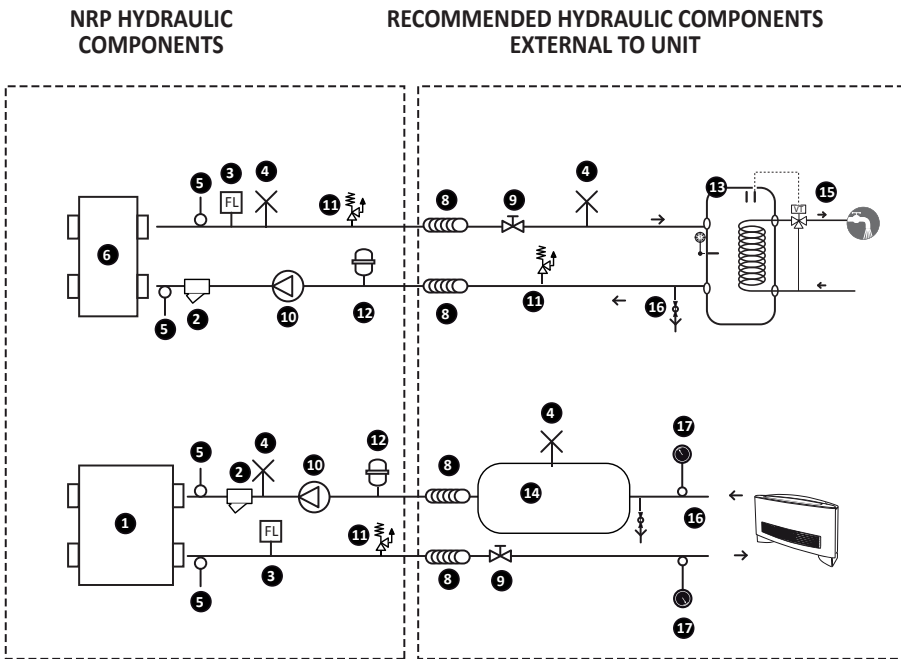
ATTENTION
It is recommended to design systems with high water content (minimum recommended values shown in TAB 1), in order to limit:

1. The hourly number of inversions between operating modes.
2. Drop in water temperature during winter defrost cycles.

25.3. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT TO NRP "P1...P4 - R1...R4" (with pumps on system side and DHW side)

2-PIPE SYSTEM

4-PIPE SYSTEM



STANDARD NRP COMPONENTS FOR 2-PIPE SYSTEMS

1	Plate heat exchanger (SYSTEM SIDE)
2	Water filter (mounted)
3	Flow switches (mounted)
4	Air vent valve
5	Water IN/OUT temperature probes
6	Total recovery (DHW SIDE)
10	Pumps (SYSTEM AND DHW SIDE)
11	Safety valve
12	Expansion vessel

RECOMMENDED COMPONENTS NOT SUPPLIED FOR WHICH INSTALLER IS RESPONSIBLE

8	Anti-vibration joints
4	Air vent valve
9	Cutoff cocks
13	Domestic hot water storage tank (DHW)
14	System water storage tank
15	Thermostatic valve
16	Drain cock
17	Manometer

TAB1		200	240	280	300	330	350	500	550	600	650	700	750
Number of compressors	n°	2	2	2	2	2	2	3	3	4	4	4	4
Minimum water content admitted COLD SIDE	l/kW	7	7	7	7	7	7	7	7	7	7	7	7
Minimum water content admitted the HOT SIDE	l/kW	10	10	10	10	10	10	10	10	10	10	10	10
Recommended water content cooling side heating side	l/kW	14	14	14	14	14	14	14	14	14	14	14	14

WATER FEATURES

PH	6-8
Electric 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

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 installation of components outside the NRP unit is the installer's responsibility, who must operate according to the code of practice and in compliance with the Standard in force in the country of destination.



ATTENTION

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



ATTENTION

Wash the system thoroughly before connecting the unit. This cleaning operation will eliminate any residues such as welding drips, scale, rust, or other impurities from the piping. These substances can also deposit inside and cause machine malfunctioning. The connection piping must be adequately supported so that its weight is not borne by the appliance.



ATTENTION

An appropriate load/reintegration system must be prepared, which is engaged on the return line, along with a drain cock in the lowest part of the system. Water disconnectors must be used in systems loaded with anti-freeze or where particular legal provisions apply.



ATTENTION

Particular supply/reintegration waters must be conditioned with appropriate treatment systems. The "water features" provided in the table can be used as a reference.



ATTENTION

It is prohibited to release water-glycol mixtures into the environment.



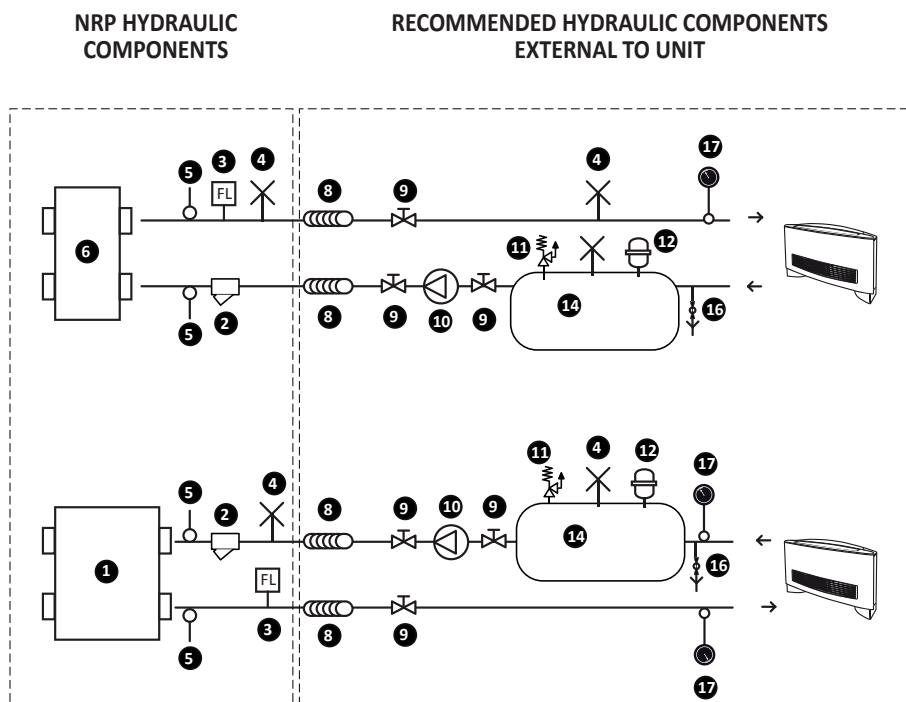
ATTENTION

It is recommended to design systems with high water content (minimum recommended values shown in TAB 1), in order to limit:

- The hourly number of inversions between operating modes.
- Drop in water temperature during winter defrost cycles.

26. BASIC 4-PIPE SYSTEM HYDRAULIC CIRCUITS

26.1. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT TO NRP "0" (standard)



STANDARD NRP COMPONENTS FOR 4-PIPE SYSTEMS

1	Plate heat exchanger (COOLING SYSTEM SIDE)
2	Water filter (mounted)
3	Flow switches (mounted)
4	Air vent valve
5	Water IN/OUT temperature probes
6	Total recovery (HEATING SYSTEM SIDE)

RECOMMENDED COMPONENTS NOT SUPPLIED FOR WHICH INSTALLER IS RESPONSIBLE

8	Anti-vibration joints
9	Cutoff cocks
10	Pump
11	Safety valve
12	Expansion vessel
14	System Storage Tank
16	Drain cock
17	Manometer

TAB1		200	240	280	300	330	350	500	550	600	650	700	750
Number of compressors	n°	2	2	2	2	2	2	3	3	4	4	4	4
Minimum water content admitted COLD SIDE	l/kW	7	7	7	7	7	7	7	7	7	7	7	7
Minimum water content admitted the HOT SIDE	l/kW	10	10	10	10	10	10	10	10	10	10	10	10
Recommended water content cooling side heating side	l/kW	14	14	14	14	14	14	14	14	14	14	14	14

WATER FEATURES

PH	6-8
Electric 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

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 installation of components outside the NRP unit is the installer's responsibility, who must operate according to the code of practice and in compliance with the Standard in force in the country of destination.



ATTENTION

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



ATTENTION

Wash the system thoroughly before connecting the unit. This cleaning operation will eliminate any residues such as welding drips, scale, rust, or other impurities from the piping. These substances can also deposit inside and cause machine malfunctioning. The connection piping must be adequately supported so that its weight is not borne by the appliance.



ATTENTION

An appropriate load/reintegration system must be prepared, which is engaged on the return line, along with a drain cock in the lowest part of the system. Water disconnectors must be used in systems loaded with anti-freeze or where particular legal provisions apply.

ATTENTION

Particular supply/reintegration waters must be conditioned with appropriate treatment systems. The "water features" provided in the table can be used as a reference.



ATTENTION

It is prohibited to release water-glycol mixtures into the environment.



ATTENTION

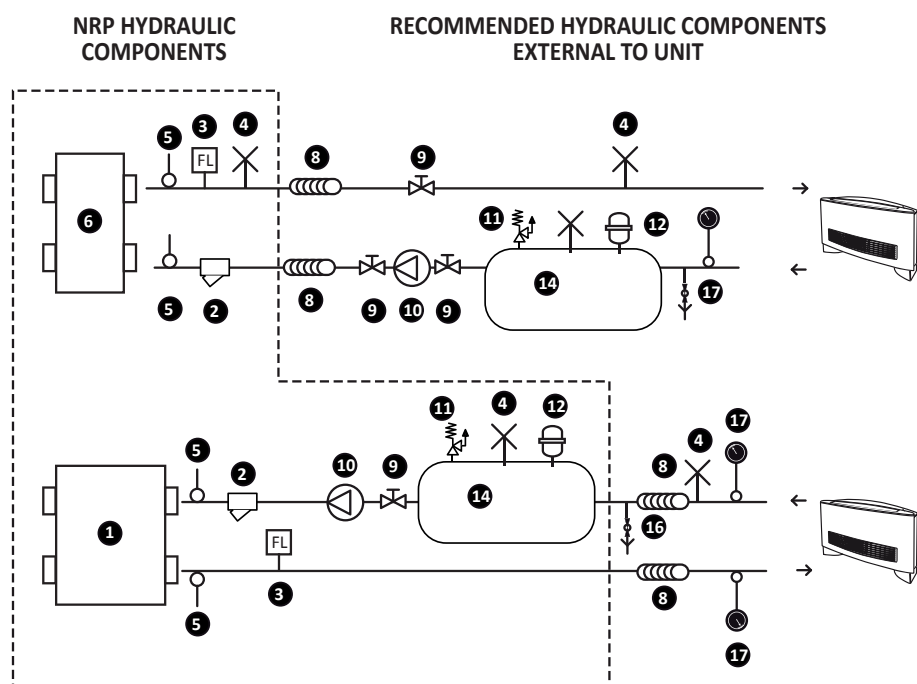
It is recommended to design systems with high water content (minimum recommended values shown in TAB 1), in order to limit:

- The hourly number of inversions between operating modes.
- Drop in water temperature during winter defrost cycles.

26.2. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT TO NRP "01...08" (with cooling system side storage tank only)

2-PIPE SYSTEM

4-PIPE SYSTEM



ATTENTION
The choice and installation of components outside the NRP unit is the installer's responsibility, who must operate according to the code of practice and in compliance with the Standard in force in the country of destination.

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

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

ATTENTION
An appropriate load/reintegration system must be prepared, which is engaged on the return line, along with a drain cock in the lowest part of the system. Water disconnectors must be used in systems loaded with anti-freeze or where particular legal provisions apply.

ATTENTION
Particular supply/reintegration waters must be conditioned with appropriate treatment systems. The "water features" provided in the table can be used as a reference.

ATTENTION
It is prohibited to release water-glycol mixtures into the environment.

ATTENTION
It is recommended to design systems with high water content (minimum recommended values shown in **TAB 1**), in order to limit:
1. The hourly number of inversions between operating modes.
2. Drop in water temperature during winter defrost cycles.

STANDARD NRP COMPONENTS FOR 4-PIPE SYSTEMS

1	Plate heat exchanger (COOLING SYSTEM SIDE)
2	Water filter (mounted)
3	Flow switches (mounted)
4	Air vent valve
5	Water IN/OUT temperature probes
6	Total recovery
9	Cutoff cock
10	Pump
11	Safety valve
12	Expansion vessel
14	System storage tank (COOLING SIDE)

RECOMMENDED COMPONENTS NOT SUPPLIED FOR WHICH INSTALLER IS RESPONSIBLE

8	Anti-vibration joints
9	Cutoff cocks
10	Pump
11	Safety valve
12	Expansion vessel
14	System storage tank (HEATING SIDE)
16	Drain cock
17	Manometer

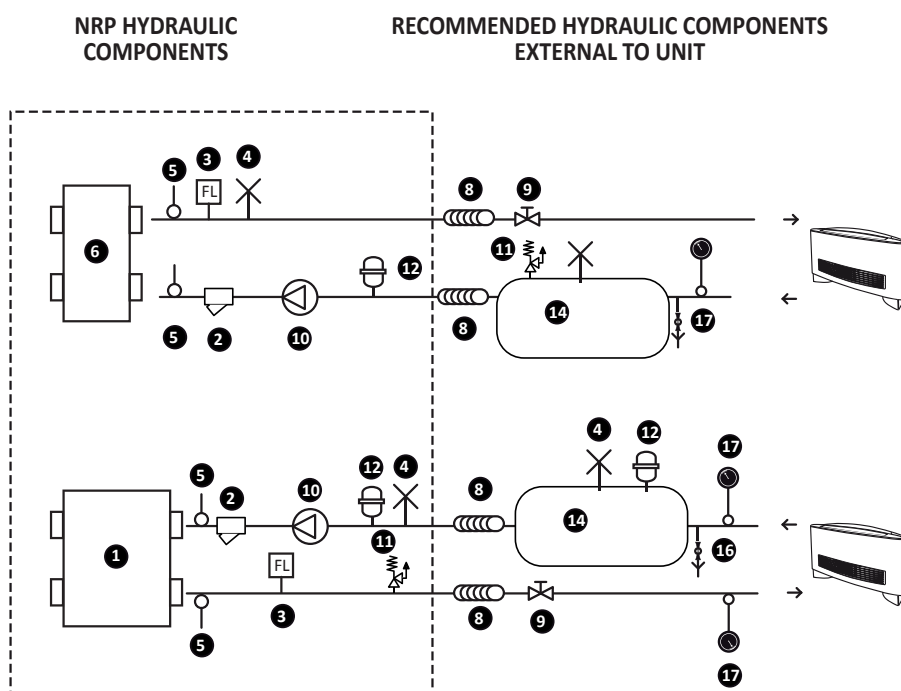
TAB1		200	240	280	300	330	350	500	550	600	650	700	750
Number of compressors	n°	2	2	2	2	2	2	3	3	4	4	4	4
Minimum water content admitted COLD SIDE	l/kW	7	7	7	7	7	7	7	7	7	7	7	7
Minimum water content admitted the HOT SIDE	l/kW	10	10	10	10	10	10	10	10	10	10	10	10
Recommended water content cooling side heating side	l/kW	14	14	14	14	14	14	14	14	14	14	14	14

WATER FEATURES

PH	6-8
Electric 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

Alkalinity M	Less than 50 ppm
Total hardness	Less than 50 ppm
Sulphur ions	None
Ammonia ions	None
Silicone ions	Less than 30 ppm

26.3. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT TO NRP "P1...P4 - R1...R4" (with pumps on COOLING and HEATING side)



STANDARD NRP COMPONENTS FOR 4-PIPE SYSTEMS	
1	Plate heat exchanger (SYSTEM SIDE)
2	Water filter (mounted)
3	Flow switches (mounted)
4	Air vent valve
5	Water IN/OUT temperature probes
6	Total recovery (DHW SIDE)
10	Pumps (SYSTEM AND DHW SIDE)
11	Safety valve
12	Expansion vessel

RECOMMENDED COMPONENTS NOT SUPPLIED FOR WHICH INSTALLER IS RESPONSIBLE	
8	Anti-vibration joints
4	Air vent valve
9	Cutoff cocks
14	System water storage tank (COOLING SIDE)
14	System water storage tank (HEATING SIDE)
16	Drain cock
17	Manometer

TAB1		200	240	280	300	330	350	500	550	600	650	700	750
Number of compressors	n°	2	2	2	2	2	2	3	3	4	4	4	4
Minimum water content admitted COLD SIDE	l/kW	7	7	7	7	7	7	7	7	7	7	7	7
Minimum water content admitted the HOT SIDE	l/kW	10	10	10	10	10	10	10	10	10	10	10	10
Recommended water content cooling side heating side	l/kW	14	14	14	14	14	14	14	14	14	14	14	14

WATER FEATURES	
PH	6-8
Electric 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

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 installation of components outside the NRP unit is the installer's responsibility, who must operate according to the code of practice and in compliance with the Standard in force in the country of destination.

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

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

ATTENTION
An appropriate load/reintegration system must be prepared, which is engaged on the return line, along with a drain cock in the lowest part of the system. Water disconnectors must be used in systems loaded with anti-freeze or where particular legal provisions apply.

ATTENTION
Particular supply/reintegration waters must be conditioned with appropriate treatment systems. The "water features" provided in the table can be used as a reference.

ATTENTION
It is prohibited to release water-glycol mixtures into the environment.

ATTENTION
It is recommended to design systems with high water content (minimum recommended values shown in TAB 1), in order to limit:

- The hourly number of inversions between operating modes.
- Drop in water temperature during winter defrost cycles.

**ATTENTION**

Check the hydraulic sealing of the joints.

**ATTENTION**

It is recommended to repeat this operation after the appliance has functioned for a few hours and to periodically check the system pressure. The machine must be off (pump Off) when reintegrated.

26.4. LOADING SYSTEM

Before beginning loading, place the switch at OFF

1. Check that system drain cock is closed.
2. Open all vent valves of the system and the relative terminals.
3. Open the system cut-off devices.
4. Start filling by slowly opening the system water loading cock outside the appliance.
5. When water starts to escape from the terminal vent valves, close them and continue loading until the intended pressure value for the system is reached.

26.5. DISCHARGING SYSTEM

1. Before beginning emptying, place the master switch at "OFF".
2. Check that the loading/water system reintegration cock is closed.
3. Open the drain cock outside the appliance and all system vent valves and relative terminals.

**ATTENTION**

If antifreeze is used by the unit, it must not be dumped as it is harmful to the environment.

It should be collected and if possible reused.

27. COLLEGAMENTI ELETTRICI

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

It is also advised to check that:

1. The electrical mains features are suitable for the absorption values indicated in the electrical data table, also taking into consideration any other machines operating at the same time.
2. The unit is only powered when installation has been completed (hydraulic and electric).
3. Respect the connection indications of the phase, and earth wires.
4. The power supply line must have a relevant protection mounted upstream against short circuits and dispersions to earth, which isolates the system with respect to other utilities.
5. The voltage must be within a tolerance of $\pm 10\%$ of the nominal power supply voltage of the machine (for unbalanced three-phase unit max 3% between the phases). Whenever these parameters are not respected, contact the electric energy public body.
6. For electric connections, use the cables with double isolation according to the Standards in force on this subject in the different countries.

MANDATORY

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



All the electrical operations must be carried out by **STAFF IN POSSESSION OF THE NECESSARY QUALIFICATIONS BY LAW**, suitably trained and informed on the risks related to these operations.



The characteristics of the electrical lines and of the related components must be determined by **STAFF QUALIFIED TO DESIGN ELECTRICAL SYSTEMS**, in compliance with the international and national regulations of the place of installation of the unit and in compliance with the regulations in force at the moment of installation.



For the installation requirements refer only to the electrical diagram supplied with the appliance. The electrical diagram along with the manuals must be kept in good condition and **ALWAYS AVAILABLE FOR ANY FUTURE SERVICING ON THE UNIT**.



It is mandatory to verify that the machine is watertight before making the electrical connections and it must only be powered up after the hydraulic and electrical works have been completed.

27.1. ELECTRIC DATA TABLE

The cable section shown in the table are recommended for maximum lengths of 50m.

For longer lengths or different cable laying, it is up to the PLANNER to calculate the appropriate line switch, the power supply line as well as the connection to the earth wire and connection cables depending on:

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



ATTENTION

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



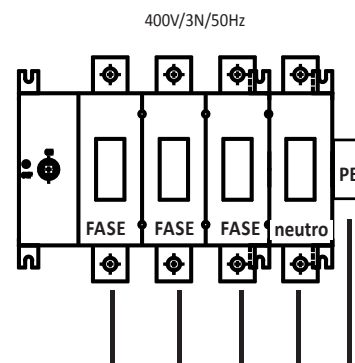
ATTENTION

Check the tightening of all power wire terminals on commissioning and after 30 days from start-up. Subsequently they must be checked every six months. Loose terminals can cause overheating of the cables and components.

NRP SIZE	Power supply	Compressors [n°]	Fans [n°]	TOTAL ABSORPTION		RECOMMENDED CABLE CROSS-SECTION							
				L.R.A.:	F.L.A.:	SEC. A				SEC. B	EARTH	IL	
				[A]	[A]	Phases [n°]	Cables for single phase [n°]	Cable cross-section [mm²]	Neutral cross-section [mm²]	Total cables [n°]	[mm²]	[mm²]	[A]
0200	400V/3N/50Hz	2	6	119	36	3+N	1	10	10	4	4	1,5	63
0240	400V/3N/50Hz	2	6	150	41	3+N	1	16	16	4	4	1,5	63
0280	400V/3N/50Hz	2	6	155	46	3+N	1	16	16	4	1,5	16	63
0300	400V/3N/50Hz	2	8	184	53	3+N	1	16	16	4	1,5	16	63
0330	400V/3N/50Hz	2	8	190	58	3+N	1	25	16	4	1,5	16	80
0350	400V/3N/50Hz	2	8	200	63	3+N	1	25	16	4	1,5	16	80
0500	400V/3N/50Hz	3	2	214	76	3+N	1	35	25	4	1,5	16	100
0550	400V/3N/50Hz	3	2	220	81	3+N	1	35	25	4	1,5	16	100
0600	400V/3N/50Hz	4	2	232	100	3+N	1	50	25	4	1,5	25	125
0650	400V/3N/50Hz	4	2	243	112	3+N	1	70	35	4	1,5	35	160
0700	400V/3N/50Hz	4	3	261	122	3+N	1	70	35	4	1,5	35	160
0750	400V/3N/50Hz	4	3	320	144	3+N	1	95	50	4	1,5	50	200

KEY

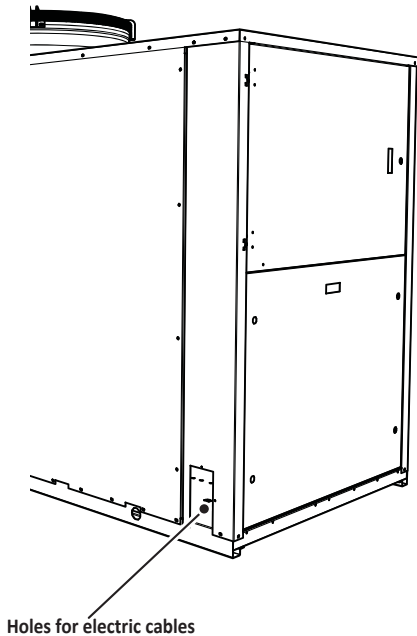
F.L.I.:	Maximum input power	3+N:	3 phases + neutral
F.L.A.:	Maximum input current	Sec B:	Controls and safety device connection
L.R.A.:	Initial starting current	EARTH:	Earth wire to connect to unit
Sec A:	Power supply	IL:	Main switch



28. ELECTRIC POWER CONNECTION TO THE ELECTRICAL MAINS

1. Before connecting the unit to the power supply mains, ensure that the disconnection switch is open.
2. Open the front panel.
3. Use the plates to pass the main electric power supply cable and the cables of the other external connections under the responsibility of the installer.
4. It is forbidden to access with electric cables in positions not specifically envisioned in this manual.
5. Avoid direct contact with non-insulated copper piping and with the compressor.
6. Identify the terminals for the electric

7. connection and always refer to the wiring diagram supplied with the unit.
7. For the functional connection of the unit, take the power supply cable to the electric control board inside the unit and connect it to terminals L1-L2-L3 and PE respecting the polarities.
8. L1-L2-L3 as phases, and PE as earth; see figure.
9. Re-position the inspection panels.
10. Ensure that all protections removed for the electric connection have been restored before electrically powering the unit.
11. Position the system master switch (external to the appliance) at "ON".



29. CONTROL AND COMMISSIONING

27.2. PREPARATION FOR COMMISSIONING

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

27.3. START - UP

27.3.1. PRELIMINARY OPERATIONS TO BE PERFORMED WITH NO VOLTAGE PRESENT

Control:

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

27.3.2. THE FOLLOWING OPERATIONS ARE TO BE CARRIED OUT WHEN THE UNIT IS LIVE

1. Supply power to the unit by turning the master switch to the ON position; see (fig1.) The display will come on a few seconds after voltage has been supplied; check that the operating status is on OFF.(OFF BY KEY B on lower side of the display).
2. Use a tester to verify that the value of the power supply voltage to the RST phases is equal to $400V \pm 10\%$; also verify that the unbalance between phases is no greater than 3%.
3. Check that the connections made by the installer are in compliance with the documentation.

4. Verify that the resistor of the compressor casing is working by measuring the increase in temperature of the oil pan. The resistance/s must function for at least 12 hours before start-up of the compressor and in any event, the temperature of the oil pan must be $10-15^{\circ}C$ higher than room temperature.

HYDRAULIC CIRCUIT

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

27.4. MACHINE COMMISSIONING

After having performed all controls stated above, it is possible to start the unit by pressing the ON key. The display shows the temperature of the water and machine functioning mode. Check the operating parameters (set-point) and reset any alarms present. After a few minutes, the unit will begin operating.



ATTENTION:

Before carrying out the controls indicated below, make sure that the unit is disconnected from the power mains. Make sure that the master switch is locked in the OFF position and an appropriate sign is affixed. Before starting the operations, check that there is no voltage present using a voltmeter or a phase indicator.

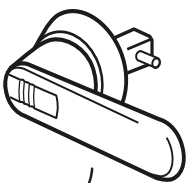


Fig. 1

**ATTENTION**

Commissioning must be performed with standard settings. Only when the inspection has been completed can the functioning Set Point values be changed.

Before start-up, power the unit for at least 12-24 hours positioning the protection magnet circuit breaker switch and the door lock isolating switch at ON. Make sure that the control panel is off in order to allow the compressor oil sump to heat.

27.4.1. WITH THE MACHINE ON, CHECK**COOLING CIRCUIT****CHECK:**

- That the compressor input current is lower than the maximum indicated in the technical data table.
- That in models with three-phase power supply, the compressor noise level is not abnormal. If this is the case, invert a phase.
- That the voltage value lies within the pre-fixed limits and that unbalance between the three phases (three-phase power supply) is not above 3%.
- The presence of any refrigerant GAS leaks particularly with reference to pressure gauge, pressure transducers and pressure switches plugs. (VIBRATIONS DURING TRANSPORTATION MAY LOOSEN CONNECTIONS).
- Overheating.
Comparing the temperature read using a contact thermostat positioned on the compressor intake with the temperature shown on the low pressure gauge (saturation temperature corresponding to the evaporation pressure). The difference between these two temperatures gives the overheating value. Optimal values are between 4 and 8°C.
- Pressing line temperature If the subcooling and overheating values are regular, the temperature measured in the pressing line pipe at the outlet of the compressor must be 30/40°C above the condensation temperature.

CONTROL AND SAFETY DEVICES**CHECK:**

- **The manually reset high pressure switch.**
That stops the compressor, generating the respective alarm, when the flow pressure exceeds the setpoint value. The control of its correct functioning can be performed by closing the air intake to the exchanger (in cooling mode) and keeping the high pressure manometer under control, check the intervention in correspondence of the calibration value. Attention: In the event of failure to intervene at the calibration value, stop the compressor immediately and check the cause. The reset is manual and can only be performed when the pressure falls below the differential value (For the set and differential values, consult the technical manual).
- **The anti-freeze control**
The anti-freeze control managed by the electronic regulation and by the temperature probe located at the outlet of the evaporator is to prevent the formation of ice when the water flow rate is too low. Correct operation can be checked by progressively increasing the anti-freeze set-point until it passes the outlet water temperature and keeping the water temperature controlled with a high precision thermometer, verify that the unit is off and generates the respective alarm. After this operation, take the antifreeze setpoint back to its original value.

30. FUNCTIONING FEATURES**30.1. SET POINT IN COOLING MODE**

(Factory set) = 7°C, $\Delta t = 5^\circ\text{C}$.

30.2. SET POINT IN HEATING MODE

(Factory set) = 45°C, $\Delta t = 5^\circ\text{C}$.

If the unit power supply is restored after a temporary interruption, the set mode will be kept in the memory.

30.3. COMPRESSOR START-UP DELAY

Two functions have been prepared to prevent compressor start-ups that are too close.

- Minimum time from last switch-off 60 seconds in cooling mode.
- Minimum time from last switch-on 300 seconds in heating mode.

30.4. CIRCULATION PUMPS (NOT SUPPLIED)

The circuit board envisions outputs for the management of the circulation pumps.

The pump side utilities start immediately after the first 30 seconds of functioning. When the water flow rate has gone into normal working conditions, the flow

meter control functions are activated (if envisioned). Below find the compressor start-up procedure, by switching the source side pump on with flow meter check if enabled after 20 seconds. Whenever alarms do not occur, the compressor starts.

30.5. ANTI-FREEZE ALARM

The anti-freeze alarm ¹¹ is active if the machine is off or in stand-by mode. In order to prevent the heat exchanger from breaking due to the water it contains freezing, envision compressor block (if the machine is on below 3.5°C) and ignition of the resistance (if standby below 5°C). If the temperature detected by the probe positioned in output of the heat exchanger and in inlet to the chiller is less than +3.8°C.

The intervention of this alarm ¹² determines compressor block and not pump block, which remains active along with the switch-on of the resistance if installed.

To restore normal functions the temperature of the outlet water must rise above +4°C. Rearm is manual.

30.6. WATER FLOW RATE ALARM

The unit manages a water flow rate alarm controlled by a pressure switch or flow switch installed as per standard on the machine. This type of safety device intervenes after the first 30 seconds of pump functioning, if the water flow rate is not sufficient. The intervention of this alarm determines compressor and pump block.

**ATTENTION**

¹¹ This anti-freeze set temperature can only be varied by an authorised after-sales centre and only after having checked that there is anti-freeze solution in the water system.

¹² Whenever this alarm intervenes, call the nearest after-sales service immediately.

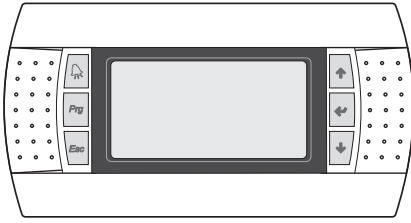
Control
panel

fig. 1



fig. 2

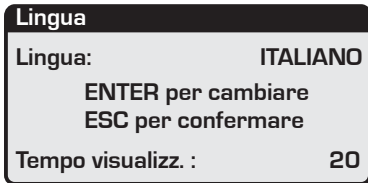
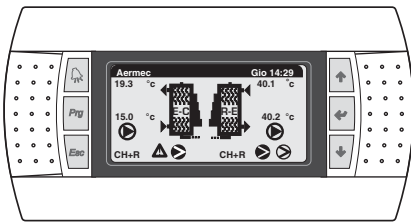


fig. 3 Main display

**1 ATTENTION:**

Only qualified personnel can change the language accessing the assistance menu.

When 20 seconds have passed, it will no longer be possible to modify the language until the next time the board is restarted.

31. SWITCH-ON AND USE OF UNIT

Once the unit has been powered, after 30 sec. the control panel will switch on, displaying:

1. The window (fig. 1) which will remain active for 6 sec.
Before passing to the window for choosing the language (fig. 2).
2. The second window makes it possible to select the software language¹. It will remain active for 20 sec, before passing on to the **main window/menu** (fig. 3).

The NRP unit control panel allows quick setting of the machine functioning parameters and their display.

The display is made up from a graphical matrix with 132 x 64 pixel in order to signal the type of functioning, displaying set parameters and any alarms that have intervened.

All default settings and any modifications are memorised in the board.

The control panel is represented by a graphical display with six keys for browsing the displays organised in **MENUS**.

The **main display** is (fig. 3).

Browsing the various **menus/parameters** is done by:

1. Pressing "Prg" to enter the menu selection mode.
2. Press the keys "↑ ← ↓" on the right side of the panel to browse; these keys are also used to modify the selected parameters.

31.1. MENU STRUCTURE

A IN/OUT MENU

Temperatures, pressures, etc... of the various components of the unit.

B ON/OFF MENU

Switches the unit on and off and sets its functioning mode (summer/winter) and time periods.

2-PIPE VERSIONS

C SYSTEM MENU

Management of the chiller parameters, standard/energy saving work set-point.

D DHW MENU

DHW management parameters (set-point, consent, temperature, time periods, etc...).

4-PIPE VERSIONS

C COOLED WATER MENU

Management of the chiller parameters, standard/energy saving work set-point in cooling mode.

D HOT WATER MENU

Management of the chiller parameters, standard/energy saving work set-point in heating mode.

E CLOCK MENU

Manages all parameters linked to the system time (hour, date, etc...).

F ASSISTANCE MENU

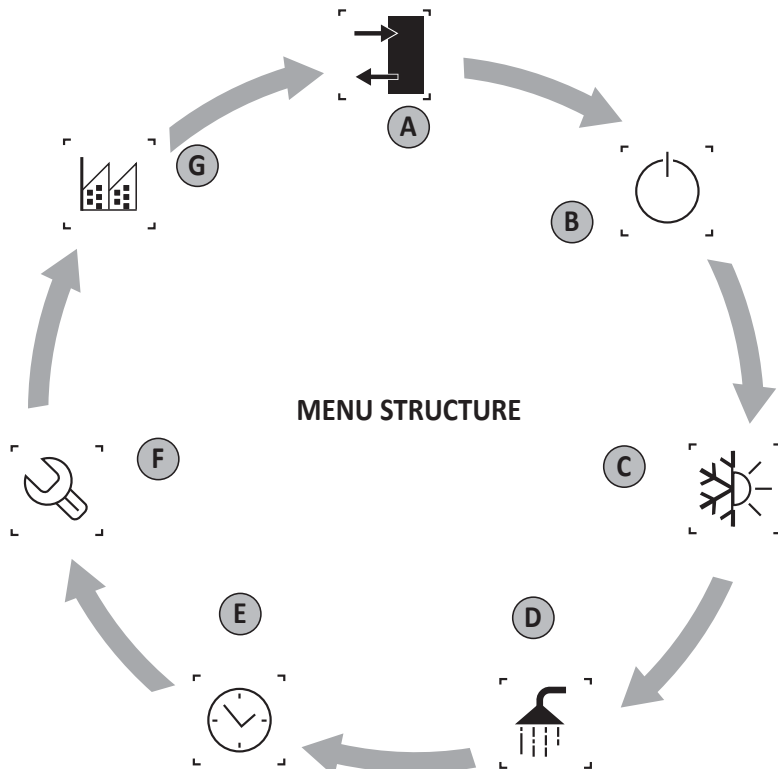
Protects the after-sales assistance menu with password request.

G MANUFACTURE MENU

Protects the manufacturer menu with password request.

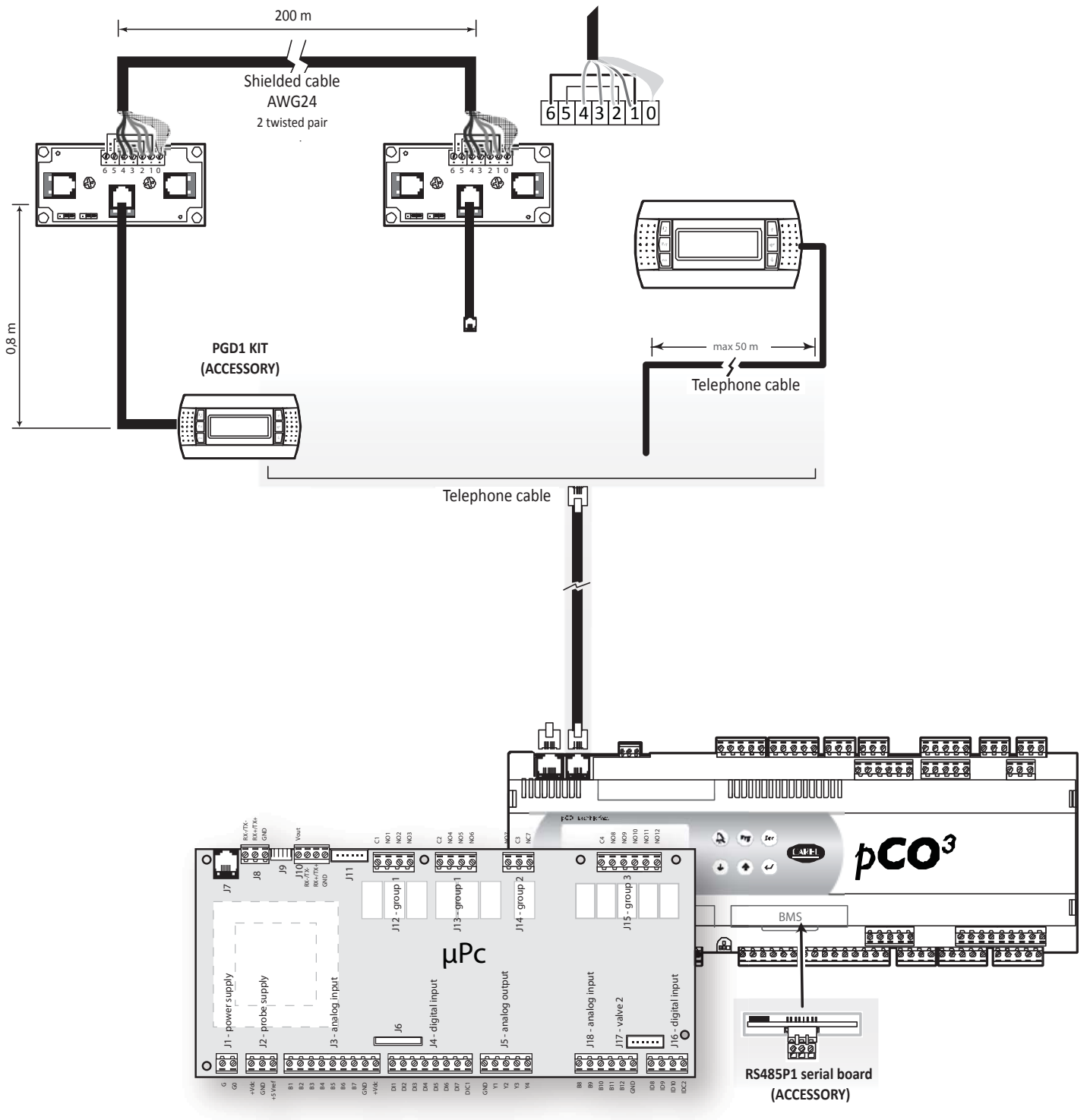
Note:

For further information refer to the user manual.



MENU STRUCTURE

32. ACCESSORY CONNECTIONS





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