

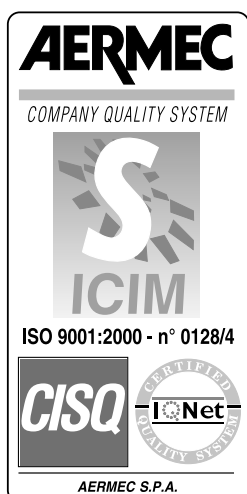
TECHNICAL MANUAL MANUAL TÉCNICO

Air/water chillers and heat pumps and condensing units with scroll compressors

Enfriadoras y bombas de calor aire agua y motocondensadores con compresores scroll

nra

R407C



2 UNIT DESCRIPTION

The devices of the NRA range are units used to produce cold water for technological systems; the heat pump models also allow you to produce hotwater for heating. They consist of two R407C refrigerating circuits and a single hydraulic circuit (which may or may not be fitted with an accumulation unit).

The presence of more than one scroll type compressor allows the NRA chillers various capacity controls of the cooling capacity. By means of a microprocessor, the electronic regulation controls and manages all the components and working parameters of the unit; an internal memory registers the working conditions in the moment when an alarm condition arises, in order to visualise it on the display. The units have a protection rating of IP 24.

2.1 MODELS AVAILABLE

- "STANDARD COOLING ONLY (°)" maximum outside temperature allowed 41-42°C. Acoustic protection cover for the compressor, for quiet operation..
- "HEAT PUMPS (H)" in cooling mode the operating limits arrive to a maximum outside air temperature of 46°C.. Le grandezze 275, 300, 325 e 350 sono disponibili nella sola versione silenziosa. NRAH do not envisage the following configurations:
 - YH (with processed water lower than 4°C)
 - HC (condensing heat pump)
 - HA (heat pump in high temperature because the heat pump is, by its very nature, a machine for high temperatures)

2.2 VERSION AVAILABLE

- "STANDARD/BASE"
RAH heat pump appliances are not available

in the following configurations

NOTE

NRA with water produced at - 6°C: YA version only (high temperature with water produced at - 6°C) is available. For all other configurations including Y, please contact the company.

- "HIGH TEMPERATURE" **(available only for cold working versions)** via the expansion of the pack finned heat exchanger, it allows you to widen the operating limits, arriving at a maximum outside air temperature of 46°C.
- "SILENZIATE (L)" this indicates models configured for particularly low noise operation. In cold only and heat pump appliances sizes 275, 300, 325 and 350 the units are low noise. Sizes 500, 550, 600, 650 and 700 are fitted with a fan speed adjustment device. **All the sizes are fitted with a device for regulating the fan speed. When the temperature is lower than 35°C, the low noise version further reduces the number of fan rotations, thereby obtaining an even quieter operation than that in nominal conditions.**
- "SILENCED HEAT PUMPS (HL)" represents the models designed for particularly quiet operation. **500 and 750 are fitted with a device for regulating the fan speed. (DCPX)**
- "HEAT RECOVERY"
A unit with air condensation, complete with section for partial heat recovery. The heat exchanger is specially scaled to guarantee heat recovery for the production of hot water for use in bathrooms or other purposes.

1. Desuperheater (D)

The desuperheater is also available for heat pump versions, limitedly in the cooling function. It must be intercepted in the heating function.

2. Total heat recovery (T)

In heat pumps total recovery is only available for the "OO versions without hydronic kit"

- "CONDENSING UNITS C"
- "SILENCED CONDENSING UNITS LC"
- "VERSION Y" is the version that allows you to produce chilled water below the standard value of +4°C, to a minimum of -6°C.
For lower values, contact the company headquarters.
ONLY THE VERSION YA IS AVAILABLE.

WARNING

For the devices designed to work with a low air temperature, and also the heat pumps, before starting up the unit (or at the end of each period of prolonged disuse) it is extremely important for the oil of the compressor carter to be heated beforehand, via the power supply to the special heaters, for at least 8 hours.

The carter heater is automatically powered when the unit stops, provided that the unit is kept under tension.

2.3 CONFIGURATORE

1,2,3	4,5,6,7	8	9	10	11	12	13	14	15,16
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NRA 0750 ° ° ° L ° ° ° 00

field 15 - 16

HYDRONIC KIT	
00	Without accumulation
01	Accumulation and low pressure pump
02	Accumulation, low pressure pump and reserve pump
03	Accumulation and high pressure pump
04	Accumulation, high pressure pump and reserve pump
05	Accumulation with holes for integrative resistance, and low pressure pump
06	Accumulation with holes for integrative resistance, low pressure pump and reserve pump
07	Accumulation with holes for integrative resistance, high pressure pump
08	Accumulation with holes for integrative resistance, high pressure pump and reserve pump

field 14

Power supply	
°	3~ 400V-50Hz with thermomagnetic switches
4	3~ 230V-50Hz with thermomagnetic switches
9	3~ 500V-50Hz with thermomagnetic switches

field 13

Evaporator	
°	According to PED standards
C	Condensing (without evap.)

field 12

Coils	
°	- Aluminium
R	- Copper
S	- Tinned copper
V	- Varnished aluminium copper

field 11

Version	
°	Standard
A	High temperature
L	Standard in Silenced operation

field 10

Heat recoverers	
°	Without recoverers
D	Desuperheater
T	Total recovery

field 9

Model	
°	Cooling only
H	Heat pump

field 8

Refrigerant	
°	Standard
Y	Version for low temperature of processed water, down to -6°C

field 4 - 5 - 6 - 7

0275 - 0300 - 0325 - 0350 - 0500 - 0550 - 0600 - 0650 - 0700 - 0750

3 DESCRIPTION OF COMPONENTS

3.1 COOLING CIRCUIT

Compressor

Hermetic scroll type compressors, fitted with an antifreeze resistor as standard accessory. The resistor is powered automatically when the unit pauses, provided the power supply is not turned off.

The compressor compartment is sound-proofed.

Exchanger air side

Features copper tube bundle with aluminium fins, fixed by mechanical expansion of tubes. High-efficiency type; splined pipe and corrugated fins for heat pump, smooth pipe and turbo fins for cooling-only version.

Exchanger water side

Plate type (AISI 316), with double cooling circuit and alternating water-freon circuits. Insulated externally with closed cell material, to reduce heat loss.

Liquid separator (heat pump versions only)

Located on the compressor suction side to offer protection against possible returns of liquid refrigerant, flooded starting, and operation in the presence of liquid.

Drier filter

Mechanical filter made from ceramic and hygroscopic material, designed to capture impurities and all residual moisture in the cooling circuit.

Liquid indicator

Indicates the level of the coolant gas charge and the presence of moisture in the cooling circuit.

Thermostatic valve

The valve, with equaliser at the evaporator outlet, regulates gas flow to the evaporator according to the thermal load, ensuring a sufficient degree of superheating of intake gas.

Suction side liquid and discharge gas shut-off valves (cooling version only)

These valves provide the facility to intercept the flow of refrigerant to allow supplementary maintenance work to be carried out.

Solenoid valve

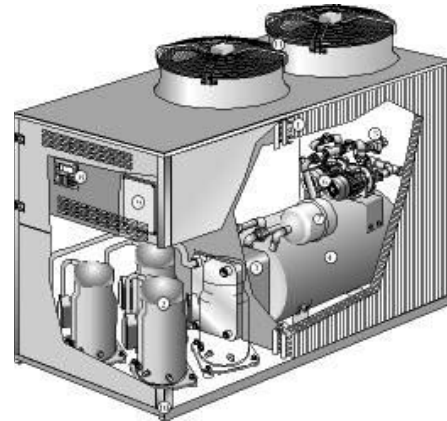
Cuts in when the compressor shuts down to stop flow of coolant gas to the evaporator.

By pass solenoid valve (heat pumps only)

By-passes the thermostat valve during the defrosting cycle.

KEY

- 1 Air side exchanger
- 2 Compressor
- 3 Water side exchanger
- 4 Storage tank
- 5 Water filter
- 6 Circulation pump
- 7 Expansion Vessel
- 8 Control keypad
- 9 Electric panel
- 10 Frame
- 11 Fan assembly



Reverse cycle valve

(heat pump version only)

Reverses the flow of coolant on changing from Summer to Winter operating mode and during defrosting cycles.

Unidirectional valve

Allows refrigerant to flow in only one direction.

Desuperheater (only if requested)

Plate-type exchanger (AISI 316) with outer closed-cell heat insulation.

Total recovery device (only if requested)

Not available for heat pump versions. Plate-type exchanger (AISI 316) with outer closed-cell heat insulation.

3.2 FRAME AND FANS

Fan assembly

Statically and dynamically balanced axial flow type. The fan units are electrically protected with thermal-magnetic circuit breakers and mechanically protected with metal anti-intrusion grilles. CEI EN 60335-2-40.

Frame

Made from hot-galvanised thick sheet metal, painted with stoved polyurethane powder for resistance to atmospheric agents.

3.3 HYDRAULIC COMPONENTS

Circulation pump

Fitted to the tank, provides the head required to compensate for pressure drops in the system. The option of a reserve pump is also foreseen, and in this case the software resident in the regulation card will provide for alternation of the pump to keep the number of working hours even.

Flow switch (Supplied as a standard accessory)

Has the job of checking the circulation of water. If there is no circulation, it blocks the unit.

Water filter (Supplied as a standard accessory)

Allows any impurities in the hydraulic circuits to be collected and eliminated. Interior houses a filter mesh with holes not exceeding one millimetre. It is essential to prevent serious damage to the plate heat exchanger.

Storage tank

Steel tank with 500-litre capacity. To reduce heat loss and eliminate the formation of condensation, it is insulated with layer of polyurethane material of adequate thickness.

Equipped as standard with an electric antifreeze heater controlled by the antifreeze sensor located in the tank.

Bleed valve

(version with storage tank)

Automatic valve fitted in upper section of tank. Discharges residual air present in tank. It is intercepted by a tap to facilitate

Filling assembly

(version with storage tank)

Features pressure gauge for measuring system pressure values.

Expansion vessel

(version with storage tank)

Diaphragm type pre-charged with nitrogen.

Hydraulic circuit safety valve

Set to 6 Bar with ductable discharge, it in-

tervenes to discharge excess pressure if the pressure level rises above normal.

3.4 SAFETY AND CONTROL DEVICES

Low pressure switch

Not included in the heat pump version.

Fixed setting, located on the low pressure side of the cooling circuit, the switch shuts down compressor operation in the event of abnormal operating pressure levels.

High pressure switch

Variable setting, located on the high pressure side of the cooling circuit, the switch shuts down compressor operation in the event of abnormal operating pressure levels.

Anti-freeze electric heater (Supplied as a standard accessory)

This is turned on by the antifreeze sensor, located in the plate evaporator. It turns on when the water temperature drops to +3°C and turns off again when the temperature reaches +5°C. The resistor is managed by dedicated software, resident in the regulation card.

Refrigerator circuit safety valves

Calibrated at 30 Bar, it cuts in by letting off the overpressure in the case of abnormal pressures.

TP1 low pressure transducer: as a standard option for heat pumps, as an accessory for cooling only versions

TP2 high pressure transducer:
Standard options for size to 500 ap 750 and in all heat pump version.

3.5 ELECTRICAL COMPONENT

Electric panel

Features power section, regulation of controls and safety devices. Compliant with CEI 60204-1 standards and Directives EMC 89/336/EEC and 92/31/EEC

Door lock disconnecter

For safety's sake it is only possible to access the electric panel after cutting off the power supply using the lever that opens the panel itself. This lever can be fastened with one or more locks during maintenance operations, to prevent power from being restored to the machine accidentally

Control Keypad

Gives complete control over unit functions. For more information, refer to the user manual.

Remote control panel

For remote control of chiller operation.

- **compressor thermomagnetic cut-out.**
- **fan thermomagnetic cut-out;**
- **auxiliary thermomagnetic cut-out.**
- **exhaust gas temperature control thermostat**

3.6 ELECTRONIC REGULATION

Microprocessor

Comprises control board and display panel. Functions include:

- evaporator inlet water temperature control with thermostating up to 6 steps and proportional - integral control on the fan speed.
- compressor start-up delay;
- chiller operating mode with possibi-

lity of additional cooling capacity using "free-cooling";

- compressor sequence rotation;
 - low temperature control device (accessory);
 - compressor operation timer;
 - start/stop control;
 - reset;
 - permanent alarm log;
 - automatic restart after power failure;
 - multi-language messages;
 - local or remote-control operation;
 - machine status display: compressors ON/OFF; alarm summary;
 - alarm control:
 - high pressure;
 - flow switch;
 - low pressure;
 - anti-freeze;
 - compressor overload;
 - fan overload;
 - pumps overload;
 - display of the following parameters:
 - inlet water temperature; evaporator inlet water temperature; outlet water temperature; delta T;
 - high pressure; low pressure;
 - restart delay time.
 - alarm display.
 - settings:
 - a) without password:
 - set cooling; total differential;
 - b) with password:
 - set anti-freeze; low pressure off time;
 - display language; access code.
- The main functions controlled by the microprocessor are described below (for more information, refer to the user manual)

4 ACCESSORIES

AER485 - Modbus system board

Accessory for connecting the unit to BMS supervisor systems with electric standard RS485 and MODBUS protocol.

AVX - VT Vibration damper support

Group of vibration dampers to be fitted under the plate base of the unit, at the points provided, and which serves to reduce the vibration produced by the fan unit and compressors during operation.

DCPX - Dispositivo per basse temperatura

Fitted as standard in sizes 500L, 550L, 600L, 650L, 700L, 750L and in all models with Desuperheater (D).

Low temperature device designed to ensure correct operation during cooling cycles below 20°C (only for Standard and High Temperature versions). Comprises an electronic regulation card that adjusts the ventilator speed according to the condensation pressure, read by the high pressure transducer, to keep it sufficiently high.

GP - Protective grille

Each kit contains two grills; it will be necessary to use two or three kits, according to the model. This kit is used to protect the external battery from accidental knocks.

PGS -

Board designed for installation on the unit microprocessor. Used to program two time settings per day (i.e. two on-off cycles); different programs may be set for each day of the week.

ROME0

Remote Overwaching Modem Enabling Operation (Remote Overwaching Modem Enabling Operation) is a device that enables a remote control of a chiller from an ordinary mobile phone with WAP browser.

Furthermore it allows to send alarm or pre-alarm SMS up to 3 GSM mobile phones which may not be equipped with WAP browser

TP1 - Low pressure transducer Standard

equipment on heat pump models.

Serves to show the compressor suction pressure value on the microprocessor board display (one per circuit). Located

on the low-pressure side of the refrigerant circuit, disconnects the compressor if anomalous working pressures are detected.

TP2 - High pressure transducer Standard equipment on sizes 500, 550, 600, 650, 700, 750 and on all heat pump models.

Serves to show the compressor discharge pressure value on the microprocessor board display (one per circuit). This adjustable sensor located on the high-pressure side of the refrigerant circuit disconnects the compressor if anomalous working pressures are detected.

DRE - Dispositivo riduzione corrente di spunto.

Electronic peak current reducer.

It must be factory-mounted.

RIF - Current rephaser.

Parallel connection with the motor makes the reduction of input current possible. This can only be installed when the machine is being made and must therefore be specified when the order is placed.

MOD.	ROME0	TP1	TP2	DRE	AER485	PGS	GP	DCPX	RIF	VT
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VERSIONI STANDARD (*)											S.a	C.a
0275	-	-	-	-	-	-	-	-	-	-	-	-
0300	-	-	-	-	-	-	-	-	-	-	-	-
0325	-	-	-	-	-	-	-	-	-	-	-	-
0350	-	-	-	-	-	-	-	-	-	-	-	-
0500	•	• (x2)	Std.	500	•	•	2 (x2)	38	63	4	10	10
0550	•	• (x2)	Std.	550	•	•	2 (x2)	38	63	4	10	10
0600	•	• (x2)	Std.	600	•	•	2 (x2)	38	64	4	10	10
0650	•	• (x2)	Std.	650	•	•	2 (x2)	38	64	4	11	11
0700	•	• (x2)	Std.	650	•	•	2 (x2)	38	64	4	11	11
0750	•	• (x2)	Std.	750	•	•	2 (x3)	38	64	4	11	11

NRA POMPA DI CALORE H												
0275	-	-	-	-	-	-	-	-	-	-	-	-
0300	-	-	-	-	-	-	-	-	-	-	-	-
0325	-	-	-	-	-	-	-	-	-	-	-	-
0350	-	-	-	-	-	-	-	-	-	-	-	-
0500	•	Std.	Std.	500	•	•	2 (x2)	38	63	4	10	10
0550	•	Std.	Std.	550	•	•	2 (x2)	38	63	4	10	10
0600	•	Std.	Std.	600	•	•	2 (x2)	38	64	4	10	10
0650	•	Std.	Std.	650	•	•	2 (x3)	38	64	4	11	11
0700	•	Std.	Std.	650	•	•	2 (x3)	38	64	4	11	11
0750	•	Std.	Std.	750	•	•	2 (x3)	38	64	4	11	11

NRA L												
0275	•	• (x2)	• (x2)	275	•	•	3	16	62	12	13	13
0300	•	• (x2)	• (x2)	300	•	•	3	16	62	12	13	13
0325	•	• (x2)	• (x2)	325	•	•	3	16	62	12	13	13
0350	•	• (x2)	• (x2)	325	•	•	3	16	82	12	13	13
0500	•	• (x2)	di serie	500	•	•	2 (x2)	Std.	63	4	10	10
0550	•	• (x2)	Std.	550	•	•	2 (x2)	Std.	63	4	10	10
0600	•	• (x2)	Std.	600	•	•	2 (x2)	Std.	64	4	10	10
0650	•	• (x2)	Std.	650	•	•	2 (x3)	Std.	64	4	11	11
0700	•	• (x2)	Std.	650	•	•	2 (x3)	Std.	64	4	11	11
0750	•	• (x2)	Std.	750	•	•	2 (x3)	Std.	64	4	11	11

NRA HL												
0275	•	Std.	Std.	275	•	•	4	Std.	62	12	13	13
0300	•	Std.	Std.	300	•	•	4	Std.	62	12	13	13
0325	•	Std.	Std.	325	•	•	4	Std.	62	12	13	13
0350	•	Std.	Std.	325	•	•	4	Std.	82	12	13	13
0500	•	Std.	Std.	500	•	•	2 (x2)	Std.	63	4	10	10
0550	•	Std.	Std.	550	•	•	2 (x2)	Std.	63	4	10	10
0600	•	Std.	Std.	600	•	•	2 (x2)	Std.	64	4	10	10
0650	•	Std.	Std.	650	•	•	2 (x3)	Std.	64	4	11	11
0700	•	Std.	Std.	650	•	•	2 (x3)	Std.	64	4	11	11
0750	•	Std.	Std.	750	•	•	2 (x3)	Std.	64	4	11	11

MOD.	ROMEO	TP1	TP2	DRE	AER485	PGS	GP	DCPX	RIF	VT	
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NRA A											S.a	C.a
0275	•	• (x2)	• (x2)	275	•	•	3	16	62	12	13	
0300	•	• (x2)	• (x2)	300	•	•	3	16	62	12	13	
0325	•	• (x2)	• (x2)	325	•	•	3	16	62	12	13	
0350	•	• (x2)	• (x2)	325	•	•	4	16 (x2)	82	12	13	
0500	•	• (x2)	Std.	500	•	•	2 (x2)	38	63	4	10	
0550	•	• (x2)	Std.	550	•	•	2 (x2)	38	63	4	10	
0600	•	• (x2)	Std.	600	•	•	2 (x2)	38	64	4	10	
0650	•	• (x2)	Std.	650	•	•	2 (x3)	38	64	4	10	
0700	•	• (x2)	Std.	650	•	•	2 (x3)	38	64	4	11	
0750	•	• (x2)	Std.	750	•	•	2 (x3)	38	64	4	11	

NRA C											
0275	-	-	-	-	-	-	-	-	-	-	-
0300	-	-	-	-	-	-	-	-	-	-	-
0325	-	-	-	-	-	-	-	-	-	-	-
0350	-	-	-	-	-	-	-	-	-	-	-
0500	•	• (x2)	Std.	500	•	•	2 (x2)	38	63	4	-
0550	•	• (x2)	Std.	550	•	•	2 (x2)	38	63	4	-
0600	•	• (x2)	Std.	600	•	•	2 (x2)	38	64	4	-
0650	•	• (x2)	Std.	650	•	•	2 (x2)	38	64	4	-
0700	•	• (x2)	Std.	650	•	•	2 (x3)	38	64	4	-
0750	•	• (x2)	Std.	750	•	•	2 (x3)	38	64	4	-

NRA LC											
0275	•	• (x2)	• (x2)	275	•	•	3	16	62	12	-
0300	•	• (x2)	• (x2)	300	•	•	3	16	62	12	-
0325	•	• (x2)	• (x2)	325	•	•	3	16	62	12	-
0350	•	• (x2)	• (x2)	325	•	•	3	16 (x2)	82	12	-
0500	•	• (x2)	Std.	500	•	•	2 (x2)	di serie	63	4	-
0550	•	• (x2)	Std.	550	•	•	2 (x2)	di serie	63	4	-
0600	•	• (x2)	Std.	600	•	•	2 (x2)	di serie	64	4	-
0650	•	• (x2)	Std.	650	•	•	2 (x2)	di serie	64	4	-
0700	•	• (x2)	Std.	650	•	•	2 (x3)	di serie	64	4	-
0750	•	• (x2)	Std.	750	•	•	2 (x3)	di serie	64	4	-

1= It must be factory-mounted.
The braces indicate that installation of

the combination of accessories shown is required.

S.a = Without storage tank
C.a = With storage tank

5 TECHNICAL DATA

5.1 NOMINAL REFERENCE CONDITIONS

The technical data is calculated as follows

Cooling mode

- Temperature water inlet	12 °C
- Temperature of processed water	7 °C
- Ambient air temperature	35 °C
- Δt	5 °C

Heating mode

- Temperature of processed water	50 °C
- Ambient air temperature	b.s. 7 °C b.u. 6 °C
- Δt	5 °C

Sound Power

Aermec determines the value of sound power on the basis of measurements performed in compliance with regulation 9614, in respect with that requested by Eurovent certification.

(1) Sound Pressure

Sound pressure in free field on a reflective surface (factor of directionality Q=2), at 10 metres from the external surface of the unit, using the

parallel expansion method (box-method, ISO 3744)

NOTE

- The noise data refer to configuration without pump.
- For heat pumps the data refers to functioning in cooling mode

E.S.E.E.R.

There is a growing awareness in Europe as well that attention needs to be paid to the electricity consumed by air conditioning machines. For many years now in the United States talk has not just been about efficiency in the plan conditions, but an assessment index is used that takes account of the marginal operation of the unit under plan conditions and the greater use with partial loads with external air that is less than that planned and in conditions of compressor capacity control. In Europe the proposed

EECCAC (Energy Efficiency and Certification of Central Air Conditioner) has been adopted, the ESEER (European Seasonal Energy Efficiency Ratio), that has the purpose of being able to compare the chillers with each other.

After estimating the total energy required by the system during summer management (kW/h), the seasonal electrical energy consumption can be deduced with this formula:

$$\text{Input energy} = \frac{\text{Required energy}}{\text{Efficiency index}}$$

The actual energy calculation can be obtained, more accurately, by considering:

1. The load profile with external temperature
2. The climatic profile
3. The total number of hours

With this data, every consultant or designer will be able to his or her evaluations.

$$\text{ESEER} = (3 \times \text{EER}_{100\%} + 33 \times \text{EER}_{75\%} + 41 \times \text{EER}_{50\%} + 23 \times \text{EER}_{25\%}) / 100$$

Acqua uscita evaporatore	7 °C
ΔT a pieno carico	5 °C
Carico	100% 75% 50% 25%
Temperatura aria esterna	35 °C 30 °C 25 °C 20 °C

5.3 TECHNICAL DATA, HIGH EFFICIENCY VERSIONS A

		0275	0300	0325	0350	0500	0550	0600	0650	0700	0750
Cooling capacity:	kW	53	62	71	82	98	107	125	142	166	185
Total input power	kW	18	21	24	28	34	38	46	53	58.5	64
Evaporator water flow rate	l/h	9120	1066	1238	1410	1680	1840	2150	2600	2850	3182
Evaporator pressure drop	kPa	40	35.5	36.5	50	33.5	27	37	37	44	47

ENERGY INDICES											
EER	W/W	2.94	2.95	2.96	2.98	2.87	2.83	2.72	2.70	2.84	2.89
ESEER	W/W	3.57	3.58	2.83	3.61	3.51	3.48	3.81	3.80	3.98	

ELECTRICAL DATA											
Fuel feed	A	3N~400 V 50Hz									
Total input power	A	36.2	41.6	45.4	54	61.7	68.7	84.5	96.7	103.6	115.5
Maximum current	A	65	68	71	77	98	104	133	148	148	160
Peak current	A	155	161	166	209	215	222	239	253	260	314

COMPRESSORS											
Type		scroll	scroll	scroll	scroll	scroll	scroll	scroll	scroll	scroll	scroll
Number	n°	2	2	2	2	3	3	4	4	4	4
Number per circuit	n°/n°	2/2	2/2	2/2	2/2	3/2	3/2	4/2	4/2	4/2	4/2
COMPRESSOR HEATER											
Compressor carter heater	n° + W	2 x 75	2 x 75	2 x 75	2 x 75	3 x 75	3 x 75	4 x 75	4 x 75	4 x 75	2 x 75
											2x130

FANS											
Type		Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial
Number	n°	4	6	6	8	2	2	2	3	3	3
Input current ventilation unit	A	3.2	4.8	4.8	6.4	5	5	5	5	7.5	
Input power ventilation unit	kW	2.32	5.22	5.22	9.28	2.8	2.8	2.8	2.8	4.2	
Air flow rate	m ³ /h	13720	20450	20450	27300	35500	35500	35500	35000	54900	56000

EVAPORATORS											
Type		piastre	piastre	piastre	piastre	piastre	piastre	piastre	piastre	piastre	piastre
Number	n°	1	1	1	1	1	1	1	1	1	1

HYDRAULIC CIRCUIT											
Water Tank	l	500	500	500	500	500	500	500	500	500	500
Accumulation anti-freeze heater	n° x kW	300	300	300	300	300	300	300	300	300	300

PLUMBING CONNECTIONS STANDARD VERSIONS (hydraulic parallel not supplied)											
Hydraulic connections	V	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½

LOW PRESSURE PUMPING UNIT											
Input power	kW	0.75	0.75	0.75	0.75	1.1	1.1	1.1	1.5	1.85	3
Input current	A	1.85	1.85	1.85	2.14	2.14	2.14	2.14	2.92	3.60	6.4
Useful pressure pumping	kPa	122	126	113	91	112	103	55	76	83	80

HIGH PRESSURE PUMPING UNIT											
Input power	kW	1.1	1.1	1.5	1.5	1.8	1.8	3.7	3.7	3.7	5.5
Input current	A	2.14	2.14	2.92	2.92	3.60	3.60	7.21	7.21	7.21	11.3
Useful pressure pumping	kPa	172	162	161	145	180	179	171	158	133	195

SOUND DATA											
Sounud Power	dB(A)	76.0	76.0	77.0	77.0	82.5	82.5	83.0	84.0	84.0	84.5
Sound pressure (1)	dB(A)	44.0	44.0	45.0	45.0	50.5	50.5	51.0	52.0	52.0	52.0

DIMENSIONS for all versions											
Height	mm	1606	1606	1606	1606	1875	1875	1875	1875	1875	1875
Width	mm	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
Length	mm	2450	2450	2450	2950	2950	2950	2950	2950	3950	4275
EMPTY WEIGHT versions without accumulation and pumps											
	kg	660	690	705	790	980	1005	1080	1165	1345	1530



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