

## NRA Free-Cooling Air-cooled water chillers With axial fans and capacities from 198 to 420 kW

### R407C



Aermec adheres to the EUROVENT Certification Programme. The products concerned appear in the EUROVENT Certified Products Guide.



### • STANDARD VERSION • VERSION EQUIPPED WITH WATER PUMP

### • VERSION EQUIPPED WITH WATER PUMP AND STORAGE TANK

The devices of the NRA Free-Cooling range are water chillers provided with additional air-water coils for recovery of the chilling power supplied by the external air. This free, water cooling system, called "Free-Cooling", will supplement, to the point of even fully substituting it, the chilling power delivered by the compressors if the external air temperature permits (installation water return temperature greater than the external air temperature). In this way, E.E.R. may be obtained that is as much as ten times greater than traditional "compressors only" chillers.

#### Features

- 6 sizes available
- Cooling only versions with R407C
- Operation mode:
  - Free-Cooling only: is the most economical operating condition of the unit. Only the fan units work in speed modulation, the chilling power is totally recovered from the external air
  - Mix of Free-Cooling and compressors: the chilling power recovered from the external air is integrated with the total or partial operation of the compressors
  - Compressors only: the chilling power is delivered entirely by the compressors (standard operation for a chiller)
- Available in 3 versions:
  - Standard with water filter and flow switch
  - With water pump only
  - With high-head pumping group, accumulation tank of 300 l with two 300 W antifreeze electric heaters, water filter, flow switch and expansion tank
- All versions except the motocondensing one can be ordered for low temperature operation for production of chilled water from 4 °C down to -10 °C. This option must be specified at the time of ordering
- High efficiency scroll compressors with low power consumption
- Electric heater for the compressor carter
- Adjustment by microprocessor of the compressors and of the fan units for handling the three modes of operation (Free-Cooling only, mix of Free-Cooling and compressors, and compressors only)
- Functional parameters can be displayed in any of four languages
- Simplified remote control panel. All main functions of the unit, alarms included, are possible
- High efficiency plate type heat exchangers
- Evaporator electric heating element
- Air-water exchanger (Free-Cooling) of the high efficiency type with smooth tubes and corrugated fins
- Three-way valve located on the water side for switching of the water on the Free-Cooling coils
- High and low pressure transducers
- Axial flow fan units for extremely quiet operation
- Speed adjustment device of the fan units for operation with low air temperatures. In Free-Cooling mode, manages the chilling power
- Compact size
- Metallic protective cabinet with rustproof polyester paint

## Accessories

- **AER485:** RS-485 interface for supervision systems with MODBUS protocol.
- **AVX:** Spring anti-vibration mounts. Select the AVX model by using the compatibility table.
- **DRE:** Electronic peak current reducer. **It must be factory-mounted.**
- **GP FC:** Safety grille: protects external coils from accidental impact.
- **PGS:** Daily/weekly programmer with facility to program two daily on/off cycles and set different parameters for each day of the week.
- **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.**
- **ROMEO:** (Remote Overwatching Modem Enabling Operation) is a device that enables a remote control of a chiller from an ordinary WAP mobile phone. Furthermore it allows to send alarm or pre-alarm SMS messages up to 3 GSM mobile phones which may not be equipped with WAP. **This device includes AER485 accessory.**

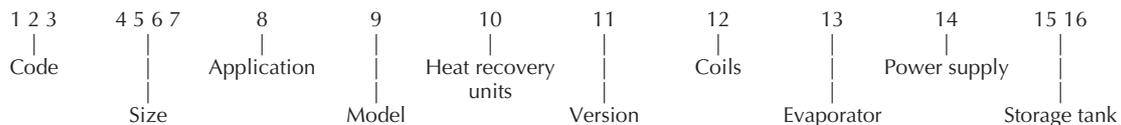
Mod. NRA	Compatibility of accessories					
	800	900	1000	1200	1350	1500
AER485	✓	✓	✓	✓	✓	✓
AVX (NRA without storage tank)	155	155	155	158	158	160
AVX (NRA with storage tank)	156	156	157	159	159	161
DRE 25	✓ (x4)	✓ (x2) }		✓ (x6)	✓ (x3) }	
DRE 30		✓ (x2) }	✓ (x4)		✓ (x3) }	✓ (x6)
GP 350 FC	✓	✓	✓			
GP 500 FC				✓	✓	✓
PGS	✓	✓	✓	✓	✓	✓
RIF	64	74	84	66	76	86
ROMEO	✓	✓	✓	✓	✓	✓

N.B. = the brackets indicated on certain models specify the combination of accessories to be installed.

## Selection

By combining the various options, each model can be configured exactly to match even the most specific system requirements.

### Configuration rules:



#### Code:

NRA

#### Size:

0800, 0900, 1000, 1200, 1350, 1500

#### Application:

- ° - Standard with produced water above +4 °C
- Y - Low temperature with produced water down to -6 °C

#### Model:

- ° - Cooling only

#### Heat recovery units:

- ° - Without heat recovery units

#### Version:

- ° - Standard
- A - High temperature
- L - Silenced

#### Coils:

- ° - Aluminium
- R - Copper
- S - Tinned copper
- V - Painted copper / aluminium version

#### Evaporator:

- ° - To PED standards
- G - To TÜV-D standards

#### Power supply:

- ° - 3~ 400V 50Hz with thermal-magnetic cut-outs
- 4 - 3~ 230V 50Hz with thermal-magnetic cut-outs
- 9 - 3~ 500V 50Hz with thermal-magnetic cut-outs

#### Storage tank:

- F0 - without accumulator
- F3 - high head storage tank and single pump
- F4 - high head storage tank and standby pump
- F5 - without storage unit with high head pump
- F6 - without storage unit with high head and standby pumps

### Warning:

- standard options are shown by symbol °;
- it is possible only the combination between options Y and A (please, contact the Headquarter for particular needs).

Commercial code example: **NRA0900LF3**

This is an NRA unit, of size 0900, silenced version, with evaporator to PED standards, with electric panel for compressors with 3~ 400V 50Hz motors and single pump storage tank.

Note that as each option is precisely identified, it is not necessary to specify standard options (shown with °) in the commercial code.

## Technical data

Mod. NRA FC	Vers.	0800	0900	1000	1200	1350	1500
Cooling capacity (kW)	°	221	246	272	330	370	410
	A	226	254	280	340	380	420
	L	198	222	246	298	334	368
Total input power (kW)	°	88	97	105	130	143	156
	A	83.5	91.5	99	123	135	147
	L	90	99.5	109	134	148	162
E.E.R. (W/W)	°	2.51	2.54	2.59	2.54	2.59	2.63
	A	2.71	2.78	2.83	2.76	2.81	2.86
	L	2.20	2.23	2.26	2.22	2.26	2.27
Working current (A)	°	152	167	182	225	247	269
	A	147	162	176	217	239	260
	L	153	168	182	228	250	271
Water flow rate (l/h)	°	38010	42310	46780	56760	63640	70520
	A	38870	43690	48160	58480	65360	72240
	L	34060	38180	42310	51260	57450	63300
Pressure drops (kPa)	° F0	38	33	37.5	38	34	38
	A F0	40	35	40	40	36	40
	L F0	31	27.5	31.5	32	28.5	32
Effective pressure (kPa)	° F3/F4	210	205	180	197	175	170
	A F3/F4	205	198	175	185	163	150
	L F3/F4	230	230	205	230	215	230
Cooling capacity (kW)	°	242	274	308	332	392	452
	A	246	278	312	338	396	456
	L	232	264	296	320	378	436
Total input power (kW)	All	10.8	10.8	10.8	14.4	14.4	14.4
E.E.R. (W/W)	°	22	25	29	23	27	31
	A	23	26	29	23	28	32
	L	21	24	27	22	26	30
Working current (A)	All	24	24	24	32	32	32
Water flow rate (l/h)	°	35730	39770	43980	53350	59820	66290
	A	36540	41070	45270	54970	61440	67910
	L	32010	35890	39770	47180	54000	59500
Pressure drops (kPa)	° F0	73	70	74	56	68	100
	A F0	74	70	76	59	68	104
	L F0	61	62	65	49	56	86
Effective pressure (kPa)	° F3/F4	192	189	164	202	169	145
	A F3/F4	188	182	161	191	160	133
	L F3/F4	212	207	192	233	209	208
♪ Sound pressure dB (A)	° - A	61	61	61	63	63	63
	L	55	55	55	57	57	57
	°	114000	111500	109000	152000	149500	147000
Total air flow rate (m <sup>3</sup> /h)	A	111000	109000	107000	149000	146500	144000
	L	58000	61000	64000	76000	80000	84000
	All	4	4	4	6	6	6
Compressors (n.)	All	4 x 130	4 x 130	4 x 130	6 x 130	6 x 130	6 x 130
Carter electric heater (W)	°	352	392	432	432	480	527
	A	348	388	427	425	473	520
	L	345	385	425	425	474	522
Evaporators (n.)	All	1	1	1	1	1	1
Water connections* (Ø)	F0	3"	3"	3"	4"	4"	4"
Storage tank capacity (l)	All	700	700	700	700	700	700
Expansion tank capacity (l)	All	2 x 24					
Safety valve setting (bar)	All	6	6	6	6	6	6
Pump absorbed power (kW)	All	5.5	5.5	5.5	7.5	7.5	9.2
Pump input current (A)	All	11	11	11	14.6	14.6	17.5

Performance values refer to the following conditions:

♪ Sound pressure measured in free field conditions at distance of 10 m and direction factor = 2.

■ Cooling:

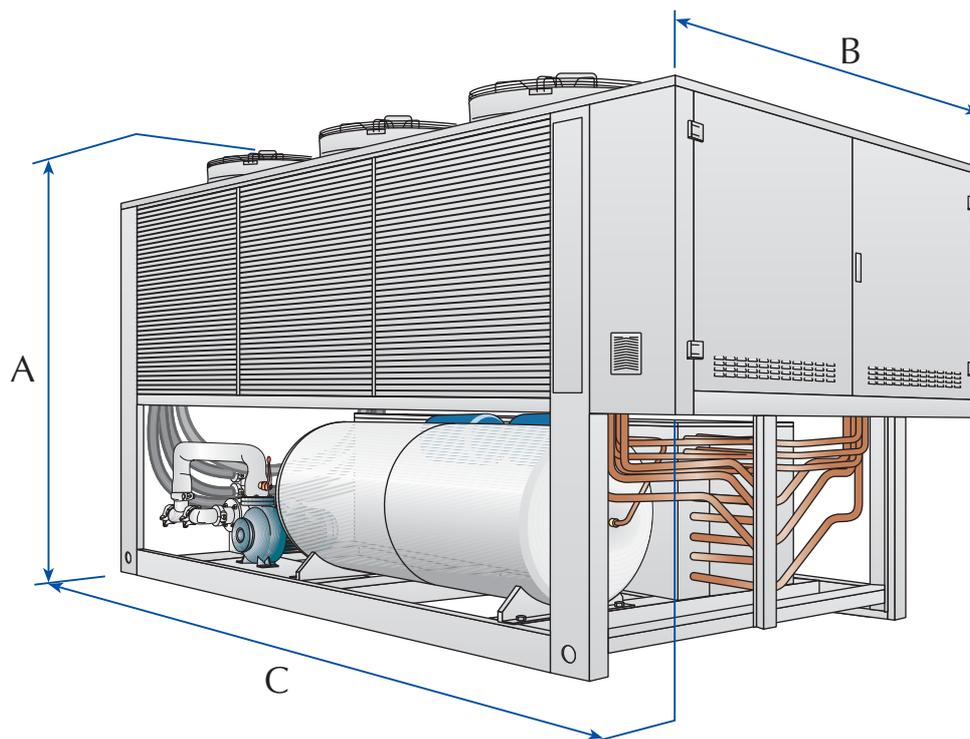
- water outlet temperature 7 °C;
- ambient air temperature 35 °C;
- Δt = 5 °C.

■ Cooling in Free-Cooling mode:

- water inlet temperature 15 °C;
- ambient air temperature 2 °C;
- nominal water flow rate;
- compressors off.

\* = Victaulic couplings (Standard version only, refer to technical manual for all other versions).

## Dimensions (mm)



Mod. NRA		800	900	1000	1200	1350	1500
Height	A	2450	2450	2450	2450	2450	2450
Width	B	2200	2200	2200	2200	2200	2200
Depth	C	4250	4250	4250	5750	5750	5750
	°	2953	3071	3133	3953	4109	4260
Weight (kg)	A	2992	3166	3280	4035	4264	4487
	L	2992	3166	3280	4035	4264	4487

**Warning:** weights refer to versions without accumulation and pump.