



TECHNICAL MANUAL

CHILLER

- EXTERNAL UNIT
- HIGH EFFICIENCY
- POWER SUPPLY 60Hz

# NRL free cooling 280-750

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 CE mark guarantees that our appliances fully comply with the requirements of the European Machinery Directive in terms of safety. We constantly monitor the quality level of our products, and as a result they are synonymous with Safety, Quality, and Reliability. Product data may be subject to modifications deemed necessary for improving the product without the obligation to give prior notice.

Thank you again.  
AERMEC S.p.A

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AERMEC S.p.A. reserves the right at all times to make any modification for the improvement of its product and is not obliged to add these modification to machines of previous manufacture that have already been delivered or are being built.

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Standards and Directives respected on designing and constructing the unit:

**PROTECTION RATING**

1. IP 24

**ACOUSTIC PART:**

1. ISO DIS 9614/2  
(INTENSIMETRIC METHOD)
2. SOUND POWER (EN ISO 9614-2)
3. SOUND PRESSURE (EN ISO 3744)

**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.

**STANDARD:**

**UL 1995**

Heating and cooling equipment.

**ANSI/NFPA**

Standard 70 National Electrical code (N.E.C.).

**CSA C.22.1.- C.22.2**

Safety Standard Electrical Installation.

## 1. DESCRIPTION AND CHOICE OF UNIT

The NRL Free-cooling series appliances are water chillers equipped with an external air cooling capacity recovery system called "free-cooling".

The water free-cooling system consists in integrating and eventually completely replacing the cooling capacity delivered by the compressors through an additional water coil that exploits the low temperature of the external air to cool the system's return water.

**Maximum reliability**

The presence of several scroll compressors allows NRL chillers various partialisations of the cooling capacity.

**OPERATING MODE:**

**FREE-COOLING ONLY:**

when the external temperature is sufficiently low to allow water cooling inside the free-cooling coils at the desired temperature. This is the most economical mode of the unit with only the fans operating in speed modulation.

**MIXED FREE-COOLING + COMPRESSORS:**

the compressors operate in integration with the free-cooling when the cooling capacity recovered from the external air is no longer sufficient for the power required by the system. The higher the cooling capacity recovery with free-cooling the lower the integration is.

**COMPRESSORS ONLY:**

when the external air temperature is greater than the return temperature of the system water.

**Models:**

1. NRL "F" free-cooling

The versions can be in different set-ups at the same time in order to satisfy a wide range of plant engineering solutions:

1. "A" HIGH EFFICIENCY
2. "E" SILENCED HIGH EFFICIENCY
3. "D" WITH DESUPERHEATER

The units with desuperheater (D) are not available in the versions:

1. YD
2. XD

## 2. CHECK LIST

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

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

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

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

VERSION WITH "D" DESUPERHEATER											
hydraulic circuit	Version "F with D"	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
Water filter		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Differential pressure switch		no	no	no	no	no	no	no	no	no	no
Flow switch		no	no	no	no	no	no	no	no	no	no
Exchanger (desuperheater)		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

hydraulic circuit	Storage tank version with D"	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
Water filter		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Differential pressure switch		no	no	no	no	no	no	no	no	no	no
Flow switch		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Exchanger (desuperheater)		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Safety valve		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Air vent		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Pump		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Expansion tank		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Storage tank		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

### 3. CONFIGURATOR

	DESCRIPTION
<b>1, 2, 3</b>	<b>NRL</b>
<b>4, 5, 6</b>	<b>Size</b> 028 - 030 - 033 - 035 - 050 - 055 - 060 - 065 - 070 - 075
<b>7</b>	<b>Compressors</b> <b>0</b> Standard compressor
<b>8</b>	<b>Thermostatic valve</b> ° Standard mechanical thermostatic valve with produced water up to 39.2°F / +4°C <sup>(1)</sup> <b>Y</b> Mechanical thermostatic valve with produced water from 39.2°F / +4°C to -42.8°F / -6°C <sup>(1)</sup> <b>X</b> Electronic thermostatic valve with produced water up to 39.2°F / +4°C <sup>(1)</sup>
<b>9</b>	<b>Model</b> <b>F</b> Free-cooling
<b>10</b>	<b>Heat recovery</b> ° Without recovery units <b>D</b> Desuperheater <sup>(2)</sup>
<b>11</b>	<b>Version</b> <b>A</b> High efficiency (not available for sizes 028 ÷ 035) <b>E</b> High efficiency, silenced version (on demand for sizes 050 ÷ 075) <sup>(2)</sup>
<b>12</b>	<b>Coils</b> ° Made of aluminium <b>R</b> Made of copper <b>S</b> Tinned copper <b>V</b> Painted aluminium (epoxy paint)
<b>13</b>	<b>Ventilation</b> <b>I</b> Fan speed modulating for condensation control
<b>14</b>	<b>Power supply</b> <b>6</b> 230V-3-60Hz with thermomagnetic switches <sup>(2)</sup> <b>7</b> 460V-3-60Hz with thermomagnetic switches <b>8</b> 575V-3-60Hz with thermomagnetic switches
<b>15, 16</b>	<b>Hydronic kit</b> <b>00</b> Without hydronic kit <b>03</b> Water storage tank and high-head single pump <b>04</b> Water storage tank, with high-head pump and reserve pump <b>P3</b> Without water storage tank, with high-head pump <b>P4</b> Without water storage tank, with high-head pump and reserve pump

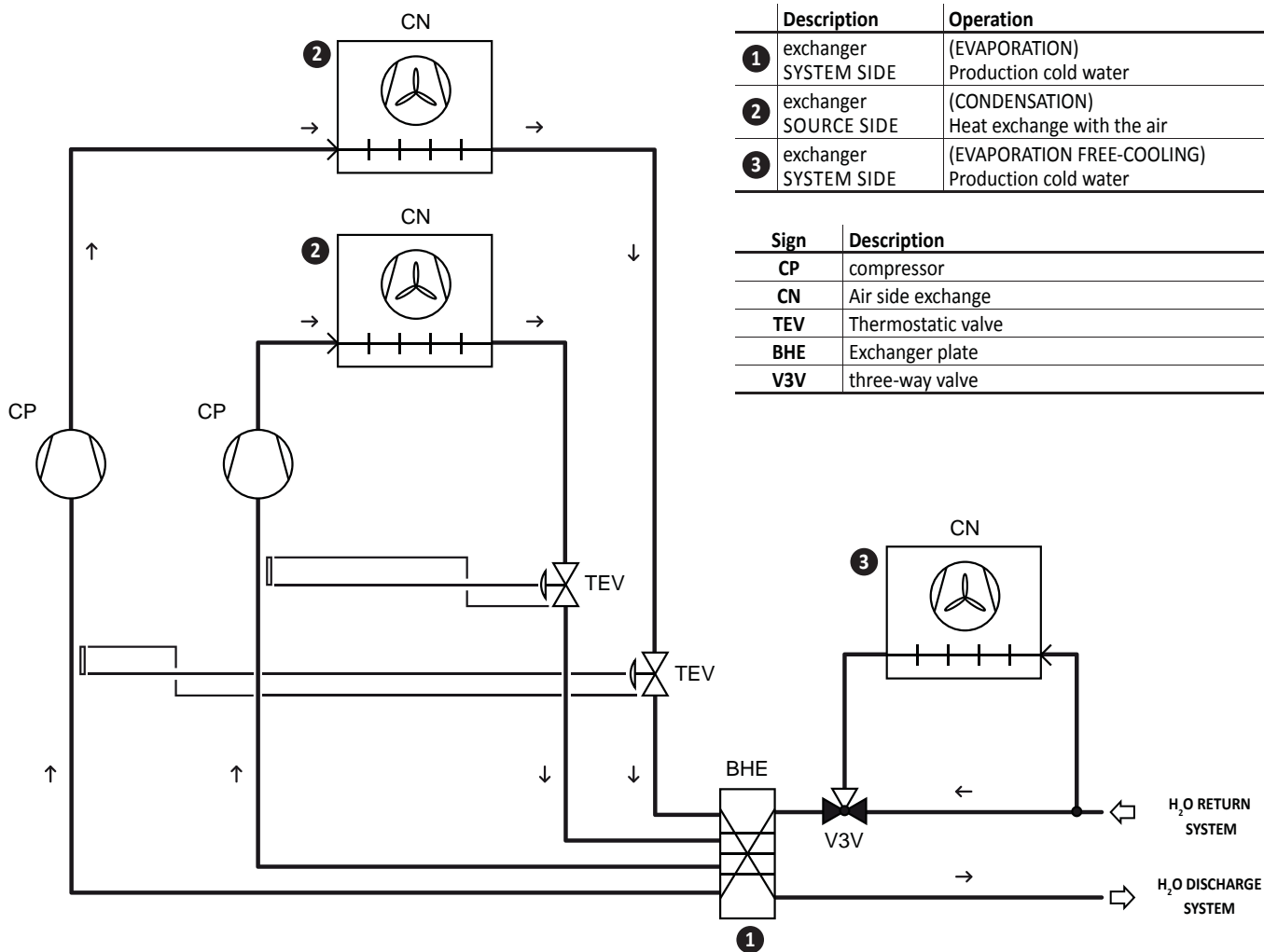
<sup>(1)</sup> For lower temperatures, contact the office.

<sup>(2)</sup> Versions available only on demand



4. PRINCIPLE OF OPERATION SCHEMES

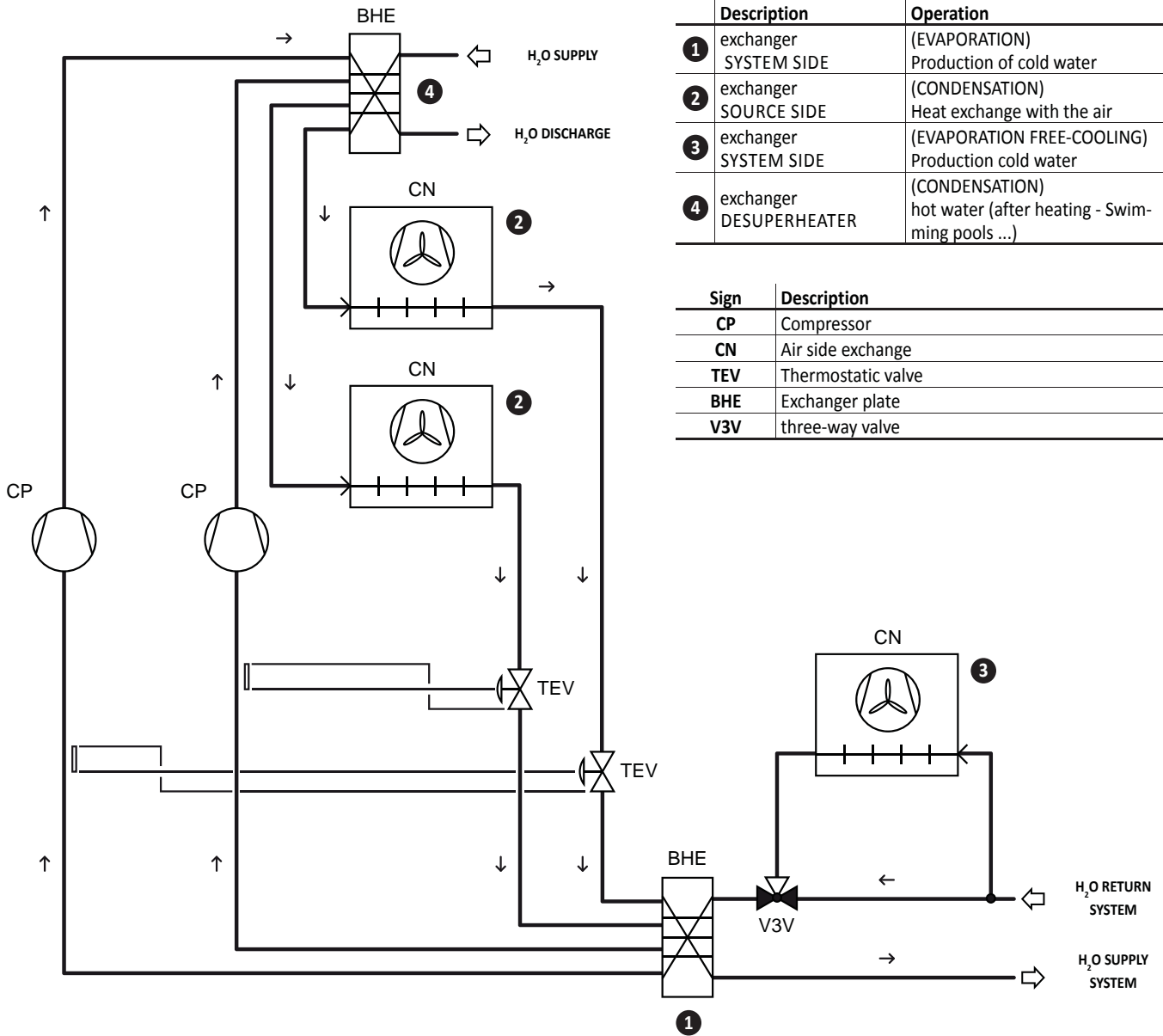
4.1. PRODUCTION OF COLD WATER ONLY THE SYSTEM



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

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

4.2. COLD WATER PRODUCTION AND THE SYSTEM RECOVERY (DESUPERHEATER)



	Description	Operation
①	exchanger SYSTEM SIDE	(EVAPORATION) Production of cold water
②	exchanger SOURCE SIDE	(CONDENSATION) Heat exchange with the air
③	exchanger SYSTEM SIDE	(EVAPORATION FREE-COOLING) Production cold water
④	exchanger DESUPERHEATER	(CONDENSATION) hot water (after heating - Swimming pools ...)

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

## 5. DESCRIPTION OF THE COMPONENTS

### 5.1. CHILLER CIRCUIT

#### SCROLL COMPRESSORS

High efficiency scroll-type hermetic compressors, assembled on elastic antivibration supports, driven by a 2-pole electric motor with internal thermal protection. of the electric heater casing included as standard. The heater is automatically powered when the unit stops, provided that the unit is kept under tension.

#### WATER SIDE HEAT EXCHANGER

Of the plate-type (AISI 316), externally insulated with closed cell material to reduce thermal dispersion. Fitted, as standard, with antifreeze heater.

#### 5.1.1. WATER FEATURES

PH	6-8
Electric conductivity	less than 200 mV/cm (77°F / 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

#### SOURCE SIDE HEAT EXCHANGER

Made with copper pipes and aluminium louvered fins blocked by mechanical expansion of the pipes. Provided with protective grid.

#### DESUPERHEATER

Unit with (AISI 316) heat plate, insulated externally with closed cell material to reduce heat loss.

#### 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.

#### ONE-WAY VALVES

Allows the passage of the refrigerant in just one direction.

#### THERMOSTATIC VALVE

The valve with external equaliser positioned at the evaporator inlet, modulates the flow of gas to the evaporator, according to the heat load, in order to ensure a correct heating level of the intake gas.

#### SOLENOID VALVE

The valve closes when the compressor turns off, preventing the flow of refrigerant gas towards the evaporator.

#### SIGHT GLASS

Used to check the refrigerant gas load and the eventual presence of humidity in the cooling circuit.

#### TAPS

Present in the liquid and discharge lines, and allow to intercept the refrigerant in case of extraordinary maintenance.

### 5.2. FRAME AND FANS

#### SUPPORT FRAME

Load-bearing structure Made of hot-galvanised steel sheet of a suitable thickness, varnished with polyester powders able to resist atmospheric agents over time.

#### FAN UNIT

Axial fan, balanced statically and dynamically. The electric fans are protected electrically by magnet-circuit breakers and mechanically by anti-intrusion metal grids, according to the IEC EN 60335-2-40 Standard.

### 5.3. HYDRAULIC COMPONENTS (standard version)

#### AIR-WATER HEAT EXCHANGER (FREE-COOLING)

Crossed by water for the free-cooling function. Is made of copper pipes and aluminium blades blocked through the mechanical expansion of the pipes. (High efficiency type).

#### 3-WAY VALVE

This is an electric servo-controlled ON-OFF diverting valve on the water side of the freecooling circuit controlled.

#### WATER FILTER

Allows you to block and eliminate any impurities in the hydraulic circuits. Inside, it has a filtering mesh with holes not greater than one millimetre. It is essential for avoiding serious damage to the plate-type exchanger.

#### FLOW SWITCH

Controls that the water is circulating, otherwise the unit blocks.

#### AIR VENT

Of the automatic type, assembled on the upper part of the hydraulic system; it releases any air bubbles that may be present in the system.

### 5.4. HYDRAULIC COMPONENTS (configurable version)

#### DRAIN VALVE

Of the automatic type, assembled on the upper part of the hydraulic system; it releases any air bubbles that may be present in the system.

#### CIRCULATION PUMPS (HIGH PUMP)

Depending on the characteristics of the pump chosen, it offers a useful head to overcome the pressure drops in the system.

#### EXPANSION TANK

Of the membrane type, with nitrogen pre-charge.

#### SAFETY VALVE

Calibrated to 87psi / 6bar and with ductable discharge, it releases overpressure in the event of abnormal working pressure levels.

#### STORAGE TANK

In order to reduce the thermal dispersion and eliminate the phenomenon of the formation of condensation, it is insulated with polyurethane material of a suitable thickness.

### 5.5. SAFETY AND CONTROL COMPONENTS

#### HIGH PRESSURE SWITCH

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

#### HIGH PRESSURE TRANSDUCER

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

#### LOW PRESSURE TRANSDUCER

Allows displaying, on the microprocessor board display, the value of the compressor's suction pressure (one per circuit) on the low-pressure side of the cooling circuit

#### EVAPORATOR ANTIFREEZE HEATING ELEMENT

Its operation is commanded by the antifreeze probe located in the plate evaporator.

It is activated when the water temperature is +3°C, and deactivated when the water temperature is +5°C. The dedicated software in the regulation card manages the heater.

#### SAFETY VALVE

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

- Set at 45 bar on the branch HP
- Set at 30 bar on the branch LP

#### DCPX\_UL CONDENSATION PRESSURE CONTROLLER

This accessory allows correct functioning when external temperatures drop below 50 °F / 10°C (up to 14 °F / -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.

### 5.6. ELECTRICAL PANEL CONTROL AND POWER

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

- 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
- all numbered cables.

#### **DOOR-BLOCK DISCONNECTING SWITCH**

It is possible to access the electrical panel by disconnecting the voltage, then using the opening lever of the panel itself. This lever can be blocked with one or more padlocks during maintenance, in order to prevent the machine being powered up accidentally.

#### **REMOTE CONTROL PANEL (PR3)**

This allows the chiller command operations to be given from a distance. compressor protection thermomagnetic switch; fan protection thermomagnetic switch; auxiliary protection thermomagnetic switch; discharge gas temperature control thermostat

#### **CONTROL KEYPAD**

Provides full control functions. For a detailed description refer to the user manual.

#### **Electronic regulation**

##### **GR3**

- Consisting of a management/control card and a visualisation card.
- Functions carried out:
  - adjustment of water temperature at evaporator inlet, with thermostat control for up to 4 levels and integral-proportional fan speed control (with DCPX\_UL);
  - compressor start-up delay;
  - compressor sequence rotation;
  - count of compressor work hours;
  - start/stop;
  - reset;
  - permanent alarms memory;
  - autostart after voltage drop;
  - multi-lingual messages;
  - operation with local or remote control.

##### **Machine status display:**

1. alarms summary;
2. ON/OFF compressors.

##### **Display of the following parameters**

1. water inlet temperature;
2. accumulator temperature;
3. water outlet temperature;
4.  $\Delta T$ ;
5. high pressure;
6. low pressure;
7. waiting time for restart;
8. alarms visualisation.

**For further information, refer to the user manual.**

## 6. ACCESSORIES

### 6.1. MECHANICAL ACCESSORIES

#### VT

Group of anti-vibration, to be installed under the base.

#### GP

Protection grille, protects the external coil from accidental knocks.

### 6.2. ELECTRICAL ACCESSORIES

#### 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;

#### DRE

It allows the reduction of peak power necessary for the machine during start-up phase.

Accessories can only be fitted in the factory.

#### DUALCHILLER

Simplified control system to switch on and off, and command, two chillers (using Aermec GR3 command) in a single system, as if they were a single unit.

#### MULTICHILLER

Control system to switch the individual chillers on and off, and command them, in a system in which several

units are installed in parallel, always ensuring a constant delivery to the evaporators.

PGS: Daily/Weekly Programmer.

Allows you to programme two time bands per day (two switch on/off cycles) and to have differentiated programming for each day of the week.

#### PRM1-PRM2 FACTORY FITTED ACCESSORY.

It is a manual pressure switch electrically wired in series with the existing automatic high pressure switch on the compressor discharge pipe.

#### AER485

RS-485 interface for supervision systems with MODBUS protocol.

#### FOR MORE INFORMATION PLEASE CONTACT US

## 7. TECHNICAL DATA vers. F (CHILLER FUNCTION)

Model				0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
Cooling capacity	FA	Alls	Tons	-	-	-	-	23.84	27.23	34.06	37.91	41.17	46.24
	FE	Alls	Tons	13.16	15.18	17.44	21.39	-	-	-	-	-	-
Total power input	FA	Alls	kW	-	-	-	-	33.30	40.02	48.02	56.23	64.65	65.05
	FE	Alls	kW	16.38	19.52	22.32	29.95	-	-	-	-	-	-
Total power input with HIGH - PUMP	FA	230V-460V	kW	-	-	-	-	35.65	42.37	51.02	59.23	67.65	68.05
	FE	230V-460V	kW	18.73	21.87	24.67	32.30	-	-	-	-	-	-
	FA	575V	kW	-	-	-	-	35.50	42.22	51.02	59.23	67.65	68.05
	FE	575V	kW	17.88	21.02	23.82	31.45	-	-	-	-	-	-
Water flow rate	FA	Alls	gpm	-	-	-	-	57	65	82	91	99	111
	FE	Alls	gpm	32	36	42	51	-	-	-	-	-	-
Total pressure drop	FA	Alls	psi	-	-	-	-	7	9	10	10	12	12
	FE	Alls	psi	6	5	7	8	-	-	-	-	-	-
Useful head with HIGH - PUMP	FA	230V-460V	psi	-	-	-	-	24	21	30	28	26	24
	FE	230V-460V	psi	27	28	26	24	-	-	-	-	-	-
	FA	575V	psi	-	-	-	-	23	21	30	28	26	24
	FE	575V	psi	28	28	25	23	-	-	-	-	-	-

## ENERGY INDICES

EER	FA	Alls	BTU/Wat	-	-	-	-	8.60	8.17	8.52	8.10	7.65	8.54
	FE	Alls	BTU/Wat	9.65	9.34	9.39	8.58	-	-	-	-	-	-
IPLV	FA	Alls	BTU/Wat	-	-	-	-	12.02	11.92	12.56	12.19	11.87	11.51
	FE	Alls	BTU/Wat	11.85	11.82	11.89	11.48	-	-	-	-	-	-

## PROTECTION RATING

IP	24	24	24	24	24	24	24	24	24	24	24	24	24
----	----	----	----	----	----	----	----	----	----	----	----	----	----

## ELECTRICAL DATA

Total input current <sup>(1)</sup>	FA	230V	A	-	-	-	-	103.10	120.80	146.90	170.20	194.80	199.10
	FE			54.30	62.60	71.30	93.40	-	-	-	-	-	-
	FA	460V	A	-	-	-	-	52.00	60.80	75.50	85.10	95.20	99.40
	FE			30.80	35.00	40.50	49.50	-	-	-	-	-	
	FA	575V	A	-	-	-	-	42.00	49.60	61.20	69.80	78.90	81.60
	FE			25.60	29.10	34.20	42.40	-	-	-	-	-	
Model WITHOUT PUMP													
L.R.A.	FA	230V	A	-	-	-	-	376	389	373	454	494	539
	FE			235	283	294	375	-	-	-	-	-	
	FA	460V	A	-	-	-	-	189	200	199	229	239	272
	FE			134	161	171	201	-	-	-	-	-	
	FA	575V	A	-	-	-	-	138	146	134	171	186	214
	FE			108	111	119	156	-	-	-	-	-	
M.C.A.	FA	230V	A	-	-	-	-	148	161	180	225	265	277
	FE			82	90	101	146	-	-	-	-	-	
	FA	460V	A	-	-	-	-	70	81	99	110	120	130
	FE			52	61	71	83	-	-	-	-	-	
	FA	575V	A	-	-	-	-	57	64	72	89	105	115
	FE			43	49	57	74	-	-	-	-	-	
M.O.P.	FA	230V	A	-	-	-	-	205	218	218	283	323	339
	FE			113	127	138	203	-	-	-	-	-	
	FA	460V	A	-	-	-	-	95	106	119	135	145	159
	FE			67	81	91	108	-	-	-	-	-	
	FA	575V	A	-	-	-	-	79	86	86	112	127	141
	FE			54	63	71	97	-	-	-	-	-	
RECOM FUSE	FA	230V	A	-	-	-	-	200	200	200	250	300	300
	FE			110	125	125	200	-	-	-	-	-	
	FA	460V	A	-	-	-	-	90	100	110	125	125	150
	FE			60	80	90	100	-	-	-	-	-	
	FA	575V	A	-	-	-	-	75	80	80	110	125	125
	FE			50	60	70	90	-	-	-	-	-	

## COOLING (AHRI STANDARD CONDITIONS)

Outlet water temperature 6.7°C / 44.6°F  
Flow rate 0.043l/s per kW  
External temperature 35°C / 95°F

AHRI conditions: leaving water 6.7°C / 44.6°F

flow rate 0.043 l/s per kW (full load)

Load 100% air 35°C / 95°F

Load 75% air 26.7°C / 80.06°F

Load 50% air 18.3°C / 64.94°F

Load 25% air 12.8°C / 55.04°F

<sup>(1)</sup> data referred to no pump version

Model	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
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**Model WITH HIGH HEAD PUMP**

L.R.A.	FA	230V	A	-	-	-	-	384	397	383	464	504	549
	FE			243	291	302	383	-	-	-	-	-	-
	FA	460V	A	-	-	-	-	194	210	220	239	245	288
	FE			123	167	175	194	-	-	-	-	-	
	FA	575V	A	-	-	-	-	141	149	138	175	190	218
	FE			110	113	121	158	-	-	-	-	-	
M.C.A.	FA	230V	A	-	-	-	-	156	169	190	235	275	287
	FE			90	98	109	154	-	-	-	-	-	
	FA	460V	A	-	-	-	-	78	82	104	111	117	126
	FE			43	51	59	66	-	-	-	-	-	
	FA	575V	A	-	-	-	-	60	67	76	93	109	119
	FE			45	51	59	77	-	-	-	-	-	
M.O.P.	FA	230V	A	-	-	-	-	213	226	228	293	333	349
	FE			121	135	146	211	-	-	-	-	-	
	FA	460V	A	-	-	-	-	90	100	125	125	125	150
	FE			50	70	75	80	-	-	-	-	-	
	FA	575V	A	-	-	-	-	82	89	90	116	131	145
	FE			56	65	73	99	-	-	-	-	-	
RECOM FUSE	FA	230V	A	-	-	-	-	200	225	225	250	300	300
	FE			110	125	125	200	-	-	-	-	-	
	FA	460V	A	-	-	-	-	90	110	110	125	150	150
	FE			70	80	90	110	-	-	-	-	-	
	FA	575V	A	-	-	-	-	80	80	90	110	125	125
	FE			50	60	70	90	-	-	-	-	-	

**SCROLL COMPRESSORS**

Quantity / circuits	n°/n°	2/2	2/2	2/2	2/2	3/2	3/2	4/2	4/2	4/2	4/2
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**HEAT EXCHANGER SYSTEM SIDE**

Exchanger capacity	gal	0,8	1,1	1,1	1,3	1,7	1,7	2,2	2,9	2,9	3,4
Hydraulic connenction	∅	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½

**COOLING (AHRI STANDARD CONDITIONS)**

Outlet water temperature 6.7°C / 44,6 °F  
Flow rate 0.043l/s per kW  
External temperature 35°C / 95 °F

AHRI conditions: leaving water 6.7°C / 44.6°F

flow rate 0.043 l/s per kW (full load)

Load 100% air 35°C / 95°F

Load 75% air 26.7°C / 80.06°F

Load 50% air 18.3°C / 64.94°F

Load 25% air 12.8°C / 55.04°F

<sup>(1)</sup> data refered to no pump version

Model	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
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#### HYDRONIC GROUP SYSTEM SIDE

STORAGE TANK											
Storage tank capacity	n°/gal	79	79	79	79	79	79	79	79	79	132

EXPANSION TANK											
Expansion tank	n°/gal	6,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6
Expansion tank calibration	psi	21,8	21,8	21,8	21,8	21,8	21,8	21,8	21,8	21,8	21,8

HIGH HEAD PUMP												
Pump power input		kW	2,35	2,35	2,35	2,35	2,35	2,35	3,00	3,00	3,00	3,00
Pump input current	230V	A	7,00	7,00	7,00	7,00	7,00	7,00	10,40	10,40	10,40	10,40
	460V		3,34	3,34	3,34	3,34	3,34	3,34	4,94	4,94	4,94	4,94
	575V		4,42	4,21	4,26	3,88	3,67	3,57	4,72	4,54	4,42	4,58

SAFETY VALVE											
Safety valve calibration	psi	87	87	87	87	87	87	87	87	87	87

ELECTRICAL DATA													
Total input current <sup>(1)</sup>	FA	230V	A	-	-	-	-	103.10	120.80	146.90	170.20	194.80	199.10
	FE			54.30	62.60	71.30	93.40	-	-	-	-	-	-
	FA	460V	A	-	-	-	-	52.00	60.80	75.50	85.10	95.20	99.40
	FE			30.80	35.00	40.50	49.50	-	-	-	-	-	-
	FA	575V	A	-	-	-	-	42.00	49.60	61.20	69.80	78.90	81.60
	FE			25.60	29.10	34.20	42.40	-	-	-	-	-	-

FAN MOTORS												
Quantity	n°	6	6	8	8	2	2	3	3	3	3	
Air flow	CFM	14750	14514	18172	18172	23836	23836	37170	36580	36580	36580	
Fan input current	-	230V	A	6.96	6.96	9.28	9.28	13.0	13.0	19.5	19.5	19.5
	-	460V	A	6.96	6.96	9.28	9.28	7.6	7.6	11.4	11.4	11.4
	-	575V	A	6.96	6.96	9.28	9.28	6.64	6.64	9.96	9.96	9.96
Fan power input	-	230V	kW	1.56	1.56	2.08	2.08	4.0	4.0	6.0	6.0	6.0
	-	460V	kW	1.56	1.56	2.08	2.08	4.0	4.0	6.0	6.0	6.0
	-	575V	kW	1.56	1.56	2.08	2.08	4.36	4.36	6.54	6.54	6.54

SOUND DATA											
Sound pressure	dB(A)	42	43	45	46	51	51	52	53	54	55
Sound power	dB(A)	74	75	77	78	83	83	84	85	86	87

CHARGE (The data reported can be changed at any time if deemed necessary from Aermec)												
R410A Gas refrigerant	C1	kg	9,9	9,0	9,0	9,0	12,5	12,0	13,5	13,5	14,0	22,3
		lib	21,83	21,83	21,83	21,83	27,56	26,46	29,76	29,76	30,86	49,16
	C2	kg	9,9	9,0 21,83	9,0 21,83	9,0	9,5	9,0 21,83	13,5	13,5	14,0	23,5
		lib	21,83	21,83	21,83	21,83	20,94	29,76	29,76	29,76	30,86	51,81
Oil	C1	kg	2,7	3,0	3,0	3,0	5,4	6,0	6,0	6,0 13,23	6,0 13,23	6,0
		lib	5,95	6,61	6,61	6,61	11,90	13,23	13,23	13,23	13,23	13,23
	C2	kg	2,7	2,7	3,0	3,0	3,0	3,0	6,0	6,0	6,0	6,4
		lib	5,95	5,95	6,61	6,61	6,61	6,61	13,23	13,23	13,23	14,11

DIMENSION											
Height	in	63	63	63	63	74	74	74	74	74	77
Width	in	43	43	43	43	43	43	43	43	43	59
Depth	in	116	116	116	116	126	126	156	156	156	171
Weight when empty	kg	837	908	923	937	1110	1119	1369	1450	1470	1789
	lib	1847	2002	2037	2066	2449	2467	3020	3197	3241	3946

#### COOLING (AHRI STANDARD CONDITIONS)

Outlet water temperature	6.7°C / 44,6 °F
Flow rate	0.043l/s per kW
External temperature	35°C / 95 °F

AHRI conditions: leaving water 6.7°C / 44.6°F

flow rate 0.043 l/s per kW (full load)

Load 100% air 35°C / 95°F

Load 75% air 26.7°C / 80.06°F

Load 50% air 18.3°C / 64.94°F

Load 25% air 12.8°C / 55.04°F

<sup>(1)</sup> data referred to no pump version



## 8. TECHNICAL DATA vers. F (FREE-COOLING MODE)

Model			0280	0300	0330	0350	0500	0550	0600	0650	0700	0750	
Cooling capacity	FA	Alls	Tons	-	-	-	-	18.48	19.39	25.19	29.82	30.68	32.71
	FE	Alls	Tons	10.22	13.21	15.47	16.55	-	-	-	-	-	-
Total power input	FA	Alls	kW	-	-	-	-	4.67	4.67	6.59	6.66	6.66	6.66
	FE	Alls	kW	2.06	2.06	2.58	2.58	-	-	-	-	-	-
Water flow rate	FA	Alls	gpm	-	-	-	-	57	65	82	91	99	111
	FE	Alls	gpm	32	36	42	51	-	-	-	-	-	-
Total pressure drop	FA	Alls	psi	-	-	-	-	9	12	14	15	17	19
	FE	Alls	psi	9	7	9	11	-	-	-	-	-	-
Useful head with HIGH - PUMP	FA	230V-460V	psi	-	-	-	-	22	18	26	24	20	17
	FE	230V-460V	psi	24	26	23	21	-	-	-	-	-	-
	FA	575V	psi	-	-	-	-	21	18	26	24	20	17
	FE	575V	psi	24	26	23	20	-	-	-	-	-	-

ENERGY INDICES													
EER	FA	Alls	BTU/Wat	-	-	-	-	47.55	49.89	45.91	53.79	55.34	59.00
	FE	Alls	BTU/Wat	59.58	77.04	72.02	77.06	-	-	-	-	-	-

PROTECTION RATING													
IP	-	-	-	24	24	24	24	24	24	24	24	24	24

ELECTRICAL DATA													
Total input current <sup>(1)</sup>	FA	230V	A	-	-	-	-	13.0	13.0	19.5	19.5	19.5	19.5
	FE			7.0	7.0	9.3	9.3	-	-	-	-	-	-
	FA	460V	A	-	-	-	-	7.6	7.6	11.4	11.4	11.4	11.4
	FE			7.0	7.0	9.3	9.3	-	-	-	-	-	-
	FA	575V	A	-	-	-	-	6.6	6.6	10.0	10.0	10.0	10.0
	FE			7.0	7.0	9.3	9.3	-	-	-	-	-	-

SOUND DATA													
Sound pressure	dB(A)			42	43	45	46	51	51	52	53	54	55
Sound power	dB(A)			74	75	77	78	83	83	84	85	86	87

FREE-COOLING MODE  
(AHRI STANDARD CONDITIONS)

Inlet water temperature 15°C / 59°F

Outside air temperature 2°C / 35.6°F

Rated water flow

Compressors off

<sup>(1)</sup> data referred to no pump version

AHRI conditions: leaving water 6.7°C / 44.6°F

flow rate 0.043 l/s per kW (full load)

Load 100% air 35°C / 95°F

Load 75% air 26.7°C / 80.06°F

Load 50% air 18.3°C / 64.94°F

Load 25% air 12.8°C / 55.04°F

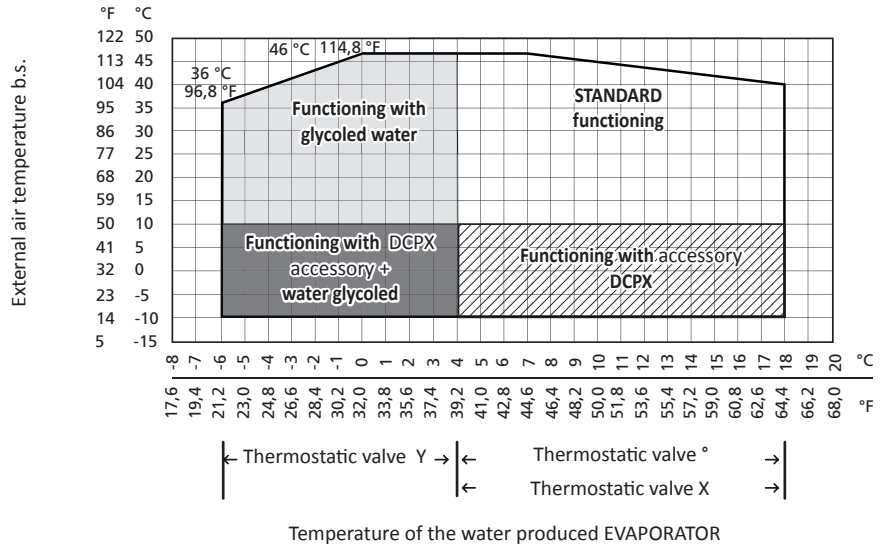
9. OPERATING LIMITS

The devices in their standard configurations are not suitable for installation in salty environments. For the operating limits, refer to diagram, valid for AHRI standard conditions.  
 Wind breaks should be implemented if the unit is installed in particularly windy areas, to prevent a malfunction of the unit.



**ATTENTION**

Wind breaks should be implemented if the unit is installed in particularly windy areas, to prevent a malfunction of the unit.



9.1. DESIGN SPECIFICATIONS

REFRIGERANT SIDE		High pressure side	Low pressure side
Acceptable maximum pressure	bar/PSI	45/653	30/435
Acceptable maximum temperature	°C / °F	120 / 248	51 / 131
Acceptable minimum temperature	°C / °F	-30 / -22	-30 / -22



**ATTENTION**

Contact our technical sales department if the unit needs to be operated outside the operating limits.

WATER SIDE		
Acceptable maximum pressure	bar/PSI	6/87

**Hydarulic circuit safety valve (only in version with storage tank or with pump)**

Calibrated at 6/87 bar/PSI and with piped discharge, which intervenes by discharging overpressure if abnormal work pressure occur.

**Note:**

1 - In summer mode the unit can be started with external air 46°C/114,8°F and water inlet 35°C/95°F. In winter mode the unit can be started with external air -15°C/5°F and water inlet

20°C/68°F. Operate in such conditions is permitted only for a short time and to bring the system up to temperature. To reduce the time of this operation, it is recommended to install a three-way valve that allows bypassing water from the

system utilities, until the conditions that allow the unit to work within the permitted operation limits are achieved.

## 10. CORRECTION FACTORS

### 10.1. INPUT POWER AND COOLING CAPACITY "HIGH EFFICIENCY VERSION"

The refrigerating capacity yielded and the input electrical capacity in conditions other than rated conditions are obtained by multiplying the rated values (Pf, Pa) by the respective correction coefficients (Cf, Ca).

The following diagrams allow you to obtain the correction coefficients to be used for the various versions of the devices, in cold mode; next to each curve you can see the outside air temperature to which it refers.

KEY

Cf: correction coefficient of the cooling capacity.

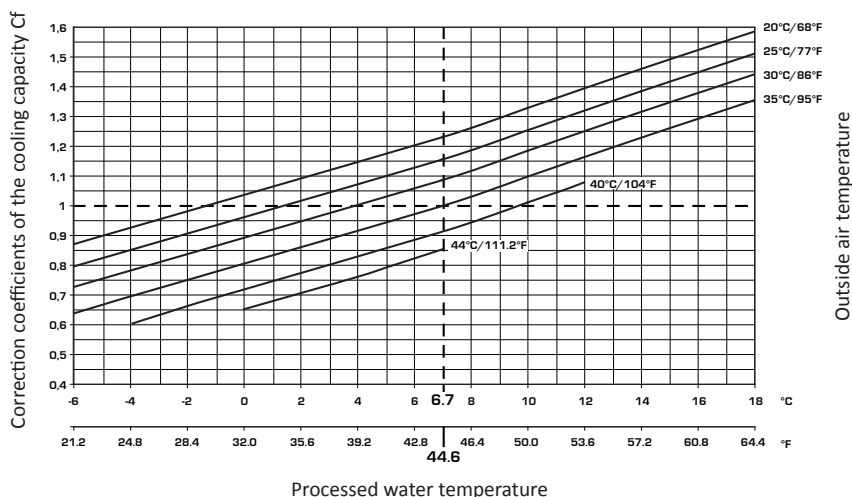
Ca: correction coefficient of the input power.



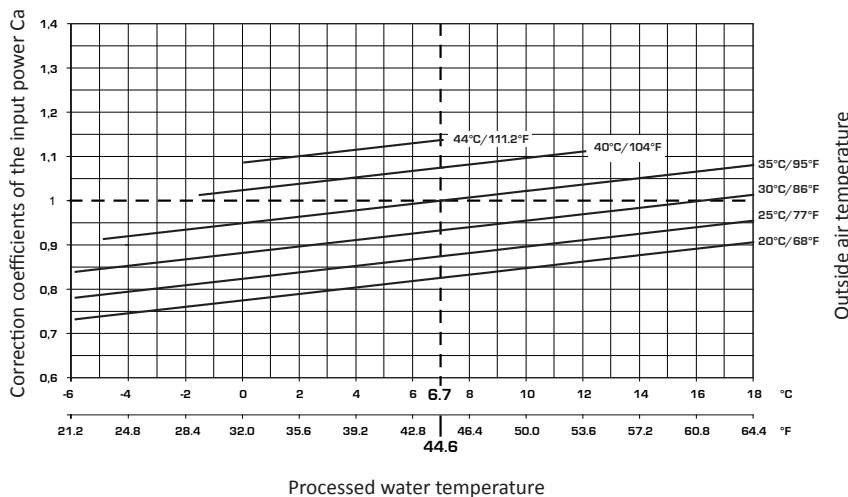
**ATTENZIONE**  
FOR  $\Delta t$  DIFFERENT  
FROM 10.01°F / 5.56°C

Tab. 10.2 is used for the correction factors of the cooling capacity and input power of the water consumption. To take into account the soiling of the exchanger, apply the relative fouling factors, Tab. 10.3

CORRECTION COEFFICIENTS OF THE COOLING CAPACITY



CORRECTION COEFFICIENTS OF THE INPUT POWER IN COOLING MODE



### 10.2. FOR $\Delta t$ DIFFERENT FROM THE RATED VALUE

The performances given by the technical data refer to AHRI standard conditions: flow rate 0.043l/s per kW ( $\Delta t$  10.01°F / 5.56°C).

Use table to obtain the corrective factors of the cooling capacity and input power different than  $\Delta t$  10.01°F / 5.56°C.

$\Delta t$ DIFFERENT FROM THE RATED VALUE ( $\Delta T$ 5°C - 10.01°F)	3°C / 5.40°F	5.56°C / 10.01°F	8°C / 14.40°F	10°C / 18°F
Cooling capacity correction factors	0,99	1	1,02	1,03
Input power correction factors	0,99	1	1,01	1,02

### 10.3. FOULING FACTORS

The performance levels given by the technical data refer to conditions with clean tubes, with a fouling factor = 1.

For other fouling factor values, multiply the data of performance table by the coefficients given.

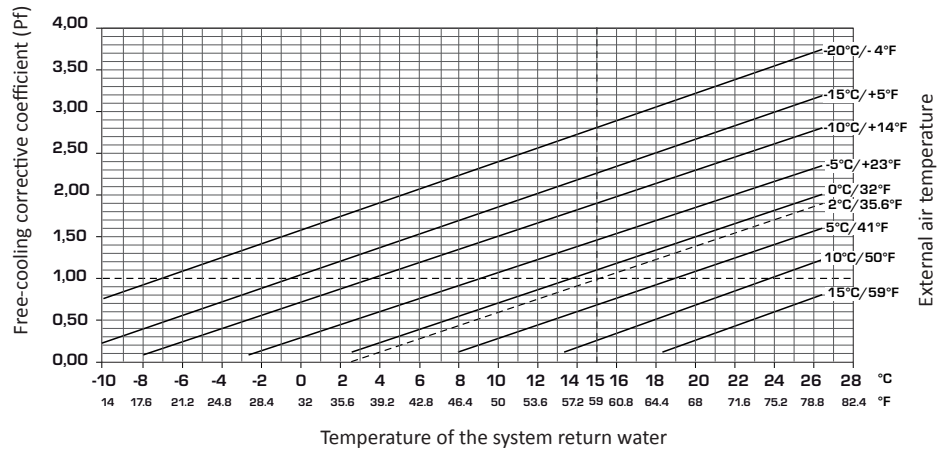
FOULING FACTOR [K*M2]/[KW]	0.018	0.05	0.1
Cooling capacity correction factors	1	0.987	0.967
Input power correction factors			

## 11. FREE-COOLING FUNCTIONING CORRECTIVE FACTORS

The maximum cooling capacity yielded when functioning is completely in free-cooling mode, i.e. all compressors are off, is obtained by multiplying the cooling capacity nominal value (Pf) given in the Technical Data by the respective corrective coefficient, which is obtained from the following diagram on the basis of the temperature of the water produced and the temperature of the external air.

These values refer to the fans in full rev conditions (maximum input power). If the power yielded should result in excess, a modulation will intervene on the number of revs.

FREE-COOLING ONLY FUNCTIONING COOLING CAPACITY CORRECTIVE COEFFICIENTS



### 11.1. FOR Δt DIFFERENT FROM THE RATED VALUE

The performances given by the technical data refer to AHRI standard conditions: flow rate 0.043/s per kW (Δt 10.01°F / 5.56°C).

Use table to obtain the corrective factors of the cooling capacity and input power different than Δt 10.01°F / 5.56°C.

Δt DIFFERENT FROM THE RATED VALUE (Δt 5°C - 10.01°F)	3°C / 5.40°F	5.56°C / 10.01°F	8°C / 14.40°F	10°C / 18°F
Cooling capacity correction factors	0,99	1	1,02	1,03
Input power correction factors	0,99	1	1,01	1,02

### 11.2. FOULING FACTORS

The performance levels given by the technical data refer to conditions with clean tubes, with a fouling factor = 1.

For other fouling factor values, multiply the data of performance table by the coefficients given.

FOULING FACTOR [K*M2]/[KW]	0.018	0.05	0.1
Cooling capacity correction factors	1	0.987	0.967
Input power correction factors	1	0.987	0.967

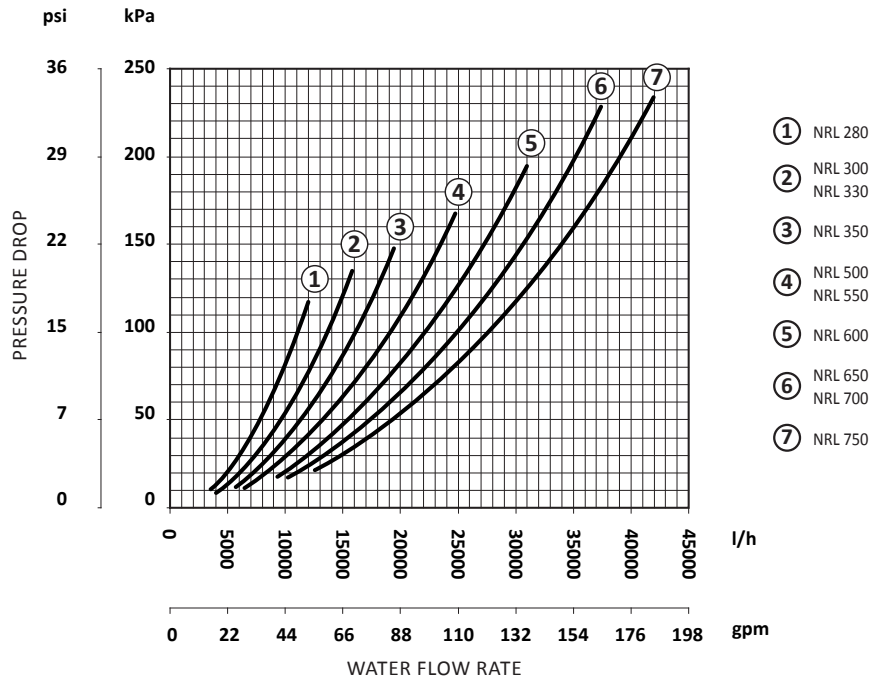
12. TOTAL PRESSURE DROPS

12.1. CHILLER FUNCTION PRESSURE DROP

Inlet temperature 53.6°F / 12°C  
 Outlet temperature 44.6°F / 7°C  
 Outside air temperature 95°F / 35°C

Average water temperature 50°F / 10°C

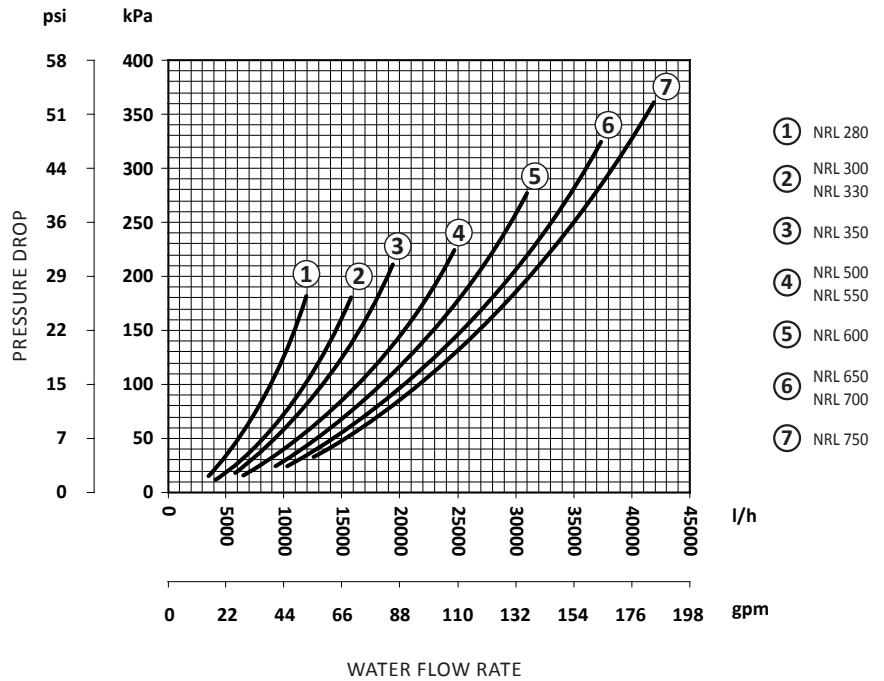
For temperatures other than 50°F / 10°C to use the table of correction factors.



Average water temperature °F/°C	41/5	<b>50/10</b>	59/15	68/20	86/30	104/40	122/50
Coefficients	1,02	<b>1</b>	0,98	0,97	0,95	0,93	0,91

12.2. FREE-COOLING FUNCTION PRESSURE DROP

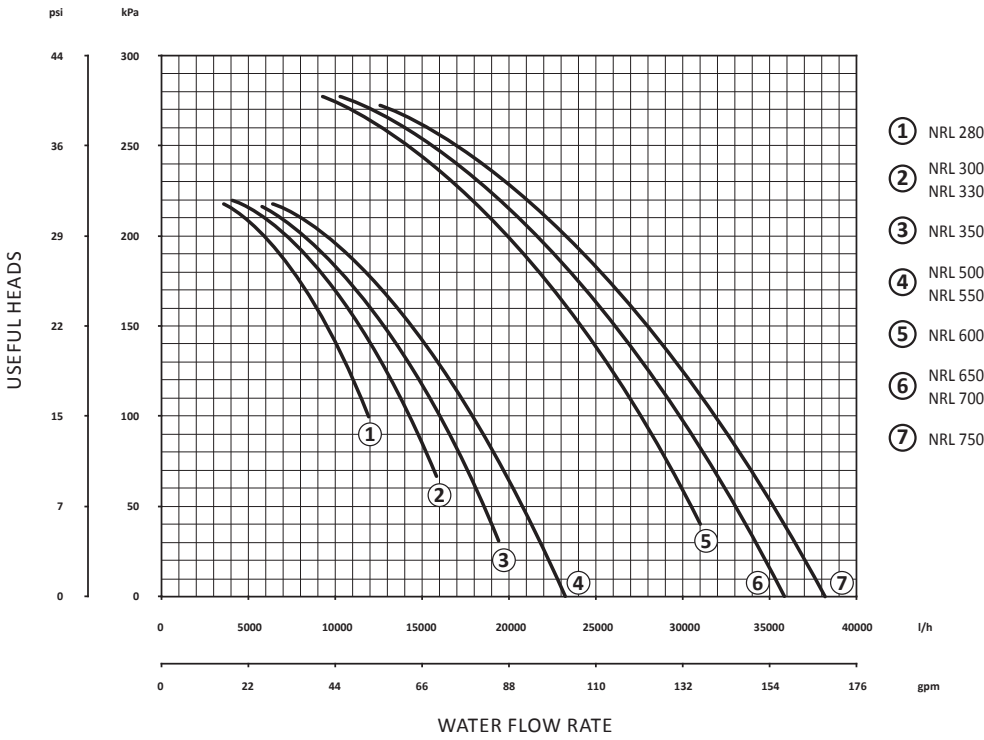
Inlet water temperature 15°C / 59°F  
 Outside air temperature 2°C / 35.6°F  
 Rated water flow  
 Compressors off



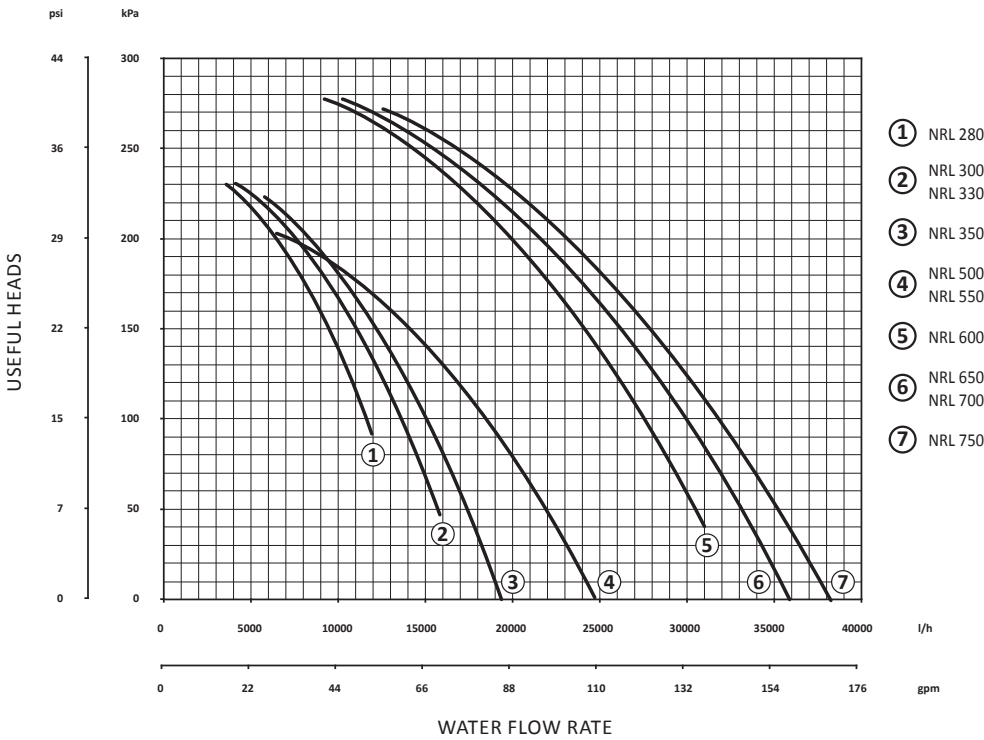
Average water temperature °F/°C	41/5	<b>50/10</b>	59/15	68/20	86/30	104/40	122/50
Coefficients	1,02	<b>1</b>	0,98	0,97	0,95	0,93	0,91

13. USEFUL HEADS

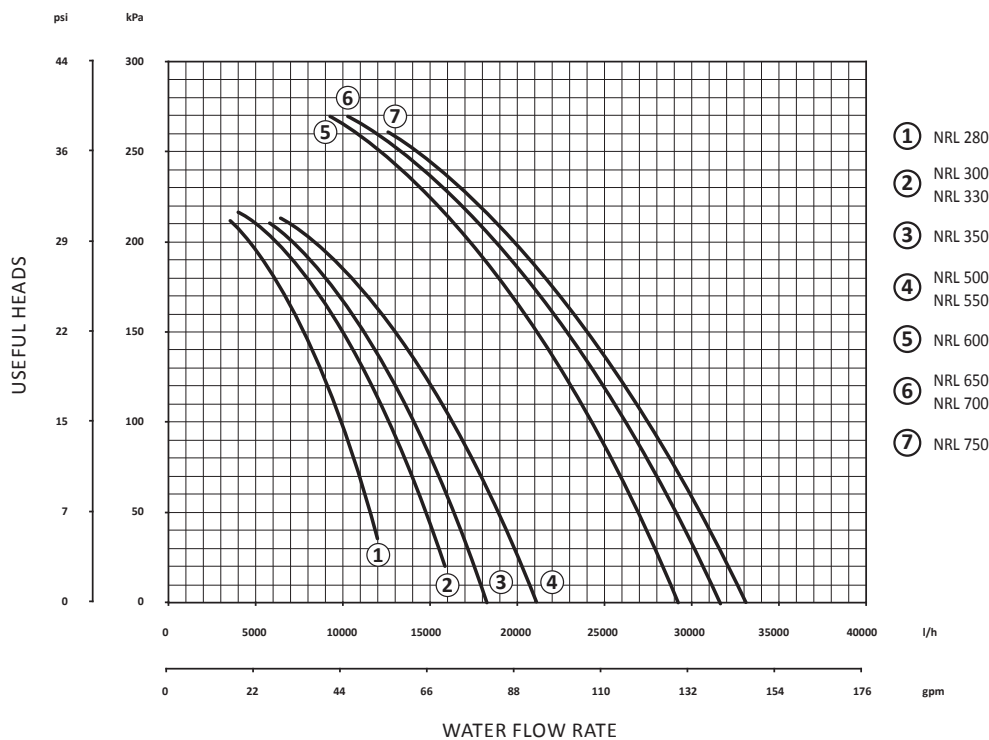
13.1. CHILLER MODE USEFUL HEADS 230-460/3/60



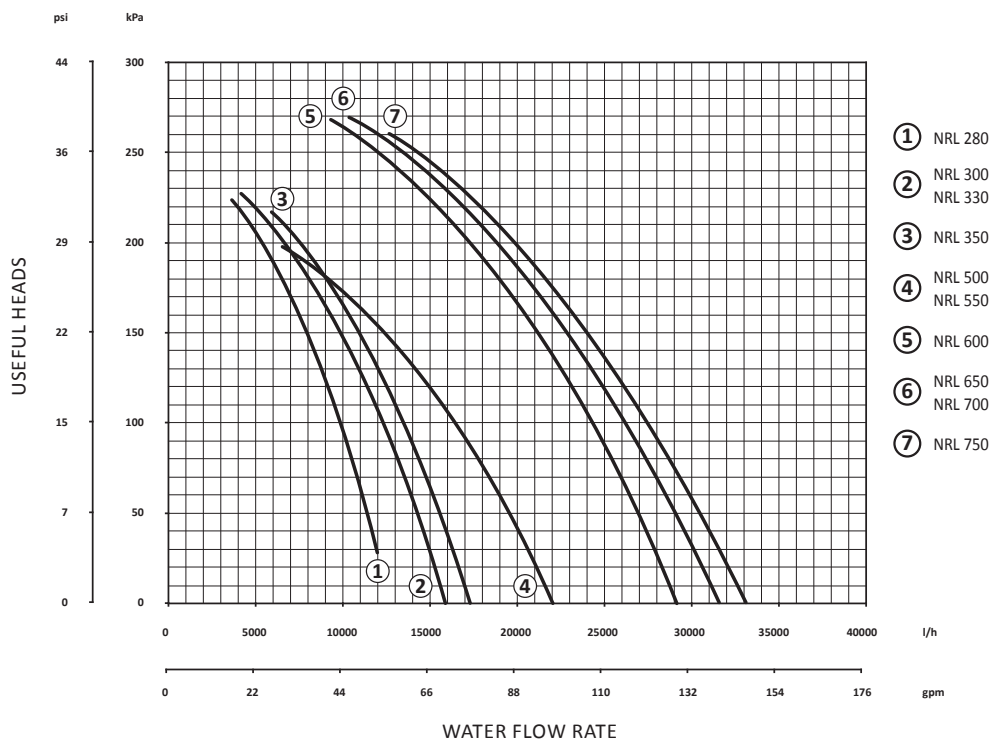
13.2. CHILLER MODE USEFUL HEADS 575/3/60



13.3. FREE-COOLING MODE USEFUL HEADS 230-460/3/60



13.4. FREE-COOLING MODE USEFUL HEADS 575/3/60



14. ETHYLENE GLYCOL SOLUTIONS

- The correction factors of cooling power and input power take into account the presence of glycol and diverse 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  $\Delta t$  that would be present with the absence of glycol.

NOTE

On the following page an example is given to help graph reading. Using the diagram below it is possible to determine the percentage of glycol required; this percentage can be calculated by taking of the following factors into consideration one:

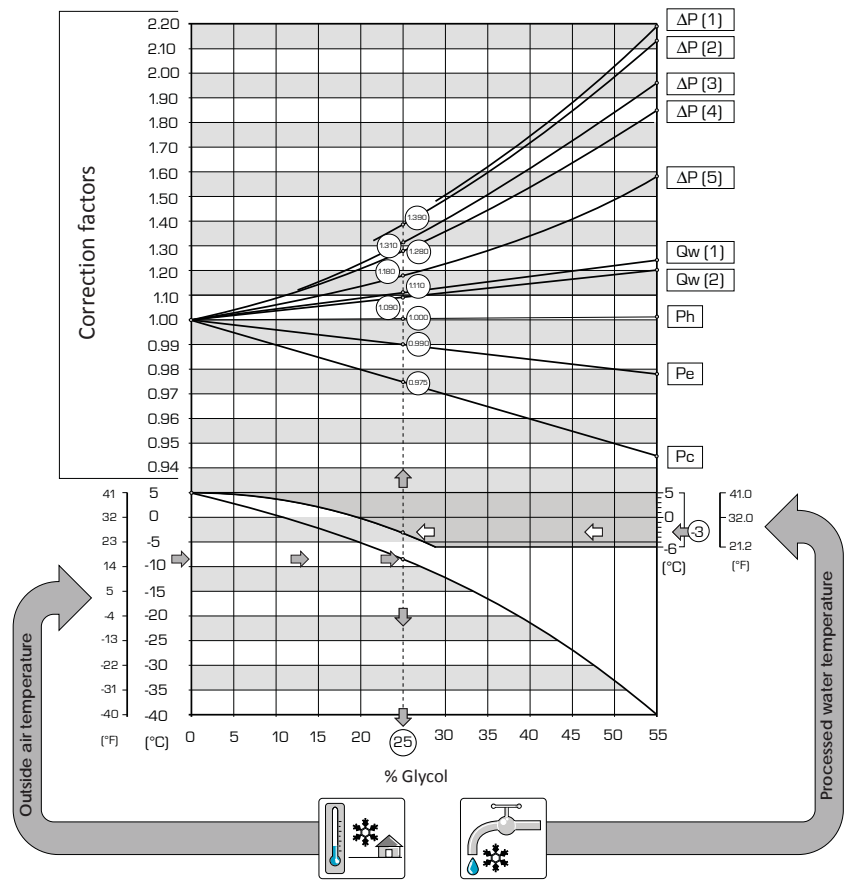
Depending on which fluid is considered (water or air), the graph is interpreted by the right or left side at the crossing point on the curves with the external temperature line or the water produced line. A point from which the vertical line will pass is obtained and this will distinguish both glycol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

1. 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.
2. 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 factors of heating capacity
- $\Delta P$  (1) Correction factors for pressure drop av. temp. = -3.5°C/25.7°F
- $\Delta P$  (2) Correction factors for pressure drop av. temp. = 0.5°C/32.9°F
- $\Delta P$  (3) Correction factors for pressure drop av. temp. = 5.5°C/41.9°F
- $\Delta P$  (4) Correction factors for pressure drop av. temp. = 9.5°C/49.1°F
- $\Delta P$  (5) Correction factors for pressure drop av. temp. = 47.5°C/117.5°F
- Qw (1) Correction factor of flow rates (evap.) av. temp = 9.5°C/49.1°F
- Qw (2) Correction factor of flow rates (cond.) av. temp = 47.5°C/117.5°F



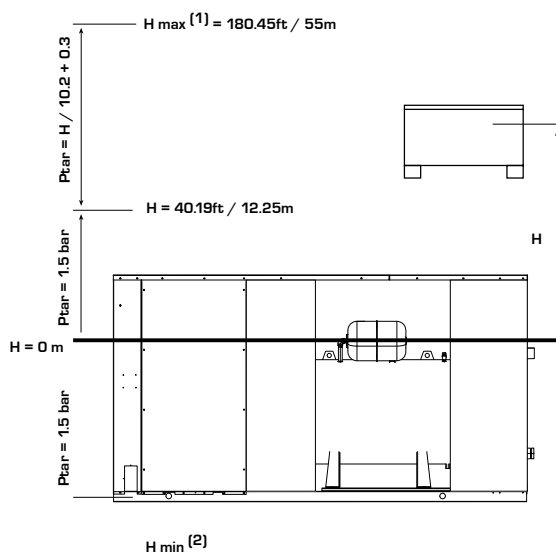
NOTE

Although the graph arrives at external air temperatures of -40°C/°F, unit operational limits must be considered.



### 15. EXPANSION TANK CALIBRATION

The standard pressure value for pre-charging the expansion tank is 1.5 bar, and the volume is 25 litres/ 6.6 gallon. Maximum value 6 bar.  
 The tank must be calibrated according to the maximum difference in height (H) of the device (see figure) according to the formula:  
 $p \text{ (calibration) [bar]} = H \text{ [m]} / 10.2 + 0.3$ .  
 For example, if the level difference H is 20m, the calibration value of the tank will be 2.3 bar.  
 If the calibration value obtained from the calculation is lower than 1.5 bar (i.e. for  $H < 12.25$ ), maintain the standard calibration.



KEY

- (1) Check that the highest user does not exceed a level difference of 180.45ft / 55m.
- (2) Check that the lowest user can sustain the global pressure acting at that point.

### 16. MINIMUM WATER CONTENT

NRL	n° Compressor	(1) l/KW	(2) l/KW
0280	2	7	14
0300			
0330			
0350			
0500	3	5	10
0550			
0600	4	4	8
0650			
0700			
0750			

Key:

(1)	Minimum water content
(2)	Minimum water content in the case of process applications or applications with low outside temperatures and low load.
	Regulation on the temperature outlet water. project $\Delta t$ less than 5°C.

## 17. PART LOAD

## COOLING (AHRI CONDITIONS)

Outlet water temperature	6,7°C / 44,6°F
Flow rate	0,043l/s per kW
External temperature	35°C / 95°F

## LEVELS OF POWER

COOLING CAPACITY %	1%	2%	3%	4%
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	28	50	78	100
0700	25	50	75	100
0750	27	53	77	100
POWER INPUT %	1%	2%	3%	4%
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	23	45	73	100
0700	20	45	70	100
0750	23	47	73	100

## 18. SOUND DATA

### Sound power

Aermec determines the sound power value on the basis of measurements taken in accordance with standard 9614-2.

### Sound pressure

Sound pressure in free field, on a reflecting plane (directional factor Q=2), in accordance with standard ISO 3744.

NRL	VERS.	Total sound levels			Octave band[Hz]						
		Pot. [dB (A)]	Pressure		125	250	500	1000	2000	4000	8000
			[dB (A)] 10 m	[dB (A)] 1 m							
280	FE	74	42	54	72,2	61,1	66,4	63,5	61,0	50,0	43,7
300	FE	75	43	55	73,2	62,1	67,4	64,5	62,0	51,0	44,7
330	FE	77	45	57	75,1	64,0	69,1	66,3	64,1	53,3	46,8
350	FE	78	46	58	76,1	65,0	70,1	67,6	64,6	55,0	47,1
500	FA	83	51	63	69,1	70,8	75,0	77,7	77,5	75,1	64,8
550	FA	83	51	63	69,1	70,9	76,0	78,5	77,5	73,0	62,0
600	FA	84	52	64	70,4	71,6	76,1	78,9	79,0	75,6	65,1
650	FA	85	53	65	71,4	73,6	77,8	81,1	79,3	75,7	62,2
700	FA	86	54	66	72,9	74,9	78,3	80,6	81,7	75,5	62,4
750	FA	87	55	67	73,9	75,9	79,3	81,6	82,7	76,5	63,4
500	FE	77	45	57	63,0	66,9	70,3	70,7	70,4	67,3	62,9
550	FE	77	45	57	63,0	66,9	70,3	70,7	70,4	67,3	62,9
600	FE	77	45	57	63,3	67,1	70,4	70,8	70,5	67,3	63,1
650	FE	78	46	58	66,7	68,6	69,6	70,8	72,4	66,7	63,0
700	FE	81	49	61	70,9	73,4	73,8	71,0	76,2	70,0	66,9
750	FE	82	50	62	72,3	74,5	74,9	72,1	77,3	71,1	67,8

## 19. CONTROL AND SAFETY PARAMETERS CALIBRATION

COOLING SET	Min	Max.	Default
Water inlet temperature in cooling mode	-10°C / 14°F	20°C / 68°F	7°C / 44,6°F
ANTI-FREEZE INTERVENTION	Min	Max.	Default
Intervention temperature of the anti-freeze alarm on the EV side (water outlet temperature)	-15°C / 5°F	4°C / 39,2°F	3°C / 37,4°F
TOTAL DIFFERENTIAL	Min	Max.	Default
Proportional temperature band within which the compressors are activated and deactivated	3°C / 5,4	10°C / 18	5°C / 10

		NRL 0280	NRL 0300	NRL 0330	NRL 0350	NRL 0500	NRL 0550	NRL 0600	NRL 0650	NRL 0700	NRL 0750
<b>HIGH PRESSURE PRESSURE SWITCH MANUAL REARM</b>											
PA	psi / bar	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40
<b>HIGH PRESSURE TRANSDUCER</b>											
TAP	psi / bar	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39
<b>LOW PRESSURE TRANSDUCER</b>											
TBP	psi / bar	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2
<b>COOLING CIRCUIT SAFETY VALVES</b>											
AP	psi / bar	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45

**19.1. COMPRESSOR THERMOMAGNETIC**

COMPRESSOR THERMOMAGNETIC		POWER SUPPLY	CIRCUIT	NRL 280	NRL 300	NRL 330	NRL 350	NRL 500	NRL 550	NRL 600	NRL 650	NRL 700	NRL 750
MTC1	A	220V-3-60Hz	1	35.0	48.0	48.0	54.5	35.0	48.0	48.0	48.0	54.5	59.0
MTC1A	A	220V-3-60Hz		-	-	-	-	35.0	48.0	48.0	54.5	54.5	54.5
MTC2	A	220V-3-60Hz	2	35.0	35.0	48.0	54.5	54.5	54.5	48.0	48.0	54.5	59.0
MTC2A	A	220V-3-60Hz		-	-	-	-	-	-	48.0	54.5	54.5	54.5
MTC1	A	460V-3-60Hz	1	16.0	23.0	23.0	26.0	16.0	23.0	23.0	23.0	26.0	30.4
MTC1A	A	460V-3-60Hz		-	-	-	-	16.0	23.0	23.0	26.0	26.0	26.0
MTC2	A	460V-3-60Hz	2	16.0	16.0	23.0	26.0	26.0	26.0	23.0	23.0	26.0	30.4
MTC2A	A	460V-3-60Hz		-	-	-	-	-	-	23.0	26.0	26.0	26.0
MTC1	A	575V-3-60Hz	1	14.5	19.0	19.0	23.0	14.5	19.0	19.0	19.0	23.0	27.5
MTC1A	A	575V-3-60Hz		-	-	-	-	14.5	19.0	19.0	23.0	23.0	23.0
MTC2	A	575V-3-60Hz	2	14.5	14.5	19.0	23.0	23.0	23.0	19.0	19.0	23.0	27.5
MTC2A	A	575V-3-60Hz		-	-	-	-	-	-	19.0	23.0	23.0	23.0

**19.2. PUMP THERMOMAGNETIC (03-P3)**

COMPRESSOR THERMOMAGNETIC		POWER SUPPLY	NRL 280	NRL 300	NRL 330	NRL 350	NRL 500	NRL 550	NRL 600	NRL 650	NRL 700	NRL 750
MP1	A	220V-3-60Hz	7.8	7.8	7.8	7.8	10.4	10.4	11.5	11.5	11.5	14.5
	A	460V-3-60Hz	3.9	3.9	3.9	3.9	5.2	5.2	5.8	5.8	5.8	7.2
	A	575V-3-60Hz	2.5	2.5	2.5	2.5	3.5	3.5	4.6	4.6	4.6	5.8
MP2	A	220V-3-60Hz	7.8	7.8	7.8	7.8	10.4	10.4	11.5	11.5	11.5	14.5
	A	460V-3-60Hz	3.9	3.9	3.9	3.9	5.2	5.2	5.8	5.8	5.8	7.2
	A	575V-3-60Hz	2.5	2.5	2.5	2.5	3.5	3.5	4.6	4.6	4.6	5.8

**19.3. PUMP THERMOMAGNETIC (04-P4)**

COMPRESSOR THERMOMAGNETIC		POWER SUPPLY	NRL 280	NRL 300	NRL 330	NRL 350	NRL 500	NRL 550	NRL 600	NRL 650	NRL 700	NRL 750
MP1	A	220V-3-60Hz	7.8	7.8	7.8	7.8	10.4	10.4	11.5	11.5	11.5	14.5
	A	460V-3-60Hz	3.9	3.9	3.9	3.9	5.2	5.2	5.8	5.8	5.8	7.2
	A	575V-3-60Hz	2.5	2.5	2.5	2.5	3.5	3.5	4.6	4.6	4.6	5.8
MP1A	A	220V-3-60Hz	7.8	7.8	7.8	7.8	10.4	10.4	11.5	11.5	11.5	14.5
	A	460V-3-60Hz	3.9	3.9	3.9	3.9	5.2	5.2	5.8	5.8	5.8	7.2
	A	575V-3-60Hz	2.5	2.5	2.5	2.5	3.5	3.5	4.6	4.6	4.6	5.8
MP2	A	220V-3-60Hz	7.8	7.8	7.8	7.8	10.4	10.4	11.5	11.5	11.5	14.5
	A	460V-3-60Hz	3.9	3.9	3.9	3.9	5.2	5.2	5.8	5.8	5.8	7.2
	A	575V-3-60Hz	2.5	2.5	2.5	2.5	3.5	3.5	4.6	4.6	4.6	5.8
MP2A	A	220V-3-60Hz	7.8	7.8	7.8	7.8	10.4	10.4	11.5	11.5	11.5	14.5
	A	460V-3-60Hz	3.9	3.9	3.9	3.9	5.2	5.2	5.8	5.8	5.8	7.2
	A	575V-3-60Hz	2.5	2.5	2.5	2.5	3.5	3.5	4.6	4.6	4.6	5.8

**19.4. FAN THERMOMAGNETIC (220V-3-60Hz)**

COMPRESSOR THERMOMAGNETIC		CIRCUIT	NRL 280	NRL 300	NRL 330	NRL 350	NRL 500	NRL 550	NRL 600	NRL 650	NRL 700	NRL 750
MTV1	A	1	8	8	10	10	7.2	7.2	7.2	7.2	7.2	7.2
MTV1A	A		8	8	10	10	-	-	7.2	7.2	7.2	7.2
MTV1B	A		8	8	10	10	-	-	-	-	-	-
MTV1C	A		-	-	10	10	-	-	-	-	-	-
MTV1D	A		-	-	-	-	-	-	-	-	-	-
MTV2	A	2	8	8	10	10	7.2	7.2	7.2	7.2	7.2	7.2
MTV2A	A		8	8	10	10	-	-	-	-	-	-
MTV2B	A		8	8	10	10	-	-	-	-	-	-
MTV2C	A		-	-	10	10	-	-	-	-	-	-
MTV2D	A		-	-	-	-	-	-	-	-	-	-

**19.5. FAN THERMOMAGNETIC (460V-3-60Hz)**

COMPRESSOR THERMOMAGNETIC		CIRCUIT	NRL 280	NRL 300	NRL 330	NRL 350	NRL 500	NRL 550	NRL 600	NRL 650	NRL 700	NRL 750
MTV1	A	1	8	8	10	10	4.2	4.2	4.2	4.2	4.2	4.2
MTV1A	A		8	8	10	10	-	-	4.2	4.2	4.2	4.2
MTV1B	A		8	8	10	10	-	-	-	-	-	-
MTV1C	A		-	-	10	10	-	-	-	-	-	-
MTV1D	A		-	-	-	-	-	-	-	-	-	-
MTV2	A	2	8	8	10	10	4.2	4.2	4.2	4.2	4.2	4.2
MTV2A	A		8	8	10	10	-	-	-	-	-	-
MTV2B	A		8	8	10	10	-	-	-	-	-	-
MTV2C	A		-	-	10	10	-	-	-	-	-	-
MTV2D	A		-	-	-	-	-	-	-	-	-	-

**19.6. FAN THERMOMAGNETIC (575V-3-60Hz)**

COMPRESSOR THERMOMAGNETIC		CIRCUIT	NRL 280	NRL 300	NRL 330	NRL 350	NRL 500	NRL 550	NRL 600	NRL 650	NRL 700	NRL 750
MTV1	A	1	8	8	10	10	3.7	3.7	3.7	3.7	3.7	3.7
MTV1A	A		8	8	10	10	-	-	3.7	3.7	3.7	3.7
MTV1B	A		8	8	10	10	-	-	-	-	-	-
MTV1C	A		-	-	10	10	-	-	-	-	-	-
MTV1D	A		-	-	-	-	-	-	-	-	-	-
MTV2	A	2	8	8	10	10	3.7	3.7	3.7	3.7	3.7	3.7
MTV2A	A		8	8	10	10	-	-	-	-	-	-
MTV2B	A		8	8	10	10	-	-	-	-	-	-
MTV2C	A		-	-	10	10	-	-	-	-	-	-
MTV2D	A		-	-	-	-	-	-	-	-	-	-





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