



Technical Manual



INTERTEK
CERTIFICATION



AHRI
CERTIFICATION



R410A



FREE-COOLING



GAS



SCROLL
COMPRESSOR



AXIAL FAN



PLATE
EXCHANGER



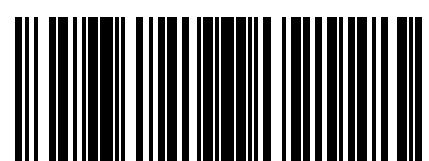
60Hz

CHILLER

- HIGH EFFICENCY
- POWER SUPPLY 60Hz

NRL FC 028-075

EN



21.05 5641350_06

TRANSLATION FROM ORIGINAL

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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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 CHOCE 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

2. CHECK LIST

Circuit	Model	Components		
Cooling circuit		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 (glycol free)		no	yes	/

"F" VERSION											
Hydraulic circuit	Version "F 00"	028	030	033	035	050	055	060	065	070	075
Water filter		yes									
Flow switch		yes									
Air vent		yes									

Hydraulic circuit	Version "P1...P4"	028	030	033	035	050	055	060	065	070	075
Water filter		yes									
Flow switch		yes									
Safety valve		yes									
Air vent		yes									
Pump		yes									
Expansion tank		yes									

Hydraulic circuit	Version "01...04"	028	030	033	035	050	055	060	065	070	075
Water filter		yes									
Flow switch		yes									
Safety valve		yes									
Air vent		yes									
Pump		yes									
Expansion tank		yes									
Storage tank		yes									

3. CONFIGURATOR

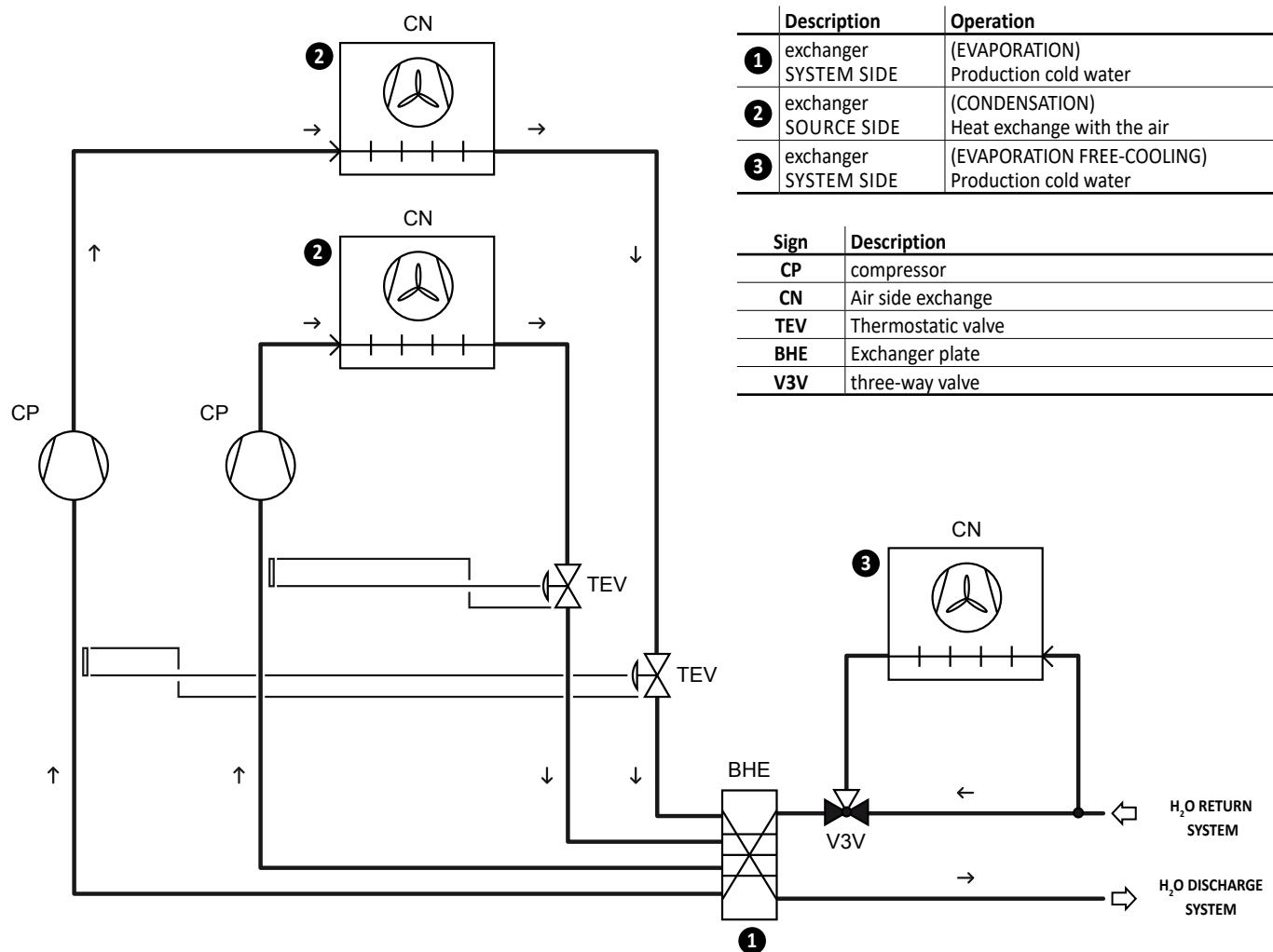
Field	DESCRIPTION
1,2,3	NRL
4,5,6	SIZE 028 - 030 - 033 - 035 - 050 - 055 - 060 - 065 - 070 - 075
7	COMPRESSOR 0 R410A standard compressor
8	THERMOSTATIC VALVE ° Standard mechanical thermostatic valve with produced water up to 39,2°F / +4°C ⁽¹⁾ Y Mechanical thermostatic valve with produced water from 39,2°F / +4°C to -42,8°F / -6°C ⁽¹⁾ X Electronic thermostatic valve min. Water out temp 39,2°F / +4°C ⁽¹⁾
9	MODELS F Free-cooling
10	HEATING RECOVERY ° Without Recovery
11	VERSION A High efficiency (not available for size 028 ÷ 035) E ⁽²⁾ High efficiency low noise (data on demand for size 050 ÷ 075)
12	COILS ° Alluminium R Copper S Copper tin plated V Epoxy coated
13	FANS I Fan speed modulating for condensation control
14	SUPPLY 6 230V ±10% -3-60Hz with thermomagnetic switches 7 460V ±10% -3-60Hz with thermomagnetic switches 8 575V ±10% -3-60Hz with thermomagnetic switches 9 208V ±5% -3-60Hz with thermomagnetic switches
15,16	HYDRONIC KIT 00 Without hydronic kit 03 Water storage tank and high-head single pump 04 Water storage tank, with high-head pump and reserve pump P3 Without water storage tank, with high-head pump P4 Without water storage tank, with high-head pump and reserve pump

⁽¹⁾ For lower temperatures, contact the office.

⁽²⁾Versions available only on demand

4. PRINCIPLE OF OPERATION SCHEMES

4.1. PRODUCTION OF COLD WATER ONLY THE SYSTEM



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

System: Chiller with plate heat exchanger	
PH	7.5-9
Electric conductivity	10-500µS/cm
Total hardness	4.5-8.5°dH
Temperature	< 65°C
Oxygen content	< 0.1 ppm
Max. glycol amount	50%
Phosphates (PO4)	< 2ppm
Manganese (Mn)	< 0.05 ppm
Iron (Fe)	< 0.3 ppm
Alkalinity (HCO3)	70 - 300 ppm
Chloride ions (Cl-)	< 50 ppm
Sulphate ions (SO4)	< 50 ppm
Sulphide ion (S)	none
Ammonium ions (NH4)	none
Silica (SiO2)	< 30ppm

SOURCE SIDE HEAT EXCHANGER

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

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 sumary;
2. ON/OFF compressors.

Display of the following parameters

1. water inlet temperature;
2. accumulator temperature;
3. water outlet temperature;
4. ΔT ;
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 ACCESORIES

AERNET

The device allows the control, the management and the remote monitoring of a Chiller with a PC, smartphone or tablet using Cloud connection. AERNET works as Master while every unit connected is configured as Slave (max. 6 unit); also, with a simple click is possible to save a log file with all the connected unit datas in the personal terminal for post analysis.

DRE

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

Accessories can only be fitted in the factory.

MULTICHILLER_EVO

Control, switch-on and switch-off system of the single chillers where multiple units are installed in parallel, always ensuring constant flow rate to the evaporators

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.

AER485P1

RS-485 interface for supervision systems with MODBUS protocol.

FOR MORE INFORMATION PLEASE CONTACT US

NRL Version:	NRL028	NRL030	NRL033	NRL035	NRL050	NRL055	NRL060	NRL065	NRL070	NRL075
00 / P3 / P4	VT 17	VT 17	VT 17	VT 17	VT 13	VT 13	VT 22	VT 22	VT 22	VT 23
03 / 04	VT 13	VT 13	VT 13	VT 13	VT 10	VT 10	VT 22	VT 22	VT 22	VT 23
GP	GP4	GP4	GP4	GP4	2 x GP2	2 x GP2	3 x GP2	3 x GP2	3 x GP2	3 x GP10

NRL free cooling 028-075 60Hz

7. TECHNICAL DATA vers. F (CHILLER FUNCTION)

Model			028	030	033	035	050	055	060	065	070	075
Cooling capacity	FA	Alls	ton	-	-	-	-	23.84	27.23	34.06	37.91	41.17
	FE	Alls	ton	13.16	15.18	17.44	21.39	-	-	-	-	-
Total power input	FA	Alls	kW	-	-	-	-	33.30	40.02	48.02	56.23	64.65
	FE	Alls	kW	16.38	19.52	22.32	29.95	-	-	-	-	-
Total power input with HIGH - PUMP	FA	Alls	kW	-	-	-	-	35.01	41.84	50.04	59.28	67.79
	FE	Alls	kW	17.54	20.76	23.65	31.43	-	-	-	-	-
Total input current ⁽¹⁾	FA	Alls	A	-	-	-	-	52	61	76	85	95
	FE		A	31	35	41	50	-	-	-	-	-
EER	FA	Alls	BTU/W	-	-	-	-	8.591	8.165	8.511	8.090	7.642
	FE	Alls	BTU/W	9.641	9.331	9.377	8.570	-	-	-	-	-
IPLV	FA	Alls	BTU/W	-	-	-	-	12.01	11.91	12.56	12.18	11.87
	FE	Alls	BTU/W	11.84	11.81	11.87	11.46	-	-	-	-	-
Water flow rate	FA	Alls	gpm	-	-	-	-	57.03	65.14	81.48	90.69	98.50
	FE	Alls	gpm	31.48	36.31	41.73	51.17	-	-	-	-	-
Total pressure drop	FA	Alls	ft H ₂ O	-	-	-	-	15.7	20.1	23.4	23.1	27.4
	FE	Alls	ft H ₂ O	14.1	12.4	16.1	17.7	-	-	-	-	-
Useful head with HIGH - PUMP	FA	Alls	ft H ₂ O	-	-	-	-	58.59	52.35	44.36	64.93	59.77
	FE	Alls	ft H ₂ O	61.39	62.7	58.21	55.04	-	-	-	-	-

PROTECTION RATING

IP	24	24	24	24	24	24	24	24	24	24	24	24
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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

⁽¹⁾ data referred to no pump versionAHRI 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

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

Model			028	030	033	035	050	055	060	065	070	075
Cooling capacity	FA	Alls	ton	-	-	-	-	14.44	15.15	19.68	23.30	23.97
	FE	Alls	ton	7.986	10.33	12.09	12.94	-	-	-	-	-
Total power input	FA	Alls	kW	-	-	-	-	4.670	4.670	6.590	6.660	6.660
	FE	Alls	kW	2.060	2.060	2.580	2.580	-	-	-	-	-
Total input current ⁽¹⁾	FA	Alls	A	-	-	-	-	7.3	7.1	10	10	9.8
	FE	Alls	A	3.9	3.7	4.7	4.3	-	-	-	-	-
EER	FA	Alls	BTU/W	-	-	-	-	37.11	38.93	35.84	41.98	43.20
	FE	Alls	BTU/W	46.52	60.15	56.22	60.16	-	-	-	-	-
Water flow rate	FA	Alls	gpm	-	-	-	-	53.61	61.23	76.59	85.25	92.58
	FE	Alls	gpm	29.59	34.14	39.22	48.10	-	-	-	-	-
Total pressure drop	FA	Alls	ft H ₂ O	-	-	-	-	18.6	23.9	29.2	29.5	34.5
	FE	Alls	ft H ₂ O	19.2	14.8	19.2	22.4	-	-	-	-	-
Useful head with HIGH - PUMP	FA	Alls	ft H ₂ O	-	-	-	-	56.15	49.57	40.21	59.23	53.43
	FE	Alls	ft H ₂ O	56.53	60.48	55.60	50.91	-	-	-	-	-

PROTECTION RATING

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

⁽¹⁾ 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

Model		028	030	033	035	050	055	060	065	070	075		
Alimentation 208/3/60Hz													
MODEL WITHOUT PUMP - "I" EC INVERTER FAN													
LRA	FA	208V	A	-	-	-	-	385	407	398	469	489	546
	FE			243	291	307	378	-	-	-	-	-	-
MCA	FA	208V	A	-	-	-	-	150	150	175	225	250	300
	FE			90	90	100	150	-	-	-	-	-	-
MOP	FA	208V	A	-	-	-	-	175	200	200	250	250	300
	FE			100	110	125	175	-	-	-	-	-	-
MODEL WITH HIGH HEAD PUMP (P3-P4-03-04) - "I" EC INVERTER FAN													
LRA	FA	208V	A	-	-	-	-	393	415	406	483	503	560
	FE			251	299	315	386	-	-	-	-	-	-
MCA	FA	208V	A	-	-	-	-	150	175	200	225	300	300
	FE			90	100	110	150	-	-	-	-	-	-
MOP	FA	208V	A	-	-	-	-	175	200	200	250	300	300
	FE			110	125	125	175	-	-	-	-	-	-
Alimentation 230/3/60Hz													
MODEL WITHOUT PUMP - "I" EC INVERTER FAN													
LRA	FA	230V	A	-	-	-	-	374	394	380	450	468	524
	FE			234	282	296	366	-	-	-	-	-	-
MCA	FA	230V	A	-	-	-	-	150	150	175	225	250	300
	FE			75	90	100	150	-	-	-	-	-	-
MOP	FA	230V	A	-	-	-	-	175	175	175	250	250	300
	FE			100	110	125	175	-	-	-	-	-	-
MODEL WITH HIGH HEAD PUMP (P3-P4-03-04) - "I" EC INVERTER FAN													
LRA	FA	230V	A	-	-	-	-	382	402	388	463	481	537
	FE			242	290	304	374	-	-	-	-	-	-
MCA	FA	230V	A	-	-	-	-	150	175	175	225	300	300
	FE			90	90	110	150	-	-	-	-	-	-
MOP	FA	230V	A	-	-	-	-	175	200	200	250	300	300
	FE			110	110	125	175	-	-	-	-	-	-
Alimentation 460/3/60Hz													
MODEL WITHOUT PUMP - "I" EC INVERTER FAN													
LRA	FA	460V	A	-	-	-	-	186	195	192	221	229	265
	FE			127	156	163	192	-	-	-	-	-	-
MCA	FA	460V	A	-	-	-	-	70	75	90	100	110	125
	FE			45	60	60	70	-	-	-	-	-	-
MOP	FA	460V	A	-	-	-	-	80	90	100	110	125	125
	FE			50	70	75	90	-	-	-	-	-	-
MODEL WITH HIGH HEAD PUMP (P3-P4-03-04) - "I" EC INVERTER FAN													
LRA	FA	460V	A	-	-	-	-	190	199	196	227	235	272
	FE			131	160	167	196	-	-	-	-	-	-
MCA	FA	460V	A	-	-	-	-	70	80	100	110	125	125
	FE			50	60	70	75	-	-	-	-	-	-
MOP	FA	460V	A	-	-	-	-	80	100	110	125	125	150
	FE			50	75	80	90	-	-	-	-	-	-
Alimentation 575/3/60Hz													
MODEL WITHOUT PUMP - "I" EC INVERTER FAN													
LRA	FA	575V	A	-	-	-	-	137	144	132	164	170	199
	FE			99	104	109	142	-	-	-	-	-	-
MCA	FA	575V	A	-	-	-	-	60	60	70	90	100	110
	FE			35	40	45	60	-	-	-	-	-	-
MOP	FA	575V	A	-	-	-	-	70	75	75	100	110	125
	FE			40	50	50	80	-	-	-	-	-	-
MODEL WITH HIGH HEAD PUMP (P3-P4-03-04) - "I" EC INVERTER FAN													
LRA	FA	575V	A	-	-	-	-	140	147	135	169	175	204
	FE			102	107	113	145	-	-	-	-	-	-
MCA	FA	575V	A	-	-	-	-	60	70	70	90	100	110
	FE			40	45	50	70	-	-	-	-	-	-
MOP	FA	575V	A	-	-	-	-	70	80	80	100	110	125
	FE			45	50	60	80	-	-	-	-	-	-

LRA: Peak current

MCA: Minimum circuit amperage

MOP: Maximum overcurrent permitted by the protection device

NRL free cooling 028-075 60Hz

Model		028	030	033	035	050	055	060	065	070	075
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
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 connection	Ø	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½
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
	230V	A	7.00	7.00	7.00	7.00	7.00	10.40	10.40	10.40	10.40
Pump input current	460V		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	4.72	4.54	4.42	4.58
SAFETY VALVE											
Safety valve calibration	psi	87	87	87	87	87	87	87	87	87	87
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
	-	230V	A	6.96	6.96	9.28	9.28	13.0	13.0	19.5	19.5
Fan input current	-	460V	A	6.96	6.96	9.28	9.28	7.6	7.6	11.4	11.4
	-	575V	A	6.96	6.96	9.28	9.28	6.64	6.64	9.96	9.96
	-	230V	kW	1.56	1.56	2.08	2.08	4.0	4.0	6.0	6.0
Fan power input	-	460V	kW	1.56	1.56	2.08	2.08	4.0	4.0	6.0	6.0
	-	575V	kW	1.56	1.56	2.08	2.08	4.36	4.36	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 lib	9.9 21.83	9.0 21.83	9.0 21.83	9.0 21.83	12.5 27.56	12.0 26.46	13.5 29.76	13.5 29.76	14.0 30.86
	C2	kg lib	9.9 21.83	9.0 21.83	9.0 21.83	9.0 21.83	9.5 20.94	9.0 21.83	13.5 29.76	13.5 29.76	14.0 30.86
Oil	C1	kg lib	2.7 5.95	3.0 6.61	3.0 6.61	3.0 6.61	5.4 11.90	6.0 13.23	6.0 13.23	6.0 13.23	6.0 13.23
	C2	kg lib	2.7 5.95	2.7 6.61	3.0 6.61	3.0 6.61	3.0 6.61	6.0 13.23	6.0 13.23	6.0 13.23	6.4 14.11
DIMENSION											
Height	in	63	63	63	63	74	74	74	74	74	78
Width	in	43	43	43	43	43	43	43	43	43	59
Depth	in	116	116	116	116	128	128	158	158	158	172
Weight when empty	kg lib	837 1847	908 2002	923 2037	937 2066	1110 2449	1119 2467	1369 3020	1450 3197	1470 3241	1789 3946

COOLING (AHRI STANDARD CONDITIONS)

Outlet water temperature 6.7°C / 44.6 °F
 Flow rate 0.0431/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

(1) data referred to no pump version

9. OPERATING LIMITS

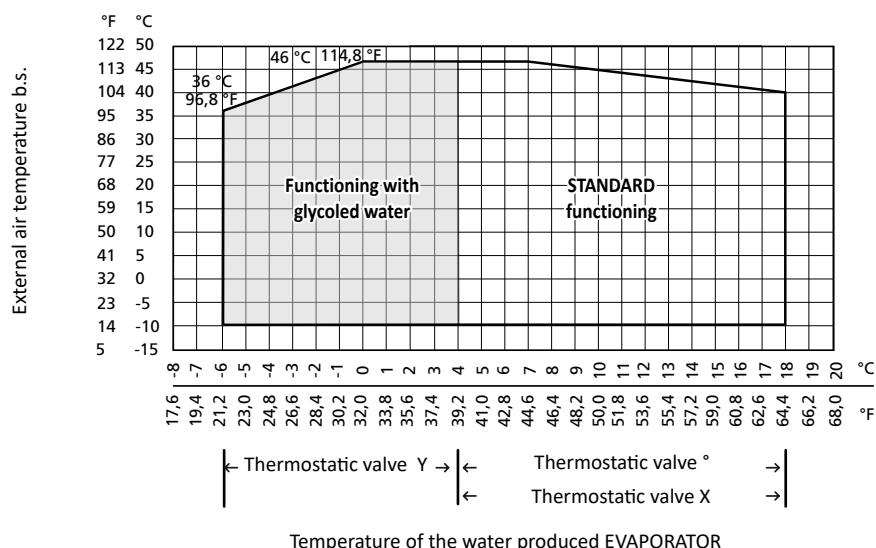
The devices in their standard configurations are not suitable for installation in salty environments. For the operating limits, refer to diagram, valid for AHRI standard conditions.

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
WATER SIDE			
Acceptable maximum pressure	bar/PSI	6/87	



ATTENTION

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

Hydraulic 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

10°C/50°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 (P_f , P_a) by the respective correction coefficients (C_f , C_a).

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

C_f : correction coefficient of the cooling capacity.

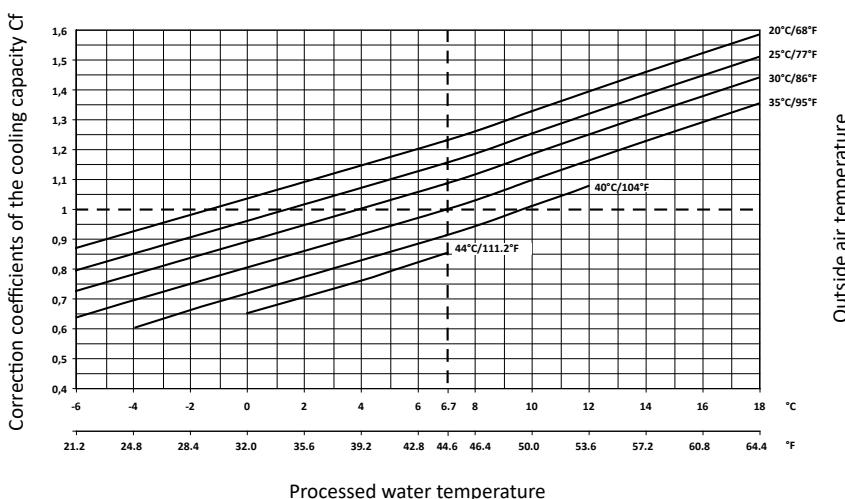
C_a : correction coefficient of the input power.



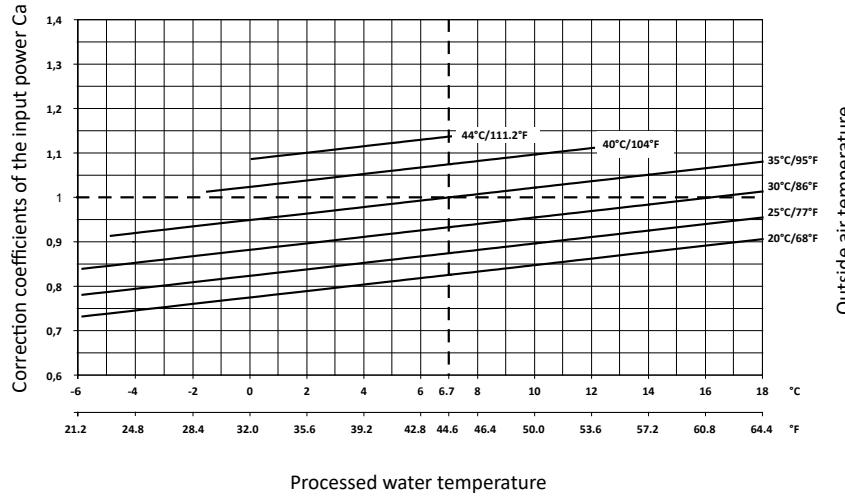
ATTENZIONE FOR Δt DIFFERENT FROM 10.01°F / 5.56°C

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 Δt DIFFERENT FROM THE RATED VALUE

The performances given by the technical data refer to AHRI standard conditions: flow rate 0.043l/s per kW (At 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.

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.

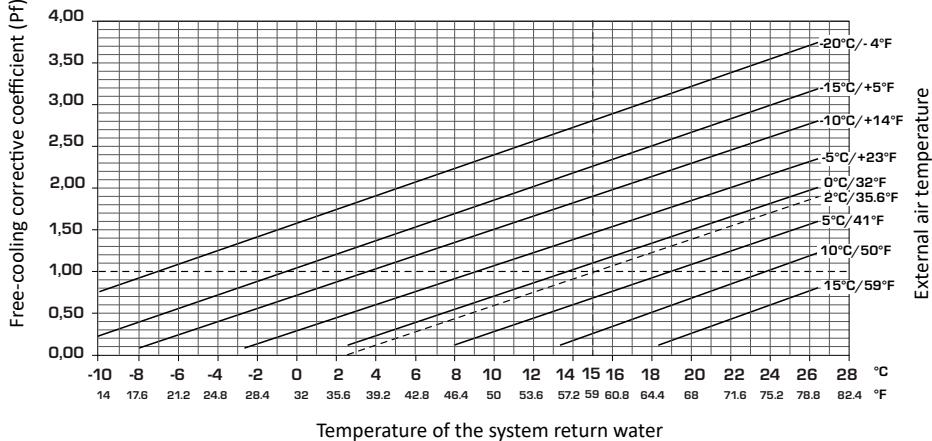
Δt DIFFERENT FROM THE RATED VALUE (Δt 5°C - 10.01°F)	3°C / 5.40°F	5.56°C / 10.01°F	8°C / 14.40°F	10°C / 18°F
Cooling capacity correction factors	0,99	1	1,02	1,03
Input power correction factors	0,99	1	1,01	1,02

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 (P_f) 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 0.043l/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.

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.

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

FOULING FACTOR [K*M ²]/[KW]	0.018	0.05	0.1
Cooling capacity correction factors	1	0.987	0.967
Input power correction factors			

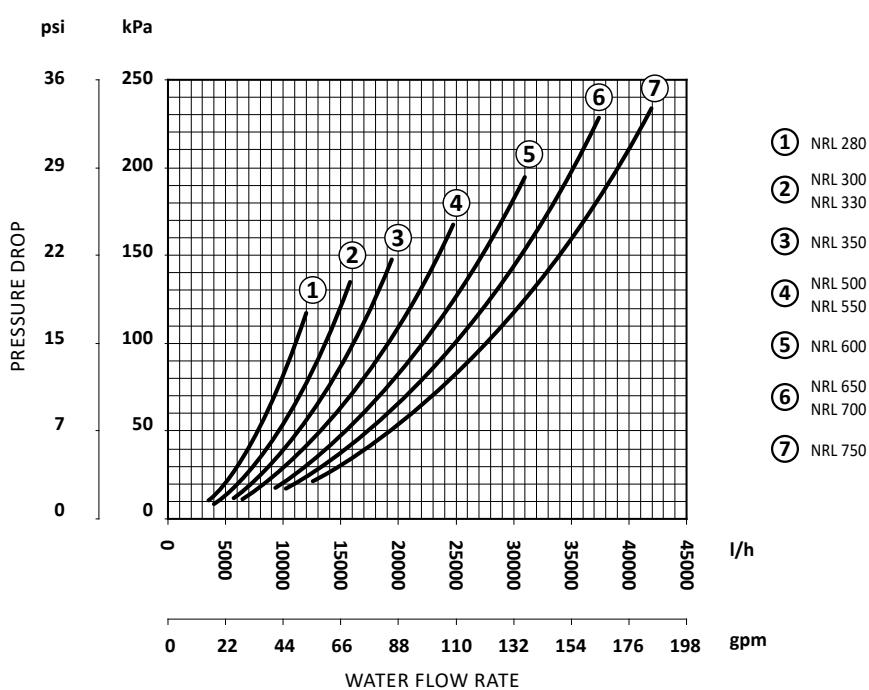
12. TOTAL PRESSURE DROPS

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.



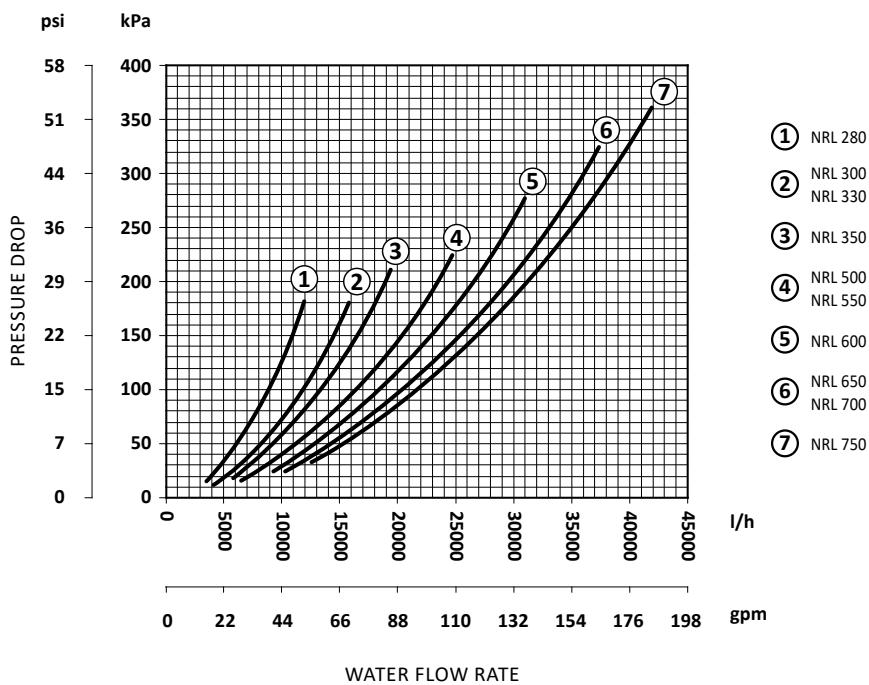
Average water temperature °F/°C	41/5	50/10	59/15	68/20	86/30	104/40	122/50
Coefficients	1,02	1	0,98	0,97	0,95	0,93	0,91

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

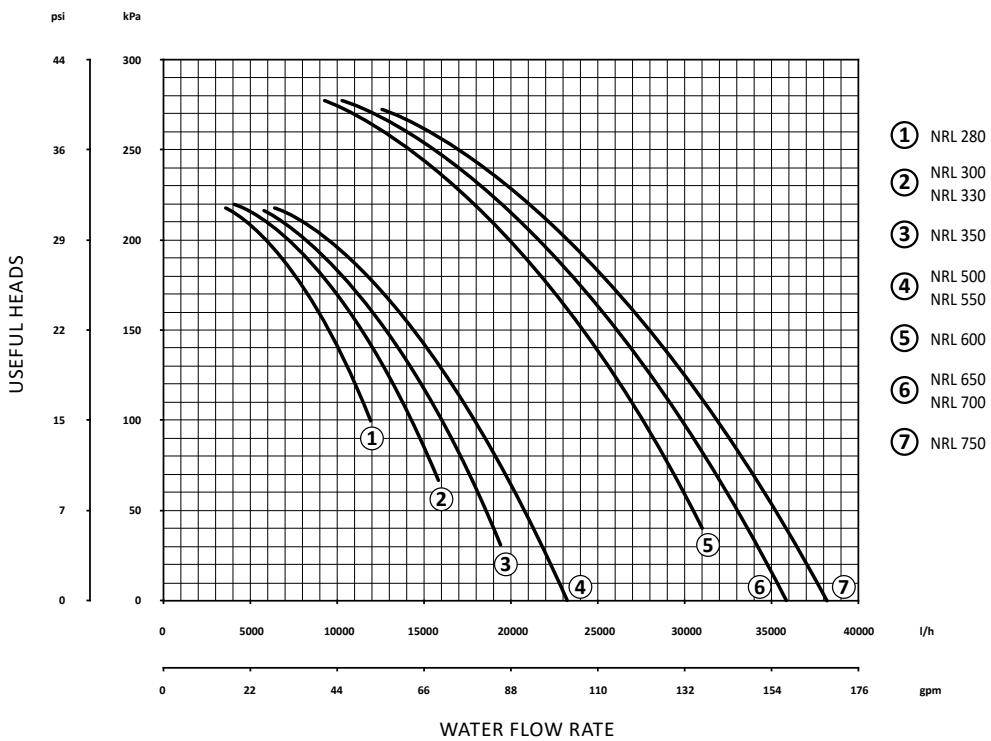
Compressors off



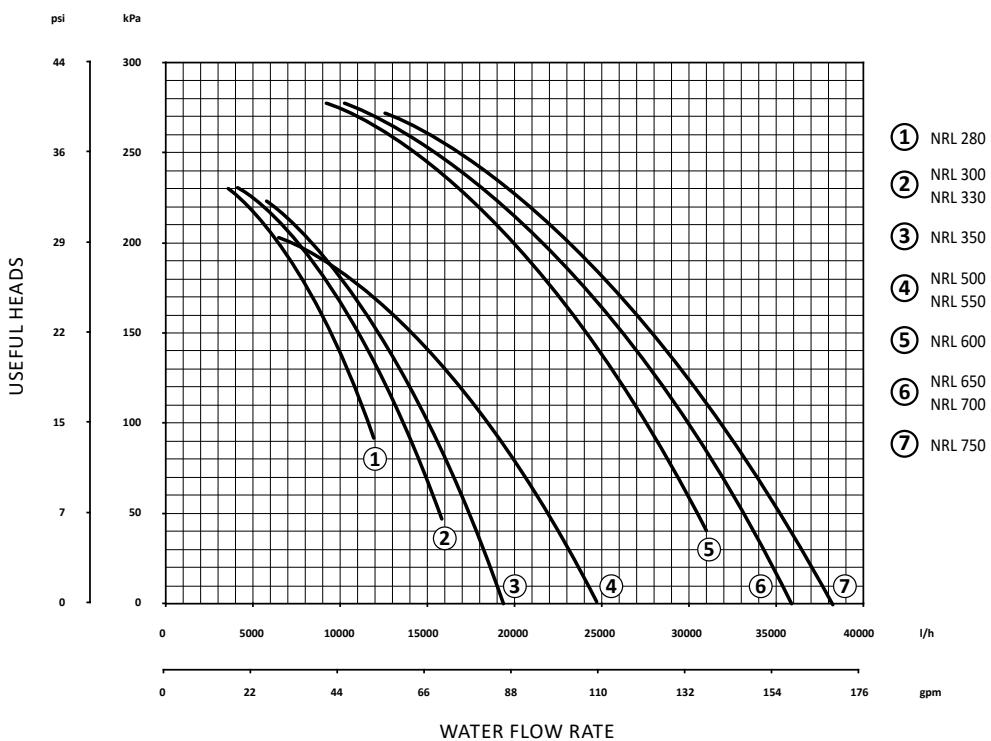
Average water temperature °F/°C	41/5	50/10	59/15	68/20	86/30	104/40	122/50
Coefficients	1,02	1	0,98	0,97	0,95	0,93	0,91

13. USEFUL HEADS

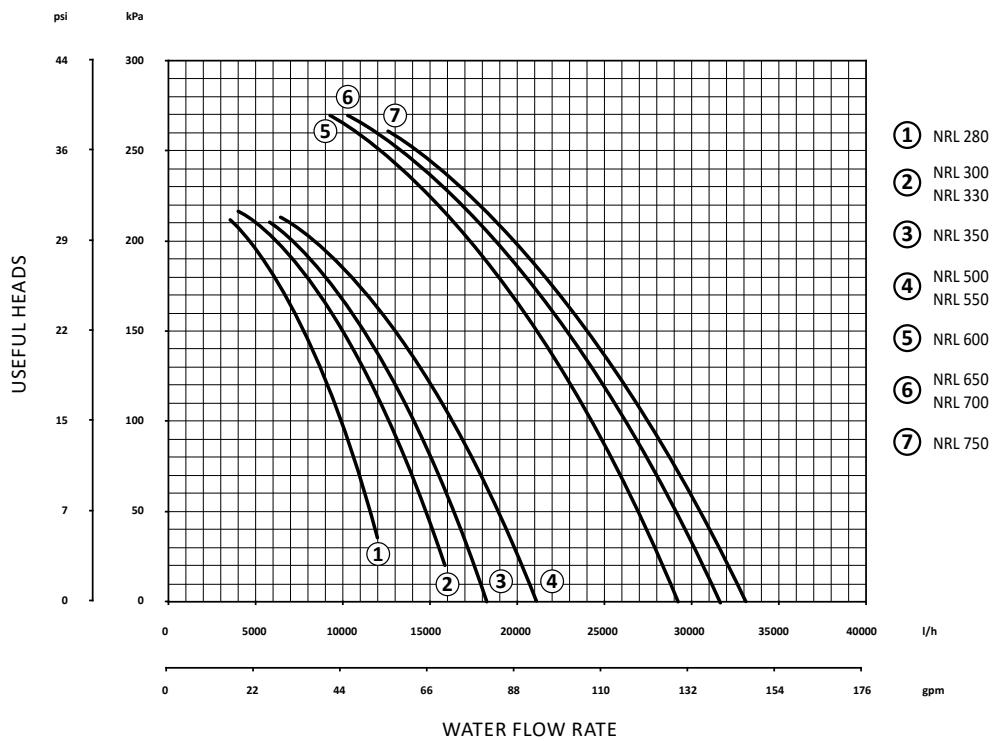
13.1. CHILLER MODE USEFUL HEADS 230-460/3/60



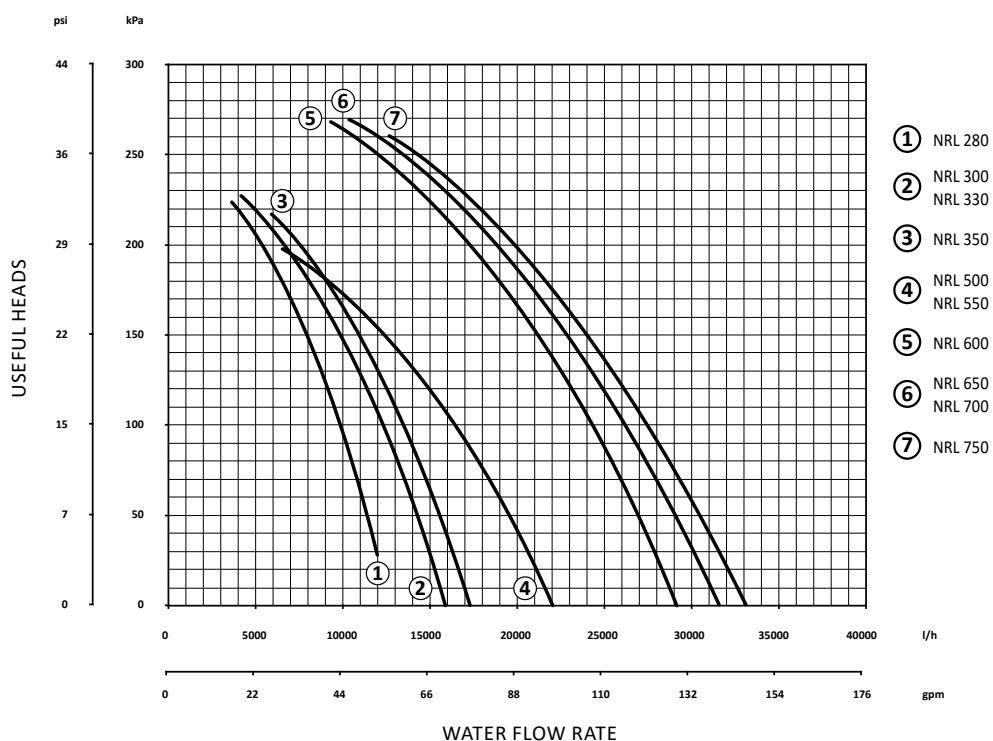
13.2. CHILLER MODE USEFUL HEADS 575/3/60



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



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



14. GLYCOL SOLUTIONS

ETHYLENE GLYCOL

COOLING MODE

CORRECTION FACTOR WITH ETHYLENE GLYCOL - COOLING MODE											
Freezing Point	°C	0	-3.63	-6.10	-8.93	-12.11	-15.74	-19.94	-24.79	-30.44	-37.10
Percent ethylene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwc	-	1.000	1.033	1.040	1.049	1.060	1.072	1.086	1.102	1.120	1.141
Pc	-	1.000	0.990	0.985	0.980	0.975	0.970	0.965	0.960	0.955	0.950
Pa	-	1.000	0.996	0.994	0.992	0.990	0.988	0.986	0.984	0.982	0.980
Dp	-	1.000	1.109	1.157	1.209	1.268	1.336	1.414	1.505	1.609	1.728

Average water temperature = 9.5 °C

HEATING MODE

CORRECTION FACTOR WITH ETHYLENE GLYCOL - HEATING MODE											
Freezing Point	°C	0	-3.63	-6.10	-8.93	-12.11	-15.74	-19.94	-24.79	-30.44	-37.10
Percent ethylene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwh	-	1.000	1.027	1.038	1.050	1.063	1.078	1.095	1.114	1.135	1.158
Ph	-	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Pa	-	1.000	1.002	1.003	1.004	1.005	1.007	1.008	1.010	1.012	1.015
Dp	-	1.000	1.087	1.128	1.175	1.227	1.286	1.353	1.428	1.514	1.610

Average water temperature = 42.5 °C

Qwc: Corrective factor of flow rates (middle water temperatur 9.5°C)

Qwh: Corrective factor of flow rates (middle water temperatur 42.5°C)

Pc: Corrective factor of cooling capacity

Ph: Corrective factor of heating capacity

Pa: Corrective factor of input power

Dp: Corrective factor of pressure drop

PROPYLENE GLYCOL

COOLING MODE

CORRECTION FACTOR WITH PROPYLENE GLYCOL - COOLING MODE											
Freezing Point	°C	0	-3.43	-5.30	-7.44	-9.98	-13.08	-16.86	-21.47	-27.04	-33.72
Percent PROPYLENE glycol	%	0	10	15	20	25	30	35	40	45	50
Qwc	-	1.000	1.007	1.006	1.007	1.010	1.015	1.022	1.032	1.044	1.058
Pc	-	1.000	0.985	0.978	0.970	0.963	0.955	0.947	0.939	0.932	0.924
Pa	-	1.000	0.996	0.994	0.992	0.990	0.988	0.986	0.984	0.982	0.980
Dp	-	1.000	1.082	1.102	1.143	1.201	1.271	1.351	1.435	1.520	1.602

Average water temperature = 9.5 °C

HEATING MODE

CORRECTION FACTOR WITH PROPYLENE GLYCOL - HEATING MODE											
Freezing Point	°C	0	-3.43	-5.30	-7.44	-9.98	-13.08	-16.86	-21.47	-27.04	-33.72
Percent PROPYLENE glycol	%	0	10	15	20	25	30	35	40	45	50
Qwh	-	1.000	1.008	1.014	1.021	1.030	1.042	1.055	1.071	1.090	1.112
Ph	-	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Pa	-	1.000	1.003	1.004	1.005	1.007	1.009	1.011	1.014	1.018	1.023
Dp	-	1.000	1.050	1.077	1.111	1.153	1.202	1.258	1.321	1.390	1.467

Average water temperature = 42.5 °C

Qwc: Corrective factor of flow rates (middle water temperatur 9.5°C)

Qwh: Corrective factor of flow rates (middle water temperatur 42.5°C)

Pc: Corrective factor of cooling capacity

Ph: Corrective factor of heating capacity

Pa: Corrective factor of input power

Dp: Corrective factor of pressure drop

 **Do not fill up the hydraulic system by glycol near the suction of the pump. High concentration of glycol could stuck the pump. Do not use the pump to mix water and glycol**

15. EXPANSION TANK CALIBRATION

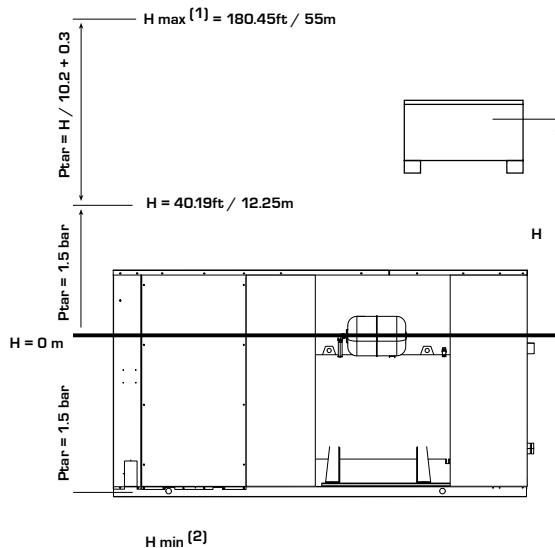
The standard pressure value for pre-charging the expansion tank is 1.5 bar, and the volume is 25 litres/6.6 gallon. Maximum value 6 bar.

The tank must be calibrated according to the maximum difference in height (H) of the device (see figure) according to the formula:

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

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
028			
030			
033			
035			
050			
055			
060			
065			
070			
075			
	2	7	14
	3	5	10
	4	4	8

Key:

(1)	Minimum water content
(2)	Minimum water content in the case of process applications or applications with low outside temperatures and low load.
(2)	Regulation on the temperature outlet water. project Δt 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

COOLING CAPACITY %	LEVELS OF POWER			
	1%	2%	3%	4%
028	55	100	-	-
030	55	100	-	-
033	55	100	-	-
035	55	100	-	-
050	40	75	100	-
055	36	68	100	-
060	25	50	75	100
065	28	50	78	100
070	25	50	75	100
075	27	53	77	100
POWER INPUT %	1%	2%	3%	4%
028	45	100	-	-
030	45	100	-	-
033	45	100	-	-
035	45	100	-	-
050	30	65	100	-
055	26	58	100	-
060	20	45	70	100
065	23	45	73	100
070	20	45	70	100
075	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	Sound power by central band frequency [dB(A)]						
028	FE	74	42	54	72,2	61,1	66,4	63,5	61,0	50,0	43,7
030	FE	75	43	55	73,2	62,1	67,4	64,5	62,0	51,0	44,7
033	FE	77	45	57	75,1	64,0	69,1	66,3	64,1	53,3	46,8
035	FE	78	46	58	76,1	65,0	70,1	67,6	64,6	55,0	47,1
050	FA	83	51	63	69,1	70,8	75,0	77,7	77,5	75,1	64,8
055	FA	83	51	63	69,1	70,9	76,0	78,5	77,5	73,0	62,0
060	FA	84	52	64	70,4	71,6	76,1	78,9	79,0	75,6	65,1
065	FA	85	53	65	71,4	73,6	77,8	81,1	79,3	75,7	62,2
070	FA	86	54	66	72,9	74,9	78,3	80,6	81,7	75,5	62,4
075	FA	87	55	67	73,9	75,9	79,3	81,6	82,7	76,5	63,4
050	FE	77	45	57	63,0	66,9	70,3	70,7	70,4	67,3	62,9
055	FE	77	45	57	63,0	66,9	70,3	70,7	70,4	67,3	62,9
060	FE	77	45	57	63,3	67,1	70,4	70,8	70,5	67,3	63,1
065	FE	78	46	58	66,7	68,6	69,6	70,8	72,4	66,7	63,0
070	FE	81	49	61	70,9	73,4	73,8	71,0	76,2	70,0	66,9
075	FE	82	50	62	72,3	74,5	74,9	72,1	77,3	71,1	67,8

19. CONTROL AND SAFETY PARAMETERS

CALIBRATION

		Min	Max.	Default
COOLING SET				
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
HIGH PRESSURE PRESSURE SWITCH MANUAL REARM										
PA	psi / bar	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40
HIGH PRESSURE TRANSDUCER										
TAP	psi / bar	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39
LOW PRESSURE TRANSDUCER										
TBP	psi / bar	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2
COOLING CIRCUIT SAFETY VALVES										
AP	psi / bar	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 028	NRL 030	NRL 033	NRL 035	NRL 050	NRL 055	NRL 060	NRL 065	NRL 070	NRL 075
MTC1	A	208V-3-60Hz 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	208V-3-60Hz 220V-3-60Hz		-	-	-	-	35.0	48.0	48.0	54.5	54.5	54.5
MTC2	A	208V-3-60Hz 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	208V-3-60Hz 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 028	NRL 030	NRL 033	NRL 035	NRL 050	NRL 055	NRL 060	NRL 065	NRL 070	NRL 075
MP1	A	208V-3-60Hz 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 028	NRL 030	NRL 033	NRL 035	NRL 050	NRL 055	NRL 060	NRL 065	NRL 070	NRL 075
MP1	A	208V-3-60Hz 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 028	NRL 030	NRL 033	NRL 035	NRL 050	NRL 055	NRL 060	NRL 065	NRL 070	NRL 075
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		-	-	-	-	-	-	-	-	-	-

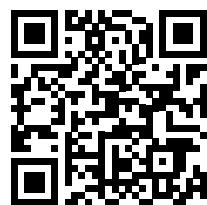
19.5. FAN THERMOMAGNETIC (460V-3-60Hz)

COMPRESSOR THERMOMAGNETIC		CIRCUIT	NRL 028	NRL 030	NRL 033	NRL 035	NRL 050	NRL 055	NRL 060	NRL 065	NRL 070	NRL 075
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 028	NRL 030	NRL 033	NRL 035	NRL 050	NRL 055	NRL 060	NRL 065	NRL 070	NRL 075
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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