AERMEC

60Hz R410A AHRI

Technical Manual

AIR/WATER CHILLERS WITH FREE COOLING

- HIGH EFFICIENCY EVEN WITH PARTIAL LOADS
- MICRO-CHANNEL COIL
- NIGHT-TIME MODE

NRB
0800÷3000
FREE COOLING

EN

C ETL US LISTED Intertek

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Dear customer,
Thank you for choosing an AERMEC product. It is the fruit of many years of experience and special design studies and has been made of the highest grade materials and with cutting edge technology.
The quality level is being constantly monitored, so AERMEC products are synonymous with Safety, Quality and Reliability.

The data may undergo modifications considered necessary for the improvement of the product, at any time and without the obligation for any notice thereof.

Thank you once again.
AERMEC S.p.A

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PRODUCT DESCRIPTION

The state of the art NRB free cooling liquid chillers are available in different versions. They are designed and manufactured to meet air conditioning requirements in residential/commercial buildings or to meet refrigeration requirements in industrial facilities. NRB Free-cooling appliances are water chillers equipped with a recovery system of the cooling capacity of outdoor air called "free cooling". This free water cooling system (thus the name free cooling) consists in integrating, and eventually fully replacing, the cooling capacity supplied by the compressors by using an additional water coil which exploits the low-temperature of outdoor air to cool water returning from the system.

ENERGY EFFICIENCY
Energy efficiency is an important requirement for new projects and redevelopment of the existing ones.
The NRB free cooling appliances rank among the best solutions, as they can ensure high levels of energy efficiency.

ACOUSTIC EFFICIENCY
Our chillers present different levels of noise suppression**.** The different versions have been designed to identify the unit according to the intended use of the system. The NRB free cooling range excludes any compromise in technological choices, as efficiency and silence can coexist perfectly.

MAXIMUM VERSATILITY
To obtain a solution that allows you to save money and to facilitate installation. These units can be configured with an integrated hydronic system. The kit includes the main hydraulic components and it is available in different configurations: with single pump or spare pump, with various static pressures (see configurator).

EXTENDED OPERATING RANGE
This range can work at full load with outdoor temperature up to + 122.00°F. This occurs in the high efficiency versions and also, for example, in versions with silent operation. Therefore, their natural location is in urban centres, where environmental requirements are strictly related to noise.

STATE-OF-THE-ART CONTROL
The controller with liquid crystal display is supplied as per standard with all the units. It has a multilingual user interface, which is available also in remote version (accessory) to be connected to the unit with serial connection.
The presence of an internal clock allows you to program the operation in time periods in order to improve the system efficiency and reduce consumption during periods of non-use.
This option (Night Mode) is perfect for night operation, since it guarantees greater acoustic comfort in the evenings, and a high efficiency in the time of greater load.

Systems consisting of two chillers allow the unit to be adjusted via (Master/Slave), supplied as per standard. In case of several chillers through the Multichiller_EVO. The supervision is possible thanks to different options, with proprietary devices or by integrating other systems via ModBus, Bacnet, LonWorks etc. protocols.

Version with desuperheater
Cooler with desuperheater section.
In this configuration a coolant/water heat exchanger is added on the gas flow line. The exchanger is set i series before the condenser and is appropriately sized to guarantee the recovery of all or part of the heat produced, for the free production of hot water at a medium-high temperature for domestic or other uses. Each exchanger is protected by an anti-freeze resistance.

High-efficiency versions FA-FE-FU-FN
These versions can produce water cooled to 14.00°F.

CONFIGURATOR

Field		Description		
1,2,3		**NRB**		
4,5,6,7		**Size**		
		0800-0900-1000-1100-1200-1400-1600-1800-2000-2200-2400-2600-2800-3000		
8		**Field of use**		
	°	Standard (processed water up to +39.20°F) **(1)**		
	Y	Low temperature (processed water from +39.20°F to 14.00°F) **(1)**		
	X	Electronic thermostatic valve (processed water up to +39.20°F)		
	Z	Electronic thermostatic valve low temperature (processed water from +39.20°F to 14.00°F)		
9		**Model**		
	F	Free Cooling		
10		**Heat recovery**		
	°	Without heat recovery		
	D	With desuperheater **(2)**		
11		**Version**		
	A	High efficiency		
	E	Silenced high efficiency		
	U	Extra high efficiency		
	N	Silenced extra high efficiency		
12		**Condensing coils**	**Free Cooling water coils**	
	°	Micro-channel aluminium	Copper Aluminium	
	O	Painted micro-channel aluminium	Copper Painted aluminium	
	R	Copper - Copper	Copper - Copper	
	S	Copper - Tin-plated	Copper - Tin-plated	
	V	Painted copper / aluminium	Copper Painted aluminium	
13		**Fans**		
	J	Inverter		
14		**Power supply**		
	6	230V/3/60Hz **(3)**		
	7	460V/3/60Hz		
	8	575V/3/60Hz		
	9	208V/3/60Hz **(3)**		
15-16		**Integrated hydronic kit**		
	00	Without hydronic kit		
		With 1 pump:	**With 1 pump and accumulation tank:**	
	PA	Pump A	**AA**	Pump A and accumulation tank
	PB	Pump B	**AB**	Pump B and accumulation tank
	PC	Pump C	**AC**	Pump C and accumulation tank
	PD	Pump D	**AD**	Pump D and accumulation tank
	PE	Pump E	**AE**	Pump E and accumulation tank
	PF	Pump F	**AF**	Pump F and accumulation tank
	PG	Pump G	**AG**	Pump G and accumulation tank
	PH	Pump H	**AH**	Pump H and accumulation tank
		With 2 pumps:	**With 2 pumps and accumulation tank:**	
	DA	Pump A and reserve pump	**BA**	Pump A with reserve pump and accumulation tank
	DB	Pump B and reserve pump	**BB**	Pump B with reserve pump and accumulation tank
	DC	Pump C and reserve pump	**BC**	Pump C with reserve pump and accumulation tank
	DD	Pump D and reserve pump	**BD**	Pump D with reserve pump and accumulation tank
	DE	Pump E and reserve pump	**BE**	Pump E with reserve pump and accumulation tank
	DF	Pump F and reserve pump	**BF**	Pump F with reserve pump and accumulation tank
	DG	Pump G and reserve pump	**BG**	Pump G with reserve pump and accumulation tank
	DH	Pump H and reserve pump	**BH**	Pump H with reserve pump and accumulation tank

(1) Sizes **2000 - 3000** have an electronic thermostatic valve fitted as standard

(2) **D** heat recovery units not compatible with operating ranges **Y** and **Z (NO = YD - ZD)**. Warning: on the recovery side, a minimum input temperature of 95.0°F must always be guaranteed on the heat exchanger

For more information on the operating range of the unit, refer to the Magellano selection program

(3) Available only for sizes **0800 - 1200**

DESCRIPTION OF COMPONENTS

COOLING CIRCUIT

Compressor
Scroll hermetic compressors with 2-pole electric motors. All the compressors are equipped with guard resistance, inner electronic thermal protection device with centralised manual reset.

System side heat exchanger (1)
Braze welded AISI 316 steel plate heat exchanger. The heat exchanger is insulated externally with closed cell neoprene anti-condensation material. When the unit is not running, it is protected against formation of ice by an electric resistance.

Source side heat exchanger
Microchannels heat exchanger that guarantees higher thermal exchange yield. Circuit that optimises the liquid distribution in the coil, which is arranged with V beam geometry with open angle. The configurator has always the standard copper/aluminium coils available.

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

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.

Mechanical thermostatic valve
With external equaliser positioned at evaporator outlet, it modulates the flow of gas to the evaporator, according to the heat load, in order to ensure correct heating level of the intake gas.

Electronic thermostatic valve (2)
Compared to the classic thermostatic valve, the electronic thermostatic valve stands out for its best overheating regulation. This way, the evaporator is fully exploited increasing the machine yield.
Its use in applications intended for comfort provides important benefits, especially in the presence of variable loads, as it allows you to maintain maximum efficiency with any outdoor air temperature.
In industrial applications, where temperature changes are often required in relation to various environmental conditions, the electronic valve is ideal to prevent the system from continuous calibration, thus adapting the system to different load conditions, making it independent.

Solenoid valves (3)
The valves close when the compressor switches off, blocking the flow of refrigerant gas to the evaporator, recovery and the coil.

Liquid separator
Located in the intake line, it protects the compressor from any liquid returns.

Liquid indicator
It is used to verify that the expansion system is powered correctly and the presence of humidity in the cooling circuit.

STANDARD HYDRAULIC CIRCUIT

Free Cooling Water Coils
With water running through the system for free-cooling operating mode. It presents copper pipes and aluminium louvers locked in place due to the expansion of the pipes.

Water filter
Equipped with steel filtering mesh, it prevents the heat-exchanger from clogging system side due to any impurity inside the circuit.

Butterfly cut-off valves
Useful for cutting out the hydraulic system in case of maintenance, for example, to clean the filter. In the event of variable flow rate, the motorised hydronic valves can intercept one or more modules to reduce the flow rate in low heat load conditions.

HYDRONIC KIT COMPONENTS

Pump (4)
It provides useful static pressure to the system, excluding the unit pressure drops. A second standby pump (twin pumps) can be supplied upon request.

Expansion vessel
With nitrogen pre-load membrane

Air vent valve
Manual type, discharges any air pockets in the hydraulic circuit.

Safety valve
Calibrated at 6 Bar and drain pipe, it activates by discharging overpressure if abnormal pressure occurs.

Three-way valve
Located on the water side of the Free Cooling circuit, this is an ON-OFF diverting valve managed via an electric servo-command.

System Storage Tank (5)
It is required to reduce the number of peaks of the compressor and to even the temperature of water to be sent to the system.
Made of steel to reduce heat loss and to eliminate the formation of condensation, it is insulated by thick polyurethane.
It is equipped with antifreeze electrical resistances as per standard to ensure minimum temperature of stored water of +41.00°F, with minimum outdoor temperature of -4.00°F. The resistance is activated by the water temperature probe located in the hydronic water circuit

COMPONENTS OF THE STRUCTURE AND FANS

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

Standard fan unit
Equipped with accident-prevention net, it consists of axial fans and 6-pole motor with external rotor and protection rating IP54. Moreover, the motor

1 A shell and tube heat exchanger is available on request (contact the office for feasibility and compatibility with hydraulic kits).
2 All versions from size 1800 to size 3000 use the electronic thermostatic valve as per standard.
3 Only with mechanical thermostatic valve.
4 The pumps are programmed in rotation with automatic exchange if the running pump fails.
5 The storage tank alone made of AISI 304 stainless steel is available upon request.

is equipped with inner thermal protection with automatic reset.

Inverter Fans
Continuous modulation of revolution speed according to the condensation pressure, highly efficient brushless motor for low energy consumption.

CONTROL AND SAFETY COMPONENTS

Manually reset high pressure switch
With fixed calibration, placed on the high pressure side of the cooling circuit, it inhibits the operation of the compressor if abnormal work pressure occurs

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

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

Checking the speed of the fans DCPX (4)
Condensation check by means of a fan speed continuous regulation device.
As the speed of the fan is managed electronically, it is increased automatically to guarantee unit proper operation in the event environmental conditions become more demanding.

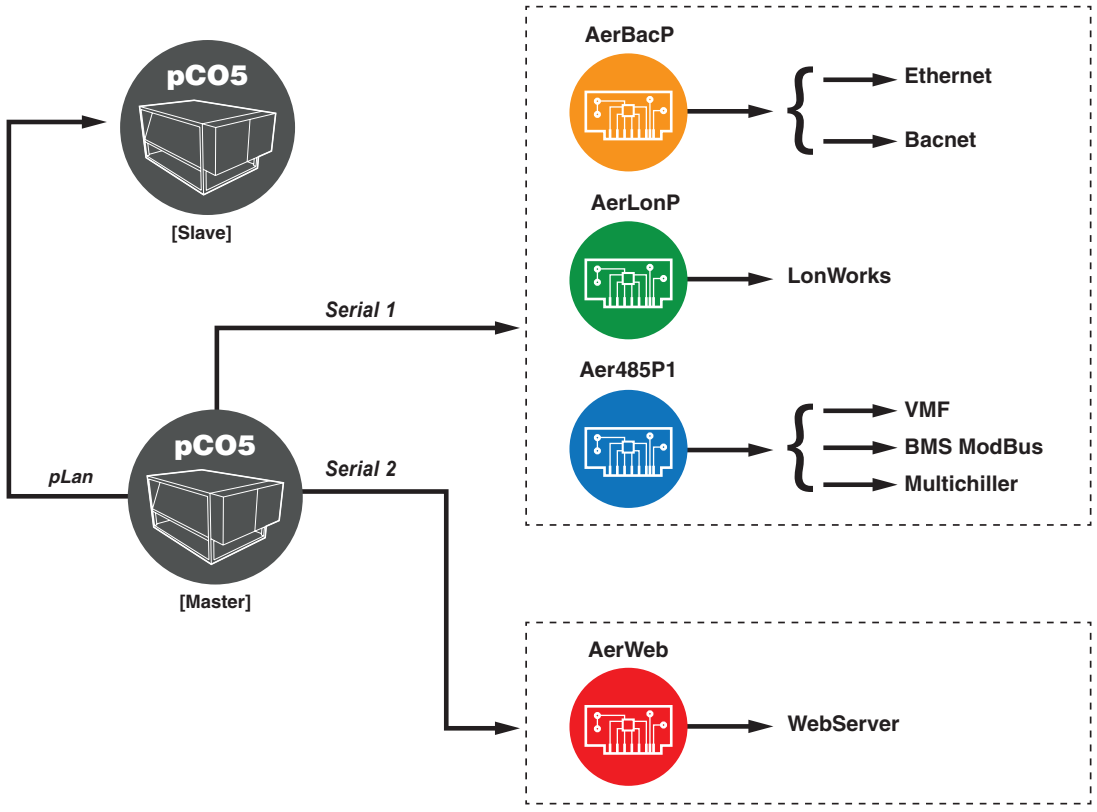
Control and electric power board
complete with:
- door lock main isolating switch,
- Circuit breakers and contactors for compressors and fans,
- terminals for REMOTE PANEL
- evaporator pump and recovery pump control consent relay (only for versions without pump units),
- all numbered cables.
- electronic controller,
- pump evaporator and pump recovery unit control consent relay (only for versions without pump units).
- All numbered cables

DOOR-LOCK ISOLATING SWITCH

THE electrical board can be accessed by disconnecting the power supply using the door-lock isolating switch lever. In order to prevent energising the unit accidentally during maintenance, the isolator switch has been provided with a safety-lock.

Control board
The microprocessor controls features cutting edge functions and proprietary adjustments
The keyboard is equipped with control keys and LCD display, which allows you to consult and make interventions on the unit by means of the multi-level menu, with language selection settings. It controls:
The system temperature for cooling the environments or industrial processes. The different temperatures are managed automatically according to the unit work conditions and requirements.
Management and alarm log to have always a prompt diagnosis of the unit operation.
Creation of operation time periods required for efficient programming.
A self-adaptive logic is used to defrost. This logic allows you to adjust the number of defrosts in order to increase efficiency.
Systems consisting of two chillers allow the unit to be adjusted via (Master/Slave), supplied as per standard. In case of several chillers through the Multichiller_EVO. The supervision is possible thanks to different options, with proprietary devices or by integrating other systems via ModBus, Bacnet, LonWorks etc. protocols.
A specific keyboard for wall-mounting installation (PGD1 accessory) allows the remote control of all the functions.

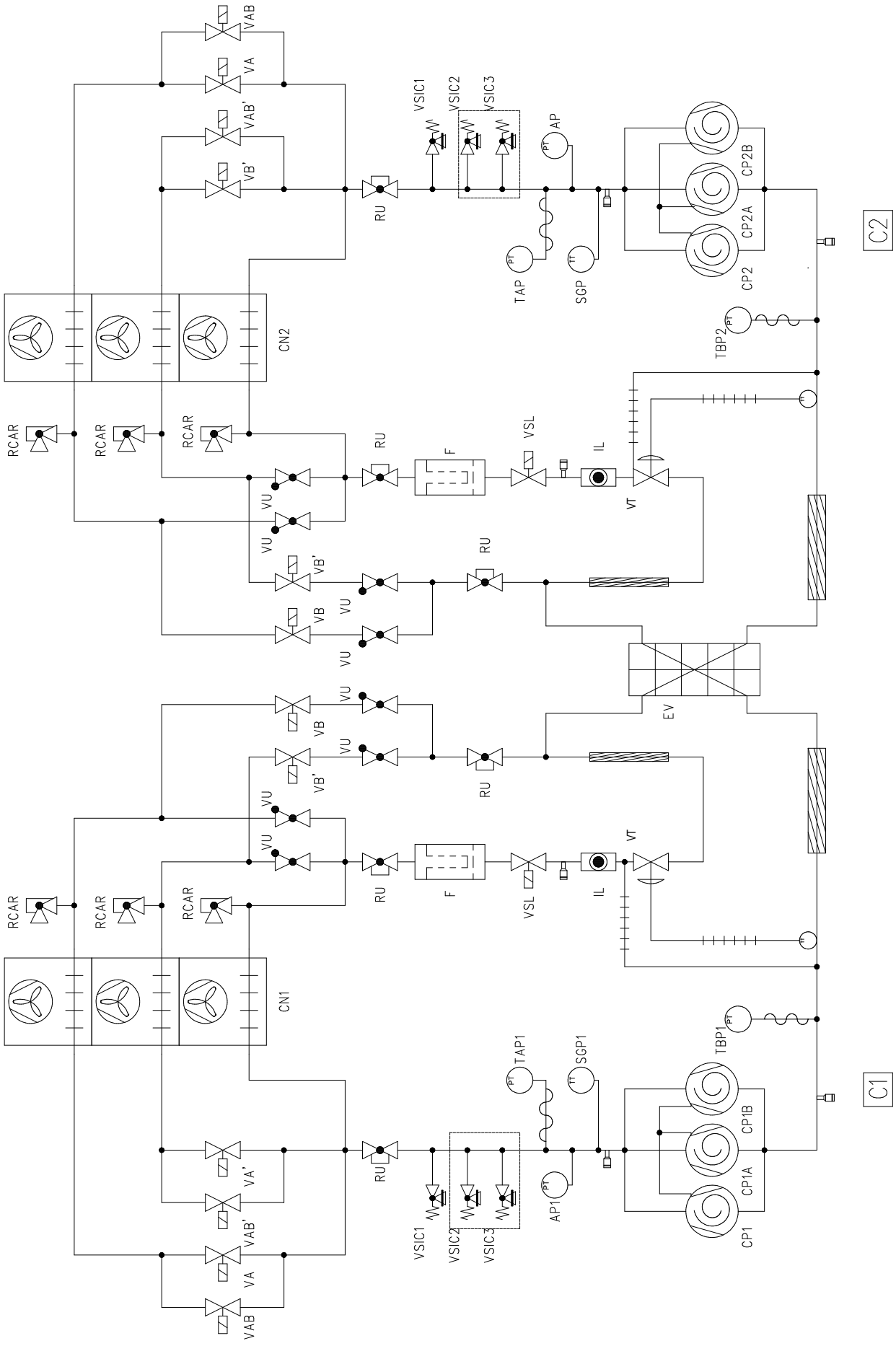
Note: For further information, refer to the user manual.



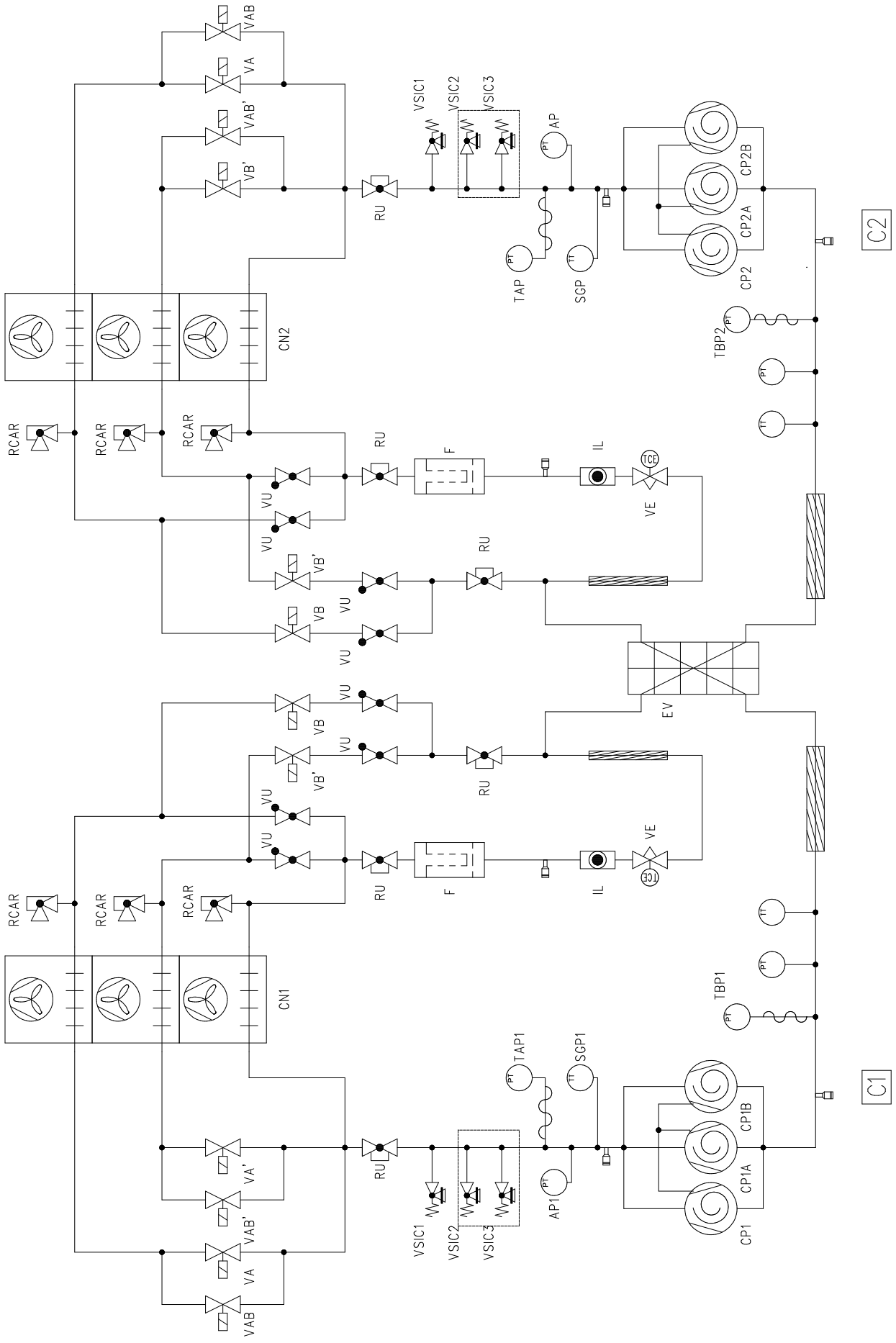
4 Standard in the silenced versions or with the desuperheater; an accessory for all other versions

REFRIGERANT CIRCUIT

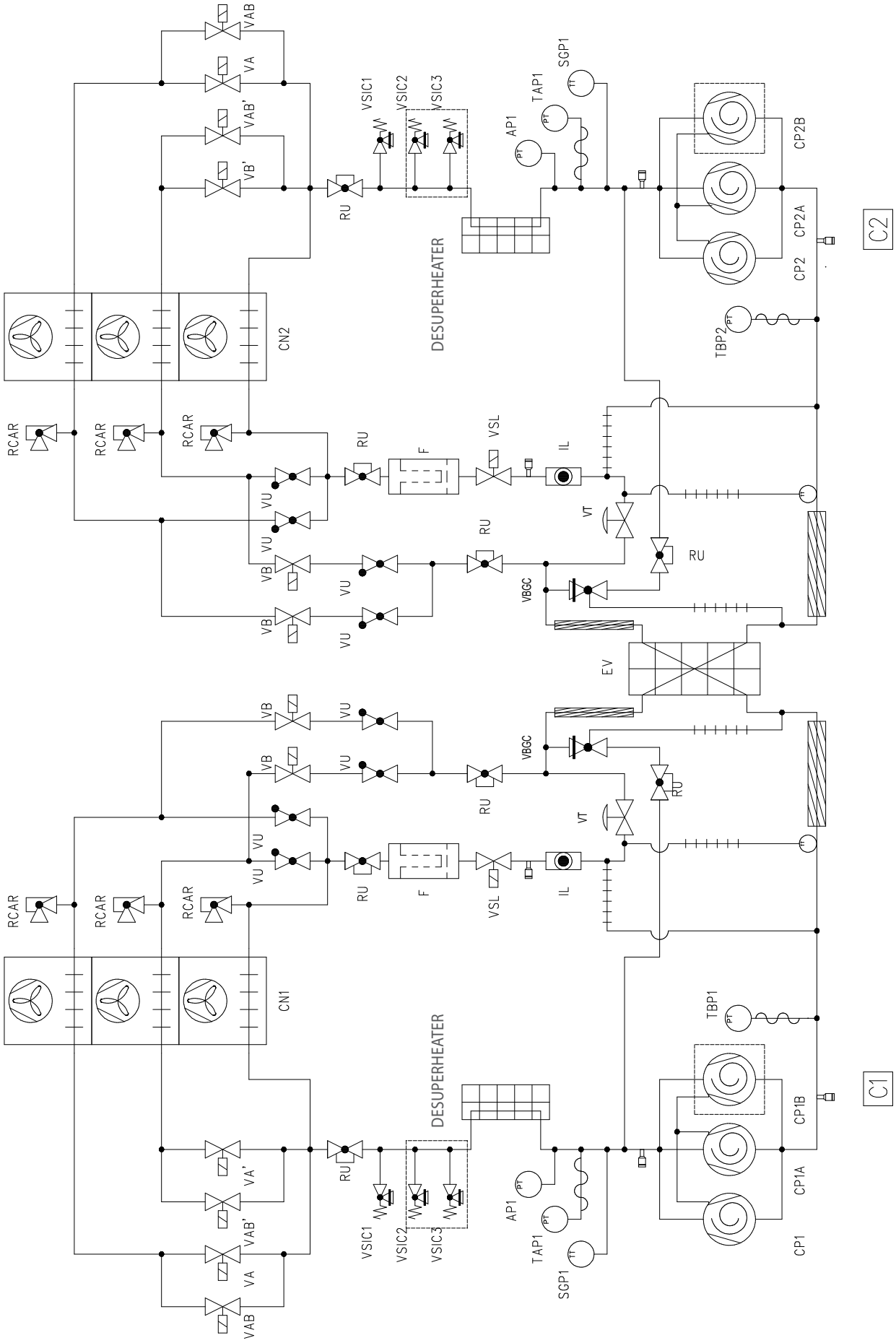
NRB F 0800-1600 - MECHANICAL THERMOSTAT VALVE - °



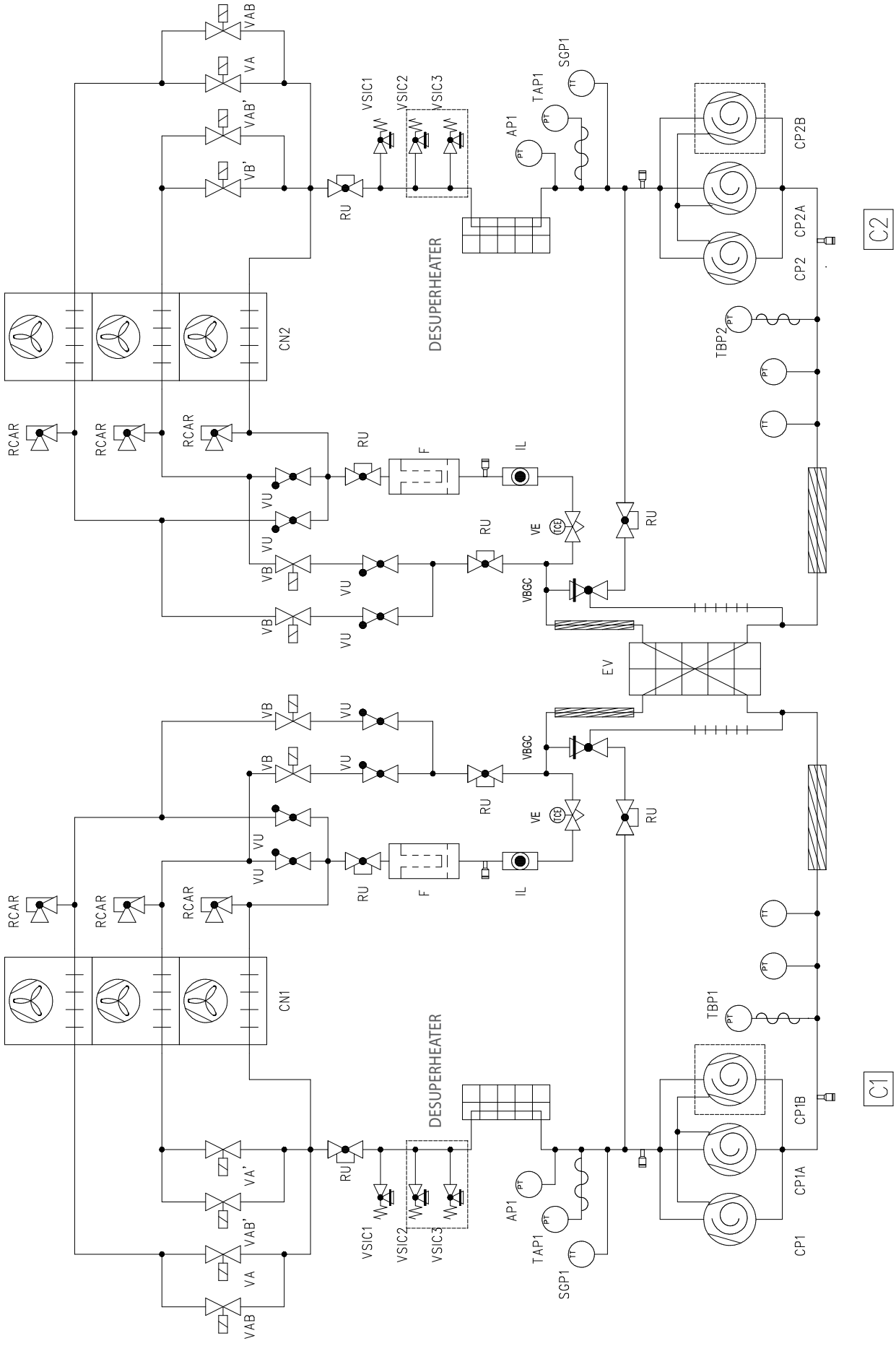
NRB F 0800-1600 - ELECTRONIC THERMOSTAT VALVE - X
NRB F 1800-3000 - ELECTRONIC THERMOSTAT VALVE - X (STANDARD)



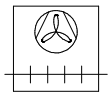
NRB F D 0800-1600 - MECHANICAL THERMOSTAT VALVE - °



NRB F D 0800-1600 - ELECTRONIC THERMOSTAT VALVE - X
NRB F D 1800-3000 - ELECTRONIC THERMOSTAT VALVE - X (STANDARD)



Key:

SYMBOL	SYMBOL NAME	FUNCTION
	STE	Electronic expansion valve temperature probe
	TAP	High pressure transducer
	TBP	Low pressure transducer
	TPE	Electronic expansion valve pressure transducer
 0.98x	VE	Electronic expansion valve
 0.73x	VSIC	Safety valve
	VSL	Solenoid valve
 0.98x	VT	Thermostatic valve
	SC SF	Drain water / Air vent valve
	FL	Flow switch
	SFC	Free cooling probe
	MAN	Pressure gauge
	AP	Pressure switch
 0.64x	BATTERIA ALETTATA	Heat exchanger with finned coil with fan
	C	Scroll compressors
 0.84x	COMPONENTE OPZIONALE	Optional component
	FD	Dehydrator filter
	IDL	Liquid indicator

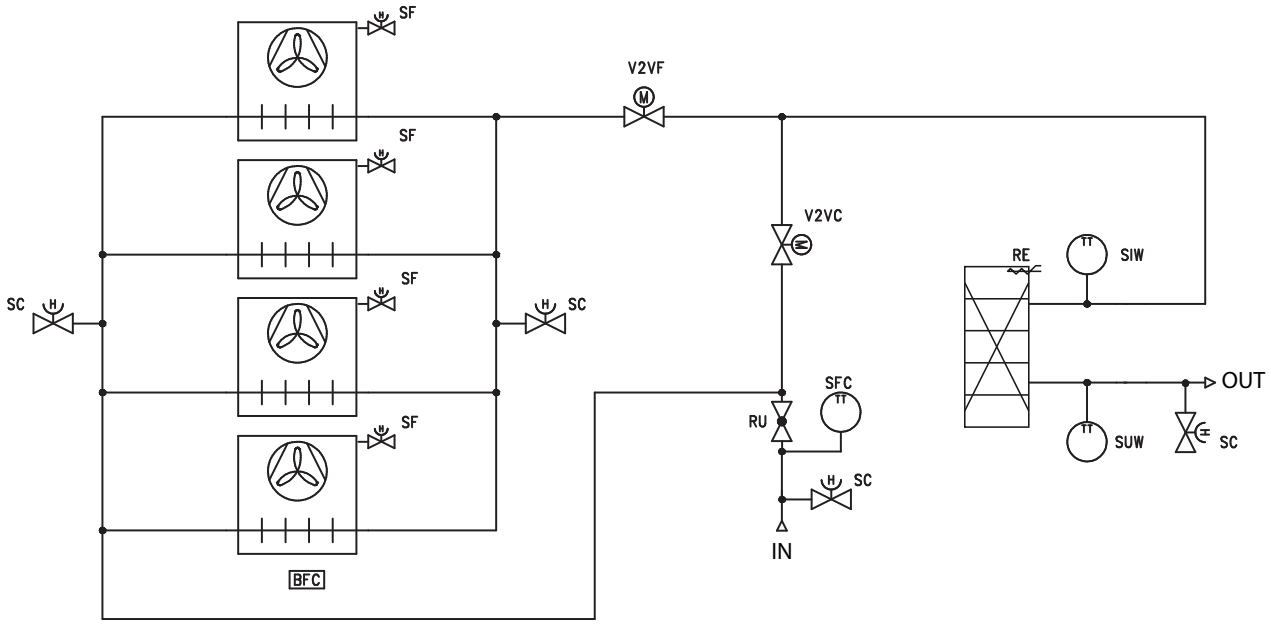
Key:

SYMBOL	SYMBOL NAME	FUNCTION
	ISOL	Insulated piping
 0.56x	LINEE-REGOL	Adjustment line
	RACC-DR_CF	Pressure plug
	RCAR	Loading tap
	RU	Tap
	SGP	Pressing gas temperature probe
	P	Pump
	VESP	Expansion tank
	R	Resistance
	BP	Pressure switch
	SRU	Utility recovery probe
	F	Water filter
		Removable connections
		One way valve
	SP	Plate heat exchanger

HYDRAULIC CIRCUIT

INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT VERSION "00"

0800-1800 FA
0800-1400 FU/FE
0800-1000 FN



CODE	DESCRIPTION
SC	Drain tap
SF	Vent tap
V2VF	2-way free cooling valve
V2VC	2-way chiller valve
SFC	Free cooling probe
BFC	Free cooling coil
SUW	Outlet water probe
SIW	Inlet water probe
PDIFF	Differential pressure switch
RU	Tap
P	Pumps
VSIC	Safety valve
VESP	Expansion vessel
RE	Exchangers electric resistance

ATTENTION
The choice and installation of components external to the unit is up to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.

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

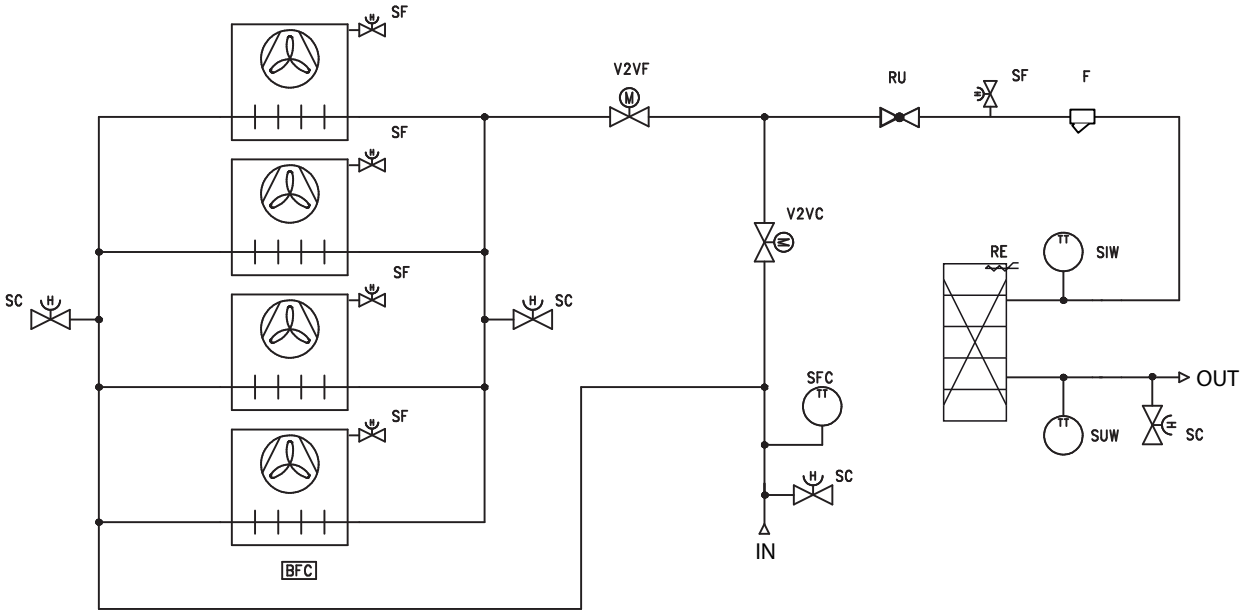
ATTENTION
Wash the system thoroughly before connecting the unit. This cleaning will eliminate any residues such as welding drips, scale, rust, or other impurities from the piping. These substances can also deposit inside and cause unit malfunctions. The connection piping must be adequately supported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

ATTENTION
DISCHARGING SYSTEM
In the event the system is stopped during winter, the water in the heat exchanger can freeze damaging the heat exchanger irreversibly.
To prevent danger of freezing, three solutions are possible:

1. **Full water discharge from** the unit.
2. **Operation with glycol/water fluid**, with a percentage of glycol based on the minimum outdoor temperature expected.
3. **Using the resistances.**
   In this case the resistances must always be supplied with electrical power for the entire period of possible freezing (machine in stand-by).

Internal and external hydraulic circuit - Standard

2000-3000 FA
1600-3000 FU/FE
1100-3000 FN



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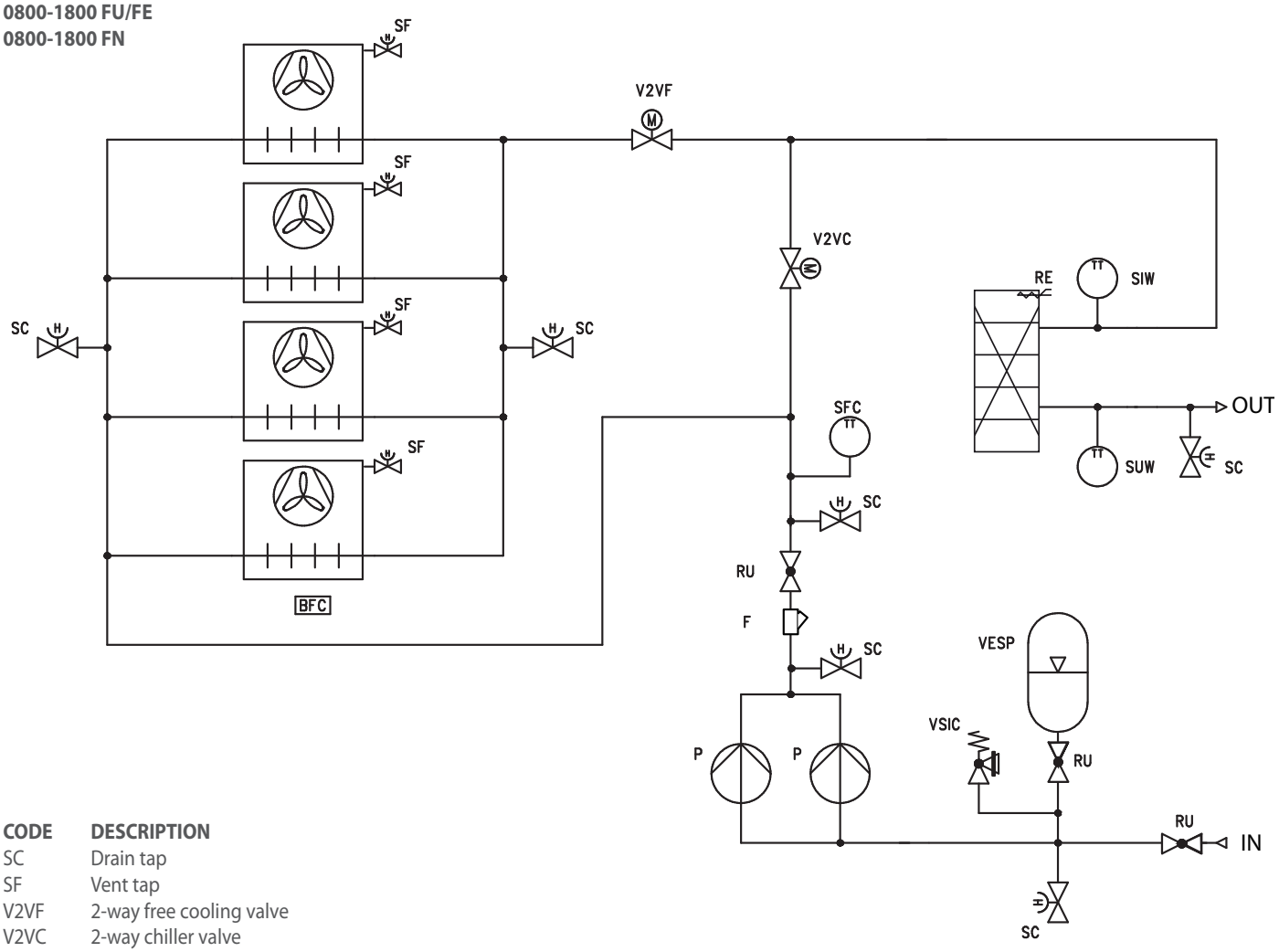
0800-1800 FA
0800-1800 FU/FE
0800-1800 FN



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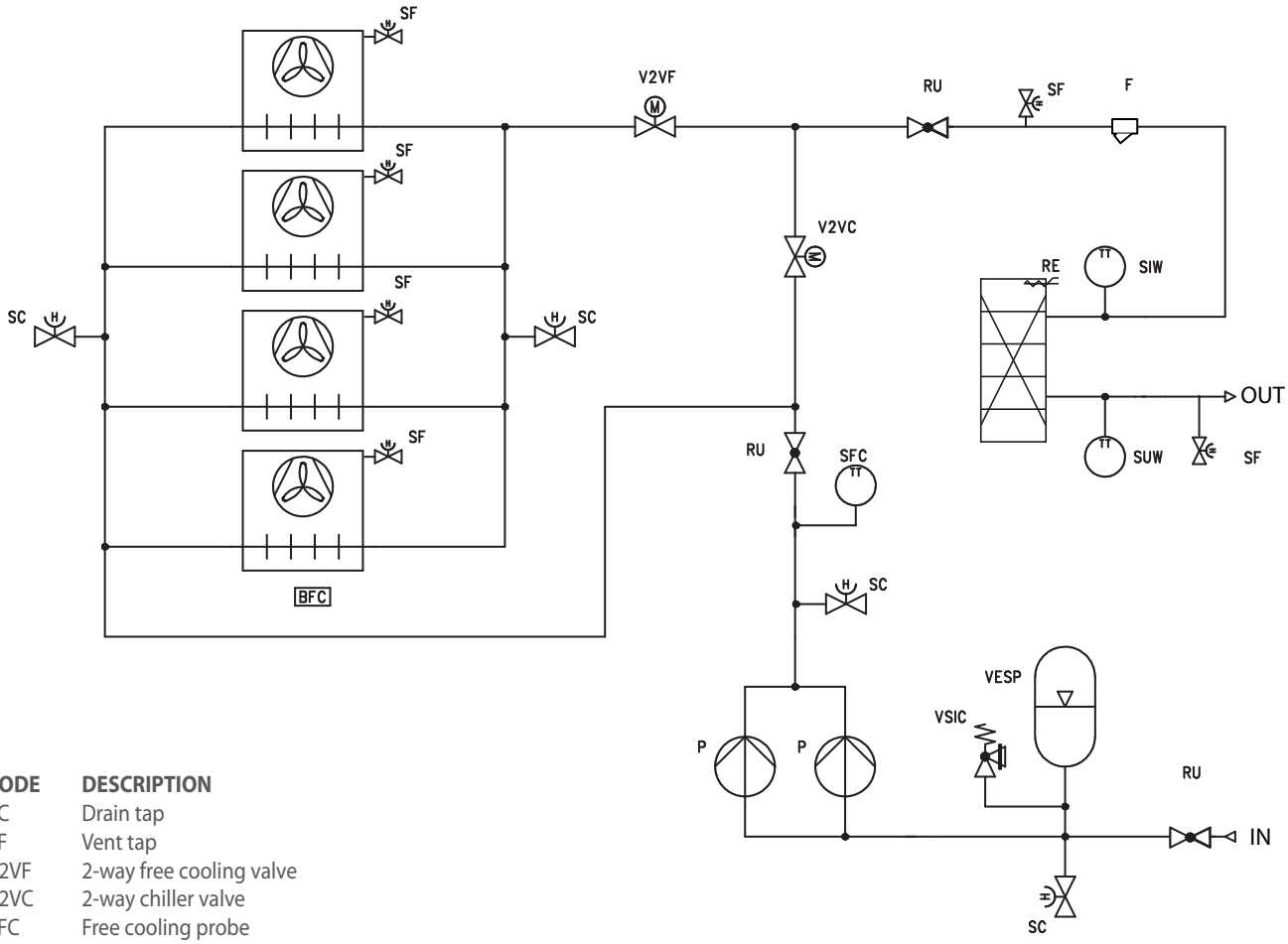
INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT WITH PUMP UNIT "P - D"

2000-3000 FA
2000-3000 FU/FE
2000-3000 FN



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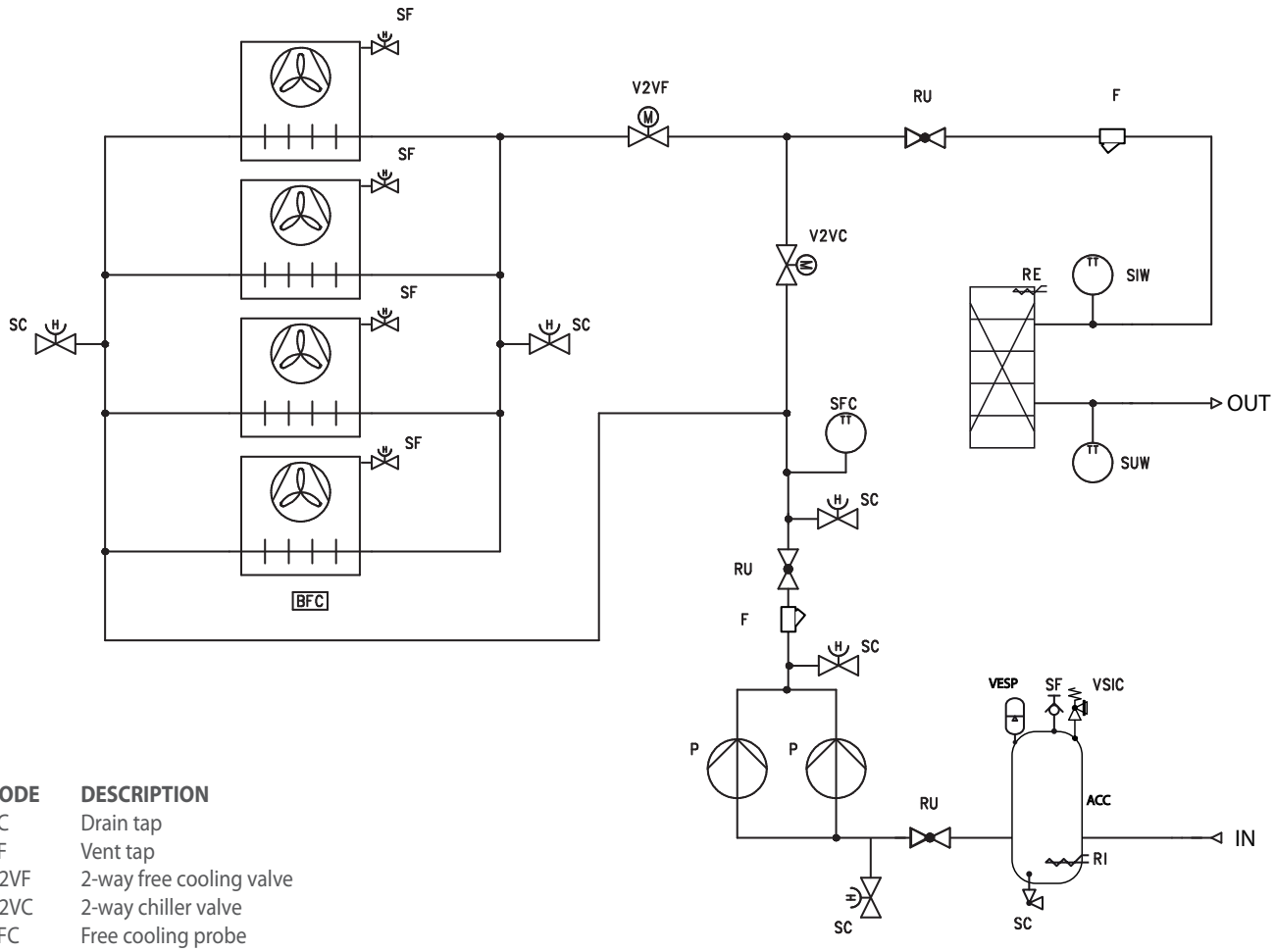
INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT WITH STORAGE TANK "A -B "

0800-1800 FA
0800-1800 FU/FE
0800-1800 FN



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PDIFF	Differential pressure switch
RU	Tap
RI	Integrative resistance
P	Pumps
VSIC	Safety valve
ACC	Storage tank
VESP	Expansion vessel
RE	Exchangers electric resistance

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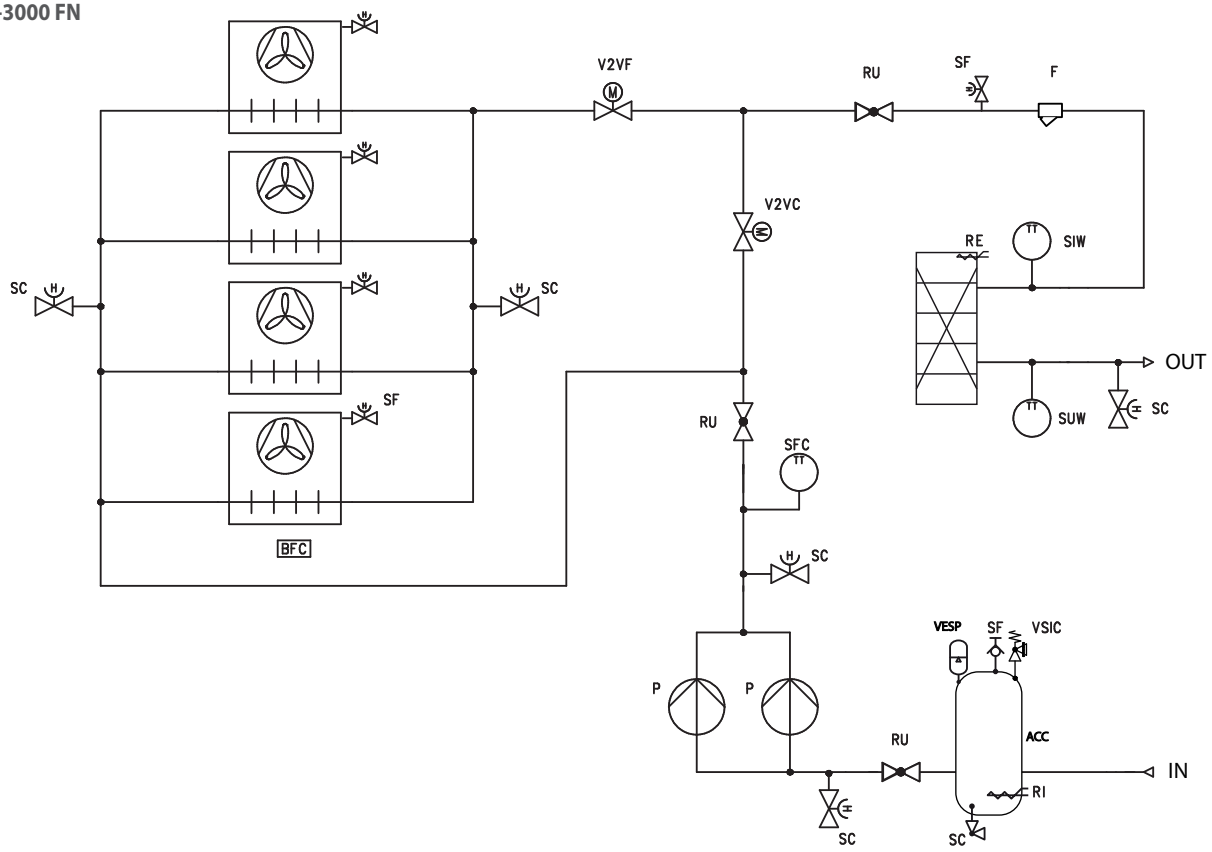
INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT WITH STORAGE TANK "A -B "

2000-3000 FA
2000-3000 FU/FE
2000-3000 FN



CODE	DESCRIPTION
SC	Drain tap
SF	Vent tap
V2VF	2-way free cooling valve
V2VC	2-way chiller valve
SFC	Free cooling probe
BFC	Free cooling coil
SUW	Outlet water probe
SIW	Inlet water probe
PDIFF	Differential pressure switch
RU	Tap
RI	Integrative resistance
P	Pumps
VSIC	Safety valve
ACC	Storage tank
VESP	Expansion vessel
RE	Exchangers electric resistance

ATTENTION
The choice and installation of components external to the unit is up to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.

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

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

ATTENTION
DISCHARGING SYSTEM
In the event the system is stopped during winter, the water in the heat exchanger can freeze damaging the heat exchanger irreversibly.
To prevent danger of freezing, three solutions are possible:
1. **Full water discharge from** the unit.
2. **Operation with glycol/water fluid**, with a percentage of glycol based on the minimum outdoor temperature expected.
3. **Using the resistances.**
   In this case the resistances must always be supplied with electrical power for the entire period of possible freezing (machine in stand-by).

ACCESSORIES

AER485P1
RS-485 interface for supervision systems with MODBUS protocol.

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.

PGD1
This allows chiller command operations to be implemented from a distance.

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 exchangers.

FL-UL Flow switch.
Warning: the flow switch and water filter must be fitted. Otherwise, the warranty will be considered null.

Air filters (shipped to the package including packaging)
Filter to protect the micro-channel coils. Formed of a frame and a composite baffle in micro-expanded aluminium mesh, with particularly low pressure drops.

AVX
Anti-vibration spring supports.

Accessories installed in the factory

DRENRB
Electronic device for reducing the rated starting current.

RIFNRB
Current phase advancer. When connected to the motor in parallel, the input current is reduced (by about 10%).

GP
Anti-intrusion grille.

Air filters filter to protect the micro-channel coils.
Formed of a frame and a composite baffle in micro-expanded aluminium mesh, with particularly low pressure drops.

COMPATIBILITY OF ACCESSORIES

NRB-FC	vers.	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
AER485P1		•	•	•	•	•	•	•	•	•	•	•	•	•	•
AERNET		•	•	•	•	•	•	•	•	•	•	•	•	•	•
PGD1		•	•	•	•	•	•	•	•	•	•	•	•	•	•
MULTICHILLER_EVO		•	•	•	•	•	•	•	•	•	•	•	•	•	•
FL-UL		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Air filters	**FA**	FB2M	FB2M	FB3M	FB3M	FB3M	FB3M	FB2M (2x)	FB2M (2x)	FB2M + FB3M	FB2M + FB3M	FB3M (2x)	FB2M (2x) + FB3M	FB2M (2x) + FB3M	FB2M (2x) + FB3M
	FE	FB3M	FB3M	FB3M	FB2M (2x)	FB2M (2x)	FB2M (2x)	FB2M + FB3M	FB3M (2x)	FB3M (2x)	FB2M (2x) + FB3M	FB2M (2x) + FB3M	FB2M + FB3M (2x)	FB2M + FB3M (2x)	FB3M (3x)
	FU	FB3M	FB3M	FB3M	FB2M (2x)	FB2M (2x)	FB2M (2x)	FB2M + FB3M	FB3M (2x)	FB3M (2x)	FB2M (2x) + FB3M	FB2M (2x) + FB3M	FB2M + FB3M (2x)	FB2M + FB3M (2x)	FB3M (3x)
	FN	FB2M (2x)	FB2M (2x)	FB2M (2x)	FB2M + FB3M	FB2M + FB3M	FB2M + FB3M	FB3M (2x)	FB2M (2x) + FB3M	FB2M (2x) + FB3M	FB2M + FB3M (2x)	FB2M + FB3M (2x)	FB3M (3x)	FB3M (3x)	FB2M (2x) + FB3M (2x)
AVX	**FA**	AVX1082	AVX1082	AVX1080	AVX1080	AVX1080	AVX1080	AVX1095	AVX1095	AVX1086	AVX1086	AVX1084	AVX1094	AVX1094	AVX1094
	FE	AVX1080	AVX1080	AVX1080	AVX1095	AVX1095	AVX1095	AVX1096	AVX1084	AVX1084	AVX1094	AVX1094	AVX1088	AVX1088	AVX1098
	FU	AVX1080	AVX1080	AVX1080	AVX1095	AVX1095	AVX1095	AVX1096	AVX1084	AVX1084	AVX1094	AVX1094	AVX1088	AVX1088	AVX1098
	FN	AVX1095	AVX1095	AVX1095	AVX1096	AVX1096	AVX1096	AVX1084	AVX1094	AVX1094	AVX1097	AVX1088	AVX1098	AVX1098	AVX1093

ACCESSORIES INSTALLED IN THE FACTORY															
DRENRB		•	•	•	•	•	•	•	•	•	•	•	•	•	•
RIFNRB		•	•	•	•	•	•	•	•	•	•	•	•	•	•
GP (1)	**FA**	2VN	2VN	3VN	3VN	3VN	3VN	4VN	4VN	5VN	5VN	6V	7V	7V	7V
	FE	3VN	3VN	3VN	4VN	4VN	4VN	5VN	6V	6V	7V	7V	8V	8V	9VN
	FU	3VN	3VN	3VN	4VN	4VN	4VN	5VN	6V	6V	7V	7V	8V	8V	9VN
	FN	4VN	4VN	4VN	5VN	5VN	5VN	6V	7V	7V	8V	8V	9VN	9VN	10V
Air filters	**FA**	FB1 (2x)	FB1 (2x)	FB1 (3x)	FB1 (3x)	FB1 (3x)	FB1 (3x)	FB1 (4x)	FB1 (4x)	FB1 (5x)	FB1 (5x)	FB1 (6x)	FB1 (7x)	FB1 (7x)	FB1 (7x)
	FE	FB1 (3x)	FB1 (3x)	FB1 (3x)	FB1 (4x)	FB1 (4x)	FB1 (4x)	FB1 (5x)	FB1 (6x)	FB1 (6x)	FB1 (7x)	FB1 (7x)	FB1 (8x)	FB1 (8x)	FB1 (9x)
	FU	FB1 (3x)	FB1 (3x)	FB1 (3x)	FB1 (4x)	FB1 (4x)	FB1 (4x)	FB1 (5x)	FB1 (6x)	FB1 (6x)	FB1 (7x)	FB1 (7x)	FB1 (8x)	FB1 (8x)	FB1 (9x)
	FN	FB1 (4x)	FB1 (4x)	FB1 (4x)	FB1 (5x)	FB1 (5x)	FB1 (5x)	FB1 (6x)	FB1 (7x)	FB1 (7x)	FB1 (8x)	FB1 (8x)	FB1 (9x)	FB1 (9x)	FB1 (10x)

(1) **2VN** models become **2VNA** for configuration with **Ax** and **Bx** hydronic kits

SELECTION CRITERIA OF THE HEAT EXCHANGERS ACCORDING TO THE PLACE OF INSTALLATION OF THE UNIT

N.B.: The purpose of this application guide is to provide general information on the mechanisms of corrosion and corrosive environments. The guide provides advice on the applications, however, you cannot anticipate all the details concerning the application in the actual destination place of our products in this document. In addition, the requirements relating to the service life of a potential product are not known. For these reasons, Aermec prefers to work closely with the customers to fully understand the requirements of the project and the operating environments. Aermec assumes no liability for the completeness and correctness of the information contained herein.

Potentially corrosive outdoor environments include areas near coasts, industrial sites, densely populated urban areas, certain rural areas or a combination of these environments. Other factors, including the presence of effluent gas, sewage vents or open sewage systems and the exhaust of diesel engines can all be harmful for the microchannel coil.

• **Coastal/marine environments**: Coastal and marine environments are distinguished by an abundance of sodium chloride (salt) transported by sea spray, vapour or mist. It is important to note that salt water can be transported many miles by wind and tidal currents. It is not uncommon for contamination due to salt water to occur 10 km away from the coast. For this reason, equipment may have to be protected from the electrolytes of marine origin.
• **Industrial Environments**: Industrial applications are associated with several different conditions that can potentially produce a variety of atmospheric emissions. Contaminants from sulphur and nitrogen oxides are most often linked to high-density urban environments. The combustion of coal oils and fuel oils releases sulphur oxides (SO2, SO3) and nitrogen oxides (NOx) into the atmosphere. These gases accumulate in the atmosphere and return to the ground as acid rain or low pH dew. Industrial emissions are not only potentially corrosive: many industrial dust particles can be loaded with harmful components such as metal oxides, chlorides, sulphates, sulfuric acid, carbon and carbon compounds. In the presence of oxygen, water or high humidity environments, these particles can be extremely corrosive and in several forms, including general and localised corrosion, such as pitting and anthill.

A combination of marine/industrial environments: Sea mist loaded with salt, associated with the harmful emissions of an industrial environment, poses a serious risk. The combined effects of the salt loaded mist and industrial emissions accelerate corrosion. Within the manufacturing plants, corrosive gas may result from the processing of chemicals or by the typical industrial processes used in manufacturing. Potential contributing factors that must be considered are open sewers, vent openings, diesel exhaust, heavy traffic emissions, landfills, exhaust from aircraft engines and ocean-going vessels, industrial production, chemical treatment structures (cooling towers located nearby) and fossil fuel electrical installations.
• **Urban Environments**: Densely populated areas generally have high levels of emissions of motor vehicles and increases in duel use for heating buildings. Both conditions increase the concentration of sulphur oxides (SOx) and nitrogen oxide (NOx). Inside a building, the gas can be produced from cleaning agents, cigarette smoke, process operations and data centre printers. Corrosive atmospheres may even occur in some closed areas, such as facilities with swimming pools and water treatment systems.
The severity of corrosion in this environment is influenced by the levels of pollution,
which in turn depend on several factors, including the population density of the area. Each piece of equipment installed in places immediately near exhaust of diesel engines, exhaust chimneys of incinerators, chimneys of fuel-powered boilers or areas exposed to emissions from fossil fuels, must be
considered an industrial application.

• **Rural Environments**: Rural environments may contain high levels of pollution from ammonia and nitrogen products from animal excrements, fertilizers and high concentration of diesel engine exhaust. The approach to these environments must be entirely similar to that of industrial environments.
Local weather conditions have a major role in the concentration or dispersion of outdoor gaseous contaminants. Thermal inversions can trap pollutants, thereby producing serious air pollution problems.
ADDITIONAL TIPS

Although each of the above corrosive environments can be detrimental to the life of the heat exchanger, several additional factors must be considered before choosing the final design. The local climate surrounding the site of application may be influenced by the presence of:

- **Wind**
- **Dust**
- **Salty roads**
- **Swimming pools**
- **Diesel engine / traffic exhaust**
- **Localised mist**
- **Cleaning agents for domestic use**
- **Sewage system outlets**
- **Many other separate contaminants**

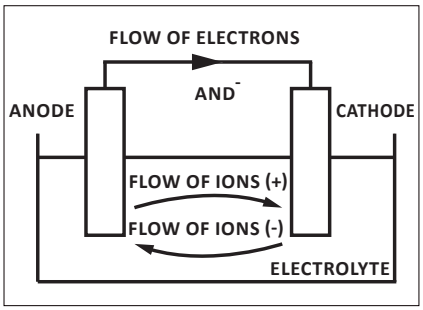
Even within 3-5 km from these particular local climates a normal environment with moderate characteristics can be classified as an environment that requires preventive corrosion measures. When these factors are directly and immediately part of the environment, their influence is further aggravating.

Application	Tip
• Urban Environments:	Coils O-R-S-V
Moderate environments	Standard coil ° (microchannel)

BASIC PRINCIPLES ON MICROCHANNEL COIL CORROSION

The main material in AERMEC heat exchangers is aluminium. Aluminium is a very reactive material, whose surface is easily oxidized. As long as this hard layer of aluminium oxide remains intact, the aluminium at the base will remain corrosion resistant. For other materials, for example steel, the oxide layer detaches from the surface and peels off, thereby allowing the underlying metal to be constantly attacked.
Extreme environments may, however, damage the layer of oxide that could not be regenerated as quickly as necessary to provide sufficient protection to the product. These hostile environments are distinguished by very high or very low levels of pH. Normally, the protective oxide of aluminium is generally stable in the pH range of 4.5 and 8.5. For this reason, sea water with neutral pH does not intrinsically corrode aluminium.
Galvanic corrosion is the reason why precautions are required in marine environments for heat exchangers with aluminium cooling louvers and copper piping.
Galvanic corrosion occurs when different metals come into contact through an electrolyte. Because of an electrochemical reaction, electrons detach from one of the metals (reduce), whereas the other metal increases the electrons (oxidized).

The role of each metal is determined by the respective galvanic potential, typically summarised by the galvanic series. The metal with the lower galvanic potential will be reduced (consumed), whereas the metal with higher potential will be oxidized, thereby becoming more resistant. In the case of aluminium and copper (for example in the presence of salt water), the aluminium will be sacrificed in favour of the copper. It is customary for AERMEC to custom design the chemistry and the selection of materials to make sure that the first component to corrode is a fin structure. The pipe that carries the refrigerant, which has a round or microchannel section, is the component of the most protected exchanger since perforation would cause the
refrigerant to leak.



Pitting corrosion is nothing else than the localised version of galvanic corrosion. The different material is often an inclusion in the same base metal alloy. Often, the surface treatment, for example thermal zinc spraying (with low galvanic potential), are those used most in order to create general corrosion, which acts laterally across the surface of the part, which is a preferable corrosion to direct downward corrosion through a cavity, so as to avoid perforation.
Anthill or ant-nest corrosion is a poorly known phenomenon which takes its name from the morphology that is similar to that of a nest of ants. It can be best described as micro-pitting because the cavities on the surface are generally so small that they are invisible to the naked eye. This type of corrosion occurs more commonly in copper pipes. The ant-hill corrosion is caused by the chemical reaction which requires three components: oxygen, water and an organic acid.

PERFORMANCE SPECIFICATIONS

NRB F°°°(A-E-U-N)°°°00

Size			0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
NRB - FA																
Performance in cooling mode																
Cooling capacity	(1)	ton	56.90	64.10	75.35	84.21	91.90	106.7	120.2	133.6	150.5	163.6	180.8	199.1	211.3	225.0
Input power	(1)	kW	67.92	79.45	88.37	100.4	112.7	131.8	146.3	167.8	185.4	204.9	219.5	238.5	258.7	279.9
EER	(1)	BTU/W	10.05	9.681	10.23	10.07	9.788	9.714	9.859	9.555	9.741	9.583	9.880	10.02	9.802	9.647
IPLV		BTU/W	16.00	15.42	16.31	16.04	15.59	15.49	15.70	15.22	15.53	15.66	15.76	16.00	15.66	15.39
Water flow rate	(1)	gpm	136.1	153.3	180.3	201.5	219.9	255.2	287.6	319.7	360.1	391.4	432.5	476.3	505.5	538.3
Pressure drops	(1)	ft H_2O	12.1	13.3	18.4	20.3	24.1	29.6	17.5	19.0	24.1	26.7	32.9	19.1	21.5	22.9
Performance in free cooling mode																
Cooling capacity	(2)	ton	37.52	38.66	54.16	56.07	57.38	58.91	76.15	78.01	95.22	97.09	114.3	131.3	133.4	135.4
Input power	(2)	kW	9.637	9.637	14.46	14.46	14.46	14.46	19.28	19.28	24.09	24.09	28.91	33.73	33.73	33.73
EER	(2)	BTU/W	46.72	48.14	44.96	46.54	47.63	48.90	47.41	48.57	47.43	48.36	47.44	46.72	47.46	48.17
Water flow rate	(2)	gpm	136.1	153.3	180	201.5	220	255.2	287.6	319.7	360.1	391.4	432.5	476.3	505.5	538.3
Pressure drops	(2)	ft H_2O	26.2	30.4	32.5	37.3	44.2	59.0	34.2	39.1	43.5	49.2	55.7	35.7	40.1	43.6
NRB - FE																
Performance in cooling mode																
Cooling capacity	(1)	ton	57.08	63.73	71.03	82.28	90.19	100.6	117.2	133.0	145.3	161.9	173.1	189.2	199.8	217.4
Input power	(1)	kW	62.70	74.18	85.95	93.94	107.2	127.5	141.0	157.1	179.7	194.8	215.1	230.6	253.5	269.3
EER	(1)	BTU/W	10.93	10.31	9.917	10.51	10.10	9.467	9.979	10.16	9.702	9.973	9.656	9.847	9.461	9.686
IPLV		BTU/W	17.40	16.41	15.80	16.75	16.07	15.08	15.90	16.17	15.46	16.28	15.42	15.73	15.12	15.46
Water flow rate	(1)	gpm	136.6	152.5	169.9	196.8	215.8	240.7	280.5	318.1	347.6	387.3	414.1	452.6	478.1	520.1
Pressure drops	(1)	ft H_2O	10.6	13.2	14.4	19.7	21.9	27.2	14.6	19.0	21.2	22.1	25.2	17.2	19.2	21.4
Performance in free cooling mode																
Cooling capacity	(2)	ton	37.32	38.53	39.55	50.93	52.15	53.44	65.78	77.96	79.47	91.81	93.09	105.4	106.6	119.1
Input power	(2)	kW	3.763	3.763	3.763	5.017	5.017	5.013	6.272	7.523	7.526	8.780	8.780	10.04	10.04	11.29
EER	(2)	BTU/W	119.0	122.9	126.1	121.8	124.7	127.9	125.8	124.3	126.7	125.5	127.2	126.1	127.5	126.6
Water flow rate	(2)	gpm	136.6	152.5	169.9	196.8	215.8	240.7	280.5	318.1	347.6	387.3	414.1	452.6	478.1	520.1
Pressure drops	(2)	ft H_2O	18.9	23.4	26.7	32.0	36.3	45.0	26.7	31.8	36.3	37.9	43.3	30.3	33.8	36.5
NRB - FU																
Performance in cooling mode																
Cooling capacity	(1)	ton	60.21	67.77	76.17	87.19	96.23	108.6	125.4	141.4	156.0	173.2	186.4	202.6	215.3	233.3
Input power	(1)	kW	68.63	78.50	88.60	100.7	112.0	128.8	145.7	165.4	184.9	202.3	218.6	238.0	257.4	277.2
EER	(1)	BTU/W	10.53	10.36	10.32	10.39	10.31	10.12	10.33	10.26	10.12	10.28	10.23	10.21	10.04	10.10
IPLV		BTU/W	16.82	16.51	16.45	16.55	16.45	16.11	16.45	16.34	16.17	16.79	16.34	16.31	16.04	16.14
Water flow rate	(1)	gpm	144.0	162.1	182.2	208.6	230.2	259.7	300.1	338.4	373.2	414.5	445.9	484.6	515.1	558.2
Pressure drops	(1)	ft H_2O	11.8	14.9	16.6	22.2	24.9	31.7	16.8	21.5	24.5	25.3	29.3	19.7	22.3	24.6
Performance in free cooling mode																
Cooling capacity	(2)	ton	49.67	52.13	54.36	68.54	71.14	74.03	90.24	105.9	109.6	125.7	128.8	144.8	147.7	164.2
Input power	(2)	kW	14.46	14.46	14.46	19.28	19.28	19.27	24.09	28.91	28.91	33.73	33.73	38.55	38.55	43.37
EER	(2)	BTU/W	41.23	43.27	45.12	42.67	44.29	46.09	44.94	43.97	45.47	44.73	45.82	45.08	45.97	45.43
Water flow rate	(2)	gpm	144.0	162.1	182.2	208.6	230.2	259.7	300.1	338.4	373.2	414.5	445.9	484.6	515.1	558.2
Pressure drops	(2)	ft H_2O	20.9	26.4	30.9	36.2	41.2	52.2	30.5	35.9	41.7	43.3	50.0	34.7	39.1	42.0
NRB - FN																
Performance in cooling mode																
Cooling capacity	(1)	ton	59.06	66.41	74.56	84.85	93.50	105.1	121.1	136.2	149.6	165.9	177.9	193.4	204.8	222.0
Input power	(1)	kW	60.91	71.13	81.56	91.21	103.2	121.3	136.0	153.2	174.2	189.8	208.5	225.0	246.5	263.4
EER	(1)	BTU/W	11.64	11.21	10.97	11.16	10.88	10.40	10.68	10.67	10.30	10.49	10.24	10.31	9.971	10.11
IPLV		BTU/W	18.53	17.85	17.47	17.78	17.33	16.58	17.03	16.99	16.41	17.13	16.34	16.48	15.93	16.14
Water flow rate	(1)	gpm	141.3	158.9	178.4	203.0	223.7	251.5	289.7	325.9	357.8	396.8	425.6	462.6	490.0	531.0
Pressure drops	(1)	ft H_2O	11.5	14.6	16.2	21.0	23.5	29.7	15.7	19.9	22.5	23.2	26.7	18.0	20.2	22.3
Performance in free cooling mode																
Cooling capacity	(2)	ton	45.45	47.52	49.47	59.87	61.87	64.03	75.98	87.70	90.05	102.1	104.0	115.9	117.6	129.9
Input power	(2)	kW	5.017	5.017	5.015	6.272	6.272	6.272	7.526	8.780	8.780	10.04	10.04	11.29	11.29	12.54
EER	(2)	BTU/W	108.7	113.7	118.4	114.5	118.4	122.5	121.1	119.9	123.1	122.1	124.3	123.2	125.0	124.3
Water flow rate	(2)	gpm	141.3	158.9	178.4	203.0	223.7	251.5	289.7	325.9	357.8	396.8	425.6	462.6	490.0	531.0
Pressure drops	(2)	ft H_2O	18.1	22.9	26.6	32.4	36.7	46.3	26.5	31.8	36.5	38.3	44.1	30.3	33.9	36.8

Data (AHRI CONDITION)

(1) Water evaporator 54°F/44°F, Outside air 95°F; 0% Free-cooling

(2) Evaporator water 54°F; Outside air 35.6°F

GENERAL SPECIFICATIONS

Size	*Notes*	*ver.*		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Electrical data																	
Power supply			V/ph/Hz	**208V-3-60Hz** (fan J)													
Total input current **(1)**		FA	A	268	295	317	358	400	-	-	-	-	-	-	-	-	-
		FE	A	249	276	304	333	378	-	-	-	-	-	-	-	-	-
		FU	A	273	295	317	361	400	-	-	-	-	-	-	-	-	-
		FN	A	244	267	291	325	366	-	-	-	-	-	-	-	-	-
LRA		FA	A	605	780	816	929	956	-	-	-	-	-	-	-	-	-
		FE	A	620	795	816	944	971	-	-	-	-	-	-	-	-	-
		FU	A	620	795	816	944	971	-	-	-	-	-	-	-	-	-
		FN	A	635	810	831	959	986	-	-	-	-	-	-	-	-	-
MCA		FA	A	272	313	364	389	414	-	-	-	-	-	-	-	-	-
		FE	A	287	328	364	404	429	-	-	-	-	-	-	-	-	-
		FU	A	287	328	364	404	429	-	-	-	-	-	-	-	-	-
		FN	A	302	343	379	419	444	-	-	-	-	-	-	-	-	-
MOP		FA	A	328	387	438	475	499	-	-	-	-	-	-	-	-	-
		FE	A	343	402	438	490	514	-	-	-	-	-	-	-	-	-
		FU	A	343	402	438	490	514	-	-	-	-	-	-	-	-	-
		FN	A	358	417	453	505	529	-	-	-	-	-	-	-	-	-
Recommended fuse		FA	A	300	350	400	450	450	-	-	-	-	-	-	-	-	-
		FE	A	300	400	400	450	500	-	-	-	-	-	-	-	-	-
		FU	A	300	400	400	450	500	-	-	-	-	-	-	-	-	-
		FN	A	350	400	450	500	500	-	-	-	-	-	-	-	-	-
Power supply			V/ph/Hz	**230V-3-60Hz** (fan J)													
Total input current **(1)**		FA	A	243	268	287	324	362	-	-	-	-	-	-	-	-	-
		FE	A	225	250	275	302	342	-	-	-	-	-	-	-	-	-
		FU	A	247	267	287	327	362	-	-	-	-	-	-	-	-	-
		FN	A	221	242	263	294	332	-	-	-	-	-	-	-	-	-
LRA		FA	A	578	752	786	938	1.042	-	-	-	-	-	-	-	-	-
		FE	A	593	767	786	953	1.057	-	-	-	-	-	-	-	-	-
		FU	A	593	767	786	953	1.057	-	-	-	-	-	-	-	-	-
		FN	A	608	782	801	968	1.072	-	-	-	-	-	-	-	-	-
MCA		FA	A	267	308	359	385	407	-	-	-	-	-	-	-	-	-
		FE	A	282	323	359	400	422	-	-	-	-	-	-	-	-	-
		FU	A	282	323	359	400	422	-	-	-	-	-	-	-	-	-
		FN	A	297	338	374	415	437	-	-	-	-	-	-	-	-	-
MOP		FA	A	323	382	433	470	493	-	-	-	-	-	-	-	-	-
		FE	A	338	397	433	485	508	-	-	-	-	-	-	-	-	-
		FU	A	338	397	433	485	508	-	-	-	-	-	-	-	-	-
		FN	A	353	412	448	500	523	-	-	-	-	-	-	-	-	-
Recommended fuse		FA	A	300	350	400	450	450	-	-	-	-	-	-	-	-	-
		FE	A	300	350	400	450	500	-	-	-	-	-	-	-	-	-
		FU	A	300	350	400	450	500	-	-	-	-	-	-	-	-	-
		FN	A	350	400	400	450	500	-	-	-	-	-	-	-	-	-
Power supply			V/ph/Hz	**460V-3-60Hz** (fan J)													
Total input current **(1)**		FA	A	111	122	132	149	166	192	214	244	270	298	321	349	377	407
		FE	A	102	114	125	137	156	184	203	226	257	280	310	332	363	386
		FU	A	114	123	132	151	167	190	215	243	270	297	322	350	377	405
		FN	A	101	110	120	134	151	176	197	221	250	274	301	325	354	378
LRA		FA	A	291	341	357	413	432	484	521	632	666	699	655	774	800	826
		FE	A	299	349	357	421	440	492	529	648	674	715	663	782	808	842
		FU	A	299	349	357	421	440	492	529	648	674	715	663	782	808	842
		FN	A	307	357	365	429	448	500	537	656	682	723	671	790	816	849
MCA		FA	A	129	139	155	181	204	233	266	307	352	370	390	440	477	514
		FE	A	137	147	155	189	212	240	273	323	360	385	398	447	485	529
		FU	A	137	147	155	189	212	240	273	323	360	385	398	447	485	529
		FN	A	145	154	163	196	220	248	281	331	368	393	406	455	492	537
MOP		FA	A	156	169	185	223	246	287	320	380	425	443	445	513	550	587
		FE	A	164	177	185	231	254	295	328	396	433	458	452	520	558	602
		FU	A	164	177	185	231	254	295	328	396	433	458	452	520	558	602
		FN	A	171	185	193	238	262	303	336	404	441	466	460	528	565	610
Recommended fuse		FA	A	150	150	175	200	225	250	300	350	400	400	400	500	500	500
		FE	A	150	150	175	225	225	250	300	350	400	450	400	500	500	500
		FU	A	150	150	175	225	225	250	300	350	400	450	400	500	500	500
		FN	A	150	175	175	225	250	250	300	350	400	450	450	500	500	600
Power supply			V/ph/Hz	**575V-3-60Hz** (fan J)													
Total input current **(1)**		FA	A	86	95	102	115	128	149	166	189	209	231	249	270	292	315
		FE	A	79	88	97	106	120	142	157	174	199	216	239	256	280	298
		FU	A	88	95	102	117	129	147	167	189	210	231	249	271	292	314
		FN	A	78	85	93	104	116	136	152	171	193	211	232	250	273	292
LRA		FA	A	219	270	283	348	362	374	403	549	575	600	506	658	679	699
		FE	A	225	276	283	354	368	380	409	561	581	613	512	665	685	711
		FU	A	225	276	283	354	368	380	409	561	581	613	512	665	685	711
		FN	A	231	282	289	360	374	387	415	567	587	619	519	671	691	717
MCA		FA	A	115	117	125	148	169	202	237	243	254	298	348	360	365	370
		FE	A	121	123	125	154	175	208	243	255	260	311	354	366	371	383
		FU	A	121	123	125	154	175	208	243	255	260	311	354	366	371	383
		FN	A	128	130	131	160	181	214	249	261	266	317	361	373	378	389
MOP		FA	A	139	142	150	183	203	251	286	294	306	350	398	412	417	422
		FE	A	145	148	150	189	210	257	293	307	312	363	404	418	423	434
		FU	A	145	148	150	189	210	257	293	307	312	363	404	418	423	434
		FN	A	151	154	156	195	216	263	299	313	318	369	410	424	429	441
Recommended fuse		FA	A	125	125	125	175	175	225	250	250	250	300	350	400	400	400
		FE	A	125	125	125	175	200	250	250	300	300	350	350	400	400	400
		FU	A	125	125	125	175	200	250	250	300	300	350	350	400	400	400
		FN	A	125	125	150	175	200	250	250	300	300	300	400	400	400	400

(1) Unit with standard configuration and operation, without integrated hydronic kit

GENERAL SPECIFICATIONS

Size	*Notes*	*ver.*		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Compressor																	
Type											Scroll						
Number		FA	n°	4	4	4	4	4	4	4	4	4	5	6	6	6	6
		FE	n°	4	4	4	4	4	4	4	4	4	5	6	6	6	6
		FU	n°	4	4	4	4	4	4	4	4	4	5	6	6	6	6
		FN	n°	4	4	4	4	4	4	4	4	4	5	6	6	6	6
Number of circuits		FA	n°	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		FE	n°	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		FU	n°	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		FN	n°	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Partialisation (of the unit) with mechanical thermostatic valve		FA	%	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	20-40-60-80-100	17-35-53-69-87-100	17-35-53-69-87-100	17-35-53-69-87-100	17-35-53-69-87-100
		FE	%	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	20-40-60-80-100	17-35-53-69-87-100	17-35-53-69-87-100	17-35-53-69-87-100	17-35-53-69-87-100
		FU	%	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	20-40-60-80-100	17-35-53-69-87-100	17-35-53-69-87-100	17-35-53-69-87-100	17-35-53-69-87-100
		FN	%	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	25-50-75-100	20-40-60-80-100	17-35-53-69-87-100	17-35-53-69-87-100	17-35-53-69-87-100	17-35-53-69-87-100
Refrigerant																	
Type of refrigerant											R410A						
Refrigerant load	C1	FA	lbs	35.3	35.3	44.1	46.3	46.3	48.5	57.3	61.7	70.5	79.4	83.8	105.8	105.8	108.0
		FE	lbs	44.1	44.1	47.4	57.3	55.1	55.1	66.1	79.4	83.8	105.8	110.2	116.8	116.8	143.3
		FU	lbs	44.1	44.1	47.4	57.3	55.1	55.1	66.1	79.4	83.8	105.8	110.2	116.8	116.8	143.3
		FN	lbs	57.3	57.3	58.4	63.9	63.9	63.9	79.4	79.4	86.0	112.4	116.8	127.9	127.9	154.3
	C2	FA	lbs	35.3	35.3	44.1	46.3	46.3	48.5	57.3	61.7	70.5	94.8	83.8	105.8	105.8	121.3
		FE	lbs	44.1	44.1	47.4	59.5	61.7	61.7	70.5	86.0	83.8	105.8	110.2	127.9	138.9	143.3
		FU	lbs	44.1	44.1	47.4	59.5	61.7	61.7	70.5	86.0	83.8	105.8	110.2	127.9	138.9	143.3
		FN	lbs	57.3	57.3	58.4	66.1	68.3	68.3	86.0	86.0	88.2	114.6	127.9	143.3	143.3	154.3
Oil																	
Oil type																	
Oil load	C1		gal	1.7	1.7	2.5	3.0	3.6	3.5	3.3	3.3	3.3	3.3	5.0	5.0	5.0	5.0
	C2		gal	1.7	2.5	2.5	3.0	3.6	3.5	3.3	3.3	3.3	5.0	5.0	5.0	5.0	5.0
	Total		gal	3.4	4.2	4.9	6.1	7.2	6.9	6.7	6.7	6.7	8.3	10.0	16.3	16.3	10.0
System side heat exchanger																	
Type											Plates						
Number			no.								1						
Min. flow rate		FA	gpm	76	85	100	112	122	142	160	178	200	218	240	265	281	299
		FE	gpm	76	85	94	109	120	134	156	177	193	215	230	252	266	289
		FU	gpm	80	90	101	116	128	144	167	188	207	230	248	269	286	310
		FN	gpm	79	88	99	113	124	140	161	181	199	221	237	257	272	295
Max. flow rate		FA	gpm	252	284	334	373	407	473	533	592	667	725	801	883	937	998
		FE	gpm	253	283	315	365	400	446	520	590	644	718	768	839	886	964
		FU	gpm	267	301	338	387	427	481	556	627	692	768	826	898	955	1035
		FN	gpm	262	294	331	376	415	466	537	604	663	735	789	857	908	984
Water content (Versions 00)		FA	gal	5	7	7	8	8	12	12	15	15	18	18	22	22	26
		FE	gal	7	7	8	8	12	12	15	15	18	22	22	22	22	26
		FU	gal	7	7	8	8	12	12	15	15	18	22	22	22	22	26
		FN	gal	7	7	8	8	12	12	15	15	18	22	22	22	22	26
Hydraulic connections (in/out)		FA	Ø	3''	3''	3''	3''	3''	3''	3''	3''	3''	3''	3''	5''	5''	5''
		FE	Ø	3''	3''	3''	3''	3''	3''	3''	3''	3''	5''	5''	5''	5''	5''
		FU	Ø	3''	3''	3''	3''	3''	3''	3''	3''	3''	5''	5''	5''	5''	5''
		FN	Ø	3''	3''	3''	3''	3''	3''	3''	3''	3''	5''	5''	5''	5''	5''
Resistance			no./W								2/150						

GENERAL SPECIFICATIONS

Size	*Notes*	*ver.*		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Standard axial fans																	
FANS J 208V																	
Fans		FA	nr.	4	4	6	6	6	-	-	-	-	-	-	-	-	-
		FE	nr.	6	6	6	8	8	-	-	-	-	-	-	-	-	-
		FU	nr.	6	6	6	8	8	-	-	-	-	-	-	-	-	-
		FN	nr.	8	8	8	10	10	-	-	-	-	-	-	-	-	-
Air flow rate		FA	cfm	39,680	39,680	59,520	59,520	59,520	-	-	-	-	-	-	-	-	-
		FE	cfm	34,114	34,114	34,114	45,486	45,486	-	-	-	-	-	-	-	-	-
		FU	cfm	59,520	59,520	59,520	79,360	79,360	-	-	-	-	-	-	-	-	-
		FN	cfm	45,486	45,486	45,529	56,857	56,857	-	-	-	-	-	-	-	-	-
Input current (total)		FA	A	30	30	45	45	45	-	-	-	-	-	-	-	-	-
		FE	A	45	45	45	60	60	-	-	-	-	-	-	-	-	-
		FU	A	45	45	45	60	60	-	-	-	-	-	-	-	-	-
		FN	A	60	60	60	75	75	-	-	-	-	-	-	-	-	-
Input power (total)		FA	kW	9.600	9.600	14.40	14.40	14.40	-	-	-	-	-	-	-	-	-
		FE	kW	14.40	14.40	14.40	19.20	19.20	-	-	-	-	-	-	-	-	-
		FU	kW	14.40	14.40	14.40	19.20	19.20	-	-	-	-	-	-	-	-	-
		FN	kW	19.20	19.20	19.20	24.00	24.00	-	-	-	-	-	-	-	-	-
FANS J 230V																	
Fans		FA	nr.	4	4	6	6	6	-	-	-	-	-	-	-	-	-
		FE	nr.	6	6	6	8	8	-	-	-	-	-	-	-	-	-
		FU	nr.	6	6	6	8	8	-	-	-	-	-	-	-	-	-
		FN	nr.	8	8	8	10	10	-	-	-	-	-	-	-	-	-
Air flow rate		FA	cfm	39,680	39,680	59,520	59,520	59,520	-	-	-	-	-	-	-	-	-
		FE	cfm	34,114	34,114	34,114	45,486	45,486	-	-	-	-	-	-	-	-	-
		FU	cfm	59,520	59,520	59,520	79,360	79,360	-	-	-	-	-	-	-	-	-
		FN	cfm	45,486	45,486	45,529	56,857	56,857	-	-	-	-	-	-	-	-	-
Input current (total)		FA	A	30	30	45	45	45	-	-	-	-	-	-	-	-	-
		FE	A	45	45	45	60	60	-	-	-	-	-	-	-	-	-
		FU	A	45	45	45	60	60	-	-	-	-	-	-	-	-	-
		FN	A	60	60	60	75	75	-	-	-	-	-	-	-	-	-
Input power (total)		FA	kW	9.600	9.600	14.40	14.40	14.40	-	-	-	-	-	-	-	-	-
		FE	kW	14.40	14.40	14.40	19.20	19.20	-	-	-	-	-	-	-	-	-
		FU	kW	14.40	14.40	14.40	19.20	19.20	-	-	-	-	-	-	-	-	-
		FN	kW	19.20	19.20	19.20	24.00	24.00	-	-	-	-	-	-	-	-	-
FANS J 460V																	
Fans		FA	nr.	4	4	6	6	6	6	8	8	10	10	12	14	14	14
		FE	nr.	6	6	6	8	8	8	10	12	12	14	14	16	16	18
		FU	nr.	6	6	6	8	8	8	10	12	12	14	14	16	16	18
		FN	nr.	8	8	8	10	10	10	12	14	14	16	16	18	18	20
Air flow rate		FA	cfm	39,680	39,680	59,520	59,520	59,520	59,520	79,360	79,361	99,201	99,201	119,041	138,881	138,881	138,881
		FE	cfm	34,114	34,114	34,114	45,486	45,486	45,589	56,857	68,304	68,229	79,600	79,600	90,972	90,972	102,342
		FU	cfm	59,520	59,520	59,520	79,360	79,360	79,375	99,201	119,041	119,041	138,881	138,881	158,721	158,721	178,561
		FN	cfm	45,486	45,486	45,529	56,857	56,857	56,837	68,229	79,600	79,600	90,971	90,972	102,343	102,343	113,714
Input current (total)		FA	A	16	16	23	23	23	23	31	31	39	39	47	55	55	55
		FE	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		FU	A	16	16	23	23	23	23	31	31	39	39	47	55	55	55
		FN	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Input power (total)		FA	kW	8.696	8.696	13.04	13.04	13.04	13.04	17.39	17.39	21.74	21.74	26.09	30.44	30.44	30.44
		FE	kW	3.366	3.366	3.366	4.488	4.488	4.488	5.610	6.732	6.732	7.854	7.854	8.976	8.976	10.10
		FU	kW	8.696	8.696	13.04	13.04	13.04	13.04	17.39	17.39	21.74	21.74	26.09	30.44	30.44	30.44
		FN	kW	3.366	3.366	3.366	4.488	4.488	4.488	5.610	6.732	6.732	7.854	7.854	8.976	8.976	10.10
FANS J 575V																	
Fans		FA	nr.	4	4	6	6	6	6	8	8	10	10	12	14	14	14
		FE	nr.	6	6	6	8	8	8	10	12	12	14	14	16	16	18
		FU	nr.	6	6	6	8	8	8	10	12	12	14	14	16	16	18
		FN	nr.	8	8	8	10	10	10	12	14	14	16	16	18	18	20
Air flow rate		FA	cfm	39,680	39,680	59,520	59,520	59,520	59,520	79,360	79,361	99,201	99,201	119,041	138,881	138,881	138,881
		FE	cfm	34,114	34,114	34,114	45,486	45,486	45,589	56,857	68,304	68,229	79,600	79,600	90,972	90,972	102,342
		FU	cfm	59,520	59,520	59,520	79,360	79,360	79,375	99,201	119,041	119,041	138,881	138,881	158,721	158,721	178,561
		FN	cfm	45,486	45,486	45,529	56,857	56,857	56,837	68,229	79,600	79,600	90,971	90,972	102,343	102,343	113,714
Input current (total)		FA	A	12	12	19	19	19	19	25	25	31	31	37	44	44	44
		FE	A	12	12	19	19	19	19	25	25	31	31	37	44	44	44
		FU	A	12	12	19	19	19	19	25	25	31	31	37	44	44	44
		FN	A	12	12	19	19	19	19	25	25	31	31	37	44	44	44
Input power (total)		FA	kW	10.24	10.24	15.36	15.36	15.36	15.36	20.48	20.48	25.60	25.60	30.72	35.84	35.84	35.84
		FE	kW	10.24	10.24	15.36	15.36	15.36	15.36	20.48	20.48	25.60	25.60	30.72	35.84	35.84	35.84
		FU	kW	10.24	10.24	15.36	15.36	15.36	15.36	20.48	20.48	25.60	25.60	30.72	35.84	35.84	35.84
		FN	kW	10.24	10.24	15.36	15.36	15.36	15.36	20.48	20.48	25.60	25.60	30.72	35.84	35.84	35.84

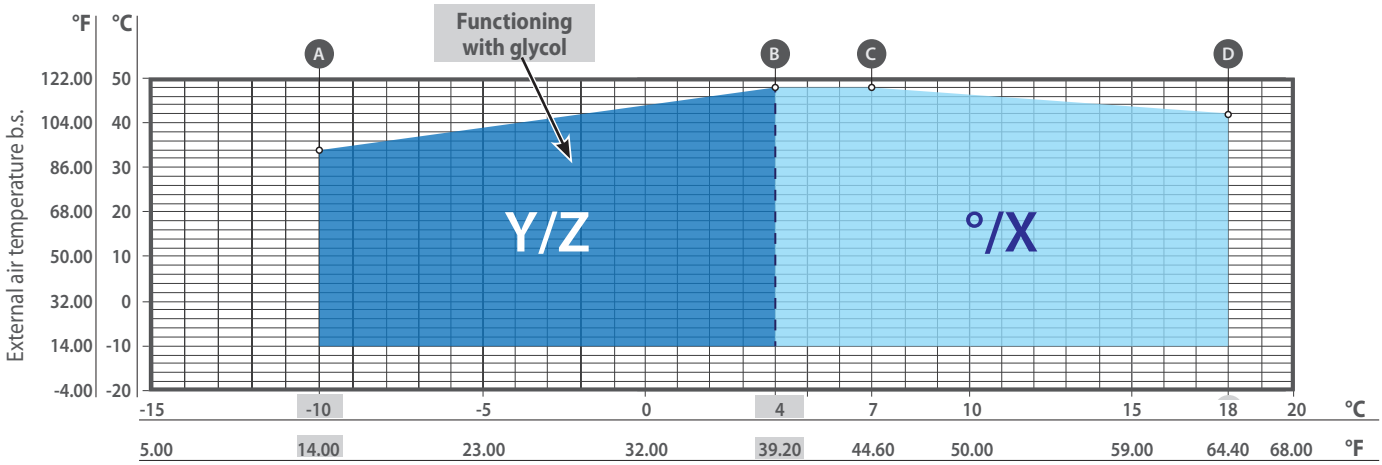
GENERAL SPECIFICATIONS

Size	*Notes*	*ver.*		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Sound Data																	
Sound power level		FA	dB(A)	87.5	90.1	92.1	93.4	94.4	94.0	93.9	95.8	97.3	96.5	95.7	97.2	98.2	99.0
		FE	dB(A)	84.0	88.5	90.6	92.4	93.6	93.1	92.6	95.0	96.6	95.6	94.4	96.1	97.4	98.3
		FU	dB(A)	88.6	90.7	92.1	93.7	94.7	94.3	94.2	96.2	97.4	96.8	95.9	97.3	98.3	99.2
		FN	dB(A)	84.2	88.5	90.7	92.4	93.6	93.2	92.7	95.1	96.6	95.6	94.4	96.1	97.4	98.3
Sound pressure level 32.8 ft		FA	dB(A)	55.4	58.0	59.8	61.1	62.1	61.7	61.5	63.4	64.8	64.0	63.0	64.4	65.4	66.2
		FE	dB(A)	51.7	56.2	58.3	60.0	61.2	60.7	60.1	62.3	63.9	62.8	61.6	63.2	64.5	65.3
		FU	dB(A)	56.3	58.4	59.8	61.3	62.3	61.9	61.7	63.5	64.7	64.0	63.1	64.4	65.4	66.2
		FN	dB(A)	51.8	56.1	58.3	59.9	61.1	60.7	60.0	62.3	63.8	62.7	61.5	63.1	64.4	65.2
Sound pressure level 3.3 ft		FA	dB(A)	68.4	71.0	72.3	73.6	74.6	74.2	73.5	75.4	76.4	75.6	74.4	75.5	76.5	77.3
		FE	dB(A)	64.2	68.7	70.8	72.0	73.2	72.7	71.7	73.7	75.3	73.9	72.7	74.0	75.3	75.9
		FU	dB(A)	68.8	70.9	72.3	73.3	74.3	73.9	73.3	74.9	76.1	75.1	74.2	75.2	76.2	76.8
		FN	dB(A)	63.8	68.1	70.3	71.5	72.7	72.3	71.4	73.4	74.9	73.5	72.3	73.7	75.0	75.7
Dimensions and weights																	
Standard unit (00)																	
Height		FA	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
		FE	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
		FU	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
		FN	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
Width		FA	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
		FE	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
		FU	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
		FN	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
Depht		FA	in	110	110	156	156	156	156	203	203	250	250	297	344	344	344
		FE	in	156	156	156	203	203	203	250	297	297	344	344	391	391	438
		FU	in	156	156	156	203	203	203	250	297	297	344	344	391	391	438
		FN	in	203	203	203	250	250	250	297	344	344	391	391	438	438	469
Unit with hydronic kit (PA÷DH)																	
Height		FA	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
		FE	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
		FU	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
		FN	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
Width		FA	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
		FE	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
		FU	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
		FN	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
Depht		FA	in	110	110	156	156	156	156	203	203	250	250	297	344	344	344
		FE	in	156	156	156	203	203	203	250	297	297	344	344	391	391	438
		FU	in	156	156	156	203	203	203	250	297	297	344	344	391	391	438
		FN	in	203	203	203	250	250	250	297	344	344	391	391	438	438	469
Unit with storage tank (AA÷BH)																	
Height		FA	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
		FE	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
		FU	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
		FN	in	97	97	97	97	97	97	97	97	97	97	97	97	97	97
Width		FA	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
		FE	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
		FU	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
		FN	in	87	87	87	87	87	87	87	87	87	87	87	87	87	87
Depht		FA	in	156	156	156	156	156	156	203	203	250	250	297	344	344	344
		FE	in	156	156	156	203	203	203	250	297	297	344	344	391	391	438
		FU	in	156	156	156	203	203	203	250	297	297	344	344	391	391	438
		FN	in	203	203	203	250	250	250	297	344	344	391	391	438	438	469
Empty weight (00)		FA	lbs	5,666	5,776	7,187	7,341	7,430	7,540	8,995	9,281	10,692	10,957	12,258	14,484	15,036	15,366
		FE	lbs	6,790	6,900	7,253	8,796	8,951	8,995	10,274	11,574	11,861	13,625	13,845	15,675	16,226	17,725
		FU	lbs	6,790	6,900	7,253	8,796	8,951	8,995	10,274	11,574	11,861	13,625	13,845	15,675	16,226	17,725
		FN	lbs	8,289	8,378	8,730	9,987	10,163	10,207	11,376	12,875	13,162	14,815	13,845	15,675	16,226	18,739

OPERATING RANGE

The units, in standard configuration, are not suitable for installation in salty environment.
The values indicated in the table refer to the min. and max. limits of the unit. For further information, refer to the tables of yields and consumptions different from the nominal ones. For operating limits, please refer to the diagrams, valid for ΔT = 9.00 °F.
If the unit operates beyond the operational limits, we recommend you first contact our technical-sales service.

Note: If the unit is installed in particularly windy areas it is mandatory to have windbreak barriers to prevent unit malfunctions. It should be installed if wind speed is above 2.5 m/s



Temperature of the water produced

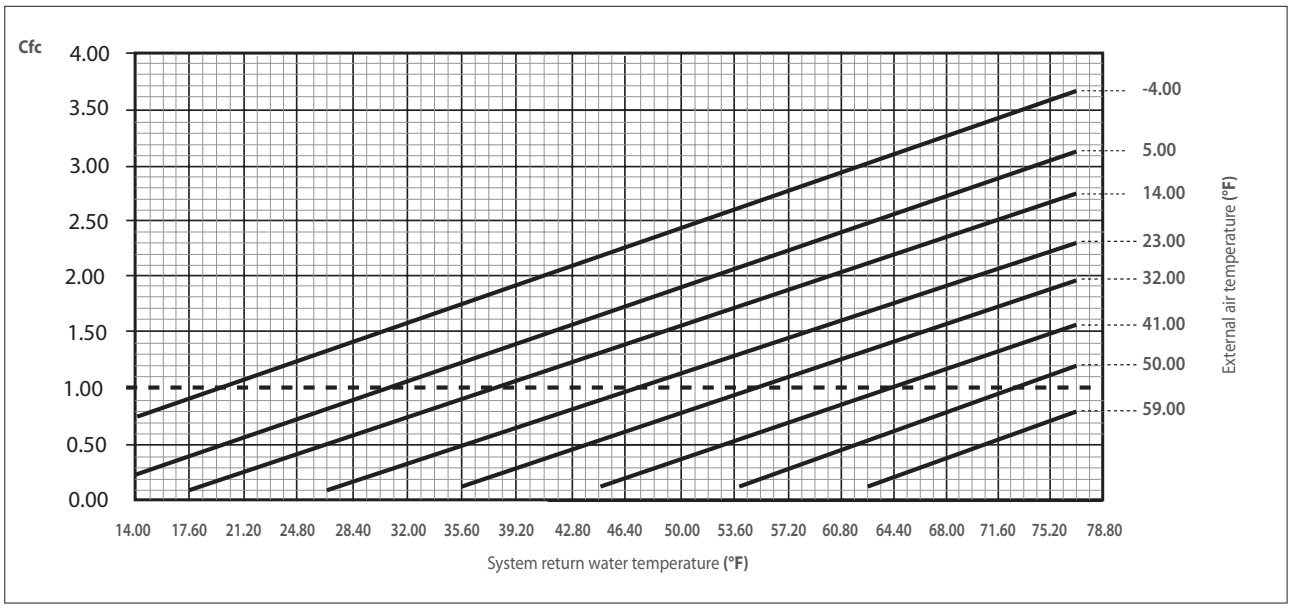
NRB FA	External air temperature (TA) (°F)			
Size	A	B	C	D
0800	93.20	118.40	**118.40**	107.60
0900	89.60	111.20	**111.20**	104.00
1000	95.00	118.40	**118.40**	111.20
1100	95.00	118.40	**118.40**	111.20
1200	91.40	114.80	**114.80**	107.60
1400	89.60	114.80	**114.80**	107.60
1600	91.40	118.40	**118.40**	111.20
1800	89.60	114.80	**114.80**	107.60
2000	91.40	118.40	**118.40**	111.20
2200	89.60	114.80	**114.80**	107.60
2400	91.40	118.40	**118.40**	111.20
2600	91.40	118.40	**118.40**	111.20
2800	91.40	118.40	**118.40**	111.20
3000	89.60	114.80	**114.80**	107.60

NRB FE	External air temperature (TA) (°F)			
Size	A	B	C	D
0800	93.20	114.80	**114.80**	107.60
0900	89.60	114.80	**114.80**	107.60
1000	95.00	111.20	**111.20**	104.00
1100	95.00	114.80	**114.80**	107.60
1200	91.40	111.20	**111.20**	104.00
1400	89.60	107.60	**107.60**	100.40
1600	91.40	111.20	**111.20**	104.00
1800	89.60	111.20	**111.20**	104.00
2000	91.40	111.20	**111.20**	104.00
2200	89.60	111.20	**111.20**	104.00
2400	91.40	107.60	**107.60**	100.40
2600	91.40	107.60	**107.60**	100.40
2800	91.40	107.60	**107.60**	100.40
3000	89.60	107.60	**107.60**	100.40

NRB FU	External air temperature (TA) (°F)			
Size	A	B	C	D
0800	93.20	122.00	**122.00**	114.80
0900	89.60	122.00	**122.00**	114.80
1000	95.00	122.00	**122.00**	114.80
1100	95.00	122.00	**122.00**	114.80
1200	91.40	122.00	**122.00**	114.80
1400	89.60	118.40	**118.40**	111.20
1600	91.40	122.00	**122.00**	114.80
1800	89.60	122.00	**122.00**	114.80
2000	91.40	118.40	**118.40**	111.20
2200	89.60	118.40	**118.40**	111.20
2400	91.40	118.40	**118.40**	111.20
2600	91.40	122.00	**122.00**	114.80
2800	91.40	118.40	**118.40**	111.20
3000	89.60	118.40	**118.40**	111.20

NRB FN	External air temperature (TA) (°F)			
Size	A	B	C	D
0800	98.60	122.00	**122.00**	114.80
0900	98.60	122.00	**122.00**	114.80
1000	98.60	122.00	**122.00**	114.80
1100	98.60	122.00	**122.00**	114.80
1200	98.60	122.00	**122.00**	114.80
1400	98.60	122.00	**122.00**	114.80
1600	98.60	122.00	**122.00**	114.80
1800	98.60	122.00	**122.00**	114.80
2000	98.60	122.00	**122.00**	114.80
2200	98.60	122.00	**122.00**	114.80
2400	98.60	122.00	**122.00**	114.80
2600	98.60	122.00	**122.00**	114.80
2800	98.60	122.00	**122.00**	111.20
3000	98.60	122.00	**122.00**	111.20

CORRECTIVE COEFFICIENTS NRB FREE COOLING



Key

Pfc=	Cooling capacity
Pe=	Input power
Ca =	Corrective coefficients of absorbed power (Pe)
Ce =	Corrective coefficients of cooling capacity (Pc)

The maximum cooling capacity when working in free-cooling mode only, namely with the compressors off, is achieved by multiplying the nominal free-cooling cooling capacity value (Pc) reported in the technical data by the respective corrective coefficient (Cfc) which is obtained from the following diagram based on the produced water temperature and the external air temperature.

These values refer to full speed fans (maximum absorbed power); if the power output is in excess speed will be modulated.

NOMINAL REFERENCE CONDITIONS:

Free cooling

Water input temperature	15 °C. 59.00 °F
External air temperature	2 °C. 35.60 °F
Glycol	0%

PRESSURE DROPS WITH HYDRONIC KIT

Size NRB FC	*vers.*		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Performance in cooling mode																
Pressure drops system side Vers. PA-PB-PC-PD-PE-PF-PG-PH / DA-DB-DC-DD-DE-DF-DG-DH	FA	ft H_2O	12,0	12,9	17,9	19,6	19,9	23,9	24,2	27,4	16,4	17,6	21,5	12,5	14,0	14,4
	FE	ft H_2O	10,3	12,8	13,9	18,7	17,3	21,6	21,2	27,2	13,9	12,9	14,8	11,2	12,5	13,6
	FU	ft H_2O	11,4	14,5	16,0	21,0	19,8	25,1	24,2	30,8	16,0	14,8	17,2	12,9	14,6	15,7
	FN	ft H_2O	11,0	13,9	15,3	20,1	18,9	23,9	22,6	28,6	14,7	13,6	15,6	11,9	13,3	14,3
Pressure drops system side Vers. AA-AB-AC-AD-AE-AF-AG-AH / BA-BB-BC-BD-BE-BF-BG-BH	FA	ft H_2O	13,3	14,6	20,2	22,5	23,5	28,7	26,4	30,0	19,7	21,5	26,3	15,0	16,9	17,7
	FE	ft H_2O	11,6	14,5	16,0	21,5	20,7	25,8	23,2	29,8	17,0	16,8	19,2	13,5	15,1	16,6
	FU	ft H_2O	12,9	16,4	18,4	24,1	23,6	30,0	26,6	33,8	19,6	19,2	22,3	15,5	17,5	19,2
	FN	ft H_2O	12,4	15,7	17,7	23,1	22,5	28,5	24,7	31,3	18,0	17,6	20,3	14,3	16,0	17,5
Performance in free cooling mode																
Pressure drops system side Vers. PA-PB-PC-PD-PE-PF-PG-PH /DA-DB-DC-DD-DE-DF-DG-DH	FA	ft H_2O	24,8	28,8	30,3	35,5	39,4	47,0	37,9	44,5	38,7	44,0	50,6	31,3	35,2	38,6
	FE	ft H_2O	17,9	22,2	25,9	34,6	36,6	45,5	32,2	39,6	33,6	36,5	41,6	27,4	30,5	33,6
	FU	ft H_2O	19,9	25,1	29,8	38,9	41,6	52,9	36,9	44,8	38,7	41,7	48,2	31,4	35,4	38,7
	FN	ft H_2O	19,0	24,0	28,5	35,5	37,7	47,6	32,9	40,5	34,2	37,3	42,8	27,6	30,9	34,1
Pressure drops system side Vers. AA-AB-AC-AD-AE-AF-AG-AH/BA-BB-BC-BD-BE-BF-BG-BH	FA	ft H_2O	24,8	28,8	30,3	35,5	39,4	47,0	37,9	44,5	38,7	44,0	50,6	31,3	35,2	38,6
	FE	ft H_2O	17,9	22,2	25,9	34,6	36,6	45,5	32,2	39,6	33,6	36,5	41,6	27,4	30,5	33,6
	FU	ft H_2O	19,9	25,1	29,8	38,9	41,6	52,9	36,9	44,8	38,7	41,7	48,2	31,4	35,4	38,7
	FN	ft H_2O	19,0	24,0	28,5	35,5	37,7	47,6	32,9	40,5	34,2	37,3	42,8	27,6	30,9	34,1

Performance in cooling mode **(AHRI CONDITION)**

System side water temperature (in/out)	12.22°C. 54.00 °F - / 6.67°C. 44.01 °F
Outdoor air temperature	35 °C. 95.00 °F

Performance in Free cooling

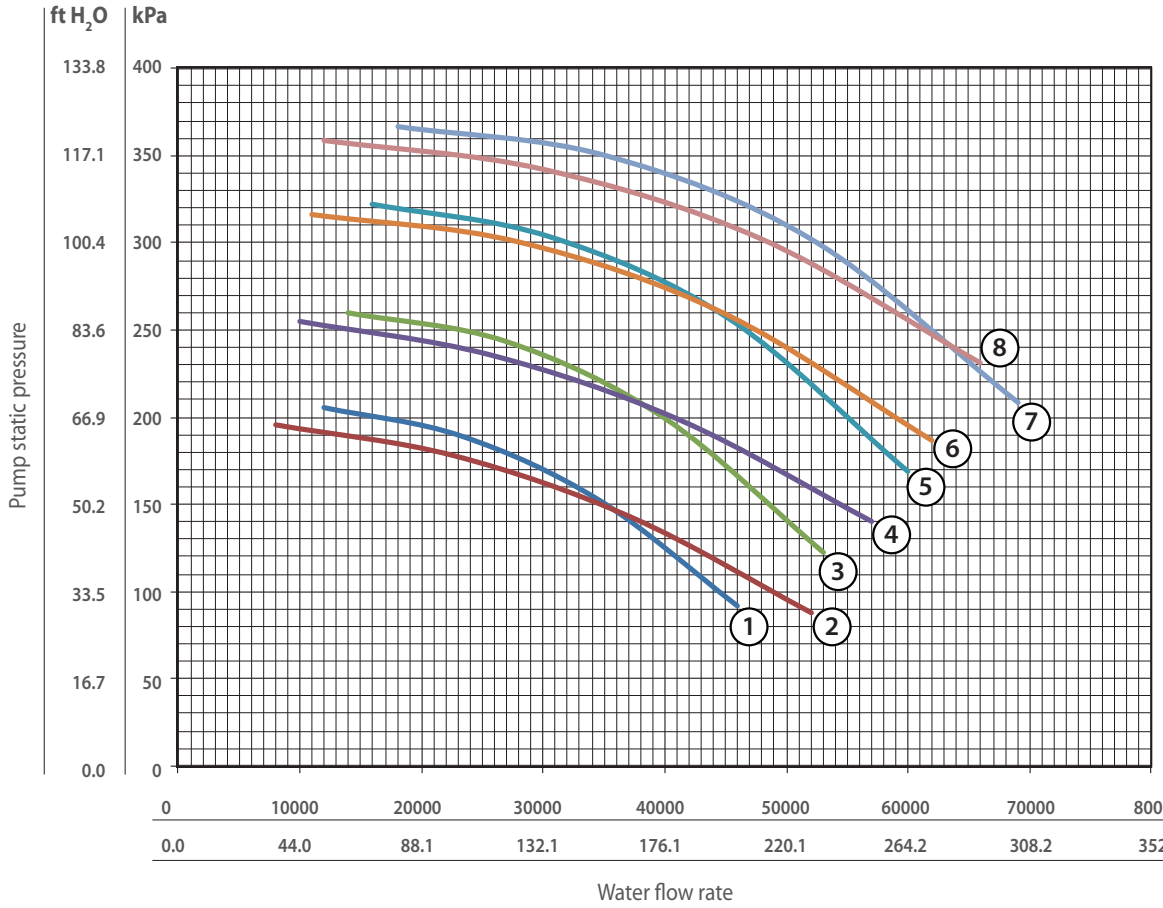
System side water temperature	15 °C. 59.00 °F
Outdoor air temperature	2 °C. 35.60 °F

STATIC PRESSURES

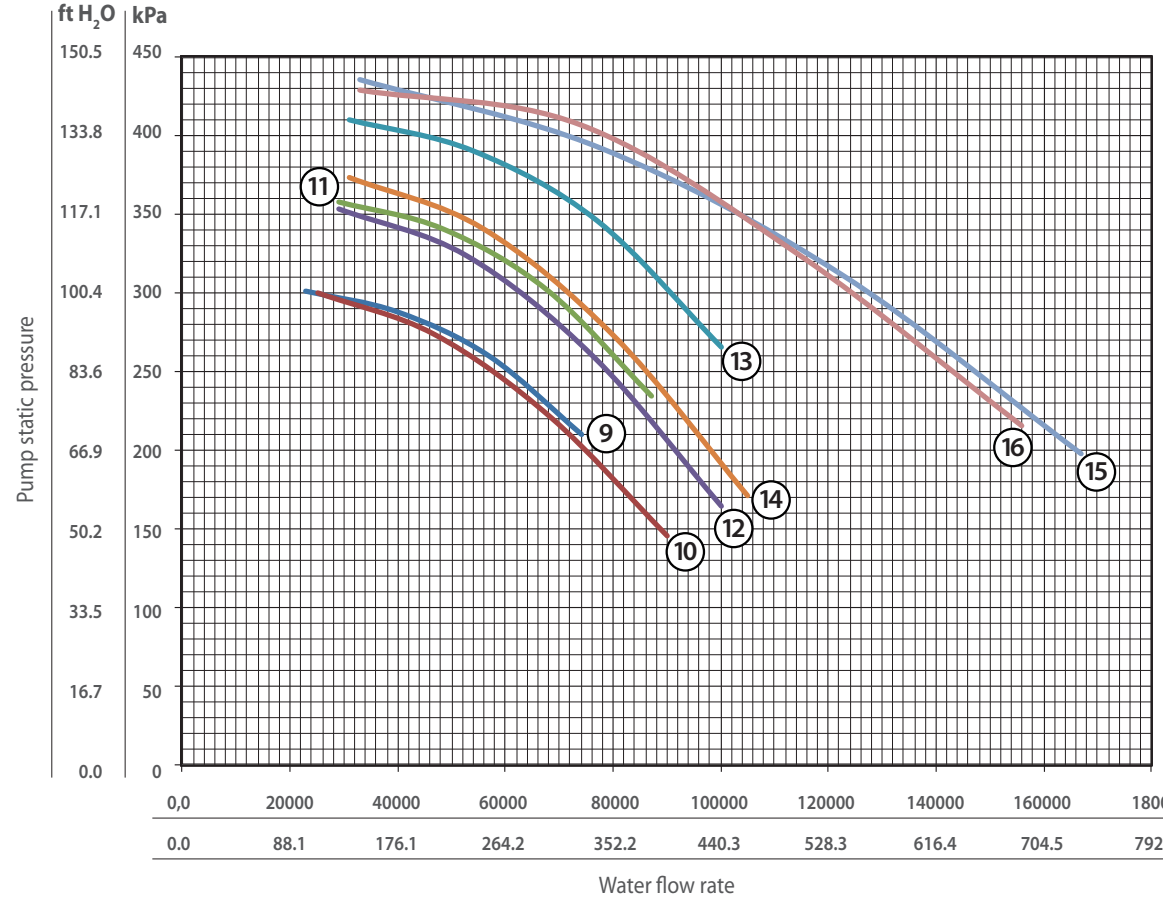
	Ref.	no.	F.L.I.	F.L.A. (460V)	F.L.A. (208V)	F.L.A. (230V)	F.L.A. (575V)	QminP	QmaxP
	Pump	Poles	(kW)	(A)	(A)	(A)	(A)	(gpm)	(gpm)
Pump (*)									
PA-AA	1	2	2.96	5.5	11.3	10.9	4.4	52.8	202.5
DA-BA	2	2	3.07	5.5	11.3	10.9	4.4	35.2	228.9
PB-AB	3	2	4.29	6.7	14.1	13.4	5.3	61.6	233.4
DB-BB	4	2	4.46	6.7	14.1	13.4	5.3	44.0	251.0
PC-AC	5	2	6.02	8.9	18.7	17.8	7.2	70.4	264.2
DC-BC	6	2	6.15	8.9	18.7	17.8	7.2	48.4	273.0
PD-AD	7	2	8.06	12.2	26.0	24.5	10.0	79.3	303.8
DD-BD	8	2	7.60	12.2	26.0	24.5	10.0	52.8	290.6
PE-AE	9	2	8.29	12.2	26.0	24.5	10.0	101.3	325.8
DE-BE	10	2	7.36	12.2	26.0	24.5	10.0	110.1	396.3
PF-AF	11	2	9.14	15.1	31.7	30.3	12.1	127.7	383.0
DF-BF	12	2	9.42	15.1	31.7	30.3	12.1	127.7	440.3
PG-AG	13	2	12.02	17.4	37.1	35.0	13.9	136.5	440.3
DG-BG	14	2	10.29	17.4	37.1	35.0	13.9	136.5	462.3
PH-AH	15	2	15.12	22.8	50.0	46.5	19.0	145.3	735.3
DH-BH	16	2	14.86	22.8	50.0	46.5	19.0	145.3	686.8

F.L.I. Pump maximum input power
F.L.A. Pump maximum input current
QminP Minimum water flow rate of the pump
QmaxP Maximum water flow rate of the pump
(*) Hydronic kits DA-DB-DC-DD-DE-DF-DG-DH-BA-BB-BC-BD-BE-BF-BG-BH have twin pumps, 1 of which in operation and 1 as a spare

The table shows the characteristic curves of the pumps, **and therefore they do not represent the useful static pressures of the system**.
The useful static pressures of the system must be calculated by subtracting the pressure drop (Δp) of the unit from the static pressure of the pump that is read in this graph, which can be calculated using the above tables.



1	PA-AA
2	DA-BA
3	PB-AB
4	DB-BB
5	PC-AC
6	DC-BC
7	PD-AD
8	DD-BD



9	PE-AE
10	DE-BE
11	PF-AF
12	DF-BF
13	PG-AG
14	DG-BG
15	PH-AH
16	DH-BH

WATER SYSTEM CONTENT

Minimum water content in the system

The minimum water content of the system allows you to limit the switch-ons and offs of the compressor.
To calculate it use the formula Pc (kW) X l.

Minimum system water content	ver	u.m.	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
For air conditioning systems		gal/ton	6.5													
For systems with process water		gal/ton	13.0													

Maximum water content in the system

Units with the hydronic kit mounted come standard with the expansion vessel set at 1.5 bar, the safety valve, the flow switch and the water filter mounted. The maximum system water content depends on the capacity of the expansion vessel and on the calibration of the safety valve.

Model	ver	u.m.	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Expansion vessel with hydronic kit only pumps																
PA - DJ	A	n°/gal	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3
	E	n°/gal	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3
	U	n°/gal	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3
	N	n°/gal	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3
Expansion vessel with hydronic kit storage tank and pumps																
AA - BJ	A	n°/gal	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	3/6.3	3/6.3	3/6.3	3/6.3
	E	n°/gal	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3
	U	n°/gal	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3
	N	n°/gal	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	2/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3	3/6.3
Safety valve		n°/bar	1/6													

The table gives an example of the maximum water content calculated at the indicated operating conditions and only to protect the unit. If the volume of water in the system is higher, add another expansion vessel which is correctly sized.

System water temperature max/min	°F	104.00/39.20				
Hydraulic height	**ft**	**98.4**	**82.0**	**65.6**	**49.2**	**≤40.2**
Expansion vessel pre-load	bar	3.2	2.8	2.3	1.8	1.5
Maximum water content	gal	574.3	699.0	823.7	948.4	1017.6
System water temperature max/min	**°F**	**140.00/39.20**				
Expansion vessel pre-load	bar	3.2	2.8	2.3	1.8	1.5
Maximum water content	gal	258.4	314.4	370.9	426.9	457.5
System water temperature max/min	**°F**	**185.00/39.20**				
Expansion vessel pre-load	bar	3.2	2.8	2.3	1.8	1.5
Maximum water content	gal	134.7	164.3	193.4	223.0	238.8

The data in the table refer to units with a 6.3 gal expansion vessel and a water temperature (in/out) of 12.22°C. 54.00 °F - / 6.67°C. 44.01 °F

	NRB Water Content without Hydronic Group [gal]													
Version	**0800**	**0900**	**1000**	**1100**	**1200**	**1400**	**1600**	**1800**	**2000**	**2200**	**2400**	**2600**	**2800**	**3000**
FA	39.6	39.6	52.8	52.8	52.8	58.1	81.9	84.5	95.1	97.7	113.6	142.7	142.7	147.9
FU	52.8	52.8	52.8	71.3	76.6	76.6	95.1	108.3	113.6	137.4	137.4	158.5	158.5	179.6
FE	52.8	52.8	52.8	71.3	76.6	76.6	95.1	108.3	113.6	137.4	137.4	158.5	158.5	179.6
FN	71.3	71.3	71.3	81.9	87.2	87.2	108.3	124.2	126.8	153.2	153.2	174.4	174.4	192.8

	Water content NRB with hydronic group PA-PB-PC-PD-PE-PF-PG-PH-PI-PJ-DA-DB-DC-DD-DE-DF-DG-DH-DI-DJ [gal]													
Version	**0800**	**0900**	**1000**	**1100**	**1200**	**1400**	**1600**	**1800**	**2000**	**2200**	**2400**	**2600**	**2800**	**3000**
FA	42.3	42.3	55.5	55.5	55.5	60.8	87.2	89.8	100.4	105.7	118.9	155.9	155.9	161.1
FU	55.5	55.5	55.5	76.6	79.3	79.3	100.4	116.2	118.9	145.3	145.3	169.1	169.1	190.2
FE	55.5	55.5	55.5	76.6	79.3	79.3	100.4	116.2	118.9	145.3	145.3	169.1	169.1	190.2
FN	74.0	74.0	76.6	87.2	92.5	92.5	116.2	129.4	134.7	158.5	158.5	184.9	184.9	206.1

	Water content NRB with hydronic group AA-AB-AC-AD-AE-AF-AG-AH-AI-AJ-BA-BB-BC-BD-BE-BF-BG-BH-BI-BJ [gal]													
Version	**0800**	**0900**	**1000**	**1100**	**1200**	**1400**	**1600**	**1800**	**2000**	**2200**	**2400**	**2600**	**2800**	**3000**
FA	198.1	200.8	211.3	211.3	211.3	216.6	243.0	245.7	256.2	261.5	433.2	470.2	470.2	475.5
FU	211.3	211.3	211.3	232.5	237.8	237.8	256.2	430.6	433.2	459.7	459.7	486.1	486.1	504.6
FE	211.3	211.3	211.3	232.5	237.8	237.8	256.2	430.6	433.2	459.7	459.7	486.1	486.1	504.6
FN	232.5	232.5	232.5	243.0	248.3	248.3	430.6	443.8	449.1	475.5	475.5	499.3	499.3	520.4

	Dewatering water content [gal]													
Version	**0800**	**0900**	**1000**	**1100**	**1200**	**1400**	**1600**	**1800**	**2000**	**2200**	**2400**	**2600**	**2800**	**3000**
FA	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	5.3	5.3	5.3
FU	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	5.3	5.3	5.3
FE	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	5.3	5.3	5.3
FN	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	5.3	5.3	5.3

CORRECTIVE FACTORS

Corrective factors for Average water temperatures different from the nominal															
System side heat exchanger		**Operation in cooling mode**							**Heating mode**						
Average water temperatures	**(°F)**	**41.00**	**50.00**	**59.00**	**68.00**	**86.00**	**104.00**	**122.00**	**73.40**	**82.40**	**91.40**	**100.40**	**109.40**	**118.40**	**127.40**	**136.40**
Corrective factor		1.02	**1**	0.98	0.97	0.95	0.93	0.91	1.04	1.03	1.02	1.01	**1**	0.99	0.98	0.97

DIRT

Deposit corrective factors [K*m²]/[kW]				
	0.0	**0.00005**	**0.0001**	**0.0002**
Cooling capacity correction factors	**1.00**	**1.00**	0.98	0.94
Input power correction factors	**1.00**	**1.00**	0.98	0.95

GLYCOL

ETHYLENE GLYCOL

COOLING MODE

CORRECTION FACTOR WITH ETHYLENE GLYCOL - COOLING MODE											
Freezing Point	°F	0	25.47	21.02	15.93	10.20	3.67	-3.89	-12.62	-22.79	-34.78
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 = 49.1 °F

HEATING MODE

CORRECTION FACTOR WITH ETHYLENE GLYCOL - HEATING MODE											
Freezing Point	°F	0	25.47	21.02	15.93	10.20	3.67	-3.89	-12.62	-22.79	-34.78
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 = 108.5 °F

Qwc: Corrective factor of flow rates (middle water temperatur 49.1 °F)
Qwh: Corrective factor of flow rates (middle water temperatur 108.5 °F)
Pc: Corrective factor of cooling capacity
Ph: Corrective factor of heating capacity
Pa: Corrective factor of imput power
Dp: Corrective factor of pressure drop

PROPYLENE GLYCOL

COOLING MODE

CORRECTION FACTOR WITH PROPILENE GLYCOL - COOLING MODE											
Freezing Point	°F	0	25.83	22.46	18.61	14.04	8.46	1.65	-6.65	-16.67	-28.70
Percent PROPILENE 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 = 49.1 °F

HEATING MODE

CORRECTION FACTOR WITH PROPILENE GLYCOL - HEATING MODE											
Freezing Point	°F	0	25.83	22.46	18.61	14.04	8.46	1.65	-6.65	-16.67	-28.70
Percent PROPILENE 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 = 108.5 °F

Qwc: Corrective factor of flow rates (middle water temperatur 49.1°F)
Qwh: Corrective factor of flow rates (middle water temperatur 108.5 °F)
Pc: Corrective factor of cooling capacity
Ph: Corrective factor of heating capacity
Pa: Corrective factor of imput 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

SOUND DATA

Unit	Vers.	Total sound levels			Octave band (Hz)						
		Pow.	Pres. 32.8 m	Pres. 3.3 m	125	250	500	1000	2000	4000	8000
		dB(A)	dB(A)	dB(A)	Sound potential for central band [dB] (A) frequency						
NRB0800	**FA**	**87.5**	**55.4**	**68.4**	81.3	78.5	82.4	86.6	86.7	79.9	71.5
NRB0900	**FA**	**90.1**	**58.0**	**71.0**	81.3	80.1	84.4	88.4	90.3	83.8	72.2
NRB1000	**FA**	**92.1**	**59.8**	**72.3**	83.1	82.3	86.4	90.4	92.5	86.0	73.0
NRB1100	**FA**	**93.4**	**61.1**	**73.6**	83.1	81.9	86.1	92.6	93.7	87.5	76.1
NRB1200	**FA**	**94.4**	**62.1**	**74.6**	83.1	81.5	85.8	94.0	94.6	88.6	77.9
NRB1400	**FA**	**94.0**	**61.7**	**74.2**	83.1	81.9	86.3	93.3	94.3	88.0	76.5
NRB1600	**FA**	**93.9**	**61.5**	**73.5**	84.3	83.0	87.3	92.9	94.2	87.4	74.6
NRB1800	**FA**	**95.8**	**63.4**	**75.4**	84.3	84.0	87.7	95.4	96.2	89.0	75.9
NRB2000	**FA**	**97.3**	**64.8**	**76.4**	85.3	85.3	88.4	97.1	97.6	90.2	77.1
NRB2200	**FA**	**96.5**	**64.0**	**75.6**	85.3	84.8	88.6	96.0	96.8	89.7	76.7
NRB2400	**FA**	**95.7**	**63.0**	**74.4**	86.1	84.8	89.0	94.7	96.0	89.1	76.3
NRB2600	**FA**	**97.2**	**64.4**	**75.5**	86.8	85.9	89.6	96.7	97.5	90.3	77.4
NRB2800	**FA**	**98.2**	**65.4**	**76.5**	86.8	86.4	89.8	97.9	98.5	91.2	78.1
NRB3000	**FA**	**99.0**	**66.2**	**77.3**	86.8	86.9	90.0	98.9	99.3	91.9	78.8
NRB0800	**FE**	**84.0**	**51.7**	**64.2**	69.5	69.4	78.7	81.8	84.9	78.8	70.7
NRB0900	**FE**	**88.5**	**56.2**	**68.7**	69.6	76.0	82.5	85.9	89.6	83.4	71.5
NRB1000	**FE**	**90.6**	**58.3**	**70.8**	69.8	78.5	84.4	88.0	91.9	85.6	72.1
NRB1100	**FE**	**92.4**	**60.0**	**72.0**	70.9	77.8	84.1	91.3	93.2	87.2	75.7
NRB1200	**FE**	**93.6**	**61.2**	**73.2**	70.8	76.8	83.5	93.2	94.2	88.4	77.7
NRB1400	**FE**	**93.1**	**60.7**	**72.7**	70.7	77.7	84.4	92.3	93.9	87.8	76.1
NRB1600	**FE**	**92.6**	**60.1**	**71.7**	71.7	78.6	85.2	91.3	93.7	87.0	73.8
NRB1800	**FE**	**95.0**	**62.3**	**73.7**	72.5	81.0	85.9	94.6	95.8	88.7	75.4
NRB2000	**FE**	**96.6**	**63.9**	**75.3**	72.6	82.5	86.4	96.5	97.3	89.9	76.5
NRB2200	**FE**	**95.6**	**62.8**	**73.9**	73.2	81.6	86.7	95.1	96.5	89.4	76.0
NRB2400	**FE**	**94.4**	**61.6**	**72.7**	73.2	80.3	86.9	93.0	95.4	88.8	75.5
NRB2600	**FE**	**96.1**	**63.2**	**74.0**	73.8	82.1	87.4	95.5	97.0	90.0	76.6
NRB2800	**FE**	**97.4**	**64.5**	**75.3**	73.8	83.3	87.8	97.1	98.1	90.9	77.5
NRB3000	**FE**	**98.3**	**65.3**	**75.9**	74.3	84.3	88.1	98.2	99.0	91.7	78.3
NRB0800	**FU**	**88.6**	**56.3**	**68.8**	83.1	80.3	83.7	87.9	87.4	80.4	71.9
NRB0900	**FU**	**90.7**	**58.4**	**70.9**	83.1	81.4	85.2	89.3	90.7	84.0	72.5
NRB1000	**FU**	**92.1**	**59.8**	**72.3**	83.1	82.3	86.4	90.4	92.5	86.0	73.0
NRB1100	**FU**	**93.7**	**61.3**	**73.3**	84.3	82.8	86.7	93.0	93.8	87.6	76.3
NRB1200	**FU**	**94.7**	**62.3**	**74.3**	84.3	82.5	86.4	94.3	94.7	88.7	78.0
NRB1400	**FU**	**94.3**	**61.9**	**73.9**	84.3	82.8	86.9	93.7	94.5	88.1	76.6
NRB1600	**FU**	**94.2**	**61.7**	**73.3**	85.3	83.7	87.7	93.3	94.4	87.5	74.8
NRB1800	**FU**	**96.2**	**63.5**	**74.9**	86.1	85.1	88.5	95.8	96.4	89.1	76.2
NRB2000	**FU**	**97.4**	**64.7**	**76.1**	86.1	85.7	88.8	97.3	97.7	90.2	77.2
NRB2200	**FU**	**96.8**	**64.0**	**75.1**	86.8	85.7	89.2	96.3	97.0	89.8	76.9
NRB2400	**FU**	**95.9**	**63.1**	**74.2**	86.8	85.3	89.3	94.9	96.1	89.2	76.5
NRB2600	**FU**	**97.3**	**64.4**	**75.2**	87.3	86.3	89.9	96.8	97.5	90.3	77.5
NRB2800	**FU**	**98.3**	**65.4**	**76.2**	87.3	86.8	90.1	98.0	98.5	91.2	78.2
NRB3000	**FU**	**99.2**	**66.2**	**76.8**	87.8	87.5	90.5	99.0	99.4	92.0	78.9
NRB0800	**FN**	**84.2**	**51.8**	**63.8**	70.7	70.6	79.1	82.0	84.9	78.8	70.8
NRB0900	**FN**	**88.5**	**56.1**	**68.1**	70.8	76.3	82.6	86.0	89.6	83.4	71.5
NRB1000	**FN**	**90.7**	**58.3**	**70.3**	71.0	78.7	84.5	88.1	91.9	85.6	72.1
NRB1100	**FN**	**92.4**	**59.9**	**71.5**	71.8	78.0	84.2	91.4	93.2	87.2	75.7
NRB1200	**FN**	**93.6**	**61.1**	**72.7**	71.7	77.0	83.7	93.2	94.2	88.4	77.7
NRB1400	**FN**	**93.2**	**60.7**	**72.3**	71.7	77.9	84.5	92.3	93.9	87.8	76.2
NRB1600	**FN**	**92.7**	**60.0**	**71.4**	72.5	78.8	85.3	91.3	93.7	87.0	73.8
NRB1800	**FN**	**95.1**	**62.3**	**73.4**	73.2	81.1	85.9	94.6	95.8	88.7	75.4
NRB2000	**FN**	**96.6**	**63.8**	**74.9**	73.2	82.6	86.4	96.5	97.3	89.9	76.5
NRB2200	**FN**	**95.6**	**62.7**	**73.5**	73.8	81.7	86.7	95.1	96.5	89.4	76.1
NRB2400	**FN**	**94.4**	**61.5**	**72.3**	73.7	80.4	87.0	93.1	95.4	88.8	75.5
NRB2600	**FN**	**96.1**	**63.1**	**73.7**	74.3	82.2	87.4	95.5	97.0	90.0	76.7
NRB2800	**FN**	**97.4**	**64.4**	**75.0**	74.3	83.3	87.8	97.1	98.1	90.9	77.5
NRB3000	**FN**	**98.3**	**65.2**	**75.7**	74.8	84.3	88.2	98.2	99.0	91.7	78.3

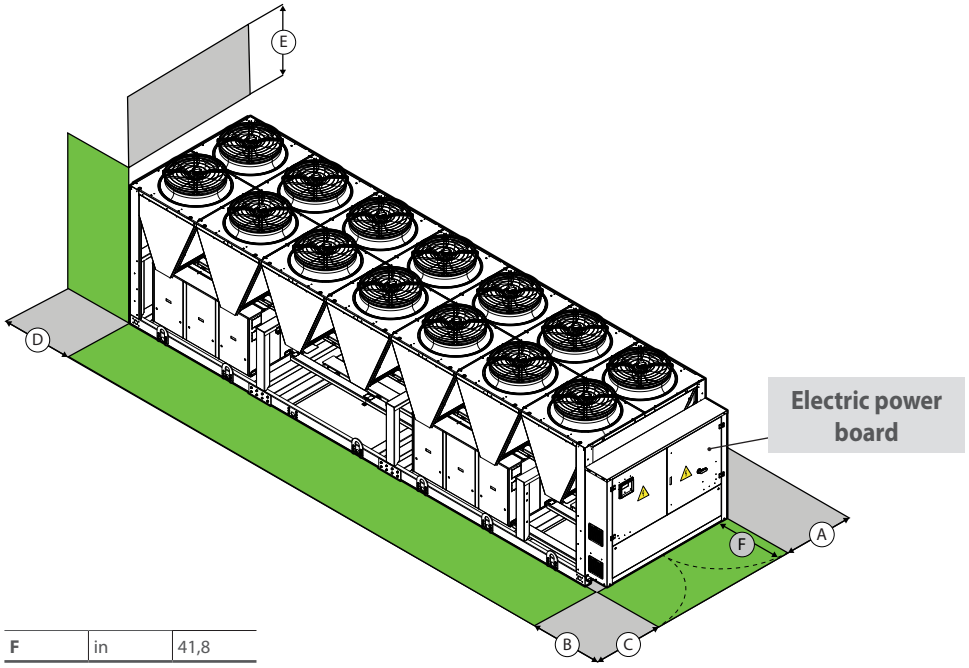
AHRI CONDITION

System side water temperature (in/out) 12.22°C. 54.00 °F - / 6.67°C. 44.01 °F
Outdoor air temperature 35 °C. 95.00 °F
Inverter fans

MINIMUM TECHNICAL SPACES

Panel type

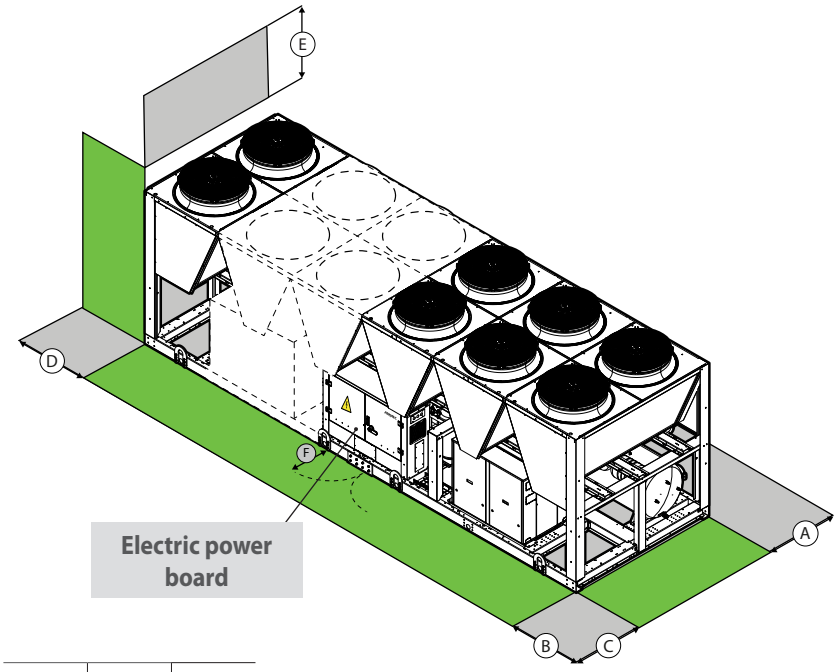
1



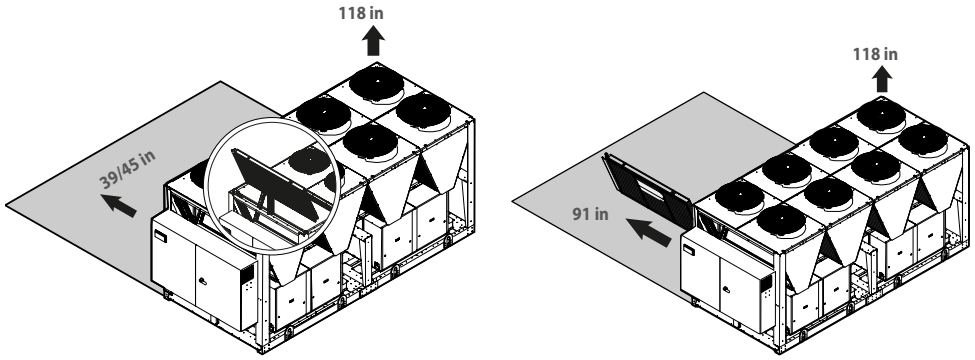
F	in	41,8

2

NRB 3000 N



F	in	39



*** Minimum technical space, to be ensured in order for the chiller to work properly and for possible maintenance. ATTENTION with this space, the condenser coil can only be pulled out from above; to pull it out from the side you must leave at least 91 in.**

MINIMUM TECHNICAL SPACES

Unit	Vers.	V-blok	Fans	Panel type	A	B	C	D	E
NRB F		n°	n°		in	in	in	in	in
800	A	2	4	1	39*	43	39*	32	118
900	A	2	4	1	39*	43	39*	32	118
1000	A	3	6	1	39*	43	39*	32	118
1100	A	3	6	1	39*	43	39*	32	118
1200	A	3	6	1	39*	43	39*	32	118
1400	A	3	6	1	39*	43	39*	32	118
1600	A	4	8	1	45*	43	45*	32	118
1800	A	4	8	1	45*	43	45*	32	118
2000	A	5	10	1	45*	43	45*	32	118
2200	A	5	10	1	45*	43	45*	32	118
2400	A	6	12	1	45*	43	45*	32	118
2600	A	7	14	1	45*	43	45*	32	118
2800	A	7	14	1	58*	43	58*	32	118
3000	A	7	14	1	58*	43	58*	32	118
800	E	4	8	1	39*	43	39*	32	118
900	E	4	8	1	39*	43	39*	32	118
1000	E	5	10	1	39*	43	39*	32	118
1100	E	6	12	1	45*	43	45*	32	118
1200	E	6	12	1	45*	43	45*	32	118
1400	E	7	14	1	45*	43	45*	32	118
1600	E	7	14	1	45*	43	45*	32	118
1800	E	8	16	1	45*	43	45*	32	118
2000	E	8	16	1	45*	43	45*	32	118
2200	E	8	18	1	45*	43	45*	32	118
2400	E	10	20	1	45*	43	45*	32	118
2600	E	10	20	1	45*	43	45*	32	118
2800	E	10	20	1	58*	43	58*	32	118
3000	E	9	18	1	58*	43	58*	32	118
800	U	4	8	1	39*	43	39*	32	118
900	U	4	8	1	39*	43	39*	32	118
1000	U	5	10	1	39*	43	39*	32	118
1100	U	6	12	1	45*	43	45*	32	118
1200	U	6	12	1	45*	43	45*	32	118
1400	U	7	14	1	45*	43	45*	32	118
1600	U	7	14	1	45*	43	45*	32	118
1800	U	8	16	1	45*	43	45*	32	118
2000	U	8	16	1	45*	43	45*	32	118
2200	U	9	18	1	45*	43	45*	32	118
2400	U	10	20	1	45*	43	45*	32	118
2600	U	10	20	1	45*	43	45*	32	118
2800	U	10	20	1	58*	43	58*	32	118
3000	U	9	18	1	58*	43	58*	32	118
800	N	5	10	1	45*	43	45*	32	118
900	N	5	10	1	45*	43	45*	32	118
1000	N	6	12	1	45*	43	45*	32	118
1100	N	7	14	1	45*	43	45*	32	118
1200	N	7	14	1	45*	43	45*	32	118
1400	N	8	16	1	45*	43	45*	32	118
1600	N	8	16	1	45*	43	45*	32	118
1800	N	9	18	1	45*	43	45*	32	118
2000	N	9	18	1	45*	43	45*	32	118
2200	N	10	20	1	45*	43	45*	32	118
2400	N	11	22	1	45*	43	45*	32	118
2600	N	11	22	1	45*	43	45*	32	118
2800	N	11	22	1	58*	43	58*	32	118
3000	N	10	20	2	58*	32	58*	32	118

**** Minimum technical space, to be ensured in order for the chiller to work properly and for possible maintenance. ATTENTION: with this space, the condenser coil can only be pulled out from above, see figures on the next page; to pull it out from the side you must leave at least 91 in.***

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