

EN

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Translation of Original instructions

NRB 0800-3000

F

Technical manual



AIR-WATER CHILLER WITH FREE-COOLING

Cooling capacity 56.90 ÷ 233.3 ton

Dear Customer,

Thank you for wanting to learn about a product Aermec. 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.

The manual you are about to read is meant to present the product and help you select the unit that best meets the needs of your system.

WARNING: personnel who possess the necessary skills according to state, national and local regulations in force must choose and size the machine

Aermec, always attentive to the continuous changes in the market and its regulations, reserves the right to make all the changes deemed necessary for improving the product, including technical data.

Thank you again.

Aermec S.p.A.

CERTIFICATIONS



COMPANY CERTIFICATIONS



SAFETY CERTIFICATIONS



This mark indicates that the disposal of this product must strictly follow the national and local laws in force.

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1 PRODUCT DESCRIPTION



The Selection and the sizing of the unit for each application must be approved by a person skilled in the field of the existing legislation

Air-cooled outdoor chiller designed to meet air conditioning needs in residential/commercial complexes or industrial applications.

They are outdoor units with axial fan scroll compressors, microchannel batteries and plate exchangers.

In the unit with desuperheater, it is also possible to produce free-hot water.

The base, the structure and the panels are made of galvanized steel treated with polyester paint RAL 9003.

ACOUSTIC EFFICIENCY

This product range does not consider the energy class as the only selection parameter. Chillers can be chosen between different noise levels that do not affect the energy class but maintain the best energy efficiency status.

The different versions have been designed to identify the unit according to the intended use of the system.

The NRB range excludes any compromise in technological choices, as efficiency and silence can coexist perfectly.

MAXIMUM ADAPTABILITY

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 contains the main hydraulic components, and is available in various configurations with a single pump or a standby pump and with various heads. (see configurator)

EXTENDED OPERATING RANGE

This range can work at full load with outdoor temperature up to 122.0 °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.

The unit can produce chilled water at a negative temperature (up to 14.0 °F of produced water in some versions).

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 complete with a desuperheater section.

In this configuration a coolant/water heat exchanger is added on the gas flow line. The exchanger is set in 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.

DUAL-CIRCUIT UNIT

Unit with 2 refrigerant circuits designed to provide maximum efficiency at full load, ensuring high efficiency at partial loads also and ensuring continuity in case one of the circuits stops.

ALUMINIUM MICROCHANNEL COILS

The microchannel condensing aluminum coils ensure high levels of efficiency, reduced quantities of refrigerant and lower unit weight. The treatment "O" available as configurator it ensures high resistance to corrosion even in the most aggressive environments.

ELECTRONIC EXPANSION VALVE

The possibility to use electronic expansion valve, offers significant benefits, especially when the chiller is working with partial loads, increasing the energy efficiency of the unit.

It is standard in all sizes from 2000 to 3000.

2 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	Operating field <ul style="list-style-type: none"> ◦ Standard mechanic thermostatic valve (1) X Electronic thermostatic expansion valve (2) Y Low temperature mechanic thermostatic valve (3) Z Low temperature electronic thermostatic valve (3)
9	Model F Free-cooling
10	Heat recovery <ul style="list-style-type: none"> ◦ Without heat recovery D With desuperheater (4)
11	Version <ul style="list-style-type: none"> A High efficiency E Silenced high efficiency N Silenced very high efficiency U Very high efficiency
12	Coils / free-cooling coils <ul style="list-style-type: none"> ◦ Alluminium microchannel / Copper - aluminium O Painted alluminium microchannel / Copper painted aluminium R Copper-copper/Copper-copper S Copper-Tinned copper / Copper -Tinned copper V Copper-painted aluminium / Copper-painted aluminium
13	Fans J Inverter
14	Power supply <ul style="list-style-type: none"> 6 230V ±10% ~3 / 60Hz with thermomagnetic switches (5) 7 460V ±10% ~3 / 60Hz with thermomagnetic switches 8 575V ±10% ~3 / 60Hz with thermomagnetic switches 9 208V ±10% ~3 / 60Hz with thermomagnetic switches (5)
15,16	Integrated hydronic kit <ul style="list-style-type: none"> Without hydronic kit 00 Without hydronic kit Kit with n°1 pump <ul style="list-style-type: none"> PA Pump A (6) PB Pump B (6) PC Pump C (6) PD Pump D (6) PE Pump E (6) PF Pump F (6) PG Pump G (6)

Field	Description
PH	Pump H (6)
PI	Pump I (6)
PJ	Pump J (6)
	Pump n°1 pump + stand-by pump
DA	Pump A + stand-by pump (6)
DB	Pump B + stand-by pump (6)
DC	Pump C + stand-by pump (6)
DD	Pump D + stand-by pump (6)
DE	Pump E + stand-by pump (6)
DF	Pump F + stand-by pump (6)
DG	Pump G + stand-by pump (6)
DH	Pump H + stand-by pump (6)
DI	Pump I + stand-by pump (6)
DJ	Pump J + stand-by pump (6)
	Kit with storage tank and n°1 pump
AA	Storage tank and pump A (6)
AB	Storage tank and pump B (6)
AC	Storage tank and pump C (6)
AD	Storage tank and pump D (6)
AE	Storage tank and pump E (6)
AF	Storage tank and pump F (6)
AG	Storage tank and pump G (6)
AH	Storage tank and pump H (6)
AI	Storage tank and pump I (6)
AJ	Storage tank and pump J (6)
	Kit with storage tank and n°1 pump + stand-by pump
BA	Storage tank with pump A + stand-by pump (6)
BB	Storage tank with pump B + stand-by pump (6)
BC	Storage tank with pump C + stand-by pump (6)
BD	Storage tank with pump D + stand-by pump (6)
BE	Storage tank with pump E + stand-by pump (6)
BF	Storage tank with pump F + stand-by pump (6)
BG	Storage tank with pump G + stand-by pump (6)
BH	Storage tank with pump H + stand-by pump (6)
BI	Storage tank with pump I + stand-by pump (6)
BJ	Storage tank with pump J + stand-by pump (6)

(1) Water produced up to 39.2 °F.

(2) Processed water temperature up to 39.2°F. The standard electronic expansion valve with a size from 2000 to 3000.

(3) Processed water temperature from 39.2 °F to 14.0 °F.

(4) During operation, a water temperature no lower than 95°F must always be guaranteed on the heat exchanger inlet. The option is not compatible with application Y and Z.

(5) Available only for size from 0800 to 1200.

(6) For the availability of the pumps in the different configurations, refer to the Magellano selection program or the technical documentation.

3 UNIT COMPONENTS DESCRIPTION

REFRIGERANT CIRCUIT

Compressors

Crankcase heaters as standard, automatically activated when the unit stops, as long as power is maintained to the unit.

Microchannel coils

The full range uses aluminium microchannel coils, ensuring very high levels of efficiency.

This allows using less refrigerant compared to traditional copper coils.

System side heat exchanger

Brazed plate heat exchanger in stainless steel. It is externally insulated with closed cell neoprene anti-condensation material.

When the unit is not functioning, it's protected against the formation of ice by an electric heater.

Filter drier

Hermetic-mechanical made of hygroscopic material, able to withhold impurities and any traces of humidity present in the cooling circuit.

Mechanic thermostatic valve

The mechanical type valve, with external equaliser located at the evaporator outlet, modulates the flow of refrigerant into the evaporator based on the load and ensures the correct superheat of the suction gas.

Electronic thermostatic expansion valve

Compared with a mechanical thermostatic valve, the electronic one offers better overheating control so the evaporator is used more efficiently in all conditions, thereby boosting machine output.

Its use in comfort dedicated applications allows to make substantial benefits especially in the presence of varying loads, because it allows you to maintain the maximum efficiency with any external air temperature.

In industrial applications, where there is often a need to make temperature changes in a wide range of environmental conditions, the use of the electronic valve is ideal because it avoids the need for continuous calibration, adapting the system to different load conditions and hence making it independent.

■ *Electronic thermostatic X as standard from size 2000÷3000.*

Solenoid valves

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

■ *Only with the mechanical thermostatic valve*

Sight glass

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

HYDRAULIC CIRCUIT

Water filter

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

■ *Installed in versions with the hydronic kit. For version 00:*

- 0800÷1805 FA, 0800÷1400 FU-FE, 0800÷1000 FN (supplied as standard)
- 2000÷3000 FA, 1600÷3000 FU-FE, 1100÷3000 FN (installed)

Recovery side heat exchanger (optional)

Brazed plate heat exchanger in stainless steel. It is externally insulated with closed cell neoprene anti-condensation material.

When the unit is not functioning, it's protected against the formation of ice by an electric heater.

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.

Shut-off valve

They can be used to cut off the hydraulic circuit in case of maintenance, for example to clean the filter.

Two 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.

HYDRAULIC CIRCUIT (VERSIONS WITH HYDRONIC KIT)

Pump

They provide useful static pressure to the system, excluding the unit pressure drops.

■ *The pumps are programmed in rotation with automatic exchange if the running pump fails*

Expansion vessel

Membrane type precharged with nitrogen.

Pressure relief valve

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

Air drain valve

Mounted at the highest level of the hydraulic system. The air vent is used for the release of any air pockets from the hydraulic circuit.

Drain valve

System buffer tank

In steel to reduce heat gain and avoid the formation of condensation.

Insulated with polyurethane material of adequate thickness.

It reduces the number of compressor starts and stabilises the water temperature delivered to the system.

It is equipped with antifreeze electrical resistances to ensure minimum temperature of stored water of +5°, with minimum outdoor temperature of -20°C. The resistance is activated by a water temperature probe placed inside the unit's hydronic circuit.

STRUCTURE AND FANS

Structure

Supporting structure for outdoor installation, in hot-dipped galvanized sheet steel, with RAL 9003 polyester powder coating.

Designed to ensure the maximum access for service and maintenance.

Inverter fans

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

CONTROL AND SAFETY COMPONENTS

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.

■ *Manual reset*

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.

Condensation control temperature

Fitted as standard with a device for electronic condensation control so that the unit can work even with low temperatures, adapting the air flow rate to the actual system request in order to reduce consumption.

ELECTRICAL CONTROL AND POWER PANEL

Complete with:

- door interlocked isolator
- Magnet circuit breakers and contactors for compressors and fans
- external electrical panel
- electronic controller
- All numbered cables

Door interlocked isolator

Access to the electrical panel is by operating the handle of the door interlocked isolator which removes power to the unit.

To avoid accidentally powering up the unit during maintenance the isolator is fitted with a locking mechanism.

Controller keypad

Allows complete control of the unit.

For further information refer to the user manual.

Electronic controller

The microprocessor controls features cutting edge functions and proprietary adjustments.

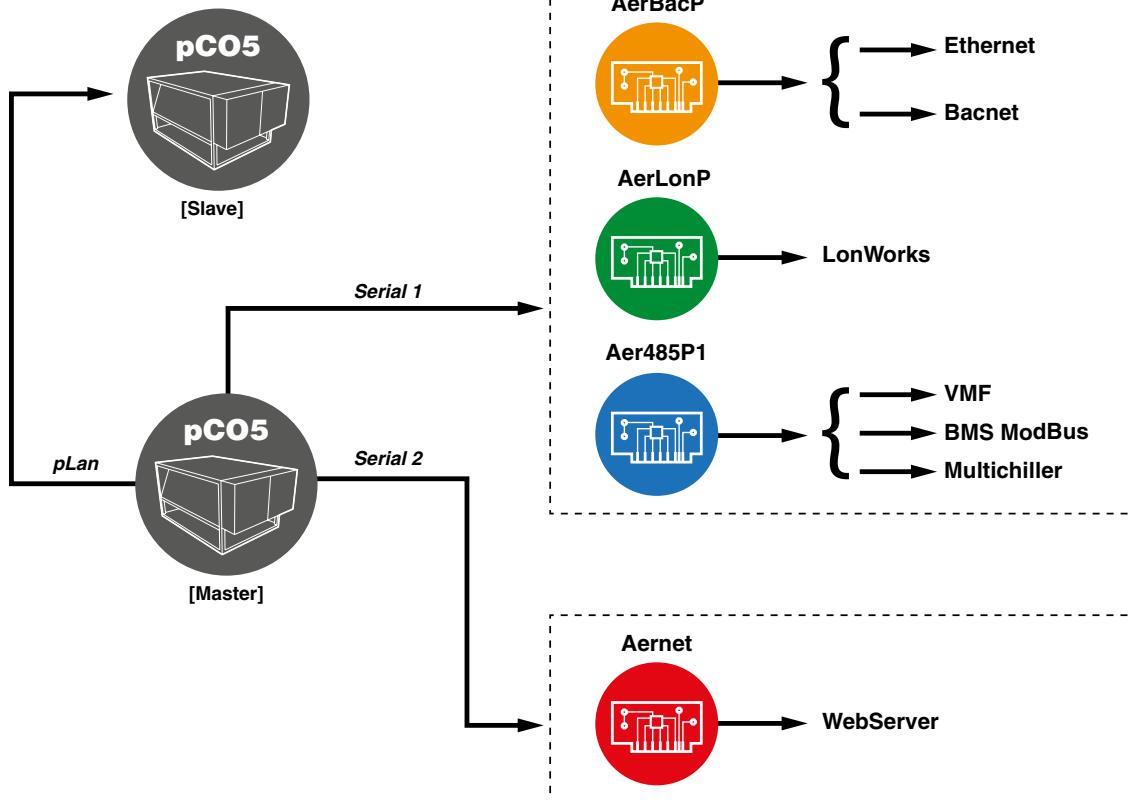
The control panel allows the user to consult and manage the unit operating parameters thanks to a purposely designed multi-language graphic interface.

The multi-level menu can be used to control:

- 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.

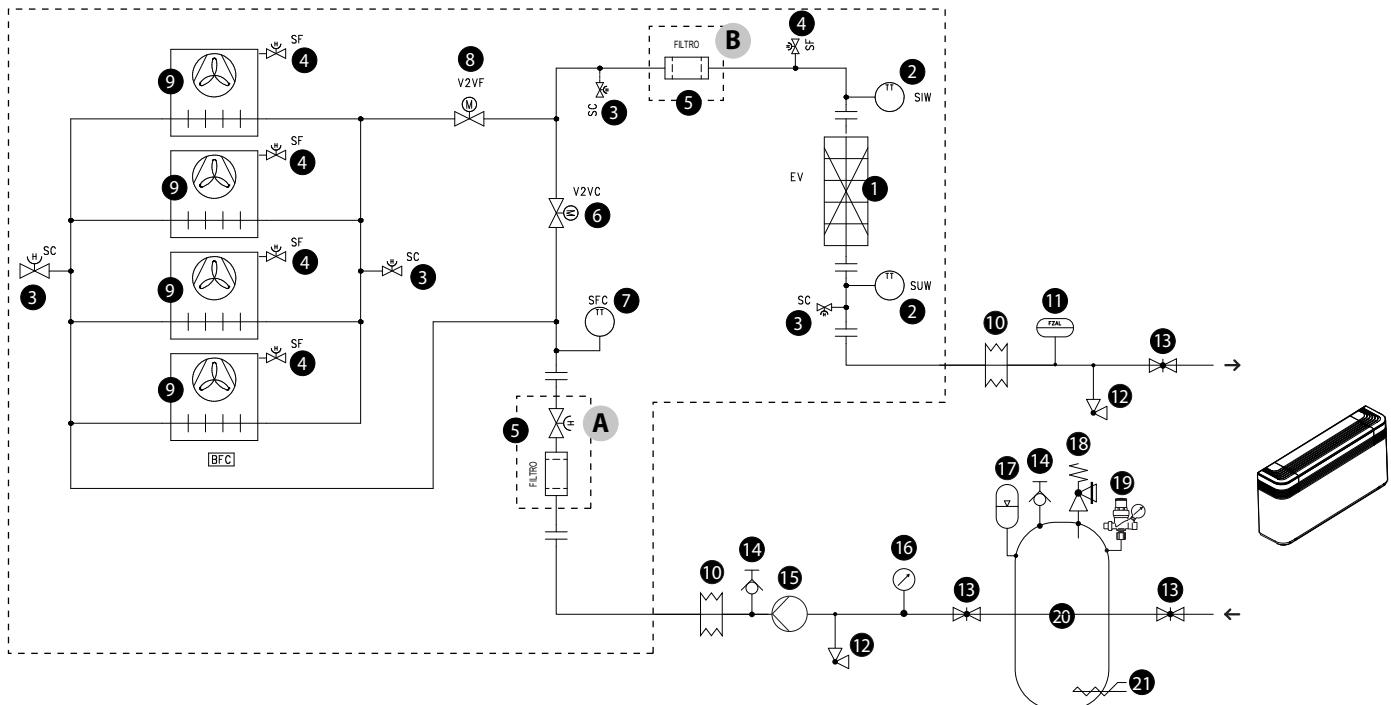


4 MAIN HYDRAULIC CIRCUITS

WITHOUT HYDRONIC KIT

■ Water filter: Installation in the immediate vicinity of the heat exchanger is mandatory.

■ 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.



Components as standard

- 1 Plate heat exchanger
- 2 Water temperature sensors (IN/OUT)
- 3 Drain valve
- 4 Air drain valve
- 5 Water filter
- 6 2-way valve (chiller operation)
- 7 Free-cooling probe

Components not provided and responsibility of the installer

- 8 2-way valve (free-cooling operation)
- 9 Free-cooling coil
- 10 Anti-vibration joints
- 11 Flow switch (MANDATORY)
- 12 Drain valve
- 13 Flow shut-off valves

- 14 Air drain valve
- 15 Pump
- 16 Pressure gauge
- 17 Expansion vessel
- 18 Pressure relief valve
- 19 Loading unit
- 20 Storage tank
- 21 Antifreeze electric heater

A: Filter position for sizes: 0800÷1800 FA, 0800÷1400 FU-FE, 0800÷1000 FN (supplied as standard)

B: Filter position for sizes: 2000÷3000 FA, 1600÷3000 FU-FE, 1100÷3000 FN (installed)

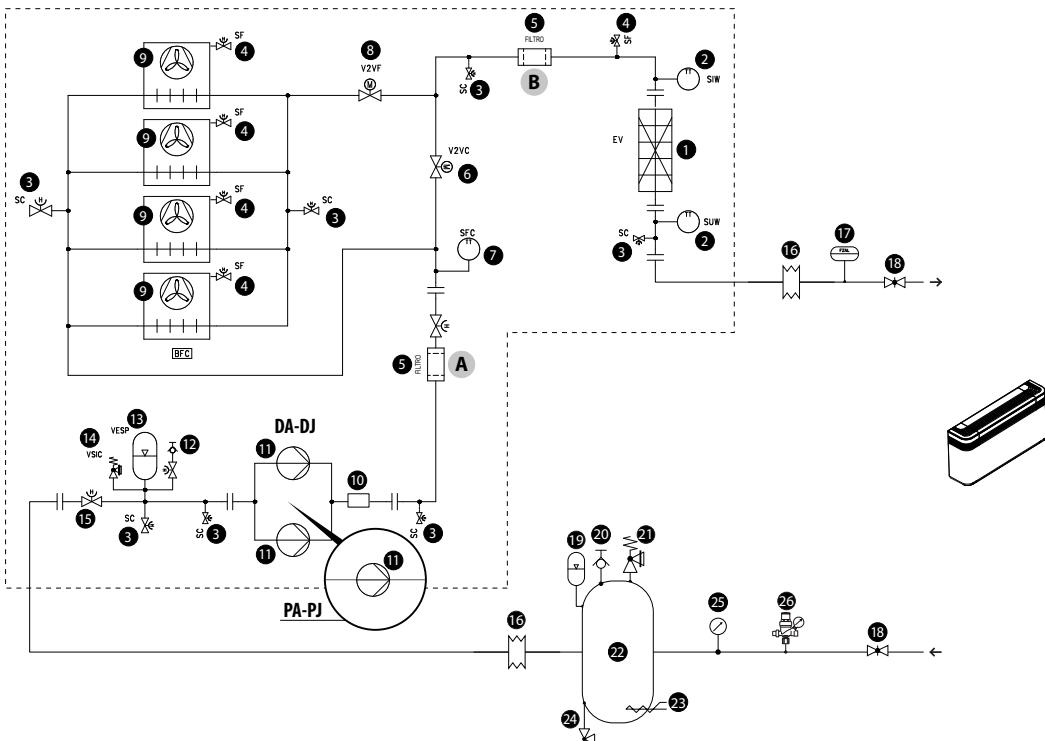
Water characteristics

System: Chiller with plate heat exchanger

PH	7,5 - 9
Total hardness	4,5 - 8,5 °dH
Electric conductivity	10-500 µS /cm
Temperature	< 65 °C
Oxygen content	< 0,1 ppm
Max. glycol amount	50 %
Phosphates (PO ₄)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,2 ppm
Alkalinity (HCO ₃)	70 - 300 ppm
Chloride ions (Cl ⁻)	< 50 ppm
Free chlorine	< 0,5 ppm
Sulphate ions (SO ₄)	< 50 ppm
Sulphide ion (S)	None
Ammonium ions (NH ₄)	None
Silica (SiO ₂)	< 30 ppm

WITH PUMPS

■ 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.



Components as standard

- 1 Plate heat exchanger
- 2 Water temperature sensors (IN/OUT)
- 3 Drain valve
- 4 Air drain valve
- 5 Water filter
- 6 2-way valve (chiller operation)
- 7 Free-cooling probe
- 8 2-way valve (free-cooling operation)
- 9 Free-cooling coil

Components not provided and responsibility of the installer

- 10 Clapet valve
- 11 Pump
- 12 Air drain valve
- 13 Expansion vessel
- 14 Pressure relief valve
- 15 Flow shut-off valves
- 16 Anti-vibration joints
- 17 Flow switch (MANDATORY)

- 18 Flow shut-off valves
- 19 Expansion vessel
- 20 Air drain valve
- 21 Pressure relief valve
- 22 Storage tank
- 23 Antifreeze electric heater
- 24 Drain valve
- 25 Pressure gauge
- 26 Loading unit

A: Filter position for sizes: 0800÷1800 FA, 0800÷1400 FU-FE, 0800÷1000 FN (installed)

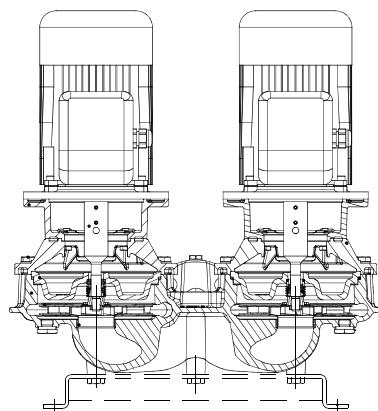
B: Filter position for sizes: 2000÷3000 FA, 1600÷3000 FU-FE, 1100÷3000 FN (installed)

Water characteristics

System: Chiller with plate heat exchanger

PH	7,5 - 9
Total hardness	4,5 - 8,5 °dH
Electric conductivity	10-500 µS /cm
Temperature	< 65 °C
Oxygen content	< 0,1 ppm
Max. glycol amount	50 %
Phosphates (PO ₄)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,2 ppm
Alkalinity (HCO ₃)	70 - 300 ppm
Chloride ions (Cl ⁻)	< 50 ppm
Free chlorine	< 0,5 ppm
Sulphate ions (SO ₄)	< 50 ppm
Sulphide ion (S)	None
Ammonium ions (NH ₄)	None
Silica (SiO ₂)	< 30 ppm

Clapet valve

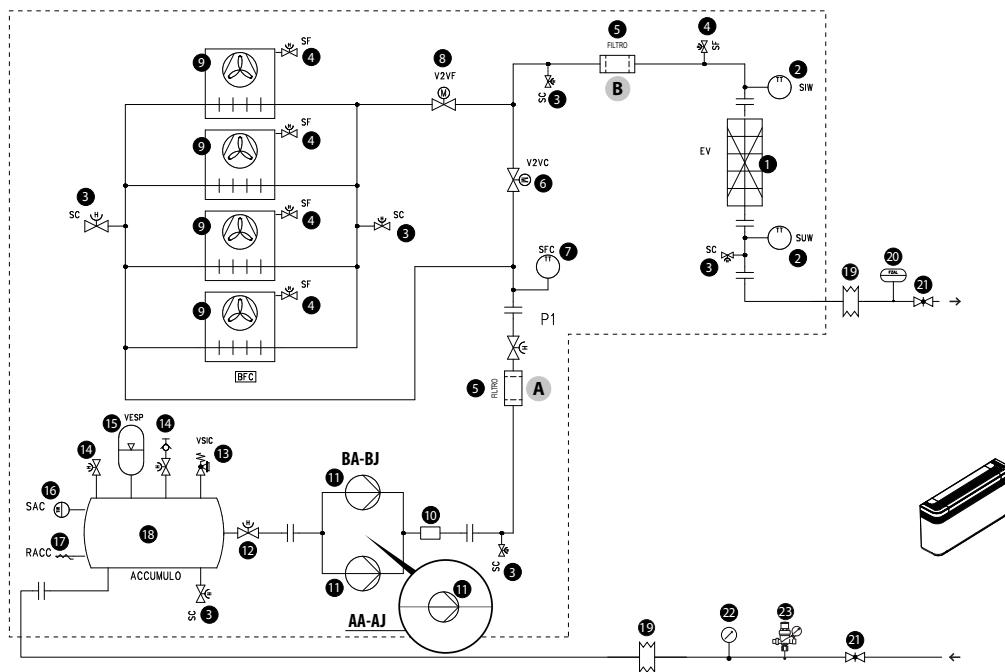


1 Clapet valve

The unit with double pump circuit does not have one-way valves. If you choose to install two units in parallel or in cascade, it is recommended to provide one-way valves for the correct operation of the unit.

WITH PUMPS AND STORAGE TANK

■ 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.



Components as standard

- 1 Plate heat exchanger
- 2 Water temperature sensors (IN/OUT)
- 3 Drain valve
- 4 Air drain valve
- 5 Water filter
- 6 2-way valve (chiller operation)
- 7 Free-cooling probe
- 8 2-way valve (free-cooling operation)
- 9 Free-cooling coil
- 10 Clapet valve
- 11 Pump
- 12 Flow shut-off valves
- 13 Pressure relief valve
- 14 Air drain valve
- 15 Expansion vessel
- 16 Storage tank probe
- 17 Antifreeze electric heater

Components not provided and responsibility of the installer

- 18 Storage tank
- 19 Anti-vibration joints
- 20 Flow switch (MANDATORY)
- 21 Flow shut-off valves
- 22 Pressure gauge
- 23 Loading unit

A: Filter position for sizes: 0800÷1800 FA, 0800÷1400 FU-FE, 0800÷1000 FN (installed)

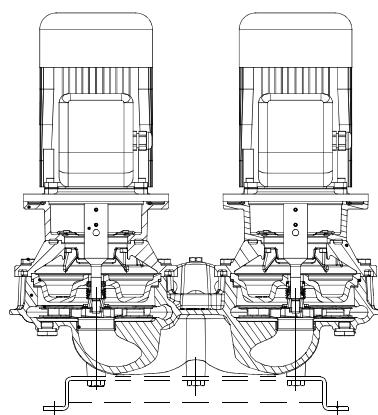
B: Filter position for sizes: 2000÷3000 FA, 1600÷3000 FU-FE, 1100÷3000 FN (installed)

Water characteristics

System: Chiller with plate heat exchanger

PH	7,5 - 9
Total hardness	4,5 - 8,5 °dH
Electric conductivity	10-500 µS /cm
Temperature	< 65 °C
Oxygen content	< 0,1 ppm
Max. glycol amount	50 %
Phosphates (PO ₄)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,2 ppm
Alkalinity (HCO ₃)	70 - 300 ppm
Chloride ions (Cl-)	< 50 ppm
Free chlorine	< 0,5 ppm
Sulphate ions (SO ₄)	< 50 ppm
Sulphide ion (S)	None
Ammonium ions (NH ₄)	None
Silica (SiO ₂)	< 30 ppm

Clapet valve

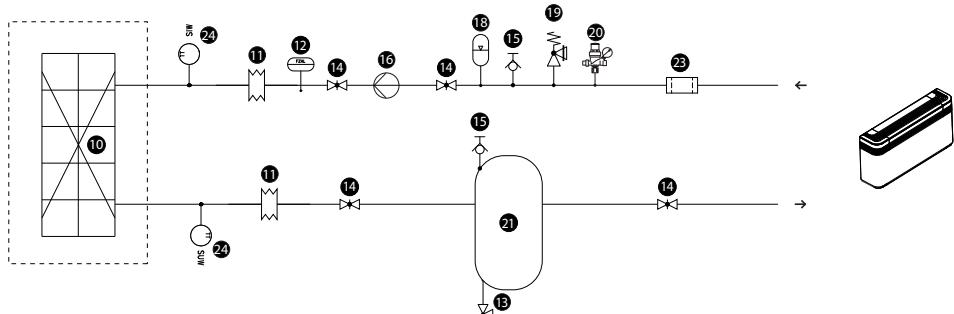
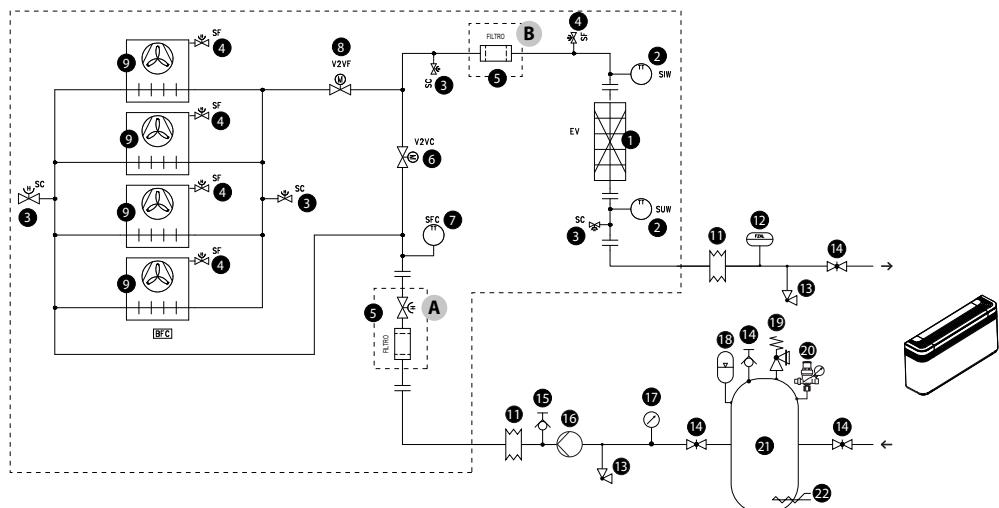


1 Clapet valve

The unit with double pump circuit does not have one-way valves. If you choose to install two units in parallel or in cascade, it is recommended to provide one-way valves for the correct operation of the unit.

WITH DESUPERHEATER

■ 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.



Components as standard

- 1 Plate heat exchanger
- 2 Water temperature sensors (IN/OUT)
- 3 Drain valve
- 4 Air drain valve
- 5 Water filter (as standard)
- 6 2-way valve (chiller operation)
- 7 Free-cooling probe
- 8 2-way valve (free-cooling operation)

Components not provided as standard

- 9 Free-cooling coil
- 10 Plate heat exchanger (desuperheater)
- 11 Anti-vibration joints
- 12 Flow switch (MANDATORY)
- 13 Drain valve
- 14 Flow shut-off valves
- 15 Air drain valve

- 16 Pump
- 17 Pressure gauge
- 18 Expansion vessel
- 19 Pressure relief valve
- 20 Loading unit
- 21 Storage tank
- 22 Antifreeze electric heater
- 23 Water filter (MANDATORY)
- 24 Water temperature sensors (IN/OUT)

A: Filter position for sizes: 0800÷1800 FA, 0800÷1400 FU-FE, 0800÷1000 FN (supplied as standard)

B: Filter position for sizes: 2000÷3000 FA, 1600÷3000 FU-FE, 1100÷3000 FN (installed)

Water characteristics

System: Chiller with plate heat exchanger

PH	7,5 - 9
Total hardness	4,5 - 8,5 °dH
Electric conductivity	10-500 µS/cm
Temperature	< 65 °C
Oxygen content	< 0,1 ppm
Max. glycol amount	50 %
Phosphates (PO ₄)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,2 ppm
Alkalinity (HCO ₃)	70 - 300 ppm
Chloride ions (Cl ⁻)	< 50 ppm
Free chlorine	< 0,5 ppm
Sulphate ions (SO ₄)	< 50 ppm
Sulphide ion (S)	None
Ammonium ions (NH ₄)	None
Silica (SiO ₂)	< 30 ppm

5 MAIN COOLING REFRIGERANT LAYOUTS

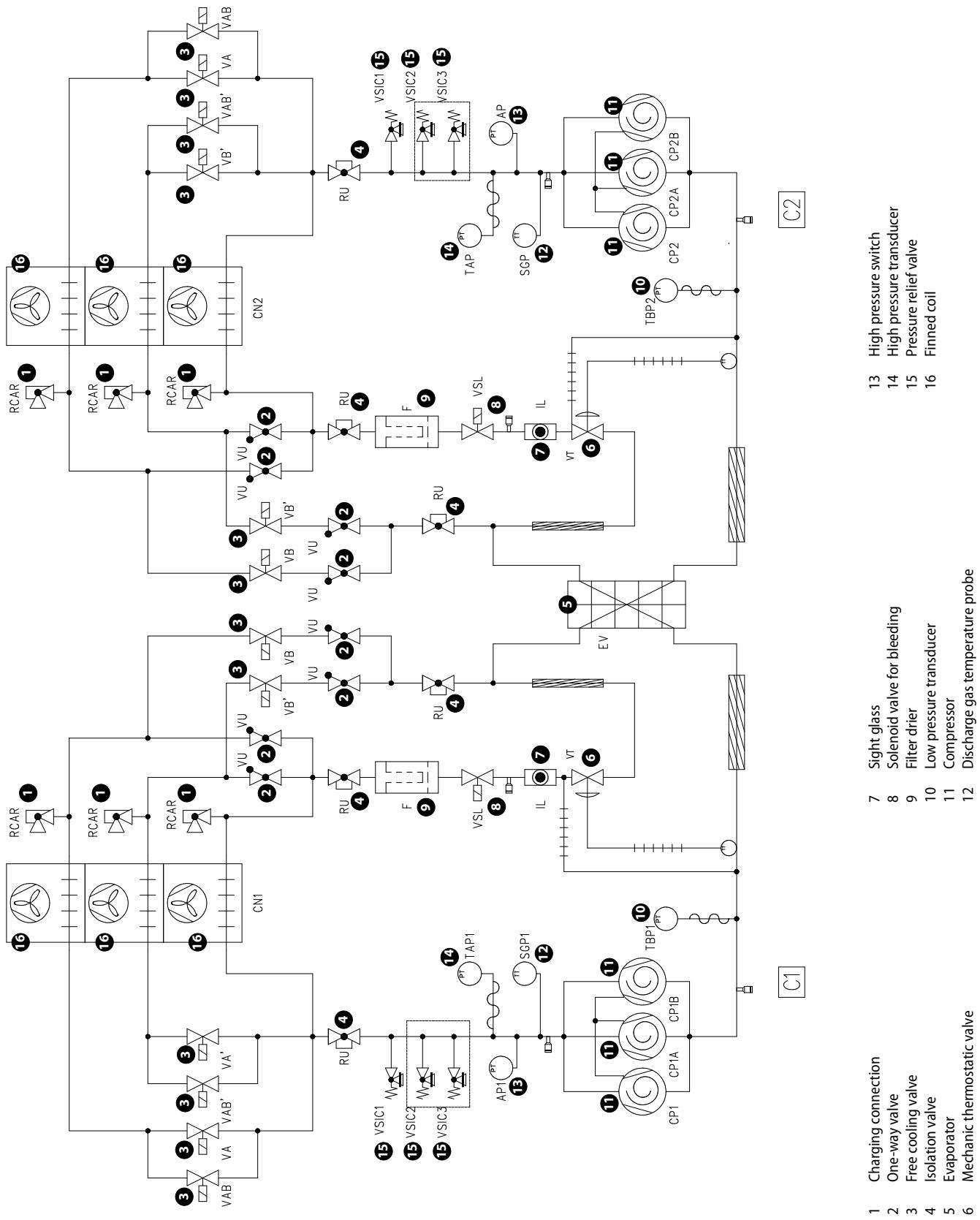
WITH STANDARD MECHANIC THERMOSTATIC VALVE



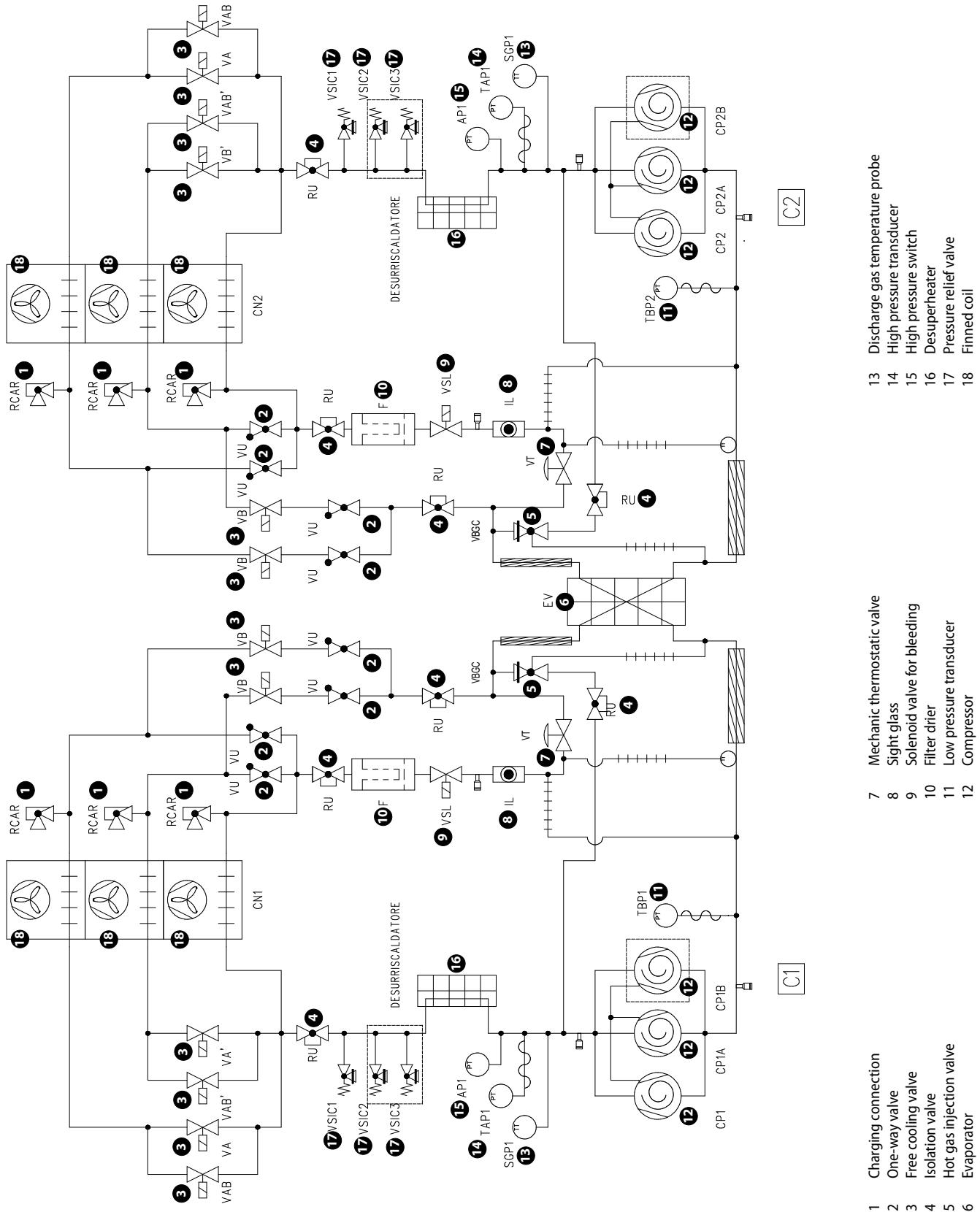
The units from size 2000 to 3000 have an electronic expansion valve as standard.

- 0800÷2000: no. 4 compressors
- 2200: no. 5 compressors
- 2400÷3000: no. 6 compressors

Without heat recovery (°)



With desuperheater (D)



WITH ELECTRONIC THERMOSTATIC EXPANSION VALVE



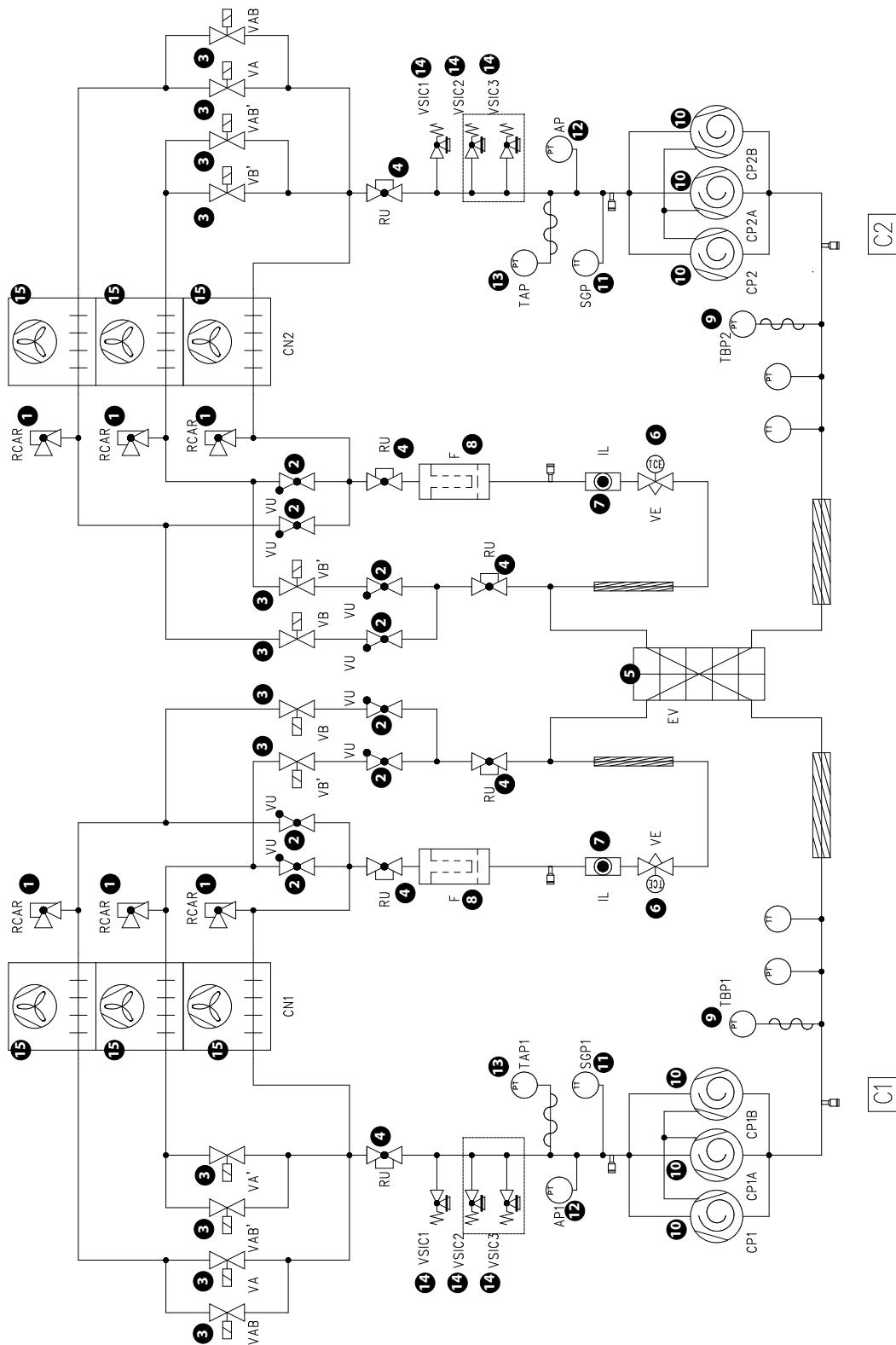
The units from size 2000 to 3000 have an electronic expansion valve as standard.

— 0800–2000: no. 4 compressors

— 2200: no. 5 compressors

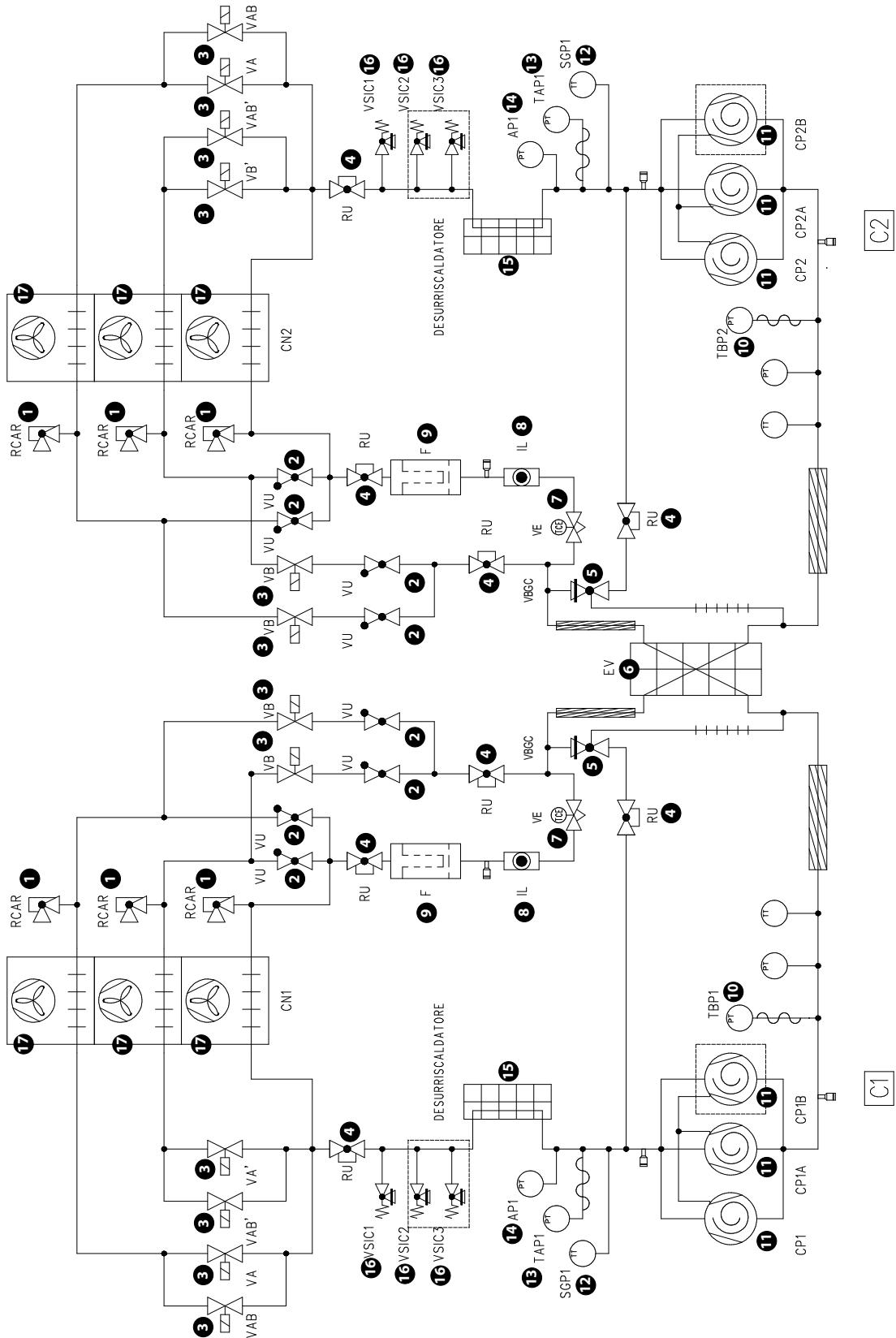
— 2400–3000: no. 6 compressors

Without heat recovery (°)



- | | |
|----|---|
| 1 | Charging connection |
| 2 | One-way valve |
| 3 | Free cooling valve |
| 4 | Isolation valve |
| 5 | Evaporator |
| 6 | Electronic thermostatic expansion valve |
| 7 | Sight glass |
| 8 | Filter drier |
| 9 | Low pressure transducer |
| 10 | Compressor |
| 11 | Discharge gas temperature probe |
| 12 | High pressure switch |
| 13 | High pressure transducer |
| 14 | Pressure relief valve |
| 15 | Finned coil |

With desuperheater (D)



- | | | | |
|---|-------------------------|----|---|
| 1 | Charging connection | 7 | Electronic thermostatic expansion valve |
| 2 | One-way valve | 8 | Sight glass |
| 3 | Free cooling valve | 9 | Filter drier |
| 4 | Isolation valve | 10 | Low pressure transducer |
| 5 | Hot gas injection valve | 11 | Compressor |
| 6 | Evaporator | 12 | Discharge gas temperature probe |
| | | 13 | High pressure transducer |
| | | 14 | High pressure switch |
| | | 15 | Desuperheater |
| | | 16 | Pressure relief valve |
| | | 17 | Finned coil |

6 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.

FL-UL: Flow switch.

MULTICHLILLER_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.

PGD1: Allows you to control the unit at a distance.

AVX: Spring anti-vibration supports.

FB2M/FB3M: Air 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.

FACTORY FITTED ACCESSORIES

DRE: Electronic device for peak current reduction.

RIF: Power factor correction. Connected in parallel to the motor allowing about 10% reduction of input current.

GP_: Anti-intrusion grid kit

FB1M: Air 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.

ACCESSORIES COMPATIBILITY

Model	Ver	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
AER485P1	A,E,N,U	.	.	.	.	.	.	.	.	.	.	.	.	.	.
AERNET	A,E,N,U	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FL-UL(1)	A,E,N,U	.	.	.	.	.	.	.	.	.	.	.	.	.	.
MULTICHLILLER_EVO	A,E,N,U	.	.	.	.	.	.	.	.	.	.	.	.	.	.
PGD1	A,E,N,U	.	.	.	.	.	.	.	.	.	.	.	.	.	.

(1) Compliant with UL regulation

Antivibration

Ver	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Integrated hydronic kit: 00														
A	AVX1082	AVX1082	AVX1080	AVX1080	AVX1080	AVX1080	AVX1095	AVX1095	AVX1086	AVX1086	AVX1084	AVX1094	AVX1094	AVX1094
E,U	AVX1080	AVX1080	AVX1080	AVX1095	AVX1095	AVX1095	AVX1096	AVX1084	AVX1084	AVX1094	AVX1094	AVX1088	AVX1088	AVX1098
N	AVX1095	AVX1095	AVX1095	AVX1096	AVX1096	AVX1096	AVX1084	AVX1094	AVX1094	AVX1097	AVX1088	AVX1098	AVX1098	AVX1093

230V and 208V power supplies: Available only for sizes from 0800 to

1200.

Air filter

Ver	0800	0900	1000	1100	1200	1400	1600
A	FB2M	FB2M	FB3M	FB3M	FB3M	FB3M	FB2M x 2 (1)
E,U	FB3M	FB3M	FB3M	FB2M x 2 (1)	FB2M x 2 (1)	FB2M x 2 (1)	FB2M + FB3M
N	FB2M x 2 (1)	FB2M x 2 (1)	FB2M x 2 (1)	FB2M + FB3M	FB2M + FB3M	FB2M + FB3M	FB3M x 2 (1)

(1) x _ indicates the quantity to buy

Ver	1800	2000	2200	2400	2600	2800	3000
A	FB2M x 2 (1)	FB2M + FB3M	FB2M + FB3M	FB3M x 2 (1)	FB2M x 2 + FB3M (1)	FB2M x 2 + FB3M (1)	FB2M x 2 + FB3M (1)
E,U	FB3M x 2 (1)	FB3M x 2 (1)	FB2M x 2 + FB3M (1)	FB2M x 2 + FB3M (1)	FB2M + FB3M x 2 (1)	FB2M + FB3M x 2 (1)	FB3M x 3 (1)
N	FB2M x 2 + FB3M (1)	FB2M x 2 + FB3M (1)	FB2M + FB3M x 2 (1)	FB2M + FB3M x 2 (1)	FB3M x 3 (1)	FB3M x 3 (1)	FB2M x 2 + FB3M x 2 (1)

(1) x _ indicates the quantity to buy

Device for peak current reduction

Ver	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
A,E,N,U	DRE (1)													

(1) Contact the factory

A grey background indicates the accessory must be assembled in the factory

Power factor correction

Ver	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
A,E,N,U	RIF (1)													

(1) Contact the factory

A grey background indicates the accessory must be assembled in the factory

Anti-intrusion grid

Ver	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
A	GP2VN	GP2VN	GP3VN	GP3VN	GP3VN	GP4VN	GP4VN	GP5VN	GP5VN	GP6V	GP7V	GP7V	GP7V	GP7V
E,U	GP3VN	GP3VN	GP3VN	GP4VN	GP4VN	GP5VN	GP6V	GP6V	GP7V	GP7V	GP8V	GP8V	GP9VN	GP10V
N	GP4VN	GP4VN	GP4VN	GP5VN	GP5VN	GP6V	GP7V	GP7V	GP8V	GP8V	GP9VN	GP9VN	GP10V	

A grey background indicates the accessory must be assembled in the factory

Units 0800A and 0900A with the optional "storage tank" are 156.3 in long and must have the GP2VNA grids installed.

Air filter

Ver	0800	0900	1000	1100	1200	1400	1600
A	FB1Mx2(1)	FB1Mx2(1)	FB1Mx3(1)	FB1Mx3(1)	FB1Mx3(1)	FB1Mx3(1)	FB1Mx4(1)
E,U	FB1Mx3(1)	FB1Mx3(1)	FB1Mx3(1)	FB1Mx4(1)	FB1Mx4(1)	FB1Mx4(1)	FB1Mx5(1)
N	FB1Mx4(1)	FB1Mx4(1)	FB1Mx4(1)	FB1Mx5(1)	FB1Mx5(1)	FB1Mx5(1)	FB1Mx6(1)

(1) x _ indicates the quantity to buy

A grey background indicates the accessory must be assembled in the factory

Ver	1800	2000	2200	2400	2600	2800	3000
A	FB1Mx4(1)	FB1Mx5(1)	FB1Mx5(1)	FB1Mx6(1)	FB1Mx7(1)	FB1Mx7(1)	FB1Mx7(1)
E,U	FB1Mx6(1)	FB1Mx6(1)	FB1Mx7(1)	FB1Mx7(1)	FB1Mx8(1)	FB1Mx8(1)	FB1Mx9(1)
N	FB1Mx7(1)	FB1Mx7(1)	FB1Mx8(1)	FB1Mx8(1)	FB1Mx9(1)	FB1Mx9(1)	FB1Mx10(1)

(1) x _ indicates the quantity to buy

A grey background indicates the accessory must be assembled in the factory

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

The guide provides advice for applications. Although recommendations are given, all the details about the real world application of our products cannot be fully covered in this document.

For these reasons, this section contains the basic warnings and precautions to be taken into account in general, it being understood that:

- The final choice of the type of exchanger according to the place of installation is left to the client (or to the professional appointed by him).
- In any case, it is recommended to wash the coils with adequate frequency (a maximum time interval of three months is recommended, shorter in conditions of particularly dirty and aggressive atmospheres) to preserve their condition and ensure the proper functioning of the unit.

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.

The purpose of this application guide is to provide general information on the mechanisms of corrosion and corrosive environments.

SEA COAST ENVIRONMENTS

Coastal or marine environments are characterized by the abundance of sodium chloride (salt) which is carried by sea spray, mist, or fog. Most importantly, this salt water can be carried more than several miles by ocean breezes and tidal currents. It's not uncommon to experience salt-water contamination as far as 6.2 mi from the coast.

For this reason, it may be necessary to protect the exchangers from electrolytes of marine origin through the appropriate choice of materials and / or appropriate protective treatment.

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 (SO_2 , SO_3) and nitrogen oxides (NO_x) 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.

MIX OF SEASIDE AND 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 sources of risk to be considered are open sewage systems, exhaust vents, diesel engine exhaust, emissions from heavy traffic, landfills, aircraft and ocean-go-

ing ship engine exhaust, industrial production, chemical treatment facilities (cooling towers in the vicinity) and fossil fuel power plants.

URBAN ENVIRONMENTS

Densely populated areas generally have high levels of emissions of motor vehicles and increases in fuel use for heating buildings.

Both conditions elevate sulfur oxide (SO_x) and nitrogen oxide (NO_x) concentrations. Corrosive atmospheres may even occur in some closed areas, such as facilities with swimming pools and water treatment systems.

It is advisable to pay particular attention to the positioning of the units if it occurs in the immediate vicinity of these places, and to avoid that they are installed in the vicinity of outlets for the expulsion of air coming from them, or in any case exposed to such atmospheres.

Corrosion severity in this environment is a function of the pollution levels, which in turn depend on several factors including population density in the area.

Any equipment installed in locations immediately adjacent to diesel engine exhausts, incinerator flues, fuel-fired boiler flues, or areas exposed to fossil fuel emissions shall be considered subject to the same measures as 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
- road salts
- swimming pools
- diesel engines discharge / traffic
- Localised mist
- cleaning agents for domestic use
- Sewage system outlets
- many other separate contaminants

Even within 1.9-3.1 mi 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.

Only in the absence of potentially risky situations such as those indicated above can an environment be considered moderate.

Application	Tip
Severe environments	Coils with suitable protection
Moderate environments	Standard coil °

8 BASIC PRINCIPLES ON MICROCHANNEL COIL CORROSION

The main material in Aermec heat exchangers is aluminium.

Aluminum is a very reactive metal, which is easily oxidized on its surface. As long as this hard layer of aluminum oxide remains intact, the aluminum at the base will remain resistant to corrosion (unlike other materials, such as steel, where the oxide layer peels off the surface and flakes off, allowing the constant attack of the underlying metal).

However, aggressive environments can damage the oxide layer, which may not regenerate as quickly as necessary to provide the product with sufficient protection. These harsh environments are typified by very high or very low pH levels. Normally, aluminum's protective oxide layer is generally stable in the pH range of 4.5 to 8.5; the lack of exposure to excessively acidic or basic pH conditions is not in itself sufficient to exclude the need for appropriate protective treatments on the batteries.

The presence of salt (associated with marine environments) as well as the presence of other aggressive substances can in fact induce widespread or localized galvanic corrosion (pitting or anthill corrosion).

OTHER RISK FACTORS FOR CORROSION

The principal cause of corrosion is elevated humidity and/or temperatures in the presence of contaminant gases. These conditions alone, or in combination, accelerate the natural corrosion process in metals.

Humidity

Moisture in air can be considered the lifeblood of galvanic corrosion. A galvanic corrosion cell requires an electrolyte or current carrying media, to reach a dynamic state. The electrolyte can be water or any water-soluble substance with good conducting properties. Moisture in the air is one such electrolyte. Humid air contaminated with corrosive gasses further accelerates the corrosion rate as the air's current carrying potential increases.

Temperature

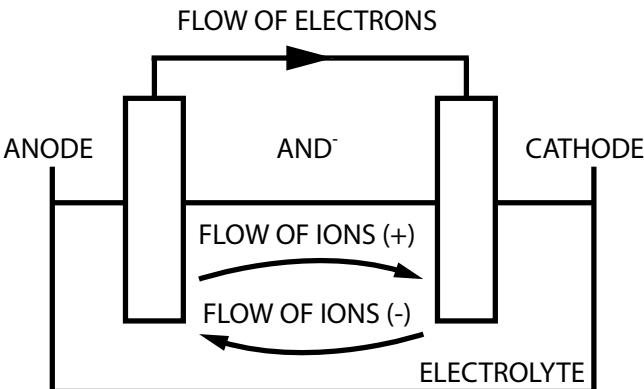
Chemical reactions generally depend on the temperature, for reactions that involve corrosion of aluminum by an increase in temperature, faster reaction frequencies usually arise.

Corrosive gases

Not all gases cause corrosion. Specifically, we are concerned with three types of gases:

- Acidic gases, such as hydrogen sulfide, sulfur oxides, chlorides, hydrogen fluoride (HF) and nitrogen oxides;
- Caustic gases, such as ammonia;
- Oxidizing gases, such as ozone

■ Of the gases that can cause corrosion, the acidic gases are typically the most harmful.



9 CLEANING MICRO-CHANNEL COIL

Keeping the surfaces of the microchannel coils clean is essential to ensure the correct operation of the unit and to avoid punctures on the coil with the consequent loss of refrigerant gas which would lead to the replacement of the coil itself.



WARNING Damage to the coil due to neglect or lack of or poor cleaning is not covered by the warranty.

Dirt, grease, oil, and other foreign material must be removed periodically from the surface of the battery according to the following recommendations.

Required elements:

- Personal protective equipment
- Hot water
- High-pressure washing

Procedure:

Use a high-pressure washer with a large cast and enough force to remove all foreign

material, proceed with care to avoid damage and possible wear of the louvers.

Lastly, also rinse the carpentry and the fans thoroughly to be sure that all impurities have been removed.

■ Aermecwe assume no liability for the completeness of the information contained in this document.

10 TECHNICAL DATA

STANDARD UNIT

NRB - A

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Cooling performance chiller operation (1)															
Cooling capacity	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	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
Cooling total input current	A	108.0	118.0	127.0	143.0	160.0	185.0	206.0	235.0	260.0	287.0	309.0	336.0	363.0	391.0
EER	BTU/(Wh)	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/(Wh)	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 system side	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 drop system side	ftH ₂ O	12.0	13.4	18.4	20.4	24.1	29.4	17.4	19.1	24.1	26.8	32.8	19.1	21.4	22.7
Cooling performances with free-cooling (2)															
Cooling capacity	ton	37.5	38.7	54.2	56.1	57.4	58.9	76.1	78.0	95.2	97.1	114.3	131.3	133.4	135.4
Input power	kW	9.6	9.6	14.5	14.5	14.5	14.5	19.3	19.3	24.1	24.1	28.9	33.7	33.7	33.7
Free cooling total input current	A	15.0	14.0	21.0	21.0	21.0	20.0	27.0	27.0	34.0	34.0	41.0	48.0	47.0	47.0
EER	BTU/(Wh)	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 system side	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 drop system side	ftH ₂ O	26.1	30.4	32.5	37.1	44.2	58.9	34.1	39.1	43.5	49.2	55.5	35.8	40.1	43.5

(1) Reference conditions: AHRI std 550/590 I-P; Service side water 54.01°F / 44.01°F; Outside air 95°F

(2) System side water heat exchanger 54.01 °F / * °F; External air 35.6 °F

NRB - E

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Cooling performance chiller operation (1)															
Cooling capacity	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	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
Cooling total input current	A	99.0	110.0	120.0	132.0	149.0	175.0	194.0	217.0	246.0	268.0	295.0	317.0	346.0	369.0
EER	BTU/(Wh)	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/(Wh)	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 system side	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 drop system side	ftH ₂ O	10.7	13.0	14.4	19.7	21.7	27.1	14.7	19.1	21.1	22.1	25.1	17.1	19.1	21.4
Cooling performances with free-cooling (2)															
Cooling capacity	ton	37.3	38.5	39.6	50.9	52.1	53.4	65.8	78.0	79.5	91.8	93.1	105.4	106.6	119.1
Input power	kW	3.8	3.8	3.8	5.0	5.0	5.0	6.3	7.5	7.5	8.8	8.8	10.0	10.0	11.3
Free cooling total input current	A	6.0	5.6	5.2	7.1	7.0	6.9	8.6	10.0	10.0	12.0	12.0	14.0	14.0	15.0
EER	BTU/(Wh)	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 system side	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 drop system side	ftH ₂ O	18.7	23.4	26.8	32.1	36.1	44.8	26.8	31.8	36.1	37.8	43.2	30.4	33.8	36.5

(1) Reference conditions: AHRI std 550/590 I-P; Service side water 54.01°F / 44.01°F; Outside air 95°F

(2) System side water heat exchanger 54.01 °F / * °F; External air 35.6 °F

NRB - U

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Cooling performance chiller operation (1)															
Cooling capacity	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	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
Cooling total input current	A	110.0	119.0	128.0	145.0	161.0	183.0	207.0	235.0	261.0	287.0	310.0	337.0	363.0	391.0
EER	BTU/(Wh)	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/(Wh)	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 system side	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 drop system side	ftH ₂ O	11.7	15.1	16.7	22.1	24.8	31.8	16.7	21.4	24.4	25.4	29.1	19.7	22.4	24.8
Cooling performances with free-cooling (2)															
Cooling capacity	ton	49.7	52.1	54.4	68.5	71.1	74.0	90.3	105.9	109.6	125.7	128.8	144.8	147.7	164.2
Input power	kW	14.5	14.5	14.5	19.3	19.3	19.3	24.1	28.9	28.9	33.7	33.7	38.6	38.6	43.4
Free cooling total input current	A	23.0	22.0	21.0	28.0	28.0	27.0	34.0	41.0	41.0	48.0	48.0	55.0	54.0	61.0
EER	BTU/(Wh)	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 system side	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 drop system side	ftH ₂ O	21.1	26.4	30.8	36.1	41.1	52.2	30.4	35.8	41.8	43.5	50.2	34.8	39.1	41.8

(1) Reference conditions: AHRI std 550/590 I-P; Service side water 54.01°F / 44.01°F; Outside air 95°F

(2) System side water heat exchanger 54.01 °F / * °F; External air 35.6 °F

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Cooling performance chiller operation (1)														
Cooling capacity	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
Input power	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
Cooling total input current	A	98.0	107.0	116.0	130.0	146.0	169.0	190.0	213.0	241.0	263.0	289.0	312.0	340.0
EER	BTU/(Wh)	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
IPLV	BTU/(Wh)	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
Water flow rate system side	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
Pressure drop system side	fth ₀	11.4	14.7	16.1	21.1	23.4	29.8	15.7	20.1	22.4	23.1	26.8	18.1	20.1
Cooling performances with free-cooling (2)														
Cooling capacity	ton	45.4	47.5	49.5	59.9	61.9	64.0	76.0	87.7	90.1	102.1	104.0	116.0	117.6
Input power	kW	5.0	5.0	5.0	6.3	6.3	6.3	7.5	8.8	8.8	10.0	10.0	11.3	11.3
Free cooling total input current	A	8.1	7.5	7.1	8.9	8.9	8.8	10.0	12.0	12.0	14.0	14.0	16.0	17.0
EER	BTU/(Wh)	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
Water flow rate system side	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
Pressure drop system side	fth ₀	18.1	22.7	26.8	32.5	36.8	46.2	26.4	31.8	36.5	38.5	44.2	30.1	33.8

(1) Reference conditions: AHRI std 550/590 I-P; Service side water 54.01°F / 44.01°F; Outside air 95°F

(2) System side water heat exchanger 54.01 °F / * °F; External air 35.6 °F

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Compressor															
Type	A,E,N,U	type													
Compressor regulation	A,E,N,U	Type													
Number	A,E,N,U	no.	4	4	4	4	4	4	4	4	5	6	6	6	
Circuits	A,E,N,U	no.	2	2	2	2	2	2	2	2	2	2	2	2	
Particulation of the unit with mechanical thermostatic valve	A,E,N,U	%	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
Particulation of the unit with electronic thermostatic expansion valve	A,E,N,U	%	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	17-35-53-69-87-100
Refrigerant	A,E,N,U	type													
Refrigerant load circuit 1 (1)	A	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	
	E,U	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	
	N	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	
Refrigerant load circuit 2 (1)	A	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	
	E,U	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	
	N	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	
Oil charge circuit 1	A,E,N,U	lbs	14.3	14.3	20.5	25.4	30.0	28.9	27.8	27.8	27.8	41.7	41.7	41.7	
Oil charge circuit 2	A,E,N,U	lbs	14.3	20.5	20.5	25.4	30.0	28.9	27.8	27.8	41.7	41.7	41.7	41.7	
System side heat exchanger															
Type	A,E,N,U	type													
Number	A,E,N,U	no.	1	1	1	1	1	1	1	1	1	1	1	1	
Minimum water flow rate	A	gpm	75.7	85.3	100.2	112.0	122.2	141.9	159.9	177.7	200.2	217.6	240.4	264.8	
	E	gpm	75.9	84.8	94.5	109.4	120.0	133.8	156.0	176.9	193.3	215.3	230.3	251.7	
	N	gpm	78.6	88.3	99.2	112.9	124.4	139.8	161.1	181.2	199.0	220.6	236.7	257.2	
	U	gpm	80.1	90.1	101.3	116.0	128.0	144.4	166.9	188.1	207.5	230.4	247.9	269.5	
Maximum water flow rate	A	gpm	252.3	284.2	334.1	373.4	407.5	472.9	533.0	592.4	667.3	725.5	801.5	882.8	
	E	gpm	253.1	282.6	314.9	364.8	399.9	446.1	519.9	589.6	644.2	717.8	767.5	838.9	
	N	gpm	261.9	294.5	330.6	376.2	414.6	466.1	536.8	604.1	663.2	735.4	788.9	857.4	
	U	gpm	267.0	300.5	337.7	386.6	426.7	481.3	556.2	627.1	691.6	768.2	826.4	898.2	
Water content	A	gal	5.0	6.6	6.6	8.5	8.5	11.9	11.9	15.3	15.3	18.5	18.5	22.5	
	E,N,U	gal	6.6	6.6	8.5	8.5	11.9	11.9	15.3	15.3	18.5	22.5	22.5	26.4	
Hydraulic connections															
Connections (in/out)	A,E,N,U	Type													
Sizes (in/out)	A	Ø	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	5"	5"	
	E,N,U	Ø	3"	3"	3"	3"	3"	3"	3"	3"	5"	5"	5"	5"	
Sound data calculated in cooling mode (2)															
Sound power level	A	dB(A)	87.5	90.1	92.1	93.4	94.4	94.0	93.9	95.8	97.3	96.3	95.5	97.1	
	E	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	
	N	dB(A)	84.2	88.5	90.7	92.4	93.6	93.2	92.7	95.1	96.6	95.6	94.4	96.2	
	U	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	
Sound pressure level (10 m / 33 ft)	A	dB(A)	55.4	57.9	59.9	61.2	62.1	61.8	61.5	63.4	64.7	63.8	62.8	64.3	
	E	dB(A)	51.8	56.2	58.4	60.0	61.2	60.7	60.1	62.4	63.9	62.8	61.6	63.2	
	N	dB(A)	51.8	56.1	58.3	59.9	61.1	60.6	60.0	62.3	63.8	62.7	61.5	63.1	
	U	dB(A)	56.4	58.5	59.9	61.3	62.3	61.9	61.7	63.5	64.7	64.0	63.1	64.4	
Sound pressure level (1 m / 3.3 ft)	A	dB(A)	68.3	70.9	72.3	73.6	74.6	74.2	73.6	75.5	76.4	75.5	74.2	75.4	
	E	dB(A)	74.3	68.7	70.8	72.0	73.2	72.8	71.8	73.8	75.3	73.9	72.7	74.1	
	N	dB(A)	63.8	68.2	70.3	71.5	72.8	72.3	71.4	73.4	74.9	73.6	72.3	73.7	
	U	dB(A)	68.8	70.9	72.3	73.4	74.3	73.9	73.3	74.9	76.1	75.1	74.2	76.2	

(1) The load indicated in the table is an estimated and preliminary value. The final value of the refrigerant load is indicated on the unit's technical label. For further information contact the office.

(2) Sound power calculated on the basis of measurements made in accordance with UNI EN ISO 9614-2. Sound pressure (cold functioning) measured in free field, 10 m / 33 ft away from the unit external surface (in compliance with UNI EN ISO 3744).

Maximum system water content

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
INTEGRATED HYDRONIC KIT: 00														
Hydronic kit														
Expansion vessel number	A,E,N,U	no.									/			

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Expansion vessel capacity	A,E,N,U	gal	/	/	/	/	/	/	/	/	/	/	/	/	/
Storage tank number	A,E,N,U	no.													
Storage tank capacity	A,E,N,U	gal	/	/	/	/	/	/	/	/	/	/	/	/	/
Pressure relief valve	A,E,N,U	n°/psi													
INTEGRATED HYDRONIC KIT: AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ															
Hydronic kit															
	A	no.	2	2	2	2	2	2	2	2	2	2	3	3	3
Expansion vessel number	E,U	no.	2	2	2	2	2	2	3	3	3	3	3	3	3
	N	no.	2	2	2	2	2	3	3	3	3	3	3	3	3
Expansion vessel capacity	A,E,N,U	gal	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Storage tank number	A,E,N,U	no.											1		
	A	gal	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	317.0	317.0	317.0
Storage tank capacity	E,U	gal	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	317.0	317.0	317.0
	N	gal	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	317.0	317.0	317.0
Pressure relief valve	A,E,N,U	n°/psi											1/85.2		

INTEGRATED HYDRONIC KIT: DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ

Hydronic kit

Expansion vessel number	A,E,N,U	no.													2
Expansion vessel capacity	A,E,N,U	gal	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Storage tank number	A,E,N,U	no.													/
Storage tank capacity	A,E,N,U	gal	/	/	/	/	/	/	/	/	/	/	/	/	/
Pressure relief valve	A,E,N,U	n°/psi											1/85.2		

Electric data

Power supply 460V-3-60Hz

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
INTEGRATED HYDRONIC KIT: 00															
Power supply: 460V															
Peak current (LRA)	A	A	303.6	355.6	375.4	430.9	447.9	502.8	544.4	659.6	701.8	734.5	692.5	815.5	849.9
	E,U	A	311.4	363.4	375.4	438.7	455.7	510.6	552.2	675.2	709.6	750.1	700.3	823.3	857.7
	N	A	319.2	371.2	383.2	446.5	463.5	518.4	560.0	683.0	717.4	757.9	708.1	831.1	865.5
	A	A	150.0	150.0	175.0	200.0	225.0	250.0	300.0	350.0	400.0	400.0	400.0	450.0	500.0
Minimum circuit amperage (MCA)	E,U	A	150.0	150.0	175.0	200.0	225.0	250.0	300.0	350.0	400.0	400.0	450.0	450.0	500.0
	N	A	150.0	175.0	175.0	200.0	225.0	250.0	300.0	350.0	400.0	400.0	450.0	500.0	600.0
Maximum overcurrent permitted by the protection device (MOP)	A	A	150.0	150.0	175.0	225.0	250.0	300.0	350.0	400.0	400.0	450.0	450.0	500.0	600.0
	E,U	A	150.0	175.0	175.0	225.0	250.0	300.0	400.0	400.0	450.0	450.0	500.0	500.0	600.0
	N	A	175.0	175.0	175.0	225.0	250.0	300.0	400.0	450.0	450.0	500.0	500.0	500.0	600.0

INTEGRATED HYDRONIC KIT: AA, BA, DA, PA

Power supply: 460V

Peak current (LRA)	A	A	309.0	361.0	380.8	436.3	453.3	-	-	-	-	-	-	-	-
	E,U	A	316.8	368.8	380.8	444.1	461.1	-	-	-	-	-	-	-	-
	N	A	324.6	376.6	388.6	451.9	468.9	-	-	-	-	-	-	-	-
	A	A	150.0	150.0	175.0	200.0	225.0	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	E,U	A	150.0	175.0	200.0	225.0	-	-	-	-	-	-	-	-	-
	N	A	175.0	175.0	175.0	225.0	250.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A,E,U	A	150.0	175.0	175.0	225.0	250.0	-	-	-	-	-	-	-	-
	N	A	175.0	175.0	200.0	225.0	250.0	-	-	-	-	-	-	-	-

INTEGRATED HYDRONIC KIT: AB, BB, DB, PB

Power supply: 460V

Peak current (LRA)	A	A	310.3	362.3	382.1	437.6	454.6	509.5	-	-	-	-	-	-	-
	E,U	A	318.1	370.1	382.1	445.4	462.4	517.3	-	-	-	-	-	-	-
	N	A	325.9	377.9	389.9	453.2	470.2	525.1	-	-	-	-	-	-	-
	A	A	150.0	150.0	175.0	200.0	225.0	250.0	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	E,U	A	150.0	175.0	175.0	200.0	225.0	250.0	-	-	-	-	-	-	-
	N	A	175.0	175.0	175.0	225.0	250.0	300.0	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	150.0	175.0	175.0	225.0	250.0	300.0	-	-	-	-	-	-	-
	E,U	A	175.0	175.0	175.0	225.0	250.0	300.0	-	-	-	-	-	-	-
	N	A	175.0	175.0	200.0	250.0	250.0	300.0	-	-	-	-	-	-	-

INTEGRATED HYDRONIC KIT: AC, BC, DC, PC

Power supply: 460V

Peak current (LRA)	A	A	312.5	364.5	384.3	439.8	456.8	511.7	553.3	668.5	-	-	-	-	-
	E,U	A	320.3	372.3	384.3	447.6	464.6	519.5	561.1	684.1	-	-	-	-	-
	N	A	328.1	380.1	392.1	455.4	472.4	527.3	568.9	691.9	-	-	-	-	-
	A	A	150.0	150.0	175.0	200.0	225.0	250.0	300.0	350.0	-	-	-	-	-
Minimum circuit amperage (MCA)	E,U	A	150.0	175.0	175.0	200.0	225.0	300.0	300.0	350.0	-	-	-	-	-
	N	A	175.0	175.0	175.0	225.0	250.0	300.0	300.0	350.0	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	150.0	175.0	175.0	225.0	250.0	300.0	300.0	350.0	-	-	-	-	-
	E,U	A	175.0	175.0	175.0	225.0	250.0	300.0	300.0	400.0	-	-	-	-	-
	N	A	175.0	175.0	200.0	250.0	250.0	300.0	300.0	400.0	-	-	-	-	-

INTEGRATED HYDRONIC KIT: AD, BD, DD, PD

Power supply: 460V

Peak current (LRA)	A	A	315.8	367.8	387.6	443.1	460.1	515.0	556.6	671.8	-	-	-	-	-
	E,U	A	323.6	375.6	387.6	450.9	467.9	522.8	564.4	687.4	-	-	-	-	-
	N	A	331.4	383.4	395.4	458.7	475.7	530.6	572.2	695.2	-	-	-	-	-

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Minimum circuit amperage (MCA)	A	A	150.0	175.0	175.0	200.0	225.0	250.0	300.0	350.0	-	-	-	-	-
	E,U	A	175.0	175.0	175.0	225.0	250.0	300.0	300.0	350.0	-	-	-	-	-
	N	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	150.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	-	-	-	-	-
	E,U	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	400.0	-	-	-	-	-
	N	A	175.0	200.0	200.0	250.0	250.0	300.0	350.0	400.0	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AE, BE, DE, PE															
Power supply: 460V															
Peak current (LRA)	A	A	315.8	367.8	387.6	443.1	460.1	515.0	556.6	671.8	714.0	-	-	-	-
	E,U	A	323.6	375.6	387.6	450.9	467.9	522.8	564.4	687.4	721.8	-	-	-	-
	N	A	331.4	383.4	395.4	458.7	475.7	530.6	572.2	695.2	729.6	-	-	-	-
Minimum circuit amperage (MCA)	A	A	150.0	175.0	175.0	200.0	225.0	250.0	300.0	350.0	400.0	-	-	-	-
	E,U	A	175.0	175.0	175.0	225.0	250.0	300.0	300.0	350.0	400.0	-	-	-	-
	N	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	400.0	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	150.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	400.0	-	-	-	-
	E,U	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	400.0	400.0	-	-	-	-
	N	A	175.0	200.0	200.0	250.0	250.0	300.0	350.0	400.0	450.0	-	-	-	-
INTEGRATED HYDRONIC KIT: AF, BF, DF, PF															
Power supply: 460V															
Peak current (LRA)	A	A	318.7	370.7	390.5	446.0	463.0	517.9	559.5	674.7	716.9	749.6	-	-	-
	E,U	A	326.5	378.5	390.5	453.8	470.8	525.7	567.3	690.3	724.7	765.2	-	-	-
	N	A	334.3	386.3	398.3	461.6	478.6	533.5	575.1	698.1	732.5	773.0	-	-	-
Minimum circuit amperage (MCA)	A	A	150.0	175.0	175.0	200.0	225.0	250.0	300.0	350.0	400.0	400.0	-	-	-
	E,U	A	175.0	175.0	175.0	225.0	250.0	300.0	300.0	350.0	400.0	450.0	-	-	-
	N	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	400.0	450.0	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	400.0	400.0	450.0	-	-	-
	E,U	A	175.0	175.0	200.0	250.0	250.0	300.0	300.0	400.0	450.0	450.0	-	-	-
	N	A	175.0	200.0	200.0	250.0	250.0	300.0	350.0	400.0	450.0	450.0	-	-	-
INTEGRATED HYDRONIC KIT: AG, BG, DG, PG															
Power supply: 460V															
Peak current (LRA)	A	A	321.0	373.0	392.8	448.3	465.3	520.2	561.8	677.0	719.2	751.9	709.9	832.9	-
	E,U	A	328.8	380.8	392.8	456.1	473.1	528.0	569.6	692.6	727.0	767.5	717.7	840.7	-
	N	A	336.6	388.6	400.6	463.9	480.9	535.8	577.4	700.4	734.8	775.3	725.5	848.5	-
Minimum circuit amperage (MCA)	A	A	150.0	175.0	175.0	200.0	225.0	250.0	300.0	350.0	400.0	400.0	450.0	500.0	-
	E,U	A	175.0	175.0	175.0	225.0	250.0	300.0	300.0	350.0	400.0	450.0	450.0	500.0	-
	N	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	400.0	450.0	450.0	500.0	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	400.0	400.0	450.0	450.0	500.0	-
	E,U	A	175.0	175.0	200.0	250.0	250.0	300.0	300.0	400.0	450.0	450.0	450.0	500.0	-
	N	A	175.0	200.0	200.0	250.0	250.0	300.0	350.0	400.0	450.0	450.0	450.0	500.0	-
INTEGRATED HYDRONIC KIT: AH, BH, DH, PH															
Power supply: 460V															
Peak current (LRA)	A	A	326.4	378.4	398.2	453.7	470.7	525.6	567.2	682.4	724.6	757.3	715.3	838.3	872.7
	E,U	A	334.2	386.2	398.2	461.5	478.5	533.4	575.0	698.0	732.4	772.9	723.1	846.1	880.5
	N	A	342.0	394.0	406.0	469.3	486.3	541.2	582.8	705.8	740.2	780.7	730.9	853.9	888.3
Minimum circuit amperage (MCA)	A	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	400.0	400.0	450.0	500.0	600.0
	E,U	A	175.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	400.0	450.0	450.0	500.0	600.0
	N	A	175.0	200.0	200.0	225.0	250.0	300.0	300.0	400.0	400.0	450.0	450.0	500.0	600.0
Maximum overcurrent permitted by the protection device (MOP)	A	A	175.0	175.0	200.0	250.0	250.0	300.0	300.0	400.0	450.0	450.0	450.0	500.0	600.0
	E,U	A	175.0	200.0	200.0	250.0	250.0	300.0	350.0	400.0	450.0	450.0	450.0	500.0	600.0
	N	A	175.0	200.0	200.0	250.0	250.0	300.0	350.0	400.0	450.0	450.0	450.0	500.0	600.0
INTEGRATED HYDRONIC KIT: AI, BI, DI, PI															
Power supply: 460V															
Peak current (LRA)	A	A	-	-	-	458.9	475.9	530.8	572.4	687.6	729.8	762.5	720.5	843.5	877.9
	E,U	A	-	-	-	466.7	483.7	538.6	580.2	703.2	737.6	778.1	728.3	851.3	885.7
	N	A	-	-	-	474.5	491.5	546.4	588.0	711.0	745.4	785.9	736.1	859.1	893.5
Minimum circuit amperage (MCA)	A	A	-	-	-	225.0	250.0	300.0	300.0	350.0	400.0	400.0	450.0	500.0	600.0
	E,U	A	-	-	-	225.0	250.0	300.0	350.0	400.0	400.0	450.0	450.0	500.0	600.0
	N	A	-	-	-	250.0	250.0	300.0	350.0	400.0	400.0	450.0	450.0	500.0	600.0
Maximum overcurrent permitted by the protection device (MOP)	A,E,U	A	-	-	-	250.0	250.0	300.0	350.0	400.0	450.0	450.0	450.0	500.0	600.0
	N	A	-	-	-	250.0	250.0	300.0	350.0	400.0	450.0	450.0	450.0	500.0	600.0
	A	A	-	-	-	250.0	250.0	300.0	350.0	400.0	450.0	450.0	450.0	500.0	600.0
INTEGRATED HYDRONIC KIT: AJ, BJ, DJ, PJ															
Power supply: 460V															
Peak current (LRA)	A	A	-	392.4	412.2	467.7	484.7	539.6	581.2	696.4	738.6	771.3	729.3	852.3	886.7
	E,U	A	-	400.2	412.2	475.5	492.5	547.4	589.0	712.0	746.4	786.9	737.1	860.1	894.5
	N	A	-	408.0	420.0	483.3	500.3	555.2	596.8	719.8	754.2	794.7	744.9	867.9	902.3
Minimum circuit amperage (MCA)	A	A	-	200.0	200.0	225.0	250.0	300.0	350.0	400.0	400.0	450.0	450.0	500.0	600.0
	E,U	A	-	200.0	200.0	250.0	250.0	300.0	350.0	400.0	400.0	450.0	450.0	500.0	600.0
	N	A	-	200.0	225.0	250.0	300.0	350.0	400.0	450.0	450.0	450.0	500.0	600.0	600.0
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	200.0	225.0	250.0	250.0	300.0	350.0	400.0	450.0	450.0	450.0	500.0	600.0
	E,U	A	-	200.0	225.0	250.0	250.0	300.0	350.0	400.0	450.0	450.0	450.0	500.0	600.0
	N	A	-	225.0	225.0	250.0	300.0	300.0	350.0	400.0	450.0	500.0	500.0	600.0	600.0

Power supply 230V-3-60Hz

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
INTEGRATED HYDRONIC KIT: 00															
Power supply: 230V															
Peak current (LRA)	A	A	588.8	769.8	815.2	935.8	977.0	-	-	-	-	-	-	-	-
	E,U	A	602.2	783.2	815.2	949.2	990.4	-	-	-	-	-	-	-	-
	N	A	615.6	796.6	828.6	962.6	1,003.8	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	300.0	350.0	400.0	400.0	-	-	-	-	-	-	-	-
	E,U	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	N	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	300.0	350.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	N	A	300.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AA, BA, DA, PA															
Power supply: 230V															
Peak current (LRA)	A	A	599.7	780.7	826.1	946.7	987.9	-	-	-	-	-	-	-	-
	E,U	A	613.1	794.1	826.1	960.1	1,001.3	-	-	-	-	-	-	-	-
	N	A	626.5	807.5	839.5	973.5	1,014.7	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A,E,U	A	300.0	350.0	400.0	400.0	450.0	-	-	-	-	-	-	-	-
	N	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	300.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AB, BB, DB, PB															
Power supply: 230V															
Peak current (LRA)	A	A	602.2	783.2	828.6	949.2	990.4	-	-	-	-	-	-	-	-
	E,U	A	615.6	796.6	828.6	962.6	1,003.8	-	-	-	-	-	-	-	-
	N	A	629.0	810.0	842.0	976.0	1,017.2	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	350.0	400.0	400.0	450.0	-	-	-	-	-	-	-	-
	E,N,U	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	300.0	350.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,U	A	300.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AC, BC, DC, PC															
Power supply: 230V															
Peak current (LRA)	A	A	606.6	787.6	833.0	953.6	994.8	-	-	-	-	-	-	-	-
	E,U	A	620.0	801.0	833.0	967.0	1,008.2	-	-	-	-	-	-	-	-
	N	A	633.4	814.4	846.4	980.4	1,021.6	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	350.0	400.0	400.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	300.0	350.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AD, AE, BD, BE, DD, DE, PD, PE															
Power supply: 230V															
Peak current (LRA)	A	A	613.3	794.3	839.7	960.3	1,001.5	-	-	-	-	-	-	-	-
	E,U	A	626.7	807.7	839.7	973.7	1,014.9	-	-	-	-	-	-	-	-
	N	A	640.1	821.1	853.1	987.1	1,028.3	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	350.0	400.0	400.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	300.0	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,N,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AF, BF, DF, PF															
Power supply: 230V															
Peak current (LRA)	A	A	619.1	800.1	845.5	966.1	1,007.3	-	-	-	-	-	-	-	-
	E,U	A	632.5	813.5	845.5	979.5	1,020.7	-	-	-	-	-	-	-	-
	N	A	645.9	826.9	858.9	992.9	1,034.1	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	300.0	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,N,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AG, BG, DG, PG															
Power supply: 230V															
Peak current (LRA)	A	A	623.8	804.8	850.2	970.8	1,012.0	-	-	-	-	-	-	-	-
	E,U	A	637.2	818.2	850.2	984.2	1,025.4	-	-	-	-	-	-	-	-
	N	A	650.6	831.6	863.6	997.6	1,038.8	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A,E,N,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
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INTEGRATED HYDRONIC KIT: AH, BH, DH, PH

Power supply: 230V

Peak current (LRA)	A	A	635.3	816.3	861.7	982.3	1,023.5	-	-	-	-	-	-	-	-
	E,U	A	648.7	829.7	861.7	995.7	1,036.9	-	-	-	-	-	-	-	-
	N	A	662.1	843.1	875.1	1,009.1	1,050.3	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	350.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A,E,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	450.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-

INTEGRATED HYDRONIC KIT: AI, BI, DI, PI

Power supply: 230V

Peak current (LRA)	A	A	-	-	-	992.7	1,033.9	-	-	-	-	-	-	-	-
	E,U	A	-	-	-	1,006.1	1,047.3	-	-	-	-	-	-	-	-
	N	A	-	-	-	1,019.5	1,060.7	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A,E,U	A	-	-	-	450.0	500.0	-	-	-	-	-	-	-	-
	N	A	-	-	-	500.0	500.0	-	-	-	-	-	-	-	-
	A,E,N,U	A	-	-	-	500.0	500.0	-	-	-	-	-	-	-	-

INTEGRATED HYDRONIC KIT: AJ, BJ, DJ, PJ

Power supply: 230V

Peak current (LRA)	A	A	-	842.8	888.2	1,008.8	1,050.0	-	-	-	-	-	-	-	-
	E,U	A	-	856.2	888.2	1,022.2	1,063.4	-	-	-	-	-	-	-	-
	N	A	-	869.6	901.6	1,035.6	1,076.8	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,N,U	A	-	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
	A,E,N,U	A	-	450.0	500.0	500.0	500.0	-	-	-	-	-	-	-	-

Power supply 575V-3-60Hz

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
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INTEGRATED HYDRONIC KIT: 00

Power supply: 575V

Peak current (LRA)	A	A	231.0	284.0	300.3	365.1	378.7	393.6	427.6	574.9	603.8	635.3	546.9	700.4	723.0	745.6
	E,U	A	237.3	290.3	300.3	371.3	384.9	399.8	433.9	587.4	610.0	647.7	553.1	706.7	729.3	758.1
	N	A	243.5	296.5	306.5	377.6	391.2	406.1	440.1	593.6	616.2	654.0	559.4	712.9	735.5	764.4
Minimum circuit amperage (MCA)	A	A	125.0	125.0	150.0	150.0	175.0	225.0	250.0	300.0	300.0	350.0	350.0	400.0	400.0	400.0
	E,U	A	125.0	125.0	150.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	350.0	400.0	400.0	400.0
	N	A	150.0	150.0	150.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	400.0	400.0	400.0	400.0
Maximum overcurrent permitted by the protection device (MOP)	A	A	125.0	125.0	150.0	175.0	200.0	250.0	250.0	300.0	300.0	350.0	350.0	400.0	400.0	400.0
	E,U	A	125.0	150.0	150.0	175.0	200.0	250.0	250.0	300.0	300.0	350.0	350.0	400.0	400.0	400.0
	N	A	150.0	150.0	150.0	175.0	200.0	250.0	300.0	300.0	350.0	400.0	400.0	400.0	400.0	400.0

INTEGRATED HYDRONIC KIT: AA, BA, DA, PA

Power supply: 575V

Peak current (LRA)	A	A	235.4	288.4	304.6	369.4	383.0	-	-	-	-	-	-	-	-
	E,U	A	241.6	294.6	304.6	375.7	389.3	-	-	-	-	-	-	-	-
	N	A	247.9	300.9	310.9	381.9	395.5	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	125.0	125.0	150.0	175.0	175.0	-	-	-	-	-	-	-	-
	E,N,U	A	150.0	150.0	150.0	175.0	200.0	-	-	-	-	-	-	-	-
	A	A	125.0	150.0	150.0	175.0	200.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	E,U	A	150.0	150.0	150.0	175.0	200.0	-	-	-	-	-	-	-	-
	N	A	150.0	150.0	150.0	200.0	200.0	-	-	-	-	-	-	-	-

INTEGRATED HYDRONIC KIT: AB, BB, DB, PB

Power supply: 575V

Peak current (LRA)	A	A	236.3	289.3	305.5	370.3	383.9	398.8	-	-	-	-	-	-	-
	E,U	A	242.5	295.5	305.5	376.6	390.2	405.1	-	-	-	-	-	-	-
	N	A	248.8	301.8	311.8	382.8	396.4	411.3	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	125.0	125.0	150.0	175.0	175.0	225.0	-	-	-	-	-	-	-
	E,N,U	A	150.0	150.0	150.0	175.0	200.0	225.0	-	-	-	-	-	-	-
	A	A	125.0	150.0	150.0	175.0	200.0	250.0	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	E,U	A	150.0	150.0	150.0	175.0	200.0	250.0	-	-	-	-	-	-	-
	N	A	150.0	150.0	150.0	200.0	200.0	250.0	-	-	-	-	-	-	-

INTEGRATED HYDRONIC KIT: AC, BC, DC, PC

Power supply: 575V

Peak current (LRA)	A	A	238.2	291.2	307.5	372.3	385.9	400.8	434.8	582.1	-	-	-	-	-
	E,U	A	244.5	297.5	307.5	378.5	392.1	407.0	441.1	594.6	-	-	-	-	-
	N	A	250.7	303.7	313.7	384.8	398.4	413.3	447.3	600.8	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	125.0	125.0	150.0	175.0	200.0	225.0	250.0	250.0	-	-	-	-	-
	E,N,U	A	150.0	150.0	150.0	175.0	200.0	225.0	300.0	300.0	-	-	-	-	-
	A	A	125.0	150.0	150.0	175.0	200.0	250.0	250.0	300.0	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	E,U	A	150.0	150.0	150.0	200.0	200.0	250.0	300.0	300.0	-	-	-	-	-
	N	A	150.0	150.0	150.0	200.0	225.0	250.0	300.0	300.0	-	-	-	-	-

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
INTEGRATED HYDRONIC KIT: AD, BD, DD, PD														
Power supply: 575V														
Peak current (LRA)	A	A	241.0	294.0	310.3	375.1	388.7	403.6	437.6	584.9	-	-	-	-
	E,U	A	247.3	300.3	310.3	381.3	394.9	409.8	443.9	597.4	-	-	-	-
	N	A	253.5	306.5	316.5	387.6	401.2	416.1	450.1	603.6	-	-	-	-
Minimum circuit amperage (MCA)	A	A	150.0	150.0	150.0	175.0	200.0	225.0	250.0	300.0	-	-	-	-
	E,N,U	A	150.0	150.0	150.0	175.0	200.0	225.0	250.0	300.0	300.0	-	-	-
	A	A	150.0	150.0	150.0	175.0	200.0	250.0	300.0	300.0	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	E,U	A	150.0	150.0	150.0	200.0	200.0	250.0	300.0	300.0	-	-	-	-
	N	A	150.0	150.0	150.0	200.0	225.0	250.0	300.0	300.0	-	-	-	-
	A	A	150.0	150.0	150.0	200.0	225.0	250.0	300.0	300.0	-	-	-	-
INTEGRATED HYDRONIC KIT: AE, BE, DE, PE														
Power supply: 575V														
Peak current (LRA)	A	A	241.0	294.0	310.3	375.1	388.7	403.6	437.6	584.9	613.8	-	-	-
	E,U	A	247.3	300.3	310.3	381.3	394.9	409.8	443.9	597.4	620.0	-	-	-
	N	A	253.5	306.5	316.5	387.6	401.2	416.1	450.1	603.6	626.2	-	-	-
Minimum circuit amperage (MCA)	A	A	150.0	150.0	150.0	175.0	200.0	225.0	250.0	300.0	300.0	-	-	-
	E,N,U	A	150.0	150.0	150.0	175.0	200.0	225.0	300.0	300.0	300.0	-	-	-
	A	A	150.0	150.0	150.0	175.0	200.0	250.0	300.0	300.0	300.0	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	E,U	A	150.0	150.0	150.0	200.0	200.0	250.0	300.0	300.0	300.0	-	-	-
	N	A	150.0	150.0	150.0	200.0	225.0	250.0	300.0	300.0	300.0	-	-	-
	A	A	150.0	150.0	150.0	200.0	225.0	250.0	300.0	300.0	300.0	-	-	-
INTEGRATED HYDRONIC KIT: AF, BF, DF, PF														
Power supply: 575V														
Peak current (LRA)	A	A	243.1	296.1	312.4	377.2	390.8	405.7	439.7	587.0	615.9	647.4	-	-
	E,U	A	249.4	302.4	312.4	383.4	397.0	411.9	446.0	599.5	622.1	659.8	-	-
	N	A	255.6	308.6	318.6	389.7	403.3	418.2	452.2	605.7	628.3	666.1	-	-
Minimum circuit amperage (MCA)	A	A	150.0	150.0	150.0	175.0	200.0	225.0	250.0	300.0	300.0	350.0	-	-
	E,U	A	150.0	150.0	150.0	175.0	200.0	225.0	300.0	300.0	300.0	350.0	-	-
	N	A	150.0	150.0	150.0	175.0	200.0	250.0	300.0	300.0	300.0	350.0	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	150.0	150.0	150.0	175.0	200.0	250.0	300.0	300.0	300.0	350.0	-	-
	E,N,U	A	150.0	150.0	150.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0	-	-
	A	A	150.0	150.0	150.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0	-	-
INTEGRATED HYDRONIC KIT: AG, BG, DG, PG														
Power supply: 575V														
Peak current (LRA)	A	A	245.0	298.0	314.3	379.1	392.7	407.6	441.6	588.9	617.8	649.3	560.9	714.4
	E,U	A	251.3	304.3	314.3	385.3	398.9	413.8	447.9	601.4	624.0	661.7	567.1	720.7
	N	A	257.5	310.5	320.5	391.6	405.2	420.1	454.1	607.6	630.2	668.0	573.4	726.9
Minimum circuit amperage (MCA)	A,E,U	A	150.0	150.0	150.0	175.0	200.0	225.0	300.0	300.0	300.0	350.0	400.0	400.0
	N	A	150.0	150.0	150.0	175.0	200.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
	A	A	150.0	150.0	150.0	200.0	200.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
Maximum overcurrent permitted by the protection device (MOP)	E,N,U	A	150.0	150.0	150.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
	N	A	150.0	175.0	175.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
	A	A	150.0	175.0	175.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
INTEGRATED HYDRONIC KIT: AH, BH, DH, PH														
Power supply: 575V														
Peak current (LRA)	A	A	250.0	303.0	319.3	384.1	397.7	412.6	446.6	593.9	622.8	654.3	565.9	719.4
	E,U	A	256.3	309.3	319.3	390.3	403.9	418.8	452.9	606.4	629.0	666.7	572.1	725.7
	N	A	262.5	315.5	325.5	396.6	410.2	425.1	459.1	612.6	635.2	673.0	578.4	731.9
Minimum circuit amperage (MCA)	A	A	150.0	150.0	150.0	175.0	200.0	225.0	300.0	300.0	300.0	350.0	400.0	400.0
	E,U	A	150.0	150.0	150.0	175.0	200.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
	N	A	150.0	150.0	175.0	200.0	200.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
Maximum overcurrent permitted by the protection device (MOP)	A,E,U	A	150.0	150.0	150.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
	N	A	150.0	175.0	175.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
	A	A	150.0	175.0	175.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
INTEGRATED HYDRONIC KIT: AI, BI, DI, PI														
Power supply: 575V														
Peak current (LRA)	A	A	-	-	-	388.1	401.7	416.6	450.6	597.9	626.8	658.3	569.9	723.4
	E,U	A	-	-	-	394.3	407.9	422.8	456.9	610.4	633.0	670.7	576.1	729.7
	N	A	-	-	-	400.6	414.2	429.1	463.1	616.6	639.2	677.0	582.4	735.9
Minimum circuit amperage (MCA)	A	A	-	-	-	175.0	200.0	225.0	300.0	300.0	300.0	350.0	400.0	400.0
	E,U	A	-	-	-	200.0	200.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
	N	A	-	-	-	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
Maximum overcurrent permitted by the protection device (MOP)	A,E,N,U	A	-	-	-	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
	N	A	-	-	-	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
	A	A	-	-	-	200.0	225.0	250.0	300.0	300.0	300.0	350.0	400.0	400.0
INTEGRATED HYDRONIC KIT: AJ, BJ, DJ, PJ														
Power supply: 575V														
Peak current (LRA)	A	A	-	-	-	312.0	328.3	393.1	406.7	421.6	455.6	602.9	631.8	663.3
	E,U	A	-	-	-	318.3	328.3	399.3	412.9	427.8	461.9	615.4	638.0	675.7
	N	A	-	-	-	324.5	334.5	405.6	419.2	434.1	468.1	621.6	644.2	682.0
Minimum circuit amperage (MCA)	A	A	-	-	-	150.0	175.0	200.0	200.0	250.0	300.0	300.0	300.0	350.0
	E,U	A	-	-	-	175.0	175.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0
	N	A	-	-	-	175.0	175.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	-	-	150.0	175.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0
	E,U	A	-	-	-	175.0	175.0	200.0	225.0	250.0	300.0	300.0	300.0	350.0
	N	A	-	-	-	175.0	175.0	225.0	225.0	250.0	300.0	300.0	35	

Power supply 208V-3-60Hz

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
INTEGRATED HYDRONIC KIT: 00															
Power supply: 208V															
Peak current (LRA)	A	A	604.2	785.2	830.6	951.2	992.4	-	-	-	-	-	-	-	-
	E,U	A	617.6	798.6	830.6	964.6	1,005.8	-	-	-	-	-	-	-	-
	N	A	631.0	812.0	844.0	978.0	1,019.2	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	350.0	400.0	400.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	N	A	350.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	300.0	350.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,U	A	300.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AA, BA, DA, PA															
Power supply: 208V															
Peak current (LRA)	A	A	615.5	796.5	841.9	962.5	1,003.7	-	-	-	-	-	-	-	-
	E,U	A	628.9	809.9	841.9	975.9	1,017.1	-	-	-	-	-	-	-	-
	N	A	642.3	823.3	855.3	989.3	1,030.5	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A,E,U	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	300.0	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,N,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AB, BB, DB, PB															
Power supply: 208V															
Peak current (LRA)	A	A	618.3	799.3	844.7	965.3	1,006.5	-	-	-	-	-	-	-	-
	E,U	A	631.7	812.7	844.7	978.7	1,019.9	-	-	-	-	-	-	-	-
	N	A	645.1	826.1	858.1	992.1	1,033.3	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	300.0	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,N,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AC, BC, DC, PC															
Power supply: 208V															
Peak current (LRA)	A	A	622.9	803.9	849.3	969.9	1,011.1	-	-	-	-	-	-	-	-
	E,U	A	636.3	817.3	849.3	983.3	1,024.5	-	-	-	-	-	-	-	-
	N	A	649.7	830.7	862.7	996.7	1,037.9	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	350.0	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,N,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AD, AE, BD, BE, DD, DE, PD, PE															
Power supply: 208V															
Peak current (LRA)	A	A	630.2	811.2	856.6	977.2	1,018.4	-	-	-	-	-	-	-	-
	E,U	A	643.6	824.6	856.6	990.6	1,031.8	-	-	-	-	-	-	-	-
	N	A	657.0	838.0	870.0	1,004.0	1,045.2	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	300.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A,E,N,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AF, BF, DF, PF															
Power supply: 208V															
Peak current (LRA)	A	A	635.9	816.9	862.3	982.9	1,024.1	-	-	-	-	-	-	-	-
	E,U	A	649.3	830.3	862.3	996.3	1,037.5	-	-	-	-	-	-	-	-
	N	A	662.7	843.7	875.7	1,009.7	1,050.9	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	350.0	350.0	400.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	400.0	400.0	450.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A,E,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	450.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AG, BG, DG, PG															
Power supply: 208V															
Peak current (LRA)	A	A	641.3	822.3	867.7	988.3	1,029.5	-	-	-	-	-	-	-	-
	E,U	A	654.7	835.7	867.7	1,001.7	1,042.9	-	-	-	-	-	-	-	-
	N	A	668.1	849.1	881.1	1,015.1	1,056.3	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	350.0	400.0	450.0	450.0	450.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A,E,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
	N	A	350.0	450.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: AH, BH, DH, PH															
Power supply: 208V															
Peak current (LRA)	A	A	654.2	835.2	880.6	1,001.2	1,042.4	-	-	-	-	-	-	-	-
	E,U	A	667.6	848.6	880.6	1,014.6	1,055.8	-	-	-	-	-	-	-	-
	N	A	681.0	862.0	894.0	1,028.0	1,069.2	-	-	-	-	-	-	-	-

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Minimum circuit amperage (MCA)	A	A	350.0	400.0	450.0	450.0	500.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
	N	A	400.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	350.0	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
	E,U	A	350.0	450.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
	N	A	400.0	450.0	500.0	500.0	500.0	-	-	-	-	-	-	-	-

INTEGRATED HYDRONIC KIT: AI, BI, DI, PI

Power supply: 208V

Peak current (LRA)	A	A	-	-	-	1,012.2	1,053.4	-	-	-	-	-	-	-	-
	E,U	A	-	-	-	1,025.6	1,066.8	-	-	-	-	-	-	-	-
	N	A	-	-	-	1,039.0	1,080.2	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A,E,U	A	-	-	-	500.0	500.0	-	-	-	-	-	-	-	-
	N	A	-	-	-	500.0	600.0	-	-	-	-	-	-	-	-
	A,E,N,U	A	-	-	-	500.0	500.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A,E,U	A	-	-	-	500.0	500.0	-	-	-	-	-	-	-	-
	N	A	-	-	-	500.0	500.0	-	-	-	-	-	-	-	-

INTEGRATED HYDRONIC KIT: AJ, BJ, DJ, PJ

Power supply: 208V

Peak current (LRA)	A	A	-	860.0	905.4	1,026.0	1,067.2	-	-	-	-	-	-	-	-
	E,U	A	-	873.4	905.4	1,039.4	1,080.6	-	-	-	-	-	-	-	-
	N	A	-	886.8	918.8	1,052.8	1,094.0	-	-	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	400.0	450.0	500.0	500.0	-	-	-	-	-	-	-	-
	E,U	A	-	450.0	450.0	500.0	600.0	-	-	-	-	-	-	-	-
	N	A	-	450.0	500.0	500.0	600.0	-	-	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A,E,U	A	-	450.0	500.0	500.0	500.0	-	-	-	-	-	-	-	-
	N	A	-	450.0	500.0	500.0	600.0	-	-	-	-	-	-	-	-

Fans data

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
POWER SUPPLY: 6															
Inverter fan															
Type	A,E,N,U	type	Axial	Axial	Axial	Axial	Axial	-	-	-	-	-	-	-	-
Fan motor	A,E,N,U	type	Inverter	Inverter	Inverter	Inverter	Inverter	-	-	-	-	-	-	-	-
Number	A	no.	4	4	6	6	6	-	-	-	-	-	-	-	-
	E,U	no.	6	6	6	8	8	-	-	-	-	-	-	-	-
	N	no.	8	8	8	10	10	-	-	-	-	-	-	-	-
Air flow rate	A	cfm	39,680	39,680	59,521	59,521	59,521	-	-	-	-	-	-	-	-
	E	cfm	34,115	34,115	34,114	45,486	45,486	-	-	-	-	-	-	-	-
	N	cfm	45,486	45,486	45,529	56,857	56,857	-	-	-	-	-	-	-	-
Fan unit input power	A,E,N,U	kW	2.4	2.4	2.4	2.4	2.4	-	-	-	-	-	-	-	-
Total fan input power	A	kW	9.6	9.6	14.4	14.4	14.4	-	-	-	-	-	-	-	-
	E,U	kW	14.4	14.4	19.2	19.2	19.2	-	-	-	-	-	-	-	-
Fan unit input current	A,E,N,U	A	7.5	7.5	7.5	7.5	7.5	-	-	-	-	-	-	-	-
Total fan input current	A	A	30.0	30.0	45.0	45.0	45.0	-	-	-	-	-	-	-	-
	E,U	A	45.0	45.0	45.0	60.0	60.0	-	-	-	-	-	-	-	-

POWER SUPPLY: 7

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
POWER SUPPLY: 7															
Inverter fan															
Type	A,E,N,U	type	Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial
Fan motor	A,E,N,U	type	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter
Number	A	no.	4	4	6	6	6	8	8	10	12	12	14	14	14
	E,U	no.	6	6	6	8	8	8	10	12	14	14	16	16	18
	N	no.	8	8	8	10	10	10	12	14	14	16	16	18	20
Air flow rate	A	cfm	39,680	39,680	59,520	59,520	59,520	59,520	79,360	79,360	99,200	99,200	119,040	138,880	138,880
	E	cfm	34,114	34,114	34,114	45,485	45,485	45,485	45,589	56,857	68,304	68,229	79,600	90,971	102,341
	N	cfm	45,485	45,485	45,529	56,857	56,857	56,837	68,229	79,600	79,600	90,971	102,342	113,714	158,721
Fan unit input power	A,J	kW	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Total fan input power	E,N	kW	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	A	kW	8.7	8.7	13.0	13.0	13.0	17.4	17.4	21.7	21.7	26.1	30.4	30.4	30.4
	E	kW	3.4	3.4	3.4	4.5	4.5	4.5	5.6	6.7	6.7	7.9	7.9	9.0	10.1
Fan unit input current	A,E,N,U	A	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Total fan input current	A	A	15.6	15.6	23.4	23.4	23.4	23.4	31.2	31.2	39.0	46.8	46.8	54.6	54.6
	E,U	A	23.4	23.4	23.4	31.2	31.2	31.2	39.0	46.8	46.8	54.6	54.6	62.4	70.2

POWER SUPPLY: 8

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Inverter fan															
Fan motor															
Type	A,E,N,U	type	Axial												
Fan motor	A,E,N,U	type	Inverter												
Number	A	no.	4	4	6	6	6	8	8	10	10	10	12	14	14
	E,U	no.	6	6	6	8	8	8	10	12	12	14	14	16	18
	N	no.	8	8	8	10	10	10	12	14	14	16	16	18	20

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Air flow rate	A	cfm	39,680	39,680	59,521	59,521	59,521	79,360	79,361	99,201	99,201	119,040	138,881	138,881	138,881
	E	cfm	34,115	34,115	34,114	45,486	45,486	45,589	56,857	68,304	68,229	79,600	79,600	90,972	90,972
	N	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
	U	cfm	59,521	59,521	59,521	79,360	79,360	79,375	99,201	119,040	119,040	138,881	138,881	158,721	158,721
Fan unit input power	A,E,N,U	kW	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Total fan input power	A	kW	10.2	10.2	15.4	15.4	15.4	20.5	20.5	25.6	25.6	30.7	35.8	35.8	35.8
	E,U	kW	15.4	15.4	20.5	20.5	20.5	25.6	30.7	30.7	35.8	35.8	41.0	41.0	46.1
	N	kW	20.5	20.5	25.6	25.6	25.6	30.7	35.8	35.8	41.0	41.0	46.1	46.1	51.2
Fan unit input current	A,E,N,U	A	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Total fan input current	A	A	12.5	12.5	18.7	18.7	18.7	25.0	25.0	31.2	31.2	37.4	43.7	43.7	43.7
	E,U	A	18.7	18.7	25.0	25.0	25.0	31.2	37.4	37.4	43.7	43.7	49.9	49.9	56.2
	N	A	25.0	25.0	31.2	31.2	31.2	37.4	43.7	43.7	49.9	49.9	56.2	56.2	62.4
POWER SUPPLY: 9															
Inverter fan															
Type	A,E,N,U	type	Axial	Axial	Axial	Axial	Axial	-	-	-	-	-	-	-	-
Fan motor	A,E,N,U	type	Inverter	Inverter	Inverter	Inverter	Inverter	-	-	-	-	-	-	-	-
Number	A	no.	4	4	6	6	6	-	-	-	-	-	-	-	-
	E,U	no.	6	6	8	8	8	-	-	-	-	-	-	-	-
	N	no.	8	8	8	10	10	-	-	-	-	-	-	-	-
Air flow rate	A	cfm	39,680	39,680	59,520	59,520	59,520	-	-	-	-	-	-	-	-
	E	cfm	34,114	34,114	34,114	45,485	45,485	-	-	-	-	-	-	-	-
	N	cfm	45,485	45,485	45,529	56,857	56,857	-	-	-	-	-	-	-	-
Fan unit input power	A,E,N,U	kW	2.4	2.4	2.4	2.4	2.4	-	-	-	-	-	-	-	-
Total fan input power	A	kW	9.6	9.6	14.4	14.4	14.4	-	-	-	-	-	-	-	-
	E,U	kW	14.4	14.4	14.4	19.2	19.2	-	-	-	-	-	-	-	-
	N	kW	19.2	19.2	24.0	24.0	24.0	-	-	-	-	-	-	-	-
Fan unit input current	A,E,N,U	A	7.5	7.5	7.5	7.5	7.5	-	-	-	-	-	-	-	-
Total fan input current	A	A	30.0	30.0	45.0	45.0	45.0	-	-	-	-	-	-	-	-
	E,U	A	45.0	45.0	45.0	60.0	60.0	-	-	-	-	-	-	-	-
	N	A	60.0	60.0	60.0	75.0	75.0	-	-	-	-	-	-	-	-

UNITS WITH DESUPERHEATER

NRB - DA

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Cooling performances with desuperheater (1)															
Recovered heating power															
Recovered heating power	BTU/h	299,535	349,717	390,649	443,203	496,917	579,368	645,181	739,650	819,528	902,801	968,342	1,053,413	1,142,924	1,236,359
Desuperheater water flow rate	gpm	67.2	78.4	87.6	99.4	111.4	129.9	144.7	165.9	183.8	202.5	217.2	236.2	256.3	277.3
Pressure drop desuperheater	fth ₂ O	7.4	9.7	11.0	13.4	10.4	12.7	15.7	20.1	19.1	24.1	27.4	27.1	25.1	29.4
Desuperheater															
Type	type														Brazed plate
Number	no.	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum water flow rate	gpm	33.3	38.9	43.5	49.3	55.3	64.4	71.7	82.2	91.1	100.4	107.7	117.1	127.1	137.5
Maximum water flow rate	gpm	111.0	129.7	144.9	164.3	184.2	214.8	239.2	274.2	303.8	334.6	358.9	390.5	423.6	458.3
Connections (in/out)	Type														Grooved joints
Sizes (in/out)	Ø	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	3"	5"	5"	5"

(1) Desuperheater water 104 °F/113 °F; External air 95 °F

NRB - DE

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Cooling performances with desuperheater (1)															
Recovered heating power															
Recovered heating power	BTU/h	276,847	325,945	376,189	414,231	470,705	555,927	617,598	691,801	788,051	854,612	938,704	1,010,529	1,107,547	1,181,341
Desuperheater water flow rate	gpm	62.1	73.1	84.4	92.9	105.6	124.7	138.5	155.1	176.7	191.7	210.5	226.6	248.4	264.9
Pressure drop desuperheater	fth ₂ O	6.0	8.7	10.0	11.7	9.4	11.7	14.4	17.7	17.7	21.4	25.8	25.1	23.4	26.8
Desuperheater															
Type	type														Brazed plate
Number	no.	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Minimum water flow rate	gpm	30.8	36.3	41.8	46.1	52.4	61.8	68.7	76.9	87.6	95.0	104.4	112.4	123.1	131.4
Maximum water flow rate	gpm	102.7	120.9	139.4	153.6	174.5	206.1	228.9	256.5	292.1	316.8	348.0	374.5	410.5	437.9
Connections (in/out)	Type														Grooved joints
Sizes (in/out)	Ø	3"	3"	3"	3"	3"	3"	3"	3"	3"	5"	5"	5"	5"	5"

(1) Desuperheater water 104 °F/113 °F; External air 95 °F

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Cooling performances with desuperheater (1)															
Recovered heating power	BTU/h	302,855	346,752	391,635	445,196	494,771	568,551	643,717	731,764	818,423	894,305	965,353	1,051,912	1,138,417	1,227,190
Desuperheater water flow rate	gpm	67.9	77.8	87.8	99.8	111.0	127.5	144.4	164.1	183.5	200.6	216.5	235.9	255.3	275.2
Pressure drop desuperheater	ftH ₂ O	7.4	9.7	11.0	13.4	10.4	12.0	15.4	19.7	19.1	23.4	27.1	27.1	24.8	28.8
Desuperheater															
Type	type														
Number	no.	2	2	2	2	2	2	2	2	2	2	2	2	2	
Minimum water flow rate	gpm	33.7	38.6	43.6	49.5	55.0	63.2	71.6	81.4	91.0	99.4	107.3	117.0	126.6	136.5
Maximum water flow rate	gpm	112.3	128.6	145.2	165.0	183.4	210.8	238.6	271.2	303.4	331.5	357.8	389.9	421.9	454.9
Connections (in/out)	Type														
Sizes (in/out)	Ø	3"	3"	3"	3"	3"	3"	3"	3"	3"	5"	5"	5"	5"	

(1) Desuperheater water 104 °F/113 °F; External air 95 °F

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Cooling performances with desuperheater (1)															
Recovered heating power	BTU/h	270,337	315,173	360,987	404,369	456,418	534,068	600,182	677,569	769,080	837,056	915,655	991,227	1,084,051	1,160,906
Desuperheater water flow rate	gpm	60.6	70.7	81.0	90.7	102.4	119.8	134.6	152.0	172.5	187.7	205.3	222.3	243.1	260.3
Pressure drop desuperheater	ftH ₂ O	6.0	8.0	9.4	11.0	8.7	10.7	13.4	17.1	17.1	20.7	24.4	24.1	22.4	25.8
Desuperheater															
Type	type														
Number	no.	2	2	2	2	2	2	2	2	2	2	2	2	2	
Minimum water flow rate	gpm	30.1	35.0	40.2	45.0	50.8	59.4	66.7	75.4	85.5	93.1	101.8	110.2	120.6	129.1
Maximum water flow rate	gpm	100.2	116.8	133.8	149.9	169.2	198.0	222.5	251.2	285.1	310.3	339.4	367.4	401.8	430.3
Connections (in/out)	Type														
Sizes (in/out)	Ø	3"	3"	3"	3"	3"	3"	3"	3"	3"	5"	5"	5"	5"	

(1) Desuperheater water 104 °F/113 °F; External air 95 °F

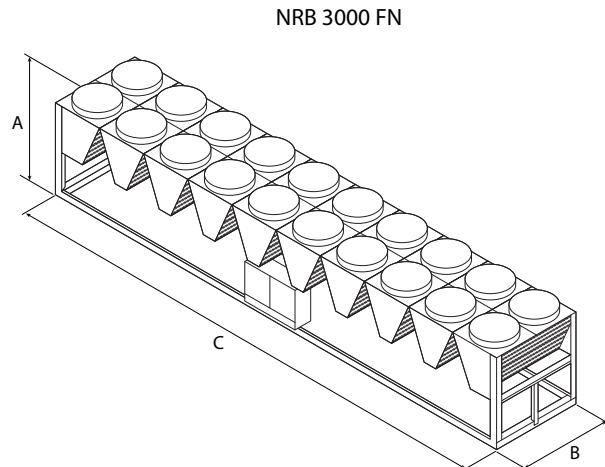
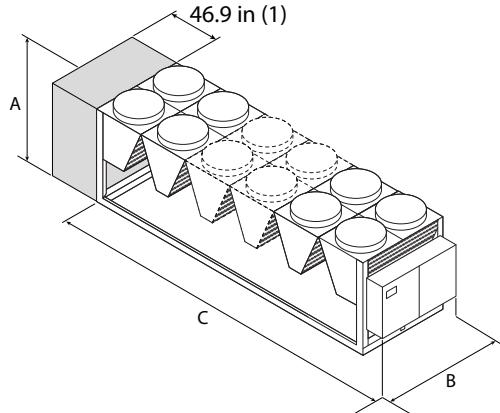
11 PARTIALISATIONS EER

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000		
Partialisations EER																
	A	BTU/W	10.07	9.690	10.24	10.07	9.793	9.725	9.861	9.554	9.725	9.588	9.895	10.03	9.793	9.656
100 %	E	BTU/W	10.92	10.30	9.929	10.51	10.10	9.452	9.963	10.17	9.690	9.963	9.656	9.861	9.452	9.690
	N	BTU/W	11.64	11.19	10.95	11.16	10.88	10.41	10.68	10.68	10.30	10.48	10.24	10.30	9.963	10.10
	U	BTU/W	10.54	10.37	10.30	10.37	10.30	10.10	10.34	10.27	10.13	10.27	10.24	10.20	10.03	10.10
	A	BTU/W	14.13	13.61	14.37	14.16	13.75	13.65	13.85	13.41	13.68	12.66	13.38	13.55	13.24	13.03
75 %	E	BTU/W	15.35	14.47	13.92	14.77	14.19	13.31	14.02	14.26	13.61	13.17	13.07	13.31	12.80	13.10
	N	BTU/W	16.34	15.73	15.42	15.70	15.29	14.60	15.01	14.98	14.47	13.85	13.85	13.96	13.48	13.68
	U	BTU/W	14.84	14.57	14.50	14.60	14.50	14.19	14.50	14.40	14.30	13.58	13.82	13.82	13.58	13.65
	A	BTU/W	17.30	16.65	17.61	17.33	16.86	16.72	16.96	16.45	16.75	17.67	17.30	17.57	17.16	16.89
50 %	E	BTU/W	18.80	17.74	17.06	18.08	17.37	16.28	17.16	17.47	16.69	18.39	16.92	17.27	16.58	16.96
	N	BTU/W	20.03	19.28	18.87	19.21	18.73	17.91	18.39	18.36	17.74	19.35	17.91	18.08	17.47	17.71
	U	BTU/W	18.19	17.85	17.74	17.88	17.74	17.40	17.78	17.64	17.47	18.94	17.91	17.57	17.71	
	A	BTU/W	18.36	17.67	18.66	18.39	17.88	17.74	18.02	17.44	17.78	19.04	18.97	19.24	18.84	18.53
25 %	E	BTU/W	19.96	18.84	18.12	19.18	18.43	17.27	18.22	18.53	17.71	19.82	18.53	18.90	18.15	18.60
	N	BTU/W	21.26	20.44	20.03	20.37	19.86	18.97	19.48	19.48	18.80	20.85	19.65	19.79	19.14	19.42
	U	BTU/W	19.21	18.90	18.84	18.97	18.84	18.46	18.87	18.73	18.49	20.40	19.65	19.62	19.28	19.42

12 DIMENSIONS AND WEIGHTS

DIMENSIONS

NRB 0800-3000 FA-FE-FU
NRB 0800-2800 FN



(1) Additional module needed to contain the hydronic kit with "accumulation" option in sizes:
NRB 0800FA, 0900FA

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
INTEGRATED HYDRONIC KIT: 00, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ														
Dimensions and weights														
A	A,E,N,U	in	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5
B	A,E,N,U	in	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6
C	A	in	109.4	109.4	156.3	156.3	156.3	156.3	203.1	203.1	250.0	250.0	296.9	343.7
	E,U	in	156.3	156.3	156.3	203.1	203.1	203.1	250.0	296.9	343.7	343.7	390.6	437.4
	N	in	203.1	203.1	203.1	250.0	250.0	250.0	296.9	343.7	343.7	390.6	437.4	468.5
INTEGRATED HYDRONIC KIT: AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ														
Dimensions and weights														
A	A,E,N,U	in	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5	96.5
B	A,E,N,U	in	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6
C	A	in	156.3	156.3	156.3	156.3	156.3	156.3	203.1	203.1	250.0	250.0	296.9	343.7
	E,U	in	156.3	156.3	156.3	203.1	203.1	203.1	250.0	296.9	343.7	343.7	390.6	437.4
	N	in	203.1	203.1	203.1	250.0	250.0	250.0	296.9	343.7	343.7	390.6	437.4	468.5

The units 0800FA, 0900FA with the "storage tank" option, are 156.3 in long.

WEIGHTS

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
INTEGRATED HYDRONIC KIT: 00														
Weights														
Empty weight	A	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
	E,U	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
	N	lbs	8,289	8,378	8,730	9,987	10,163	10,207	11,376	12,875	13,162	14,815	15,036	16,843
Weight functioning	A	lbs	5,970	6,091	7,597	7,773	7,862	8,005	9,661	9,969	11,471	11,768	13,192	15,675
	E,U	lbs	7,211	7,322	7,685	9,387	9,575	9,619	11,052	12,476	12,796	14,771	14,991	16,989
	N	lbs	8,869	8,957	9,321	10,668	10,878	10,922	12,278	13,900	14,220	16,085	16,305	18,281

13 MINIMUM TECHNICAL SPACES

For all units, it is fundamental to respect the minimum distances in order to guarantee optimal ventilation to the finned heat exchanger coils to avoid the following:

- The generation of hazardous atmospheres in the case of refrigerant gas leaks;
- Return of hot air;
- Insufficient air flow to the finned heat exchanger coils.

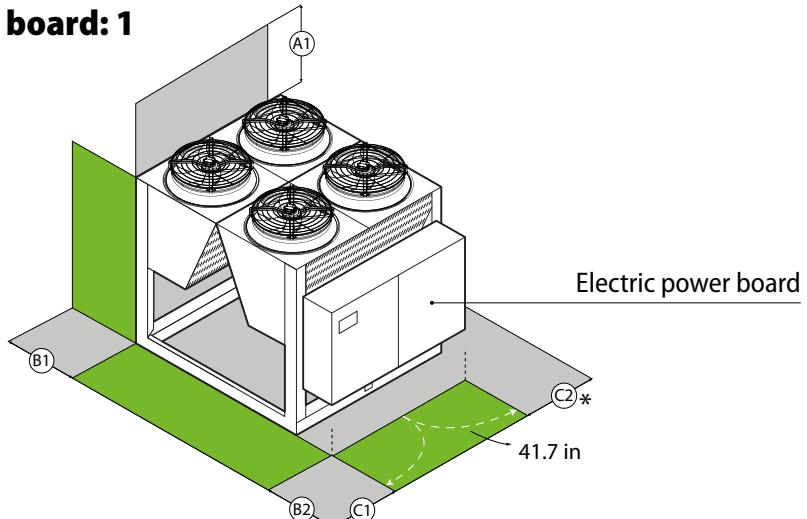
 **Each side of the unit must have space to allow all routine and extraordinary maintenance to be performed.**

 **The air suction inlet and the vertical air exhaust must not be obstructed.**

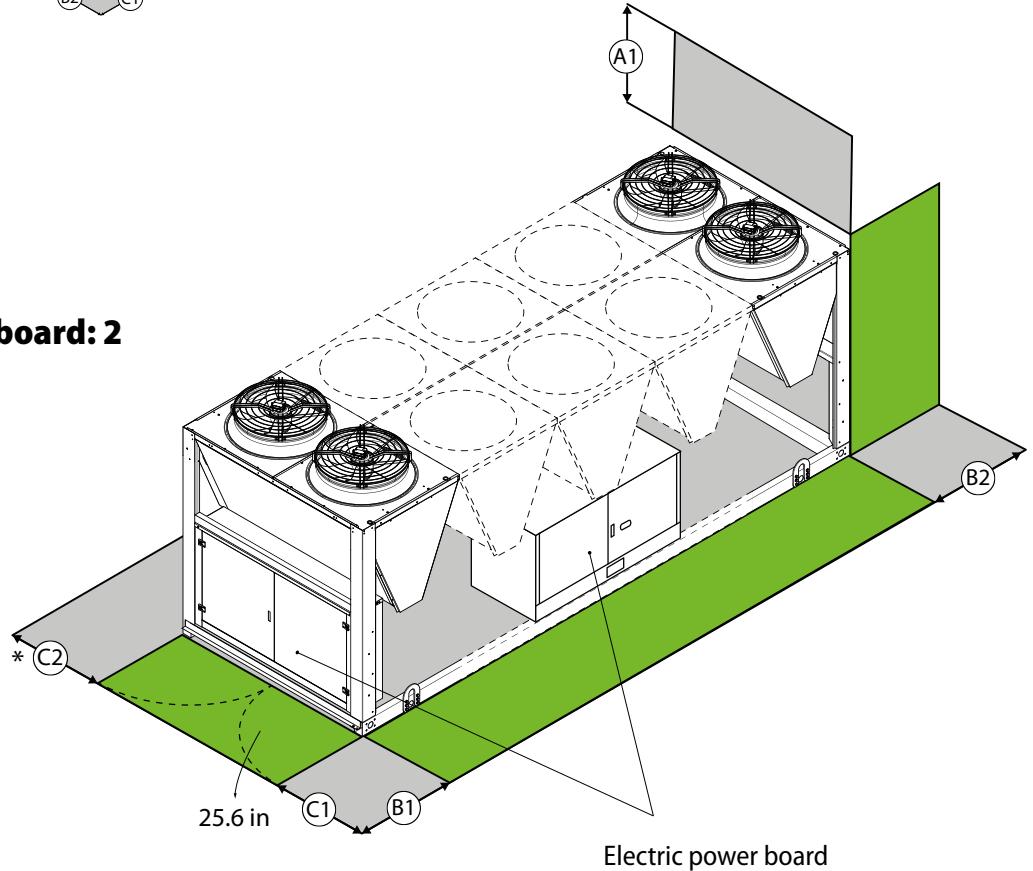
The following images indicate the minimum required space:

SINGLE INSTALLATION

Type of board: 1

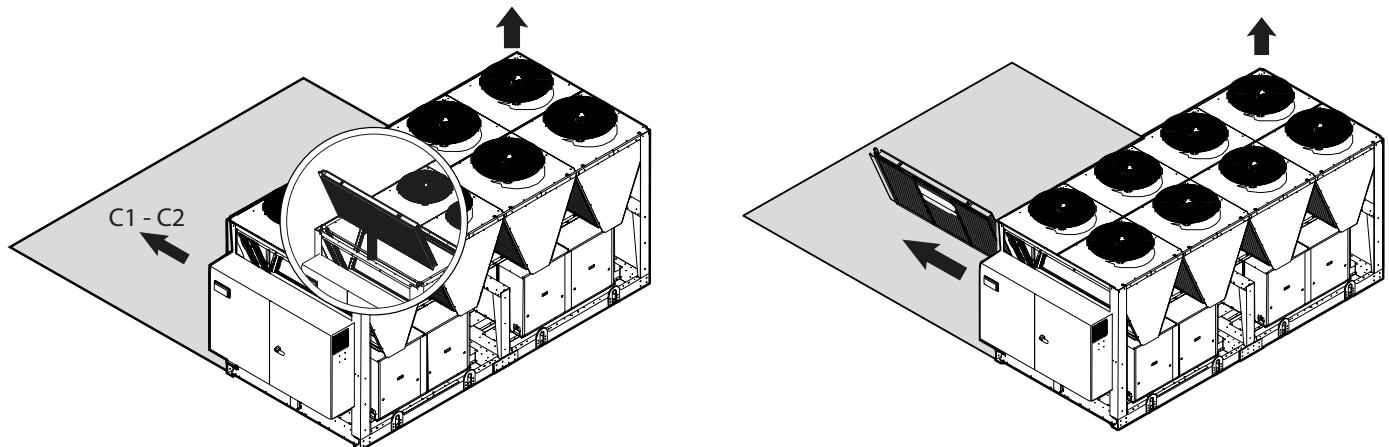


Type of board: 2



* 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 90.6 in.



■ The drawings are provided solely as examples.

VERSION A

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
POWER SUPPLY: 7														
Inverter fan														
Number	4	4	6	6	6	6	8	8	10	10	12	14	14	14
Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Minimum technical spaces														
Type of board	1	1	1	1	1	1	1	1	1	1	1	1	1	1
A1	in	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1
B1	in	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
B2	in	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3
C1	in	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4
C2	in	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4

VERSION E

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
POWER SUPPLY: 7														
Inverter fan														
Number	6	6	6	8	8	8	10	12	12	14	14	16	16	18
Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Minimum technical spaces														
Type of board	1	1	1	1	1	1	1	1	1	1	1	1	1	1
A1	in	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1
B1	in	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
B2	in	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3
C1	in	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4
C2	in	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4

VERSION U

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
POWER SUPPLY: 7														
Inverter fan														
Number	6	6	6	8	8	8	10	12	12	14	14	16	16	18
Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Minimum technical spaces														
Type of board	1	1	1	1	1	1	1	1	1	1	1	1	1	1
A1	in	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1
B1	in	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
B2	in	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3
C1	in	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4
C2	in	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
POWER SUPPLY: 7															
Inverter fan															
Number	no.	8	8	8	10	10	10	12	14	14	16	16	18	18	20
Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Minimum technical spaces															
Type of board		1	1	1	1	1	1	1	1	1	1	1	1	2	
A1	in	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	118.1	
B1	in	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	45.3	
B2	in	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	31.5	
C1	in	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	58.3	
C2	in	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	

■ Data referring to: Power supply 460V ±10% ~3 / 60Hz

MULTIPLE INSTALLATION

The minimum distances indicated above guarantee unit operation in the majority of applications. There are however specific situations that involve the installation of multiple units:



A 91 in

B 59 in

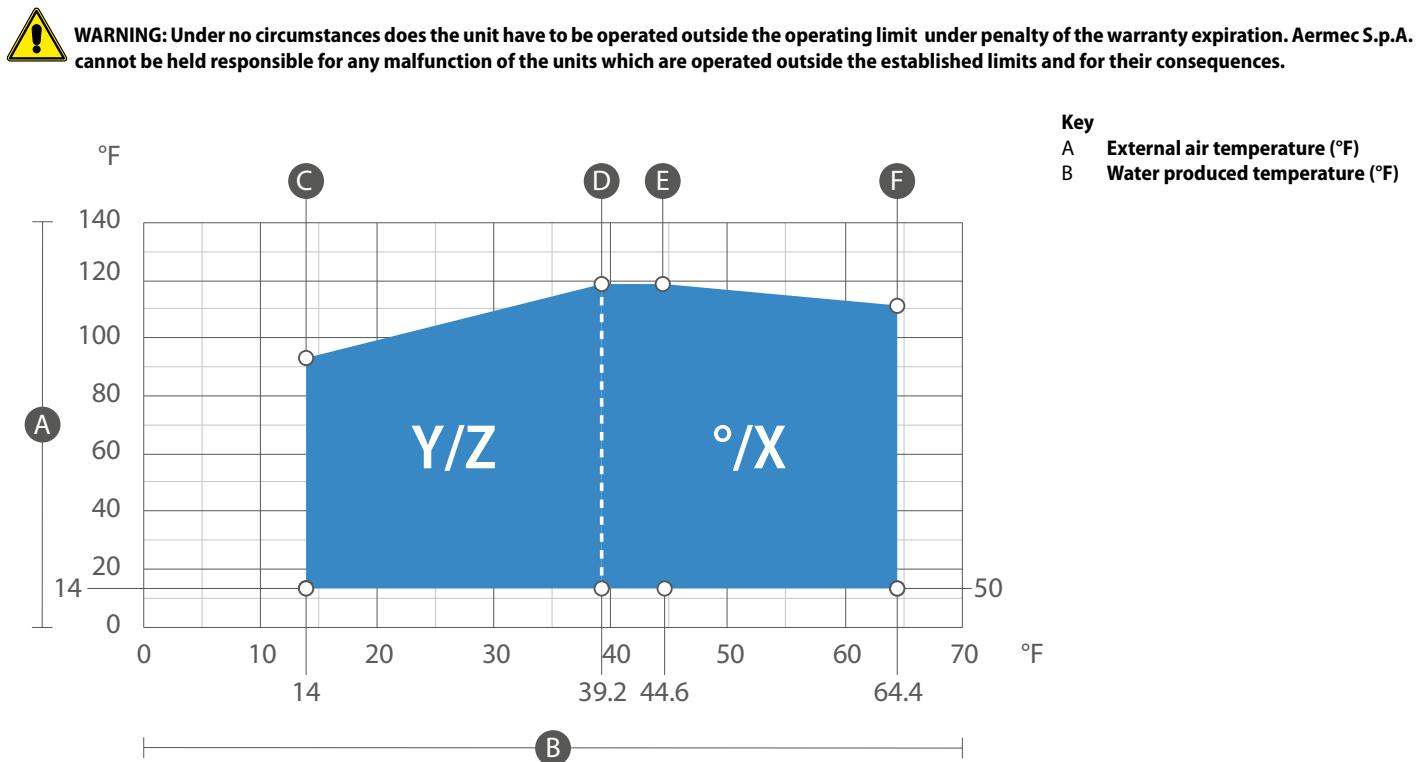
14 OPERATING LIMITS

In their standard configuration, the units are not suitable for installation in salty environments.

The values indicated in the table refer to the min. and max. limits of the unit, valid for $\Delta T = 10.1$ DT °F (cooling mode) and $\Delta T = 9.0$ DT °F (heating mode).

If the unit operates beyond the operational limits, we recommend you first contact our technical-sales service.

■ If the unit is installed in particularly windy locations the provision of wind barriers may be necessary to avoid malfunctions. It should be installed if wind speed is above 4.9 knot.



ATTENTION: The external temperature values marked in the graphs by a letter are specified in detail for each size and version in the following table.

VERSION A

VERSION F

VERSION U

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
OPERATING FIELD: °, X														
Fan J														
C	°F	-	-	-	-	-	-	-	-	-	-	-	-	-
D	°F	122.0	122.0	122.0	122.0	122.0	118.4	122.0	122.0	118.4	118.4	122.0	118.4	118.4
E	°F	122.0	122.0	122.0	122.0	122.0	118.4	122.0	122.0	118.4	118.4	122.0	118.4	118.4
F	°F	114.8	114.8	114.8	114.8	114.8	111.2	114.8	114.8	111.2	111.2	114.8	111.2	111.2
OPERATING FIELD: Y, Z														
Fan J														
C	°F	93.2	89.6	95.0	95.0	91.4	89.6	91.4	89.6	91.4	89.6	91.4	91.4	89.6
D	°F	122.0	122.0	122.0	122.0	122.0	118.4	122.0	122.0	118.4	118.4	122.0	118.4	118.4
E	°F	-	-	-	-	-	-	-	-	-	-	-	-	-
F	°F	-	-	-	-	-	-	-	-	-	-	-	-	-

VERSION N

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
OPERATING FIELD: °, X														
Fan J														
C	°F	-	-	-	-	-	-	-	-	-	-	-	-	-
D	°F	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0
E	°F	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0
F	°F	114.8	114.8	114.8	114.8	114.8	114.8	114.8	114.8	114.8	114.8	114.8	111.2	111.2
OPERATING FIELD: Y, Z														
Fan J														
C	°F	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6	98.6
D	°F	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0
E	°F	-	-	-	-	-	-	-	-	-	-	-	-	-
F	°F	-	-	-	-	-	-	-	-	-	-	-	-	-

15 PRESSURE DROPS

SERVICE SIDE - WITHOUT HYDRONIC (00) - HEAT EXCHANGER WITH FILTER INSTALLED

The water flow rate is calculated with the following formula: $Q = P_c \times 860 / \Delta T$

Q Water flow rate (l/h)

P_c Cooling capacity (kW)

ΔT Water heat drop (°C)

Pressure drops are calculated with the following formula: $\Delta p = K \times (Q)^2$

Δp Pressure drops (kPa)

Coefficient for the various sizes and versions

Q Water flow rate (l/h)

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Chiller operation (1)															
Pressure drop coefficient	A	3,7878E-08	3,2839E-08	3,2819E-08	2,8915E-08	2,8915E-08	2,6311E-08	1,2243E-08	1,0786E-08	1,0787E-08	1,0102E-08	1,0180E-08	4,8723E-09	4,8722E-09	4,5754E-09
without the hydronic kit	E	3,2859E-08	3,2846E-08	2,8915E-08	2,9499E-08	2,7199E-08	2,7198E-08	1,0785E-08	1,0862E-08	1,0180E-08	8,5269E-09	8,5269E-09	4,8721E-09	4,8720E-09	4,5753E-09
(with filter installed)	N	3,3406E-08	3,3431E-08	2,9499E-08	2,9499E-08	2,7195E-08	2,7200E-08	1,0864E-08	1,0864E-08	1,0181E-08	8,5274E-09	8,5273E-09	4,8728E-09	4,8721E-09	4,5753E-09
	U	3,2828E-08	3,2854E-08	2,8915E-08	2,9500E-08	2,7200E-08	2,7202E-08	1,0786E-08	1,0865E-08	1,0181E-08	8,5272E-09	8,5277E-09	4,8684E-09	4,8731E-09	4,5760E-09
Free-cooling operation (2)															
Pressure drop coefficient	A	8,1916E-08	7,5013E-08	5,7886E-08	5,3219E-08	5,2987E-08	5,2541E-08	2,3955E-08	2,2170E-08	1,9450E-08	1,8605E-08	1,7250E-08	9,1176E-09	9,0885E-09	8,7261E-09
without the hydronic kit	E	5,8625E-08	5,8351E-08	5,3671E-08	4,7848E-08	4,5143E-08	4,4982E-08	1,9686E-08	1,8217E-08	1,7395E-08	1,4647E-08	1,4614E-08	8,5818E-09	8,5614E-09	7,8243E-09
(with filter installed)	N	5,2560E-08	5,2502E-08	4,8439E-08	4,5596E-08	4,2512E-08	4,2419E-08	1,8276E-08	1,7341E-08	1,6536E-08	1,4115E-08	1,4090E-08	8,1910E-09	8,1740E-09	7,5546E-09
	U	5,8467E-08	5,8202E-08	5,3932E-08	4,8200E-08	4,5049E-08	4,4870E-08	1,9623E-08	1,8179E-08	1,7349E-08	1,4614E-08	1,4579E-08	8,5523E-09	8,5346E-09	7,8042E-09

(1) System side water heat exchanger 12 °C/7 °C; External air 35 °C; Chiller operation 100%; Free-cooling 0%

(2) System side water heat exchanger 12 °C / * °C; External air 2°C

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000		
System side heat exchanger																
Minimum water flow rate	A	gpm	75.7	85.3	100.2	112.0	122.2	141.9	159.9	177.7	200.2	217.6	240.4	264.8	281.1	299.3
	E	gpm	75.9	84.8	94.5	109.4	120.0	133.8	156.0	176.9	193.3	215.3	230.3	251.7	265.8	289.2
	N	gpm	78.6	88.3	99.2	112.9	124.4	139.8	161.1	181.2	199.0	220.6	236.7	257.2	272.5	295.2
Maximum water flow rate	A	gpm	80.1	90.1	101.3	116.0	128.0	144.4	166.9	188.1	207.5	230.4	247.9	269.5	286.4	310.4
	E	gpm	252.3	284.2	334.1	373.4	407.5	472.9	533.0	592.4	667.3	725.5	801.5	882.8	936.9	997.6
	N	gpm	253.1	282.6	314.9	364.8	399.9	446.1	519.9	589.6	644.2	717.8	767.5	838.9	886.0	964.0
	U	gpm	261.9	294.5	330.6	376.2	414.6	466.1	536.8	604.1	663.2	735.4	788.9	857.4	908.2	984.1
			267.0	300.5	337.7	386.6	426.7	481.3	556.2	627.1	691.6	768.2	826.4	898.2	954.6	1,034.5

ATTENTION: For average water temperature different than 10 °C refer to the chapter "Corrective factors for average water temperatures different from nominal values"

SERVICE SIDE - WITH HYDRONIC KIT PA-PJ - DA-DJ (HEAT EXCHANGER + FILTER + PIPES)

The water flow rate is calculated with the following formula: $Q = P_c \times 860 / \Delta T$

Q Water flow rate (l/h)

P_c Cooling capacity (kW)

ΔT Water heat drop (°C)

Pressure drops are calculated with the following formula: $\Delta p = K \times (Q)^2$

Δp Pressure drops (kPa)

Coefficient for the various sizes and versions

Q Water flow rate (l/h)

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Chiller operation (1)															
Pressure drops coefficient of hydronic kit with pumps	A	3,7255E-08	3,1739E-08	3,1719E-08	2,7829E-08	2,3810E-08	2,1215E-08	1,6913E-08	1,5462E-08	7,3103E-09	6,6277E-09	6,6264E-09	3,1704E-09	3,1703E-09	2,8746E-09
	E	3,1759E-08	3,1746E-08	2,7829E-08	2,7829E-08	2,1517E-08	2,1517E-08	1,5540E-08	1,5538E-08	6,6262E-09	4,9791E-09	4,9791E-09	3,1702E-09	3,1701E-09	2,9026E-09
	N	3,1721E-08	3,1745E-08	2,7829E-08	2,8120E-08	2,1806E-08	2,1810E-08	1,5539E-08	1,5540E-08	6,6276E-09	4,9795E-09	4,9794E-09	3,1990E-09	3,1983E-09	2,9307E-09
	U	3,1727E-08	3,1753E-08	2,7829E-08	2,7829E-08	2,1518E-08	2,1520E-08	1,5541E-08	1,5541E-08	6,6275E-09	4,9794E-09	4,9798E-09	3,1665E-09	3,1711E-09	2,9032E-09
Free-cooling operation (2)															
Pressure drops coefficient of hydronic kit with pumps	A	8,6939E-08	7,9464E-08	6,0575E-08	5,6797E-08	5,2875E-08	4,9535E-08	2,9713E-08	2,8258E-08	1,9340E-08	1,8650E-08	1,7542E-08	8,9589E-09	8,9379E-09	8,6416E-09
	E	6,2166E-08	6,1959E-08	5,8232E-08	5,8000E-08	5,1020E-08	5,0902E-08	2,6584E-08	2,5402E-08	1,8029E-08	1,5779E-08	1,5752E-08	8,6815E-09	8,6650E-09	8,0668E-09
	N	6,1869E-08	6,1767E-08	5,8129E-08	5,5855E-08	4,8926E-08	4,8847E-08	2,5454E-08	2,4701E-08	1,7341E-08	1,5354E-08	1,5331E-08	8,3691E-09	8,3563E-09	7,8501E-09
	U	6,2096E-08	6,1894E-08	5,8146E-08	5,7961E-08	5,0975E-08	5,0849E-08	2,6557E-08	2,5386E-08	1,8010E-08	1,5765E-08	1,5736E-08	8,6714E-09	8,6539E-09	8,0582E-09

(1) System side water heat exchanger 12 °C/7 °C; External air 35 °C; Chiller operation 100%; Free-cooling 0%

(2) System side water heat exchanger 12 °C / * °C; External air 2°C

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000		
System side heat exchanger																
Minimum water flow rate	A	gpm	75.7	85.3	100.2	112.0	122.2	141.9	159.9	177.7	200.2	217.6	240.4	264.8	281.1	299.3
	E	gpm	75.9	84.8	94.5	109.4	120.0	133.8	156.0	176.9	193.3	215.3	230.3	251.7	265.8	289.2
	N	gpm	78.6	88.3	99.2	112.9	124.4	139.8	161.1	181.2	199.0	220.6	236.7	257.2	272.5	295.2
	U	gpm	80.1	90.1	101.3	116.0	128.0	144.4	166.9	188.1	207.5	230.4	247.9	269.5	286.4	310.4
Maximum water flow rate	A	gpm	252.3	284.2	334.1	373.4	407.5	472.9	533.0	592.4	667.3	725.5	801.5	882.8	936.9	997.6
	E	gpm	253.1	282.6	314.9	364.8	399.9	446.1	519.9	589.6	644.2	717.8	767.5	838.9	886.0	964.0
	N	gpm	261.9	294.5	330.6	376.2	414.6	466.1	536.8	604.1	663.2	735.4	788.9	857.4	908.2	984.1
	U	gpm	267.0	300.5	337.7	386.6	426.7	481.3	556.2	627.1	691.6	768.2	826.4	898.2	954.6	1,034.5

■ ATTENTION: For average water temperature different than 10 °C refer to the chapter "Corrective factors for average water temperatures different from nominal values"

SERVICE SIDE - WITH HYDRONIC KIT AA-AJ - BA-BJ (HEAT EXCHANGER + FILTER + PIPES + WATER ACCUMULATION)

The water flow rate is calculated with the following formula: $Q = P_c \times 860 / \Delta T$

Q Water flow rate (l/h)

P_c Cooling capacity (kW)

ΔT Water heat drop (°C)

Pressure drops are calculated with the following formula: $\Delta p = K \times (Q)^2$

Δp Pressure drops (kPa)

Coefficient for the various sizes and versions

Q Water flow rate (l/h)

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Chiller operation (1)															
Pressure drops	A	4,1460E-08	3,5945E-08	3,5924E-08	3,2034E-08	2,8015E-08	2,5421E-08	1,8394E-08	1,6943E-08	8,7910E-09	8,1085E-09	8,1071E-09	3,8180E-09	3,8179E-09	3,5222E-09
coefficient of hydronic	E	3,5964E-08	3,5952E-08	3,2034E-08	3,2034E-08	2,5723E-08	2,5723E-08	1,7020E-08	1,7019E-08	8,1069E-09	6,4598E-09	6,4598E-09	3,8178E-09	3,8177E-09	3,5502E-09
kit with pumps and	N	3,5926E-08	3,5951E-08	3,2034E-08	3,2326E-08	2,6011E-08	2,6015E-08	1,7020E-08	8,1084E-09	6,4603E-09	6,4602E-09	3,8466E-09	3,8459E-09	3,5783E-09	
storage tank	U	3,5933E-08	3,5958E-08	3,2034E-08	3,2034E-08	2,5724E-08	2,5725E-08	1,7021E-08	1,7021E-08	8,1083E-09	6,4601E-09	6,4606E-09	3,8141E-09	3,8187E-09	3,5508E-09
Free-cooling operation (2)															
Pressure drops	A	8,6939E-08	7,9464E-08	6,0575E-08	5,6797E-08	5,2875E-08	4,9535E-08	2,9713E-08	2,8258E-08	1,9340E-08	1,8650E-08	1,7542E-08	8,9589E-09	8,9379E-09	8,6416E-09
coefficient of hydronic	E	6,2166E-08	6,1959E-08	5,8232E-08	5,8000E-08	5,1020E-08	5,0902E-08	2,6584E-08	2,5402E-08	1,8029E-08	1,5779E-08	1,5752E-08	8,6815E-09	8,6650E-09	8,0668E-09
kit with pumps and	N	6,1869E-08	6,1767E-08	5,8129E-08	5,5855E-08	4,8926E-08	4,8847E-08	2,5454E-08	2,4701E-08	1,7341E-08	1,5354E-08	1,5331E-08	8,3691E-09	8,3563E-09	7,8501E-09
storage tank	U	6,2096E-08	6,1894E-08	5,8146E-08	5,7961E-08	5,0975E-08	5,0849E-08	2,6557E-08	2,5386E-08	1,8010E-08	1,5765E-08	1,5736E-08	8,6714E-09	8,6539E-09	8,0582E-09

(1) System side water heat exchanger 12 °C / 7 °C; External air 35 °C; Chiller operation 100%; Free-cooling 0%

(2) System side water heat exchanger 12 °C / * °C; External air 2 °C

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000		
System side heat exchanger																
Minimum water flow rate	A	gpm	75.7	85.3	100.2	112.0	122.2	141.9	159.9	177.7	200.2	217.6	240.4	264.8	281.1	299.3
	E	gpm	75.9	84.8	94.5	109.4	120.0	133.8	156.0	176.9	193.3	215.3	230.3	251.7	265.8	289.2
	N	gpm	78.6	88.3	99.2	112.9	124.4	139.8	161.1	181.2	199.0	220.6	236.7	257.2	272.5	295.2
	U	gpm	80.1	90.1	101.3	116.0	128.0	144.4	166.9	188.1	207.5	230.4	247.9	269.5	286.4	310.4
Maximum water flow rate	A	gpm	252.3	284.2	334.1	373.4	407.5	472.9	533.0	592.4	667.3	725.5	801.5	882.8	936.9	997.6
	E	gpm	253.1	282.6	314.9	364.8	399.9	446.1	519.9	589.6	644.2	717.8	767.5	838.9	886.0	964.0
	N	gpm	261.9	294.5	330.6	376.2	414.6	466.1	536.8	604.1	663.2	735.4	788.9	857.4	908.2	984.1
	U	gpm	267.0	300.5	337.7	386.6	426.7	481.3	556.2	627.1	691.6	768.2	826.4	898.2	954.6	1,034.5

■ ATTENTION: For average water temperature different than 10 °C refer to the chapter "Corrective factors for average water temperatures different from nominal values"

DESUPERHEATER

The water flow rate is calculated with the following formula: $Q = P_c \times 860 / \Delta T$

Q Water flow rate (l/h)

P_c Cooling capacity (kW)

ΔT Water heat drop (°C)

Pressure drops are calculated with the following formula: $\Delta p = K \times (Q)^2$

Δp Pressure drops (kPa)

Coefficient for the various sizes and versions

Q Water flow rate (l/h)

Size	0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000		
Pressure drops coefficient																
Pressure drops coeffici- ent of desuperheater	A,E,N,U	9,2483E-08	9,2905E-08	8,2361E-08	7,8238E-08	4,8306E-08	4,3201E-08	4,3201E-08	4,2550E-08	3,2941E-08	3,3856E-08	3,3635E-08	2,8146E-08	2,2100E-08	2,2100E-08	
Desuperheater																
Minimum water flow rate	A	gpm	33.3	38.9	43.5	49.3	55.3	64.4	71.7	82.2	91.1	100.4	107.7	117.1	127.1	137.5
	E	gpm	30.8	36.3	41.8	46.1	52.4	61.8	68.7	76.9	87.6	95.0	104.4	112.4	123.1	131.4
	N	gpm	30.1	35.0	40.2	45.0	50.8	59.4	66.7	75.4	85.5	93.1	101.8	110.2	120.6	129.1
	U	gpm	33.7	38.6	43.6	49.5	55.0	63.2	71.6	81.4	91.0	99.4	107.3	117.0	126.6	136.5
Maximum water flow rate	A	gpm	111.0	129.7	144.9	164.3	184.2	214.8	239.2	274.2	303.8	334.6	358.9	390.5	423.6	458.3
	E	gpm	102.7	120.9	139.4	153.6	174.5	206.1	228.9	256.5	292.1	316.8	348.0	374.5	410.5	437.9
	N	gpm	100.2	116.8	133.8	149.9	169.2	198.0	222.5	251.2	285.1	310.3	339.4	367.4	401.8	430.3
	U	gpm	112.3	128.6	145.2	165.0	183.4	210.8	238.6	271.2	303.4	331.5	357.8	389.9	421.9	454.9

Inlet water temperature 40 °C

Outlet water temperature 45 °C

Average water temperature 43 °C

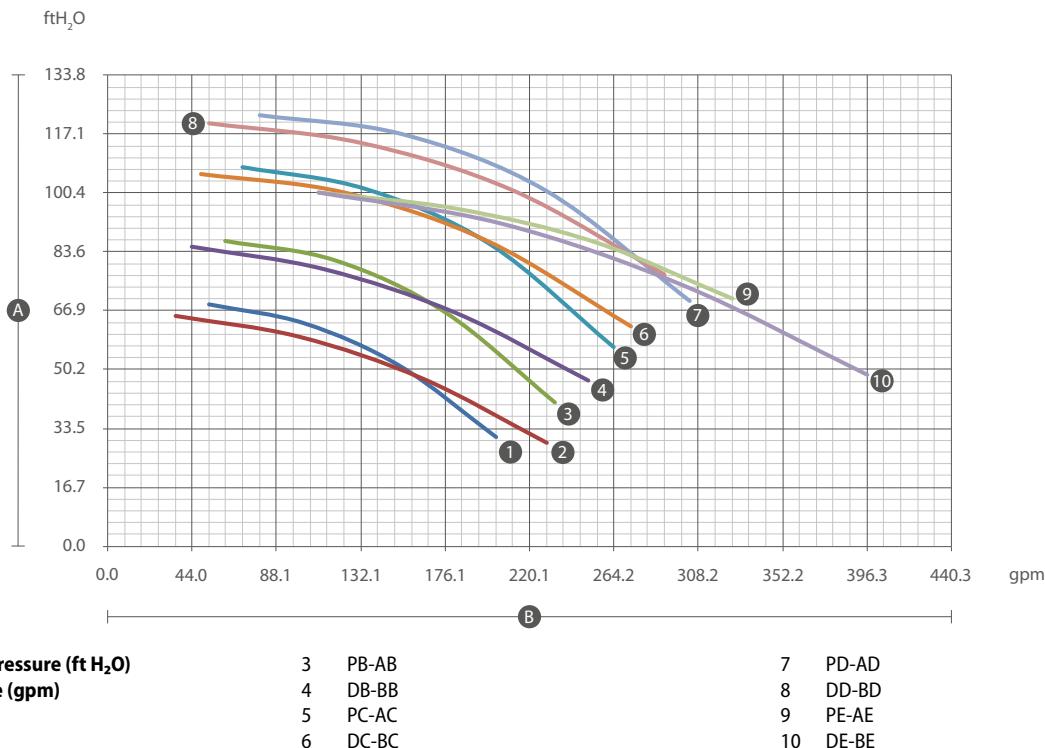
■ ATTENTION: For average water temperature different than 43 °C refer to the chapter "Corrective factors for average water temperatures different from nominal values"

16 PUMPS STATIC PRESSURE

PA÷PE / AA÷AE / DA÷DE / BA÷BE

The table shows the characteristic curves of the pumps, **and therefore they do not represent the useful static pressures of the system.**

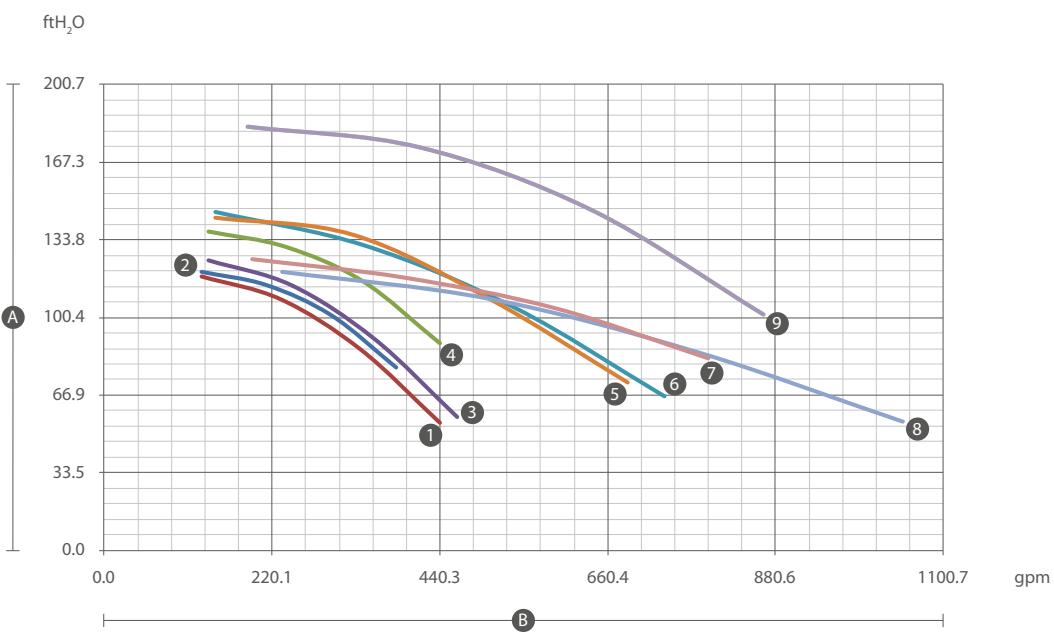
The useful heads of the system must be calculated by subtracting the unit's pressure drops (Δp) from the useful head of the pump shown in this diagram (see chapter: 15 Pressure drops p. 39).



PF÷PJ / AF÷AJ / DF÷DJ / BF÷BJ

The table shows the characteristic curves of the pumps, **and therefore they do not represent the useful static pressures of the system.**

The useful heads of the system must be calculated by subtracting the unit's pressure drops (Δp) from the useful head of the pump shown in this diagram (see chapter: 15 Pressure drops p. 39).



PA÷PE / AA÷AE / DA÷DE / BA÷BE

PF÷PJ / AF÷AJ / DF÷DJ / BF÷BJ

SINGLE HYDRONIC KITS' DATA

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Pumps	00	kW	/	/	/	/	/	/	/	/	/	/	/	/	/
	AA,PA	kW	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94
	AB,PB	kW	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29
	AC,PC	kW	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99
	AD,PD	kW	8.02	8.02	8.02	8.02	8.02	8.02	8.02	8.02	8.02	8.02	8.02	8.02	8.02
	AE,PE	kW	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25	8.25
	AF,PF	kW	9.10	9.10	9.10	9.10	9.10	9.10	9.10	9.10	9.10	9.10	9.10	9.10	9.10
	AG,PG	kW	12.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	AH,PH	kW	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13	15.13
Maximum input power	AI,PI	kW	19.16	19.16	19.16	19.16	19.16	19.16	19.16	19.16	19.16	19.16	19.16	19.16	19.16
	AJ,BJ,DJ,PJ	kW	24.46	24.46	24.46	24.46	24.46	24.46	24.46	24.46	24.46	24.46	24.46	24.46	24.46
	BA,DA	kW	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07
	BB,DB	kW	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46
	BC,DC	kW	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15
	BD,DD	kW	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60
	BE,DE	kW	7.36	7.36	7.36	7.36	7.36	7.36	7.36	7.36	7.36	7.36	7.36	7.36	7.36
	BF,DF	kW	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42
	BG,DG	kW	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29
	BH,DH	kW	14.86	14.86	14.86	14.86	14.86	14.86	14.86	14.86	14.86	14.86	14.86	14.86	14.86
	BI,DI	kW	19.32	19.32	19.32	19.32	19.32	19.32	19.32	19.32	19.32	19.32	19.32	19.32	19.32
	00	A	/	/	/	/	/	/	/	/	/	/	/	/	/
	AA,PA	A	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	AB,PB	A	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
	AC,PC	A	8.90	8.90	8.90	8.90	8.90	8.90	8.90	8.90	8.90	8.90	8.90	8.90	8.90
	AD,AE,PD,PE	A	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20
	AF,PF	A	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50	15.50
	AG,PG	A	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40	17.40
	AH,PH	A	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Maximum current	AI,BI,DI,PI	A	33.20	33.20	33.20	33.20	33.20	33.20	33.20	33.20	33.20	33.20	33.20	33.20	33.20
	AJ,BJ,DJ,PJ	A	40.50	40.50	40.50	40.50	40.50	40.50	40.50	40.50	40.50	40.50	40.50	40.50	40.50
	BA,DA	A	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23
	BB,DB	A	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62
	BC,DC	A	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40
	BD,BE,DD,DE	A	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20
	BF,DF	A	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30
	BG,DG	A	20.20	20.20	20.20	20.20	20.20	20.20	20.20	20.20	20.20	20.20	20.20	20.20	20.20
	BH,DH	A	26.80	26.80	26.80	26.80	26.80	26.80	26.80	26.80	26.80	26.80	26.80	26.80	26.80
	00	gpm	/	/	/	/	/	/	/	/	/	/	/	/	/
	AA,BD,DD,PA	gpm	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8
	AB,PB	gpm	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6	61.6
	AC,PC	gpm	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4
	AD,PD	gpm	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3	79.3
	AE,BE,DE,PE	gpm	110.1	110.1	110.1	110.1	110.1	110.1	110.1	110.1	110.1	110.1	110.1	110.1	110.1
	AF,BF,DF,PF	gpm	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7
	AG,BG,DG,PG	gpm	136.5	136.5	136.5	136.5	136.5	136.5	136.5	136.5	136.5	136.5	136.5	136.5	136.5
	AH,BH,DH,PH	gpm	145.3	145.3	145.3	145.3	145.3	145.3	145.3	145.3	145.3	145.3	145.3	145.3	145.3
	AI,PI	gpm	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4
	AJ,BJ,DJ,PJ	gpm	188.1	188.1	188.1	188.1	188.1	188.1	188.1	188.1	188.1	188.1	188.1	188.1	188.1
	BA,DA	gpm	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2
	BB,DB	gpm	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
	BC,DC	gpm	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4
	BI,DI	gpm	193.7	193.7	193.7	193.7	193.7	193.7	193.7	193.7	193.7	193.7	193.7	193.7	193.7
	00	gpm	/	/	/	/	/	/	/	/	/	/	/	/	/
	AA,PA	gpm	202.5	202.5	202.5	202.5	202.5	202.5	202.5	202.5	202.5	202.5	202.5	202.5	202.5
	AB,PB	gpm	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4
	AC,PC	gpm	264.2	264.2	264.2	264.2	264.2	264.2	264.2	264.2	264.2	264.2	264.2	264.2	264.2
	AD,PD	gpm	303.8	303.8	303.8	303.8	303.8	303.8	303.8	303.8	303.8	303.8	303.8	303.8	303.8
	AE,PE	gpm	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8
	AF,PF	gpm	383.0	383.0	383.0	383.0	383.0	383.0	383.0	383.0	383.0	383.0	383.0	383.0	383.0
	AG,BF,DF,PG	gpm	440.3	440.3	440.3	440.3	440.3	440.3	440.3	440.3	440.3	440.3	440.3	440.3	440.3
	AH,PH	gpm	735.3	735.3	735.3	735.3	735.3	735.3	735.3	735.3	735.3	735.3	735.3	735.3	735.3
	AI,PI	gpm	1,047.9	1,047.9	1,047.9	1,047.9	1,047.9	1,047.9	1,047.9	1,047.9	1,047.9	1,047.9	1,047.9	1,047.9	1,047.9
	AJ,BJ,DJ,PJ	gpm	864.3	864.3	864.3	864.3	864.3	864.3	864.3	864.3	864.3	864.3	864.3	864.3	864.3
	BA,DA	gpm	228.9	228.9	228.9	228.9	228.9	228.9	228.9	228.9	228.9	228.9	228.9	228.9	228.9
	BB,DB	gpm	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0	251.0
	BC,DC	gpm	273.0	273.0	273.0	273.0	273.0	273.0	273.0	273.0	273.0	273.0	273.0	273.0	273.0
	BD,DD	gpm	290.6	290.6	290.6	290.6	290.6	290.6	290.6	290.6	290.6	290.6	290.6	290.6	290.6
	BE,DE	gpm	396.3	396.3	396.3	396.3	396.3	396.3	396.3	396.3	396.3	396.3	396.3	396.3	396.3
	BG,DG	gpm	462.3	462.3	462.3	462.3	462.3	462.3	462.3	462.3	462.3	462.3	462.3	462.3	462.3
	BH,DH	gpm	686.8	686.8	686.8	686.8	686.8	686.8	686.8	686.8	686.8	686.8	686.8	686.8	686.8
	BI,DI	gpm	792.5	792.5	792.5	792.5	792.5	792.5	792.5	792.5	792.5	792.5	792.5	792.5	792.5

17 SYSTEM WATER CONTENT

MINIMUM SYSTEM WATER CONTENT

For correct unit operation, there must be a suitable amount of water in the system. A sufficient quantity of water not only ensures machine stability, but also helps avoid a high number of hourly compressor start-ups.

To calculate it, use the formula: Unit rated cooling capacity (ton) x table value (gal/ton) = Minimum system content (gal).

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
Minimum system water content															
Minimum water content for air conditioning	A,E,N,U	gal/ton	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Minimum water content for processes	A,E,N,U	gal/ton	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0

Note: the water content referred to in the tables corresponds to the amount of water effectively useful for inertial purposes; this value does not necessarily coincide with the entire system water content, and must be calculated on the basis of the system layout and operating modes.

A example is given below, but it does not cover a possible situation.

Example: for a chiller/heat pump equipped with a primary and a secondary circuit, and in which the zone pumps of the secondary circuit could (even occasionally) be turned off, only the water content of the primary circuit has value of useful water content for the counting purposes.

If you are in any doubt, please refer to the relevant technical documentation or contact the AERMEC Technical-Commercial Service.

 **NOTICE:** Under no circumstances does the unit have to be operated when water flow rate on the heat exchanger is below the minimum water flow rate or above the maximum water flow rate, under penalty of the warranty expiration. Aermec cannot be held responsible for any malfunction of the units which are operated outside the established limits of water flow rate and for their consequences

 **NOTICE:** Under no circumstances does the unit have to be operated in a system in which the content of the water circulating is below the MINIMUM SYSTEM WATER CONTENT, under penalty of the warranty expiration. Aermec cannot be held responsible for any malfunction of the units which are operated in a system in which the content of the water circulating is below the MINIMUM SYSTEM WATER CONTENT and for their consequences

 **NOTICE:** in the case of several units connected in parallel, the designer must ensure that the configuration of the system and the management logic adopted do not cause too frequent START/STOP cycles and / or sudden changes in the water flow rate of the groups in operation

 **ATTENTION** It is recommended to design systems with high water content (minimum recommended values shown in tab), in order to limit:

— Number of peaks made by the compressors

— The reduction of water temperature during defrosting cycles in the winter period for heat pumps.

MAXIMUM SYSTEM WATER CONTENT

Units with the hydronic kit mounted come standard with the expansion vessel set at 21.8 psi, the pressure relief valve and the water filter mounted.

The maximum system water content depends on the capacity of the expansion vessel and on the calibration of the pressure relief valve.

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
INTEGRATED HYDRONIC KIT: 00															
Hydronic kit															
Expansion vessel number	A,E,N,U	no.									/				
Expansion vessel capacity	A,E,N,U	gal	/	/	/	/	/	/	/	/	/	/	/	/	/
Storage tank number	A,E,N,U	no.									/				
Storage tank capacity	A,E,N,U	gal	/	/	/	/	/	/	/	/	/	/	/	/	/
Pressure relief valve	A,E,N,U	n°/psi									/				

INTEGRATED HYDRONIC KIT: AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ

Hydronic kit	A	no.	2	2	2	2	2	2	2	2	2	2	3	3	3
Expansion vessel number	E,U	no.	2	2	2	2	2	2	2	3	3	3	3	3	3
	N	no.	2	2	2	2	2	2	3	3	3	3	3	3	3
Expansion vessel capacity	A,E,N,U	gal	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Storage tank number	A,E,N,U	no.								1					
	A	gal	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	158.5	317.0	317.0	317.0
Storage tank capacity	E,U	gal	158.5	158.5	158.5	158.5	158.5	158.5	158.5	317.0	317.0	317.0	317.0	317.0	317.0
	N	gal	158.5	158.5	158.5	158.5	158.5	158.5	317.0	317.0	317.0	317.0	317.0	317.0	317.0
Pressure relief valve	A,E,N,U	n°/psi								1/85.2					

INTEGRATED HYDRONIC KIT: DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ

Hydronic kit	A	no.	2	2	2	2	2	2	2	2	2	2	3	3	3
Expansion vessel number	A,E,N,U	no.											2		
Expansion vessel capacity	A,E,N,U	gal	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Storage tank number	A,E,N,U	no.											/		
Storage tank capacity	A,E,N,U	gal	/	/	/	/	/	/	/	/	/	/	/	/	/
Pressure relief valve	A,E,N,U	n°/psi								1/85.2					

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 of the correct size.

System water temperature max/min	°F	104/39.2			
Hydraulic height	Ft	98.4	82.0	65.6	49.2
Expansion vessel pre-load	psi	46.4	40.6	33.4	26.1
Water content maximum	gal	574.3	699.0	823.7	948.4
System water temperature max/min	°F	140/39.2			
Expansion vessel pre-load	psi	46.4	40.6	33.4	26.1
Water content maximum	gal	258.4	314.4	370.9	426.9

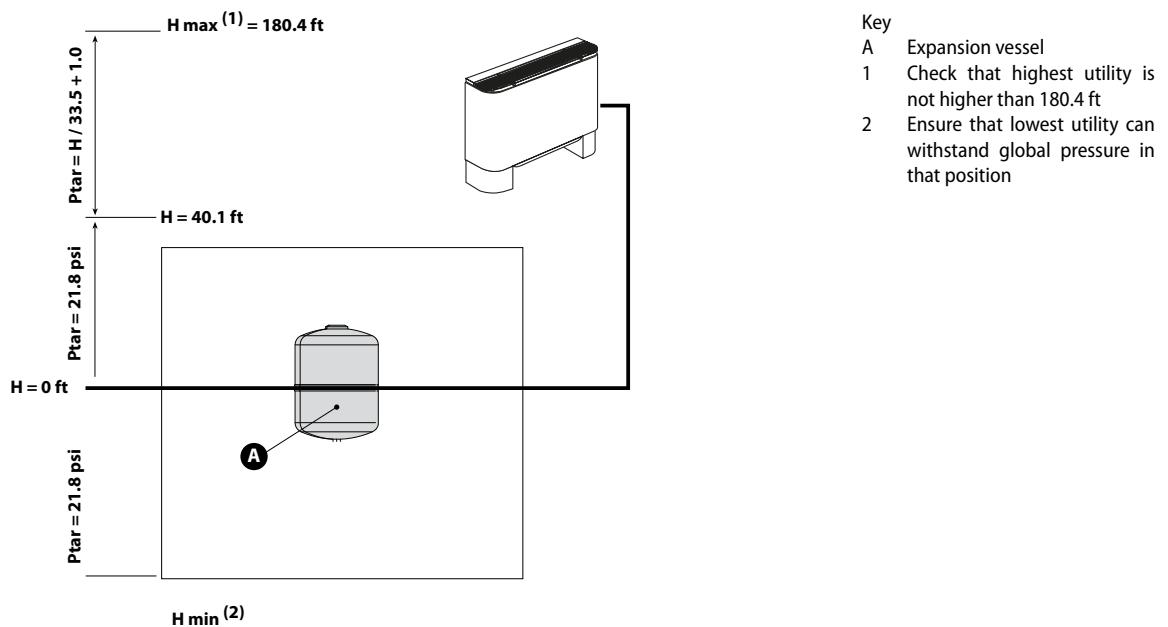
The data in the table refer to units with a 6.3 gal. expansion vessel.

EXPANSION VESSEL SETTING

The expansion tank volume is 6.3 gal. The standard value of the expansion tank pre-charge pressure is 21.8 psi, but this can be calibrated up to a maximum of 87.0 psi. The expansion tank pressure setting has to be adjusted based on the difference in height (H) of the installation (see figure) according to the formula: p (rating) [psi] = H [ft] / 33.5 + 1.0.

For example: if level difference H is equal to 65.6 ft, the calibration value of the vessel will be 33.4 psi.

If the calibration value obtained from the formula is less than 21.8 psi (i.e. for $H < 40.2$), use the standard calibration.



18 CORRECTION FACTORS

CORRECTIVE FACTORS FOR AVERAGE WATER TEMPERATURES DIFFERENT FROM NOMINAL VALUES

The pressure drops are calculated with an average water temperature of 50.0 °F (Cooling mode), 109.4 °F (Heating or recovery mode)

Average water temperatures	°F	System side heat exchanger								Heating mode or recovery						
		Cooling mode								Heating mode or recovery						
Average water temperatures	°F	41.0	50.0	59.0	68.0	86.0	104.0	122.0	73.4	82.4	91.4	100.4	109.4	118.4	127.4	134.4
Correction factor		1.02	1.00	0.98	0.97	0.95	0.93	0.91	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97

FOULING: DEPOSIT CORRECTIVE FACTORS [K*M²]/[W]

	0,0	0,00005	0,0001	0,0002
Corrective factor of cooling capacity	1,0	1	0.98	0.94
Corrective factor of input power	1,0	1	0.98	0.95

19 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
Δp	-	1.000	1.109	1.157	1.209	1.268	1.336	1.414	1.505	1.609	1.728

Heating mode range

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
Δp	-	1.000	1.087	1.128	1.175	1.227	1.286	1.353	1.428	1.514	1.610

PROPYLENE GLYCOL

Cooling mode

CORRECTION FACTOR WITH PROPYLENE 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 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
Δp	-	1.000	1.082	1.102	1.143	1.201	1.271	1.351	1.435	1.520	1.602

Heating mode range

CORRECTION FACTOR WITH PROPYLENE 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 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
Δp	-	1.000	1.050	1.077	1.111	1.153	1.202	1.258	1.321	1.390	1.467

■ Attention: Avoid adding the glycol in the hydraulic circuit near the pump intake. A high concentration of glycol and additives above the permissible limits can block the pump: do not use the pump as a mixer.

20 SOUND DATA

Size		0800	0900	1000	1100	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
Sound data calculated in cooling mode (1)																
Sound power level	A	dB(A)	87.5	90.1	92.1	93.4	94.4	94.0	93.9	95.8	97.3	96.3	95.5	97.1	97.9	98.8
	E	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
	N	dB(A)	84.2	88.5	90.7	92.4	93.6	93.2	92.7	95.1	96.6	95.6	94.4	96.2	97.4	98.4
	U	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
Sound pressure level (10 m / 33 ft)	A	dB(A)	55.4	57.9	59.9	61.2	62.1	61.8	61.5	63.4	64.7	63.8	62.8	64.3	65.1	66.0
	E	dB(A)	51.8	56.2	58.4	60.0	61.2	60.7	60.1	62.4	63.9	62.8	61.6	63.2	64.5	65.3
	N	dB(A)	51.8	56.1	58.3	59.9	61.1	60.6	60.0	62.3	63.8	62.7	61.5	63.1	64.3	65.2
	U	dB(A)	56.4	58.5	59.9	61.3	62.3	61.9	61.7	63.5	64.7	64.0	63.1	64.4	65.4	66.1
Sound pressure level (1 m / 3.3 ft)	A	dB(A)	68.3	70.9	72.3	73.6	74.6	74.2	73.6	75.5	76.4	75.5	74.2	75.4	76.2	77.1
	E	dB(A)	74.3	68.7	70.8	72.0	73.2	72.8	71.8	73.8	75.3	73.9	72.7	74.1	75.3	75.9
	N	dB(A)	63.8	68.2	70.3	71.5	72.8	72.3	71.4	73.4	74.9	73.6	72.3	73.7	75.0	75.7
	U	dB(A)	68.8	70.9	72.3	73.4	74.3	73.9	73.3	74.9	76.1	75.1	74.2	75.2	76.2	76.8
Sound power by centre octave band dB(A)																
125 Hz	A	dB(A)	77.3	77.3	79.1	79.1	79.1	80.3	80.3	81.3	81.3	82.1	82.1	82.8	82.8	82.8
	E	dB(A)	65.5	65.6	65.8	66.9	66.8	66.7	67.7	68.5	68.6	69.2	69.2	69.8	69.8	70.3
	N	dB(A)	66.7	66.8	67.0	67.8	67.7	67.7	68.5	69.2	69.2	69.8	69.7	70.3	70.3	70.8
	U	dB(A)	79.1	79.1	79.1	80.3	80.3	80.3	81.3	82.1	82.1	82.8	82.8	83.3	83.3	83.8
250 Hz	A	dB(A)	74.5	76.1	78.3	77.9	77.5	77.9	79.0	80.0	81.3	80.7	80.7	81.8	82.3	82.8
	E	dB(A)	65.4	72.0	74.5	73.8	72.8	73.7	74.6	77.0	78.5	77.6	76.3	78.1	79.3	80.3
	N	dB(A)	66.6	72.3	74.7	74.0	73.0	73.9	74.8	77.1	78.6	77.7	76.4	78.2	79.3	80.3
	U	dB(A)	76.3	77.4	78.3	78.8	78.5	78.8	79.7	81.1	81.7	81.7	81.3	82.3	82.8	83.5
500 Hz	A	dB(A)	78.4	80.4	82.4	82.1	81.8	82.3	83.3	83.7	84.4	84.4	84.9	85.5	85.7	85.9
	E	dB(A)	74.7	78.5	80.4	80.1	79.5	80.4	81.2	81.9	82.4	82.7	82.9	83.4	83.8	84.1
	N	dB(A)	75.1	78.6	80.5	80.2	79.7	80.5	81.3	81.9	82.4	82.7	83.0	83.4	83.8	84.2
	U	dB(A)	79.7	81.2	82.4	82.7	82.4	82.9	83.7	84.5	84.8	85.2	85.3	85.9	86.1	86.5
1000 Hz	A	dB(A)	82.6	84.4	86.4	88.6	90.0	89.3	88.9	91.4	93.1	91.9	90.5	92.6	93.7	94.7
	E	dB(A)	77.8	81.9	84.0	87.3	89.2	88.3	87.3	90.6	92.5	91.1	89.0	91.5	93.1	94.2
	N	dB(A)	78.0	82.0	84.1	87.4	89.2	88.3	87.3	90.6	92.5	91.1	89.1	91.5	93.1	94.2
	U	dB(A)	83.9	85.3	86.4	89.0	90.3	89.7	89.3	91.8	93.3	92.3	90.9	92.8	94.0	95.0
2000 Hz	A	dB(A)	82.7	86.3	88.5	89.7	90.6	90.3	90.2	92.2	93.6	92.7	91.8	93.3	94.3	95.1
	E,N	dB(A)	80.9	85.6	87.9	89.2	90.2	89.9	89.7	91.8	93.3	92.5	91.4	93.0	94.1	95.0
	U	dB(A)	83.4	86.7	88.5	89.8	90.7	90.5	90.4	92.4	93.7	93.0	92.1	93.5	94.5	95.4
	A	dB(A)	75.9	79.8	82.0	83.5	84.6	84.0	83.4	85.0	86.2	85.5	84.9	86.2	86.9	87.7
4000 Hz	E,N	dB(A)	74.8	79.4	81.6	83.2	84.4	83.8	83.0	84.7	85.9	85.4	84.8	86.0	86.9	87.7
	U	dB(A)	76.4	80.0	82.0	83.6	84.7	84.1	83.5	85.1	86.2	85.8	85.2	86.3	87.2	88.0
	A	dB(A)	67.5	68.2	69.0	72.1	73.9	72.5	70.6	71.9	73.1	72.5	72.2	73.3	73.9	74.6
	E	dB(A)	66.7	67.5	68.1	71.7	73.7	72.1	69.8	71.4	72.5	72.0	71.5	72.6	73.5	74.3
8000 Hz	N	dB(A)	66.8	67.5	68.1	71.7	73.7	72.2	69.8	71.4	72.5	72.1	71.5	72.7	73.5	74.3
	U	dB(A)	67.9	68.5	69.0	72.3	74.0	72.6	70.8	72.2	73.2	72.9	72.5	73.5	74.2	74.9

(1) Sound power calculated on the basis of measurements made in accordance with UNI EN ISO 9614-2. Sound pressure (cold functioning) measured in free field, 10 m / 33 ft away from the unit external surface (in compliance with UNI EN ISO 3744).



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