

NRL 028 - 075 F

Technical manual



AIR-WATER CHILLER WITH FREE-COOLING

Cooling capacity 13 ÷ 46 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 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.

Outdoor units with scroll compressors, axial fans and plate heat exchangers.

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

OPERATING FIELD

Operation at full load up to 44°C external air temperature depending on size and version. For further details refer to the selection software/technical documentation.

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.

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.

1.1 CONFIGURATOR

Field	Description
1,2,3	NRL
4,5,6	Size 028, 030, 033, 035, 050, 055, 060, 065, 070, 075
7	Operating field ° Standard mechanic thermostatic valve (1) X Electronic thermostatic expansion valve (2) Y Low temperature mechanic thermostatic valve (3)
8	Model F Free-cooling
9	Heat recovery ° Without heat recovery
10	Version A High efficiency E Silenced high efficiency
11	Coils / free-cooling coils ° Copper-aluminium / Copper-aluminium R Copper-copper/Copper-copper S Copper-Tinned copper / Copper -Tinned copper V Copper-painted aluminium / Copper-painted aluminium
12	Fans I Inverter
13	Power supply 6 220V 3 ~ 60Hz 7 460V 3 ~ 60Hz 8 575V 3 ~ 60Hz 9 208V 3 ~ 60Hz
14,15	Integrated hydronic kit 00 Without hydronic kit Kit with storage tank and pump/s 03 Storage tank with high head pump 04 Storage tank with high head pump + stand-by pump Kit with pump/s P3 Single pump high head P4 Pump high head + stand-by pump

(1) Water produced from 39,2 °F ÷ 4 °C

(2) Water produced from 39,2 °F ÷ 4 °C; Options D, T, C are not compatible with thermostatic valve Y, X.

(3) Water produced from (21,2 ; 14 °F) ÷ (-6 ; 4 °C)

FREE-COOLING WATER COILS

These units also have a water coil dedicated to free-cooling mode.

Free-cooling offers significant energy saving in applications that require cooling all year round.

As soon as the outside air temperature allows, a valve makes the water flow towards the free-cooling battery which is cooled directly by the air. The compressors are completely shut down, if possible, leading to considerable electrical savings.

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.

INTEGRATED HYDRONIC KIT

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 too, so the customer can choose the right useful head.

2 UNIT COMPONENTS DESCRIPTION

REFRIGERANT CIRCUIT

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.

Compressors

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

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.

Source side heat exchanger

Finned coil heat exchanger with copper tubes and aluminium louvers adequately spaced to ensure high efficiencies.

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.

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 (VERSION 00)

Water filter

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

Flow switch

Checks that water is circulating in the heat exchanger, and stops the unit if this is not the case.

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.

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.

Pressure relief valve

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

Pressure gauge

Three-way valves

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. A second standby pump (twin pumps) can be supplied upon request.

■ *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 5.0 °C, with minimum outdoor temperature of -4.0 °F. 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.

■ *The DCPX accessory is not necessary*

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.

■ *Automatic 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.

ELECTRICAL CONTROL AND POWER PANEL

Complete with:

- door interlocked isolator
- Magnet circuit breakers and contactors for compressors and fans
- terminals for REMOTE PANEL
- spring type terminals for control circuit
- externally rated cabinet, with double panel and seals
- electronic controller
- evaporator pump and recovery pump control consent relay (only for versions without pump units).
- 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

Microprocessor adjustment, with keyboard and LCD display, for easy access on the unit is a menu available in several languages.

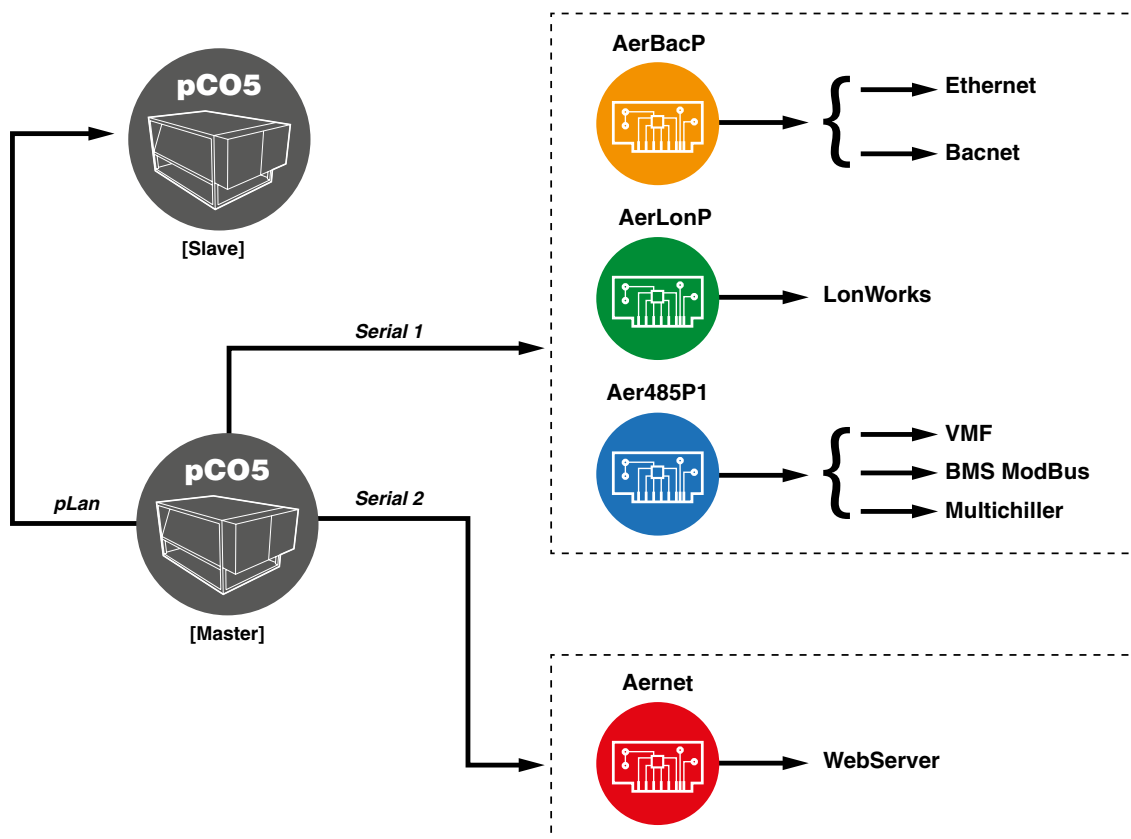
- The presence of a programmable timer allows functioning time periods and a possible second set-point to be set.
- The temperature control takes place with the integral proportional logic, based on the water output temperature.

- **Floating HP control:** the function can be activated with inverter fans or with DCPX which allows unit operation to be optimised at any operating point through continuous modulation of the fan speed. In addition, the use of inverter fans ensures an increase in energy efficiency at partial loads.
- **Night Mode:** it is possible to set a silenced operation profile. 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.

A specific keyboard for wall-mounting installation (PGD1 accessory) allows the remote control of all the functions.

■ For further information refer to the user manual.



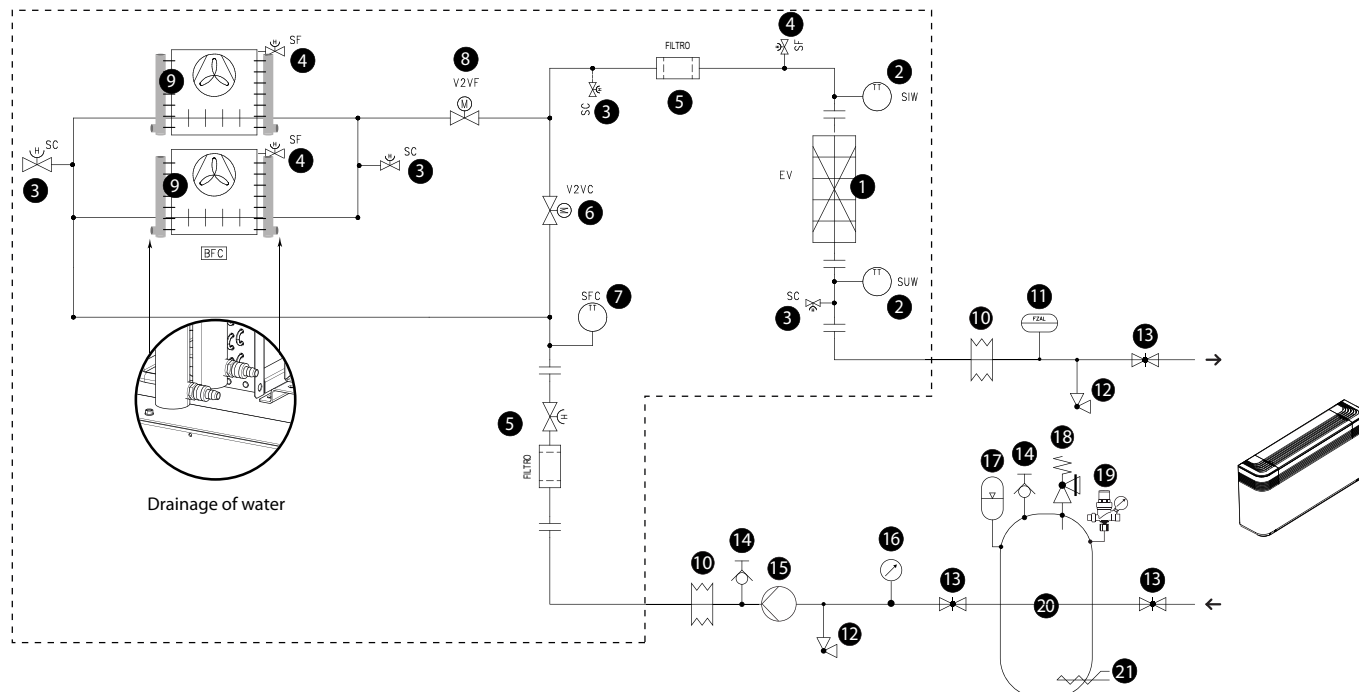
3 MAIN HYDRAULIC CIRCUITS

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 3-way valve (chiller operation)
- 7 Free-cooling probe

- 8 3-way valve (free-cooling operation)
- 9 Free-cooling coil

Components not provided and responsibility of the installer

- 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

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



It is of fundamental importance to keep the oxygen concentration in the water under control, especially in open vessel systems. This type of system, in fact, is very sensitive to the phenomenon of extra-oxygenation of the water (an event that can be encouraged by the incorrect positioning of some components). This phenomenon can trigger corrosion processes and subsequent drilling of the heat exchanger and pipes.

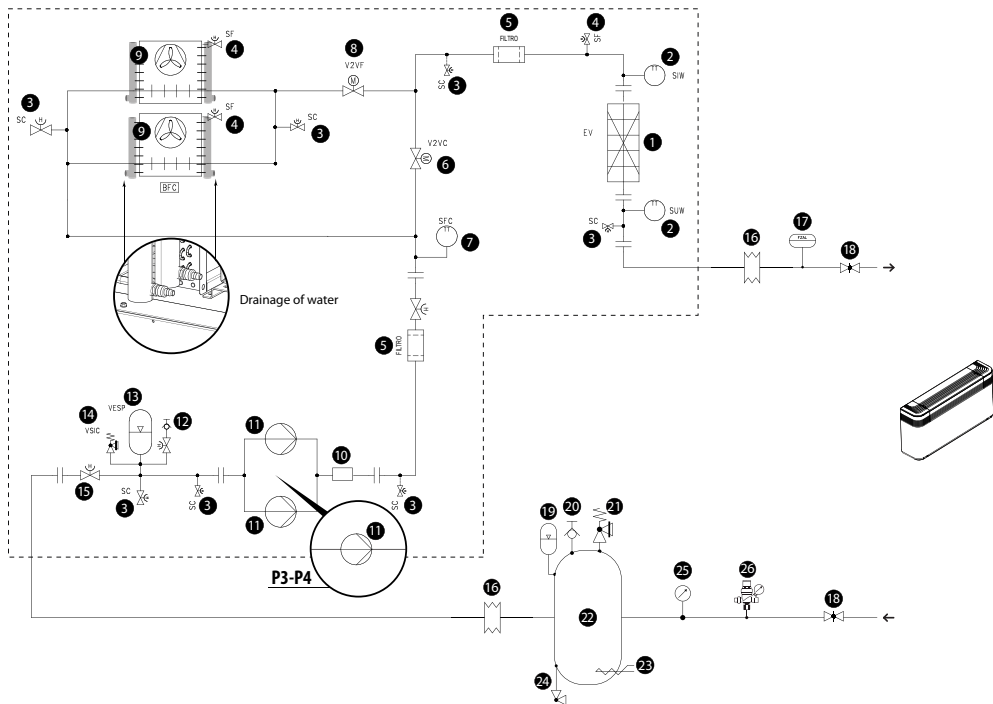


WARNING under no circumstances does the unit have to be operated with water circulating on the heat exchanger whose characteristics are different from those indicated in the table WATER CHARACTERISTICS, under penalty of the warranty expiration. Aermec cannot be held responsible for any malfunction of the units which are operated with water whose characteristics are outside the limits in the table WATER CHARACTERISTICS and for their consequences.

WITH PUMPS

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 3-way valve (chiller operation)
 - 7 Free-cooling probe
 - 8 3-way valve (free-cooling operation)
 - 9 Free-cooling coil

- 10 Clapet valve
 - 11 Pump
 - 12 Air drain valve
 - 13 Expansion vessel
 - 14 Pressure relief valve
 - 15 Flow shut-off valves

Components not provided and responsibility of the installer
 - 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

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

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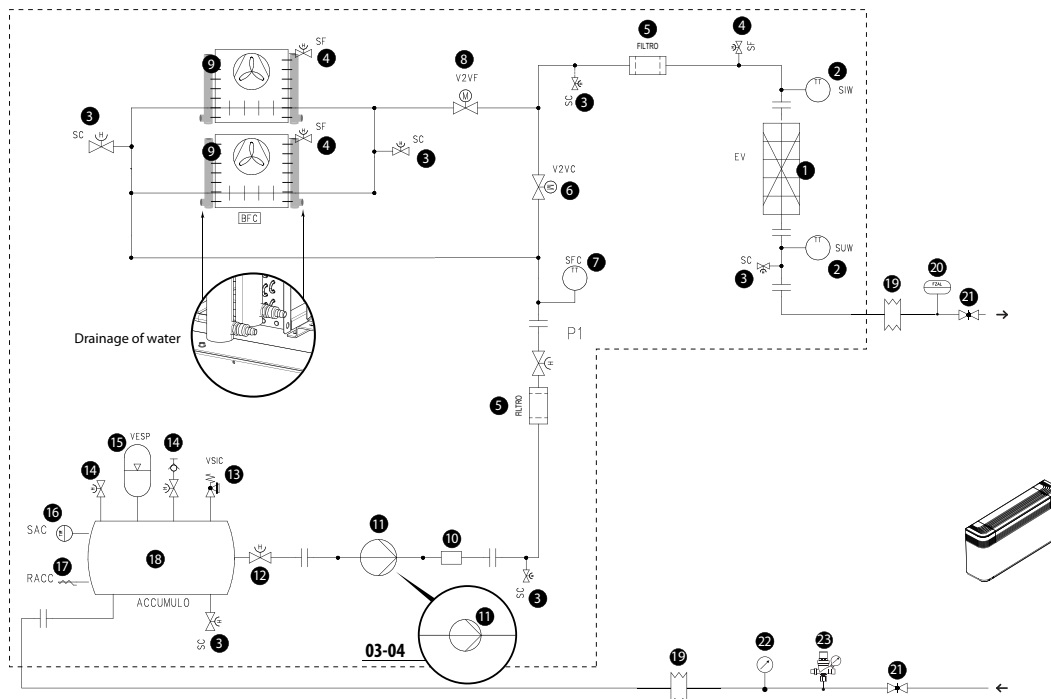
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WITH PUMPS AND STORAGE TANK



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 3-way valve (chiller operation)
- 7 Free-cooling probe
- 8 3-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

- 18 Storage tank

Components not provided and responsibility of the installer

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

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

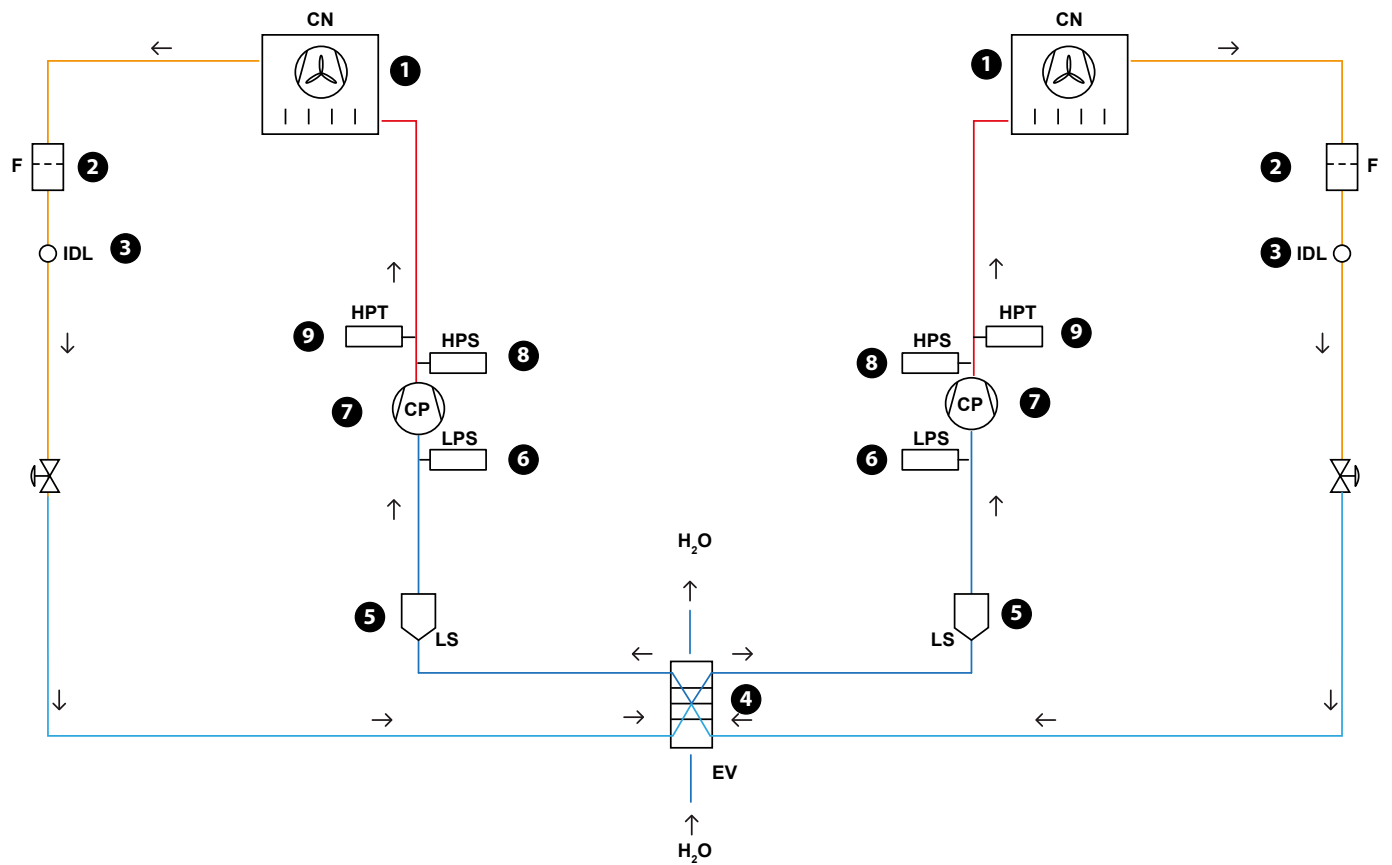


It is of fundamental importance to keep the oxygen concentration in the water under control, especially in open vessel systems. This type of system, in fact, is very sensitive to the phenomenon of extra-oxygenation of the water (an event that can be encouraged by the incorrect positioning of some components). This phenomenon can trigger corrosion processes and subsequent drilling of the heat exchanger and pipes.



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4 REFRIGERANT CIRCUIT



Components

- 1 Condenser
- 2 Filter drier
- 3 Sight glass

- 4 Plate heat exchanger
- 5 Liquid separator
- 6 Low pressure switch
- 7 Compressor

- 8 High pressure switch
- 9 High pressure transducer

5 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.

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

GP: Anti-intrusion grid.

VT: Antivibration supports

CRATE: Special crate for transport

FACTORY FITTED ACCESSORIES

DRE: Electronic device for peak current reduction.

PRM1: It is a manual pressure switch electrically wired in series with the existing automatic high pressure switch on the compressor discharge pipe.

ACCESSORIES COMPATIBILITY

Model	Ver	028	030	033	035	050	055	060	065	070	075
AER485P1	A,E	*	*	*	*	*	*	*	*	*	*
AERNET	A,E	*	*	*	*	*	*	*	*	*	*
MULTICHILLER_EVO	A,E	*	*	*	*	*	*	*	*	*	*

Anti-intrusion grid

Ver	028	030	033	035	050	055	060	065	070	075
A	-	-	-	-	GP2 x 2 (1)	GP2 x 2 (1)	GP2 x 3 (1)	GP2 x 3 (1)	GP2 x 3 (1)	GP10 x 3 (1)
E	GP4	GP4	GP4	GP4	-	-	-	-	-	-

(1) x _ indicates the quantity to buy

The accessory cannot be fitted on the configurations indicated with -

Antivibration - model F

Ver	028	030	033	035	050	055	060	065	070	075
Integrated hydronic kit: 00, P3, P4										
A	-	-	-	-	VT13	VT13	VT22	VT22	VT22	VT23
E	VT17	VT17	VT17	VT17	-	-	-	-	-	-
Integrated hydronic kit: 03, 04										
A	-	-	-	-	VT10	VT10	VT22	VT22	VT22	VT23
E	VT13	VT13	VT13	VT13	-	-	-	-	-	-

Heater exchangers

Ver	028	030	033	035	050	055	060	065	070	075
A,E	DRE (1)	DRE (1)	DRE (1)	DRE (1)	DRE (1)	DRE (1)	DRE (1)	DRE (1)	DRE (1)	DRE (1)

(1) Contact the factory

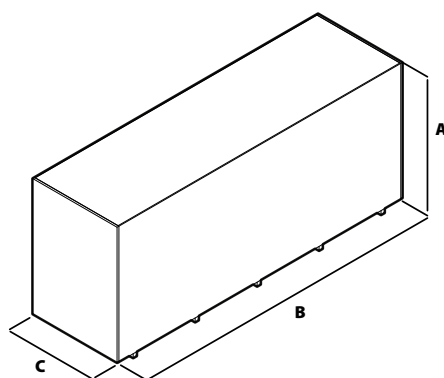
A grey background indicates the accessory must be assembled in the factory

Manually reset pressure switch

Ver	028	030	033	035	050	055	060	065	070	075
A,E	PRM1	PRM1	PRM1	PRM1	PRM1	PRM1	PRM1	PRM1	PRM1	PRM1

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

CRATE



CRATE	A (in)	B (in)	C (in)
CRATE02	87.9	138.7	50.4
CRATE03	87.9	180.1	50.4
CRATE04	95.7	184.0	66.2

6 PERFORMANCE SPECIFICATIONS

CHILLER OPERATION

Size			028	030	033	035	050	055	060	065	070	075
Cooling performance chiller operation (1)												
Cooling capacity	A	ton	-	-	-	-	23.84	27.23	34.06	37.91	41.17	46.24
	E	ton	13.16	15.18	17.44	21.39	-	-	-	-	-	-
Input power	A	kW	-	-	-	-	33.30	40.02	48.02	56.23	64.65	65.05
	E	kW	16.38	19.52	22.32	29.95	-	-	-	-	-	-
Cooling total input current	A	A	-	-	-	-	52.0	61.0	76.0	85.0	95.0	99.0
	E	A	31.0	35.0	41.0	50.0	-	-	-	-	-	-
EER	A	BTU/(Wh)	-	-	-	-	8.59	8.16	8.51	8.09	7.64	8.53
	E	BTU/(Wh)	9.64	9.33	9.38	8.57	-	-	-	-	-	-
IPLV	A	BTU/(Wh)	-	-	-	-	12.01	11.91	12.56	12.18	11.87	11.50
	E	BTU/(Wh)	11.84	11.81	11.87	11.46	-	-	-	-	-	-
Water flow rate system side	A	gpm	-	-	-	-	57.03	65.14	81.48	90.69	98.50	110.63
	E	gpm	31.48	36.31	41.73	51.17	-	-	-	-	-	-
Pressure drop system side	A	ftH ₂ O	-	-	-	-	15.72	20.07	23.42	23.08	27.43	28.10
	E	ftH ₂ O	14.05	12.38	16.06	17.73	-	-	-	-	-	-

(1) System side water heat exchanger 53.6 °F / 44.6 °F; External air 95 °F; Chiller operation 100%; Free-cooling 0%

FREECOOLING START-UP

Size			028	030	033	035	050	055	060	065	070	075
Cooling performances with free-cooling (1)												
Cooling capacity	A	ton	-	-	-	-	14.44	15.15	19.68	23.30	23.97	25.56
	E	ton	7.99	10.33	12.09	12.94	-	-	-	-	-	-
Input power	A	kW	-	-	-	-	4.67	4.67	6.59	6.66	6.66	6.66
	E	kW	2.06	2.06	2.58	2.58	-	-	-	-	-	-
Free cooling total input current	A	A	-	-	-	-	7.3	7.1	10.0	10.0	9.8	10.0
	E	A	3.9	3.7	4.7	4.3	-	-	-	-	-	-
EER	A	BTU/(Wh)	-	-	-	-	37.11	38.93	35.84	41.98	43.20	46.06
	E	BTU/(Wh)	46.52	60.15	56.22	60.16	-	-	-	-	-	-
Water flow rate system side	A	gpm	-	-	-	-	53.61	61.23	76.59	85.25	92.58	103.99
	E	gpm	29.59	34.14	39.22	48.10	-	-	-	-	-	-
Pressure drop system side	A	ftH ₂ O	-	-	-	-	18.73	23.75	29.11	29.44	34.46	38.47
	E	ftH ₂ O	19.07	14.72	19.07	22.42	-	-	-	-	-	-

(1) System side water heat exchanger 53.6 °F / * °C; External air 35.6 °F

7 GENERAL TECHNICAL DATA

Size			028	030	033	035	050	055	060	065	070	075
Compressor												
Type	A	type	-	-	-	-	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
	E	type	Scroll	Scroll	Scroll	Scroll	-	-	-	-	-	-
Compressor regulation	A,E	Type										
Number	A	no.	-	-	-	-	3	3	4	4	4	4
	E	no.	2	2	2	2	-	-	-	-	-	-
Circuits	A	no.	-	-	-	-	2	2	2	2	2	2
	E	no.	2	2	2	2	-	-	-	-	-	-
Refrigerant	A,E	type	R410A									
System side heat exchanger												
Type	A,E	type	Brazed plate									
Number	A	no.	-	-	-	-	1	1	1	1	1	1
	E	no.	1	1	1	1	-	-	-	-	-	-
System side hydraulic connections												
Connections (in/out)	A,E	Type	Grooved joints									
Sizes (in/out)	A,E	Ø	2"½									
Fan												
Type	A	type	-	-	-	-	Axial	Axial	Axial	Axial	Axial	Axial
	E	type	Axial	Axial	Axial	Axial	-	-	-	-	-	-
Fan motor	A	type	-	-	-	-	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter
	E	type	Inverter	Inverter	Inverter	Inverter	-	-	-	-	-	-
Number	A	no.	-	-	-	-	2	2	3	3	3	3
	E	no.	6	6	8	8	-	-	-	-	-	-
Air flow rate	A	cfm	-	-	-	-	23836	23836	37170	36580	36580	36580
	E	cfm	14750	14514	18172	18172	-	-	-	-	-	-
Sound data calculated in cooling mode (1)												
Sound power level	A	dB(A)	-	-	-	-	83	83	84	85	86	87
	E	dB(A)	74	75	77	78	77	77	77	78	81	82
Sound pressure level (10 m / 33 ft)	A	dB(A)	-	-	-	-	51	51	52	53	54	55
	E	dB(A)	42	43	45	46	45	45	45	46	49	50

(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).

ELECTRIC DATA

Power supply 208/3/60Hz

Size			028	030	033	035	050	055	060	065	070	075
INTEGRATED HYDRONIC KIT: 00												
Power supply: 208V												
Peak current (LRA)	A	A	-	-	-	-	385.0	407.0	398.0	469.0	489.0	546.0
	E	A	243.0	291.0	307.0	378.0	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	-	-	-	150.0	150.0	175.0	225.0	250.0	300.0
	E	A	90.0	90.0	100.0	150.0	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	-	-	-	175.0	200.0	200.0	250.0	250.0	300.0
	E	A	100.0	110.0	125.0	175.0	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: 03, 04, P3, P4												
Power supply: 208V												
Peak current (LRA)	A	A	-	-	-	-	393.0	415.0	406.0	483.0	503.0	560.0
	E	A	251.0	299.0	315.0	386.0	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	-	-	-	150.0	175.0	200.0	225.0	300.0	300.0
	E	A	90.0	100.0	110.0	150.0	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	-	-	-	175.0	200.0	200.0	250.0	300.0	300.0
	E	A	110.0	125.0	125.0	175.0	-	-	-	-	-	-

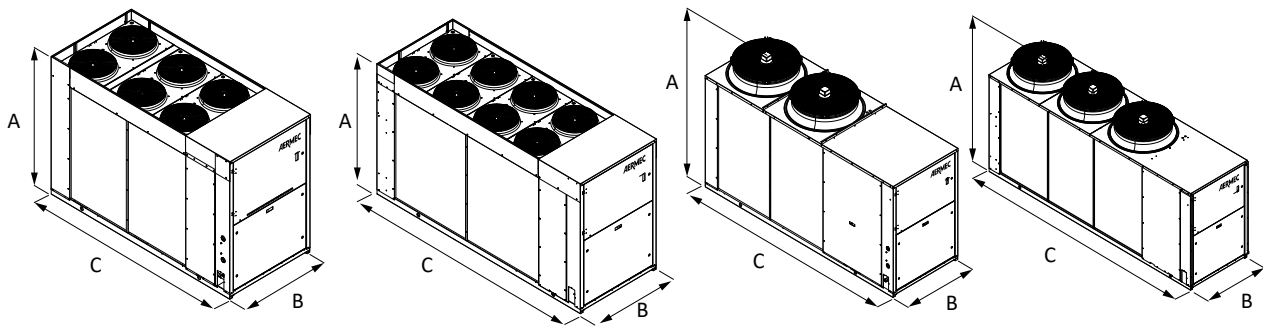
Power supply 230/3/60Hz

Size			028	030	033	035	050	055	060	065	070	075
INTEGRATED HYDRONIC KIT: 00												
Power supply: 230V												
Peak current (LRA)	A	A	-	-	-	-	374.0	394.0	380.0	450.0	468.0	524.0
	E	A	234.0	282.0	296.0	366.0	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	-	-	-	150.0	150.0	175.0	225.0	250.0	300.0
	E	A	75.0	90.0	100.0	150.0	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	-	-	-	175.0	175.0	175.0	250.0	250.0	300.0
	E	A	100.0	110.0	125.0	175.0	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: 03, 04, P3, P4												
Power supply: 230V												
Peak current (LRA)	A	A	-	-	-	-	382.0	402.0	388.0	463.0	481.0	537.0
	E	A	242.0	290.0	304.0	374.0	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	-	-	-	150.0	175.0	175.0	225.0	300.0	300.0
	E	A	90.0	90.0	110.0	150.0	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	-	-	-	175.0	200.0	200.0	250.0	300.0	300.0
	E	A	110.0	110.0	125.0	175.0	-	-	-	-	-	-

Size			028	030	033	035	050	055	060	065	070	075
INTEGRATED HYDRONIC KIT: 00												
Power supply: 460V												
Peak current (LRA)	A	A	-	-	-	-	186.0	195.0	192.0	221.0	229.0	265.0
	E	A	127.0	156.0	163.0	192.0	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	-	-	-	70.0	75.0	90.0	100.0	110.0	125.0
	E	A	45.0	60.0	60.0	70.0	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	-	-	-	80.0	90.0	100.0	110.0	125.0	125.0
	E	A	50.0	70.0	75.0	90.0	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: 03, 04, P3, P4												
Power supply: 460V												
Peak current (LRA)	A	A	-	-	-	-	190.0	199.0	196.0	227.0	235.0	272.0
	E	A	131.0	160.0	167.0	196.0	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	-	-	-	70.0	80.0	100.0	110.0	125.0	125.0
	E	A	50.0	60.0	70.0	75.0	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	-	-	-	80.0	100.0	110.0	125.0	125.0	150.0
	E	A	50.0	75.0	80.0	90.0	-	-	-	-	-	-

Size			028	030	033	035	050	055	060	065	070	075
INTEGRATED HYDRONIC KIT: 00												
Power supply: 575V												
Peak current (LRA)	A	A	-	-	-	-	137.0	144.0	132.0	164.0	170.0	199.0
	E	A	99.0	104.0	109.0	142.0	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	-	-	-	60.0	60.0	70.0	90.0	100.0	110.0
	E	A	35.0	40.0	45.0	60.0	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	-	-	-	70.0	75.0	75.0	100.0	110.0	125.0
	E	A	40.0	50.0	50.0	80.0	-	-	-	-	-	-
INTEGRATED HYDRONIC KIT: 03, 04, P3, P4												
Power supply: 575V												
Peak current (LRA)	A	A	-	-	-	-	140.0	147.0	135.0	169.0	175.0	204.0
	E	A	102.0	107.0	113.0	145.0	-	-	-	-	-	-
Minimum circuit amperage (MCA)	A	A	-	-	-	-	60.0	70.0	70.0	90.0	100.0	110.0
	E	A	40.0	45.0	50.0	70.0	-	-	-	-	-	-
Maximum overcurrent permitted by the protection device (MOP)	A	A	-	-	-	-	70.0	80.0	80.0	100.0	110.0	125.0
	E	A	45.0	50.0	60.0	80.0	-	-	-	-	-	-

DIMENSIONS AND WEIGHTS

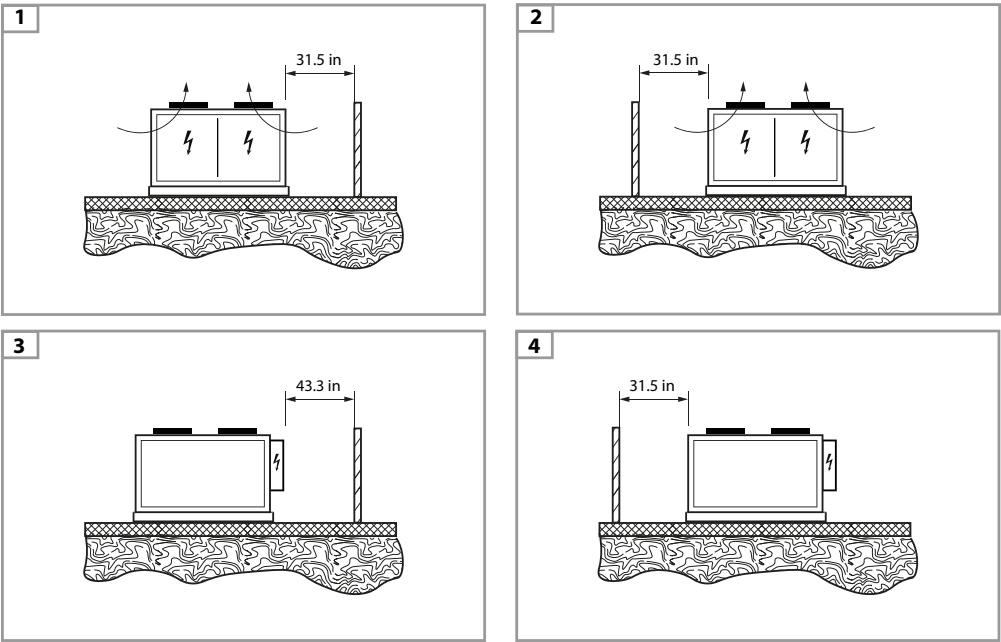


Size			028	030	033	035	050	055	060	065	070	075
Dimensions and weights												
A	A	in	-	-	-	-	73.8	73.8	73.8	73.8	73.8	77.0
	E	in	63.2	63.2	63.2	63.2	-	-	-	-	-	-
B	A	in	-	-	-	-	43.3	43.3	43.3	43.3	43.3	59.1
	E	in	43.3	43.3	43.3	43.3	-	-	-	-	-	-
C	A	in	-	-	-	-	128.3	128.3	157.9	157.9	157.9	171.5
	E	in	116.1	116.1	116.1	116.1	-	-	-	-	-	-
Weights												
Empty weight	A	lbs	-	-	-	-	2,449	2,467	3,018	3,197	3,241	3,944
	E	lbs	1,847	2,002	2,037	2,066	-	-	-	-	-	-

■ The weight of the unit does not include the hydronic kit and accessories.

8 MINIMUM TECHNICAL SPACES

SINGLE INSTALLATION



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

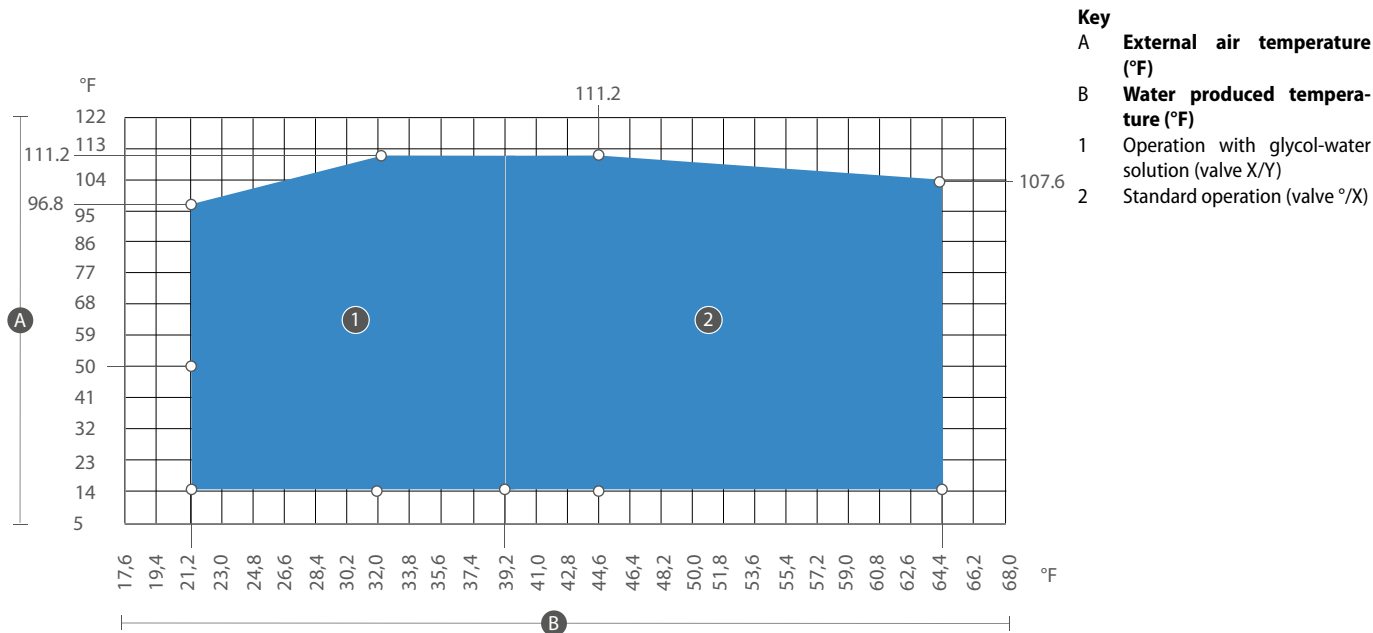
B 59 in

9 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 ΔT = -22.0 °F (cooling mode) and ΔT = -22.9 °F (heating mode).

■ 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 4.3 knot.

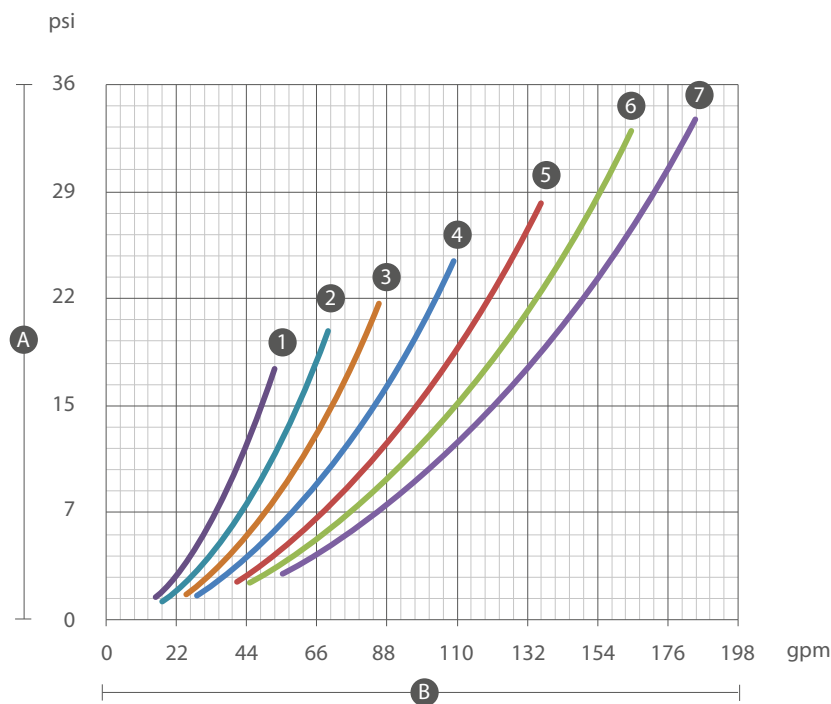
WARNING: Under no circumstances does the unit have to be operated outside the operating limit under penalty of the warranty expiration. Aermec S.p.A. cannot be held responsible for any malfunction of the units which are operated outside the established limits and for their consequences.



10 PRESSURE DROPS

CHILLER OPERATION

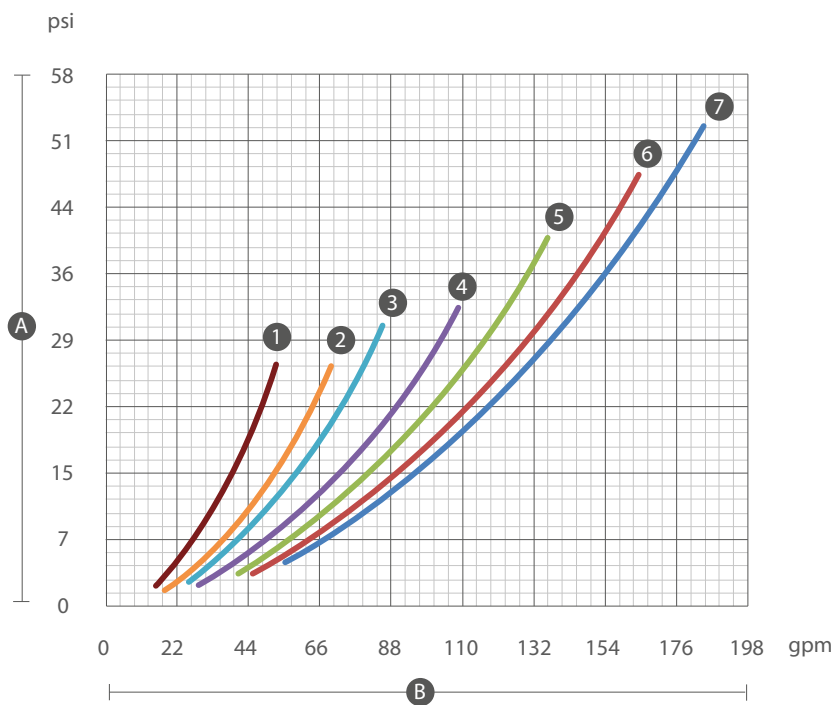
The diagram pressure drop are related to an average water temperature of 10°C/50°F
Input temperature 53,6°F / 12°C
Outlet Temperature 44,6°F / 7°C
External air temperature 95°F / 35°C



- A Pressure drops (psi)
- B Water flow rate (gpm)
- 1 028
- 2 030-033
- 3 035
- 4 050-055
- 5 060
- 6 065-070
- 7 075

FREE-COOLING OPERATION

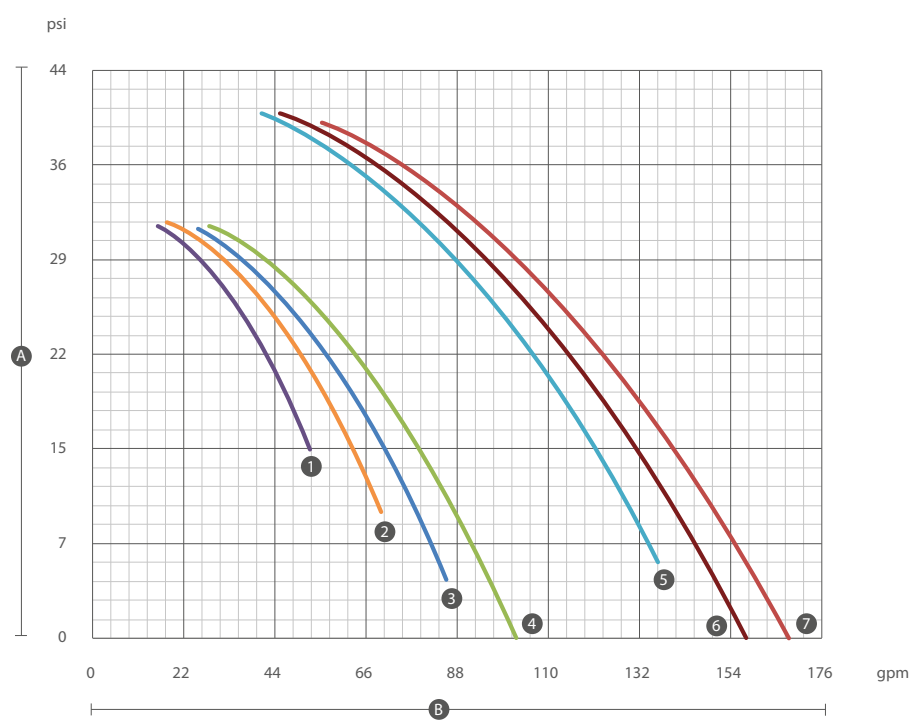
Inlet water temperature 15°C / 59°F
External air temperature 2°C / 35,6°F
Nominal water flow rate
Compressors off



- A Pressure drops (psi)
- B Water flow rate (gpm)
- 1 028
- 2 030-033
- 3 035
- 4 050-055
- 5 060
- 6 065-070
- 7 075

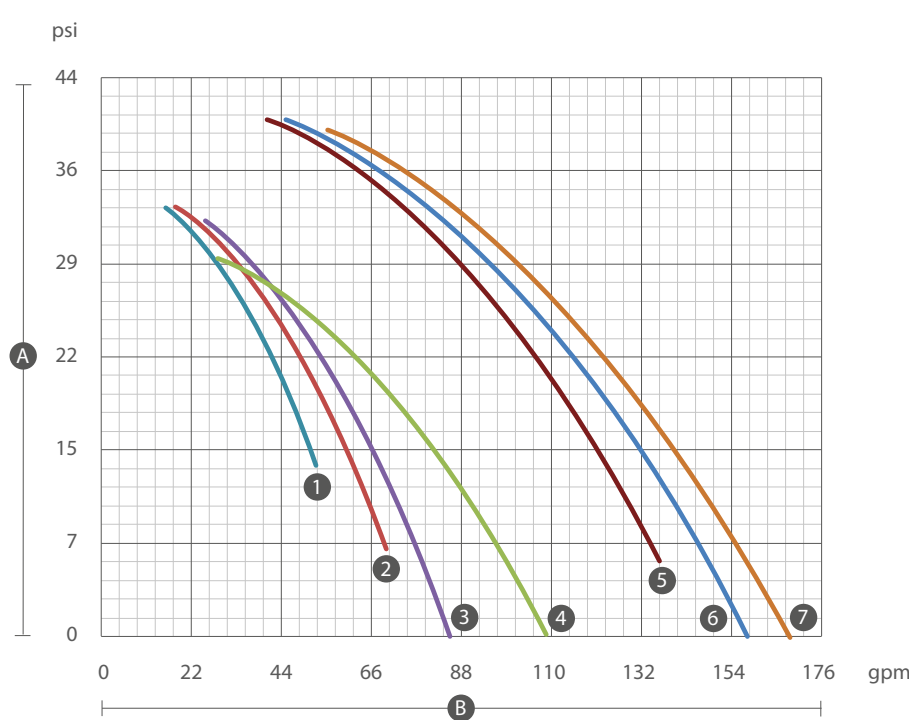
11 USEFUL HEAD SYSTEM

CHILLER (230-460/3/60)



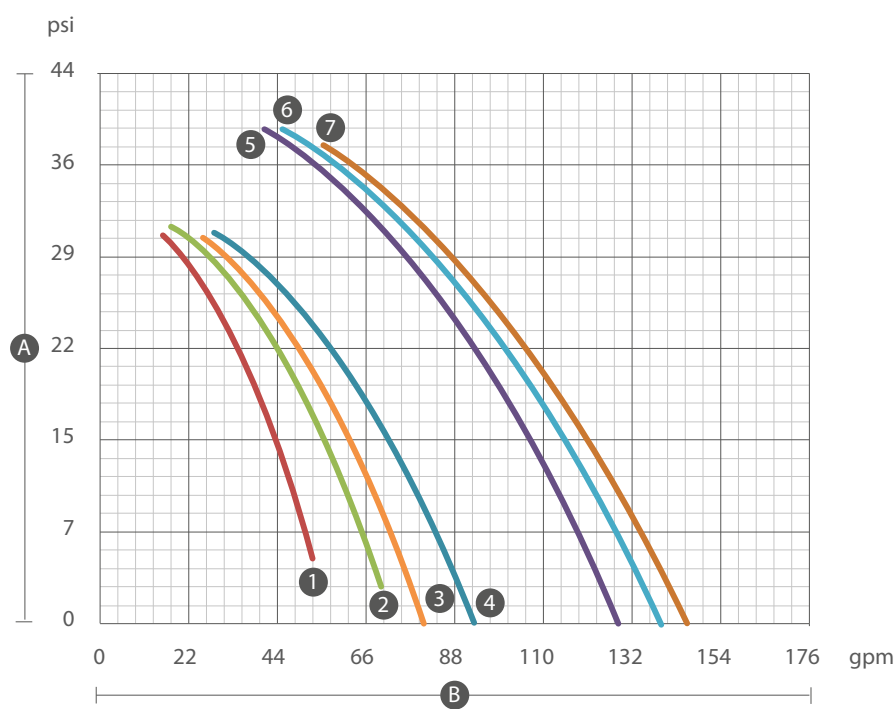
- A Useful head system (psi)
B Water flow rate (gpm)
1 028
2 030-033
3 0350
4 050-055
5 060
6 065-070
7 075

CHILLER (575/3/60)



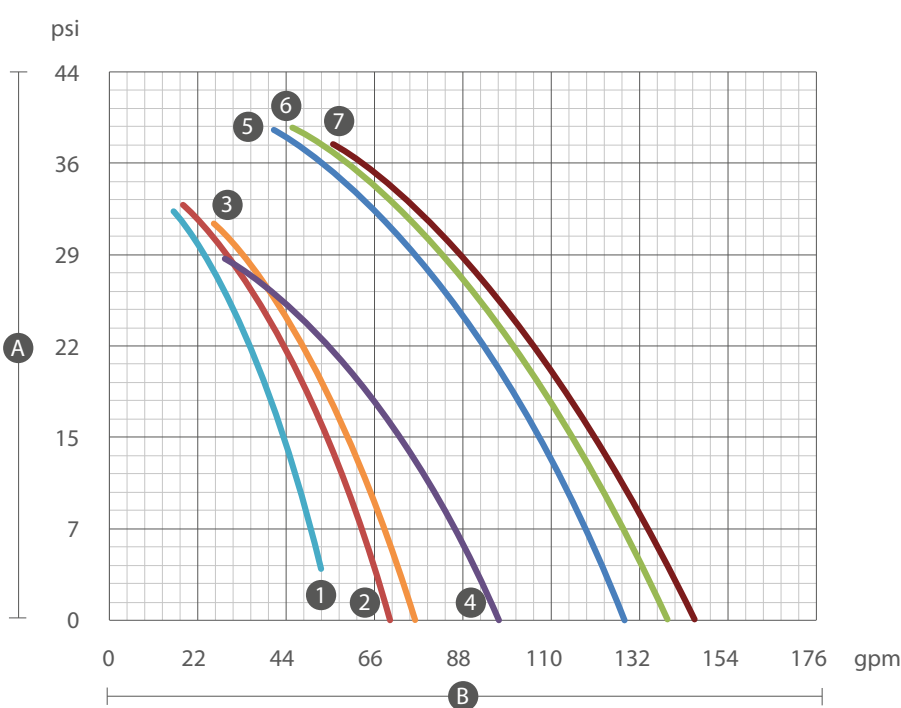
- A Useful head system (psi)
B Water flow rate (gpm)
1 028
2 030-033
3 0350
4 050-055
5 060
6 065-070
7 075

FREE-COOLING (230-460/3/60)



- A Useful head system (psi)
B Water flow rate (gpm)
1 028
2 030-033
3 0350
4 050-055
5 060
6 065-070
7 075

FREE-COOLING (575/3/60)



- A Useful head system (psi)
B Water flow rate (gpm)
1 028
2 030-033
3 0350
4 050-055
5 060
6 065-070
7 075

12 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			0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
Minimum system water content												
Application for ambient comfort	A	I/kW	-	-	-	-	5.0	5.0	4.0	4.0	4.0	4.0
	E	I/kW	7.0	7.0	7.0	7.0	5.0	5.0	4.0	4.0	4.0	4.0
Process chiller application	A	I/kW	-	-	-	-	10.0	10.0	8.0	8.0	8.0	8.0
	E	I/kW	14.0	14.0	14.0	14.0	10.0	10.0	8.0	8.0	8.0	8.0

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.

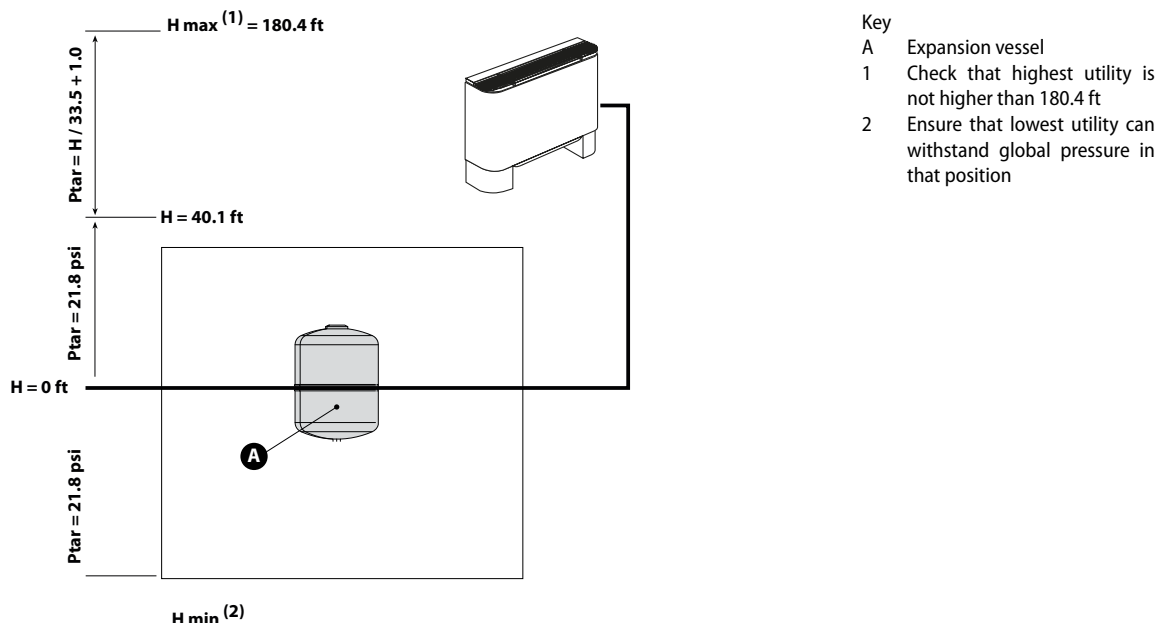
EXPANSION VESSEL SETTING

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: $p \text{ (rating) [psi]} = H \text{ [ft]} / 33.5 + 1.0$.

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.



13 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)

System side heat exchanger															
		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
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

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 imput power	1,0	1	0.98	0.95

14 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 propilene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwc	—	1.000	1.007	1.006	1.007	1.010	1.015	1.022	1.032	1.044	1.058
Pc	—	1.000	0.985	0.978	0.970	0.963	0.955	0.947	0.939	0.932	0.924
Pa	—	1.000	0.996	0.994	0.992	0.990	0.988	0.986	0.984	0.982	0.980
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 propilene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwh	—	1.000	1.008	1.014	1.021	1.030	1.042	1.055	1.071	1.090	1.112
Ph	—	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Pa	—	1.000	1.003	1.004	1.005	1.007	1.009	1.011	1.014	1.018	1.023
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.

15 SOUND DATA

COOLING

Size			028	030	033	035	050	055	060	065	070	075
Sound data calculated in cooling mode (1)												
Sound power level	A	dB(A)	-	-	-	-	83	83	84	85	86	87
	E	dB(A)	74	75	77	78	77	77	77	78	81	82
Sound pressure level (10 m / 33 ft)	A	dB(A)	-	-	-	-	51	51	52	53	54	55
	E	dB(A)	42	43	45	46	45	45	45	46	49	50
Sound pressure level (1 m / 3.3 ft)	A	dB(A)	-	-	-	-	63	63	64	65	66	67
	E	dB(A)	54	55	57	58	57	57	57	58	61	62
Sound power by centre octave band dB(A)												
125 Hz	A	dB(A)	-	-	-	-	69,1	69,1	70,4	71,4	72,9	73,9
	E	dB(A)	72,2	73,2	75,1	76,1	63,0	63,0	63,3	66,7	70,9	72,3
250 Hz	A	dB(A)	-	-	-	-	70,8	70,9	71,6	73,6	74,9	75,9
	E	dB(A)	61,1	62,1	64,0	65,0	66,9	66,9	67,1	68,6	73,4	74,5
500 Hz	A	dB(A)	-	-	-	-	75,0	76,0	76,1	77,8	78,3	79,3
	E	dB(A)	66,4	67,4	69,1	70,1	70,3	70,3	70,4	69,6	73,8	74,9
1000 Hz	A	dB(A)	-	-	-	-	77,7	78,5	78,9	81,1	80,6	81,6
	E	dB(A)	63,5	64,5	66,3	67,6	70,7	70,7	70,8	70,8	71,0	72,1
2000 Hz	A	dB(A)	-	-	-	-	77,5	77,5	79,0	79,3	81,7	82,7
	E	dB(A)	61,0	62,0	64,1	64,6	70,4	70,4	70,5	72,4	76,2	77,3
4000 Hz	A	dB(A)	-	-	-	-	75,1	73,0	75,6	75,7	75,5	76,5
	E	dB(A)	50,0	51,0	53,3	55,0	67,3	67,3	67,3	66,7	70,0	71,1
8000 Hz	A	dB(A)	-	-	-	-	64,8	62,0	65,1	62,2	62,4	63,4
	E	dB(A)	43,7	44,7	46,8	47,1	62,9	62,9	63,1	63,0	66,9	67,8

(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).

Data 14511:2018

System water temperature 54/44 °F (in/out)

External air temperature 95 °F

Standard fans

Note

For operating conditions different to those declared refer to the selection program Magellano, available on www.aermec.com

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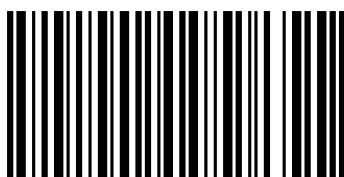


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