EN

5890732_05 – 23.09
Translation of Original instructions

WWB 0330-0900

Technical manual

60 Hz | GAS R134a

WATER-WATER HEAT PUMPS ONLY

Heating capacity 273,255 ÷ 867,605 BTU/h

AERMEC

www.aermec.com

COMPANY CERTIFICATIONS

SAFETY CERTIFICATIONS

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

TABLE OF CONTENTS

1 FIELDS OF THE RANGE

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

WWB is a range of irreversible water-water heat pumps that produce high temperature water with a low or medium temperature source.
Internal unit suitable for use in centralised residential systems, in systems that serve hotels and other forms of accommodation, and for applications in the tertiary and industrial sectors.

MAXIMUM ENERGY EFFICIENCY

Aermec, which has focused for years on energy efficiency, designed the WWB units with the aim of guaranteeing high efficiency both with full and partial loads.

OPERATING FIELD

With its wide operating range, it can be integrated with numerous applications and is a valid alternative to boilers and all conventional systems used to produce high temperature hot water since it also uses existing systems.
Production of hot water up to 176.0 °F (Max inlet temperature on source side 113.0 °F).

CONSTRUCTIONAL CHARACTERISTICS OF UNIT

— Optimised plate heat exchangers with low pressure drops.
— 2 cooling circuits, 1 compressor per circuit.
— Scroll compressors for high condensing temperatures.
— Compact size for easier installation.

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

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.

RENEWABLE ENERGY

Ideal for new construction and energy upgrading interventions, ensuring independence from fossil fuel generators, even in the presence of high-temperature terminals (e.g. radiators).

ADVANCED ELECTRONIC ADJUSTMENT

In case of installation in series with an Aermec air-water heat pump, the advanced electronic adjustment allows the interfacing of the 2 machines, managing their functioning under standard operating conditions, during defrosts, etc.

COMPACTNESS AND INSTALLATION FLEXIBILITY

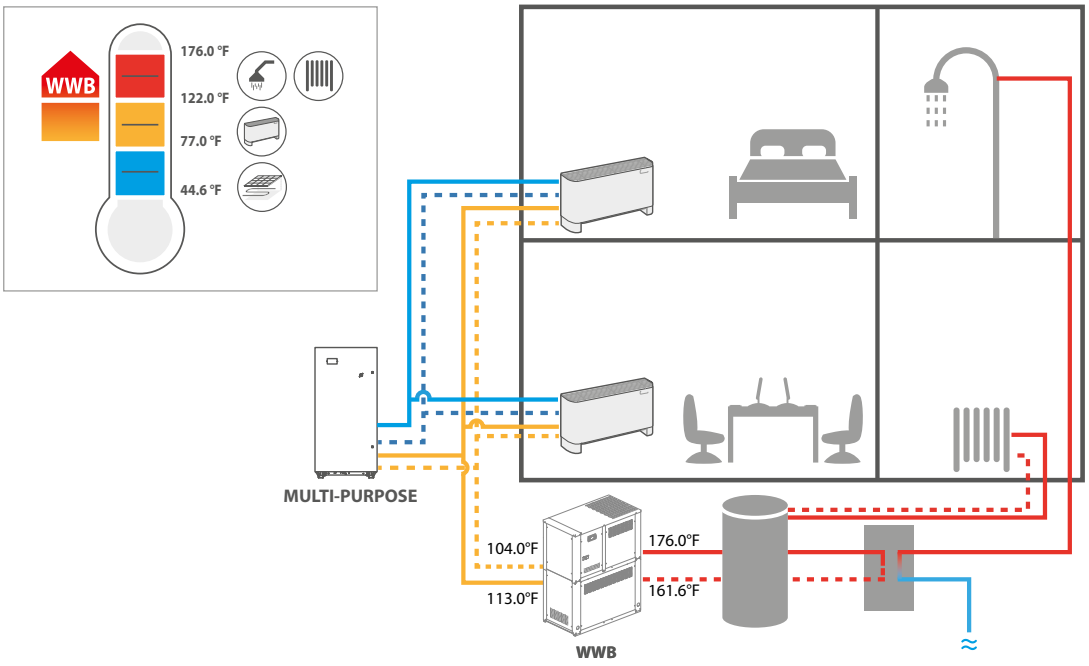
The small dimensions and possibility of choosing the opening side of the electrical panel (to be specified when ordering) facilitate installation even in contained technical rooms.

2 CONFIGURATOR

Field		Description
1,2,3		**WWB**
4,5,6,7		**Size** 0330, 0350, 0550, 0600, 0700, 0800, 0900
8		**Operating field (1)**
	X	Standard
9		**Model**
	H	Heat pump
10		**Version**
	L	Silenced
11		**Power supply**
	7	460V ~ 3 60Hz
	8	575V ~ 3 60Hz
12		**Electrical panel version**
	°	Standard opening (LH)
	R	Reverse opening (RH)

(1) Evaporator water up to +41 °F. Electronic thermostatic valve as standard.

Example of four-pipe system



3 UNIT COMPONENTS DESCRIPTION

REFRIGERANT CIRCUIT

Compressors

High-efficiency scroll hermetic compressors with 2-pole electric motors. All the compressors are equipped with inner electronic thermal protection device.

System side heat exchanger

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

Source side heat exchanger

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

Filter drier

Of hermetic/cartridge type (depending on the WWB size) with cartridges made of ceramic and hygroscopic material, able to withhold impurities and any traces of humidity present in the cooling circuit.

Solenoid valves

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

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.

CONTROL AND SAFETY COMPONENTS

Pressure relief valve for cooling circuit

Activates by discharging overpressure if abnormal pressure occurs.

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.

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.

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.

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

The microprocessor controls features cutting edge functions and proprietary adjustments.
The keyboard is equipped with control keys and LCD display, which allows you to consult and make interventions on the unit by means of the multi-level menu, with language selection settings. It controls:
— The system temperature for cooling the environments or industrial processes. The different temperatures are managed automatically according to the unit work conditions and requirements.
— Management and alarm log to have always a prompt diagnosis of the unit operation.
— Creation of operation time periods required for efficient programming
A specific keyboard for wall-mounting installation (PGD1) allows the remote control of all the functions.

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

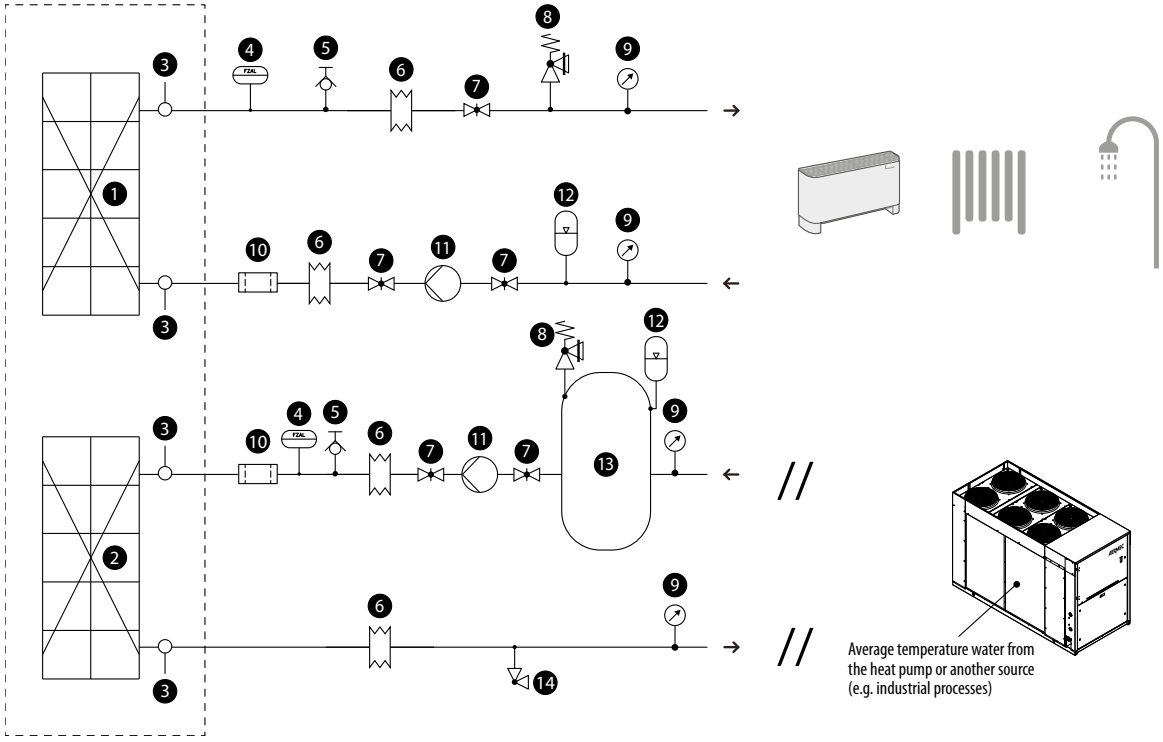
4 MAIN HYDRAULIC CIRCUITS

WARNING! Water filter and flow switch: It is necessary to install a water filter and a flow switch upstream of each heat exchanger if they are not supplied with the unit.

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

In the absence of glycol, the machine needs to be powered to ensure the heaters (if present) and the pumps (if present) are operating to avoid glazing and, therefore, damaging the components in the hydraulic circuit.

Flushing the plant's hydraulic circuit (cleaning the hydraulic circuit) needs to be done by excluding the chiller's hydraulic circuit. Make sure, in any case, that the water has not entered the chiller by ensuring you open the chiller's hydraulic circuit drains. Any water accumulated in the chiller's hydraulic circuit can cause icing/damage to the components.



Components as standard

1 Condenser
2 Evaporator
3 Water temperature sensors (IN/OUT)

Components not provided and responsibility of the installer

4 Flow switch (MANDATORY)
5 Air drain valve
6 Anti-vibration joints
7 Flow shut-off valves
8 Pressure relief valve
9 Pressure gauge
10 Water filter (MANDATORY)
11 Pump
12 Expansion vessel
13 Storage tank
14 Drain valve

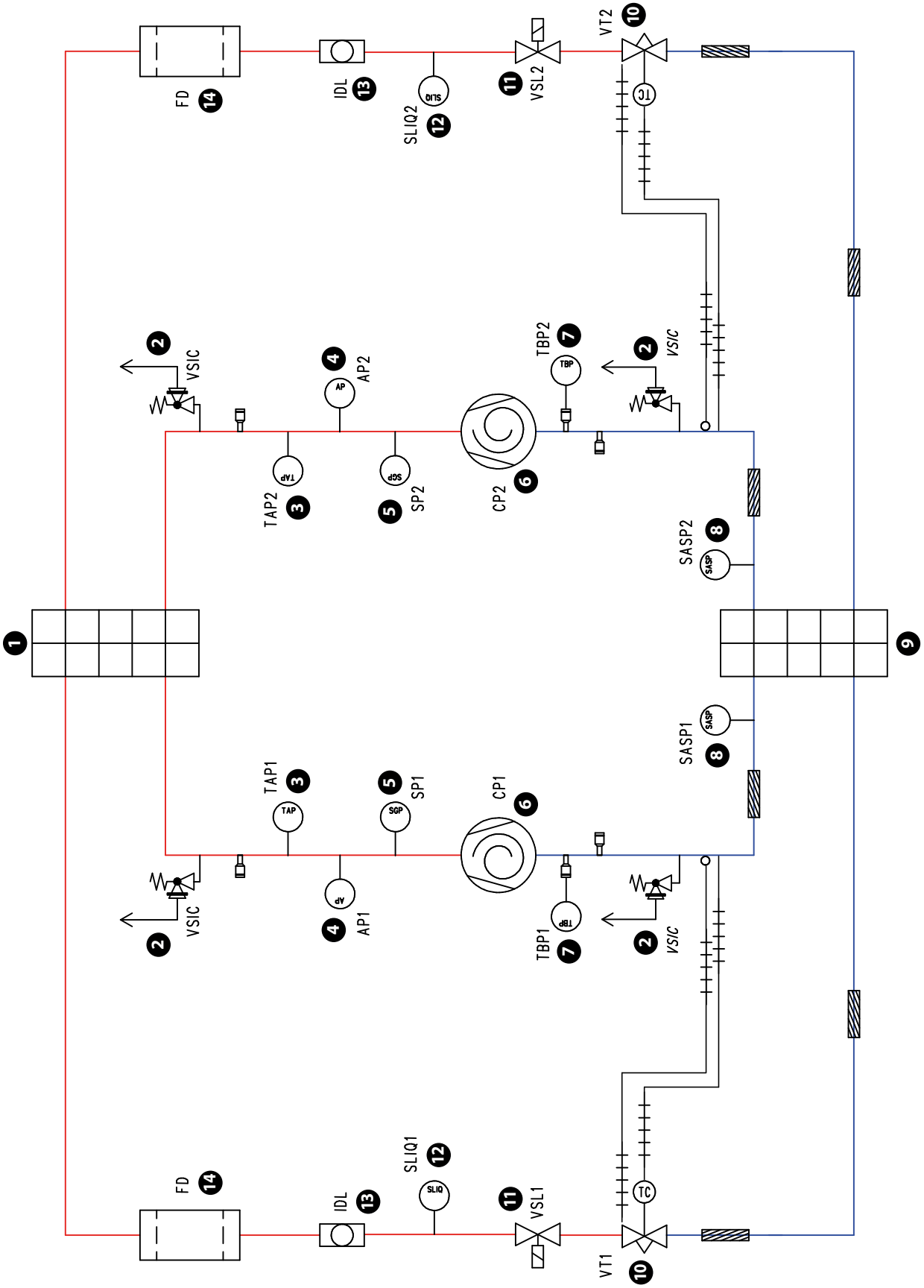
WATER CHARACTERISTICS

System: Chiller with plate heat exchanger	
PH	7,5 - 9
Total hardness	4,5 - 8,5 °dH
Temperature	< 65 °C
Oxygen content	< 0,1 ppm
Max. glycol amount	50 %
Phosphates (PO_4)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,3 ppm
Alkalinity (HCO_3)	70 - 300 ppm
Chloride ions (Cl-)	< 50 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.

5 REFRIGERANT CIRCUIT



1 Condenser
2 Pressure relief valve
3 High pressure transducer
4 High pressure switch
5 Discharge temperature sensor
6 Compressor
7 Low pressure transducer
8 Inlet gas temperature probes
9 Evaporator
10 Electronic thermostatic expansion valve
11 Solenoid valve
12 Liquid temperature probe
13 Sight glass
14 Filter drier

6 ACCESSORIES

AER485P1: RS-485 interface for supervision systems with MODBUS protocol.
AERBACP: Ethernet communication Interface for protocols Bacnet/IP, Modbus TCP/IP, SNMP
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.
PGD1: Allows you to control the unit at a distance.
VT: Anti-vibration supports.

FACTORY FITTED ACCESSORIES

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

ACCESSORIES COMPATIBILITY

Model	Ver	0330	0350	0550	0600	0700	0800	0900
AER485P1	L	•	•	•	•	•	•	•
AERBACP	L	•	•	•	•	•	•	•
AERNET	L	•	•	•	•	•	•	•
MULTICHILLER_EVO	L	•	•	•	•	•	•	•
PGD1	L	•	•	•	•	•	•	•

Antivibration

Ver	0330	0350	0550	0600	0700	0800	0900
L	VT9	VT9	VT9	VT15	VT15	VT15	VT15

Power factor correction

Ver	0330	0350	0550	0600	0700	0800	0900
L	RIFWWB03307	RIFWWB03507	RIFWWB05507	RIFWWB06007	RIFWWB07007	RIFWWB08007	RIFWWB09007

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

7 PERFORMANCE SPECIFICATIONS

Size			0330	0350	0550	0600	0700	0800	0900
Heating performances (Water user side 158.0 °F / 172.4 °F; Water source side 113.0 °F / 104.0 °F) (1)									
Heating capacity	L	BTU/h	273,255	326,269	373,165	494,406	579,467	721,828	867,605
Input power	L	kW	20.2	22.6	25.4	34.6	40.6	55.0	65.9
Heating total input current	L	A	29.0	32.0	36.0	50.0	60.0	75.0	92.0
COP	L	kW/kW	3,97	4,23	4,31	4,19	4,18	3,85	3,86
Water flow rate system side	L	gpm	38.8	46.3	53.0	70.2	82.3	102.5	123.2
Pressure drop system side	L	ftH_2O	7.69	11.04	6.36	11.37	7.03	10.71	7.36
Water flow rate source side	L	gpm	45.84	55.88	64.26	84.42	98.87	119.78	144.12
Pressure drop source side	L	ftH_2O	5.02	3.35	4.68	2.68	3.68	4.68	7.03
Heating performances (Water user side 158.0 °F / 172.4 °F; Water source side 95.0 °F / 86.0 °F) (2)									
Heating capacity	L	BTU/h	220,411	263,175	301,002	398,797	467,409	582,241	699,827
Input power	L	kW	19.8	22.2	24.9	33.9	39.9	54.0	64.7
Heating total input current	L	A	29.0	32.0	36.0	49.0	59.0	73.0	90.0
COP	L	kW/kW	3,26	3,48	3,54	3,44	3,44	3,16	3,17
Water flow rate system side	L	gpm	31.3	37.4	42.7	56.6	66.4	82.7	99.3
Pressure drop system side	L	ftH_2O	5.02	7.03	4.35	7.36	4.35	7.03	4.68
Water flow rate source side	L	gpm	34.15	41.89	48.26	63.23	74.04	88.93	107.04
Pressure drop source side	L	ftH_2O	3.01	2.01	2.68	1.34	2.01	2.68	3.68

(1) User side water 158.0 °F / 172.4 °F; Source side water 113.0 °F / 104.0 °F
(2) User side water 158.0 °F / 172.4 °F; Source side water 95.0 °F / 86.0 °F

8 GENERAL TECHNICAL DATA

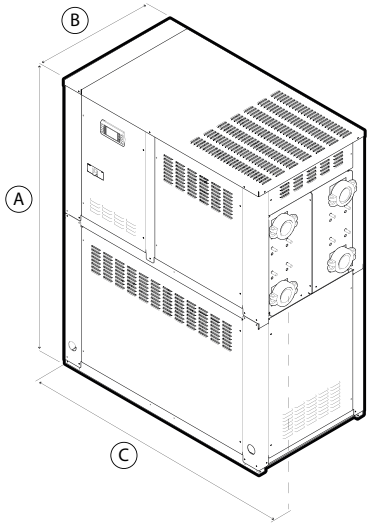
Size			0330	0350	0550	0600	0700	0800	0900
Compressor									
Type	L	type				Scroll			
Compressor regulation	L	Type				On-Off			
Number	L	no.	2	2	2	2	2	2	2
Circuits	L	no.	2	2	2	2	2	2	2
Partialisation of the unit with electronic thermostatic expansion valve	L	%	50-100	50-100	50-100	50-100	50-100	50-100	50-100
Refrigerant	L	type				R134a			
Refrigerant load circuit 1 (1)	L	lbs	6.6	7.9	9.7	13.7	17.0	17.6	21.8
Refrigerant load circuit 2 (1)	L	lbs	7.9	7.7	9.5	13.7	16.5	17.2	21.4
Oil	L	Type				POE			
Oil charge circuit 1	L	lbs	7.5	7.5	7.5	7.5	10.4	15.0	13.9
Oil charge circuit 2	L	lbs	7.5	7.5	7.5	7.5	10.4	15.0	13.9
System side heat exchanger									
Type	L	type				Brazed plate			
Number	L	no.	1	1	1	1	1	1	1
Minimum water flow rate	L	gpm	3.7	3.7	5.5	5.5	7.9	7.9	11.0
Maximum water flow rate	L	gpm	62.1	74.1	84.8	112.3	131.6	163.9	197.1
Connections (in/out)	L	Type				Grooved joints			
Sizes (in/out)	L	Ø	2″	2″	2″	2″1/2	2″1/2	2″1/2	2″1/2
Source side heat exchanger									
Type	L	type				Brazed plate			
Number	L	no.	1	1	1	1	1	1	1
Minimum water flow rate	L	gpm	5.5	7.9	7.9	11.0	11.0	12.8	12.8
Maximum water flow rate	L	gpm	76.7	93.4	107.4	141.1	165.3	200.3	241.0
Connections (in/out)	L	Type				Grooved joints			
Sizes (in/out)	L	Ø	2″	2″	2″	2″1/2	2″1/2	2″1/2	2″1/2
Sound data calculated in heating mode (2)									
Sound power level	L	dB(A)	76.8	77.8	77.3	78.6	79.3	83.9	85.9
Sound pressure level (10 m / 33 ft)	L	dB(A)	45.2	46.2	45.7	47.0	47.7	52.4	54.4
Sound pressure level (1 m / 3.3 ft)	L	dB(A)	60.7	61.7	61.2	62.5	63.2	67.8	69.8

(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).

ELECTRIC DATA

Size			0330	0350	0550	0600	0700	0800	0900
POWER SUPPLY: 7									
Electric data									
Peak current (LRA)	L	A	112.9	133.2	147.2	178.6	214.8	269.4	326.3
Minimum circuit amperage (MCA)	L	A	35.0	35.0	50.0	60.0	60.0	70.0	100.0
Maximum overcurrent permitted by the protection device (MOP)	L	A	40.0	45.0	60.0	70.0	80.0	100.0	125.0
POWER SUPPLY: 8									
Electric data									
Peak current (LRA)	L	A	94.3	95.9	98.6	133.2	160.7	215.1	281.4
Minimum circuit amperage (MCA)	L	A	35.0	35.0	35.0	50.0	60.0	70.0	70.0
Maximum overcurrent permitted by the protection device (MOP)	L	A	40.0	40.0	40.0	60.0	80.0	90.0	90.0

DIMENSIONS AND WEIGHTS

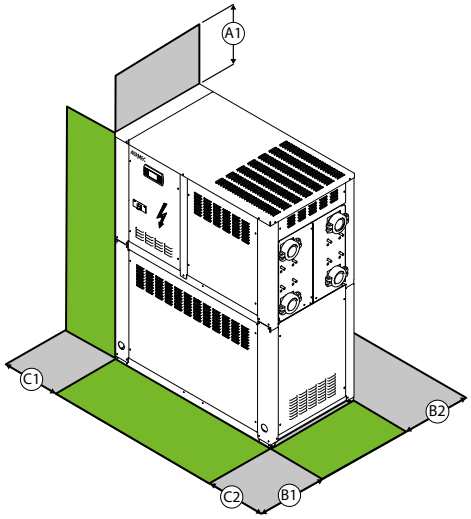


Size			0330	0350	0550	0600	0700	0800	0900
Dimensions and weights									
A	L	in	65.0	65.0	65.0	65.0	65.0	65.0	65.0
B	L	in	28.0	28.0	28.0	28.0	28.0	28.0	28.0
C	L	in	51.2	51.2	51.2	51.2	51.2	51.2	51.2

Size			0330	0350	0550	0600	0700	0800	0900
Weights									
Weight empty + packaging	L	lbs	937	970	1,003	1,102	1,576	1,676	1,808
Weight functioning	L	lbs	926	970	1,014	1,124	1,609	1,709	1,852

Minimum technical spaces

WWB ° - Standard opening electrical panel (LH)



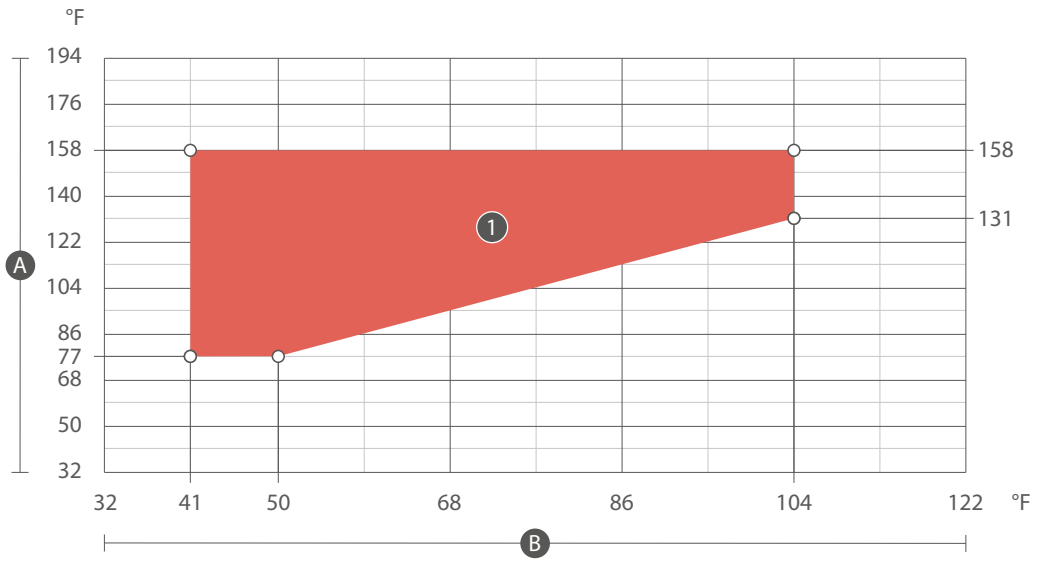
Size			0330	0350	0550	0600	0700	0800	0900
Minimum technical spaces									
A1	L	in	19.7	19.7	19.7	19.7	19.7	19.7	19.7
B1	L	in	31.5	31.5	31.5	31.5	31.5	31.5	31.5
B2	L	in	3.9	3.9	3.9	3.9	3.9	3.9	3.9
C1	L	in	3.9	3.9	3.9	3.9	3.9	3.9	3.9
C2	L	in	39.4	39.4	39.4	39.4	39.4	39.4	39.4

9 OPERATING RANGE

The units, in standard configuration, are not suitable for installation in salty environment.
The values indicated in the table refer to the min. and max. limits of the unit.

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.

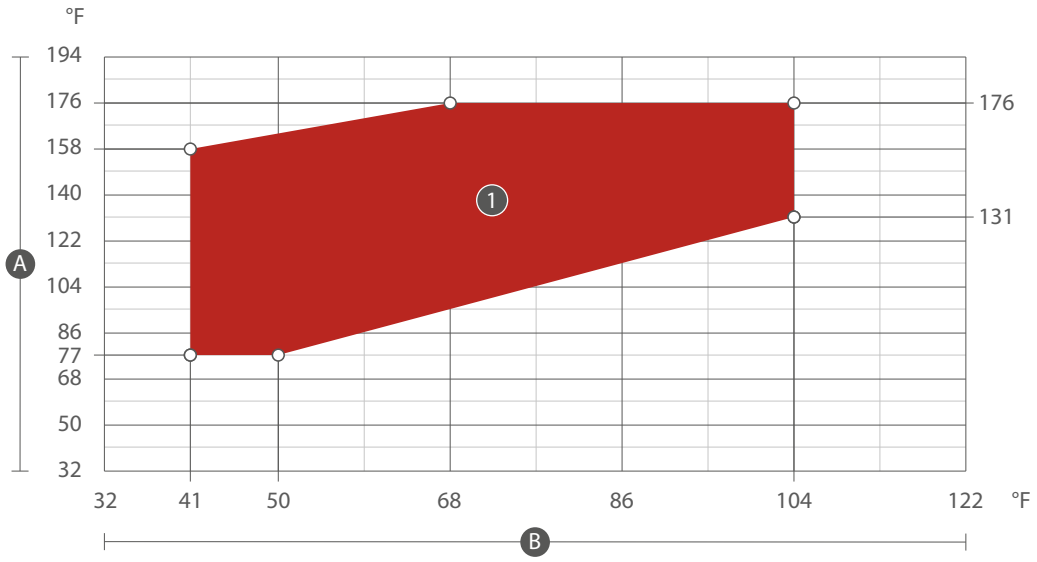
ΔT condenser = 9 °F



Key

A	**Water produced (system side) (°F)**
B	**Processed water temperature (source side) (°F)**
1	ΔT condenser = 9 °F

ΔT condenser = 14.4 °F



Key

A	**Water produced (system side) (°F)**
B	**Processed water temperature (source side) (°F)**
1	ΔT condenser = 14.4 °F

Project data

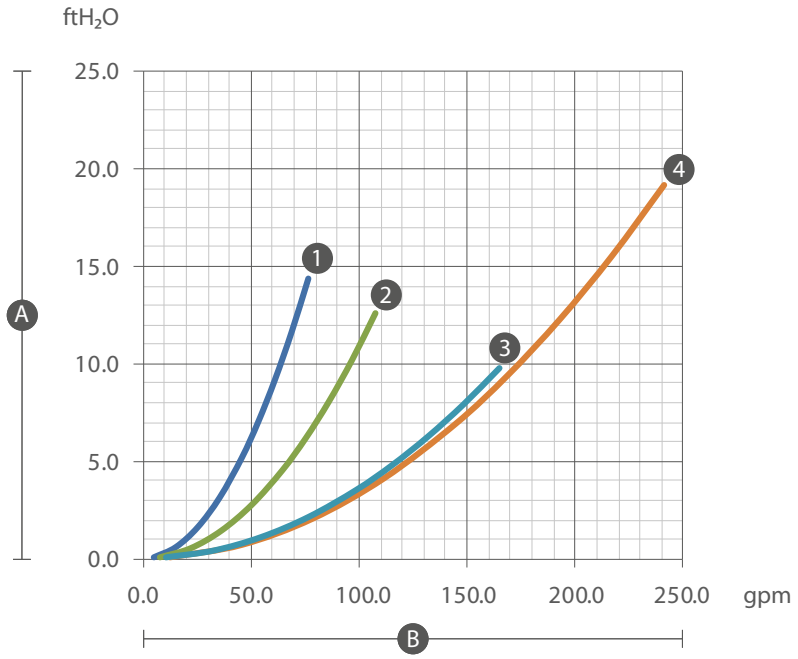
Heating		**High pressure side**	**Low Pressure side**
Maximum allowable pressure	psi	464	290
Maximum allowable temperature	°F	248	126
Minimum allowable temperature	°F	-31	-31

Technical water		**Condenser**	**Evaporator**
Maximum allowable pressure	psi	145	145

10 PRESSURE DROPS

HEATING MODE RANGE
Source side heat exchanger
Evaporator
Inlet water temperature 113.0 °F
Outlet water temperature 104.0 °F

Source side

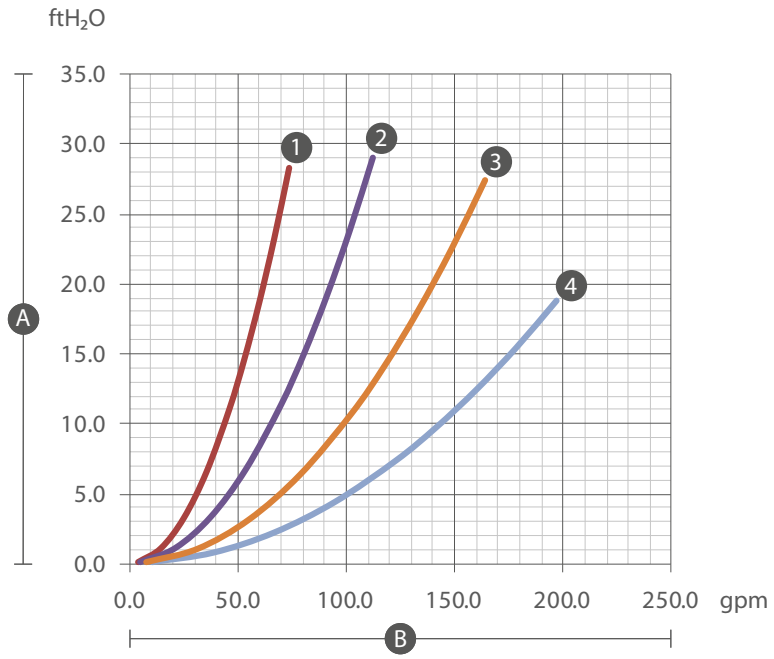


A **Pressure drops (ft H_2O)**
B **Water flow rate (gpm)**
1 0330
2 0350-0550
3 0600-0700
4 0800-0900

Size			0330	0350	0550	0600	0700	0800	0900
Source side heat exchanger									
Minimum water flow rate	L	gpm	5.5	7.9	7.9	11.0	11.0	12.8	12.8
Maximum water flow rate	L	gpm	76.7	93.4	107.4	141.1	165.3	200.3	241.0

System side heat exchanger
Condenser
Inlet water temperature 158.0 °F
Outlet water temperature 172.4 °F

System side



A **Pressure drops (ft H_2O)**
B **Water flow rate (gpm)**
1 0330-0350
2 0550-0600
3 0700-0800
4 0900

Size			0330	0350	0550	0600	0700	0800	0900
System side heat exchanger									
Minimum water flow rate	L	gpm	3.7	3.7	5.5	5.5	7.9	7.9	11.0
Maximum water flow rate	L	gpm	62.1	74.1	84.8	112.3	131.6	163.9	197.1

11 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).

	0330	0350	0550	0600	0700	0800	0900
Minimum system side water content (condenser) gal/ton	6.9	6.9	6.9	6.9	6.9	6.9	6.9

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.

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.**

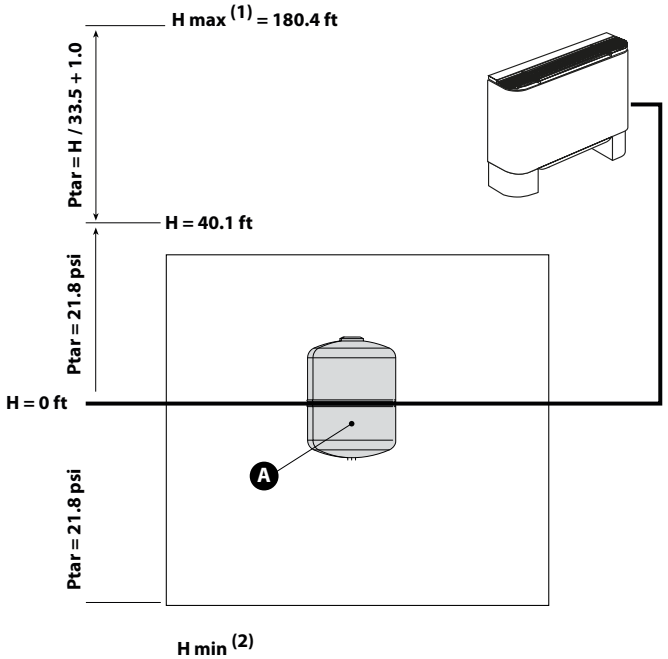
NOTICE: Under no circumstances does the unit have to be operated in a system in which the content of the water circulating is below the MINIMUM SYSTEM WATER CONTENT, under penalty of the warranty expiration. Aermec cannot be held responsible for any malfunction of the units which are operated in a system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

NOTICE: 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: 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

12 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) [bar] = 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.



Key
1 Check that highest installation is not higher than 180.4 ft.
2 Ensure that lowest utility can withstand global pressure in that position

13 CORRECTION FACTORS

CORRECTIVE FACTORS FOR ΔT OTHER THAN THE NOMINAL ONES

Δt water ev	**9.0**	**10.8**	**12.6**	**14.4**	**16.2**	**18.0**
CPt_ev	1,000	1,006	1,012	1,018	1,023	1,029
CPa_ev	1,000	1,004	1,008	1,012	1,017	1,021

Δt water cn	**9.0**	**14.4**	**19.8**	**25.2**	**30.6**	**36.0**
CPt_cn	0,985	1,000	1,009	1,011	1,008	0,998
CPa_cn	1,015	1,000	0,991	0,988	0,991	1,000

CPt: Coefficient heating capacity
CPa: Coefficient input power
ev: Evaporator
cn: Condenser

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

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 PROPILENE GLYCOL - COOLING MODE											
Freezing Point	°F	0	25.83	22.46	18.61	14.04	8.46	1.65	-6.65	-16.67	-28.70
Percent propilene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwc	–	1.000	1.007	1.006	1.007	1.010	1.015	1.022	1.032	1.044	1.058
Pc	–	1.000	0.985	0.978	0.970	0.963	0.955	0.947	0.939	0.932	0.924
Pa	–	1.000	0.996	0.994	0.992	0.990	0.988	0.986	0.984	0.982	0.980
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 PROPILENE GLYCOL - HEATING MODE											
Freezing Point	°F	0	25.83	22.46	18.61	14.04	8.46	1.65	-6.65	-16.67	-28.70
Percent propilene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwh	–	1.000	1.008	1.014	1.021	1.030	1.042	1.055	1.071	1.090	1.112
Ph	–	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Pa	–	1.000	1.003	1.004	1.005	1.007	1.009	1.011	1.014	1.018	1.023
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.

14 SOUND DATA

Size			0330	0350	0550	0600	0700	0800	0900
Sound data calculated in heating mode (1)									
Sound power level	L	dB(A)	76.8	77.8	77.3	78.6	79.3	83.9	85.9
Sound pressure level (10 m / 33 ft)	L	dB(A)	45.2	46.2	45.7	47.0	47.7	52.4	54.4
Sound pressure level (1 m / 3.3 ft)	L	dB(A)	60.7	61.7	61.2	62.5	63.2	67.8	69.8
Sound power by centre octave band dB(A)									
125 Hz	L	dB(A)	54.1	55.1	54.6	55.9	56.6	61.2	63.2
250 Hz	L	dB(A)	74.4	75.4	74.9	76.2	76.9	81.6	83.6
500 Hz	L	dB(A)	70.6	71.6	71.1	72.4	73.1	77.7	79.7
1000 Hz	L	dB(A)	66.5	67.5	67.0	68.3	69.0	73.7	75.7
2000 Hz	L	dB(A)	65.0	66.0	65.5	66.8	67.5	72.1	74.1
4000 Hz	L	dB(A)	57.4	58.4	57.9	59.2	59.9	64.5	66.5
8000 Hz	L	dB(A)	41.8	42.8	42.3	43.6	44.3	49.0	51.0

(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).

Water user side 158.0 °F / 172.4 °F (in/out); Water source side 113.0 °F / 104.0 °F (in/out)
Note
For operating conditions different to those declared refer to the selection program Magellano, available on www.aermec.com

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