



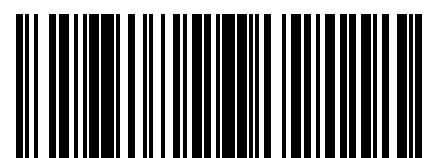
WATER-WATER CHILLER - Technical Manual

WRL-H 026-161

- **WRL H REVERSIBLE WATER-TO-WATER HEAT PUMP**
- **INDOOR UNIT**
- **USED FOR GEOTHERMAL APPLICATIONS**



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EN

Dear customer,

Thank you for choosing AERMEC. It is the fruit of many years of experience and special design studies and has been made of the highest grade materials and with cutting edge technology.

In addition, all our products bear the EC mark indicating that they meet the requirements of the European Machine Directive regarding safety. The quality level is being constantly monitored, so AERMEC products are synonymous with Safety, Quality and Reliability.

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

Thank you once again.
AERMEC S.p.A

CONTENTS

1.	Description of the unit	6
2.	Configurator	7
3.	Operating circuit diagrams	8
3.1.	WRL-H standard 026 / 081.....	8
3.2.	WRL-H standard 101 / 161.....	8
3.3.	WRL-HT 026 / 081.....	9
3.4.	WRL-HT 101 / 161.....	9
4.	System examples (WRL-H)	10
5.	Description of components	11
5.1.	Structure	11
5.2.	Refrigerant circuit	11
5.3.	Standard hydraulic circuit	11
5.4.	Hydraulic circuit components in versions with hydronic kit	11
5.5.	Control and safety components	11
5.6.	Check and power electrical panel.....	11
6.	Accessories	13
7.	Technical data	14
8.	Operating range	18
9.	Outputs and inputs different from the rated values	19
10.	Correction factors	22
11.	Ethylene glycol solutions	23
12.	Total pressure drops of the unit	24
13.	Pumping unit head	25
13.1.	Geothermal side and system side pump head, and total recovery	25
13.2.	Inverter pump head	25
14.	Expansion tank calibration	26
15.	Sound data	27
16.	Safety and control parameters setting	28
17.	Anti-legionella function	29
18.	Selection and place of installation	30
18.1.	Centers of gravity position.....	30

DICHIARAZIONE DI CONFORMITÀ UE
EU DECLARATION OF CONFORMITY / DECLARATION DE CONFORMITE UE
KONFORMITÄTSERKLÄRUNG EU / DECLARACIÓN DE CONFORMIDAD UE

WRL-H

MODEL _____
SERIAL NUMBER _____
DATE _____

Noi, firmatari della presente, dichiariamo sotto la nostra esclusiva responsabilità che l'insieme in oggetto così definito:
We, the undersigned, hereby declare under our own responsibility that the assembly in question, defined as follows:
Nous, Signataires du présent acte, déclarons sous notre responsabilité exclusive que le groupe cité à l'objet défini de la façon suivante:
Die Unterzeichner erklären unter eigener Verantwortung, dass die oben genannte Maschineneinheit, bestehend aus:
Nosotros, los abajo firmantes, declaramos bajo nuestra exclusiva responsabilidad, que el conjunto en cuestión, denominado:

Nome / Name / Nom / Name / Nombre WRL-H
Tipo / Type / Type / Typ / Tipo REVERSABLE WATER COOLED HEAT PUMPS
Modello / Model / Modèle / Model / Modelo

A cui questa dichiarazione si riferisce è conforme a tutte le disposizioni pertinenti delle seguenti direttive:
To which this declaration refers, complies with all the provisions related to the following directives:
Auquel cette déclaration se réfère, est conforme à toutes les dispositions relatives des directives suivantes :
Das Gerät, auf welches sich diese Erklärung bezieht, entspricht allen Verordnungen im Zusammenhang mit den folgenden Richtlinien.
A la que esta declaración se refiere, es conforme con todas las disposiciones pertinentes de las siguientes directivas:

Direttiva LVD: 2014/35/UE

Direttiva Compatibilità Elettromagnetica EMCD: 2014/30/UE

Direttiva PED in materia di attrezzature a pressione: 2014/68/UE

L'oggetto della dichiarazione di cui sopra è conforme alle pertinenti normative di armonizzazione dell'Unione:

The above-mentioned declaration complies with the harmonised European standards:

L'objet de la déclaration reportée ci-dessus est conforme aux normes d'harmonisation relatives de l'Union :
The above-mentioned declaration complies with the harmonized European standards.

Le sujet de la déclaration reportée ci-dessus est conforme aux normes à harmonisation relatives de l'Union.

El objeto de la declaración de arriba es conforme con las normativas pertinentes de armonización de la Unión; El Segundo anexo del acuerdo entre el Parlamento Europeo y el Consejo sobre la armonización en materia de protección de los consumidores.

**CEI EN 60335-2-40: 2005
CEI EN 60335-2-40/A1: 2007
CEI EN 60335-2-40/A2: 2009
CEI EN 60335-2-40/A13: 2012**

**CEI EN 61000-6-1: 2007
CEI EN 61000-6-3: 2007
CEI EN 55014-1: 2008
CEI EN 55014-2: 1998**

EN378-2: 2012
UNI EN 12735-1: 2010
UNI EN 14276-1: 2011

La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante.

This declaration of conformity has been released under the exclusive responsibility of the manufacturer.

This declaration of conformity has been released under the exclusive responsibility of the manufacturer.

La déclaration de conformité présente est délivrée sous la responsabilité exclusive du fabricant.
Diese Konformitätserklärung wurde unter der ausschließlichen Verantwortung des Herstellers ausgestellt.

Diese Konformitätserklärung wurde unter der Verantwortung des Herstellers aufgestellt.
Esta declaración de conformidad se ha otorgado bajo la responsabilidad exclusiva del fabricante.

Il prodotto, in accordo con la direttiva 97/23/CE, soddisfa la procedura di Garanzia qualità Totale (modulo H) con certificato n.06/270-QT3664 Rev. 10 emesso dall'organismo notificante, n.1121.CEC via Pisacane 46 Legnano (MI) - Italy.

The product, in agreement with Directive 97/23/CE, satisfies the Total quality Guarantee procedure (form H) with certificate no. 06/270-QT3664 Rev. 10 issued by the notified body n. 1131 CEC via Pisacane 46 Legnano (MI) - Italy.

Le produit, selon la directive 97/23/CE, respecte la procédure de Garantie de qualité Totale (module H) par le certificat n.06/270-QT3664 Rév. 10 émis par l'organisme notifié n.1131 CEC via Pisacane 46 Legnano (MI) - Italie.

In Übereinstimmung mit der Richtlinie 97/23/EG, erfüllt das Produkt die Anforderungen des Verfahrens der umfassenden Qualitätssicherung (Modul H), Zertifikat-Nr. 06/370 OT2664 Rev. 10, ausgestellt durch konzulta Stalla Nr. 1131 CEC Via Pisacane 46 Legnano (MI) - Italien.

Zertifikat Nr.06/270-QT3664 Rev. 10, ausgestellt durch benannte Stelle Nr. 1131 CEC via Pisacane 46, Legnano (MI) - Italy.
El producto, conforme a la directiva 97/23/CE, cumple con el procedimiento de Garantía de calidad total (módulo H) con certificado n. 06/270-QT3664 Rev. 10 emitido por el organismo autorizado n. 1131 CEC via Pisacane 46 Legnano (MI) - Italia.

1. DESCRIPTION OF THE UNIT

DESCRIPTION

The WRL water condensed heat pumps are reversible units for the production of chilled and hot water, and domestic hot water. They are indoor units with hermetic scroll compressors, system side heat exchangers and plate source which fully meet the needs of the residential market: reduced size, easy installation, low noise level. They may be combined in traditional systems or with radiant panels.

In the latter, using lower water temperatures, an overall better performance is ensured. They are particularly suitable for new buildings with low energy consumption and favor the use of renewable energy sources.

In units with total recovery, there is also the possibility to produce domestic hot water as a priority in both summer and winter. The unit is shipped with a temperature probe kit for eventual DHW tank.

STRUCTURE

The base, the structure and the panels are made of steel treated with polyester anticorrosion paints.

The technological choices made, always aim at the highest quality, ensuring complete ease of installation.

In fact, the electrical and hydraulic connections are all located at the top of the unit making it easy to install and maintain, also reducing the technical areas and their placement in the smallest space possible.

VERSIONS

WRL_H Heat pump without storage.

WRL_HA Heat pump with storage.

OPERATING LIMITS

Operating limits: Operation at full load with production of hot water for the system up to 60° C. For more details refer to the technical documentation / selection software.

CHARACTERISTICS

- Single circuit unit
- Water filter, differential pressure switch and water safety valve as standard on the system side, and source side and also on the domestic side if required.
- Possibility of a hydronic kit, which encases the main hydraulic components; available in various configurations, with low or high head pumps, inverter pumps and the possibility of a modulating valve to reduce consumption (source side, for applications with ground water)
- Microprocessor control, complete with keyboard and LCD display allowing easy operation on the unit through a multi-language menu. The regulation using an outside air temperature sensor (accessory) allows a dynamic control of the water temperature produced by increasing the energy efficiency of the system.

CONSERVING THE DOCUMENTATION

Deliver the following instructions plus all the complementary documentation to the system user, who shall be responsible for keeping the instructions so that they are always available when needed.

Read carefully this chapter; all the procedures must be carried out by qualified personnel according to the regulations in force in the different countries. (M.D. 329/2004).

INSTALLATION

The unit must be installed in such a way as to make all maintenance and/or repair operations possible.

WARRANTY

The warranty does not in any case cover costs of ladder trucks, lifts or other lifting systems

that may be required in order to carry out repairs under warranty.

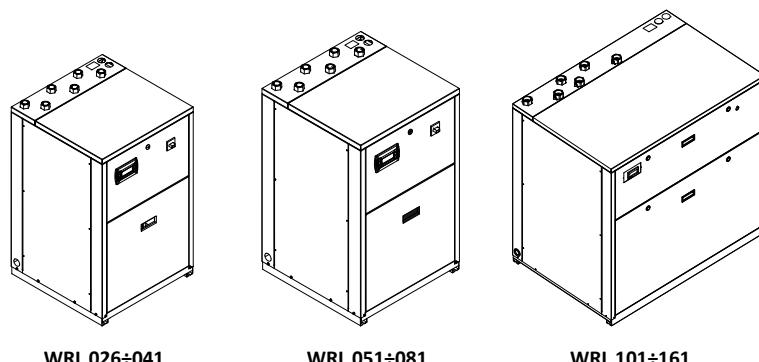
Do not modify or tamper with the unit, as it can lead to dangerous situations. Therefore, the manufacturer will not be liable for any damage caused. The warranty shall not be valid if the indications mentioned above are not observed.

SAFETY PRECAUTIONS AND INSTALLATION REGULATIONS

The unit must be installed by an authorised and qualified technician, in compliance with the national legislation in force in the country of destination (MD 329/2004).

Aermec shall not be held responsible for any damage whatsoever resulting from the non-compliance with these instructions.

Before starting any work, it is necessary TO READ CAREFULLY THE INSTRUCTIONS, AND TO PERFORM THE SAFETY CHECKS TO AVOID ANY RISKS. All the personnel in charge must be aware of the operations and the risks that may arise when all the unit installation operations begin.

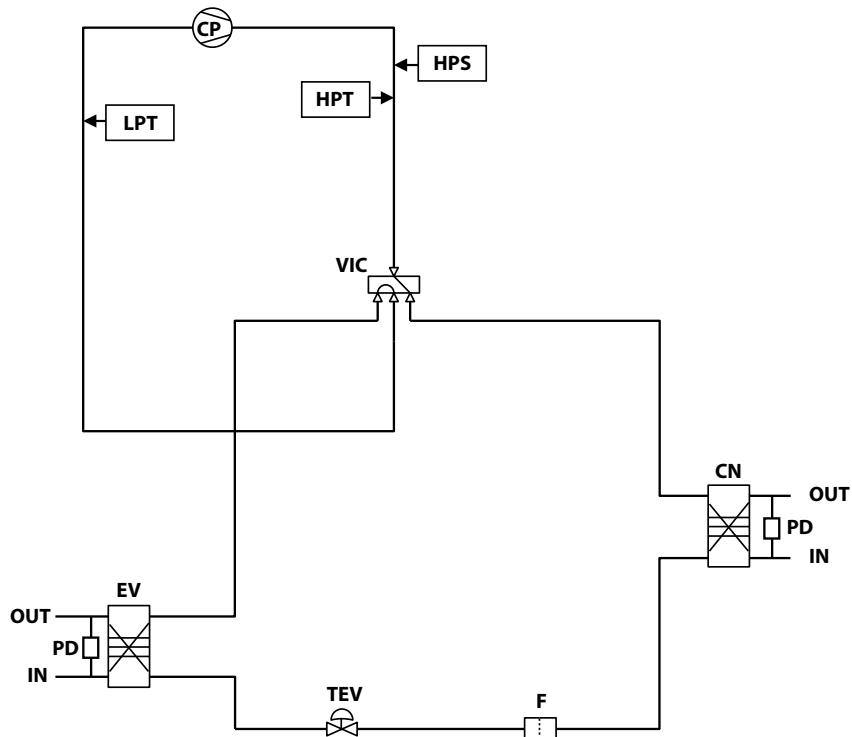


2. CONFIGURATOR

FIELD	ACCESSORY
1, 2, 3	WRL
4, 5, 6	SIZE 026 - 031 - 041 - 051 - 071 - 081 - 101 - 141 - 161
7	FIELD OF USE
	X Electronic thermostatic valve (STANDARD FOR ALL MODELS) water produced up to 4° C (for different temperatures, please contact the company.).
8	MODEL:
	H Heat pump
9	VERSION:
	◦ Standard
	A With system accumulation
10	HEAT RECOVERY
	◦ Without heat recovery
	T Total heat recovery (Not compatible with water produced up to -8° C)
11	STANDARD VERSION GEOTHERMAL SIDE PUMP KIT « ◦ / A »
	◦ Without pump
	GEOTHERMAL APPLICATIONS
	B CIRCULATOR ON-OFF 3 speed (AVAILABLE UP TO MODEL WRL 081)
	STANDARD three-phase single speed pump (MODELS WRL 101-141-161)
	U ENLARGED three-phase single speed PUMP (MODELS WRL 101-141-161)
	I Inverter pump, (AVAILABLE UP TO MODEL WRL 081)
	APPLICATIONS WITH GROUND WATER
	V Two-way modulating valve
12	USER SIDE PUMP KIT
	◦ Without pump
	P CIRCULATOR ON-OFF 3 speed (AVAILABLE UP TO MODEL WRL 081) STANDARD three-phase single speed pump (MODELS WRL 101-141-161)
	N ENLARGED three-phase single speed PUMP (MODELS WRL 101-141-161)
13	RECOVERY PUMP KIT
	◦ Without pump
	Q Pump
14	SOFT START KIT
	◦ Without Soft Start
	S With Soft Start
15	POWER SUPPLY
	◦ 400V-3N-50 Hz
	M 230V-1-50Hz (Only for sizes 026, 031, 041)
	4 230V-3-50Hz (Only for sizes 051, 071, 081, 101, 141)

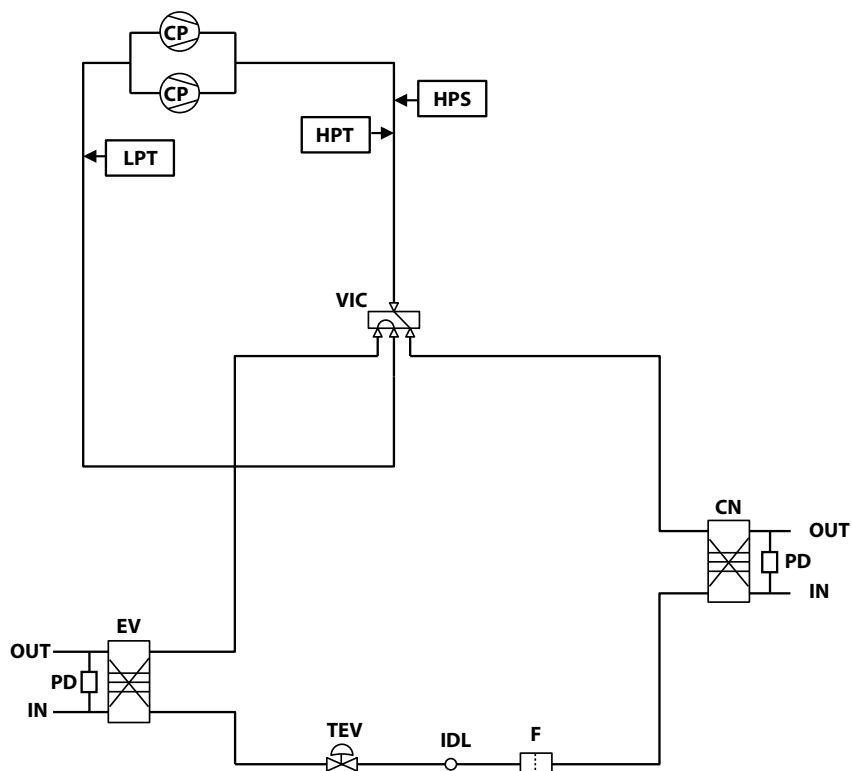
3. OPERATING CIRCUIT DIAGRAMS

3.1. WRL-H STANDARD 026 / 081



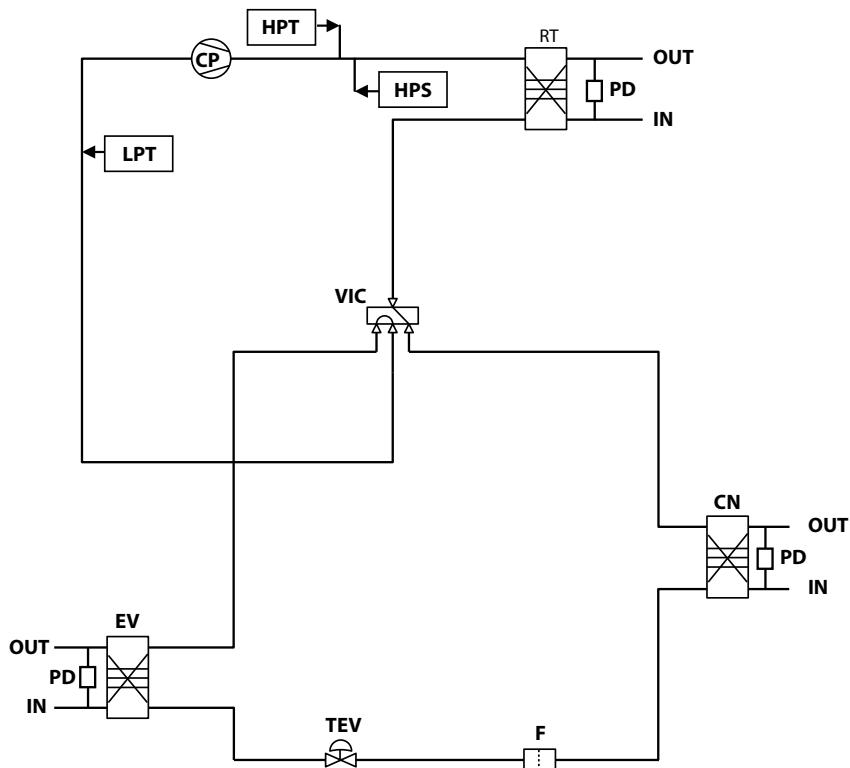
KEY	
CN	Condenser
CP	Compressor
EV	Evaporator
F	Filter-drier
HPS	High pressure switch
HPT	High pressure transducer
LPT	Low pressure transducer
TEV	Electronic thermostatic valve
VIC	Reverse cycle valve

3.2. WRL-H STANDARD 101 / 161



KEY	
CN	Condenser
CP	Compressor
EV	Evaporator
F	Filter-drier
HPS	High pressure switch
HPT	High pressure transducer
IDL	Liquid indicator
LPT	Low pressure transducer
TEV	Electronic thermostatic valve
VIC	Reverse cycle valve

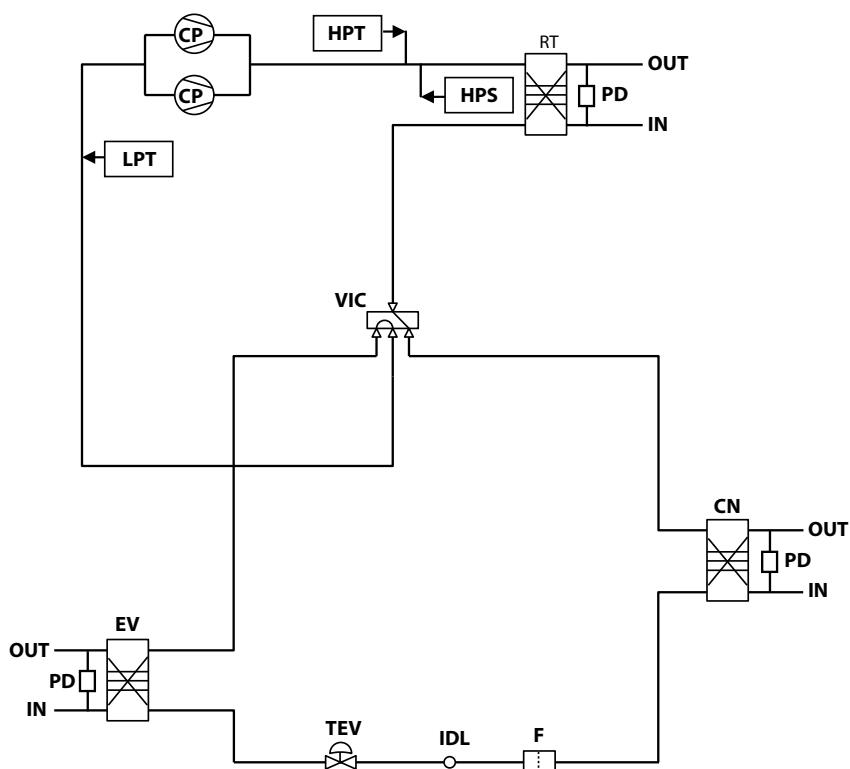
3.3. WRL-HT 026 / 081



KEY

CN	Condenser
CP	Compressor
EV	Evaporator
F	Filter-drier
HPS	High pressure switch
HPT	High pressure transducer
LPT	Low pressure transducer
RT	Total recovery (Selectable from configurator)
TEV	Electronic thermostatic valve
VIC	Reverse cycle valve

3.4. WRL-HT 101 / 161



KEY

CN	Condenser
CP	Compressor
EV	Evaporator
F	Filter-drier
HPS	High pressure switch
HPT	High pressure transducer
IDL	Liquid indicator
LPT	Low pressure transducer
RT	Total recovery (Selectable from configurator)
TEV	Electronic thermostatic valve
VIC	Reverse cycle valve

4. SYSTEM EXAMPLES (WRL-H)



The WRL-H heat pump can manage up to a maximum of 3 ZONES.

ZONE 1: Managed as standard using a cutting-edge electronic control. The Clamp-on probe "SSM" (accessory) is recommended to control the delivery temperature. The unit is shipped with 1 temperature probe kit for eventual DHW tank.

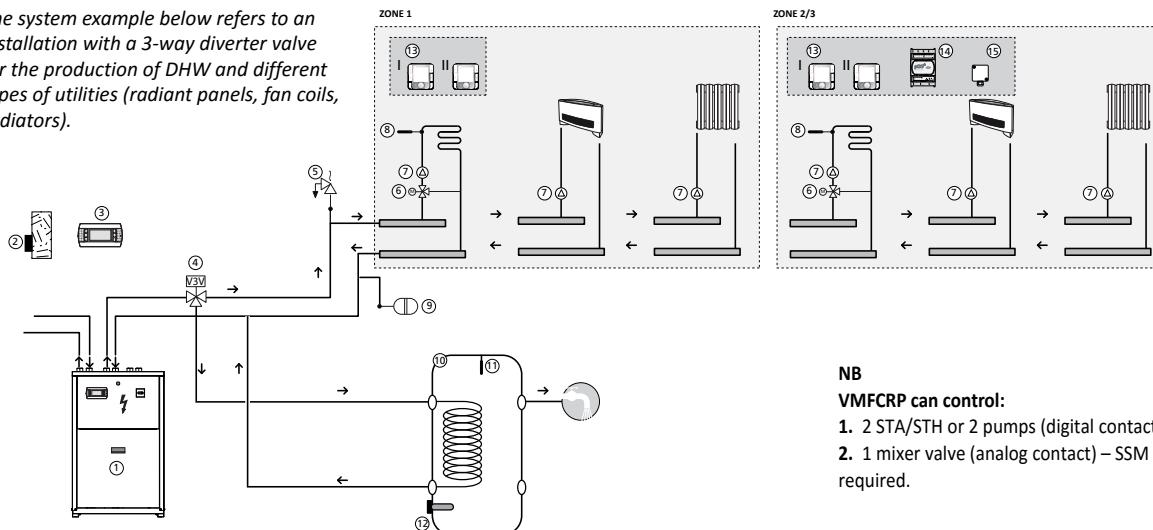
ZONE 2 and ZONE 3 are managed by using, for each zone, accessories VMFCRP + SSM.

E.G.: The heat pump is connected directly to the utilities circuit (SYSTEM), and provides domestic hot water (DHW) through a three-way diverter valve, connected to a storage tank.

The DHW production has priority over that of the system.

Exemplary hydraulic diagrams

The system example below refers to an installation with a 3-way diverter valve for the production of DHW and different types of utilities (radiant panels, fan coils, radiators).



NB

VMFCRP can control:

1. 2 STA/STH or 2 pumps (digital contacts).
2. 1 mixer valve (analog contact) – SSM probe kit required.

KEY

1. WRL-H
2. Outside air temperature sensor (ACCESSORY)
3. Remote control panel
4. Three-way valve
5. Safety valve
6. Mixer valve Zone 1
7. Circulator (**WARNING: The pumps are not managed in Zones 2 and 3**)
8. Water temperature sensor
9. Additional expansion tank (if necessary)
10. Domestic hot water storage tank "DHW" (not supplied)
11. Storage tank probe
12. Integrated electric resistor (not supplied)
13. STA - STH "Zone control panel" (accessory)
14. VMFCRP (accessory, required to control Zones 2 and 3)
15. SSM (accessory, required to control Zones 2 and 3)



WARNING:

Units are shipped with 1 TEMPERATURE SENSOR FOR POSSIBLE STORAGE TANK.



WARNING

In the version with Total recovery the charging of refrigerant should only be carried out with the Total recovery off.



5. DESCRIPTION OF COMPONENTS

5.1. STRUCTURE

BASE AND LOAD-BEARING STRUCTURE

Made from sheet galvanized steel of adequate thickness.

All parts are painted with weather resistant polyester powder paint (RAL 9002).

Made to allow full access to the internal components. All panels are lined with sound-absorbing material of suitable thickness.

5.2. REFRIGERANT CIRCUIT

COMPRESSORS

High-efficiency scroll compressors with two pole electric motor with internal thermal protection. They are all equipped with a casing heater that performs a very important function for the correct and long-lasting operation of the compressors.

Each compressor is mounted on elastic vibration dampers.

EVAPORATOR / CONDENSER/

TOTAL RECOVERY

Steel braze welded plate heat exchanger ASI 316. Externally clad with closed cell anti-condensation neoprene material to reduce thermal dispersions.

5.2.1. CHARACTERISTICS OF THE WATER

PH	7.5-9
Electrical conductivity	100-500µS/cm
Total hardness	4.5-8.5 dH
External air	< 65°C
Oxygen content	< 0.1 ppm
Maximum glycol content	50%
Phosphates (PO4)	< 2ppm
Manganese (Mn)	< 0.05 ppm
Iron (Fe)	< 0.3 ppm
Alkalinity (HCO3)	70 - 300 ppm
Chlorine ions (Cl-)	< 50 ppm
Sulphate ions (SO4)	< 50 ppm
Sulphide ion (S)	none
Ammonium ions (NH4)	none
Silica (SiO2)	< 30ppm

FILTER-DRIER

Mechanically sealed type with cartridge made of ceramic and hygroscopic material able to trap impurities and any traces of humidity in the refrigerant circuit.

ELECTRONIC THERMOSTATIC VALVE (STANDARD FOR ALL MODELS)

The electronic thermostatic valve, with respect to the classic mechanical thermostatic valve, has a better overheating control. In this way the heat exchanger operating at the time is exploited fully and in any condition, increasing the yield of the unit.

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.

Often there is the need of temperature changes to the most varied environmental conditions, the use of the electronic valve

is ideal to free the system from continuous calibration operations adapting the system to different load conditions, thus making it independent.

LIQUID FLOW GAUGE WITH HUMIDITY INDICATOR

Used to check the refrigerating gas load and any humidity in the refrigerant circuit.

4-WAY CYCLE INVERSION VALVE

Inverts the flow or refrigerant gas.

5.3. STANDARD HYDRAULIC CIRCUIT

WATER FILTER

Equipped with stainless steel mesh filter, protects the heat exchangers from clogging.

DIFFERENTIAL PRESSURE SWITCH

This checks that the water is circulating inside the heat exchanger. If this is not the case, it shuts down the unit.

SAFETY VALVE

Safety valve calibrated at 6 bar.

Equipped with ducted discharge that intervenes by releasing overpressure in the event of abnormal working pressure levels.

EXPANSION TANK (VERSIONS WITH STORAGE / STORAGE PUMPS)

Membrane type, with nitrogen pre-charge.

AIR BLEEDER VALVE

Releases any air pockets that may be present in the hydraulic circuit.

DISCHARGE TAP

Discharges the water from the hydraulic circuit.

5.4. HYDRAULIC CIRCUIT COMPONENTS IN VERSIONS WITH HYDRONIC KIT

PUMP

Depending on the characteristics of the pump chosen, it offers a useful head to overcome the pressure drops in the system.

⚠ WARNING:

In the event of installation (external pump / total recovery), the pump must be managed by the control of the unit for the correct functioning of the machine.

2-WAY MODULATING VALVE

With signal 0-10V
Max. differential pressure 4bar/40kPa.

⚠ WARNING:

In the event of an electrical blackout, the valve does not close and remains blocked in the working position. In order to avoid the unnecessary consumption of water, a shut-off device should be installed upstream of the mains water supply.

SYSTEM ACCUMULATION

Serves to lower the number of compressor peaks and standardise the temperature of the water to send to the users.

Made of steel in order to reduce the thermal

dispersion and eliminate the formation of condensation, it is insulated with polyurethane material of a suitable thickness.

5.5. CONTROL AND SAFETY COMPONENTS

LOW PRESSURE TRANSDUCERS

Placed on the low pressure side of the refrigerant circuit, it communicates to the control card the operating pressure, sending a pre-alarm in case of abnormal pressure.

HIGH PRESSURE TRANSDUCER

Placed on the high pressure side of the refrigerant circuit, it communicates to the control card the operating pressure, sending a pre-alarm in case of abnormal pressure.

HIGH PRESSURE SWITCH

With fixed calibration, placed on the high pressure side of the refrigerant circuit, it shuts down compressor operation in the case of abnormal operating pressure.

WATER TEMPERATURE PROBE(DHW);

The unit is shipped with 1 temperature probe kit for eventual DHW tank.

5.6. CONTROL AND POWER ELECTRICAL PANEL

Control and power electrical panel, including:

- General door interlock.
- Magnetothermic switches and meters for compressors.
- Phase sequence control.
- Remote keypad connection terminals (optional).
- Terminals for remote alarm signals,
- Terminals for compressor start-up signal.
- Terminals for boiler / heaters signal input.
- Terminals for differential pressure switch alarm signal.
- Terminals for external air temperature sensor, (ACCESSORY).
- Electronic control µPC.
- Soft-start (optional).
- Numbered control circuit cables.
- Terminals for 3-way valve.

“Chiller” water set-point compensation for external temp.

Adjustment of the unit's set point based on the external temperature, allowing increased comfort and energy savings. **The system return set point is established based on the external air temperature. Function guaranteed only if there is an external temperature sensor (ACCESSORY).**

Electronic control µPC

The device is the new controller for the management of the reversible water condensed units; the new 8-digit display PGD1 allows clear reading, while the icons offer instant visibility of the machine's operation. Some entries are password protected and only available to the service technician.

The electronics also integrate a series of protection algorithms with the aim of preventing any damage to the main components of the system.

LIST OF FUNCTIONS:

- Parametrization of the compressor's on/off times to prevent ON/OFF cycles too close together.
- In order to prevent the breakage due to the water freezing, the plate heat exchanger has 3 anti-freeze protections "geothermal, system and zones", the microprocessor also blocks the compressor if the temperature detected by the output sensor of the exchanger is lower than the antifreeze set.
- Water flow rate alarm activated by the differential pressure switch fitted as standard.
- Condensation control managed through the speed modulation of the circulating pumps with phase cut or inverter, two-way modulating valve, pump ON/OFF systems.
- Production of domestic hot water via a three-way diverter valve or a version with full recovery.

Additional functions:

- Management of an external integration resource dedicated to the domestic water heater.
- System management with heat pump and boiler.
- Anti-Legionella cycle.
- Time slots for the daily/weekly programming.

Thermoregulation

⚠ Temperature regulation is based on the water returning from the system. The set points refer to the return water temperature. For example, if the set point is set to +30° C, will result in a delivery temperature of +35° C.

System side circulation pump

The electronic board has an output to manage the circulation pump, always on in COOLING and HEATING mode, and off with a delay of 1 minute after the shut-down of the unit (standby).

Source side pump

The electronic board has an output for the management of the source side pump (see the available pumps on the configurator). The source side pump is turned on before the compressor is started and turned off about 30 seconds after it is turned off.

Anti-freeze alarm

⚠ The anti-freeze function is active only when the unit is on or in standby.

In order to prevent breakage of the plate heat exchanger due to the water inside it freezing, the microprocessor shuts down the compressor if the temperature detected by the output temperature probe of the heat exchanger is less than +4° C.

The anti-freeze set temperature can be varied only by an authorised service centre and only after verifying that in the water circuit is an antifreeze solution.

This alarm sets the block of the compressor and not the pump that remains active.

Domestic hot water anti-freeze

The DHW anti-freeze protection is only active if there is a dedicated integration resource to the hot water storage.

The activation of the integration resource occurs if the water temperature detected by the DHW sensor is less than +4° C and is switched off at +7° C.

Wizard

A start-up procedure has been created in order to ease the set-up of the unit. This procedure is used on the first start-up.

Supervision system:

- MODBUS

For other requirements, please contact the company.

6. ACCESSORIES



- **AER485P1**
RS-485 interface for supervision systems with MODBUS protocol.
- **VT**
Anti-vibration mountings, set of 4/6 vibration-damping components to fit under the steel base of the unit.
- **AERWEB300:** Accessory AERWEB allows remote control of a chiller through a common PC and an ethernet connection over a common browser; 4 versions available:
 - AERWEB300-6: Web server to monitor and remote control max. 6 units in RS485 network;
 - AERWEB300-18: Web server to monitor and remote control max. 18 units in RS485 network;
 - AERWEB300-6G: Web server to monitor and remote control max. 6 units in RS485 network with integrated GPRS modem;
 - AERWEB300-18G: Web server to monitor and remote control max. 18 units in RS485 network with integrated GPRS modem;
- **TAT**
Ambient temperature probe, built-in 230 Vac kit containing the ambient probe with display and adjustment knob, able to command an ON-OFF valve or a zone pump.
- **TAH**
Ambient temperature/humidity probe. Built-in 230 Vac kit containing the ambient and humidity probe with display and adjustment knob, the STH probe can command an ON-OFF valve or a zone pump and the dehumidifier.
- **SSM**
Probe used in combination with the mixer valve in the presence of applications with radiant panels. Accessory must be ordered with the zone accessory VMFCRP.
- **S...I**
System storage; available in four different capacities: 200, 300, 400 and 500 litres (S200I, S300I, S400I and S500I).
- **PGD1**
Simplified remote panel. This makes it possible to carry out the unit's basic controls with the signalling of alarms. Remote controllable up to 500 m with cable 2 TWISTED PAIRS + SHIELD with shielded pair and TCONN6J000.
- **VPHL**
Pressure switch valve with bypass solenoid valve: during cooling mode operation the bypass valve is closed so the water flows exclusively through the circuit with the pressure switch. During heating mode operation the water flows through both branches of the circuit.
- **KSAE**
Ambient air probe. Temperature probe with plastic container.
- **VMFCRP**
Zone management;
The heat pump WRL, can handle up to a maximum of 3 zones as follows:
Zone 1: Managed as standard using a cutting-edge electronic control. The Clamp-on probe "SSM" (accessory) is recommended to control the delivery temperature.
The unit is shipped with 1 temperature probe kit for eventual DHW tank.
The management of Zone 2 and Zone 3 is possible using, for each zone, accessories VMFCRP + SSM.

WRL-H	026	031	041	051	071	081	101	141	161
AER485P1	●	●	●	●	●	●	●	●	●
AERWEB	●	●	●	●	●	●	●	●	●
VT vers. H	9	9	9	9	9	9	15	15	15
VT vers. HA	15	15	15	15	15	15	15A	15A	15A
TAT	●	●	●	●	●	●	●	●	●
TAH	●	●	●	●	●	●	●	●	●
SSM	●	●	●	●	●	●	●	●	●
S...I (200-300-400-500)	●	●	●	●	●	●	●	●	●
PGD1	●	●	●	●	●	●	●	●	●
VPHL		VPHL1	VPHL1	VPHL2	VPHL2	VPHL3	VPHL3	VPHL4	VPHL4
KSAE	●	●	●	●	●	●	●	●	●
VMFCRP	●	●	●	●	●	●	●	●	●

7. TECHNICAL DATA

Mod. WRL heat pump			026H	031H	041H	051H	071H	081H	101H	141H	161H
Heating: fan coils											
Heating capacity	°	230V-1	kW	7,93	10,00	12,70	-	-	-	-	-
	°	400V-3N	kW	7,92	9,54	12,50	16,50	21,00	24,20	32,90	41,90
Input power	°	230V-1	kW	2,10	2,62	3,39	-	-	-	-	-
	°	400V-3N	kW	2,10	2,45	3,13	4,13	5,32	6,23	8,22	10,60
C.O.P.	°	230V-1	W/W	3,78	3,82	3,74	-	-	-	-	-
	°	400V-3N	W/W	3,77	3,89	3,99	3,99	3,94	3,88	4,01	3,95
Condenser water flow rate	°	230V-1	l/h	1369	1727	2190	-	-	-	-	-
	°	400V-3N	l/h	1367	1648	2157	2848	3625	4175	5682	7233
Pressure drops on system side	°	230V-1	kPa	20	22	29	-	-	-	-	-
	°	400V-3N	kPa	20	18	28	28	32	38	35	43
Evaporator water consumption	°	230V-1	l/h	1722	2180	2753	-	-	-	-	-
	°	400V-3N	l/h	1720	2091	2767	3646	4624	5306	7268	9222
Pressure drops on geothermal side	°	230V-1	kPa	34	36	46	-	-	-	-	-
	°	400V-3N	kPa	34	34	46	43	50	59	52	62
											73

Heating (14511:2013)

Evaporator water temperature (in/out) 10°C/7°C; Condenser water temperature (in/out) 40°C/45°C.

Data declared according to the conditions laid down by Eurovent.

Mod. WRL heat pump			026H	031H	041H	051H	071H	081H	101H	141H	161H
Cooling: fan coils											
Cooling capacity	°	230V-1	kW	6,28	7,88	10,30	-	-	-	-	-
	°	400V-3N	kW	6,28	8,08	10,40	13,70	17,70	20,20	27,50	35,30
Input power	°	230V-1	kW	1,73	1,97	2,50	-	-	-	-	-
	°	400V-3N	kW	1,63	2,40	2,39	3,14	4,38	5,14	6,30	8,75
EER	°	230V-1	W/W	3,63	4,00	4,12	-	-	-	-	-
	°	400V-3N	W/W	3,85	3,37	4,35	4,36	4,04	3,93	4,36	4,03
ESEER	°	230V-1	W/W	3,97	4,37	4,42	-	-	-	-	-
	°	400V-3N	W/W	4,23	4,66	4,64	4,65	4,23	4,10	5,28	4,84
Evaporator water flow rate	°	230V-1	l/h	1084	1361	1780	-	-	-	-	-
	°	400V-3N	l/h	1084	1396	1797	2366	3057	3490	4746	6095
Pressure drops on system side	°	230V-1	kPa	13	15	19	-	-	-	-	-
	°	400V-3N	kPa	13	15	19	18	21	25	21	28
Condenser water consumption	°	230V-1	l/h	1363	1678	2179	-	-	-	-	-
	°	400V-3N	l/h	1346	1782	2179	2871	3760	4313	5763	7502
Pressure drops on geothermal side	°	230V-1	kPa	22	23	30	-	-	-	-	-
	°	400V-3N	kPa	22	23	29	29	36	41	38	49
											57

Cooling (14511:2013)

Evaporator water temperature (in/out) 12°C/7°C; Condenser water temperature (in/out) 30°C/35°C.

Data declared according to the conditions laid down by Eurovent.

Mod. WRL heat pump	VERSION	SUPPLY	-	026H	031H	041H	051H	071H	081H	101H	141H	161H	
PROTECTION RATING													
IP	all		-	20	20	20	20	20	20	20	20	20	
ELECTRICAL DATA													
Total input power hot	no pumps	400V-3N	A	4.83	4.83	6.61	8.30	10.47	11.95	15.70	20.17	23.09	
Total input power cooling mode	no pumps	230V-1	A	10.45	13.12	16.53	-	-	-	-	-	-	
	no pumps	230V-3	A	-	-	-	14.44	20.79	27.30	35.07	40.16	-	
	no pumps	400V-3N	A	4.20	3.80	5.80	7.20	9.00	10.20	13.30	16.70	19.10	
Maximum current (FLA)	no pumps	230V-1	A	8.50	10.80	13.50	-	-	-	-	-	-	
	no pumps	230V-3	A	-	-	-	12.52	17.74	23.13	29.04	33.22	-	
	no pumps	400V-3N	A	8	8	15	17	21	22	32	40	41	
Starting current (LRA) without soft start	no pumps	230V-1	A	18	21	34	-	-	-	-	-	-	
	no pumps	230V-3	A	-	-	-	21	25	32	40	48	-	
	no pumps	400V-3N	A	34	37	65	75	75	75	90	94	95	
Starting current (LRA) With Soft Start	no pumps	230V-1	A	63	84	119	-	-	-	-	-	-	
	no pumps	230V-3	A	-	-	-	125	155	175	142	175	-	
	no pumps	400V-3N	A	26	28	48	55	55	55	68	72	73	
COMPRESSORS													
Compressors	°	all	no.	1	1	1	1	1	1	2	2	2	
Circuits	°	all	no.	1	1	1	1	1	1	1	1	1	
Capacity control	°	all	%	0/100	0/100	0/100	0/100	0/100	0/100	0/50/100	0/50/100	0/50/100	
Refrigerant 1 heat exchanger	°	all	kg	1.1	1.2	1.7	2.0	2.2	2.3	3.2	3.8	4.3	
Refrigerant 2 heat exchangers	°	all	kg	1.1	1.3	1.8	2.1	2.3	2.4	3.3	4.0	4.5	
Oil	°	all	kg	1.1	1.2	1.7	1.7	1.7	1.7	2 x 1.7	2 x 1.7	2 x 1.7	
	°	all	type	Emkarate RL 32 3MAF									
HEAT EXCHANGER (EVAPORATOR/CONDENSER)													
Heat exchanger	°	all	type	plates									
	°	all	no.	2	2	2	2	2	2	2	2	2	
Water content	°	all	dm³	0.73	0.92	1.23	2.00	2.57	2.95	3.99	5.23	6.18	
Water connections (IN/OUT)	°	all	Ø	F 1" ¼	F 1" ¼	F 1" ¼	F 1" ¼	F 1" ¼	F 1" ¼	F 1" ¼	F 1" ¼	F 1" ¼	
PLANT SIDE HYDRONIC KIT													
ACCUMULATOR													
Quantity	°	all	no.	1	1	1	1	1	1	1	1	1	
Tank capacity	°	all	l	100	100	100	100	100	100	150	150	150	
EXPANSION TANK													
Expansion tank (version with pump)	°	all	no	1	1	1	1	1	1	1	1	1	
	°	all	l	2	2	2	2	2	2	8	8	8	
Expansion tank (version with storage)	°	all	no.	1	1	1	1	1	1	1	1	1	
	°	all	l	8	8	8	8	8	8	8	8	8	
SAFETY VALVE (standard in all versions)													
Safety valve	-	-	no	1	1	1	1	1	1	1	1	1	
	-	-	bar	6	6	6	6	6	6	6	6	6	

Heating

Evaporator water temperature (in/out) 10°C/7°C; Condenser water temperature (in/out) 40°C/45°C.

Data declared according to the conditions laid down by Eurovent.

Cooling

Evaporator water temperature (in/out) 12°C/7°C; Condenser water temperature (in/out) 30°C/35°C.

Data declared according to the conditions laid down by Eurovent.

Mod. WRL heat pump	VERSION	-	026H	031H	041H	051H	071H	081H	101H	141H	161H
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SOUND DATA											
Sound power	-	dB(A)	55.5	57.0	57.5	59.0	60.0	60.5	62.0	63.0	63.5
Sound pressure 1m	-	dB(A)	41.1	42.6	43.1	44.2	45.2	45.7	46.7	47.7	48.2
Sound pressure 10m	-	dB(A)	24.3	25.8	26.3	27.7	28.7	29.2	30.6	31.6	32.1

DIMENSIONS											
Height	°	mm	976	976	976	1126	1126	1126	1126	1126	1126
Width	°	mm	605	605	605	605	605	605	1155	1155	1155
Depth	°	mm	603	603	603	773	773	773	773	773	773
Height	A	mm	1126	1126	1126	1126	1126	1126	1126	1126	1126
Width	A	mm	1155	1155	1155	1155	1155	1155	1755	1755	1755
Depth	A	mm	773	773	773	773	773	773	773	773	773
Weight when empty	°	mm	120	125	130	150	170	180	260	270	280
	A	mm	190	200	210	230	250	260	340	350	360

Mod. WRL heat pump	PUMPS	-	026H	031H	041H	051H	071H	081H	101H	141H	161H
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Condenser water flow rate	-	l/h	1084	1396	1797	2366	3057	3490	4746	6095	6961
Input power	B-P-Q	KW	0,075	0,082	0,089	0,173	0,184	0,188	0,627	0,848	0,904
	U-N	KW	-	-	-	-	-	-	0,962	1,287	1,370
	I	KW	0,113	0,119	0,125	0,224	0,257	0,275	-	-	-
Input current	B-P-Q	A	0,565	0,621	0,668	1,186	1,259	1,258	1,266	1,563	1,665
	U-N	A	-	-	-	-	-	-	1,812	2,454	2,613
	I	A	1,022	1,077	1,131	0,936	1,075	1,150	-	-	-

Condenser water flow rate	-	l/h	1346	1782	2179	2871	3760	4313	5763	7502	8612
Input power	B-P-Q	KW	0,081	0,087	0,092	0,182	0,189	0,190	0,676	0,937	1,001
	U-N	KW	-	-	-	-	-	-	1,048	1,421	1,522
	I	KW	0,118	0,125	0,129	0,249	0,285	0,300	-	-	-
Input current	B-P-Q	A	0,613	0,667	0,692	1,243	1,294	1,302	1,365	1,726	1,843
	U-N	A	-	-	-	-	-	-	1,974	2,709	2,902
	I	A	1,069	1,129	1,166	1,040	1,190	1,254	-	-	-

Cooling

Evaporator water temperature (in/out) 12°C/7°C; Condenser water temperature (in/out) 30°C/35°C.

Data declared according to the conditions laid down by Eurovent.

Mod. WRL heat pump	VERSION	SUPPLY	-	026H	031H	041H	051H	071H	081H	101H	141H	161H
SYSTEM'S MINIMUM WATER CONTENT												
Air conditioning system	°	all		l/kW	7 ⁽¹⁾							
System with process water	°	all		l/kW	14 ⁽²⁾							

⁽¹⁾ Minimum water content in the case of: a system for air conditioning. **Formula: CWmin= Pc(kW) x 7(l/kW).**

⁽²⁾ Minimum water content in the case of: Process / operation applications with low outdoor temperatures and low load / adjustment of the outlet water temperature / Δt 5°C. **Formula: CWmin= Pc(kW) x 14(l/kW).**

WARNING:

Systems with a high water content should be designed (the table shows the recommended minimum values) in order to limit:

1. The hourly number of inversions between the various operating modes.

2. The reduction of the water temperature during.

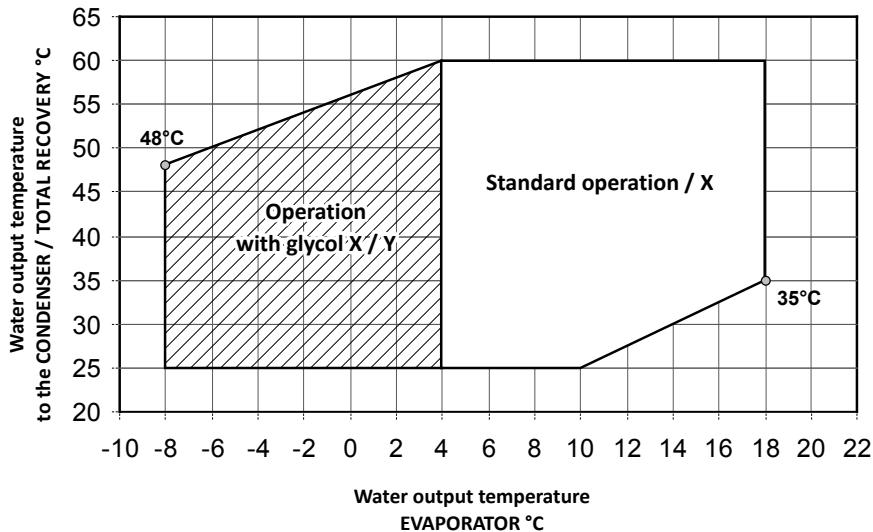
Key:

Pc: Cooling capacity.

CWmin: System's minimum water content.

8. OPERATING RANGE

The unit in their standard configurations are not suitable for installation in salty environments.
 The operating limits are related to a Δt of 5° C on the evaporator and on the condenser.
 Contact our technical sales department if the unit needs to be operated outside the operating range.



The diagram of the operating limits is related to a Δt of 5° C on the evaporator and on the condenser.

Condenser Input (Δtc) output difference:
min: 5° C.
max: 22° C.

Evaporator Inlet (Δte) output difference:
min: 3° C.
max: 10° C.

DESIGN SPECIFICATIONS

REFRIGERANT SIDE		Side High pressure	Side Low pressure
Maximum allowable pressure	bar	42	25
Maximum allowable temperature	°C	120	50
Minimum allowable temperature	°C	-25	-25

9. OUTPUTS AND INPUTS DIFFERENT FROM THE RATED VALUES

230V-1 50Hz		5°C TWE						7°C TWE						10°C TWE						18°C TWE									
		PC	pe	EER	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PC	pe	EER	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PC	pe	EER	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PC	pe	EER	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}
WRL	TWC	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa
026	25	6.64	1.37	4.83	1145	14	1350	22	7.03	1.37	5.13	1215	16	1417	25	7.62	1.37	5.55	1320	19	1517	28							
031	25	8.50	1.56	5.45	1468	17	1698	24	8.96	1.57	5.70	1549	19	1777	26	9.65	1.60	6.05	1671	22	1898	30							
041	25	11.07	2.00	5.55	1912	22	2203	32	11.67	2.02	5.78	2018	25	2308	35	12.56	2.06	6.08	2177	29	2466	40							
026	35	5.92	1.74	3.41	1022	11	1288	20	6.28	1.73	3.63	1084	13	1349	22	6.81	1.72	3.95	1178	15	1436	25	8.22	1.71	4.81	1426	22	1671	34
031	35	7.48	1.96	3.82	1291	13	1590	21	7.88	1.97	4.00	1361	15	1662	23	8.49	1.99	4.26	1469	17	1766	26	10.10	2.05	4.93	1753	24	2046	35
041	35	9.77	2.48	3.94	1687	17	2062	28	10.30	2.51	4.11	1780	19	2159	30	11.09	2.55	4.35	1920	23	2295	34	13.20	2.67	4.95	2292	32	2669	47
026	45	5.17	2.26	2.29	892	8	1245	19	5.48	2.24	2.44	946	10	1295	21	5.95	2.23	2.67	1028	11	1371	23	7.18	2.19	3.28	1244	16	1572	30
031	45	6.47	2.55	2.54	1116	10	1513	19	6.82	2.55	2.67	1176	11	1573	20	7.34	2.57	2.85	1269	13	1665	23	8.73	2.62	3.33	1514	18	1907	30
041	45	8.42	3.21	2.62	1452	13	1951	25	8.88	3.23	2.75	1533	14	2031	27	9.56	3.28	2.92	1653	17	2154	30	11.38	3.39	3.36	1973	24	2478	40
026	55	4.34	2.93	1.48	747	6	1212	18	4.60	2.91	1.58	793	7	1253	19	4.99	2.88	1.73	862	8	1315	21	6.03	2.81	2.15	1045	12	1482	27
031	55	5.27	3.32	1.59	908	7	1434	17	5.56	3.32	1.67	958	7	1483	18	6.00	3.34	1.79	1035	9	1560	20	7.16	3.38	2.12	1239	12	1768	26
041	55	6.91	4.15	1.66	1191	9	1847	22	7.29	4.18	1.75	1258	10	1915	24	7.86	4.22	1.86	1357	11	2018	27	9.37	4.34	2.16	1623	16	2296	34
026	60	3.87	3.33	1.16	667	5	1197	18	4.11	3.30	1.24	708	5	1233	19	4.46	3.27	1.37	770	6	1287	20	5.41	3.17	1.70	936	9	1434	25
031	60	4.54	3.77	1.20	781	5	1383	16	4.79	3.78	1.27	825	5	1427	17	5.18	3.80	1.37	894	6	1496	18	6.23	3.83	1.62	1078	9	1683	23
041	60	6.06	4.70	1.29	1044	7	1791	21	6.40	4.72	1.36	1104	7	1853	22	6.91	4.77	1.45	1193	9	1946	25	8.26	4.89	1.69	1429	13	2198	32

Cooling (14511:2011)

Rated values: Evaporator water temperature (in/out) 12°C/7°C; Condenser water temperature (in/out) 30°C/35°C.

For operating conditions other than those stated, refer to the Magellano selection program available on the website www.aermec.com

Key

PC Cooling capacity kW

pe Input power kW

Q_{sys} System side water flow rate l/h

Q_{geo} Geo side water flow rate l/h

TWC Evaporator water temperature °C

TWE Condenser water temperature °C

230V-1 50Hz		5°C TWE						7°C TWE						10°C TWE						18°C TWE									
		PH	pe	COP	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PH	pe	COP	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PH	pe	COP	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PH	pe	COP	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}
WRL	TWC	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa
026	25	8.19	1.18	6.95	1403	22	1221	18	8.58	1.18	7.24	1469	23	1288	20	9.16	1.19	7.67	1568	26	1390	24							
031	25	10.23	1.31	7.81	1779	25	1578	21	10.56	1.33	7.91	1837	27	1635	22	11.13	1.33	8.35	1936	30	1739	25							
041	25	13.00	1.89	6.87	2261	32	1971	25	13.60	1.92	7.08	2366	34	2077	28	14.46	1.96	7.36	2517	39	2227	32							
026	35	7.92	1.62	4.89	1362	20	1101	15	8.29	1.62	5.11	1426	22	1166	17	8.86	1.63	5.44	1522	25	1264	20	10.36	1.64	6.31	1779	34	1524	28
031	35	9.93	1.93	5.14	1733	24	1422	17	10.25	1.95	5.24	1789	25	1477	18	10.80	1.94	5.55	1885	28	1577	21	12.31	1.93	6.36	2151	37	1851	28
041	35	12.54	2.59	4.84	2189	29	1773	21	13.12	2.62	5.00	2291	32	1874	23	13.95	2.67	5.22	2437	36	2016	27	16.16	2.80	5.77	2828	49	2396	37
026	45	7.65	2.06	3.71	1321	19	982	12	8.01	2.06	3.88	1383	20	1044	13	8.55	2.06	4.15	1476	23	1141	16	10.01	2.06	4.85	1725	32	1398	24
031	45	9.65	2.56	3.77	1690	23	1269	13	9.96	2.58	3.86	1744	24	1321	14	10.49	2.56	4.10	1838	27	1421	17	11.95	2.52	4.74	2097	35	1696	24
041	45	12.07	3.29	3.66	2114	27	1574	16	12.63	3.33	3.79	2213	30	1669	18	13.43	3.38	3.97	2354	34	1807	21	15.56	3.52	4.42	2732	46	2176	31
026	55	7.38	2.51	2.95	1280	17	862	9	7.73	2.50	3.09	1339	19	922	10	8.25	2.50	3.30	1430	22	1016	13	9.66	2.48	3.89	1670	30	1266	20
031	55	9.37	3.17	2.95	1647	22	1118	10	9.67	3.19	3.03	1700	23	1168	11	10.18	3.17	3.21	1790	25	1266	13	11.60	3.10	3.74	2041	33	1536	19
041	55	11.60	4.00	2.90	2038	25	1373	12	12.13	4.04	3.01	2134	28	1463	14	12.90	4.09	3.15	2270	32	1595	17	14.96	4.23	3.53	2634	42	1947	25
026	60	7.25	2.73	2.66	1259	17	802	8	7.59	2.72	2.79	1317	18	861	9	8.10	2.72	2.98	1406	21	954	11	9.48	2.69	3.52	1643	29	1200	18
031	60	9.23	3.47	2.66	1625	21	1044	9	9.52	3.49	2.73	1677	22	1094	10	10.03	3.46	2.90	1766	25	1190	12	11.43	3.38	3.38	2015	32	1457	18
041	60	11.36	4.35	2.61	2000	24	1273	11	11.89	4.39	2.71	2094	27	1361	12	12.64	4.45	2.84	2228	30	1490	14	14.66	4.60	3.19	2586	41	1833	22

Heating (14511:2011)

Rated values: Evaporator water temperature (in/out) 10

400V-3N 50Hz		5°C TWE						7°C TWE						10°C TWE						18°C TWE									
		PC	pe	EER	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PC	pe	EER	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PC	pe	EER	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PC	pe	EER	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}
WRL	TWC	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa
026	25	6.64	1.28	5.16	1148	14	1337	22	7.03	1.29	5.45	1216	16	1405	25	7.62	1.30	5.85	1320	19	1507	29							
031	25	8.37	1.88	4.45	1449	17	1730	23	8.75	1.82	4.80	1513	18	1784	24	9.32	1.74	5.35	1614	21	1868	26							
041	25	11.15	1.91	5.83	1930	22	2206	31	11.76	1.94	6.06	2035	25	2313	34	12.69	1.99	6.38	2200	29	2479	39							
051	25	14.66	2.54	5.76	2536	21	2898	53	15.41	2.58	5.96	2664	23	3029	58	16.55	2.67	6.20	2865	27	3235	66							
071	25	18.48	3.68	5.02	3210	52	3741	37	19.71	3.74	5.26	3423	59	3956	41	21.55	3.84	5.61	3752	71	4285	49							
081	25	21.17	4.23	5.01	3664	28	4285	42	22.59	4.29	5.27	3908	31	4532	47	24.73	4.38	5.65	4286	38	4910	55							
101	25	29.45	4.99	5.90	5093	25	5824	39	30.94	5.05	6.13	5345	27	6081	43	33.19	5.18	6.40	5742	31	6486	49							
141	25	36.98	7.19	5.14	6397	31	7458	49	39.49	7.28	5.42	6825	35	7891	55	43.24	7.42	5.82	7488	42	8553	65							
161	25	42.22	8.47	4.98	7306	35	8554	57	45.08	8.58	5.25	7794	40	9047	64	49.35	8.75	5.64	8549	48	9801	75							
026	35	5.92	1.63	3.64	1022	11	1272	20	6.28	1.63	3.85	1084	13	1333	22	6.81	1.64	4.16	1178	15	1425	25	8.22	1.66	4.95	1426	22	1665	35
031	35	7.73	2.48	3.11	1333	14	1718	22	8.08	2.40	3.37	1396	15	1762	23	8.60	2.28	3.77	1488	17	1836	25	10.00	1.97	5.08	1735	24	2019	31
041	35	9.85	2.36	4.17	1701	17	2060	27	10.40	2.39	4.35	1797	19	2160	29	11.22	2.44	4.60	1942	22	2306	33	13.40	2.57	5.21	2327	32	2691	46
051	35	13.03	3.15	4.14	2248	17	2721	47	13.70	3.14	4.36	2366	18	2845	29	14.72	3.22	4.57	2545	21	3030	33	17.40	3.42	5.09	3019	30	3511	45
071	35	16.53	4.40	3.76	2862	41	3526	33	17.72	5.06	3.50	2057	21	3724	37	19.28	4.54	4.24	3350	56	4020	43	23.67	4.80	4.93	4131	86	4795	61
081	35	18.92	5.09	3.72	3266	22	4044	37	20.20	5.14	3.93	3490	25	4271	42	22.11	5.22	4.23	3827	30	4611	49	27.20	5.47	4.97	4724	46	5501	69
101	35	26.18	6.24	4.20	4514	19	5470	35	27.51	6.30	4.37	4746	21	5712	38	29.51	6.44	4.58	5101	25	6076	43	34.81	6.79	5.13	6034	34	7018	57
141	35	33.06	8.67	3.81	5702	24	7032	44	35.30	8.75	4.03	6095	28	7431	49	38.66	8.87	4.36	6686	34	8024	57	47.60	9.25	5.15	8261	51	9580	81
161	35	37.75	10.20	3.70	6512	28	8075	51	40.30	10.30	3.91	6961	32	8528	57	44.12	10.45	4.22	7634	38	9205	66	54.30	10.90	4.98	9427	58	10978	94
026	45	5.17	2.11	2.46	892	8	1222	19	5.48	2.11	2.61	946	10	1275	20	5.95	2.11	2.82	1028	11	1354	23	7.18	2.11	3.40	1244	16	1567	31
031	45	6.74	3.30	2.04	1161	11	1677	21	7.04	3.19	2.21	1216	12	1712	22	7.50	3.02	2.48	1296	13	1765	24	8.72	2.58	3.38	1511	18	1905	27
041	45	8.54	2.97	2.88	1474	13	1938	24	9.01	3.00	3.01	1556	14	2024	26	9.73	3.05	3.19	1682	17	2153	29	11.61	3.18	3.65	2014	24	2497	39
051	45	11.47	3.95	2.91	1977	13	2596	24	12.05	3.99	3.02	2080	14	2704	26	12.94	4.08	3.17	2237	16	2870	30	15.30	4.30	3.56	2651	23	3310	40
071	45	14.38	5.37	2.68	2487	31	3320	29	15.34	5.42	2.83	2657	36	3494	32	16.78	5.50	3.05	2912	43	3753	37	20.61	5.73	3.60	3592	65	4445	52
081	45	16.46	6.24	2.64	2838	17	3814	33	17.57	6.29	2.79	3033	19	4012	37	19.24	6.37	3.02	3326	23	4310	42	23.67	6.59	3.59	4107	35	5104	59
101	45	23.05	7.95	2.90	3971	15	5221	32	24.20	8.02	3.02	4174	16	5431	34	25.95	8.18	3.17	4483	19	5756	38	30.59	8.56	3.57	5299	27	6612	51
141	45	28.74	10.65	2.70	4954	18	6624	39	30.70	10.72	2.86	5297	21	6972	43	33.63	10.83	3.10	5811	25	7492	50	41.42	11.17	3.71	7181	39	8877	70
161	45	32.82	12.52	2.62	5659	21	7619	45	35.05	12.61	2.78	6049	24	8015	50	38.38	12.75	3.01	6635	29	8608	58	47.26	13.15	3.59	8195	44	10188	81
026	55	4.34	2.73	1.59	747	6	1179	17	4.60	2.73	1.69	793	7	1223	19	4.99	2.72	1.83	862	8	1290	21	6.03	2.71	2.23	1045	12	1467	27
031	55	5.27	4.27	1.23	908	6	1579	19	5.51	4.11	1.34	951	7	1597	19	5.88	3.88	1.51	1015	8	1624	20	6.85	3.27	2.09	1185	11	1696	22
041	55	7.05	3.76	1.87	1215	9	1810	21	7.44	3.79	1.96	1284	10	1882	22	8.04	3.84	2.09	1388	11	1993	25	9.62	3.98	2.42	1667	17	2286	33
051	55	9.39	5.15	1.82	1617	9	2436	21	9.88	5.21	1.90	1704	9	2528	23	10.64	5.30	2.01	1837	11	2674	26	12.65	5.55	2.28	2189	16	3058	34
071	55	12.22	6.64	1.84	2111	22	3156	26	13.03	6.68	1.95	2254	26	3303	29	14.25	6.76	2.11	2468	31	3524	33	17.48	6.97	2.51	3039	47	4113	45
081	55	13.98	7.73	1.81	2409	12	3632	30	14.92	7.78	1.92	2573	14	3801	33	16.32	7.86	2.08	2820	16	4054	38	20.06	8.07	2.49	3476	25	4730	51
101	55	18.86	10.38	1.82	3248	10	4896	28	19.84	10.47	1.89	3419	11	5079	30	21.33	10.65	2.00	3681	13	5364	33	25.29	11.07	2.28	4376	18	6111	43
141	55	24.42	13.20	1.85	4206	13	6299	35	26.06	13.28	1.96	4494	15	6594	38	28.53	13.38	2.13	4926	18	7035	44	35.09	13.69	2.56	6077	28	8213	60
161	55	27.88	15.53	1.80	4804	15	7261	41	29.76	15.61	1.91	5132	17	7597	45	32.56	15.74	2.07	5624	21	8100	51	40.04	16.11	2.49	6935	32	9443	70
026	60	3.87	3.10	1.25	667	5	1163	17	4.11	3.09	1.33	708	5	1199	18	4.46	3.09	1.45	770	6	1258	20	5.41	3.07	1.76	936	9	1417	25
031	60	4.32	4.78	0.90	743	4	1510	17	4.52	4.60	0.98	779	5	1516	17	4.83	4.33	1.12	833	5	1523	17	5.65	3.62	1.56	977	8	1551	18
041	60	6.18	4.23	1.46	1065	7	1744	19	6.53	4.26	1.53	1127	8	1809	21	7.07	4												

400V-3N 50Hz		5°C TWE						7°C TWE						10°C TWE						18°C TWE									
		PH	pe	COP	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PH	pe	COP	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PH	pe	COP	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}	PH	pe	COP	Q _{sys}	Δp _{sys}	Q _{geo}	Δp _{geo}
WRL	TWC	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa	kW	kW	W/W	I/h	kPa	I/h	kPa
026	25	8.06	1.16	6.96	1380	20	1201	17	8.45	1.17	7.25	1447	22	1269	19	9.05	1.17	7.72	1549	26	1373	22							
031	25	10.50	1.36	7.71	1800	21	1589	20	10.97	1.37	8.00	1880	23	1671	22	11.67	1.38	8.47	1999	26	1793	26							
041	25	13.23	1.84	7.17	2264	31	1981	24	13.84	1.86	7.46	2369	34	2089	27	14.77	1.88	7.85	2526	38	2247	31							
051	25	17.07	2.35	7.26	2924	30	2567	41	17.87	2.32	7.70	3061	32	2706	24	19.03	2.41	7.90	3259	37	2906	52							
071	25	23.47	3.29	7.13	4019	39	3512	30	24.64	3.32	7.43	4217	43	3714	33	26.33	3.37	7.81	4504	49	4003	39							
081	25	26.80	3.95	6.78	4587	46	3980	34	28.06	3.98	7.04	4801	50	4198	38	29.84	4.03	7.40	5103	57	4503	44							
101	25	34.53	4.59	7.52	5919	38	5203	27	36.07	4.62	7.81	6183	41	5473	30	38.45	4.67	8.23	6587	47	5881	35							
141	25	46.89	6.44	7.28	8029	53	7036	37	49.19	6.53	7.53	8421	58	7428	41	52.57	6.62	7.94	8996	67	8006	48							
161	25	52.76	7.89	6.68	9031	61	7812	42	54.87	7.93	6.92	9390	66	8181	46	58.11	8.01	7.25	9940	74	8738	52							
026	35	7.84	1.61	4.87	1349	19	1089	14	8.22	1.61	5.10	1414	21	1156	16	8.81	1.61	5.45	1514	25	1257	19	10.40	1.62	6.42	1786	34	1534	28
031	35	9.86	1.88	5.23	1697	19	1392	16	10.30	1.89	5.46	1773	21	1470	17	10.96	1.89	5.81	1885	24	1584	20	12.72	1.89	6.73	2185	32	1890	29
041	35	12.65	2.45	5.16	2174	28	1780	20	13.23	2.46	5.38	2274	31	1883	22	14.12	2.48	5.70	2424	35	2034	26	16.49	2.53	6.51	2828	48	2439	37
051	35	16.50	3.21	5.14	2838	28	2325	33	17.27	3.23	5.34	2970	30	2459	37	18.40	3.26	5.64	3162	35	2652	44	21.47	3.35	6.42	3684	47	3175	62
071	35	21.84	4.25	5.14	3756	34	3072	23	22.93	4.27	5.37	3941	38	3260	26	24.50	4.31	5.68	4209	43	3527	30	28.59	4.42	6.47	4905	59	4221	43
081	35	25.08	5.02	5.00	4310	41	3505	27	26.26	5.04	5.21	4512	44	3710	30	27.93	5.08	5.50	4795	50	3994	34	32.46	5.20	6.25	5565	68	4765	49
101	35	33.17	6.33	5.24	5707	35	4680	22	34.65	6.35	5.46	5960	39	4939	25	36.93	6.39	5.78	6350	44	5329	29	43.14	6.51	6.63	7409	60	6389	41
141	35	43.62	8.39	5.20	7501	46	6147	28	45.76	8.48	5.40	7866	51	6511	32	48.91	8.55	5.72	8402	58	7046	37	57.10	8.73	6.54	9796	79	8441	54
161	35	49.64	10.03	4.95	8531	54	6917	33	51.62	10.06	5.13	8869	59	7266	36	54.67	10.11	5.41	9388	66	7786	42	63.21	10.32	6.12	10841	88	9239	59
026	45	7.63	2.06	3.70	1318	19	978	11	8.00	2.06	3.88	1381	20	1043	13	8.57	2.06	4.16	1479	23	1144	16	10.12	2.05	4.95	1744	33	1420	24
031	45	9.22	2.41	3.83	1594	17	1196	11	9.64	2.41	4.00	1665	18	1268	13	10.25	2.40	4.27	1770	21	1378	15	11.89	2.38	5.01	2052	28	1672	22
041	45	12.07	3.06	3.94	2083	26	1580	15	12.63	3.06	4.12	2178	29	1677	17	13.47	3.08	4.38	2322	32	1825	21	15.73	3.12	5.05	2709	44	2218	30
051	45	15.92	4.08	3.90	2748	26	2081	27	16.67	4.09	4.07	2877	29	2210	30	17.76	4.12	4.31	3064	32	2400	36	20.71	4.18	4.96	3569	44	2914	53
071	45	20.21	5.21	3.88	3489	30	2630	17	21.21	5.23	4.06	3661	33	2803	19	22.67	5.26	4.31	3910	37	3055	23	26.45	5.34	4.95	4557	51	3708	33
081	45	23.34	6.09	3.83	4028	35	3027	20	24.45	6.11	4.00	4217	39	3217	22	25.99	6.13	4.24	4482	44	3488	26	30.21	6.22	4.86	5202	59	4218	38
101	45	31.82	8.08	3.94	5497	33	4161	18	33.24	8.09	4.11	5740	36	4407	20	35.43	8.12	4.37	6115	41	4789	23	41.38	8.20	5.05	7135	55	5823	34
141	45	40.35	10.35	3.90	6968	40	5259	21	42.33	10.43	4.06	7306	44	5591	24	45.24	10.49	4.31	7805	50	6095	28	52.81	10.61	4.98	9099	68	7410	41
161	45	46.54	12.18	3.82	8031	48	6027	25	48.39	12.19	3.97	8349	52	6350	28	51.25	12.23	4.19	8837	58	6850	32	59.25	12.38	4.78	10205	78	8237	47
026	55	7.42	2.51	2.95	1286	18	867	9	7.78	2.51	3.10	1348	19	930	10	8.33	2.50	3.33	1443	22	1029	13	9.84	2.47	3.98	1702	31	1300	20
031	55	8.59	2.93	2.93	1490	15	999	8	8.97	2.93	3.06	1556	16	1066	9	9.54	2.91	3.28	1655	18	1170	11	11.07	2.87	3.86	1917	24	1447	17
041	55	11.49	3.67	3.13	1991	24	1379	12	12.02	3.67	3.27	2083	26	1471	13	12.83	3.68	3.49	2220	30	1613	16	14.98	3.70	4.05	2588	40	1988	24
051	55	15.33	4.94	3.10	2658	24	1836	21	16.06	4.96	3.24	2783	27	1960	24	17.11	4.97	3.44	2964	30	2145	28	19.96	5.01	3.98	3451	41	2642	43
071	55	18.57	6.19	3.00	3220	25	2186	12	19.50	6.19	3.15	3380	28	2345	13	20.83	6.22	3.35	3610	32	2578	16	24.31	6.27	3.87	4205	43	3180	24
081	55	21.60	7.18	3.01	3743	31	2546	14	22.63	7.18	3.15	3920	34	2723	16	24.06	7.19	3.34	4167	38	2977	19	27.97	7.25	3.86	4834	51	3655	29
101	55	30.47	9.83	3.10	5286	30	3639	13	31.83	9.83	3.24	5519	33	3872	15	33.92	9.85	3.44	5880	37	4242	18	39.62	9.90	4.00	6856	51	5236	28
141	55	37.08	12.31	3.01	6430	34	4369	14	38.90	12.39	3.14	6743	37	4671	16	41.57	12.43	3.34	7204	43	5138	20	48.52	12.49	3.89	8394	58	6351	30
161	55	43.44	14.35	3.03	7529	42	5134	18	45.17	14.34	3.15	7826	46	5433	20	47.83	14.35	3.33	8284	51	5906	24	55.30	14.46	3.82	9560	68	7203	36
026	60	7.32	2.74	2.67	1270	17	812	8	7.67	2.73	2.80	1331	19	874	9	8.21	2.72	3.02	1425	22	972	11	9.70	2.68	3.61	1681	30	1240	18
031	60	8.27	3.20	2.59	1438	14	900	7	8.64	3.19	2.71	1502	15	966	7	9.19	3.17	2.90	1597	17	1066	9	10.66	3.11	3.43	1851	23	1335	14
041	60	11.20	3.98	2.82	1945	23	1278	10	11.72	3.98	2.95	2034</																	

10. CORRECTION FACTORS

All correction factors which can be used to select the desired chiller are shown below.

All data contained in this technical manual are calculated under the following conditions:

Evaporator water temperature (in/out) 12°C/7°C; Outside air temperature 35°C; Average water temperature 10° C.

Please note that for a more precise selection of your unit, you can use our Magellano selection software, also available on the website www.aermec.com

FOULING FACTOR [K*M ²]/[W]	0.00001	0.00002	0.00005
Cooling capacity correction factors	1	0.99	0.98
Input power in cooling correction factors	1	1	1
Heating capacity correction factors	1	1	0.99
Input power in heating correction factors	1	1	1.02

ΔT DIFFERENT FROM THE RATED VALUE (ΔT 5)	3	5	8	10
EVAPORATOR	3	5	8	10
Cooling capacity:	0.990	1	1.020	1.030
Input power	0.990	1	1.010	1.020
Heating capacity	0.991	1	1.013	1.022
Input power	1.014	1	0.978	0.963

ΔT DIFFERENT FROM THE RATED VALUE (ΔT 5)	3	5	8	10
CONDENSER	5	10	15	22
Cooling capacity:	1	1.010	1.020	1.030
Input power	1	0.990	0.980	0.970
Heating capacity	variations are negligible			

EVAPORATOR AVERAGE WATER TEMPERATURE						
Average water temperature °C	5	10	15	20	25	30
Multiplication coefficient	1.02	1.00	0.98	0.97	0.96	0.95
						35

CONDENSER AVERAGE WATER TEMPERATURE							
Average water temperature °C	23	28	33	38	43	48	53
Multiplication coefficient	1.02	1.01	1.00	0.99	0.98	0.97	0.96
							58

 The minimum flow rates were calculated with reference to the characteristics of the water flow control device (differential pressure switch).

11. ETHYLENE GLYCOL SOLUTION

COOLING MODE

CORRECTION FACTOR WITH ETHYLENE GLYCOL - COOLING MODE											
Freezing Point	°C	0	-3,63	-6,10	-8,93	-12,11	-15,74	-19,94	-24,79	-30,44	-37,10
Percent ethylene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwc	-	1,000	1,033	1,040	1,049	1,060	1,072	1,086	1,102	1,120	1,141
Pc	-	1,000	0,990	0,985	0,980	0,975	0,970	0,965	0,960	0,955	0,950
Pa	-	1,000	0,996	0,994	0,992	0,990	0,988	0,986	0,984	0,982	0,980
Dp	-	1,000	1,109	1,157	1,209	1,268	1,336	1,414	1,505	1,609	1,728

Average water temperature = 9,5 °C

HEATING MODE

CORRECTION FACTOR WITH ETHYLENE GLYCOL - HEATING MODE											
Freezing Point	°C	0	-3,63	-6,10	-8,93	-12,11	-15,74	-19,94	-24,79	-30,44	-37,10
Percent ethylene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwh	-	1,000	1,027	1,038	1,050	1,063	1,078	1,095	1,114	1,135	1,158
Ph	-	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Pa	-	1,000	1,002	1,003	1,004	1,005	1,007	1,008	1,010	1,012	1,015
Dp	-	1,000	1,087	1,128	1,175	1,227	1,286	1,353	1,428	1,514	1,610

Average water temperature = 42,5 °C

Qwc: Corrective factor of flow rates (middle water temperatur 9,5°C)

Qwh: Corrective factor of flow rates (middle water temperatur 42,5°C)

Pc: Corrective factor of cooling capacity

Ph: Corrective factor of heating capacity

Pa: Corrective factor of imput power

Dp: Corrective factor of pressure drop

PROPYLENE GLYCOL

COOLING MODE

CORRECTION FACTOR WITH PROPYLENE GLYCOL - COOLING MODE											
Freezing Point	°C	0	-3,43	-5,30	-7,44	-9,98	-13,08	-16,86	-21,47	-27,04	-33,72
Percent PROPYLENE glycol	%	0	10	15	20	25	30	35	40	45	50
Qwc	-	1,000	1,007	1,006	1,007	1,010	1,015	1,022	1,032	1,044	1,058
Pc	-	1,000	0,985	0,978	0,970	0,963	0,955	0,947	0,939	0,932	0,924
Pa	-	1,000	0,996	0,994	0,992	0,990	0,988	0,986	0,984	0,982	0,980
Dp	-	1,000	1,082	1,102	1,143	1,201	1,271	1,351	1,435	1,520	1,602

Average water temperature = 9,5 °C

HEATING MODE

CORRECTION FACTOR WITH PROPYLENE GLYCOL - HEATING MODE											
Freezing Point	°C	0	-3,43	-5,30	-7,44	-9,98	-13,08	-16,86	-21,47	-27,04	-33,72
Percent PROPYLENE glycol	%	0	10	15	20	25	30	35	40	45	50
Qwh	-	1,000	1,008	1,014	1,021	1,030	1,042	1,055	1,071	1,090	1,112
Ph	-	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Pa	-	1,000	1,003	1,004	1,005	1,007	1,009	1,011	1,014	1,018	1,023
Dp	-	1,000	1,050	1,077	1,111	1,153	1,202	1,258	1,321	1,390	1,467

Average water temperature = 42,5 °C

Qwc: Corrective factor of flow rates (middle water temperatur 9,5°C)

Qwh: Corrective factor of flow rates (middle water temperatur 42,5°C)

Pc: Corrective factor of cooling capacity

Ph: Corrective factor of heating capacity

Pa: Corrective factor of imput power

Dp: Corrective factor of pressure drop

12. TOTAL PRESSURE DROPS OF THE UNIT

COOLING MODE WITHOUT HYDRONIC KIT				
WRL	K - GEO SIDE		K - SYSTEM SIDE	
	230V-1-50Hz	400V-3N-50Hz	230V-1-50Hz	400V-3N-50Hz
026	1.22541E-05	1.255E-05	1.06378E-05	1.06524E-05
031	8.25416E-06	7.54354E-06	7.93599E-06	7.88472E-06
041	6.53039E-06	6.28429E-06	6.12296E-06	5.94573E-06
051	-	3.62243E-06	-	3.26905E-06
071	-	2.64274E-06	-	5.03397E-06
081	-	2.28271E-06	-	2.05253E-06
101	-	1.15763E-06	-	9.45636E-07
141	-	8.83198E-07	-	7.51029E-07
161	-	7.83755E-07	-	6.56272E-07

HEATING MODE WITHOUT HYDRONIC KIT				
WRL	K - GEO SIDE		K - SYSTEM SIDE	
	230V-1-50Hz	400V-3N-50Hz	230V-1-50Hz	400V-3N-50Hz
026	1.18429E-05	1.18834E-05	1.06734E-05	1.07004E-05
031	7.83408E-06	8.02276E-06	7.38222E-06	6.62598E-06
041	6.27155E-06	6.19191E-06	6.04324E-06	6.02132E-06
051	-	3.3349E-06	-	3.45132E-06
071	-	2.41148E-06	-	2.43553E-06
081	-	2.16188E-06	-	2.18018E-06
101	-	1.01485E-06	-	1.08412E-06
141	-	7.52008E-07	-	8.21883E-07
161	-	6.86909E-07	-	7.46671E-07

COOLING MODE WITH HYDRONIC KIT				
WRL	K - GEO SIDE		K - SYSTEM SIDE	
	230V-1-50Hz	400V-3N-50Hz	230V-1-50Hz	400V-3N-50Hz
026	8.031E-06	8.031E-06	1.234E-05	1.234E-05
031	5.954E-06	5.954E-06	8.512E-06	8.512E-06
041	5.053E-06	5.053E-06	5.641E-06	5.641E-06
051	-	4.031E-06	-	3.982E-06
071	-	2.839E-06	-	2.864E-06
081	-	2.493E-06	-	2.485E-06
101	-	1.031E-06	-	1.133E-06
141	-	7.850E-07	-	9.057E-07
161	-	6.748E-07	-	8.000E-07

HEATING MODE WITH HYDRONIC KIT				
WRL	K - GEO SIDE		K - SYSTEM SIDE	
	230V-1-50Hz	400V-3N-50Hz	230V-1-50Hz	400V-3N-50Hz
026	1.234E-05	1.234E-05	8.028E-06	8.028E-06
031	8.510E-06	8.510E-06	5.952E-06	5.952E-06
041	5.640E-06	5.640E-06	5.052E-06	5.052E-06
051	-	3.981E-06	-	4.030E-06
071	-	2.863E-06	-	2.838E-06
081	-	2.484E-06	-	2.493E-06
101	-	1.133E-06	-	1.030E-06
141	-	9.055E-07	-	7.848E-07
161	-	7.998E-07	-	6.746E-07

CALCULATION OF THE SYSTEM SIDE WATER FLOW RATE

$$Q = (P_c \times 860) / \Delta t$$

Q Water flow rate (l/h)

P_c Heating capacity (kW)

Δt Thermal head of the water (°C)

CALCULATION OF THE GEO SIDE WATER FLOW RATE

$$Q = [(P_c + P_h \times 0.95) \times 860] / \Delta t$$

Q Water flow rate (l/h)

P_c Heating capacity (kW)

P_h Input power (kW)

Δt Thermal head of the water (°C)

CALCULATION OF THE PRESSURE DROPS

$$\Delta p = K \times (Q)^2$$

Δp Pressure drops (kPa)

K Coefficient for the various sizes and versions

Q Water flow rate (l/h)

Example:

We want to know the water flow rate and the related pressure drop of a chiller with a heating capacity of 20 kW and a Δt of 5°C.

In this case we will select a WRL071XH^{*****}

1. Calculation of the system side water flow rate, applying the formula.

$$Q = (P_h \times 860) / \Delta t$$

$$Q = (22.50 \times 860) / 5 = 3870 \text{ l/h}$$

2. Calculation of the SYSTEM side pressure drop, applying the formula.

$$\Delta p = K \times (Q)^2$$

WRL071XH^{*****} K is (2.43553E-06)

$$\Delta p = 2.43553E-06 \times (3870)^2 = 36.48 \text{ kPa}$$

3. Calculation of the GEO side water flow rate, applying the formula.

$$Q = [(P_h - P_c \times 0.95) \times 860] / \Delta t$$

$$Q = [(22.50 - 4.98 \times 0.95) \times 860] / 5 = 3056 \text{ l/h}$$

4. Calculation of the GEO side pressure drop, applying the formula.

$$\Delta p = K \times (Q)^2$$

WRL071XH^{*****} K is (2.41148E-06)

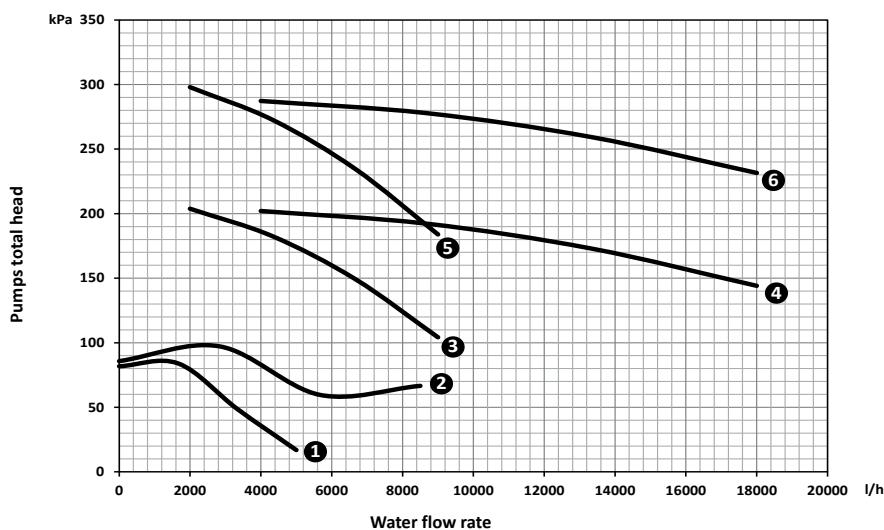
$$\Delta p = 2.41148E-06 \times (3056)^2 = 22.52 \text{ kPa}$$

The values shown are only by way of example.

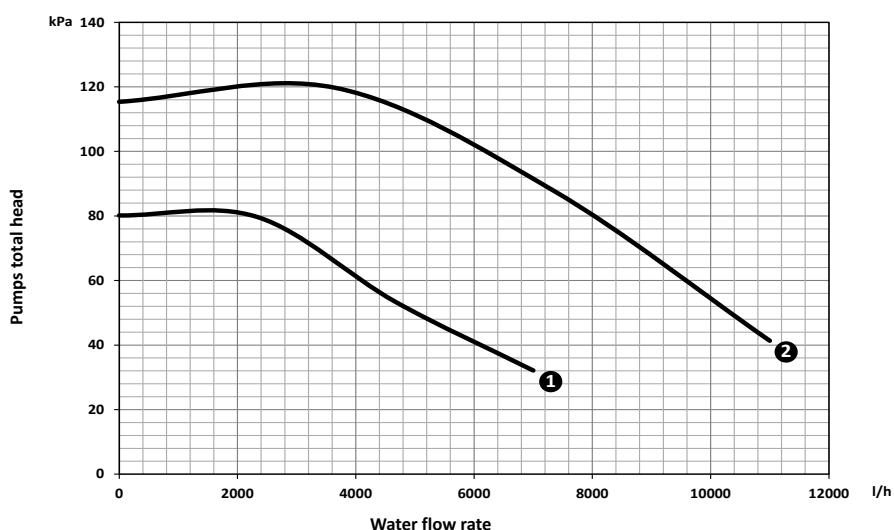
COOLING MODE WITH 2-WAY MODULATING VALVE				
WRL	K - GEO SIDE		K - SYSTEM SIDE	
	230V-1-50Hz	400V-3N-50Hz	230V-1-50Hz	400V-3N-50Hz
026	2.455E-05	2.455E-05	-	-
031	1.662E-05	1.662E-05	-	-
041	1.361E-05	1.361E-05	-	-
051	-	4.508E-06	-	-
071	-	3.319E-06	-	-
081	-	2.873E-06	-	-
101	-	1.333E-06	-	-
141	-	1.018E-06	-	-
161	-	9.010E-07	-	-

13. PUMPING UNIT HEAD

13.1. GEOTHERMAL SIDE AND SYSTEM SIDE PUMP HEAD, AND TOTAL RECOVERY



13.2. INVERTER PUMP HEAD



The curves represent the operating range of each pump.

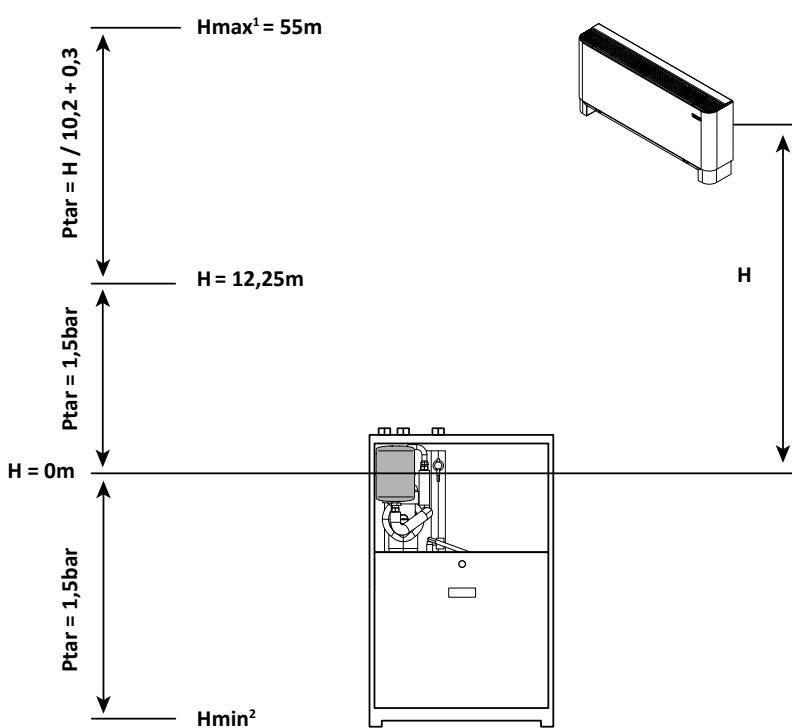
⚠ If work points outside of the range of the head curves are selected, please contact the company.

14. EXPANSION TANK CALIBRATION

The standard value of the expansion tank pre-charge pressure is 1.5 bar, maximum value 6 bar.

The tank must be calibrated according to the maximum difference in height (H) of the device (see figure) according to the formula:
 $p(\text{calibration}) [\text{bar}] = H [\text{m}] / 10.2 + 0.3$.

For example, if the level difference H is 20m, the calibration value of the tank will be 2.3 bar. If the calibration value obtained from the calculation is lower than 1.5 bar (i.e. for $H < 12.25$), maintain the standard calibration.



KEY

H_{\min}^1 Check that the highest user does not exceed a level difference of 55 metres.

H_{\max}^2 Check that the lowest user can sustain the global pressure acting at that point.

Working reference conditions:

- 1 Cooling: Max. water temp. = 40°C, Min. water temp. = 4°C.
- 2 Heating: Heat pump Max. water temp. = 60°C, Min. water temp. = 4°C.

15. SOUND DATA

WRL	Total sound levels			Octave band[Hz]						
	Power	side		125	250	500	1000	2000	4000	8000
	dB(A) [LW]	1m dB(A) [LP]	10m dB(A) [LP]	Sound power by central band frequency [dB]						
025H	55.5	41.1	24.3	66.5	58.1	51.5	46.3	44.9	36.7	33.2
030H	57.0	42.6	25.8	67.9	59.7	53.1	47.6	46.1	38.1	34.5
040H	57.5	43.1	26.3	68.2	60.2	53.7	48.2	46.6	38.9	35.1
050H	59.0	44.2	27.7	69.6	61.6	55.3	49.9	48.8	41.3	37.3
070H	60.0	45.2	28.7	70.6	62.8	56.2	50.9	49.8	42.7	38.6
080H	60.5	45.7	29.2	70.9	63.0	56.3	51.1	50.0	42.9	38.9
100H	62.0	46.7	30.6	72.8	65.0	58.2	52.6	51.6	44.3	39.5
140H	63.0	47.7	31.6	73.6	65.8	59.2	53.9	52.8	45.7	41.6
160H	63.5	48.2	32.1	73.9	66.0	59.3	54.1	53.0	45.9	41.9

The sound data is calculated in nominal cooling conditions:

Cooling (14511:2011)

Evaporator water temperature (in/out) 12°C/7°C; Condenser water temperature (in/out) 30°C/35°C.

Sound power

Aermec determines the value of the acoustic power on the basis of measurements taken in accordance with the UNI EN ISO 9614-2 standard in compliance with what is required by the Eurovent certification.

Sound pressure

Sound pressure measured in a free field, 10 m from the external surface of the unit (according to the UNI EN ISO 3744).

16. SAFETY AND CONTROL PARAMETER SETTING

		Min	Max	Default
Cooling set				
Water inlet temperature in cooling mode .	°C	6	20	7
Heating setting		Min	Max	Default
Water inlet temperature in heating mode.	°C	20	55	40
Antifreeze intervention		Min	Max	Default
Antifreeze alarm intervention temperature on EV side (water output temperature).	°C	-99	99	4
Total differential		Min	Max	Default
Proportional temperature band within which the compressors are activated and deactivated.	°C	-99	99	3

WRL	026	031	041	051	071	081	101	141	161
COMPRESSOR MAGNETOTHERMALS									
MTCP CP1	230V	A	16	19	17	-	-	-	-
MTCP CP2	230V	A	-	-	-	-	-	-	-
MTCP CP1	400V	A	5.5	6.0	6.4	8.7	10.4	11.7	8.7
MTCP CP2	400V	A	-	-	-	-	-	8.7	10.4
MAIN SWITCH									
IG	230V	A	23	23	23	-	-	-	-
IG	400V	A	20	20	20	20	20	45	45
HIGHT PRESSURE SWITCH									
AP	-	bar	42	42	42	42	42	42	42
HIGH PRESSURE TRANSDUCER									
TAP	-	bar	39	39	39	39	39	39	39
LOW PRESSURE TRANSDUCER									
TBP	-	bar	2	2	2	2	2	2	2

17. ANTI-LEGIONELLA FUNCTION

The **ANTI-LEGIONELLA** function is designed to eliminate the Legionella bacteria that can live in domestic hot water tanks. *This feature is available only if the electrical resistor or an integration system within the domestic hot water tank is enabled.*

Once this procedure is initiated, *the domestic hot water is brought up to 65° C for a minimum time of 5 minutes and a maximum of 120 minutes, every Sunday at 3:00 am. (MODIFIABLE PARAMETERS).*

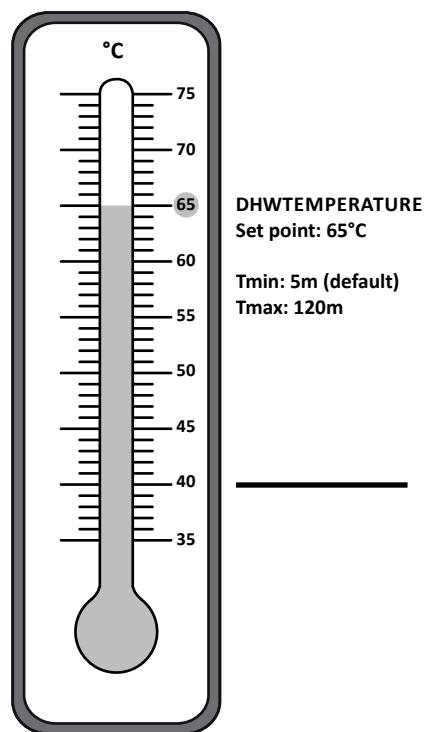
Note that the specific parameters are found under the menu DOMESTIC HOT WATER (assistance).



WARNING: Changing the parameters identified by this symbol could cause malfunctions to the unit.

THIS FUNCTION IS NOT ACTIVE WITH THE UNIT IN STAND-BY.

THESE SETS CAN BE MODIFIED BY AUTHORIZED PERSONNEL ONLY.



A weekly program can be activated from the user control panel that, through the domestic hot water integration outlet, prevents problems related to the proliferation of legionella, by raising the set-point.

From the user control panel:

- press the PRG key to open the menu;
- select DHW;
- press ENTER;
- select D18 "ANTI-LEGIONELLA".

Anti-Legionella treatment									
Mask Index	Display description	Description	Default	UOM	Min	Max	RW		
D18	Anti-Legionella								
		Function start time	3.00 a.m.	H	0	23	RW		
	Mo, Tu... Su	Day when you want to run the cycle	Su				RW		
	Enable	Enable the function			0	1	RW		

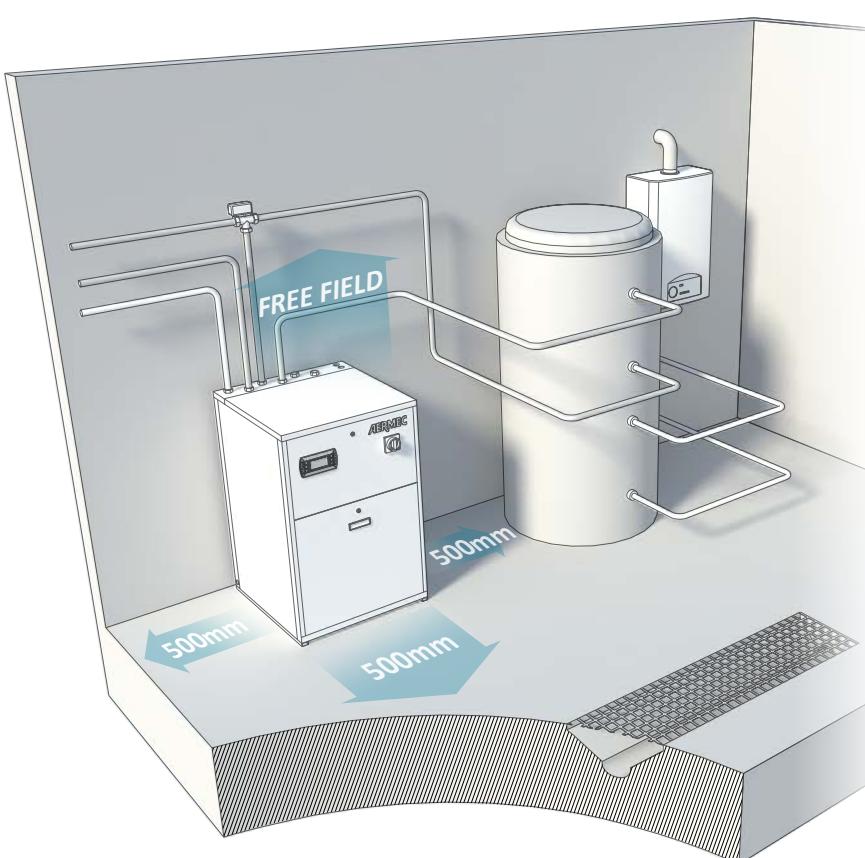
DHW Menù (assistance) - Set anti-Legionella cycle			
Viewing on the display of the unit		Alarm	Viewing/Parameters
 Setpoint end: 065.0°C Minimum time: 005min Maximum time: 120min	 	A	DHW: this menu allows to set the parameters related to the management of the domestic hot water production at an assistance service level.
		B	Setpoint end: this parameter indicates the temperature to be used to perform the anti-Legionella cycle; please note that this temperature is maintained for a minimum time set in the next parameter.
		C	Minimum time: this parameter specifies the minimum time for which the DHW temperature must exceed the end set point in order to consider the anti-Legionella cycle completed.
		D	Maximum time: This parameter specifies the maximum time for the anti-Legionella cycle, after which the "anti-Legionella cycle not finished" alarm is generated (alarm code AL45).

18. SELECTION AND PLACE OF INSTALLATION

The WRL heat pump is designed for **INTERNAL APPLICATIONS**.

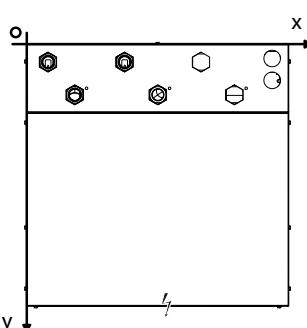
It is shipped from the factory already tested and only requires the electrical and hydraulic connections.

Before installing the unit, decide with the customer the position in which it will be placed, pay attention to the following points:



- The support surface must be able to withstand the weight of the unit.
- The safety distance between the units and other equipment or structures must be strictly respected.
- The unit must be installed by a qualified technician in accordance with the national laws in force in the country of installation.
- It is compulsory to provide the necessary technical clearances, to allow ROUTINE AND EXTRAORDINARY MAINTENANCE INTERVENTIONS.
- Note that the chiller when operating can transmit vibrations, so it is recommended to mount the anti-vibration supports "TV" (ACCESSORIES), fixing them to the base according to the assembly diagram.
- Fasten the unit checking carefully that it is levelled.
- The machine must be installed in equipment rooms or room have at least a floor drain.
- The specified minimum working spaces must be respected, the height and the back must be dimensioned according to the type of system and the installation site.

18.1. CENTERS OF GRAVITY POSITION



WRL-H	CENTRE OF GRAVITY		
	Size	Y (mm)	X (mm)
026	390	280	
031	390	280	
041	390	280	
051	500	210	
071	500	210	
081	500	210	
101	380	610	
141	380	610	
161	380	610	

WRL-HA	CENTRE OF GRAVITY		
	Size	Y (mm)	X (mm)
026	480	360	
031	480	360	
041	470	380	
051	420	460	
071	420	460	
081	420	460	
101	990	375	
141	990	375	
161	990	375	

WARNING
DRAWINGS MERELY APPROXIMATE



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Aermech reserves the right to make all modification deemed necessary for improving the product at any time with any modification of technical data.