Galletti
AIR CONDITIONING

GB

INSTALLATION, USE AND MAINTENANCE MANUAL



HWMC

10 kW - 29 kW

Total heat recovery reversible multi-purpose heat pumps - DC INVERTER

CE

R410A

Inverter Technology

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TRANSLATION OF ORIGINAL INSTRUCTIONS

I REFRIGERATORI D'ACQUA E LE POMPE DI CALORE SONO CONFORMI ALLA DIRETTIVA 97/23/CE (PED) ATTRAVERSO MODULO D1, APPROVATO DALL'ENTE TERZO NOTIFICATO ICIM N°0425.

The technical and dimensional data provided herein may undergo changes in connection with product improvements.

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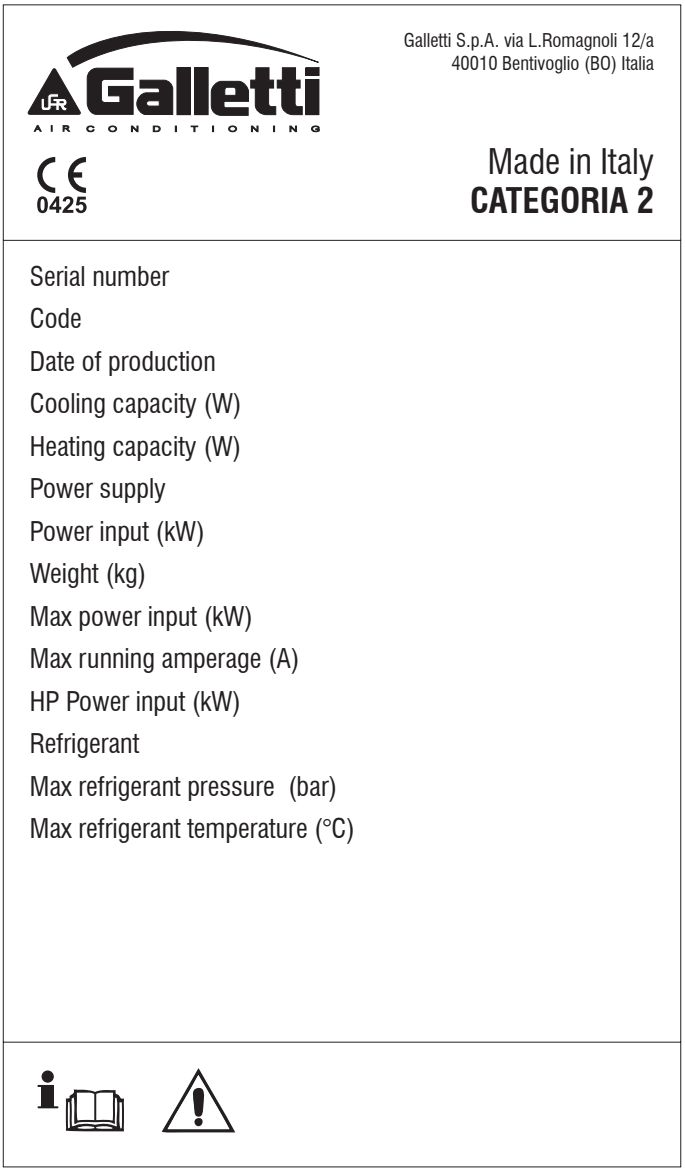
The unit data are reported on the rating label in this page.

THE LABEL SHOWS THE FOLLOWING DATA:

- Series and size of the unit
- Date of manufacture
- Main technical data
- Manufacturer
- The label is applied on the unit, usually on the enclosing panels beside the condenser coil

IMPORTANT: NEVER REMOVE THE LABEL

- Serial number of the unit
- The serial number permits to identify the technical characteristics and the components installed
- Without this datum it will be impossible to identify the unit correctly



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GENERAL CAUTIONARY NOTES

- Please keep this manual complete and in good condition for the entire life of the machine.
- Carefully read all the information contained in this manual, paying special attention to sections marked “Important” and “WARNING”; failure to comply with the instructions provided could result in injury to persons or damage to the equipment.
- Should a fault occur, consult this manual and if necessary contact the nearest Galletti S.p.A. service centre.
- All installation and maintenance operations must be carried out by qualified personnel, unless otherwise indicated in this manual.
- **FIRST START-UP MAY BE CARRIED OUT SOLELY BY QUALIFIED TECHNICIANS DULY AUTHORIZED BY GALLETTI S.P.A. (SEE ENCLOSURE)**
- Before performing any work on the unit, disconnect it from the power supply.
- Failure to comply with the rules provided in this manual will result in the immediate invalidation of the warranty.
- Galletti S.p.A. shall not accept any liability for injury or damage resulting from improper use of the equipment or failure to comply with the directions provided in this manual and on the unit itself.
- **It is mandatory to install filters to protect the heat exchangers. Failure to do so will invalidate the warranty.**
- For any further information, contact the manufacturer: info@galletti.it
- To get the weight of the unit, refer to the User Manual, Rated technical data table.

IMPORTANT:

1) (a) Do not use heat transfer fluids other than those specified.
   (b) This unit is not suitable for use in Atex environment or with inflammable heat transfer fluids.
   (c) Use original factory parts only.
(2) Use appropriate PPE (refrigerant protection gloves, protective goggles).
(3) If protection grilles (accessory) are not provided or if the unit can be reached by unauthorized persons, special protection barriers should be provided in order to prevent access to the finned coil.
(4) Upstream from the power supply it is necessary to install a differential switch for protection against earth connection failure.

SAFETY SYMBOLS



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1 THE SERIES HWMC

1.1 FIELD OF APPLICATION

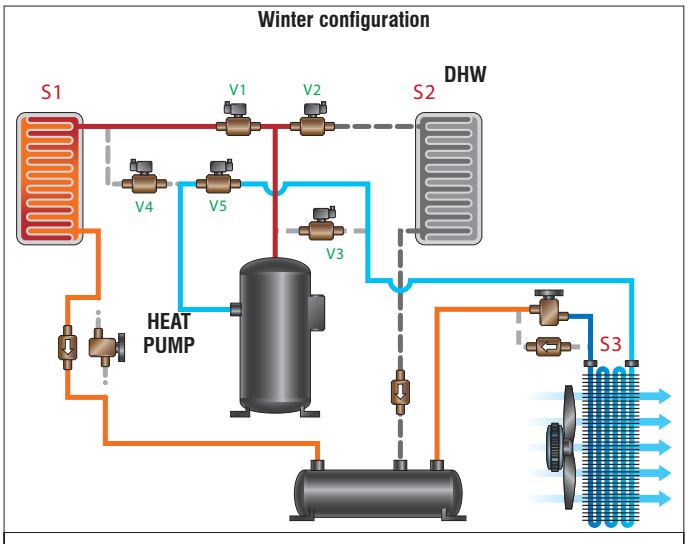
The DC INVERTER multi-purpose **HWMC** units have been designed to cool and heat water for air conditioning and heating systems and for the production of DHW for residential or commercial use. The units are “real” multipurpose units, with 4 water collections, whose operating modes are described below:

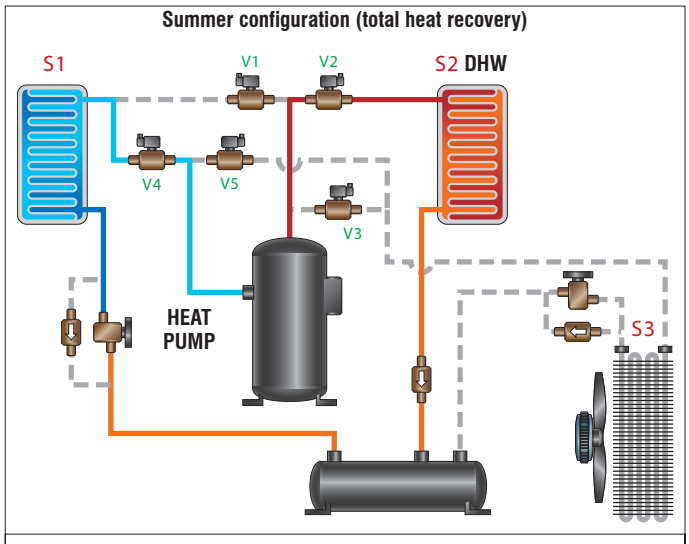
1. Cold water production in summertime mode, for the air conditioning system (air condensing system on the finned exchanger)
2. Cold water production in the summertime mode, for the air conditioning system, with TOTAL CONDENSATION HEAT RECOVERY (for the production of DHW by means of a dedicated plate exchanger)
3. Production of hot water in wintertime mode, for the heating system, functioning as a traditional heat pump (air evaporation on the heat exchanger side and water condensation on the dedicated plate heat exchanger on the system side)
4. Domestic hot water production in wintertime mode, temporarily stopping hot water production for air heating purpose (DHW priority);
5. DHW production only (in particular in mid seasons and in summertime and wintertime)

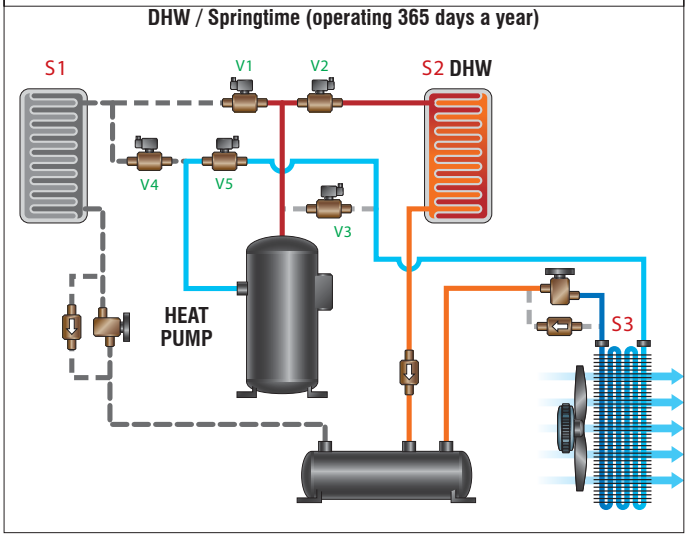
Warning ⚠ When reference is made to the production of domestic hot water, what is meant is the storage of thermal energy in a tank of “technical” water. Water for domestic use must be heated by means of a stainless steel coil contained inside the storage tank, in this way it is possible to avoid storing domestic water and it is not necessary to provide for an anti-Legionella cycle (see recommended plumbing layouts for further details).

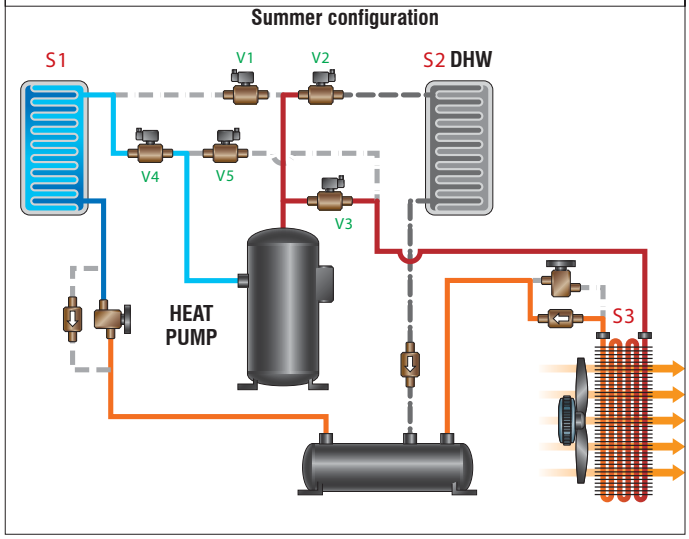
Warning ⚠ **HWMC** units are NOT suitable for use as “rapid” heaters."

The HWMC units are designed for outdoor installation (protection rating IP24), in a position not accessible to the public.
If protection grilles (accessory) are not provided or if the unit can be reached by unauthorized persons, special protection barriers should be provided in order to prevent access to the finned coil.
Do not install the unit in places where inflammable gases or powders are present.









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1 THE SERIES HWMC

1.2 MODELS AND VERSIONS

The **HWMC** series features 5 models of varying capacity, indicatively from 10 to 29 kW in cooling versions (9-32 kW in heating versions) in nominal conditions (ref. EN14511).
All models are charged with R410A refrigerant and equipped with compressors optimised for heat pump applications and domestic hot water production in all seasons.
N.B. The choice of some options may preclude the choice of others or make some other fields become mandatory. Contact Galletti S.p.A. for verification

Complete unit code	H	W	M	C	0	1	0	H	0	A	A	A	1	0	0	C	E	0	0	0	0	0	0	0

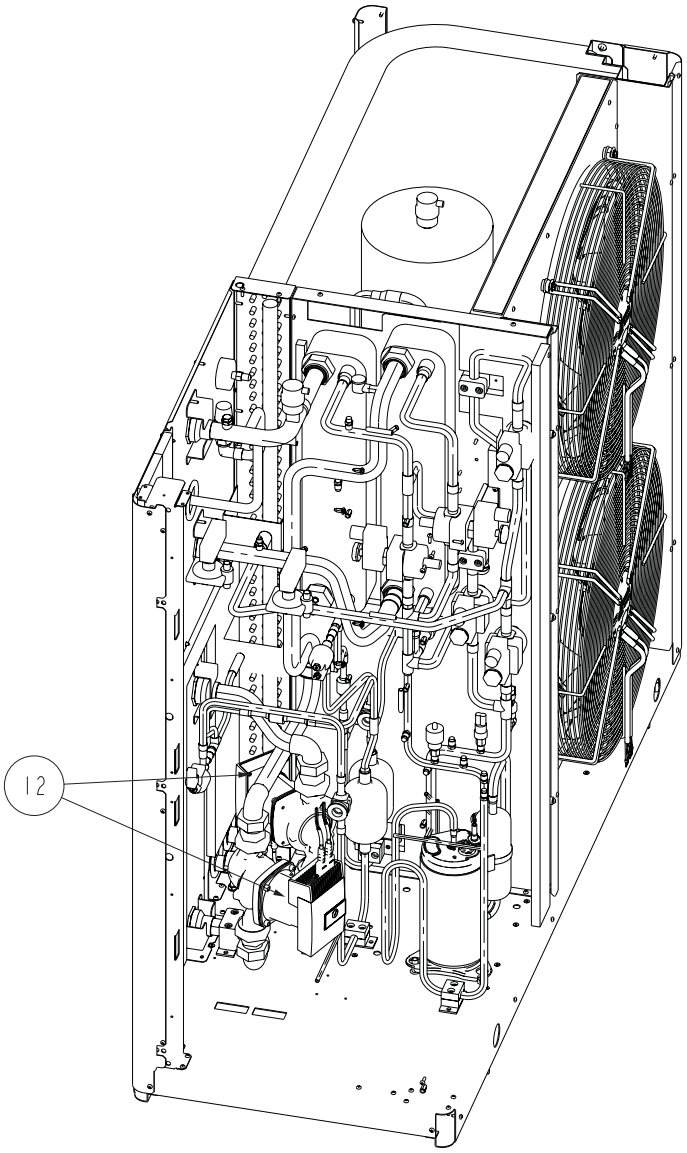
Version 0
Single compressor **0**
Tandem **T**
Model (size) 1 0
Operation H
H
Supply voltage 0
Standard 400 - 3N - 50 **0**
Single-phase **M**
400 - 3N - 50 + circuit breakers **2**
Single-phase + circuit breakers **4**
Refrigerant A
R410A high efficiency **A**
Revision A
Initial **A**
(Field 1) Expansion valve A
Electronic valve **A**
(Field 2) Pump and accessories 1
2 Modulating pumps (system+DHW side) **5**
2 EC pumps (system+DHW side) **6**
(Field 3) Inertial buffer tank 0
Absent **0**
Present, system side **S**
(Field 4) Auxiliary contacts 0
Absent **0**
User tank sensor **1**
External electric heating element control **2**
Opt 1 + Opt 2 **3**
(Field 5) Fans C
Standard with condensation control **C**
BLDC with electronic control **E**
(Field 6) Antifreeze kit E
Base (plate exchangers only) **E**
Additional protection for 1 pump **1**
Additional protection for 1 pump and tank **2**
Additional protection for 2 pumps **3**
Additional protection for 2 pumps and tank **4**
(Field 7) Sound insulation 0
Absent **0**
Compressor compartment soundproofing **1**
Compressor silencing housings **2**
Opt 1 + Opt 2 **3**
(Field 8) Cooling accessories 0
None **0**
Refrigerant pressure gauges **M**
(Field 9) Remote control 0
Absent **0**
MYCHILLER BASE remote control (option 1 - 3 field 13 disabling) **B**
MYCHILLER PLUS remote control (option 1 - 3 field 13 disabling) **P**
ADVANCED pGD1 remote control **C**
(Field 10) Special exchangers 0
Standard **0**
Copper - copper **R**
Cataphoresis **C**
Corrosion-proof **B**
Hydrophilic **GB**
(Field 11) Protective grille 0
Absent **0**
Present **G**
(Field 12) Additional options 0
Absent **0**
Exchanger heating cable **1**
(Field 13) Additional cards 0
Absent **0**
RS485 (Carel / Modbus) **1**
Clock card **2**
LON card **3**

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1 THE SERIES HWMC

1.3 DESCRIPTION OF COMPONENTS

HWMC 10 EC PUMPS



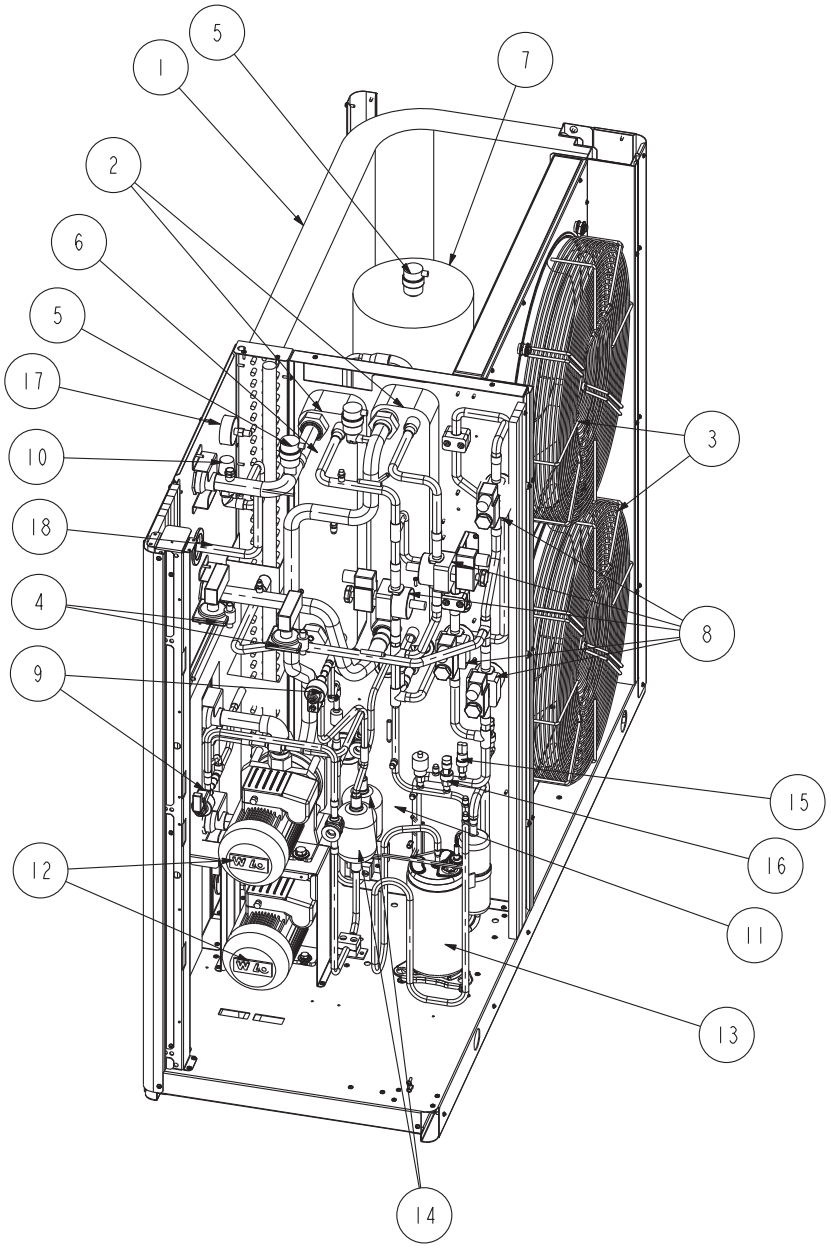
	Description
12	Circulation pump

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1 THE SERIES HWMC

1.3 DESCRIPTION OF COMPONENTS

HWMC 10



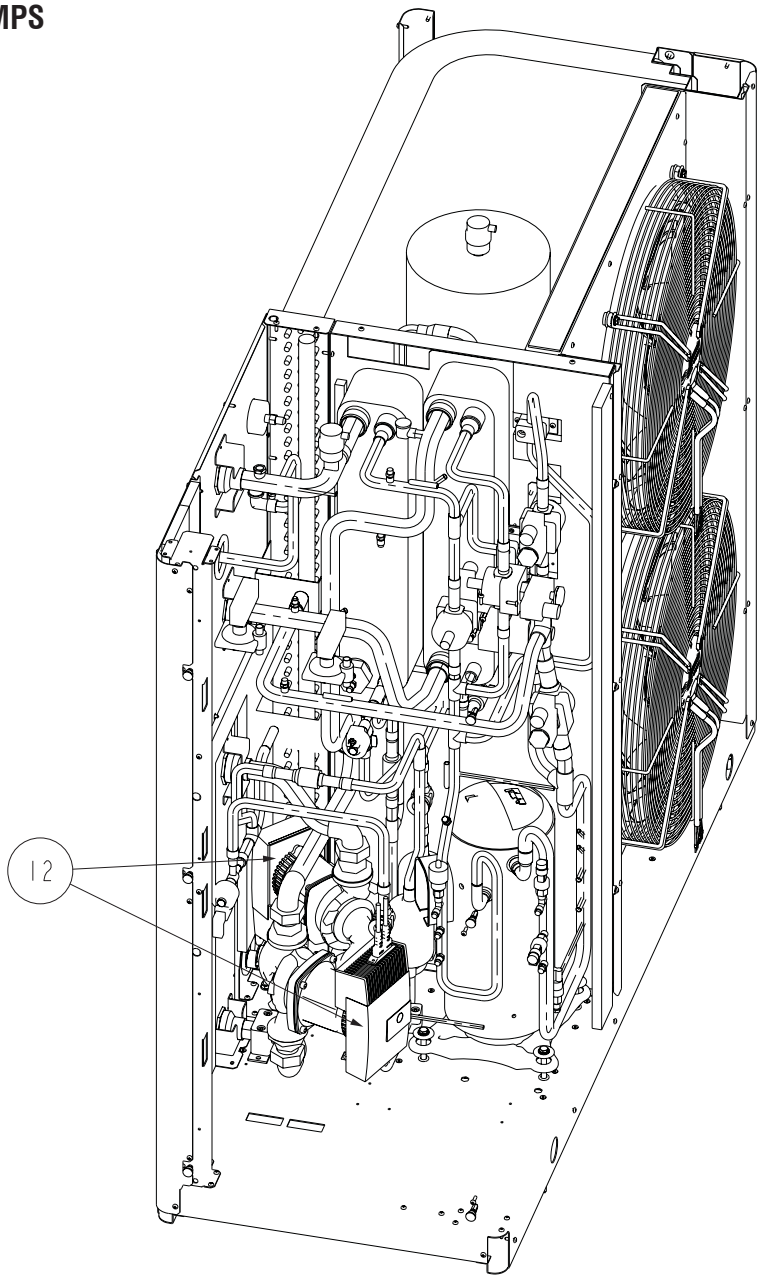
	Description
1	R410A - air exchanger
2	R410A - water exchanger
3	Fan
4	Water differential pressure switch (no. 1 fan compartment)
5	Automatic air vent valve
6	Expansion tank (fan compartment)
7	Buffer tank
8	Refrigerant solenoid valve
9	Electronic thermostatic valve
10	Water safety valve
11	Liquid receiver (fan compartment)
12	Circulation pump
13	Compressor
14	Refrigerant filter
15	Low pressure switch
16	High pressure switch
17	Water pressure gauge
18	Water filling point

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1 THE SERIES HWMC

1.3 DESCRIPTION OF COMPONENTS

HWMC 13 - 18 EC PUMPS



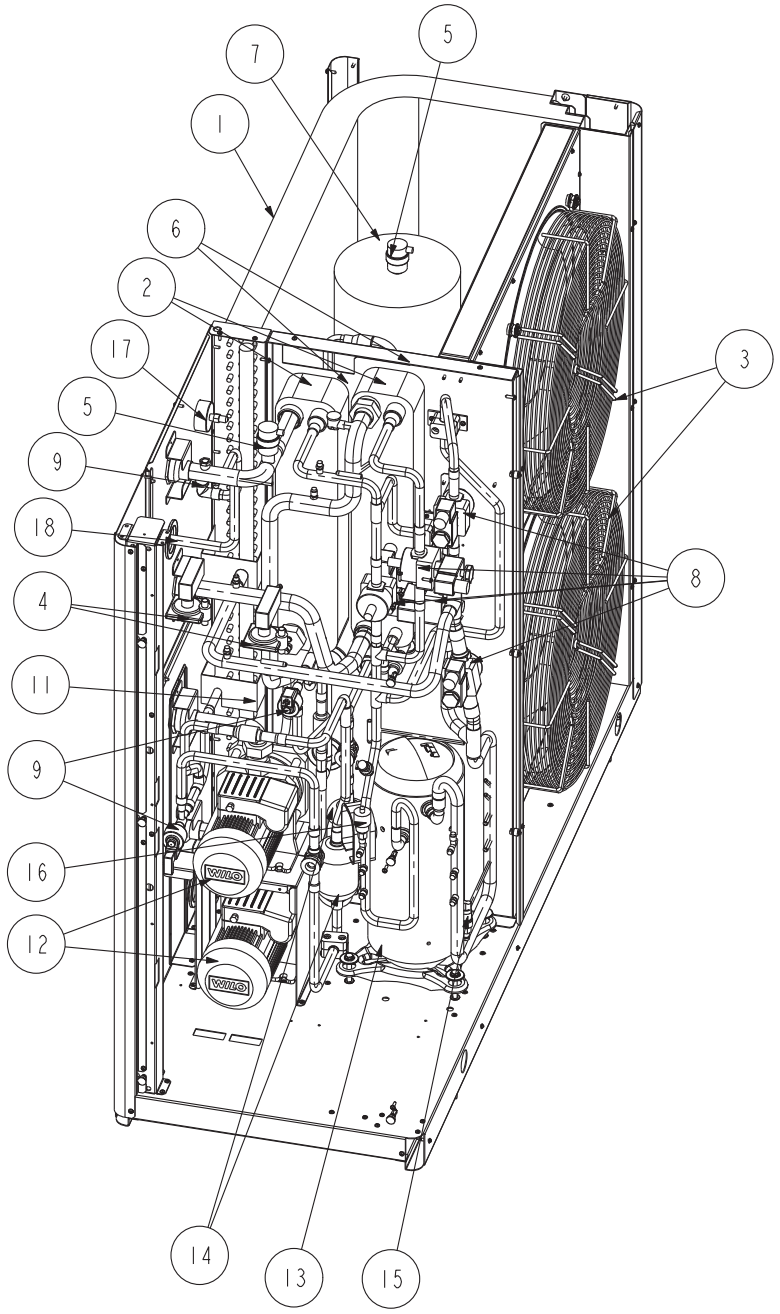
	Description
12	Circulation pump

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1 THE SERIES HWMC

1.3 DESCRIPTION OF COMPONENTS

HWMC 13 - 18



	Description
1	R410A - air exchanger
2	R410A - water exchanger
3	Fan
4	Water differential pressure switch (no. 1 fan compartment)
5	Automatic air vent valve
6	Expansion tank (fan compartment)
7	Buffer tank
8	Refrigerant solenoid valve
9	Electronic thermostatic valve
10	Water safety valve
11	Liquid receiver (fan compartment)
12	Circulation pump
13	Compressor
14	Refrigerant filter
15	Low pressure switch
16	High pressure switch
17	Water pressure gauge
18	Water filling point

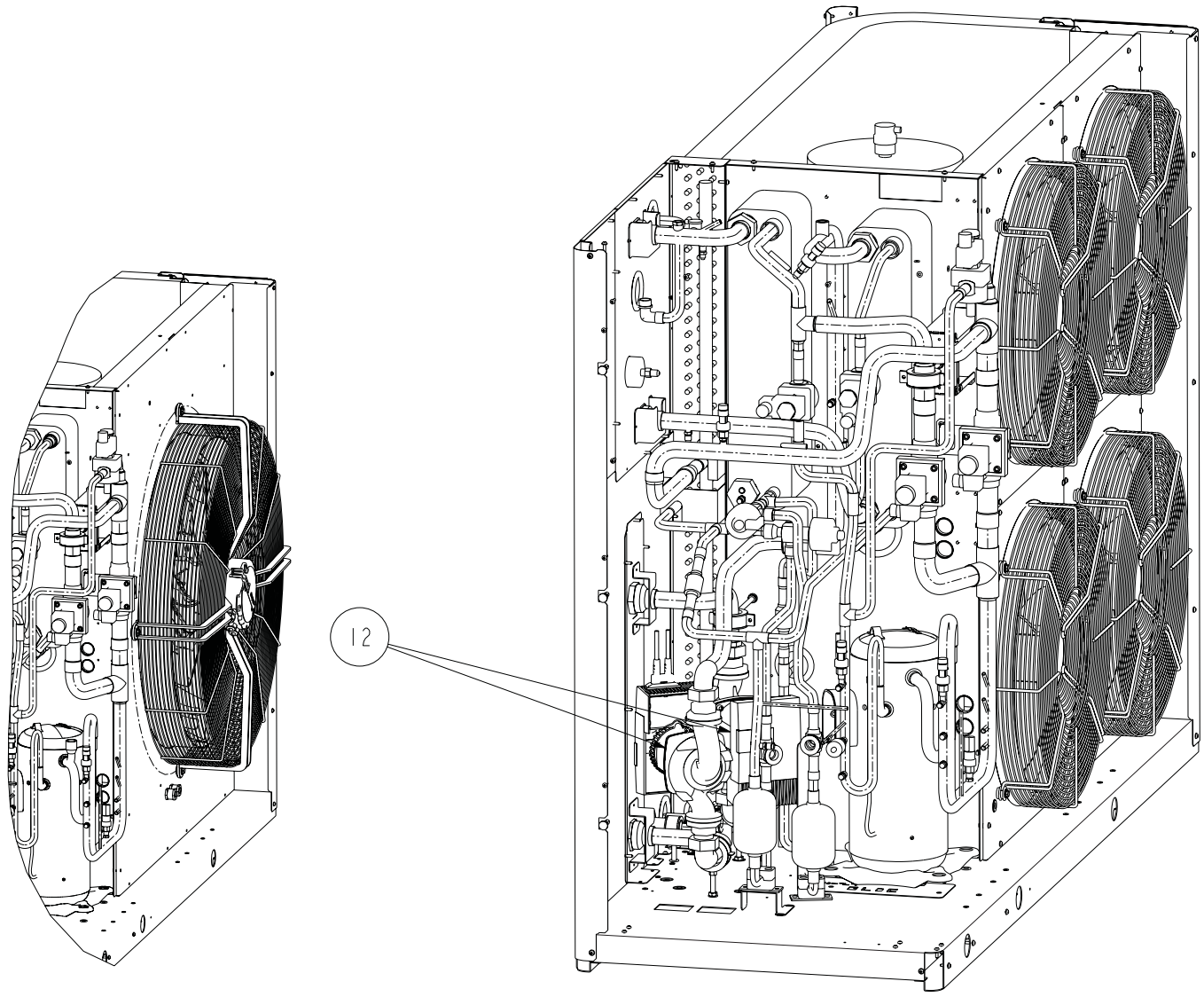
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1 THE SERIES HWMC

1.3 DESCRIPTION OF COMPONENTS

HWMC 23 - 29 FANS

HWMC 23 - 29 EC PUMPS
HWMC 23 - 29 EC PUMPS



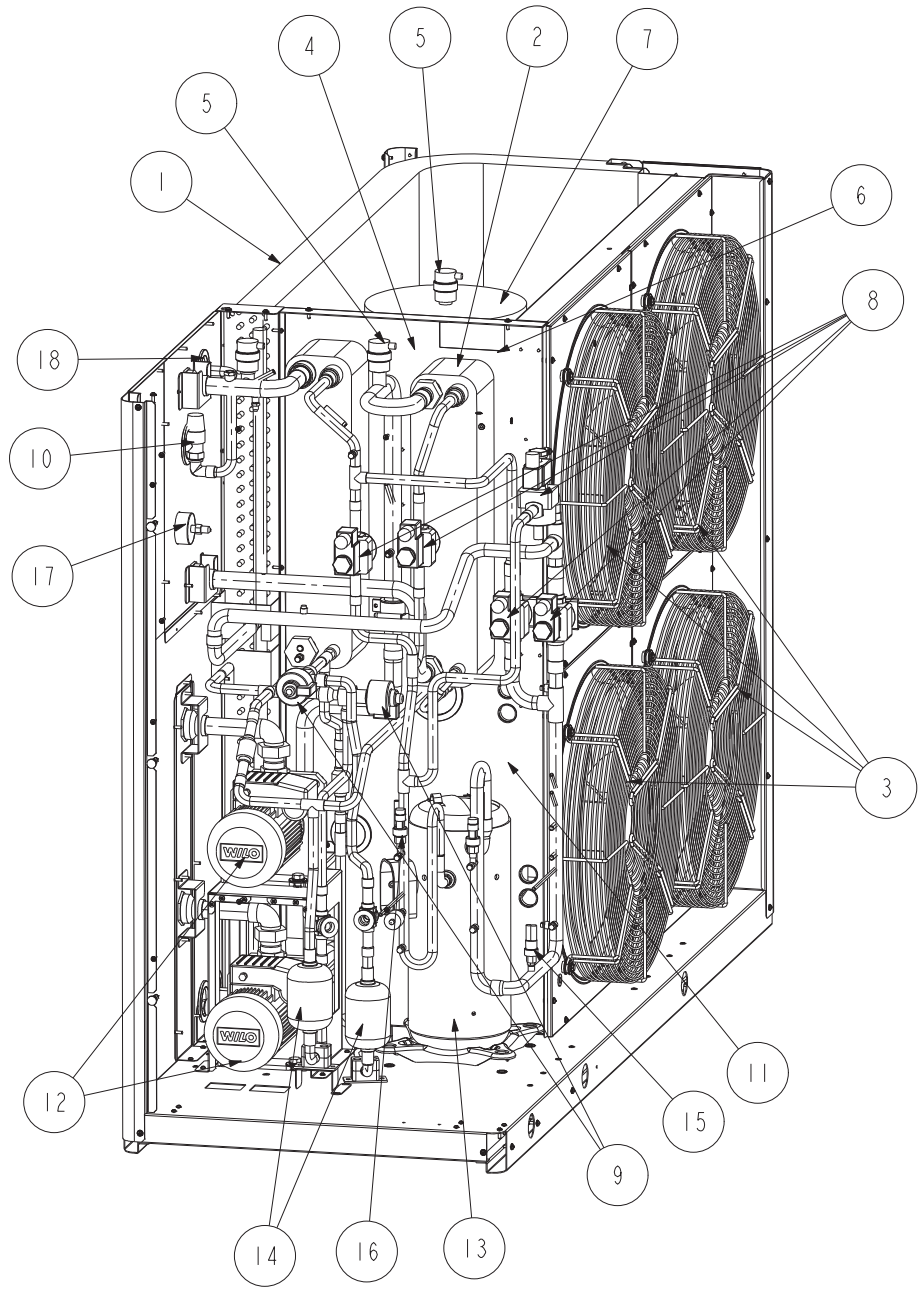
	Description
12	Circulation pump

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1 THE SERIES HWMC

1.3 DESCRIPTION OF COMPONENTS

HWMC 23 - 29



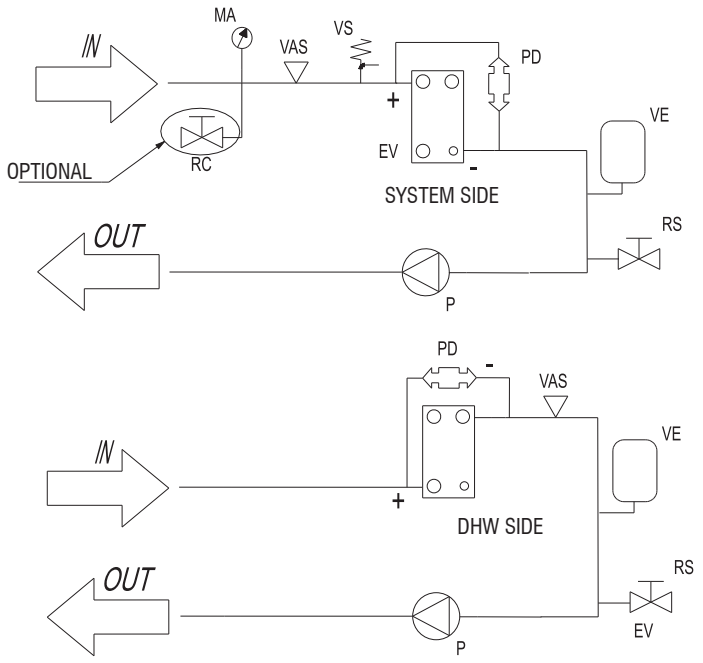
	Description
1	R410A - air exchanger
2	R410A - water exchanger
3	Fan
4	Water differential pressure switch
5	Automatic air vent valve
6	Expansion tank (fan compartment)
7	Buffer tank
8	Refrigerant solenoid valve
9	Electronic thermostatic valve
10	Water safety valve
11	Liquid receiver (fan compartment)
12	Circulation pump
13	Compressor
14	Refrigerant filter
15	Low pressure switch
16	High pressure switch
17	Water pressure gauge
18	Water filling point

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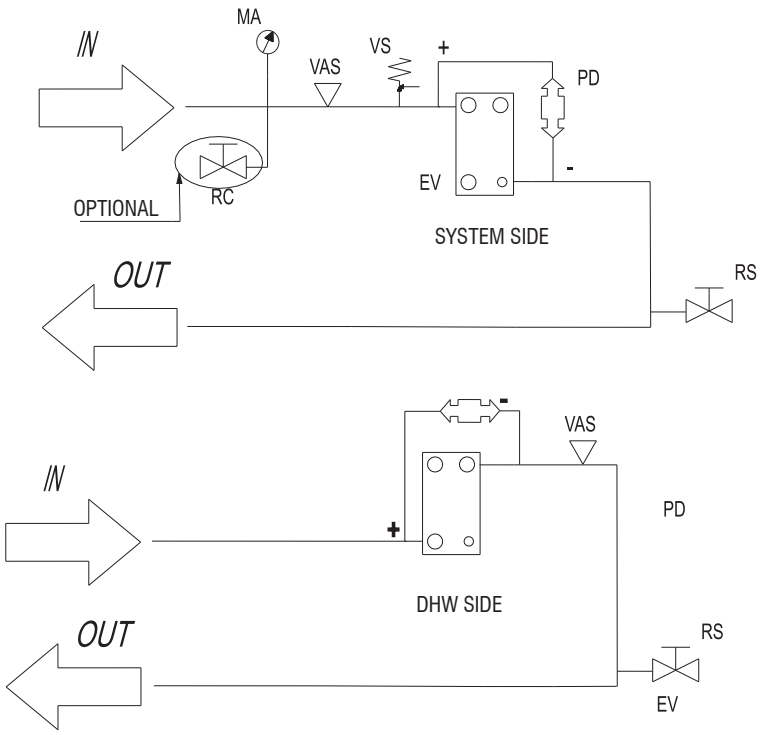
1 THE SERIES HWMC

1.4 PLUMBING DIAGRAMS

HWMC (EVAPORATOR AND PUMP)



HWMC (EVAPORATOR)



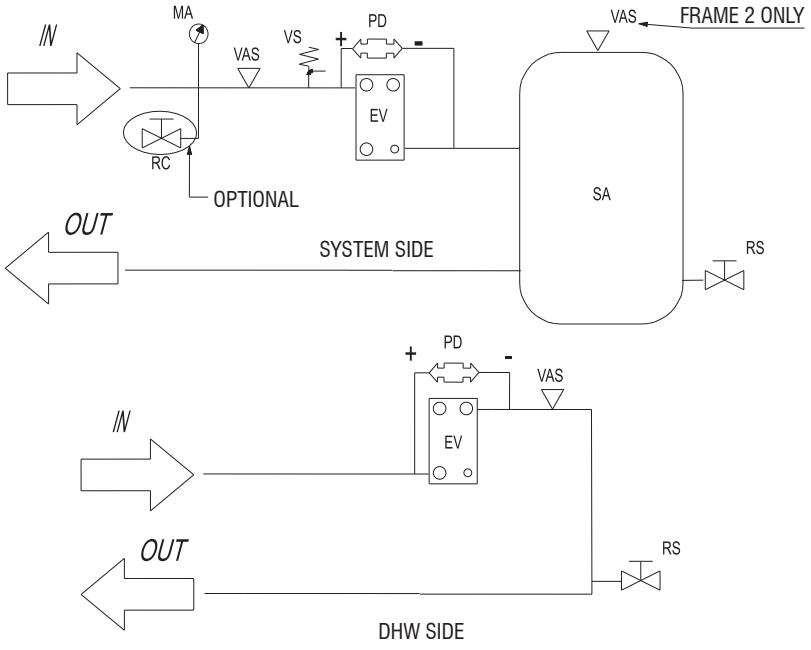
	Legend
VR	Filling valve
VS	Safety valve
EV	Evaporator
PD	Differential pressure switch
MA	Water pressure gauge
VAS	Air vent valve
VE	Expansion tank
P	Pump
RS	Drainage valve
RC	Water filling cock
VU	Check valve

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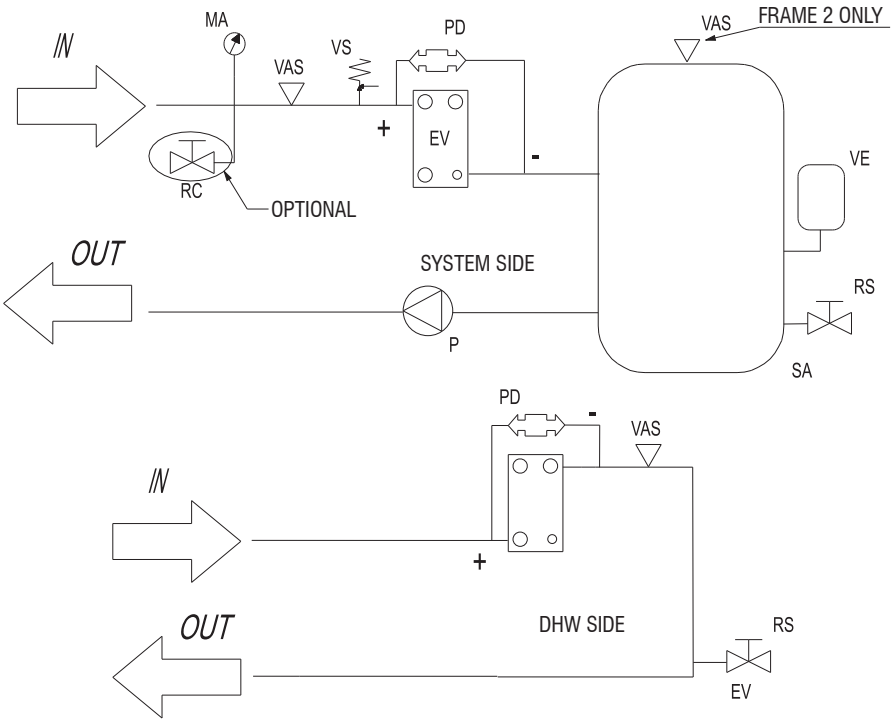
1 THE SERIES HWMC

1.4 PLUMBING DIAGRAMS

HWMC (EVAPORATOR AND TANK)



HWMC (EVAPORATOR, PUMP AND TANK)



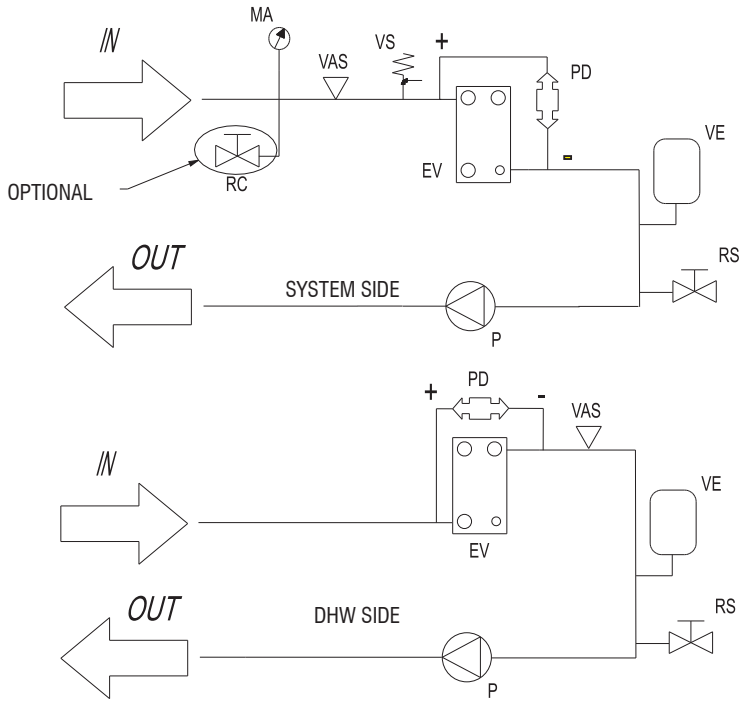
	Legend
VR	Filling valve
VS	Safety valve
EV	Evaporator
PD	Differential pressure switch
MA	Water pressure gauge
VAS	Air vent valve
VE	Expansion tank
P	Pump
RS	Drainage valve
RC	Water filling cock
VU	Check valve
SA	Buffer tank

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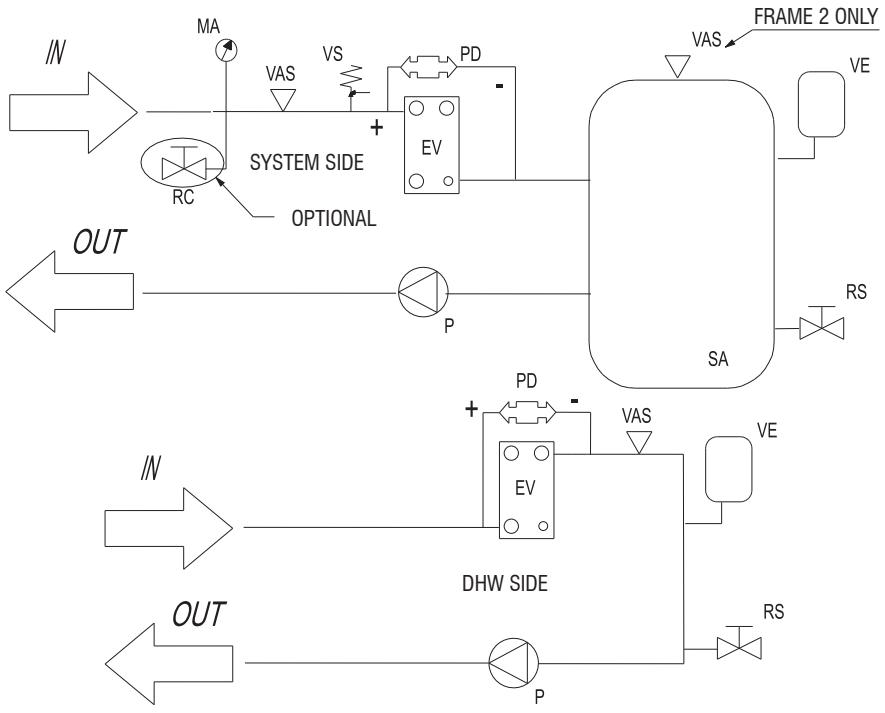
1 THE SERIES HWMC

1.4 PLUMBING DIAGRAMS

HWMC (EVAPORATOR AND DUAL PUMP)



HWMC (EVAPORATOR, DUAL PUMP AND TANK)



	Legend
VR	Filling valve
VS	Safety valve
EV	Evaporator
PD	Differential pressure switch
MA	Water pressure gauge
VAS	Air vent valve
VE	Expansion tank
P	Pump
RS	Drainage valve
RC	Water filling cock
VU	Check valve
SA	Buffer tank

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2 INSPECTION, HANDLING, DIMENSIONS AND SITING

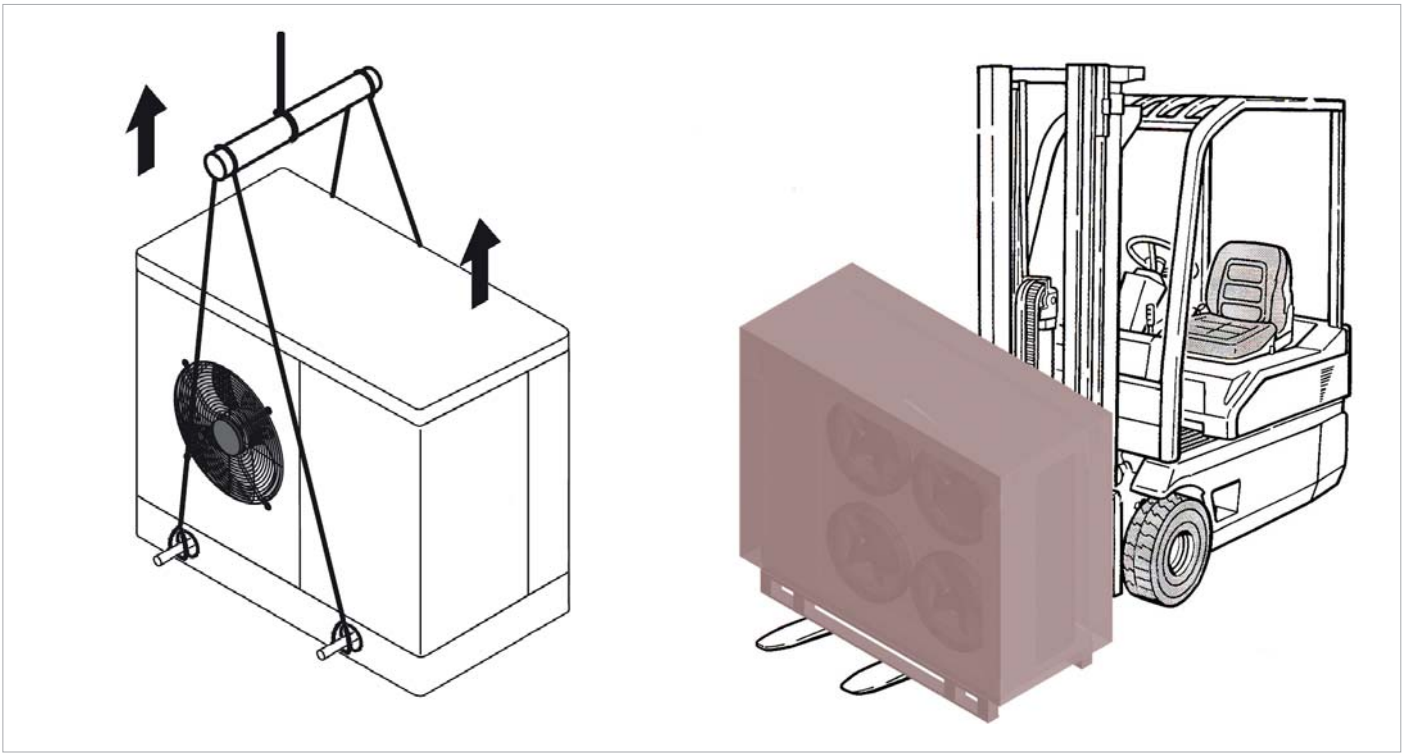
2.1 INSPECTION

On receiving the unit, check that the packing is intact: the machine left the factory in perfect conditions and after thorough inspection.
Should you detect any signs of damage, immediately report them to the carrier and note them on the delivery slip.
Galletti S.p.A. must be notified of the entity of the damage within 8 days of the delivery date.
Check that the following items are present:

- putting into service report,
- wiring diagram,
- warranty certificate and list of authorised service centres,
- make sure that this manual is intact (40 pages).

2.2 HANDLING

During handling it is compulsory to check dimensions, weights, centre of gravity and anchorages. Check as well that lifting and positioning devices conform to the current safety regulations.
The unit leaves the factory screwed onto a wooden pallet, which allows it to be easily conveyed with a forklift truck. After removing the unit from the pallet, handle it gently, without applying excessive pressure on the side panels, finned coil and fan grille.
You should collect and separate the packing materials (wood, cardboard, nylon etc.) and make them available for recycling in order to minimise their environmental impact.
Before lifting, remove the screws fastening the base of the unit to the wood platform.
The unit should be lifted using Ø1½" GAS steel pipes at least 3mm thick, to be inserted in the round holes provided on the base side members (see figure) and identified by means of stickers. The pipes, which should protrude by at least 250-300mm on every side, must be slung with ropes of equal length secured to the lifting hook (provide stops at the ends of the pipes to prevent the ropes from slipping off due to the weight).
Use ropes or belts whose length exceeds the machine height and place spacer boards and bars on the top of the unit to avoid damaging the sides and upper part of the unit itself.
At this point, before final positioning, it is possible to install the vibration-damping supports (optional).
WARNING: In all lifting operations make sure that the unit is securely anchored in order to prevent accidental falls or overturning.

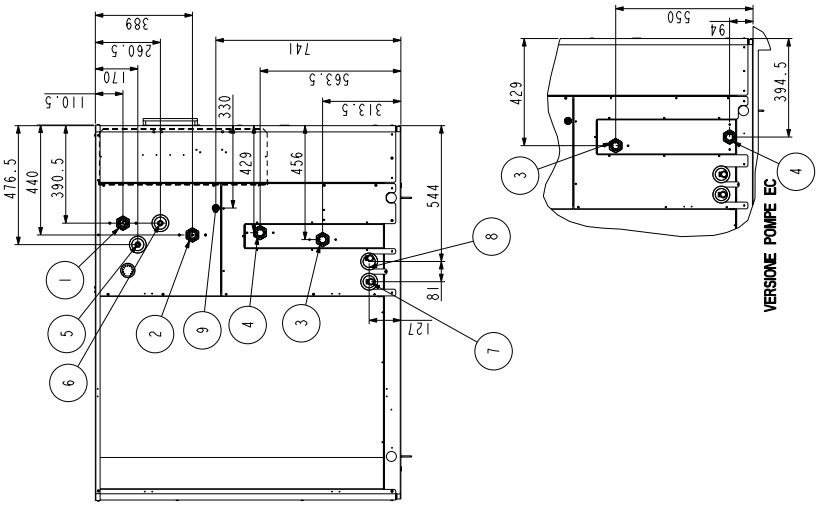


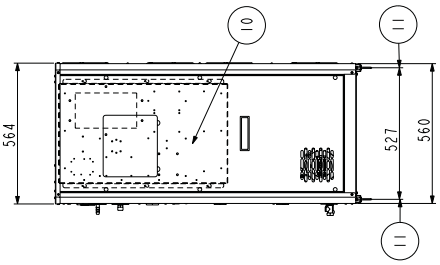
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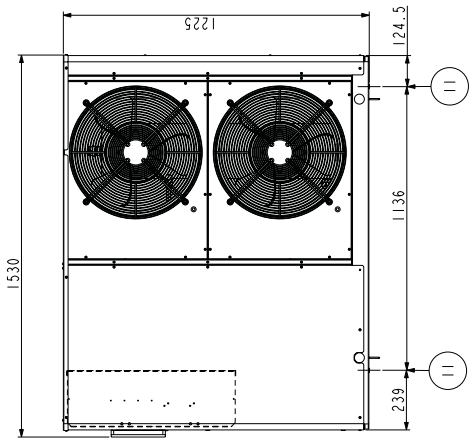
2 INSPECTION, HANDLING, DIMENSIONS AND SITING

2.3 DIMENSIONS

HWMC 10 ÷ 13 ÷ 18







Legend:

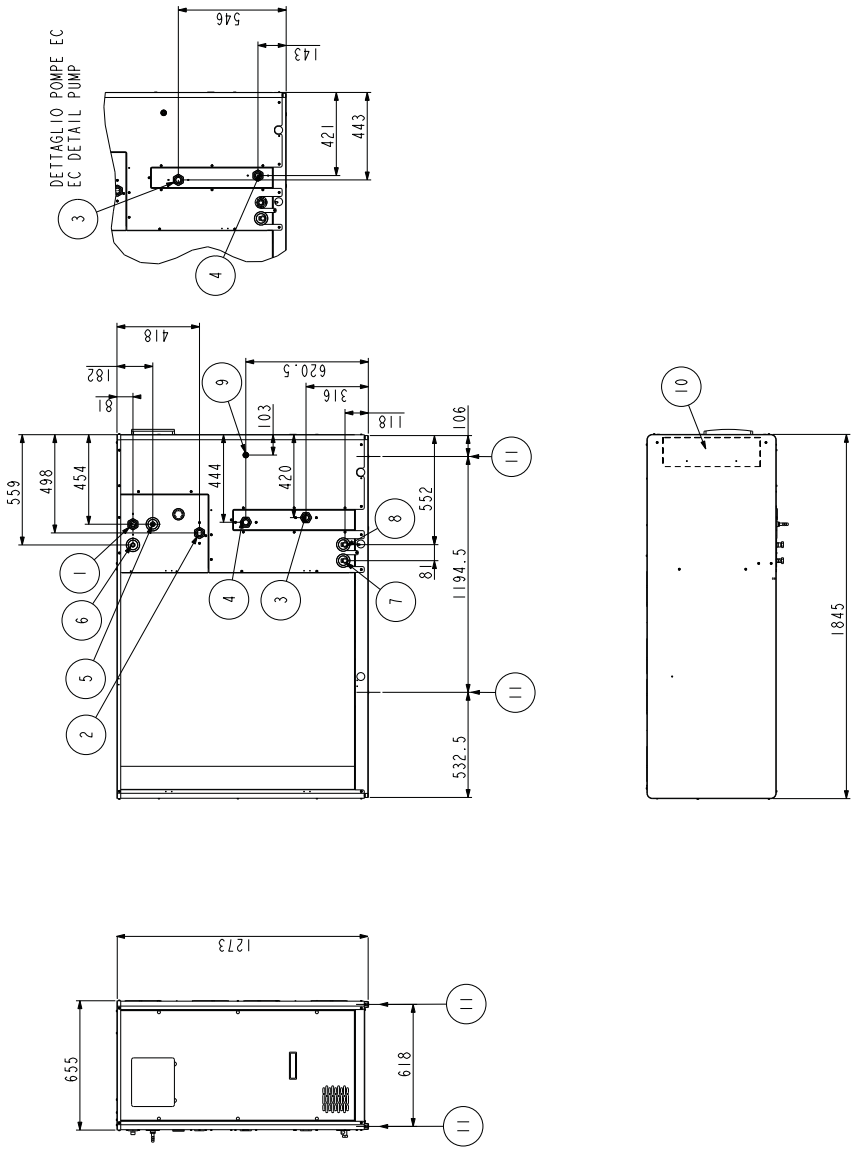
1 Water inlet 1" ¼ female
2 Sanitary hot water inlet 1" ¼ female
3 Water outlet 1" ¼ female
2 Sanitary hot water outlet 1" ¼ female
5 Safety valve discharge outlet with rubber ring holder
6 Water supply ½" male (optional tap)
7 Water drainage ½" female
8 Sanitary hot water drainage ½" female
9 Power supply Ø 28 mm
10 Electric control board
11 Fastening points for vibration dampers

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2 INSPECTION, HANDLING, DIMENSIONS AND SITING

2.3 DIMENSIONS

HWMC 23 ÷ 29



Legend:

1 Water inlet 1" ¼ female
2 Sanitary hot water inlet 1" ¼ female
3 Water outlet 1" ¼ female
2 Sanitary hot water outlet 1" ¼ female
5 Safety valve discharge outlet with rubber ring holder
6 Water supply ½" male (optional tap)
7 Water drainage ½" female
8 Sanitary hot water drainage ½" female
9 Power supply Ø 28 mm
10 Electric control board
11 Fastening points for vibration dampers

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2 INSPECTION, HANDLING, DIMENSIONS AND SITING

2.4 SITING

It is important to bear in mind the following aspects when choosing the best site for installing the unit:

- size and origin of water pipes;
- location of the power supply;
- solidity of the supporting surface;
- avoid obstacles to the outflow of air from the fan which could cause back suction (see section on “installation clearance requirements”);
- direction of prevalent winds: (position the unit so that prevalent winds do not alter the fan air flow). A prevalent wind blowing from a direction opposite to the fan air flow will reduce the maximum air temperature to a lower value than specified in the operating limits, a wind blowing in the same direction as the fan air flow will increase the minimum air temperature to a higher value than specified in the operating limits. Also in the heat pump mode, wind may have the effect of reducing the unit's operating range.
- avoid the possible reverberation of sound waves; do not install the unit in narrow or cramped spaces;
- ensure adequate accessibility for maintenance or repairs (see section on “installation clearance requirements”).

This device is not intended to be used by children or by people with physical, sensory or mental impairments, except under supervision. Make sure that children do not have access to the device.

2.4.1 INSTALLATION CLEARANCE REQUIREMENTS

To guarantee the proper functioning of the unit and access for maintenance purposes, it is necessary to comply with the minimum installation clearance requirements shown in figures 1, 2 and 3.
There must be no obstacles blocking the path of the air flow from the fans.
Avoid any and all situations of backflow of hot air between air outlet and inlet of the unit.
If even only one of the above conditions is not fulfilled, please contact the manufacturer to check for feasibility.

In the design of the HWMC series, special care has been taken to minimise noise and vibrations transmitted to the ground.
Even greater insulation may be obtained, however, by using vibration damping base supports (available as optional accessories).
If vibration damping base supports are adopted, it is strongly recommended also to use vibration damping couplings on the water pipes.
Whenever the unit is to be sited on unstable ground (various types of soil, gardens, etc.) it is a good idea to provide a supporting base of adequate dimensions.

Warning ⚠ while operating in heating or DHW mode, the units produce condensation..

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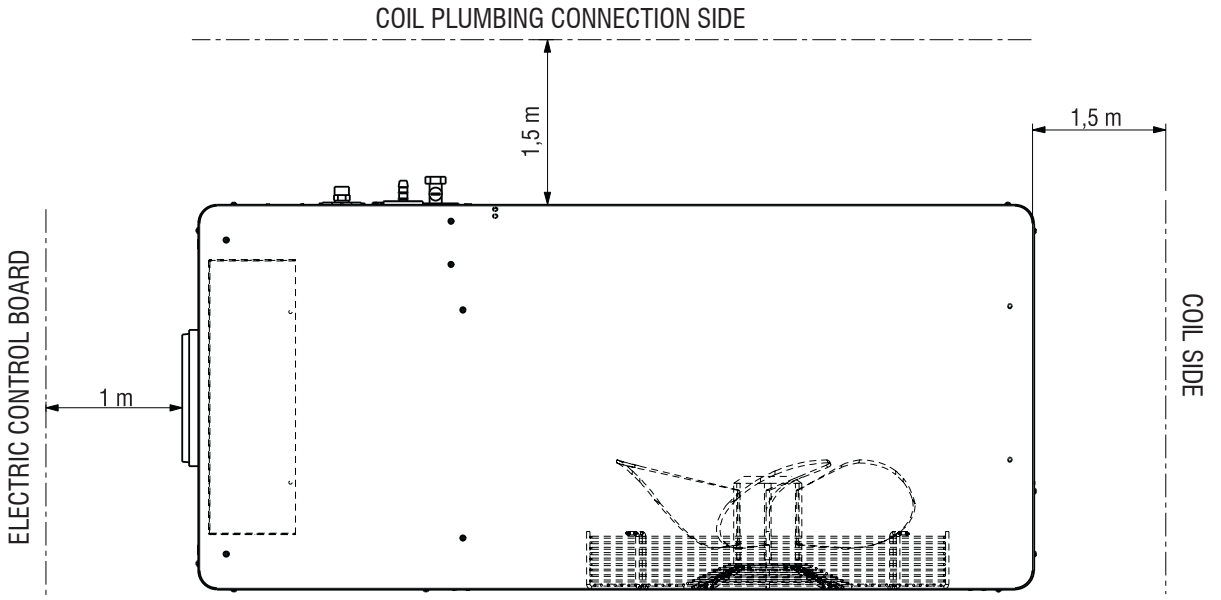
2 INSPECTION, HANDLING, DIMENSIONS AND SITING

2.4 SITING

2.4.1 INSTALLATION CLEARANCE REQUIREMENTS

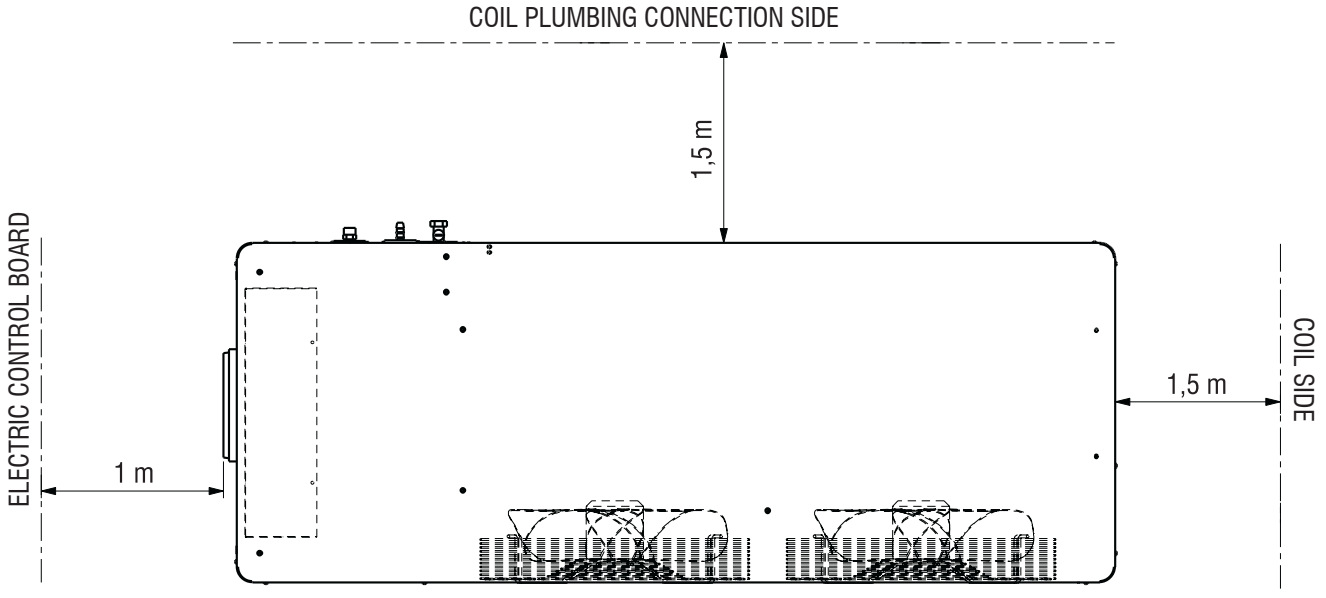
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HWMC 10 ÷ 18



2

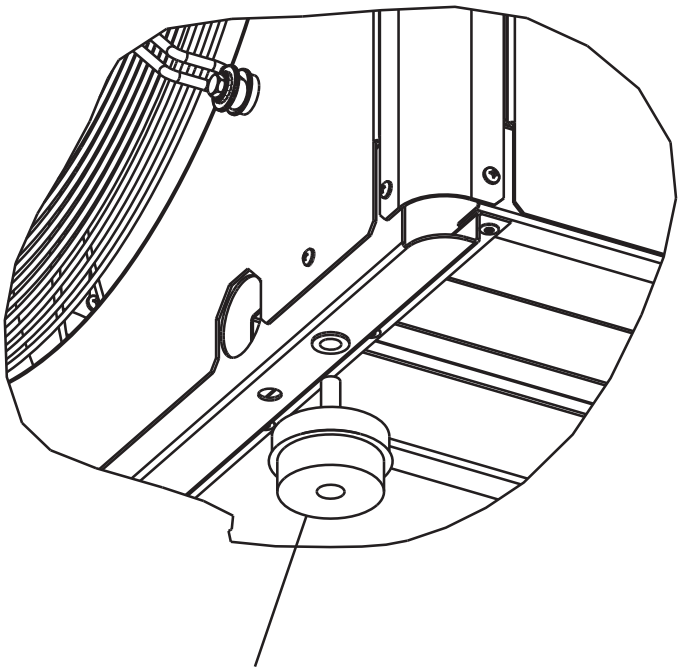
HWMC 23 ÷ 29



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2 INSPECTION, HANDLING, DIMENSIONS AND SITING

2.5 POSITIONING OF VIBRATION DAMPERS (ACCESSORY)



HWMC	NO. OF VIBRATION DAMPERS
10 - 18	4
23 - 29	4

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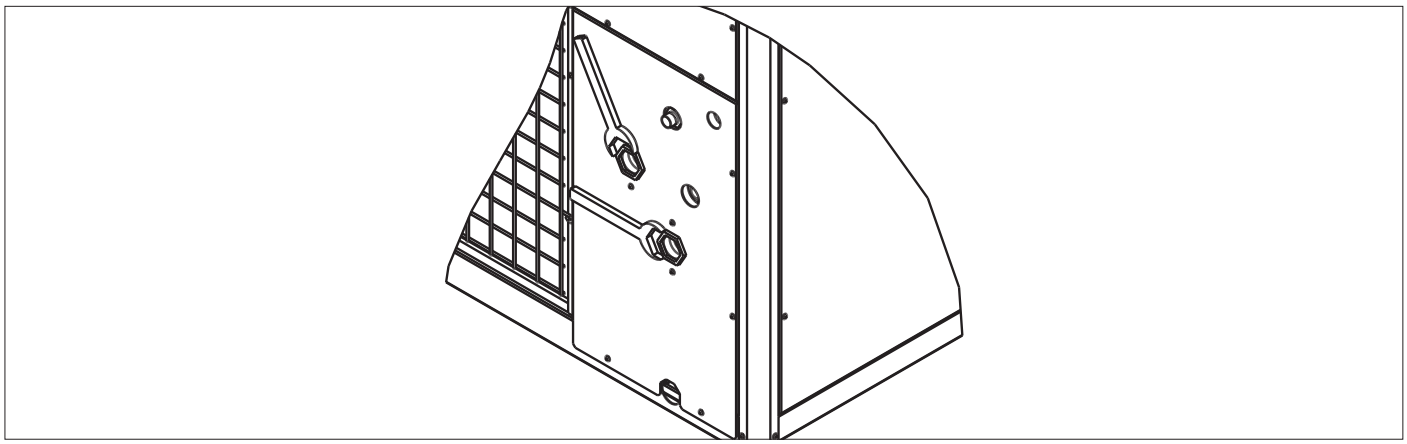
3 WATER AND ELECTRICAL CONNECTIONS

3.1 WATER CONNECTION

All units belonging to the **HWMC** series are equipped with water differential pressure switch, safety valve, water differential pressure switch, safety valve, water pressure gauge, automatic vent valve and drainage valve.
According to the specific configuration they can be equipped with pump, expansion tank and buffer tank.

3.1.1 WATER CONNECTIONS

Warning ⚠ While connecting the taps, hold the unit's plumbing connections tightly in place using a hexagonal wrench or make sure that they do not rotate to prevent the pipes inside the unit from being damaged (see figure).



3.1.2 RECOMMENDED WATER CIRCUIT

Warning! ⚠ when making the plumbing connections, make sure there are no open flames in proximity to or inside the unit.

When setting up the water circuit, it is advisable to equip it with:
- valves for regulating (**VI**) the unit on the water pipes, immediately upstream and downstream from the unit itself, to be used in the event maintenance work is required;
- a mechanical filter supplied as standard (**FM**) (**MANDATORY!**) on the pipes feeding the unit, in proximity to the latter;
- a mechanical filter supplied as standard (**FM**) (**MANDATORY!**) and a check valve (**VNR**), on the supply line upstream from the filling tap (**RC**);
- an air vent valve at the highest point of the circuit;
- escape pipe for the safety valve (**VS**), which, in the event the safety valve opens, diverts the jet of water to an area where it cannot harm persons or damage property (**Important!**);
- vibration-damping couplings (**GA**) on the pipes to prevent vibrations from being transmitted toward the system.

Important! It is advisable to ensure that the pipes connected upstream and downstream from the unit are not smaller in diameter than the plumbing connections of the unit itself.

Important! During wintertime periods of quiescence the water circuit must be emptied to prevent damages caused by freezing; in alternatively, the circuit may be filled with a mixture of water and glycol; the percentage of glycol necessary will depend on the lowest forecast temperature (see table):

Percentage by weight of ethylene glycol (%)	Mixture freezing temperature (°C)
0	0
10	-4
15	-8
20	-14
30	-18

Important! If different antifreeze product is to be used, please contact the manufacturer.

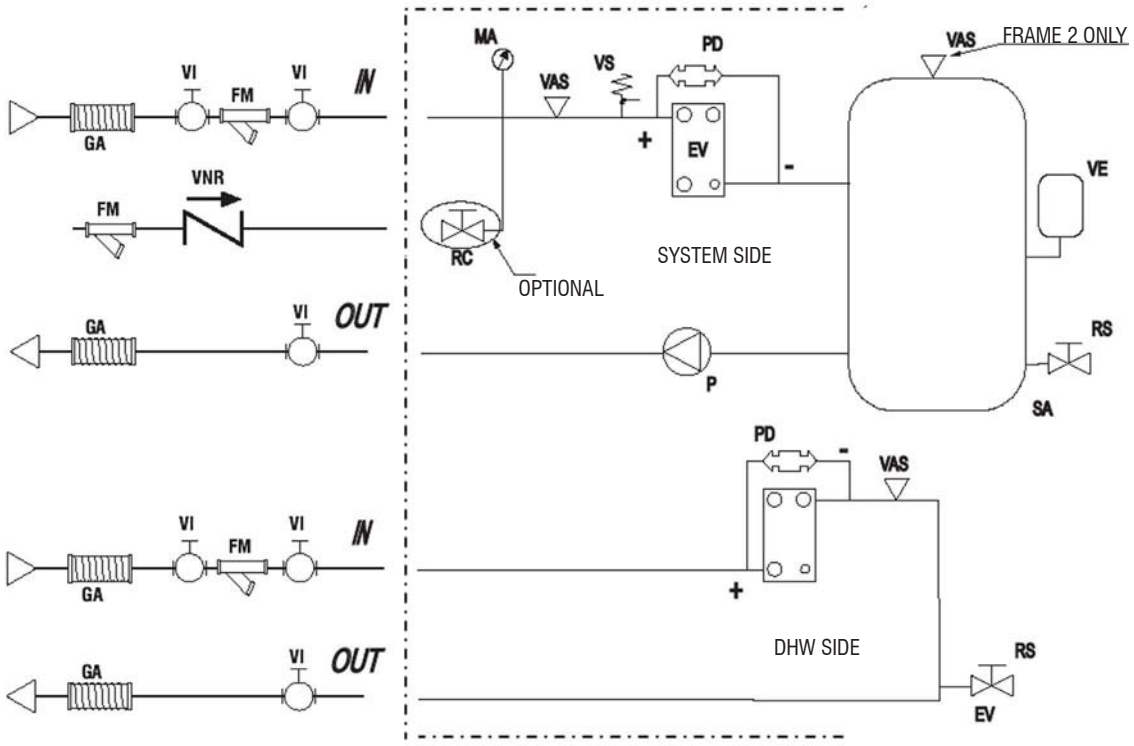
Failure to install filters and vibration dampers may cause problems of clogging, breakages and noise, for which the manufacturer may not be held liable.

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3 WATER AND ELECTRICAL CONNECTIONS

3.1 WATER CONNECTION

3.1.2 RECOMMENDED WATER CIRCUIT



	Legend
VS	Safety valve
EV	Evaporator
PD	Differential pressure switch
MA	Water pressure gauge
VAS	Air vent valve
SA	Buffer tank
VE	Expansion tank
RS	Drainage valve
RC	Water filling cock
VI	Regulating valve (not supplied)
GA	Vibration-damping coupling (not supplied)
FM	Mechanical filter (MANDATORY)
VNR	Check valve (not supplied)
P	Pump

3.1.3 FILLING THE SYSTEM

- Before you start filling, make sure that the system drainage cock is closed.
- Open all the air vent valves of the system and of the indoor units and chiller.
- Open the system regulating devices.
- Start filling the system by slowly opening the water fill valve (optional).
- When water starts coming out of the air vent valves of the indoor units, close them and continue filling until the pressure gauge reading is 1.5 bars.

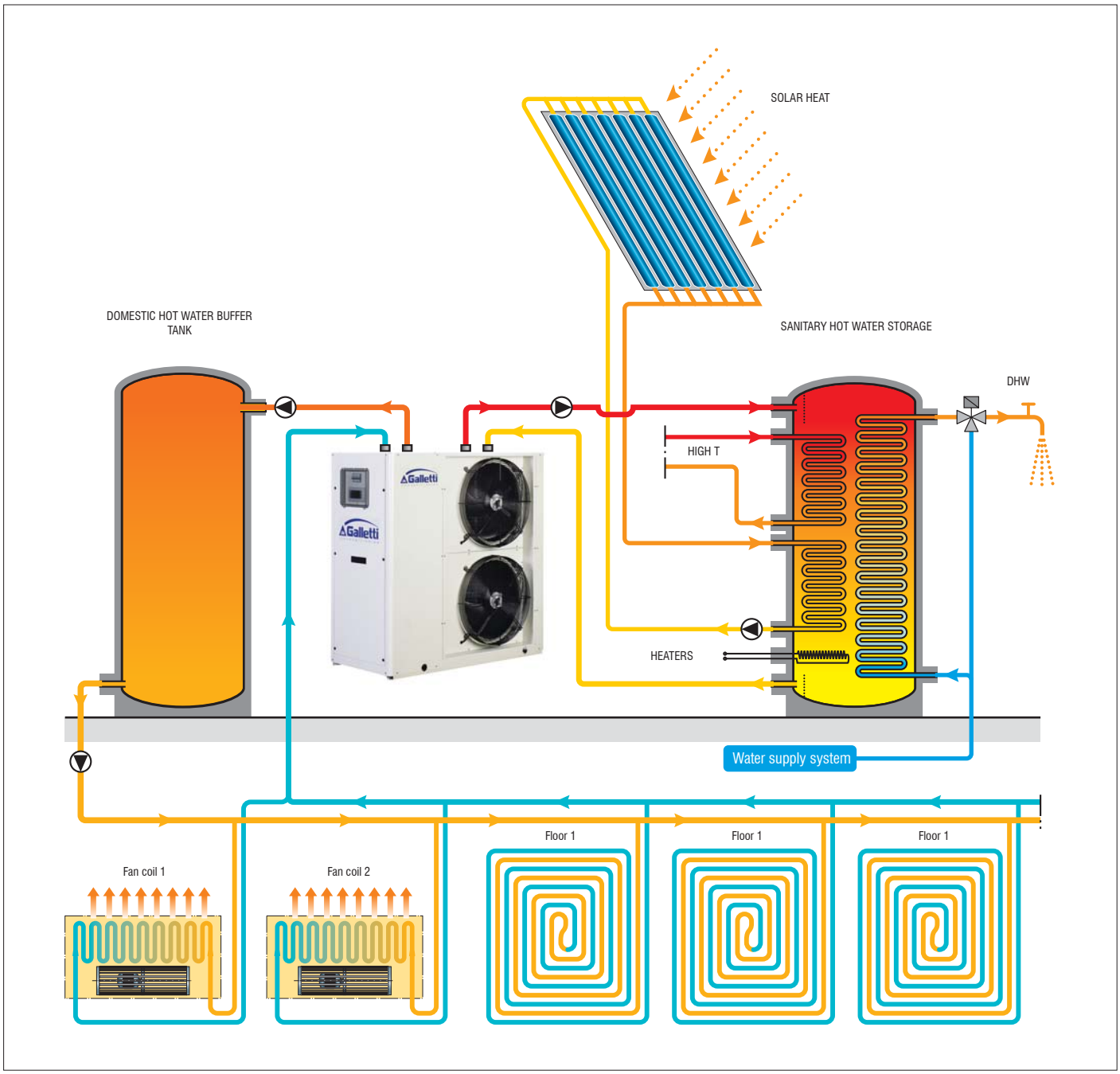
Warning ⚠ Heating/cooling system circuit and domestic hot water system circuit are separated. To fill the DHW system use a heat storage tank (boiler).

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3 WATER AND ELECTRICAL CONNECTIONS

3.1 WATER CONNECTION

3.1.4 BASE MULTI-PURPOSE SYSTEM DIAGRAM



Warning ⚠ the circuit for the production of DHW must be connected directly to the buffer tank (without interposed coil), in this way the water content of the buffer tank will be sufficient to ensure the proper operation of the unit (heat transfer to DHW line), thus avoiding repeated start-ups and stops of the compressor

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3 WATER AND ELECTRICAL CONNECTIONS

3.2 ELECTRICAL CONNECTIONS

Warning ⚠ the filters associated with the inverter (in order to minimize emissions and at the same time to ensure that the unit complies with the EMC Directives) produce earth leakage. This may cause the differential safety switch to trip It is recommended to install an additional calibratable differential switch, dedicated to the unit supply line only.

All operations must be performed by qualified service personnel in accordance with current laws and regulations. For any electrical work on the unit, refer to the electric diagrams supplied with the unit.
It is recommended to make sure that:
- The characteristics of the mains power supply are adequate for the electrical inputs specified in the table of electrical data.

Warning ⚠ Before carrying out any job on electrical parts, make sure the power supply is disconnected. Check also that the mains electricity supply is compatible with the specifications (voltage, number of phases, frequency) shown on the unit rating plate. The supply voltage may not undergo fluctuations exceeding ±5% of the rated voltage. The electrical connections must be made in accordance with the wiring diagram provided with the unit and the regulations in force.

Warning ⚠ Never attempt to modify internal electrical connections: any undue modifications will immediately invalidate the warranty.

Important! Upstream from the electrical control panel it is mandatory to use an omnipolar thermomagnetic circuit breaker complying with IEC-EN standards (contact gap of at least 3 mm), with an adequate breaking capacity and differential protection based on the electrical data table shown below, installed as close as possible to the unit.
For the unit power supply line use H07RN-F- type flexible cables having the cross sectional area shown in the table.

To route the cables use sheaths and conduits suitable for outdoor installation.
You must provide a switch with a delayed fuse meeting the specifications indicated in the table.

Important! Upstream from the electric control board, you must provide a switch with a delayed fuse meeting the specifications indicated in the table.

To access the electric control board it is necessary to remove the inspection panel (figure 4) by taking out the screws; introduce the power cable into the unit through the bushing on the side panel; then bring it to the electric control board through the cable holder provided.

Important! Tighten the wires securely to the terminals and clamp the cable in place with the cable holder (figure 5).

Important! To maintain the IP protection rating a cable gland compatible with the diameter of the sheath or power cable must be fit in the hole on the side panel of the unit.

Important! Make sure that the length of cable inside the unit enters the bushing from below: this is necessary to prevent rainwater from dripping inside the unit.

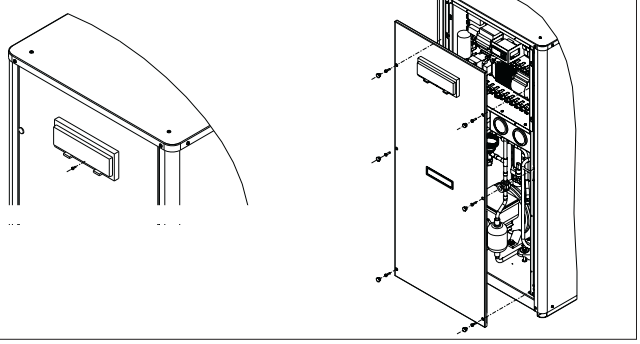
Important! An earth connection is mandatory: connect the earthing wire to the terminal provided on the electric control board (see the electric control board layout supplied with the unit), marked ⏚

Important! If you wish to include:
- a remote on/off switch
- a remote switch for changing over
- a remote control

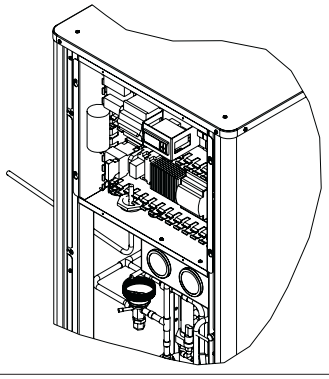
it is a good idea to do so at this stage of the installation procedure, by connecting the switches or the remote control (accessory) to the electric control board terminals as directed in section 3.3 and using the unit wiring diagram as your reference.

HWMC		010M	013	018	023	029
Cross-section area of power cables	mm^2	4	6	6	10	10
Safety fuse **F**	A	20	25	25	32	32
Main switch **IL**	A	20	25	25	40	40

4



5



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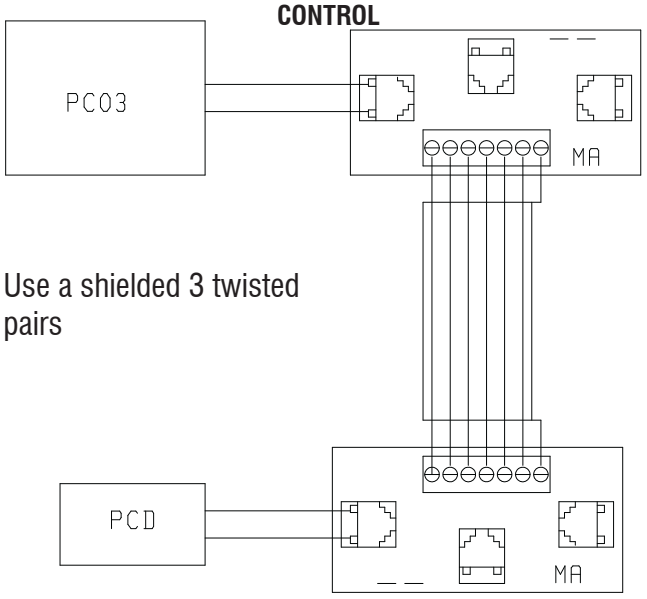
3 WATER AND ELECTRICAL CONNECTIONS

3.3 ELECTRICAL SPECIFICATIONS

HWMC		010 M	013	018	023	029
Maximum power input	kW	5,6	7,1	10,7	10,8	21,9
Maximum current absorption	A	26,6	20	22	28,5	43
Starting absorbed current	A	10	10	10	10	10
Fan motor rated power	kW	0,14	0,14	0,14	0,14	0,14
Fan motor rated current	A	0,64	0,64	0,64	0,64	0,64
Pump motor rated power	kW	0,48	0,65	0,65	0,65	0,65
Pump motor rated current	A	2,7	3	3	3	3
Power supply	V/f/Hz	230/1/50	400/3N/50			
Auxiliary power supply	V/f/Hz					
Power cables	mm^2	4	6	6	10	10
PCD connecting cables	mm^2	AWG22	AWG22	AWG22	AWG22	AWG22
PCDS connecting cables	mm^2	1	1	1	1	1
Safety fuse F	A	20	25	25	32	32
Circuit breaker IL	A	20	25	25	40	40

- The maximum power input is the mains electricity that must be available in order for the unit to work.
- The maximum current absorption refers to the current that will trigger the internal safety devices of the unit.
  It is the maximum current allowed in the unit. This value may never be exceeded; it must be used as a reference for determining the size of the power supply line and the related safety devices (refer to the wiring diagram supplied with the units).

DIAGRAM SHOWING HWMC ELECTRICAL CONNECTIONS BETWEEN REMOTE PCD CONTROL PANEL AND pCO3 REMOTE CONTROL



Note: Should the unit go into an alarm status, a voltage of 24V will be present on the terminals of the electric control panel at the terminals 50/24V; where an interface with a voltage-free contact is desired, a relay must be fitted by the installer.

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4 STARTING UP

FIRST START-UP MAY BE CARRIED OUT SOLELY BY QUALIFIED TECHNICIANS DULY AUTHORIZED BY GALLETTI S.P.A.
(SEE ENCLOSURE)
When starting up the system for the first time, abide by the provisions of the national laws currently in force.

4.1 PRELIMINARY CHECKS

When starting up the unit for the first time (or after a seasonal shutdown) it is a good idea to have the following checks carried out by specialised personnel:

- Check that the electrical connections have been made properly and that all the terminals are securely tightened.
- Check that the mains voltage corresponds to the voltage rating of the machine, within a tolerance range of ± 5%.
  If the power supply is subject to frequent voltage fluctuations, contact Galletti S.p.A. for advice on choosing suitable protections.
- Check for refrigerant leaks, with the aid of a leak detector if necessary.
- Check that the plumbing connections have been properly made according to the indications given on the plates to be found on the unit itself (water inlet, water outlet etc.).
- Make sure that the pump is not blocked.
- Make sure that the water circuit is duly bled to completely eliminate the presence of air: load the circuit gradually and open the air vent valves, which the installer should have set in place.

Warning ⚠ Before starting the unit, make sure all the covering panels are in place and secured with the fastening screws provided. To start the unit, move the main switch to on.

To start the unit turn on the main switch. Then use the keypad of the electronic control as directed in section 3.3 to select the cooling or heating mode.

Warning ⚠ You should not disconnect the unit from the power supply during periods when it is inoperative but only when it is to be taken out of service for a prolonged period (e.g. at the end of the season). To turn off the unit temporarily follow the directions provided in section 3.3.

Warning ⚠ Do not cut off power using the main switch: the latter device is used to disconnect the unit from the electricity supply when there is no passage of current. i.e. when the unit is already turned OFF.

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5 OPERATING LIMITS

The graphs below illustrate the operating limits of **HWMC** units (in the case of continuous operation) in relation to the outlet water temperature and outdoor air temperature.

Operating limits	Chiller		Heat pump	
	min	max	min	max
Inlet water temperature (°C)	8	20 [1]	25	42
Outlet water temperature (°C)	5	19	28	58 [2]
Water temperature differential (°C)	3	8	3	8
Outdoor air temperature (°C)	-10 [3]	48	-10	35

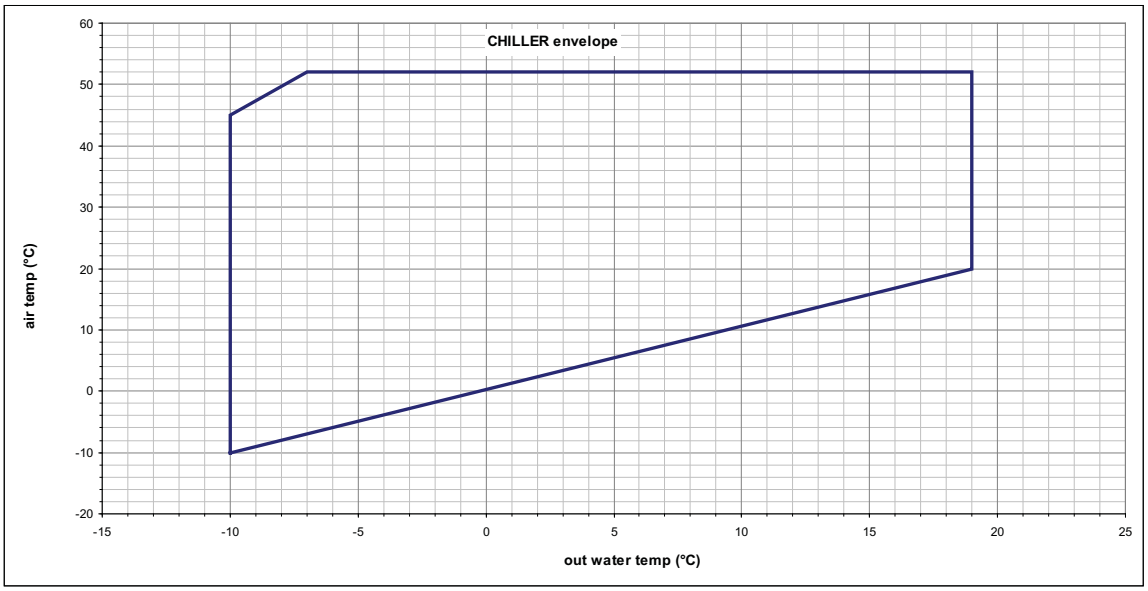
1 For transitory periods (e.g. equipment start up) values up to 25 °C are allowed

2 Value that may be reached only for outdoor air temperatures exceeding 0°C.

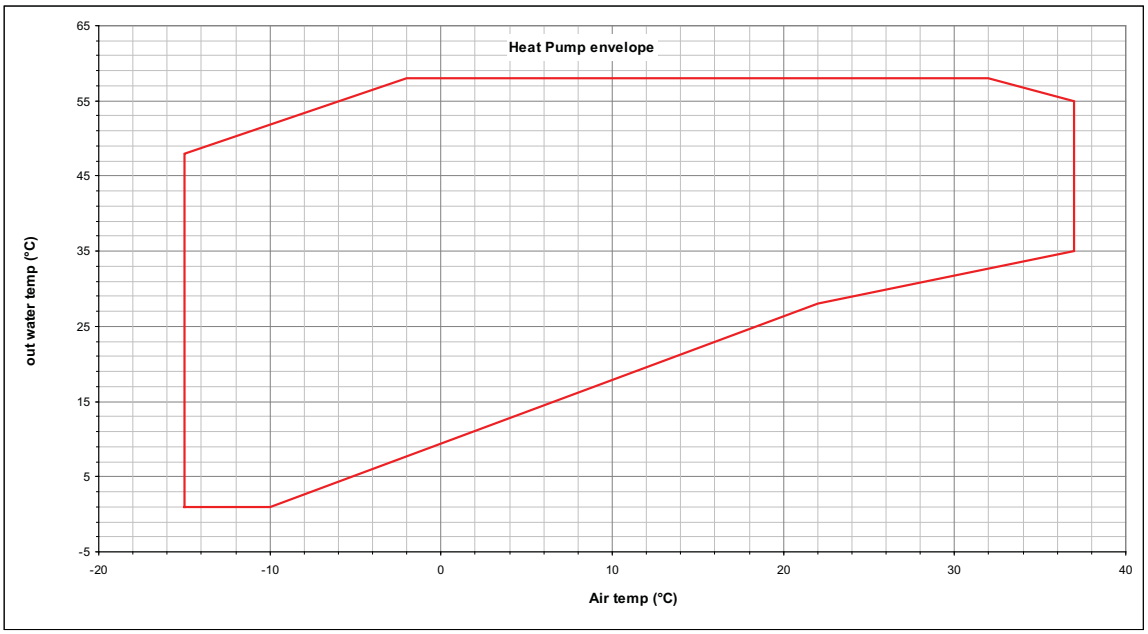
3 With condensation control: Outdoor air T min -15 °C

Warning The units are designed to work with water and air temperatures falling within the range defined by the operating limits. Attempting to operate the units beyond these limits could cause irreparable damage to the units themselves.

5.1 OPERATING LIMITS IN CHILLER MODE



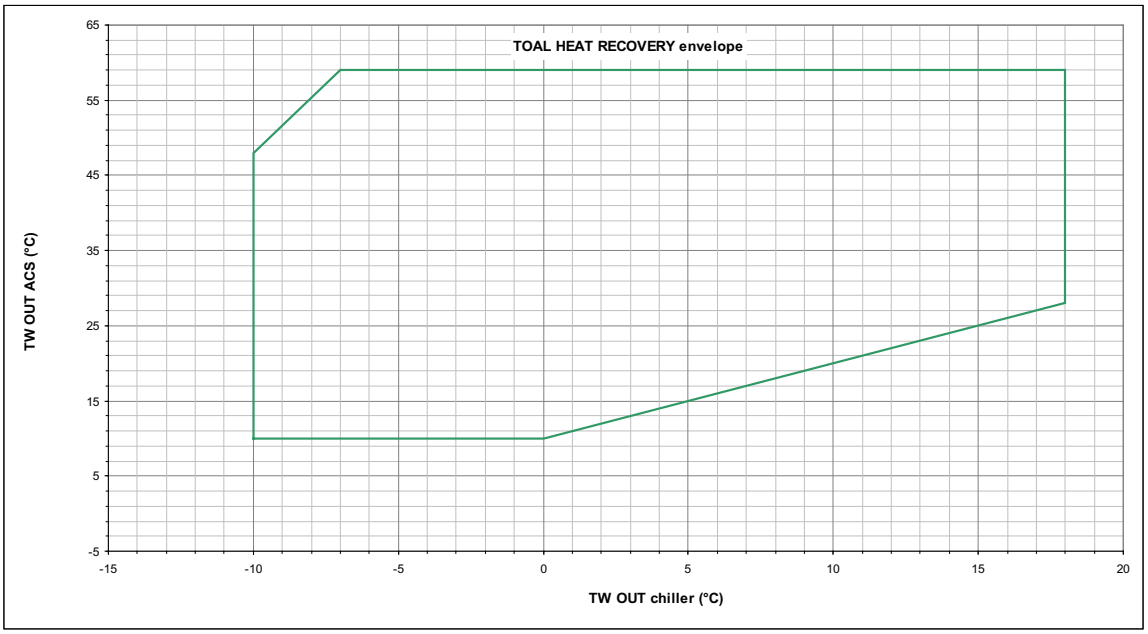
5.2 OPERATING LIMITS IN HEAT PUMP MODE



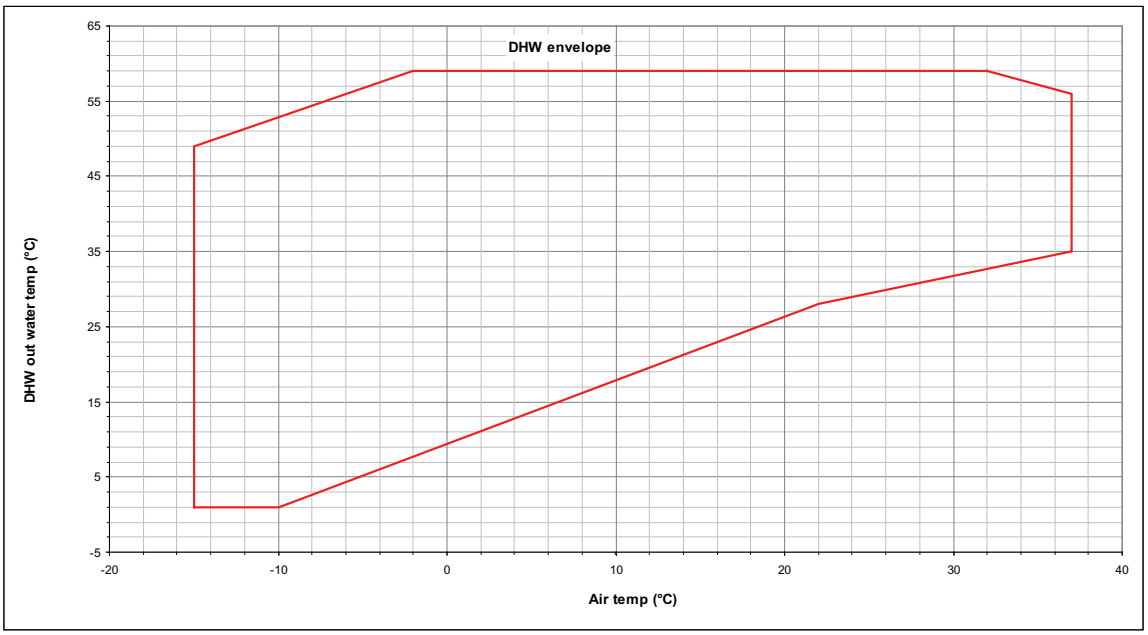
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5 OPERATING LIMITS

5.3 OPERATING LIMITS IN DHW TOTAL HEAT RECOVERY



5.4 OPERATING LIMITS ONLY IN DHW PRODUCTION



5.5 THERMAL CARRIER FLUID

The units belonging to the **HWMC** series can work with mixtures of water and up to 30% ethylene glycol.

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6 CONTROL AND SAFETY DEVICES

All the control and safety devices are set and tested in the factory before the unit is dispatched.

6.1 CONTROL DEVICES

6.1.1 Service thermostat

The service thermostat activates and deactivates the compressor according to the demand for chilled water (cooling mode) or heated water (heat pump mode), as determined by a sensor installed on the water exchanger outlet. This device is governed by the microprocessor control (see also the manual regarding the microprocessor).

6.1.2 CONTROL DEVICE SETTINGS

Control devices		Set point	min	max	differential
Service thermostat (outlet water temp. cooling mode)	°C	7	5	15	2
Service thermostat (outlet water temp. heat pump mode)	°C	45	25	53	2

6.2 SAFETY DEVICES

6.2.1 HIGH PRESSURE SWITCH

The high pressure switch stops the compressor when the outlet pressure exceeds the set value.

6.2.2 LOW PRESSURE SWITCH

The low pressure switch stops the compressor when the intake pressure falls below the set value.

6.2.3 ANTI-RECYCLE TIMER

The function of the timer is to prevent excessively frequent compressor starts and stops. This device is a function included in the microprocessor control; it prevents the compressor from starting up again after a stop until a set period of time has elapsed (approximately 5 minutes).

6.2.4 ANTIFREEZE THERMOSTAT

The antifreeze thermostat situated at the evaporator outlet performs a dual function: it prevents ice from forming in the evaporator in the event of an excessive decrease in the water flow; it stops the unit in the event of a failure of the service thermostat.
This device is governed by the microprocessor control (see also the chapter regarding the microprocessor).

6.2.5 WATER DIFFERENTIAL PRESSURE SWITCH

The water differential pressure switch stops the unit in the event of an excessive reduction in the water flow, thus protecting it from the formation of ice (chiller operation) and excessively high condensation temperatures (heat pump operation).

6.2.6 WATER SAFETY VALVE

The water safety valve opens when the pressure within the water circuit reaches a level that may cause damage to the unit.

6.2.7 SAFETY DEVICE SETTINGS

Safety device	Activation	Differential	Resetting
Maximum pressure switch (bars)	42		Manual
Minimum pressure switch (bars)	2		Automatic
Antifreeze thermostat (°C)	4	3	Manual
Water differential pressure switch (bars)	0,050	0	Automatic
Water safety valve (bars)	4		

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7 ROUTINE MAINTENANCE AND CHECKS

It is necessary to periodically check the correct functioning of safety devices (pressure switches and safety valves) and that there are no leaks of refrigerant. After the initial start-up, periodic checks must be conducted at the intervals and in the manner prescribed by current national laws and regulations.
To keep the unit in good working order and guarantee the expected levels of performance and safety, it is necessary to carry out some periodic routine checks: some may be performed directly by the user while others must be carried out solely by specialised personnel.

7.1 CHECKS TO BE PERFORMED BY THE USER

The checks and operations described in this section may be easily performed by the user, provided that the latter shows a minimum of attention.

- Remove any dirt that has built up around the coil or objects trapped in the mesh protecting the coil itself (leaves, paper etc., to be carried out monthly).

Warning ⚠ Be especially careful when working in proximity to finned coils since the aluminium fins are extremely sharp and can cause cuts.

- Check the level of water in the circuit using the water pressure gauge, which should indicate a pressure of about 1.5 bars (monthly).
- Check that the escape pipe of the water safety valve is tightly secured.
- Check the water circuit for leaks (monthly).
- If the unit is to remain out of service for a long time, drain the water (or other fluid present in the circuit) from the pipes and the unit itself.
  This is indispensable if during the period of quiescence the ambient temperature is expected to fall below the freezing point of the fluid used (seasonal operation).
  Drain the unit and parts of the circuit subject to the risk of freezing by opening the RS emptying tap (optional).
  Before placing the unit back in service at the start of the season, refill the water circuit as directed in section 1.4.
- Check that the noise emissions of the unit are regular (monthly).
- If necessary, release the pump rotor P and S models)

7.2 CHECKS AND MAINTENANCE TO BE PERFORMED BY SPECIALISED PERSONNEL

WARNINGS

Important! All the operations described in this section MUST ALWAYS BE PERFORMED BY QUALIFIED PERSONNEL.

Warning ⚠ Before carrying out any work on the unit or accessing internal parts, make sure you have disconnected it from the mains electricity supply.

Warning ⚠ The upper part of the compressor casing and the outlet pipe reach high temperatures. Be especially careful when working in their vicinity.

Warning ⚠ Be especially careful when working in proximity to finned coils since the aluminium fins are extremely sharp and can cause cuts.

Warning ⚠ **Never attempt to access internal parts of the unit without having first disconnected it from the power supply. Wait another 5 minutes before accessing the internal parts of the unit**

Warning ⚠ The electrical components of the inverter power unit are live when it is connected to the mains voltage.
Coming into contact with this voltage is extremely dangerous and can cause death or serious harm.

Warning ⚠ The inverter unit has capacitive leakage current . Set a dedicated power line, with calibratable differential switch, separate from the other power lines of home appliances.

Warning ⚠ The dissipator may be hot when the inverter is running.
Come into contact with the dissipator can cause burns.

Warning ⚠ Do not perform any voltage insulation test on any component.

Important! After completing maintenance jobs, always replace the panels enclosing the unit and secure them with the fastening screws provided.

The checks and operations described in this section must be carried out on a yearly basis by specialised personnel.

- Check the electric control board terminals to ensure that they are securely tightened: the movable and fixed contacts of the circuit breakers must be periodically cleaned and replaced whenever they show signs of deterioration.
- Check the compressor and pipes for oil leaks.
- Check the efficiency of the water differential pressure switch.
- Clean the metal filters mounted in the water pipes.
- Clean the finned coil by aiming a jet of compressed air in a direction opposite to the outflow of air, taking care not to bend the fins.

8 RETIRING THE UNIT

When the unit has reached the end of its working life and needs to be removed and replaced, a series of operations should be carried out:

- the refrigerant gas it contains should be recovered by specialised personnel and sent to a waste collection facility;
- the lubricating oil in the compressor should also be recovered by specialised personnel and sent to a waste collection facility;
- if they cannot be reused, the framework and components should be scrapped and separated according to the type of material: this applies especially for the considerable quantities of copper, aluminium and steel present in the unit.

This will make the job of waste collection, disposal and recycling facilities easier and minimise the environmental impact of the dismantling.

Installation and maintenance may be carried out solely by qualified technicians specifically trained for this type of equipment, in conformity with current regulations.
On receiving the equipment, check that it has not undergone any damage during transport.
For installation and use of accessories, please refer to the relative technical sheets.

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9 TECHNICAL FEATURES

9.1 RATED TECHNICAL DATA OF HEAT PUMPS

HWMC		010M	013	018	023	029
Power supply	V-ph-Hz	230-1-50	400-3-50	400-3-50	400-3-50	400-3-50
Cooling mode						
Cooling capacity [1]	kW	10,60	13,80	18,50	23,40	29,60
Power input 1	kW	3,34	4,37	7,52	7,40	11,50
EER		3,18	3,14	2,46	2,93	2,45
Cooling mode +ACS						
Cooling capacity [1]	kW	10,10	13,50	18,90	23,10	30,40
Power input [1]	kW	3,31	4,21	6,98	7,53	11,00
Heating capacity DHW	kW	13,00	17,20	25,00	29,70	40,00
Total COP		6,99	7,29	6,29	7,02	6,43
Heating mode (system / DHW)						
Heating capacity [2]	kW	11,40	14,90	21,50	25,60	33,70
Power input [2]	kW	3,44	4,34	7,51	8,05	12,00
COP		3,30	3,21	2,86	3,18	2,82
Water flow - chiller mode	l/h	1.820	2.362	3.174	4.013	5.080
Water flow - pdc mode	l/h	1.973	2.582	3.734	4.447	5.856
DHW water flow (total recovery)	l/h	2.263	2.984	4.351	5.170	6.952
Pump head, system side (chiller)	kPa	127	157	116	146	120
Expansion tank	dm^3	5	5	5	5	5
Pump head, DHW side	kPa	97	128	45	107	57
Expansion tank DHW side	dm^3	1	1	1	1	1
No. of scroll compressors / circuits		1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Diameter of water connections	inches	1”1/4	1”1/4	1”1/4	1”1/4	1”1/4
Buffer tank	dm^3	30	30	30	50	50
Height	mm	1250	1250	1250	1300	1300
Length	mm	1530	1530	1530	1845	1845
Depth	mm	560	560	560	600	600
Sound power level	dB(A)	70	71	71	74	74
R410A refrigeration charge	(kg)	6,4	8,3	8,3	11,5	11,5
Transport weight*	(kg)	220	220	220	300	300
Operating weight*	(kg)	240	240	240	347	347

1 Water temperature 12°C - 7°C; outdoor air temperature 35°C
2 Water temperature 40°C - 45°C, outdoor air temperature 7°C dry bulb, outdoor air temperature 6°C wet bulb
Performances reported in accordance with standard UNI EN 14511
* Weights refer to model with pump and tank

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10 COOLING CIRCUIT DIAGRAMS

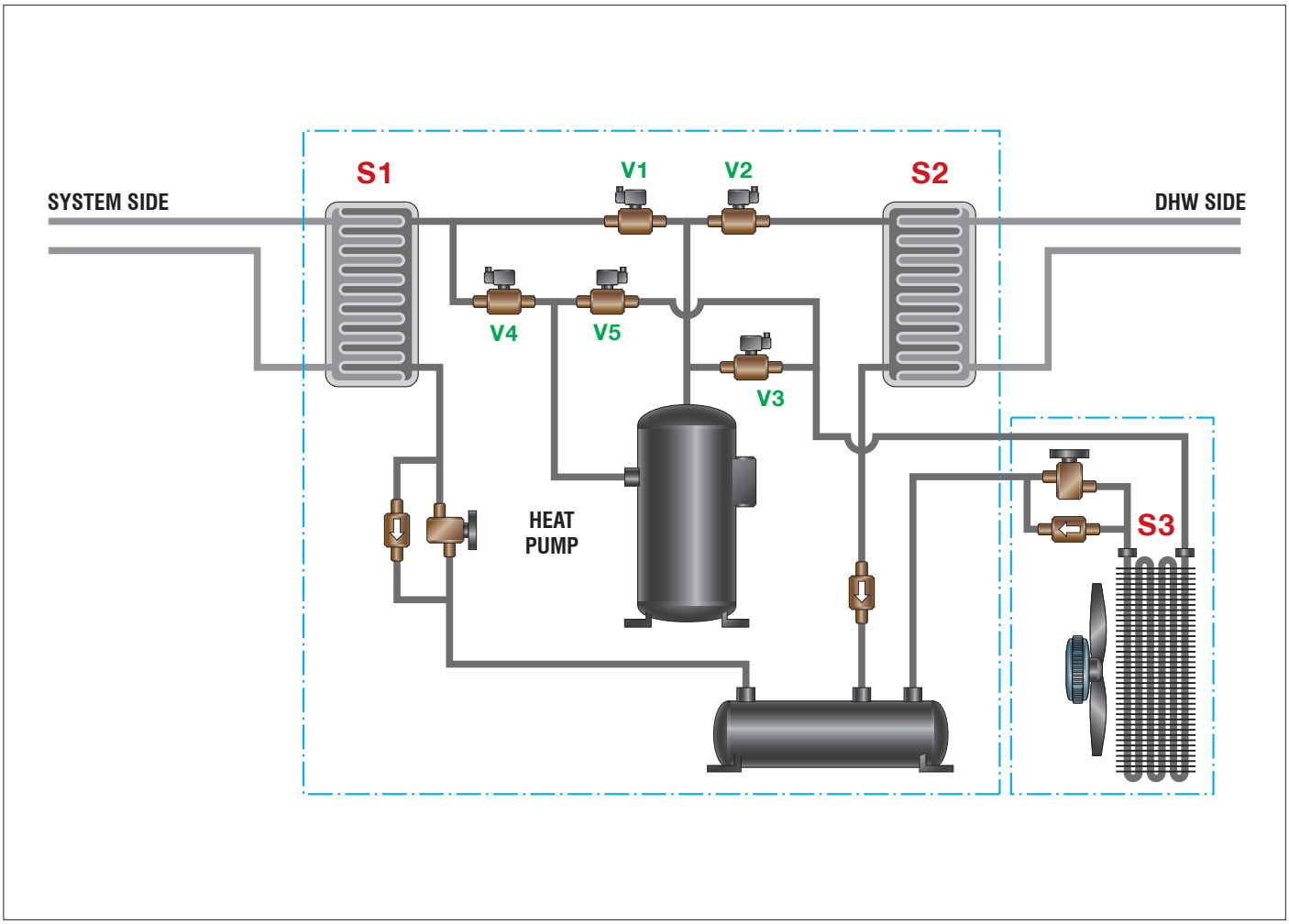
Legend

NO.	COMPONENT	SYMBOL
1	Compressor	
2	Evaporator	
3	Condenser	
4	Thermostatic valve	
5	Electric fan	
6	Filter	
7	Sight glass	
8	Solenoid valve	
9	High pressure switch	
10	Low pressure switch	
11	High pressure gauge	
12	Low pressure gauge	
13	Service connection	
14	Differential pressure switch	
15	Check valve	
16	4-way valve	
17	Liquid separator	
18	Liquid receiver	
19	Pressure transducer	
20	Liquid distributor	
21	Oil pressure gauge	
22	Desuperheater	
23	Tap	
24	Trap	
25	Safety valve	
26	Fuse cap	
27	Flow switch	
28	Throttle valve	
29	Electronic expansion valve	

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10 COOLING CIRCUIT DIAGRAMS

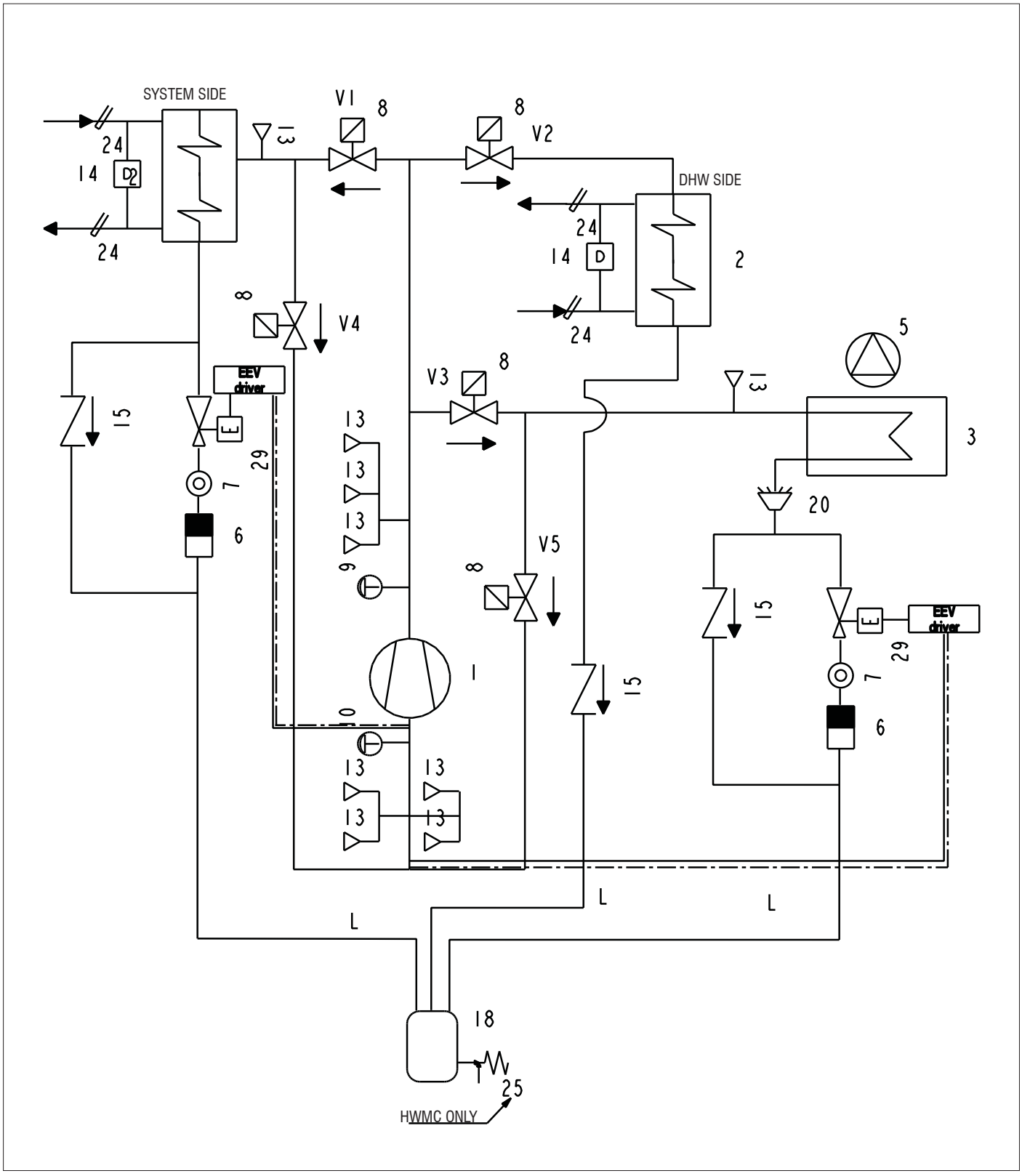
10.1 BASIC COOLING CIRCUIT LAYOUT OF HWMC CHILLING UNITS WITH ELECTRONIC VALVE



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10 COOLING CIRCUIT DIAGRAMS

10.2 COOLING CIRCUIT LAYOUT OF HWMC 10 - 29 CHILLING UNITS WITH ELECTRONIC VALVE



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11 TROUBLESHOOTING

In this section you will find a list of the most common problems that may cause the chiller unit to stop or malfunction. Possible remedies are shown alongside a description of easily identifiable remedies.

Warning ⚠ Extreme care should be taken when performing work or repairs on the unit: overconfidence can result in injuries, even serious ones, to inexpert individuals. Operations marked with the letter "U" can be performed directly by the user, who must carefully follow the instructions provided in this manual.
Operations marked with the letter "S" may be performed exclusively by specialised personnel.
Once the cause has been identified, you are advised to contact a Galletti service centre or a qualified technician for help.

SYMPTOM	Cooling	Heating	Who can take corrective action U = User S = specialised personnel	Possible control panel indication	Probable cause	Possible remedy
A The unit does not start	X	X	S	**Alarm from Digital Input**	Faulty connection or contacts open Wrong voltage	Check the voltage and close the contacts
	X	X	S		Not enabled by remote controls	Check the efficiency of the water circulation pump, pressure switch, bleed air from the circuit; check whether contacts 16 and 30 on the terminal board are closed
	X X	X X	S U	**Evaporator Inlet Temp. Sensor Alarm**	Service thermostat sensor defective Not enabled by service thermostat	Check and replace if necessary System at the set temperature, no demand; check the setting
	X	X	U	**Antifreeze Alarm - circuit 1**	Not enabled by antifreeze thermostat	Check the water temperature Checking the antifreeze setting
	X	X	S	**Evaporator Inlet Temp. Sensor Alarm**	Antifreeze sensor defective	Check whether it is functioning properly
	X	X	S		Tripping of main circuit breaker	Check for the presence of short circuits in the wiring or windings of the pump, fan and compressor motors or in the transformer.
	X X	X X	S S	**LOW pressure alarm circuit 1** **HIGH Pressure Alarm circuit 1**	Not enabled by high or low pressure switch Compressor defective	See items D-E See item B
B The compressor does not start	X	X	S		Compressor burnout or seizure	Replace the compressor
	X	X	S		Compressor contactor deenergized	Check the voltage at either end of the compressor contactor coil and verify the continuity of the coil itself
	X	X	S		Power circuit open	Locate the cause that tripped the protection; check for the presence of short circuits in the wiring or windings of the pump, fan and compressor motors or in the transformer
	X	X	S	**Inverter Alarm**	Motor thermal protection open	The compressor has operated in critical conditions or there is insufficient refrigerant within the circuit: check the working conditions and make sure they fall within the operating limits. Refrigerant leak: refer to item G
	X X	U S		**User flow alarm** **DHW flow alarm**	Water circulation pump blocked Defective water circulation pump Lack of water flow	Release the pump Check the pump and replace it if necessary Let water flow
C The compressor starts up and stops repeatedly	X	X	S	**LOW Pressure Alarm triggered by sensor -circuit 1**	Minimum pressure switch has tripped	See item E
	X	X	S		Compressor contactor defective	Check and replace if necessary
	X	X	S		Lack of refrigerant	See item G

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11 TROUBLESHOOTING

SYMPTOM	Cooling	Heating	Who can take corrective action U = User S = specialised personnel	Possible control panel indication	Probable cause	Possible remedy
D The compressor does not start because the maximum pressure switch has tripped	X	X	S	**HIGH Pressure Alarm triggered by sensor - circuit 1**	Pressure switch failure	Check and replace
	X	X	S	**HIGH Pressure Alarm triggered by sensor - circuit 1**	Excessive refrigerant charge	Discharge the excess gas
	X		U	**HIGH Pressure Alarm triggered by sensor - circuit 1**	Finned coil obstructed, insufficient air flow	Remove dirt from the coil and any obstacles to air flow.
	X		S	**HIGH Pressure Alarm triggered by sensor - circuit 1**	Fan not working	See item F
	X	X	S	**HIGH Pressure Alarm triggered by sensor - circuit 1**	Presence of incondensable gas in the cooling circuit	Recharge the circuit after having drained and evacuated it
	X	X	S	**HIGH Pressure Alarm triggered by sensor - circuit 1**	Refrigerant filter clogged	Check and replace
E The compressor does not start because the minimum pressure switch has tripped	X	X	S	**LOW Pressure Alarm triggered by sensor - circuit 1**	Pressure switch failure	Check and replace
	X	X	S	**LOW Pressure Alarm triggered by sensor - circuit 1**	Unit completely empty	See item G
		X	S	**LOW Pressure Alarm triggered by sensor - circuit 1**	Finned coil obstructed, insufficient air flow	Remove dirt from the coil
		X	S	**LOW Pressure Alarm triggered by sensor - circuit 1**	Presence of frost on the evaporating coil	See item O
		X	U	**LOW Pressure Alarm triggered by sensor - circuit 1**	Evaporator fan not working	See item F
	X	X	S	**LOW Pressure Alarm triggered by sensor - circuit 1**	Refrigerant filter clogged	Check and replace
	X	X	S	**LOW Pressure Alarm triggered by sensor - circuit 1**	Expansion valve is not working properly	Check and replace if necessary
	X	X	S	**LOW Pressure Alarm triggered by sensor - circuit 1**	Presence of humidity in the cooling circuit	Replace the filter and, if necessary, dry out the circuit and recharge
F The fans do not start	X	X	S	**HIGH Pressure Alarm triggered by sensor - circuit 1 LOW Pressure Alarm triggered by sensor - circuit 1**	Fan contactor deenergized	Check the voltage at either end of the contactor coil and verify the continuity of the coil itself
	X	X	S	**HIGH Pressure Alarm triggered by sensor - circuit 1 LOW Pressure Alarm triggered by sensor - circuit 1**	No power output by the fan speed control card	Check the contacts and replace if necessary
	X X	X X	S S	**HIGH Pressure Alarm triggered by sensor - circuit 1 LOW Pressure Alarm triggered by sensor - circuit 1**	The fan's internal thermal protection has tripped	Check the fan conditions and the air temperature while the unit is running.
	X	X	S	**HIGH Pressure Alarm triggered by sensor - circuit 1 LOW Pressure Alarm triggered by sensor - circuit 1**	Fan motor defective	Check and replace if necessary
	X	X	S	**HIGH Pressure Alarm triggered by sensor - circuit 1 LOW Pressure Alarm triggered by sensor - circuit 1**	Loose electrical connections	Check and fasten securely

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11 TROUBLESHOOTING

SYMPTOM	Cooling	Heating	Who can take corrective action U = User S = specialised personnel	Possible control panel indication	Probable cause	Possible remedy
G Lack of gas	X	X	S	LOW Pressure Alarm triggered by sensor - circuit 1	Cooling circuit leak	Check the cooling circuit using a leak detector after pressurising the circuit to approximately 4 bars. Repair, evacuate and refill.
I Frost in liquid pipe downstream from a filter	X	X	S	HIGH Pressure Alarm triggered by sensor - circuit 1 LOW Pressure Alarm triggered by sensor - circuit 1	Liquid filter clogged	Replace the filter
L The unit works continuously without ever stopping	X	X	S		Lack of refrigerant gas	See item G
	X	X	U		Wrong setting of operating thermostat	Check the setting
	X	X	S		Thermal overload	Reduce the thermal load
	X	X	S		Compressor does not provide the rated heating capacity	Check and replace or overhaul
	X	X			Liquid filter clogged	Replace
M The unit works regularly but with an insufficient capacity	X	X	S		Low level of refrigerant	See item G
	X	X	S		4-way cycle reversing valve defective	Check the valve power supply and coils and replace the valve if necessary
N Frost in the compressor intake pipe	X	X	S		Expansion valve is not working properly	Check replace
	X		S		Water circulation pump blocked	Release the pump
	X	X	S		Water circulation pump defective	Check the pump and replace it if necessary
	X	X	S		Low level of refrigerant	See item G
	X	X	S		Liquid filter clogged	Replace
O The defrosting cycle is never activated		X	S		4-way cycle reversing valve defective	Check the valve power supply and coils and replace the valve if necessary
		X	S		The defrost thermostat has broken down or has been set incorrectly	Check and replace if defective or change the setting
P Abnormal noises detected in the system	X	X	S		The compressor is noisy	Check and replace if necessary
	X	X	S		The panels vibrate	Fasten properly

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ISTRUZIONI PER AVVIAMENTO

1 VS. INSTALLAZIONE



Nel manuale d'installazione troverete tutti i suggerimenti per una perfetta posa delle apparecchiature. Ricordate d'installare il filtro a "**Y**" a protezione della scambiatore (***obbligatorio***).

2 VS. COLLEGAMENTO



Effettuate correttamente tutti gli allacciamnti. Nel Modulo Richiesta Primo Avviamento troverete una lista di tutte le verifiche prima di richiederci lo start-up della macchina.

3 VS. RICHIESTA



Con almeno una settimana di anticipo inviate via fax il modulo di richiesta persente nei documenti della macchina in mancanza di tale documento fare richiesta alla sede Galletti:

Tel. 051 8908111 - **Fax.** 051 8908122
e-mail: assistenza@galletti.it

4 NS. APPUNTAMENTO



L'assistenza Galletti organizzerà l'intervento facendovi contattare dal Centro Assistenza Tecnica Autorizzato di zona.

5 NS. COLLAUDO



Assieme a Vs. personale verranno effettuati tutti i controlli preliminari ed il collaudo della macchina.
Al Vs. personale verranno date istruzioni per la corretta gestione della macchina.

6 NS. GARANZIA



A collaudo effettuato il Centro Assistenza Tecnica Autorizzato rilascerà il certificato di collaudo valido per la garanzia della macchina.

Galletti S.p.A. mette a Vs. disposizione un programma di manutenzione personalizzato.

Galletti
AIR CONDITIONING

www.galletti.it

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Company UNI EN ISO 9001 and OHSAS 18001 certified