Galletti
AIR CONDITIONING

GB

INSTALLATION, USE AND MAINTENANCE MANUAL



MCP

7 kW - 41 kW

Total heat recovery reversible heat pumps - multifunction units

CE
1115

R407C

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TRANSLATION OF ORIGINAL INSTRUCTIONS

WATER CHILLERS AND HEAT PUMPS ARE IN ACORDARCE WITH THE LAW 97/23/CE (PED) FILLING IN D1 FORM, APPROVED BY THE THIRD NOTIFIED BODY ICIM N°0425.

The technical and dimensional data reported in this manual may be modified in view of any product improvement.

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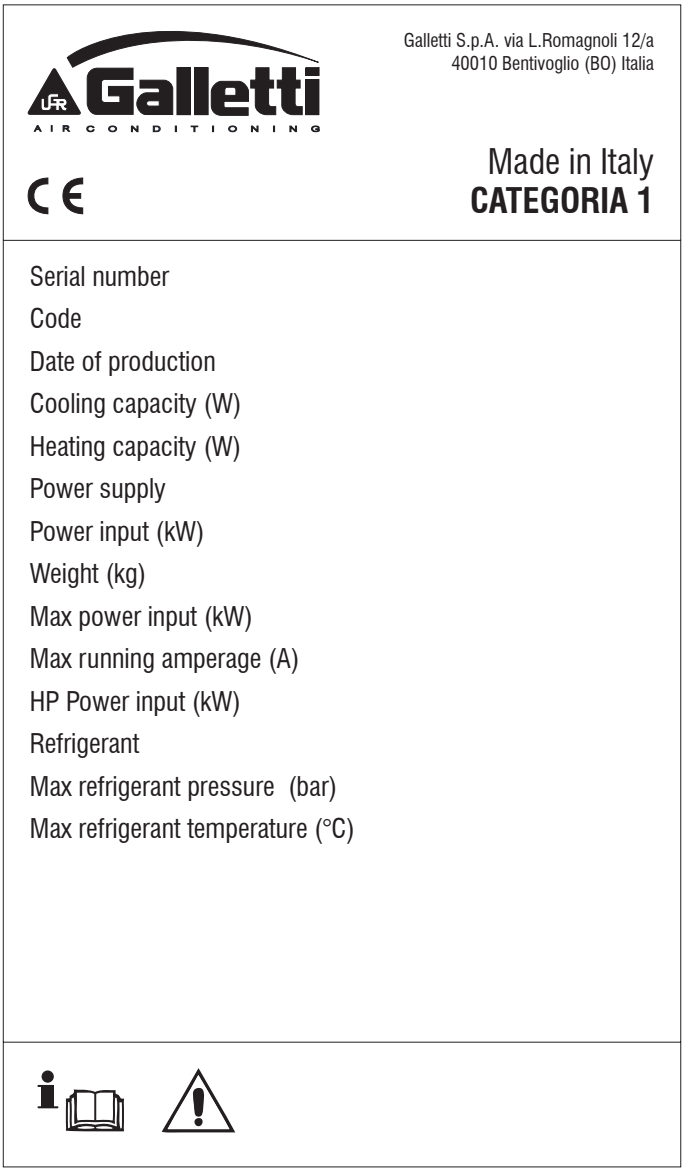
The unit data are reported on the rating label in this page.

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

- Keep this manual intact in a safe place for the all life of the unit.
- 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.
- **THE FIRST START UP MUST BE CARRIED OUT EXCLUSIVELY BY QUALIFIED PERSONNEL AND AUTHORIZED BY GALLETTI SPA (SEE WARRANTY SHEET ATTACHED).**
- 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.

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

1 THE MCP SERIES

1.1 FIELD OF APPLICATION

The multi-purpose **MCP** 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 ⚠ MCP units are NOT suitable for use as "rapid" heaters.

1.2 MODELS AND VERSIONS

The **MCP** series features 20 models of varying capacity, indicatively from 8 to 40 kW in cooling versions (9-47 kW in heating versions) in nominal conditions (ref. EN14511).
All models are charged with R407C 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.

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1 LA SERIE MCP

1.2 MODELLI E VERSIONI

Complete unit code	M	C	P	0	0	7	H	0	A	1	0	0	C	E	0	0	0	0	0	0	0

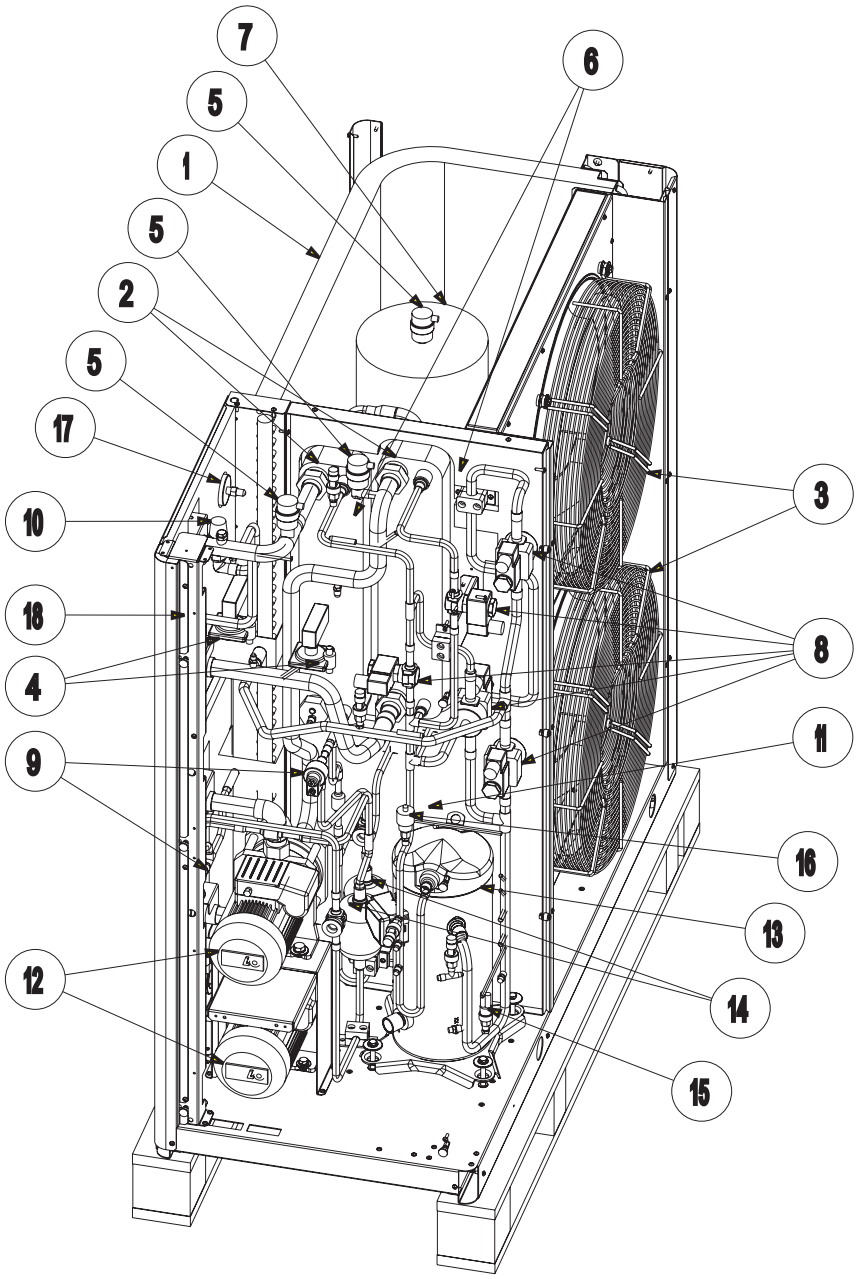
Version 0
Single compressor **0**
Tandem **T**
Model (size) 0 7
Operation H
Multifunction with ON/OFF compressor **H**
Power supply 0
Standard 400 - 3N - 50 **0**
Special 230 - 3 - 50 **1**
Singlepahse **M**
400 - 3N - 50 + magnetic breakers **2**
230 - 3 - 50 + magnetic breakers **3**
Single phase + magnetic breakers **4**
(Digit 1) Expansion valve A
Electronic expansion valve **A**
(Digit 2) Pump and accessories 1
Not present **0**
1 ON/OFF Pump system side **1**
1 Modulating pump on system side **2**
1 EC pump on user side **3**
2 ON/OFF pumps on (system+DHT) **4**
2 modulating pumps (System+DHT) **5**
2 EC pumps (System+DHT) **6**
(Digit 3) Buffer tank 0
Not present **0**
Present, system side **S**
(Digit 4) Auxiliary contacts 0
Not present **0**
Compressors status **1**
Capacity steps activation **2**
External electric heater management **3**
Opz. 1 + Opz. 2 **4**
(Digit 5) Fans C
Standard fans with condesation control **C**
BLDC with electronic regulation **E**
(Digit 6) antifreeze kit E
Base (on plates heat exchangers) **E**
1 pump antifreeze kit **1**
1 pump and tank antifreeze kit **2**
2 pumps antifreeze kit **3**
2 pumps + tank antifreeze kit **4**
(Digit 7) Acoustic insulation 0
Not present **0**
Sound proofing insulation for refrigerant circuit **1**
Compressor acoustic insulation **2**
Opz. 1 + Opz. 2 **3**
(Digit 8) Refrigerant circuit accessories 0
Not present **0**
Refrigerant gauges **M**
(Digit 9) Remote control 0
Not present **0**
MYCHILLER base remote comtrol (opz. 1- 3 digit 13 excluded) **B**
MYCHILLER plus remote control (opz. 1-3 digit 13 excluded) **P**
pGD1 advanced remote control **C**
(Digit 10) Coil with special treatment 0
Standard **0**
Copper - copper **R**
Cataphoresis **C**
Corrosion proof treatment **B**
Hydrophilic **I**
(Digit 11) Protection Grille 0
Not present **0**
Present **G**
(Digit 12) Compressor options 0
Not present **0**
Power factor correction capacitor **1**
Soft starter **2**
Opz. 1 + Opz. 2 **3**
Additional PCB 0
Not present **0**
RS485 (Carel / Modbus) **1**
Clock card **2**
LON **3**

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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 07 ÷ 15



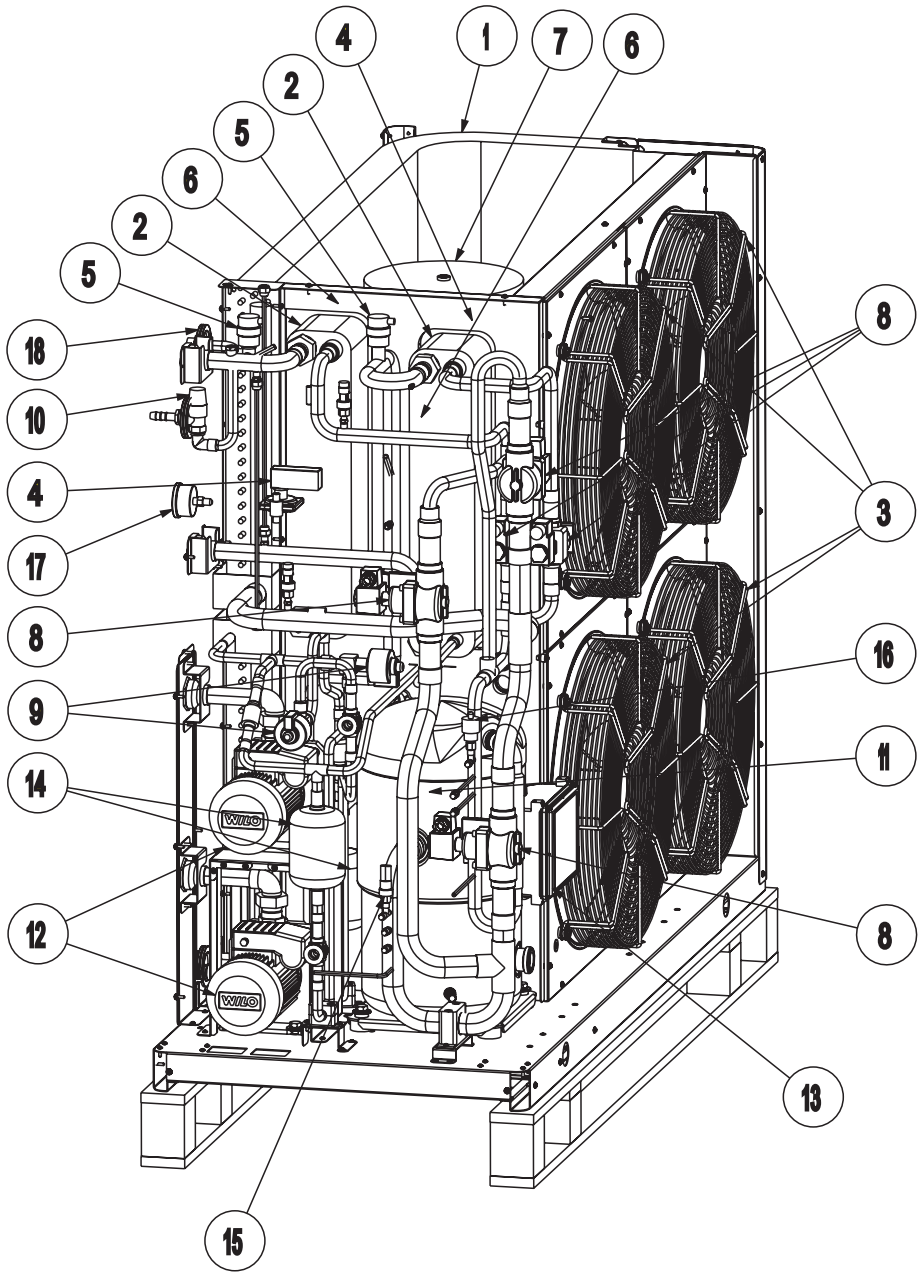
	Description
1	R407C-air heat-exchanger
2	R407C-water heat-exchanger
3	Fan
4	Water differential pressure switch
5	Automatic air purge valve
6	Expansion vessel (fan housing)
7	Water tank
8	Shut-off valve on refrigerant circuit
9	Electronic expansion valve
10	Water safety valve
11	Liquid receiver (fan housing)
12	Pump
13	Compressor
14	Refrigerant filter
15	Low pressure switch
16	High pressure switch
17	Water gauge
18	Water charge

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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 18 ÷ 27



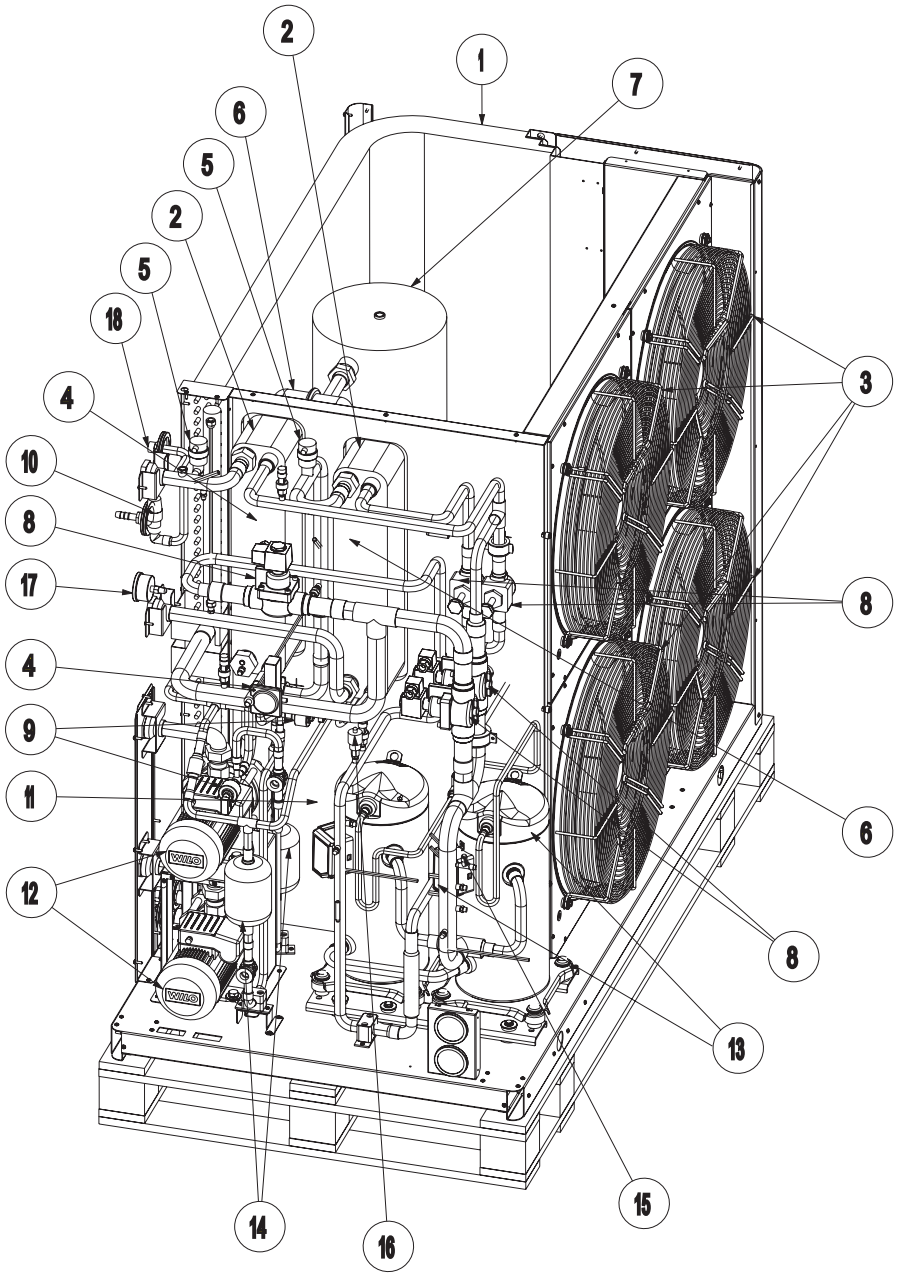
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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 18 ÷ 24T



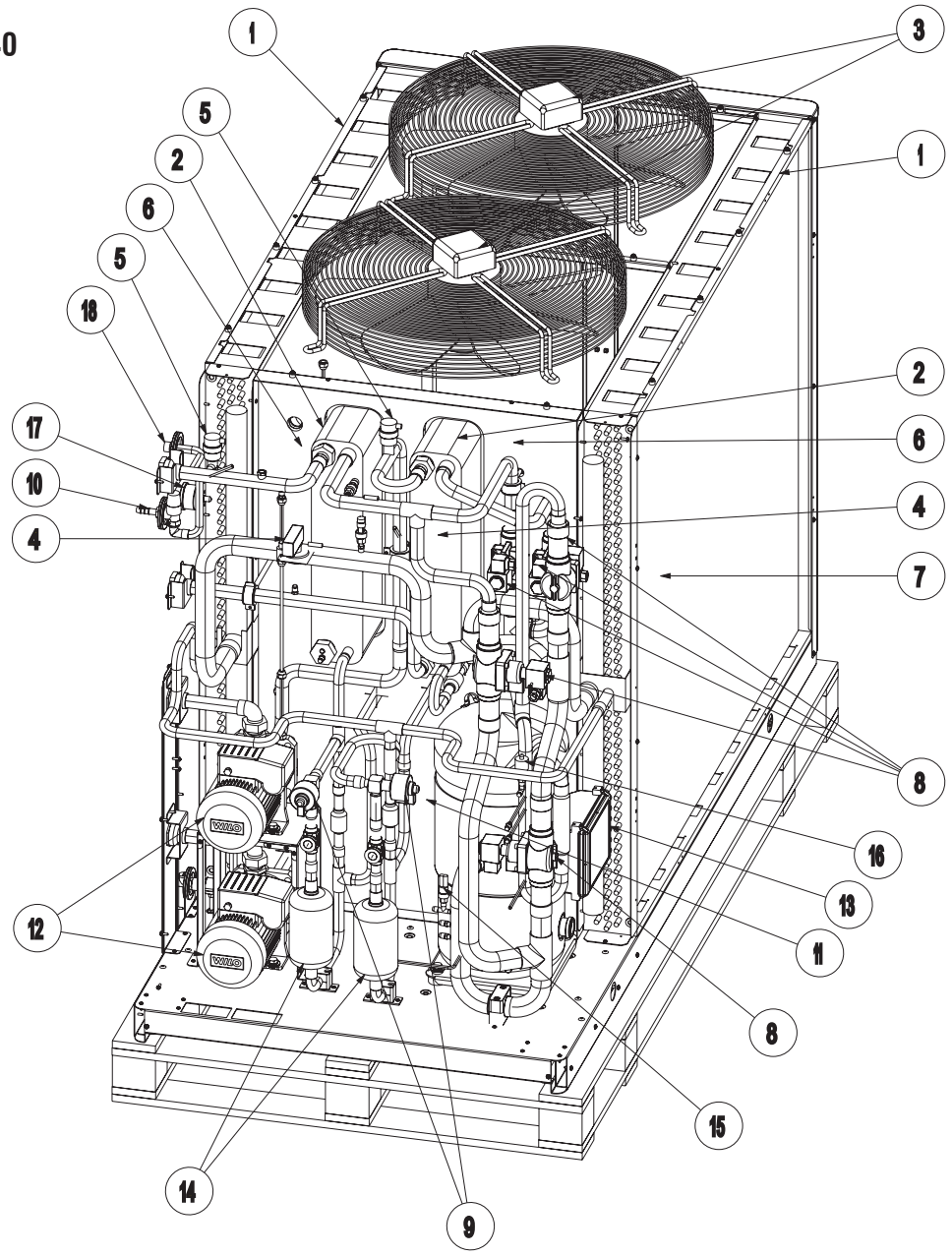
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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 32 ÷ 40



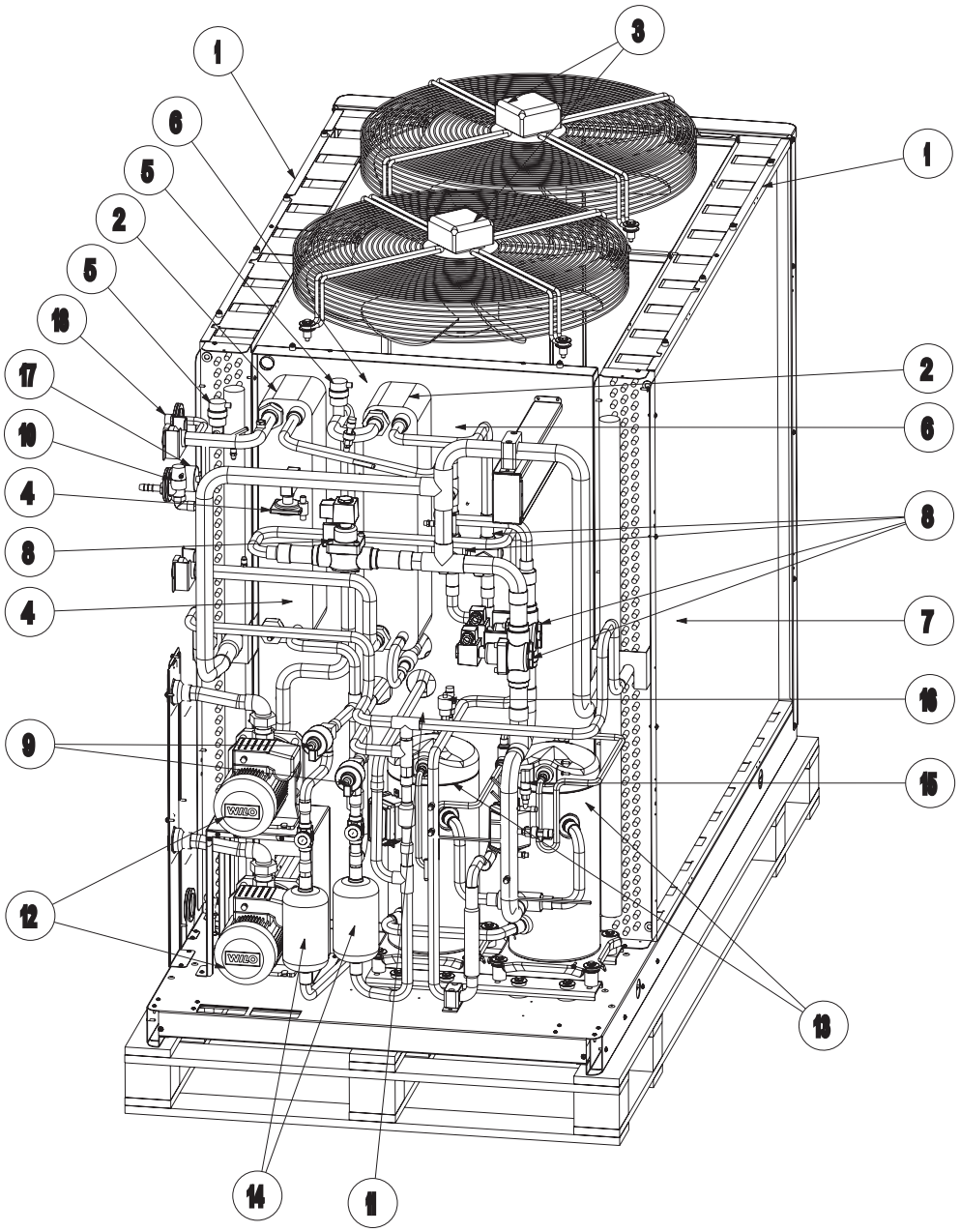
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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 30T



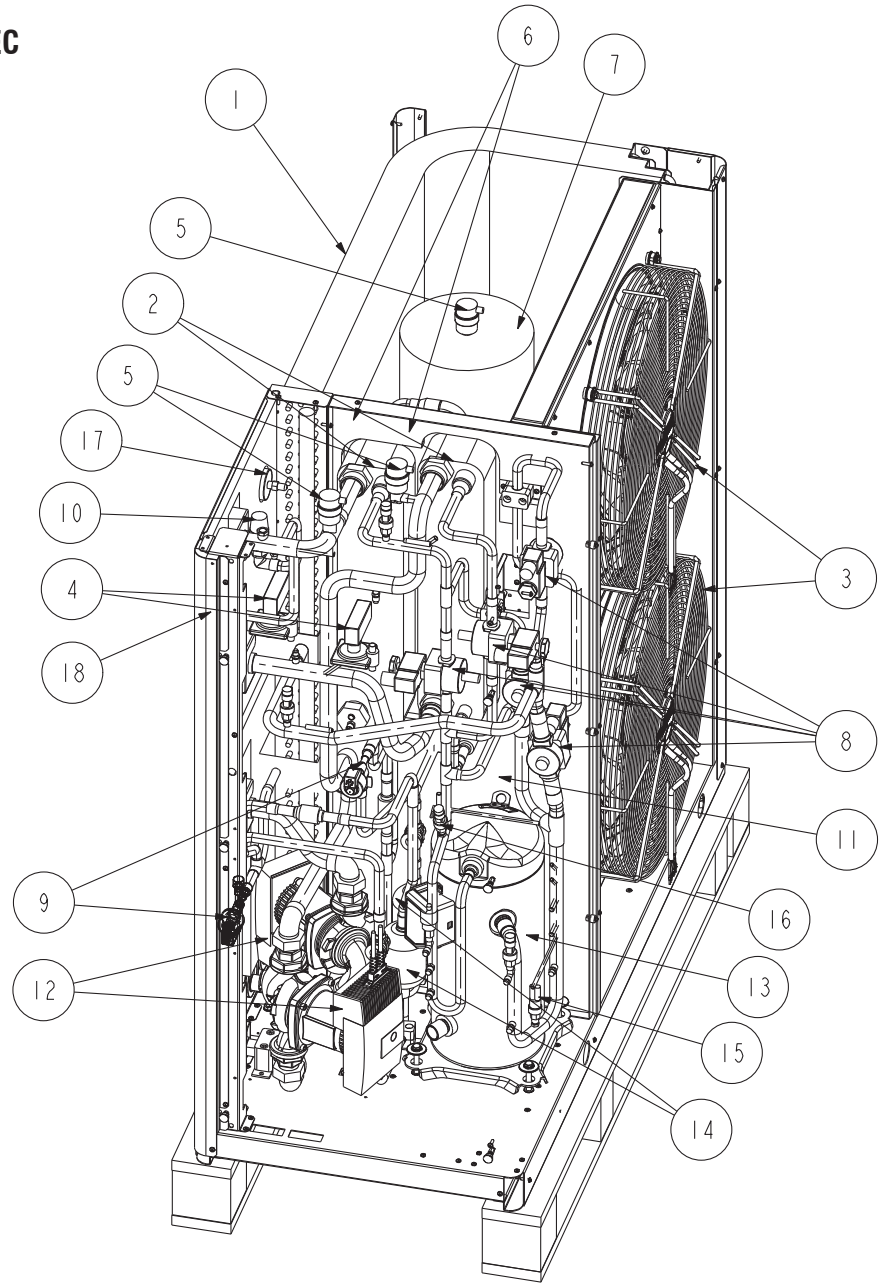
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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 07 ÷ 15/EC



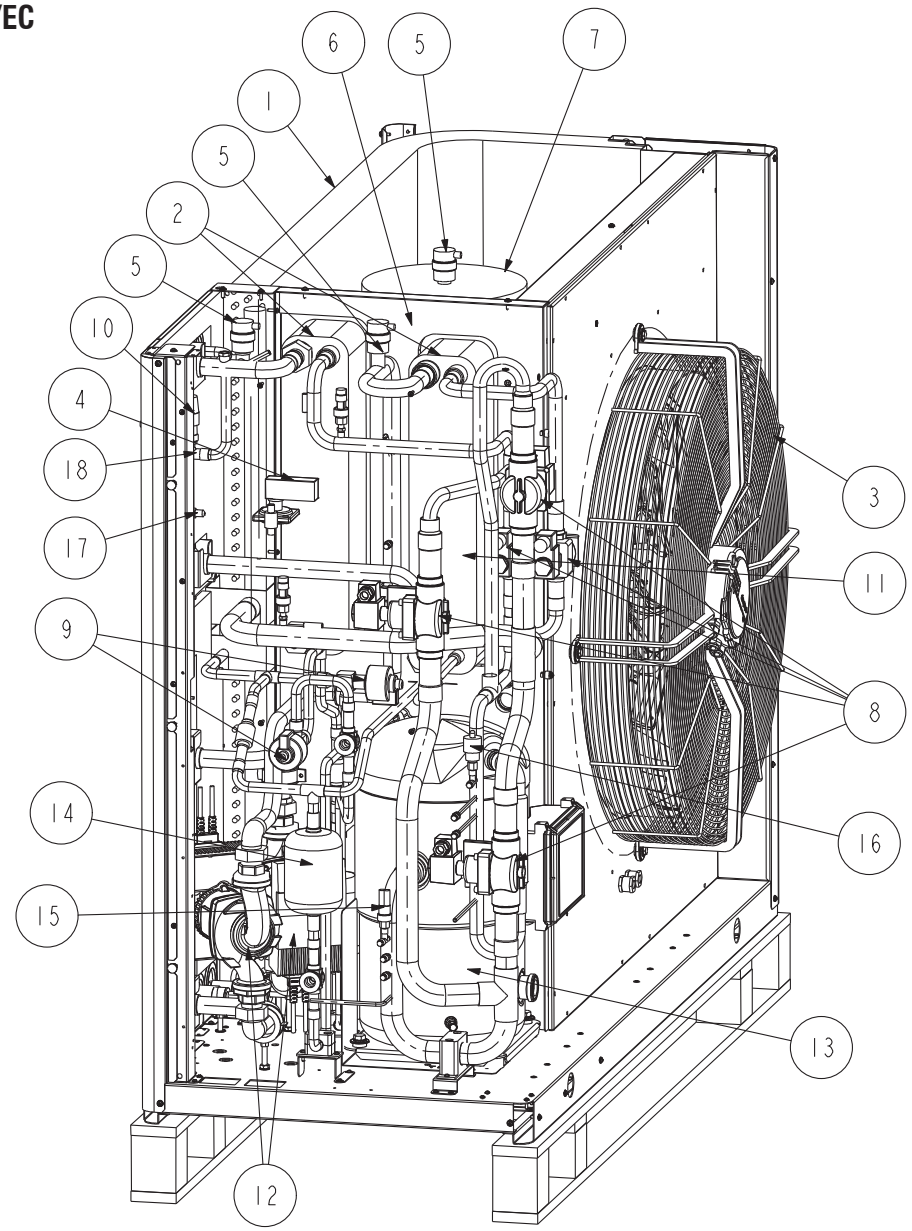
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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 18 ÷ 27/EC



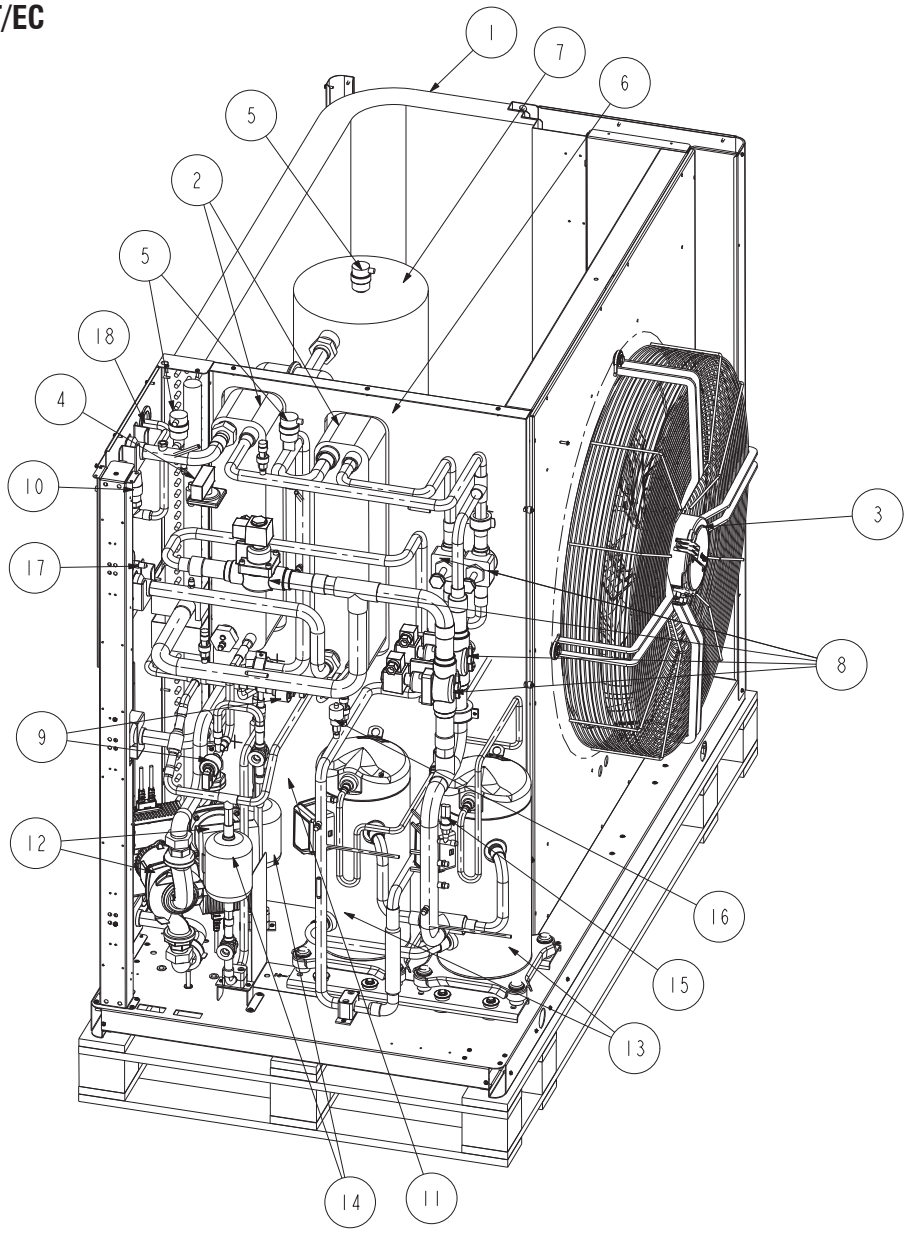
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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 18 ÷ 24T/EC



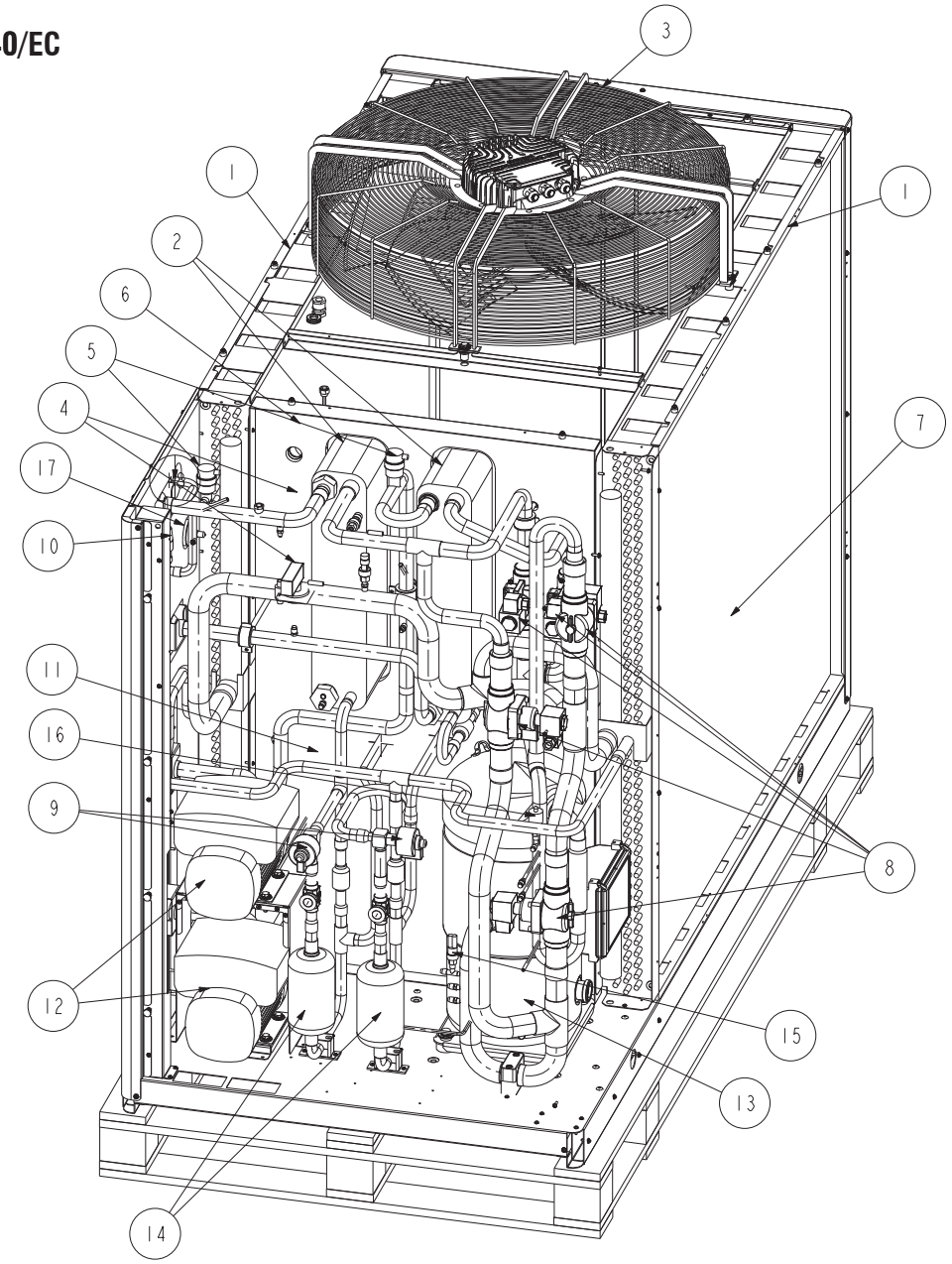
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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 32 ÷ 40/EC



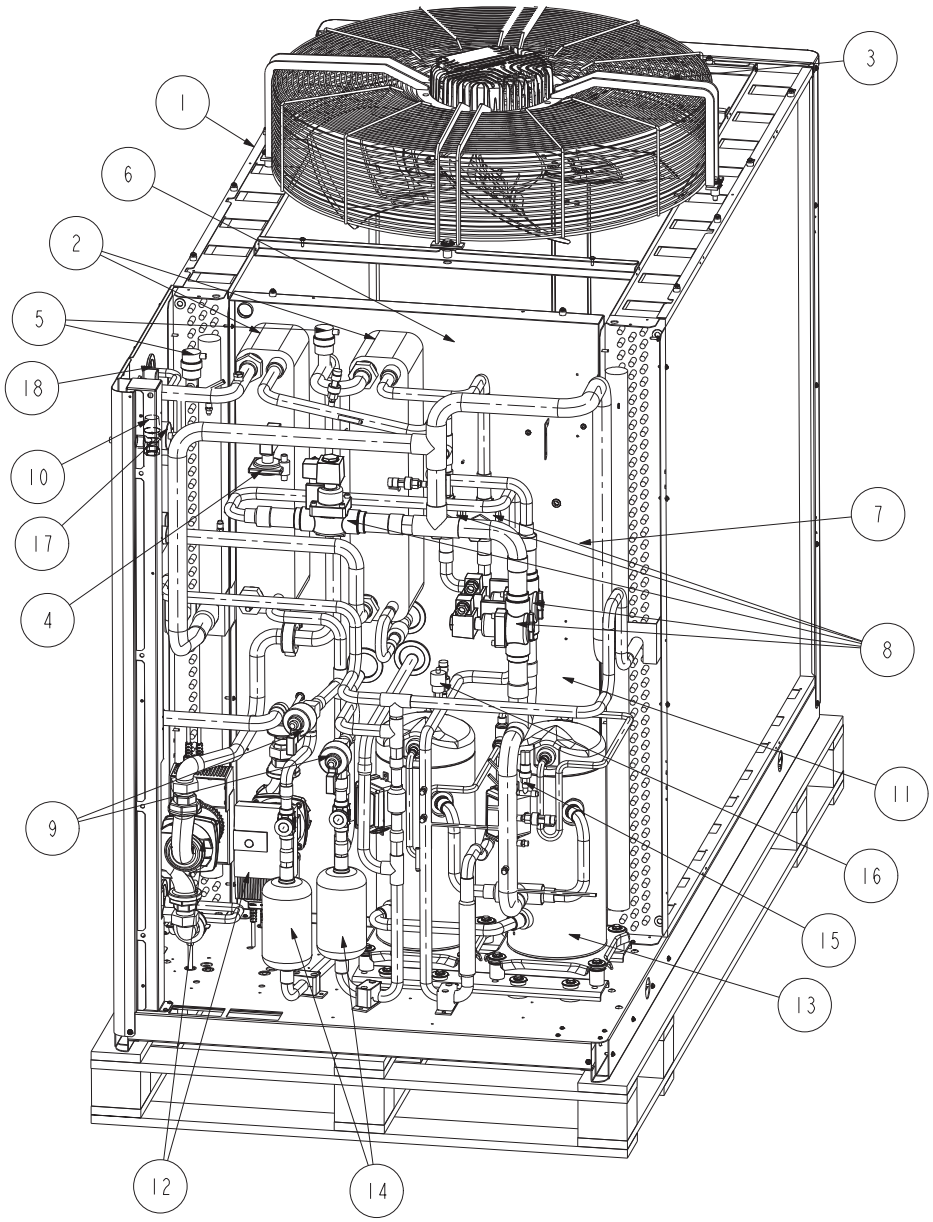
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1 THE MCP SERIES

1.3 COMPONENTS LAY-OUT

MCP 30T/EC



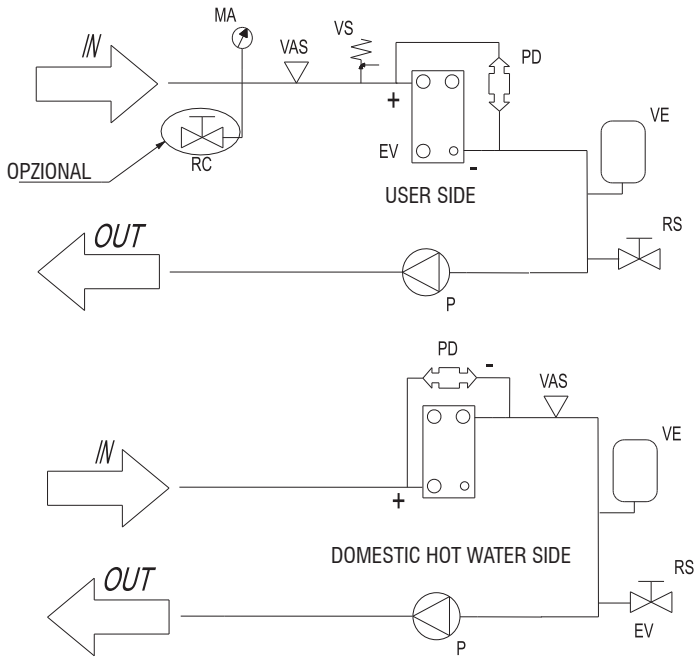
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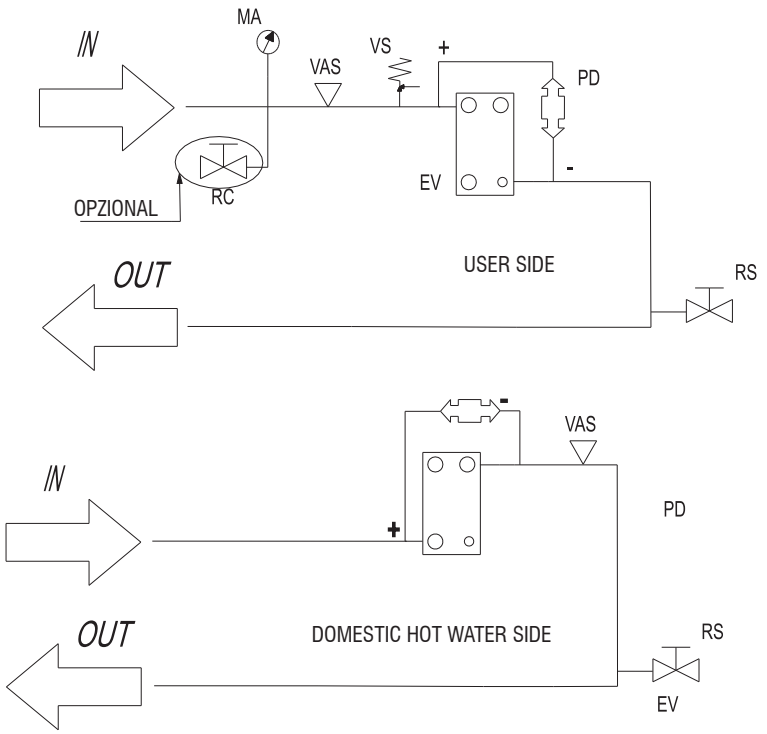
1 THE MCP SERIES

1.4 WATER CIRCUITS

MCP (EVAPORATOR AND PUMP)



MCP (EVAPORATOR)



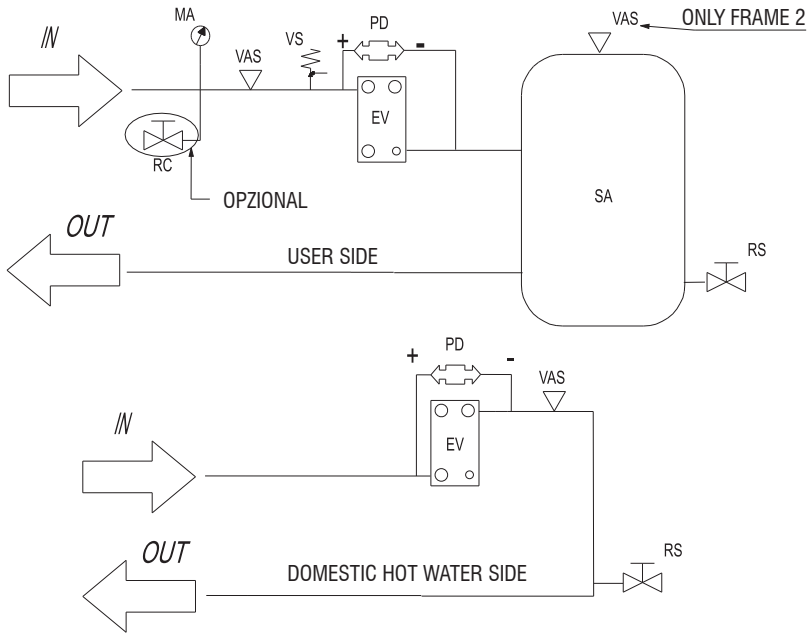
	Legend
VR	Water supply unit
VS	Safety valve
EV	Evaporator
PD	Water differential pressure switch
MA	Water gauge
VAS	Air bleed hole
VE	Expansion vessel
P	Pump
RS	Drain
RC	Water charge
VU	Check valve

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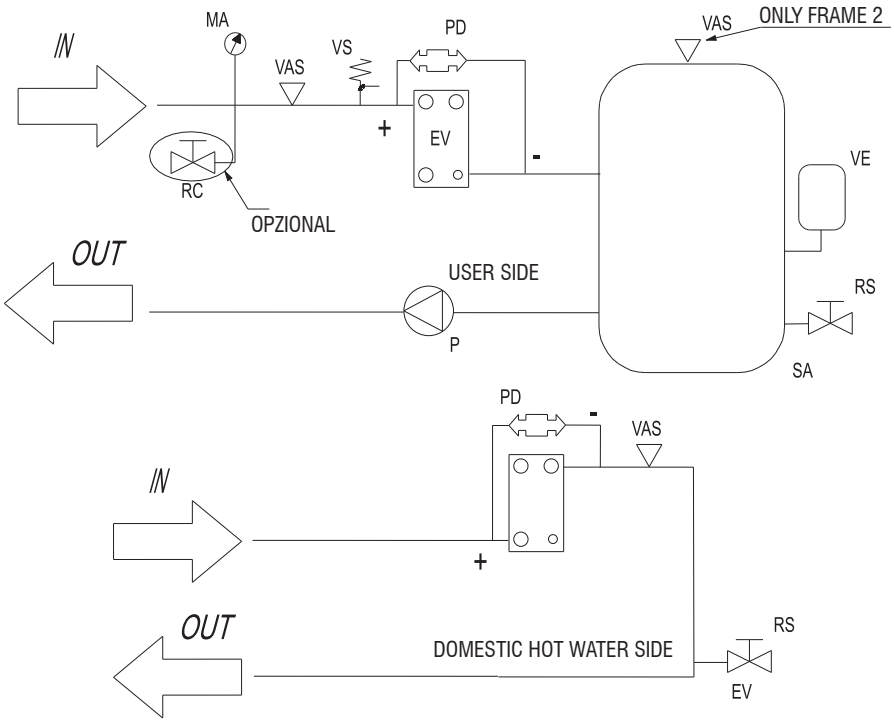
1 THE MCP SERIES

1.4 WATER CIRCUITS

MCP (EVAPORATOR AND BUFFER TANK)



MCP (EVAPORATOR, PUMP AND BUFFER TANK)

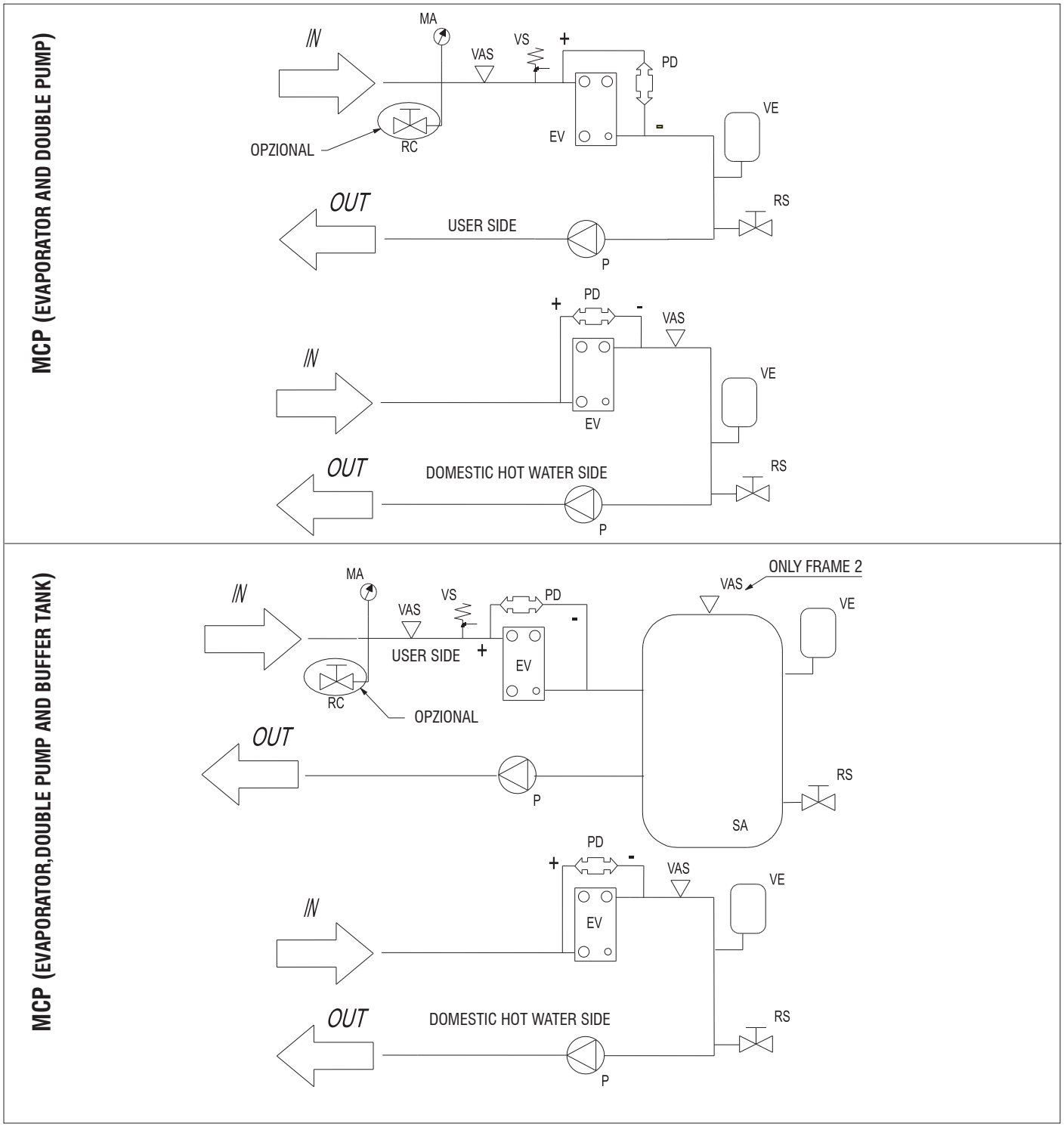


	Legend
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VS	Safety valve
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PD	Water differential pressure switch
MA	Water gauge
VAS	Air bleed hole
VE	Expansion vessel
P	Pump
RS	Drain
RC	Water charge
VU	Check valve
SA	Buffer tank

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1 THE MCP SERIES

1.4 WATER CIRCUITS



	Legend
VR	Water supply unit
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2 INSPECTION, CONVEYANCE DIMENSIONAL AND SITING

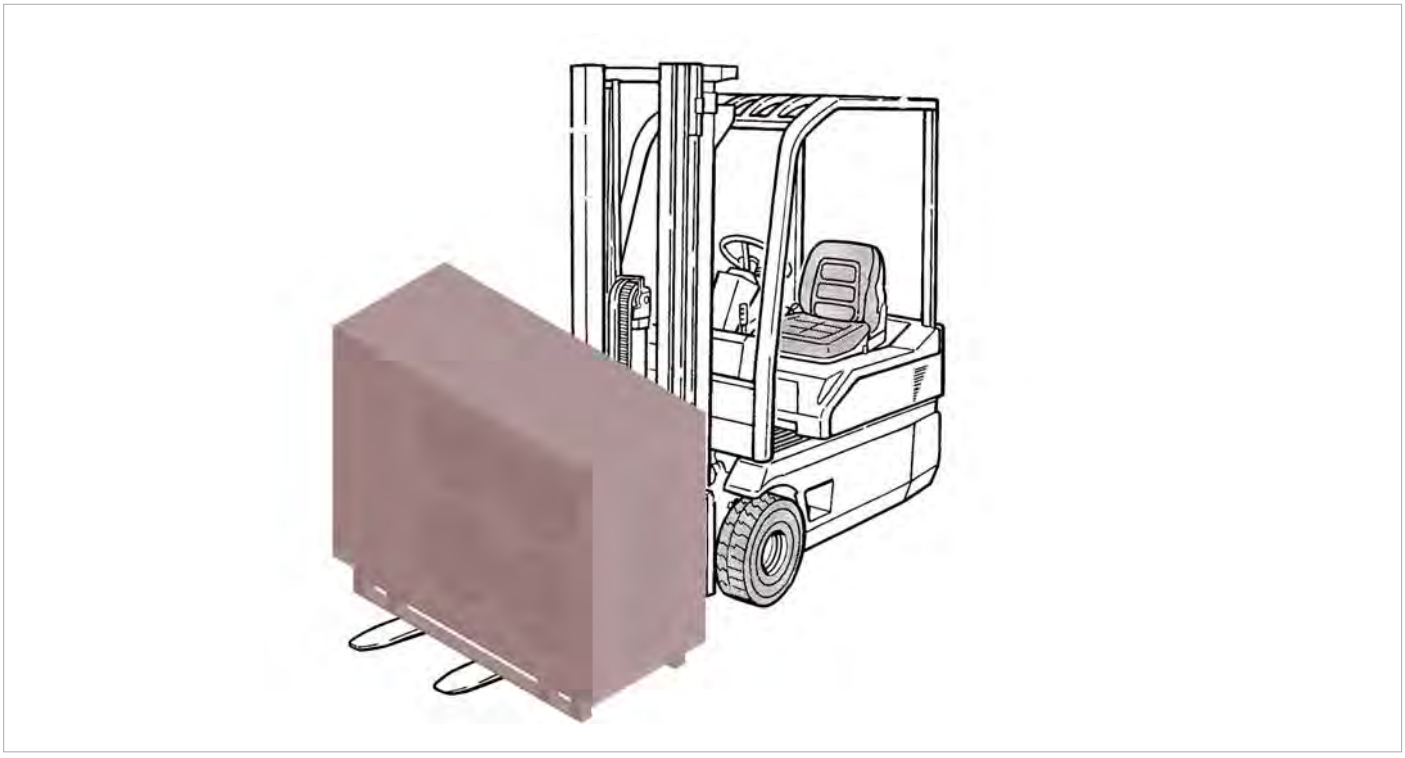
2.1 INSPECTION

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:

- starting up module,
- wiring diagram,
- warranty certificate
- make sure that this manual is intact (43 pages)

2.2 CONVEYANCE

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.

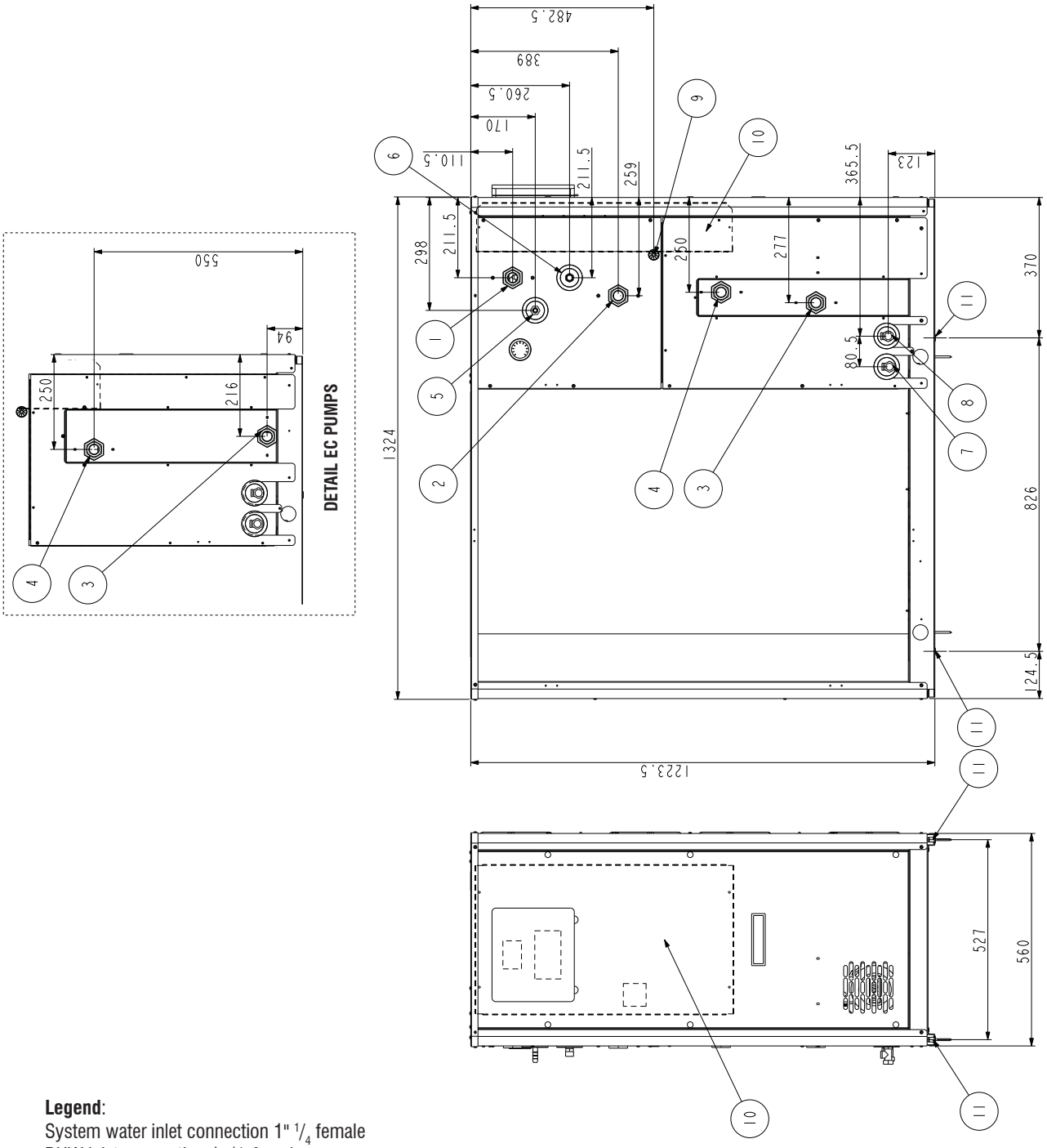


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2 INSPECTION, CONVEYANCE DIMENSIONAL AND SITING

2.3 DIMENSIONAL

MCP 07÷ 15



Legend:

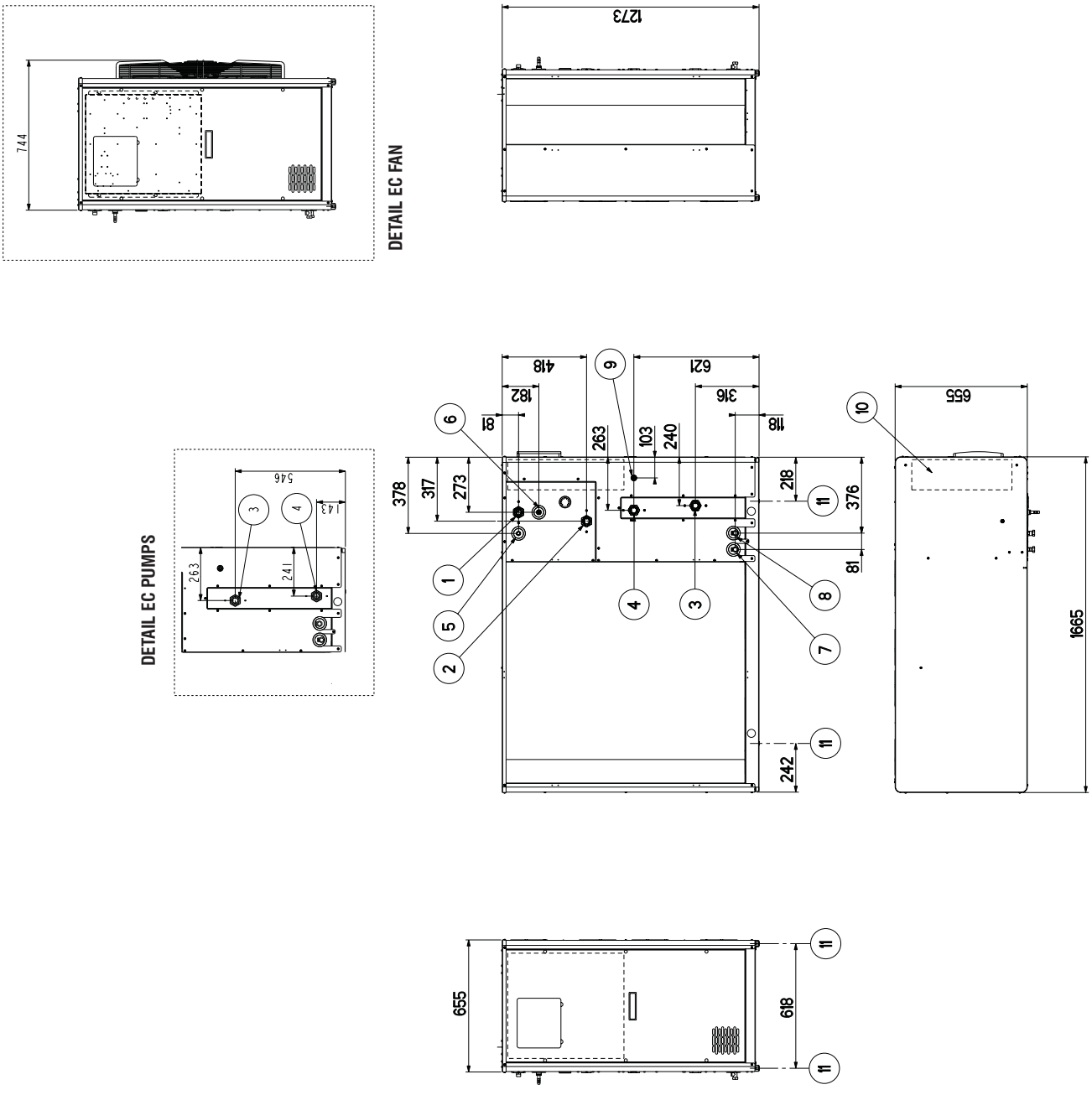
1 System water inlet connection 1" $^1/_4$ female
2 DHW inlet connection 1" $^1/_4$ female
3 System water oulet connection 1" $^1/_4$ female
4 DHW outlet connection 1" $^1/_4$ female
5 Safety valve discharge outlet provided with rubber ring holder
6 Water supply $^1/_2$" male (optional tap)
7 System drain manifold $^1/_2$" female
8 DHT drain manifold $^1/_2$" female
9 Power supply 28 mm diameter
10 Electrical box
11 Dampers fastening points (accessory)

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2 INSPECTION, CONVEYANCE DIMENSIONAL AND SITING

2.3 DIMENSIONAL

MCP 18 ÷ 27



Legend:

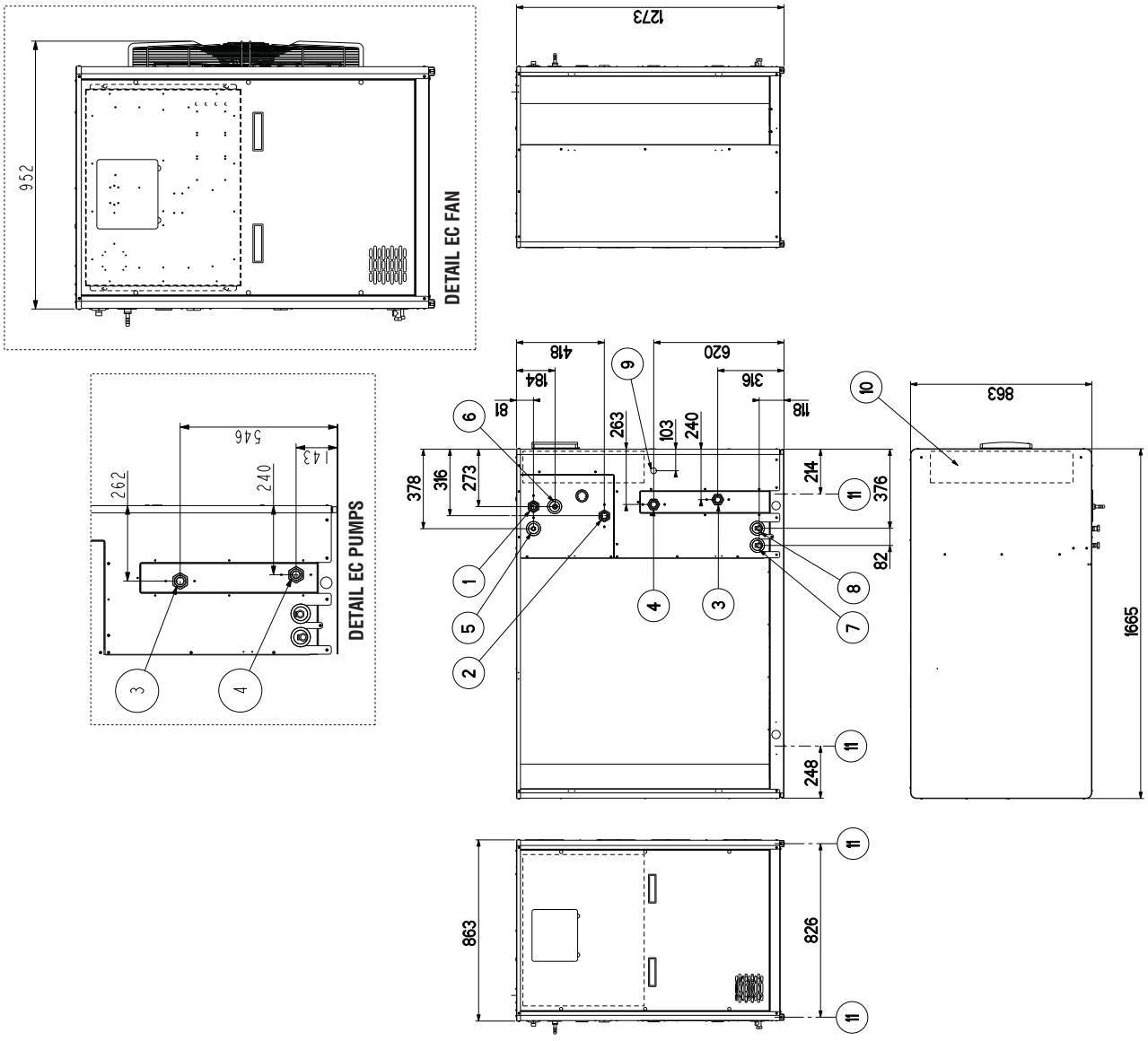
1 System water inlet connection 1" 1/4 female
2 DHW inlet connection 1" 1/4 female
3 System water oulet connection 1" 1/4 female
4 DHW outlet connection 1" 1/4 female
5 Safety valve discharge outlet provided with rubber ring holder
6 Water supply 1/2" male (optional tap)
7 System drain manifold 1/2" female
8 DHT drain manifold 1/2" female
9 Power supply 28 mm diameter
10 Electrical box
11 Dampers fastening points (accessory)

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2 INSPECTION, CONVEYANCE DIMENSIONAL AND SITING

2.3 DIMENSIONAL

MCP 18T ÷ 24T



Legend:

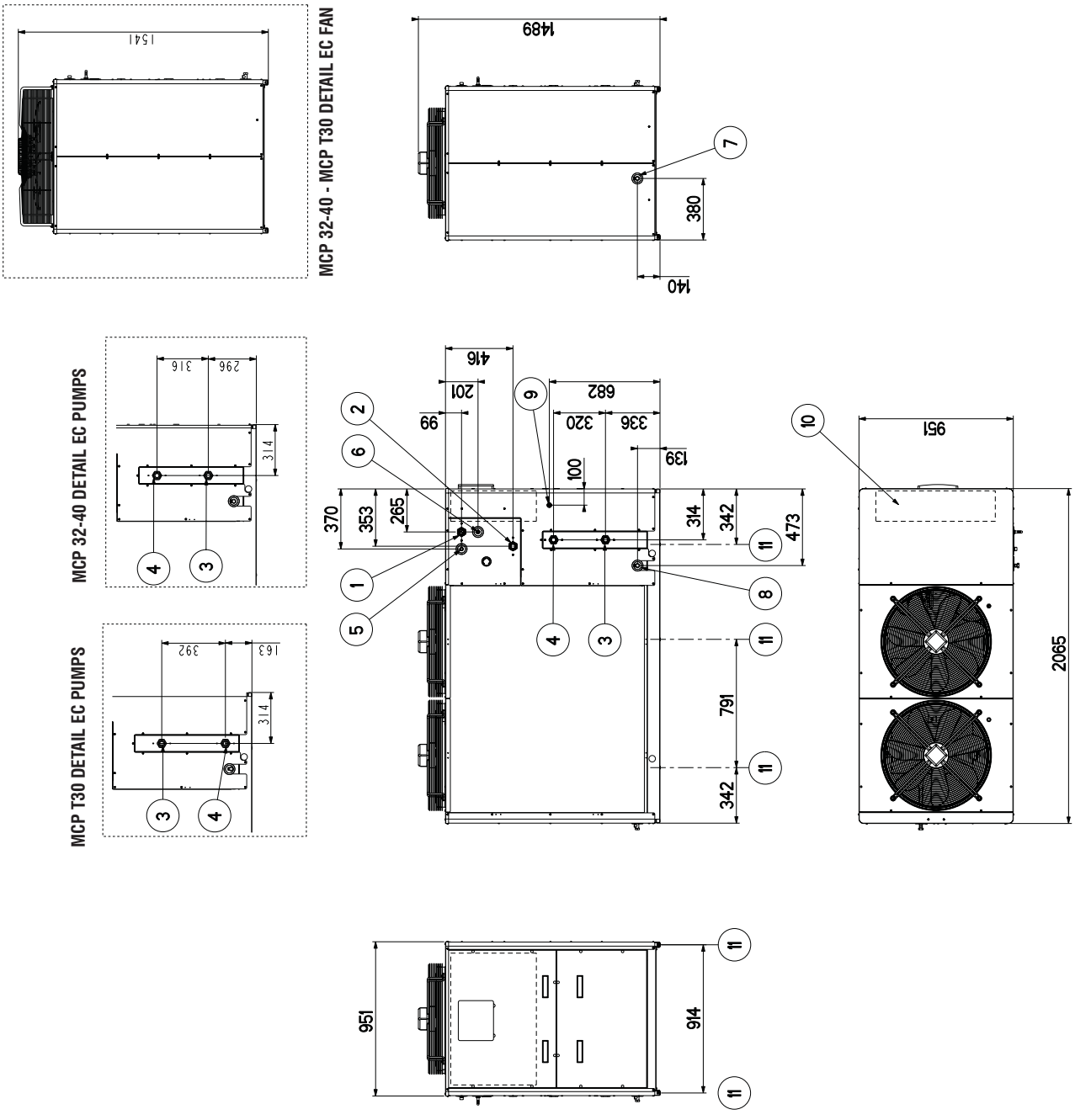
1 System water inlet connection 1" $^1/_4$ female
2 DHW inlet connection 1" $^1/_4$ female
3 System water oulet connection 1" $^1/_4$ female
4 DHW outlet connection 1" $^1/_4$ female
5 Safety valve discharge outlet provided with rubber ring holder
6 Water supply $^1/_2$" male (optional tap)
7 System drain manifold $^1/_2$" female
8 DHT drain manifold $^1/_2$" female
9 Power supply 28 mm diameter
10 Electrical box
11 Dampers fastening points (accessory)

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2 INSPECTION, CONVEYANCE DIMENSIONAL AND SITING

2.3 DIMENSIONAL

MCP 32 ÷ 40 - MCP 30T



Legend:

1 System water inlet connection 1" $^1/_4$ female
2 DHW inlet connection 1" $^1/_4$ female
3 System water oulet connection 1" $^1/_4$ female
4 DHW outlet connection 1" $^1/_4$ female
5 Safety valve discharge outlet provided with rubber ring holder
6 Water supply $^1/_2$" male (optional tap)
7 System drain manifold $^1/_2$" female
8 DHT drain manifold $^1/_2$" female
9 Power supply 28 mm diameter
10 Electrical box
11 Dampers fastening points (accessory)

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2 INSPECTION, CONVEYANCE DIMENSIONAL 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 as to prevent prevalent winds from interfering with the fan air flow)
  Prevalent winds opposing the fan air flow will result in a maximum air temperature below the value indicated in the operating limits;
  Wind flowing in the same direction as the fan flow will result in a minimum air temperature above the value indicated in the operating limits.
  Even when the chiller is running in the heat pump mode, wind may have the effect of reducing the range of operation"
- 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").

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.
Verify that there are no obstacoles in front of the fans air outlet.
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 MCP 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 ⚠ during the production of DHW or heating operation some condensation is produced from the unit.

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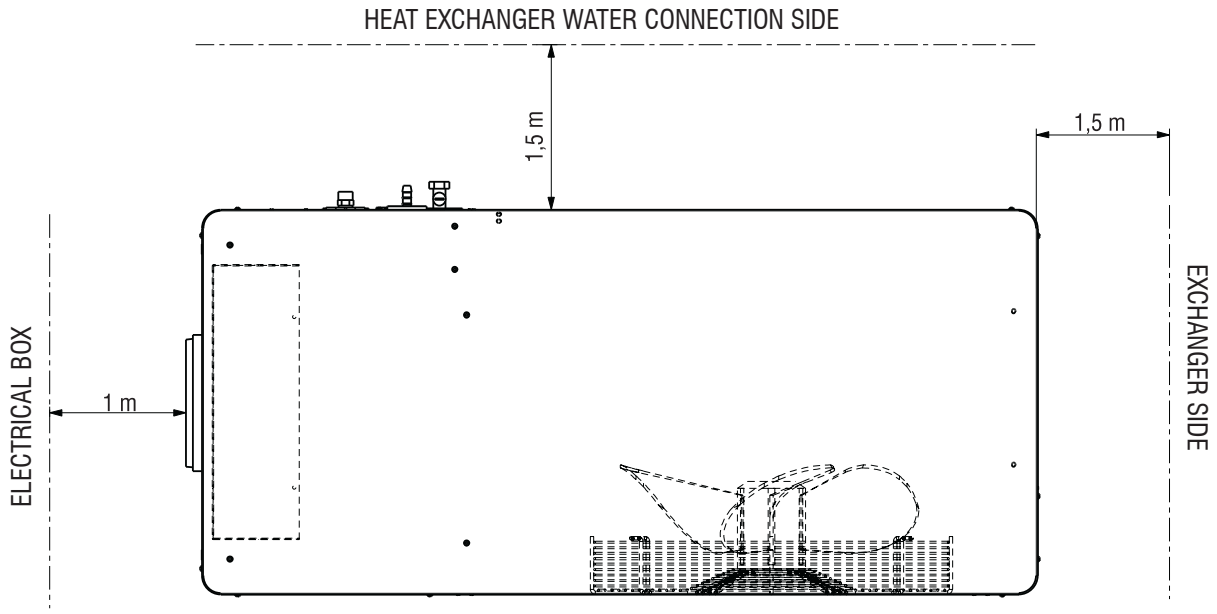
2 INSPECTION, CONVEYANCE DIMENSIONAL AND SITING

2.4 SITING

2.4.1 INSTALLATION CLEARANCE REQUIREMENTS

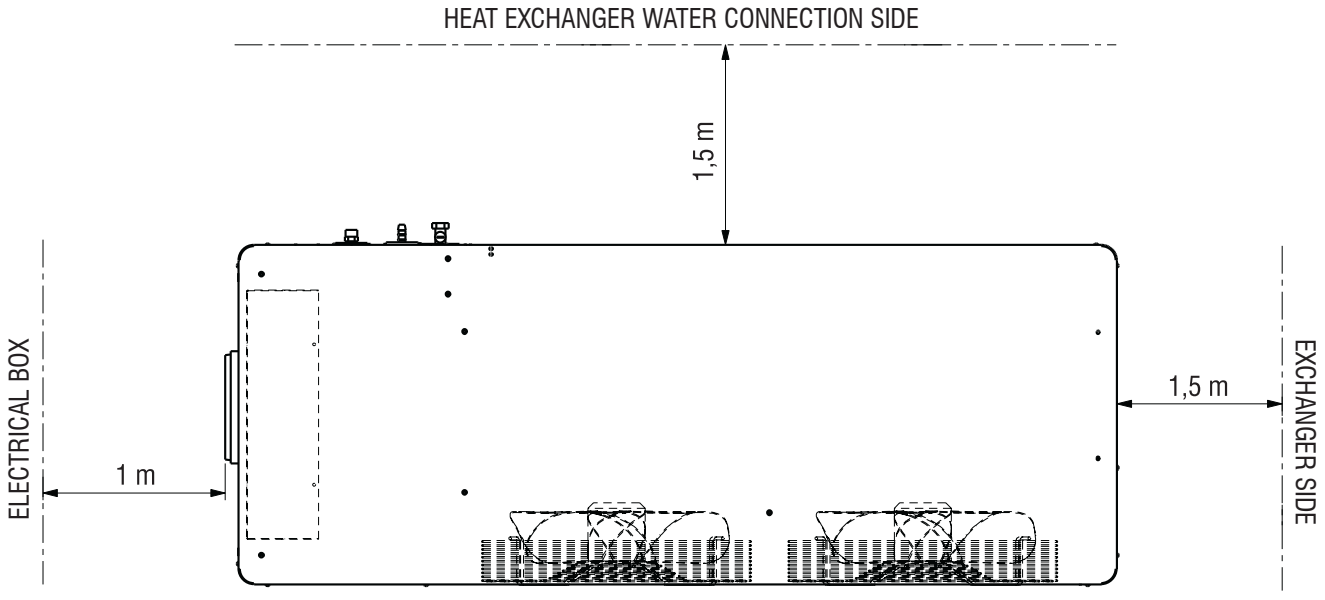
1

MCP 07 ÷ 15



2

MCP 18 ÷ 27 / MCP 18 ÷ 24T



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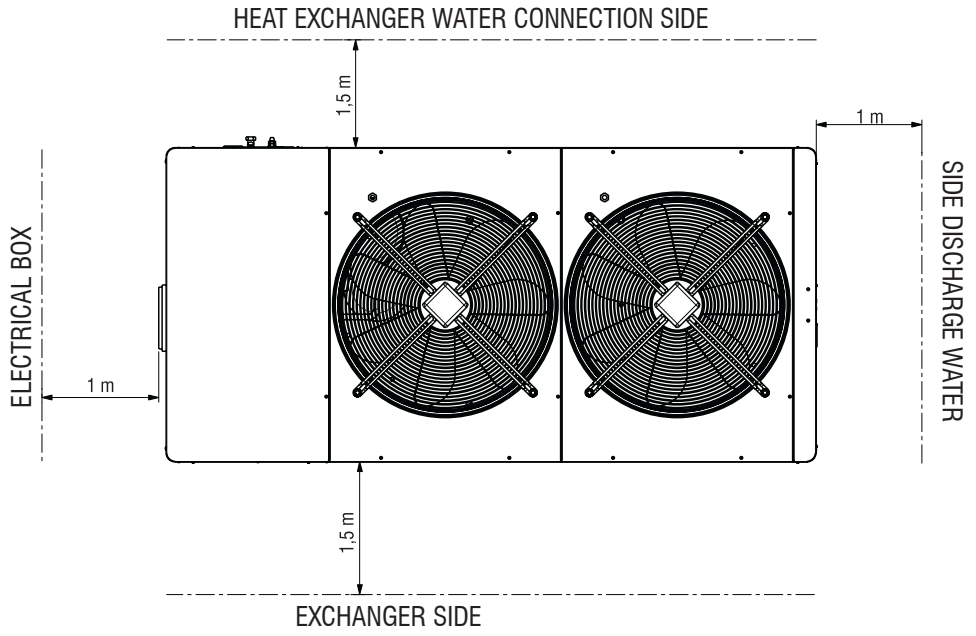
2 INSPECTION, CONVEYANCE DIMENSIONAL AND SITING

2.4 SITING

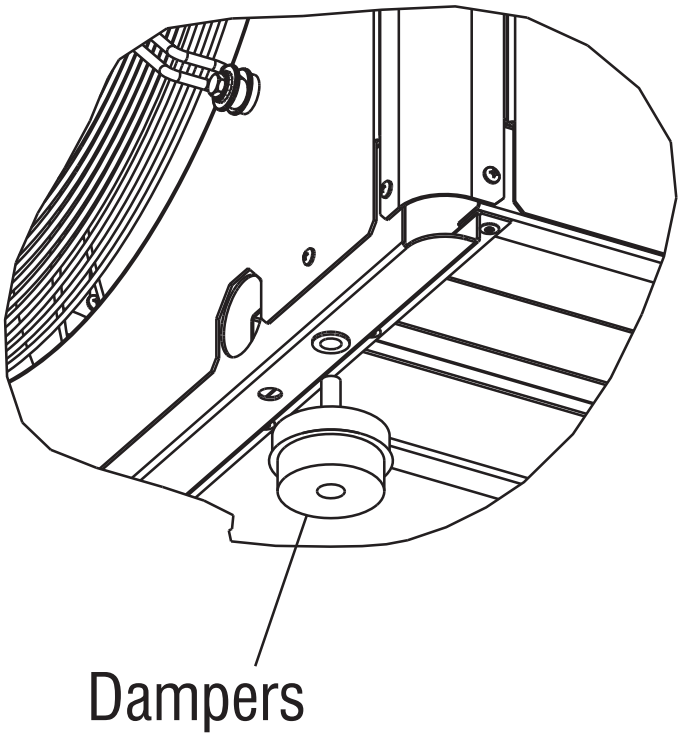
2.4.1 INSTALLATION CLEARANCE REQUIREMENTS

3

MCP 32 ÷ 40 / MCP 30T



2.5 DAMPERS SITING (ACCESSORY)



MCP	N° DAMPERS
07 - 15	4
18 - 27	4
18 - 24T	4
32 - 40	6
30T	6

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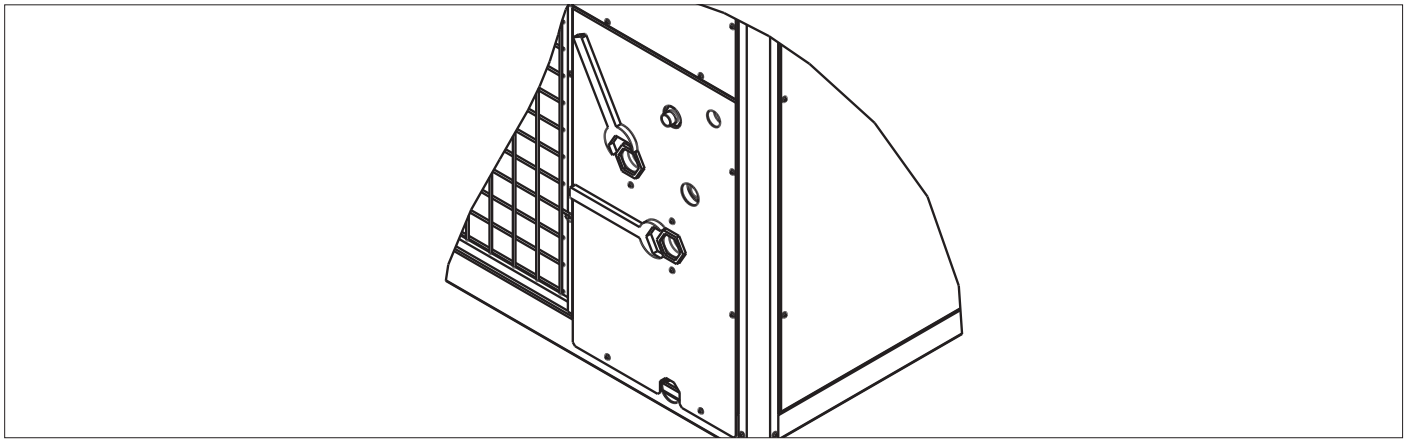
3 PLUMBING AND ELECTRICAL CONNECTIONS

3.1 PLUMBING CONNECTION

All the units belonging to the MCP series are equipped with water differential pressure switch, safety valve, water pressure gauge and automatic filling device and emptying tap.
Furthermore, depending on the version, MCP units can be supplied complete with pump, expansion vessel and buffer tank:

3.1.1 HYDRAULIC CONNECTION

Warning ⚠ While connecting the taps, hold the unit's plumbing connections tightly in place using a hexagonal wrench 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;
- standard mechanical filter (FM) (OBLIGATORY!) on the pipes feeding the unit, in proximity to the latter;
- standard mechanical filter (FM) (OBLIGATORY!) and 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; 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.

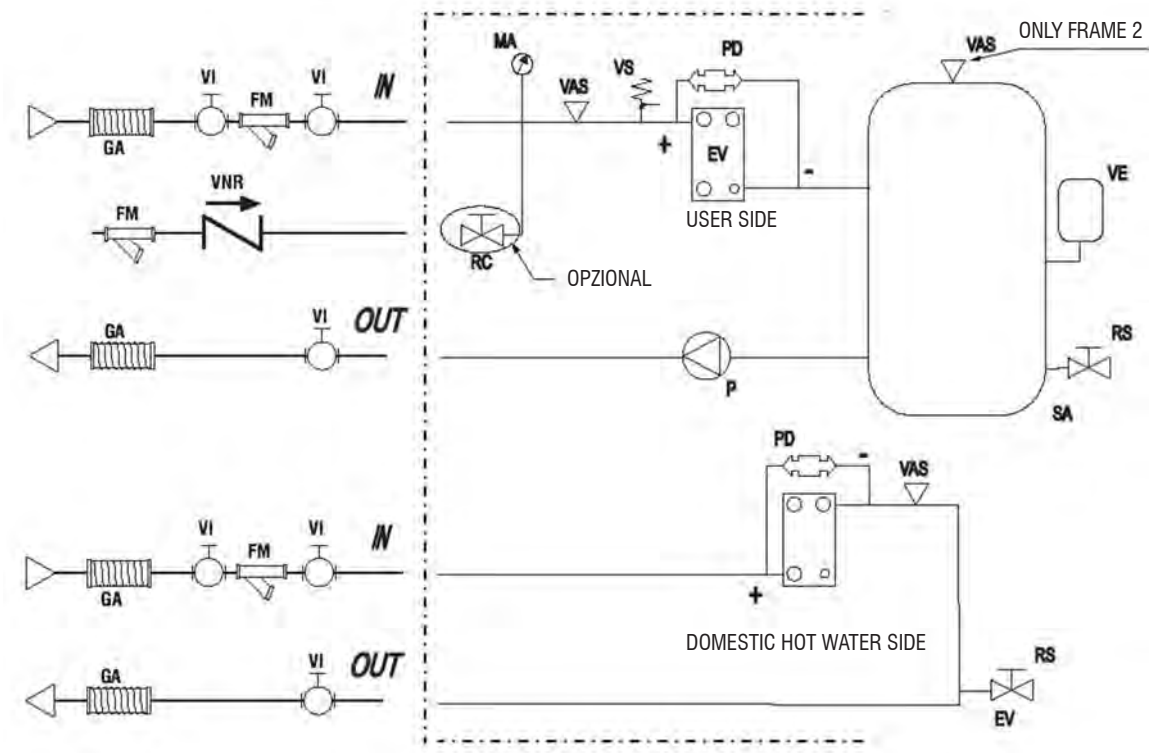
Failure to install filters and vibration dampers may cause problems of clogging, breakages and noise, for which the manufacturer may not be held liable.

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3 PLUMBING AND ELECTRICAL CONNECTIONS

3.1 PLUMBING CONNECTION

3.1.2 RECOMMENDED WATER CIRCUIT



	Legend
VS	Safety valve
EV	Evaporator
PD	Water differential pressure switch
MA	Water gauge
VAS	Air bleed hole
SA	Storage tank
VE	Expansion vessel
RS	Drain
RC	Water charge
VI	Regulation valve (not supplied)
GA	Vibration-damping coupling (not supplied)
FM	Mechanical filter (OBLIGATORY)
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.
- To fill the circuit open slowly the water tap of the system (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.

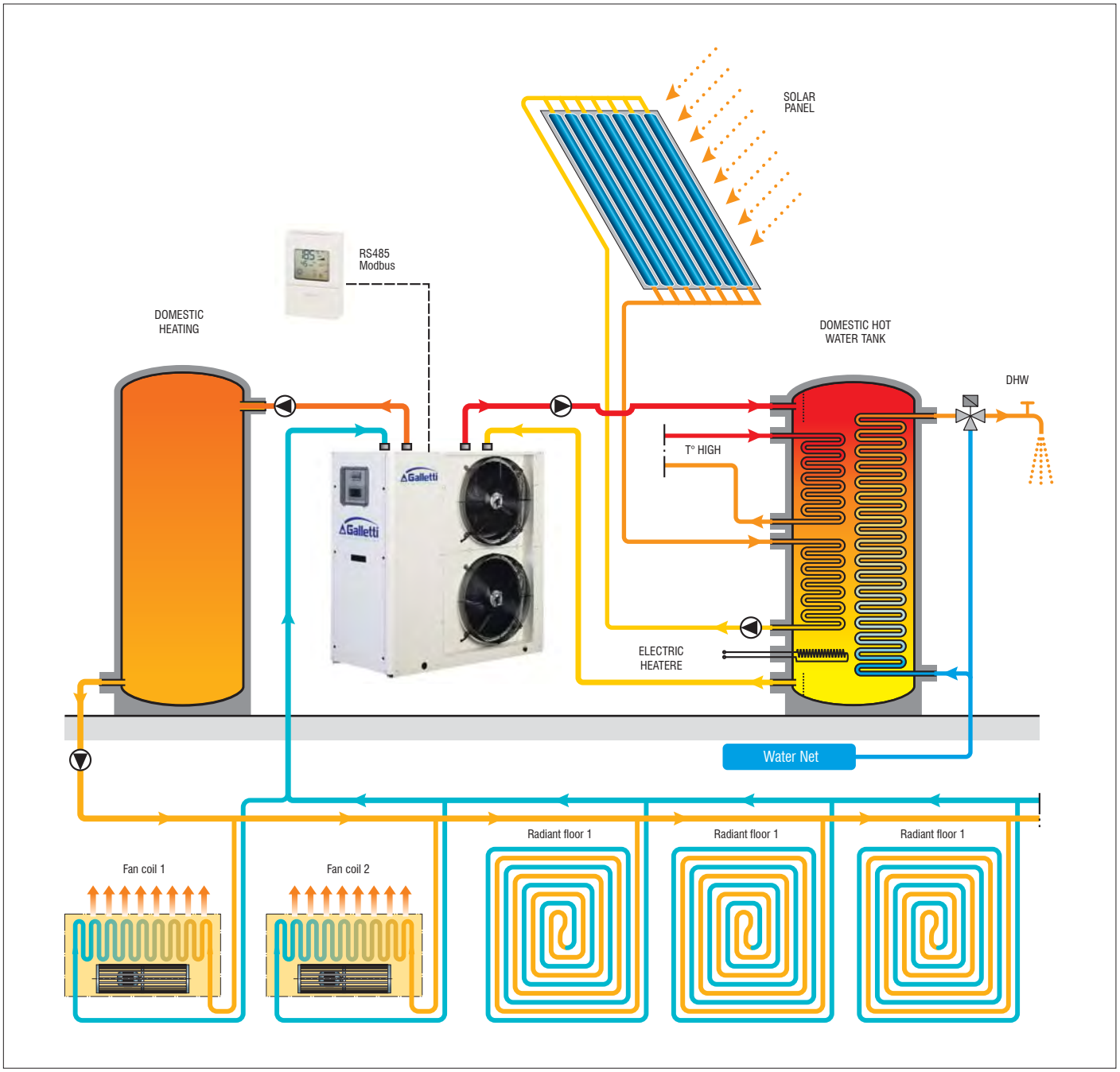
Warning ⚠ Heating/cooling system circuit and domestic hot water system circuit are separated. To fill the DHW system use a heat storage tank (boiler)

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3 PLUMBING AND ELECTRICAL CONNECTIONS

3.1 PLUMBING CONNECTION

3.1.4 MULTIFUNCTION BASE SYSTEM DRAWINGS



Warning ⚠ The domestic hot water side must be connected directly to the water thank (without any interposition of stainless steel coil): in that way the water content of the storage tank is high enough to warrant the correct working of the unit (heat transfer to the DHW), avoiding frequent on/off cycles of the compressor.

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3 PLUMBING AND ELECTRICAL CONNECTIONS

3.2 ELECTRICAL CONNECTIONS

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 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 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.

MCP		**007M**	**009M**	**010M**	**013M**	**T18M**	**T22M**	**T24M**	**007**	**009**	**010**
Power cables	mm^2	6	6	6	10	16	16	16	4	4	4
Safety fuse **F**	A	25	32	32	40	50	63	63	10	16	16
Circuit breaker **IL**	A	25	32	32	40	50	63	63	16	20	20
MCP		**013**	**015**	**018**	**T18**	**T22**	**T24**	**027**	**T30**	**032**	**040**
Power cables	mm^2	4	4	6	6	6	10	10	10	10	16
Safety fuse **F**	A	20	20	25	25	25	32	32	40	40	50
Circuit breaker **IL**	A	20	25	25	25	25	32	32	40	40	50

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

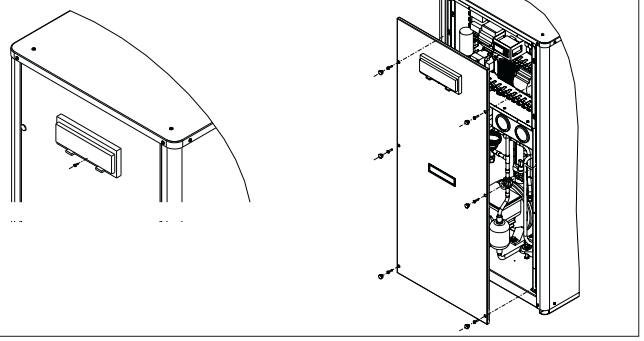
Important! Make sure that the length of cable inside the unit enters the bushing from below: this is necessary to prevent rainwater from dripping inside the unit.

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:

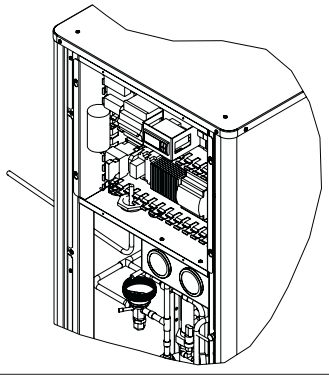
Important! If you wish to include:
- a remote on/off switch
- a remote switch for cooling/heating operation
- a remote control

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

4



5



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3 PLUMBING AND ELECTRICAL CONNECTIONS

3.3 ELECTRICAL DATA

MCP		007M	009M	010M	013M	T18M	T22M	T24M	007	009	010
Maximum power input	kW	3,4	4,6	5,1	6,3	9,1	10,2	12,3	3,6	4,6	5,3
Maximum current absorption	A	16,5	22,2	24,7	30,6	44,5	49,4	60,0	7,1	9,2	10,3
Starting absorbed current	A	77	98	109	152	119	133	180	33	47	53
Fan motor rated power	kW	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135
Fan motor rated current	A	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64
Pump motor rated power	kW	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85
Pump motor rated current	A	1,23	1,32	1,42	2,13	2,74	2,88	3,07	1,23	1,32	1,42
Power supply	V/f/Hz	230-1-50							400-3N-50		
Auxiliary power supply	V/f/Hz	230-1-50									
Power cables	mm2	6	6	6	10	16	16	16	4	4	4
Remote control connecting cables	mm2	AWG22									
Safety fuse F	A	25	32	32	40	50	63	63	10	16	16
Circuit breaker IL	A	25	32	32	40	50	63	63	16	20	20
MCP		**013**	**015**	**018**	**T18**	**T22**	**T24**	**027**	**T30**	**032**	**040**
Maximum power input	kW	6,4	7,5	10,0	9,3	10,5	12,5	12,3	15,5	14,8	18,3
Maximum current absorption	A	12,6	15,0	20,3	18,5	20,6	24,0	24,6	29,8	30,2	36,2
Starting absorbed current	A	66	76	102	55	62	76	130	89	171	202
Fan motor rated power	kW	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,32	0,32	0,32
Fan motor rated current	A	0,64	0,64	0,64	0,64	0,64	0,64	0,64	1,75	1,75	1,75
Pump motor rated power	kW	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	1,09	1,09
Pump motor rated current	A	2,13	2,27	2,74	2,74	2,88	3,07	3,12	3,26	4,11	4,21
Power supply	V/f/Hz	400-3N-50									
Auxiliary power supply	V/f/Hz	230-1-50									
Power cables	mm2	4	4	6	6	6	10	10	10	10	16
Remote control connecting cables	mm2	AWG22									
Safety fuse F	A	20	20	25	25	25	32	32	40	40	50
Circuit breaker IL	A	20	25	25	25	25	32	32	40	40	50

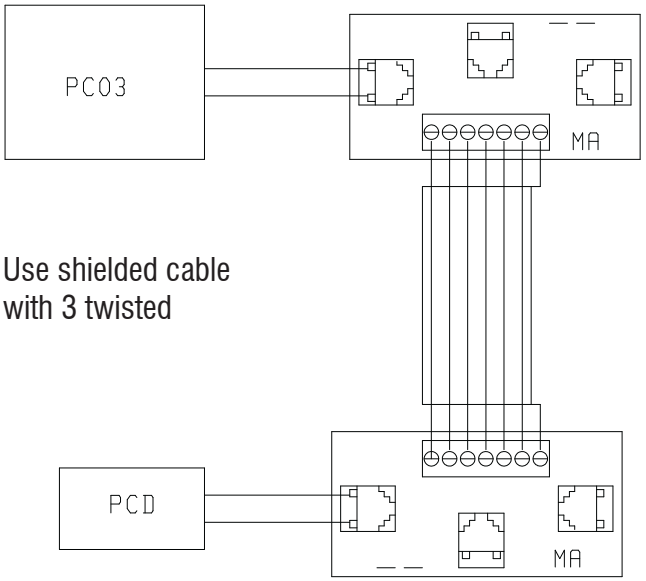
- The maximum input power is the mains power that must be available in order for the unit to work.
- The maximum current absorption refers to the current that will trigger the internal safety devices of the unit. It is the maximum current allowed in the unit. This value may never be exceeded; it must 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).

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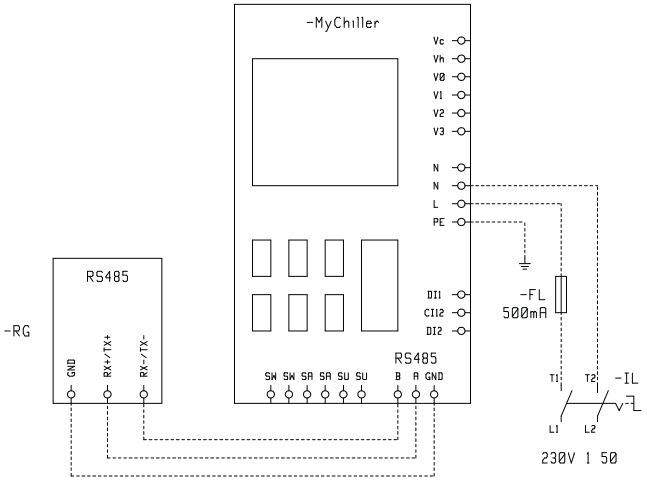
3 COLLEGAMENTI IDRAULICI ED ELETTRICI

3.3 DATI ELETTRICI

MCP WITH pCO3 REMOTE CONTROL PANEL WIRING DIAGRAMS



MCP WITH MYCHILLER REMOTE CONTROL PANEL WIRING DIAGRAMS



Note: On the terminal block of the electric control panel a voltage of 24V will be present at the 50/24V terminals in the event of an alarm; if it is desired to interface with a voltage-free contact, a relay must be applied for this purpose by the installer.

4 STARTING UP

THE FIRST START UP MUST BE CARRIED OUT EXCLUSIVELY BY QUALIFIED PERSONNEL AND AUTHORIZED BY GALLETTI SPA (SEE WARRANTY SHEET ATTACHED).
At first start-up of the installation make sure to comply with current national regulations.

4.1 PRELIMINARY CHECKS

When starting up the unit for the first time or after a seasonal period of quiescence, it is advisable to have the following checks performed by specialised personnel:
- Check that the electrical connections have been made properly and that all the terminals are securely tightened.
- Check that the external power supply is within +-5 % tolerance from the power supply reported on the unit identification label.
  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. 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 serves 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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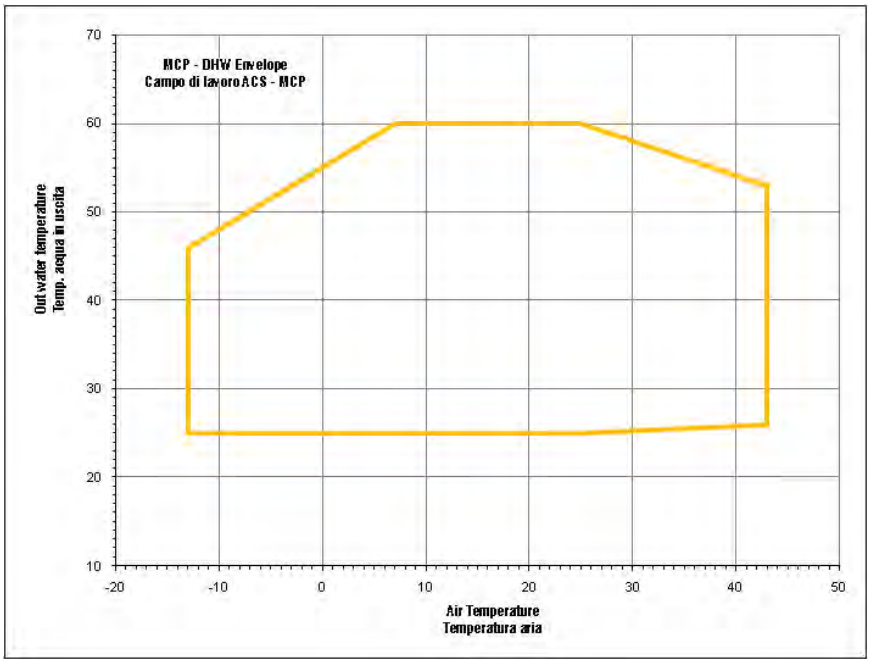
5 OPERATING LIMITS

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

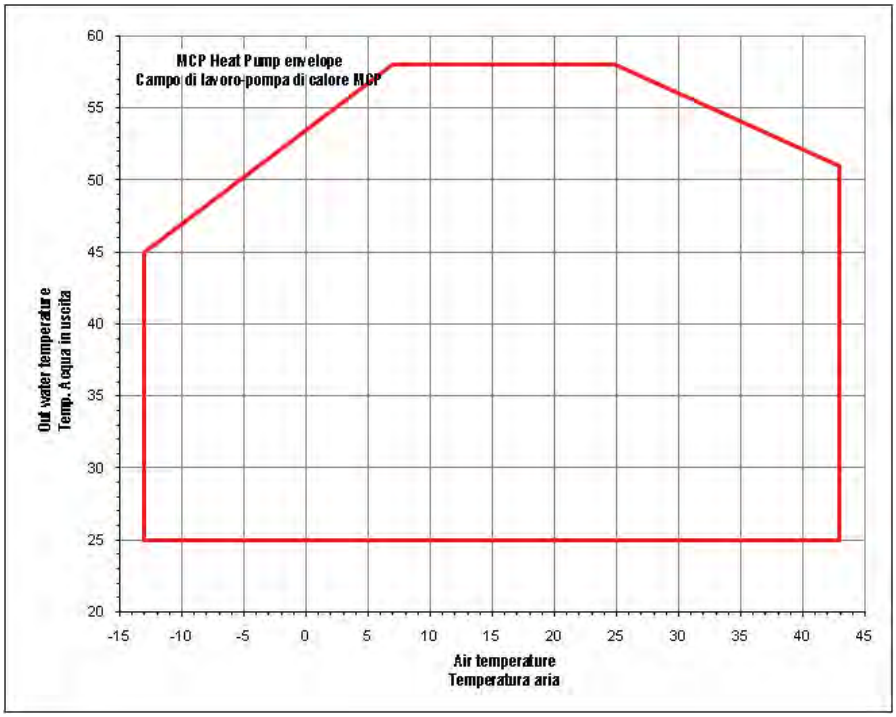
1 For transitory periods (e.g. equipment start up) values up to 25 °C are allowed
2 Value that may be reached only for outdoor air temperatures exceeding 0°C.
3 With condensation control: Outdoor air T min -15 °C

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 LIMIST FOR DOMESTIC HOT WATER PRODUCTION



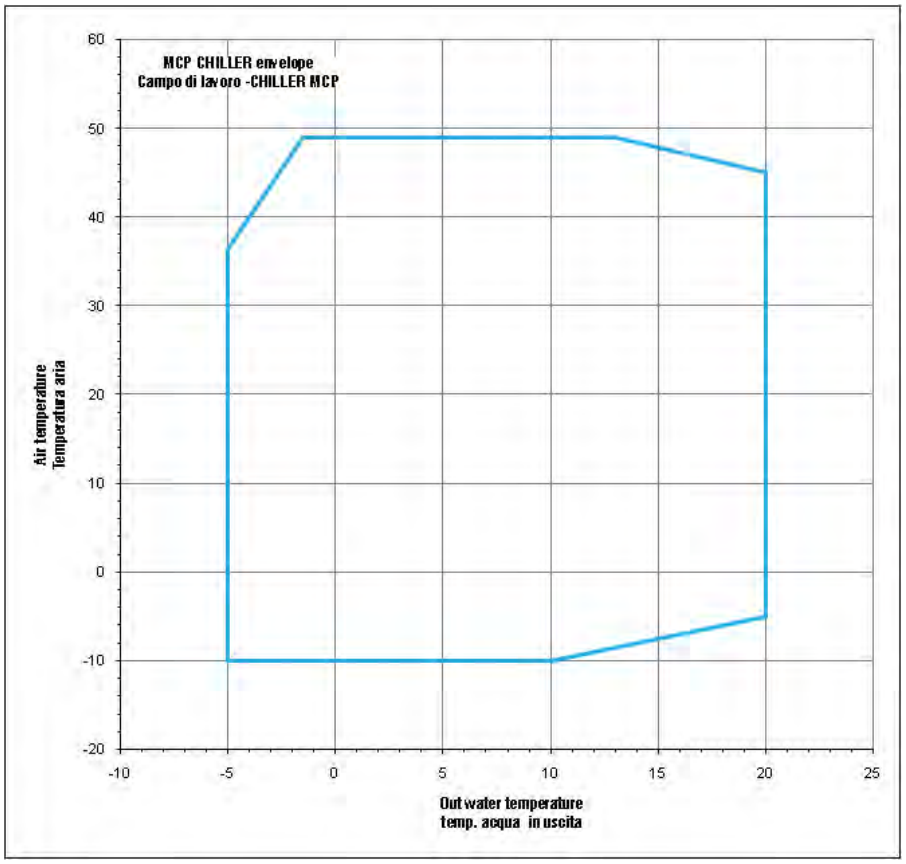
5.2 OPERATING LIMITS IN HEAT PUMP MODE



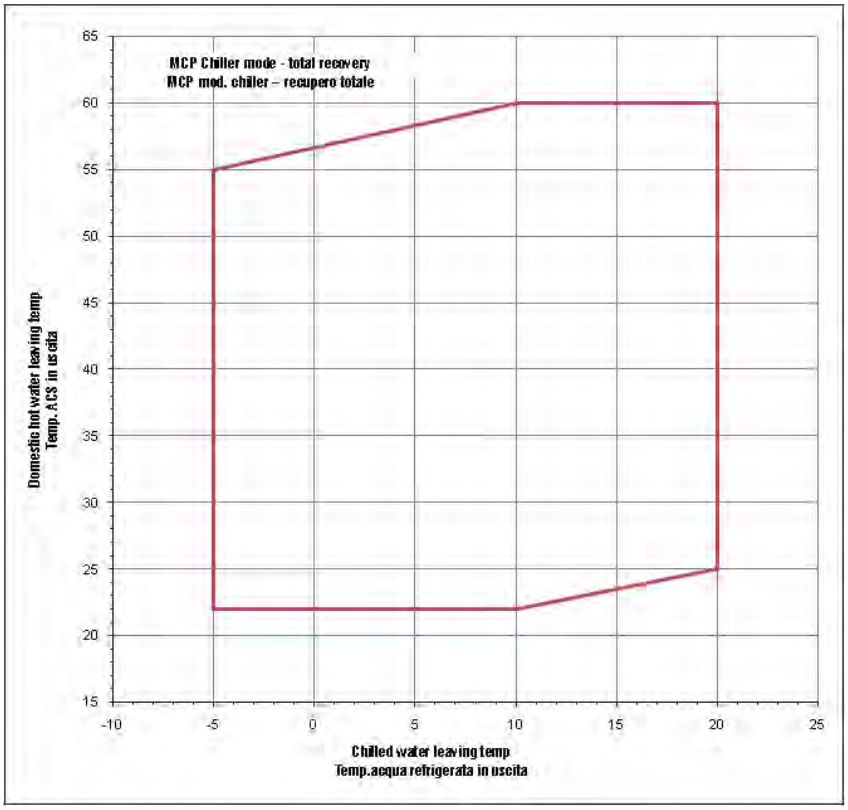
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5 OPERATING LIMITS

5.3 OPERATING LIMITS IN CHILLER MODE



5.4 OPERATING LIMITS IN TOTAL HEAT RECOVERY (CHILLER MODE)



5.5 THERMAL CARRYING FLUID

The units belonging to the **MCP** 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 inlet. 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 (inlet water temp. cooling mode)	°C	11,5	8	20	2
Service thermostat (inlet water temp. heat pump mode)	°C	45	25	47	3

6.2 SAFETY DEVICES

6.2.1 HIGH PRESSURE SWITCH

The high pressure switch stops the compressor when the delivery 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 VALORI DI TARATURA DEGLI ORGANI DI SICUREZZA

Organo di sicurezza	activation	differential	resetting
Maximum pressure switch (bars)	30		Manual
Minimum pressure switch (bars)	1,5		Automatic
Antifreeze thermostat (°C)	3	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 recommended to carry out periodic checks of the safety devices (pressure switches and safety valves) and verify the absence of refrigerant leaks. After the first start-up, the periodic checks must be carried out in conformity with the schedule and the manners provided for by current national 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 (optional) emptying tap.
  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" version)

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 the finned coils: the aluminium fins are extremely sharp and can cause cuts.

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 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 should be carried out by technical personnel qualified for this type of machine, in compliance with current safety regulations.
When receiving the unit please check its state verifying if any damage occurred during the transport.
For installation and use of possible accessories please refer to the pertinent technical sheets.

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9 TECHNICAL FEATURES

9.1 HEAT PUMPS RATED TECHNICAL DATA

MCP		007M	007	009M	009	010M	010	013M	013	015	018
Power supply	V-ph-Hz	230-1-50	400-3N-50	230-1-50	400-3N-50	230-1-50	400-3N-50	230-1-50	400-3N-50	400-3N-50	400-3N-50
Cooling mode											
Cooling capacity [1]	kW	7,60	7,60	9,60	9,70	11,10	11,30	13,40	13,60	15,80	19,60
Power input 1	kW	2,70	2,60	3,35	3,25	3,87	3,77	4,72	4,62	5,55	7,32
EER		3,01	3,14	3,04	3,17	3,04	3,18	3,03	3,15	3,02	2,83
Cooling mode +ACS											
Cooling capacity [1]	kW	7,20	7,30	9,00	9,10	10,60	10,80	12,80	13,00	15,40	18,40
Power input [1]	kW	2,66	2,66	3,38	3,28	3,90	3,80	4,85	4,65	5,48	7,28
Heating capacity DHW	kW	9,48	9,58	11,95	11,95	14,02	14,13	16,98	16,99	20,15	24,77
Total COP		6,18	6,26	6,14	6,35	6,27	6,51	6,07	6,37	6,41	5,88
Heating mode (system / DHW)											
Heating capacity [2]	kW	8,9	8,8	11,1	11,2	12,6	12,7	15,6	15,7	18,1	23,3
Power input [2]	kW	2,90	2,80	3,75	3,55	4,17	4,07	5,12	5,02	5,75	7,72
COP		3,13	3,20	3,02	3,19	3,07	3,18	3,10	3,18	3,19	3,06
Water flow - chiller mode	l/h	1.307	1.307	1.651	1.668	1.909	1.944	2.305	2.339	2.718	3.371
Water flow - pdc mode	l/h	1.527	1.510	1.916	1.918	2.171	2.189	2.680	2.698	3.105	4.002
DHW water flow	l/h	1.631	1.648	2.055	2.055	2.411	2.430	2.921	2.922	3.466	4.260
Pump head, system side (chiller)	kPa	142	142	125	124	121	119	142	140	128	129
Pump head, DHW side	kPa	123	122	98	98	88	86	109	108	79	94
No. of scroll compressors / circuits		1/1	1/1	1/1	1/1	1/1	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	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/4
Buffer tank	dm^3	30	30	30	30	30	30	30	30	30	50
Height	mm	1224	1224	1224	1224	1224	1224	1224	1224	1224	1273
Length	mm	1324	1324	1324	1324	1324	1324	1324	1324	1324	1665
Depth	mm	560	560	560	560	560	560	560	560	560	655
Sound power level	dB(A)	72	72	75	75	75	75	75	75	75	78
Ref. R407C	(kg)	6,3	6,3	6,3	6,3	6,5	6,5	7,4	7,4	8,3	10,8
Transport weight *	(kg)	228	228	265	265	256	256	265	265	270	393
Operating weight *	(kg)	245	245	282	282	272	272	282	282	287	426,5
MCP		027	032	040	T18M	T18	T22M	T22	T24M	T24	T30
Power supply	V-ph-Hz	400-3N-50	400-3N-50	400-3N-50	230-1-50	400-3N-50	230-1-50	400-3N-50	230-1-50	400-3N-50	400-3N-50
Cooling mode											
Cooling capacity [1]	kW	27,4	34,4	40,4	18,6	18,8	21,4	21,6	26,0	26,4	32,4
Power input 1	kW	10,00	11,92	14,74	6,72	6,52	7,75	7,55	9,79	9,29	10,73
EER		2,89	3,09	2,91	2,94	3,07	2,93	3,04	2,81	3,01	3,18
Cooling mode +ACS											
Cooling capacity [1]	kW	27,10	32,90	39,40	17,40	17,60	20,20	20,60	25,40	25,80	30,80
Power input [1]	kW	9,66	11,98	14,60	6,98	6,78	8,01	7,61	9,45	9,25	10,89
Heating capacity DHW	kW	35,65	43,45	52,42	23,48	23,49	27,23	27,25	33,76	33,97	40,49
Total COP		6,48	6,40	6,33	5,81	6,01	5,89	6,25	6,26	6,45	6,54
Heating mode (system / DHW)											
Heating capacity [2]	kW	31,4	40,0	47,4	22,3	22,1	25,0	25,2	30,2	30,4	37,5
Power input [2]	kW	9,90	12,52	15,04	7,52	7,32	8,55	8,35	9,99	9,79	11,53
COP		3,22	3,25	3,20	3,01	3,07	2,97	3,07	3,07	3,15	3,29
Water flow - chiller mode	l/h	4.713	5.917	6.949	3.199	3.234	3.681	3.715	4.472	4.541	5.573
Water flow - pdc mode	l/h	5.395	6.871	8.157	3.832	3.799	4.305	4.341	5.188	5.224	6.448
DHW water flow	l/h	6.132	7.473	9.015	4.039	4.040	4.684	4.687	5.807	5.843	6.964
Pump head, system side (chiller)	kPa	119	144	131	136	135	133	132	127	125	106
Pump head, DHW side	kPa	72	115	89	105	105	99	99	85	84	60
No. of scroll compressors / circuits		1/1	1/1	1/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Diameter of water connections	inches	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/4
Buffer tank	dm^3	50	125	125	50	50	50	50	50	50	125
Height	mm	1273	1489	1489	1273	1273	1273	1273	1273	1273	1489
Length	mm	1665	2065	2065	1665	1665	1665	1665	1665	1665	2065
Depth	mm	655	951	951	863	863	863	863	863	863	951
Sound power level	dB(A)	78	78	78	78	78	78	78	78	78	78
Ref. R407C	(kg)	11,5	16,0	18,0	11,5	11,5	11,5	11,5	11,5	11,5	14,0
Transport weight *	(kg)	398	525	528	395	395	388,5	388,5	394	394	525
Operating weight *	(kg)	434,7	632	635	428	428	415	415	420	420	632

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 measured according to standard EN 14511

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10 COOLING CIRCUITS

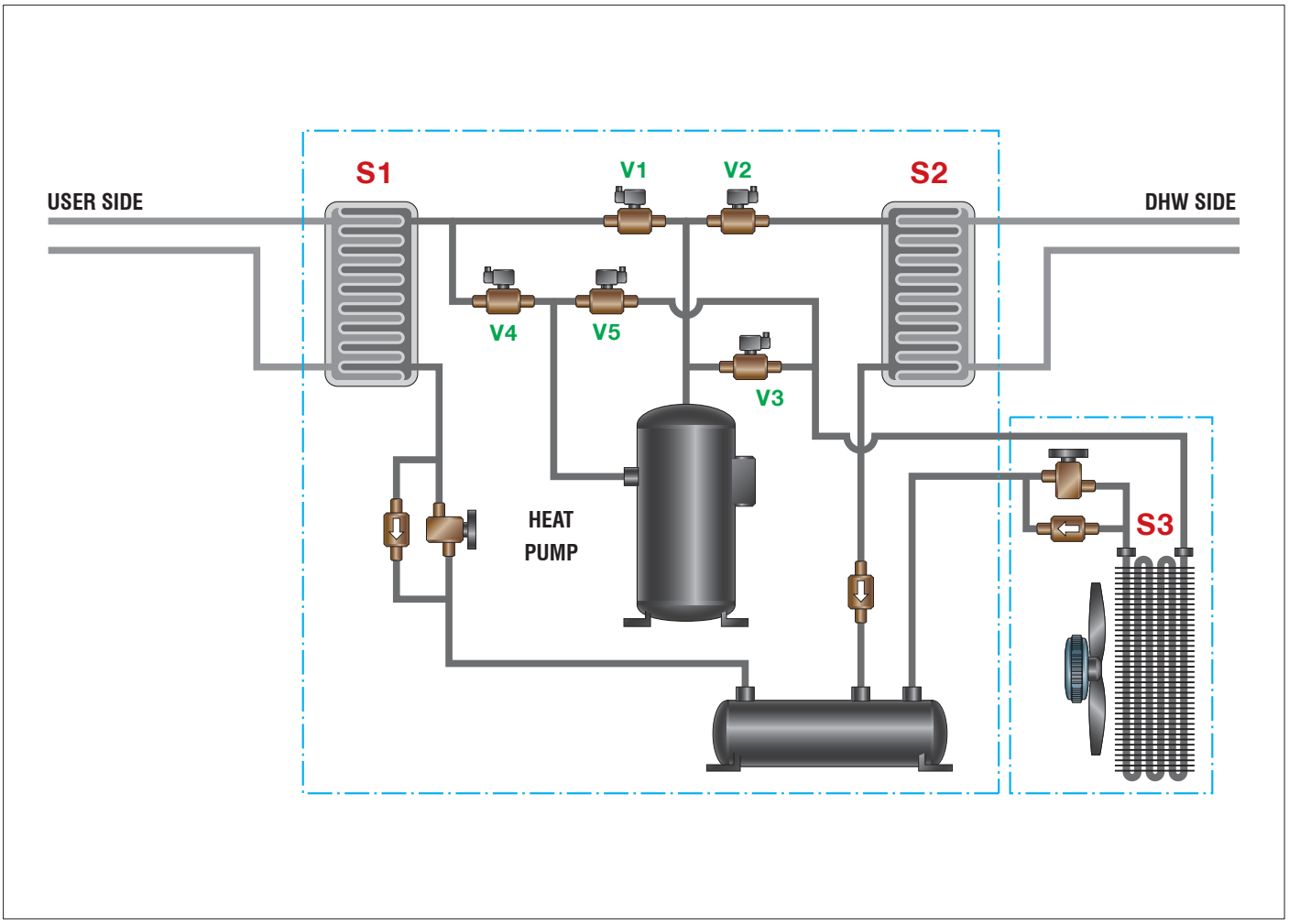
Legend

N°	COMPONENT	SYMBOL
1	Compressor	
2	Evaporator	
3	Condensator	
4	Thermostatic valve	
5	Electrical fan	
6	Filter	
7	Sight glass	
8	Solenoid valve	
9	High pressure switch	
10	Low pressure switch	
11	Manometro alta pressione	
12	Low pressure gauge	
13	Service connection	
14	Diff. pressure switch	
15	Check valve	
16	4 Way diversion valve	
17	Liquid separator	
18	Liquid receiver	
19	Pressure transducer	
20	Liquid distributor	
21	Oil pressure switch	
22	Desuperheater	
23	Shut-Off valve	
24	Pocket	
25	Security valve	
26	Fusible plug	
27	Flow switch	
28	Restrictor	
29	Electronic expansion valve	

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10 COOLING CIRCUIT

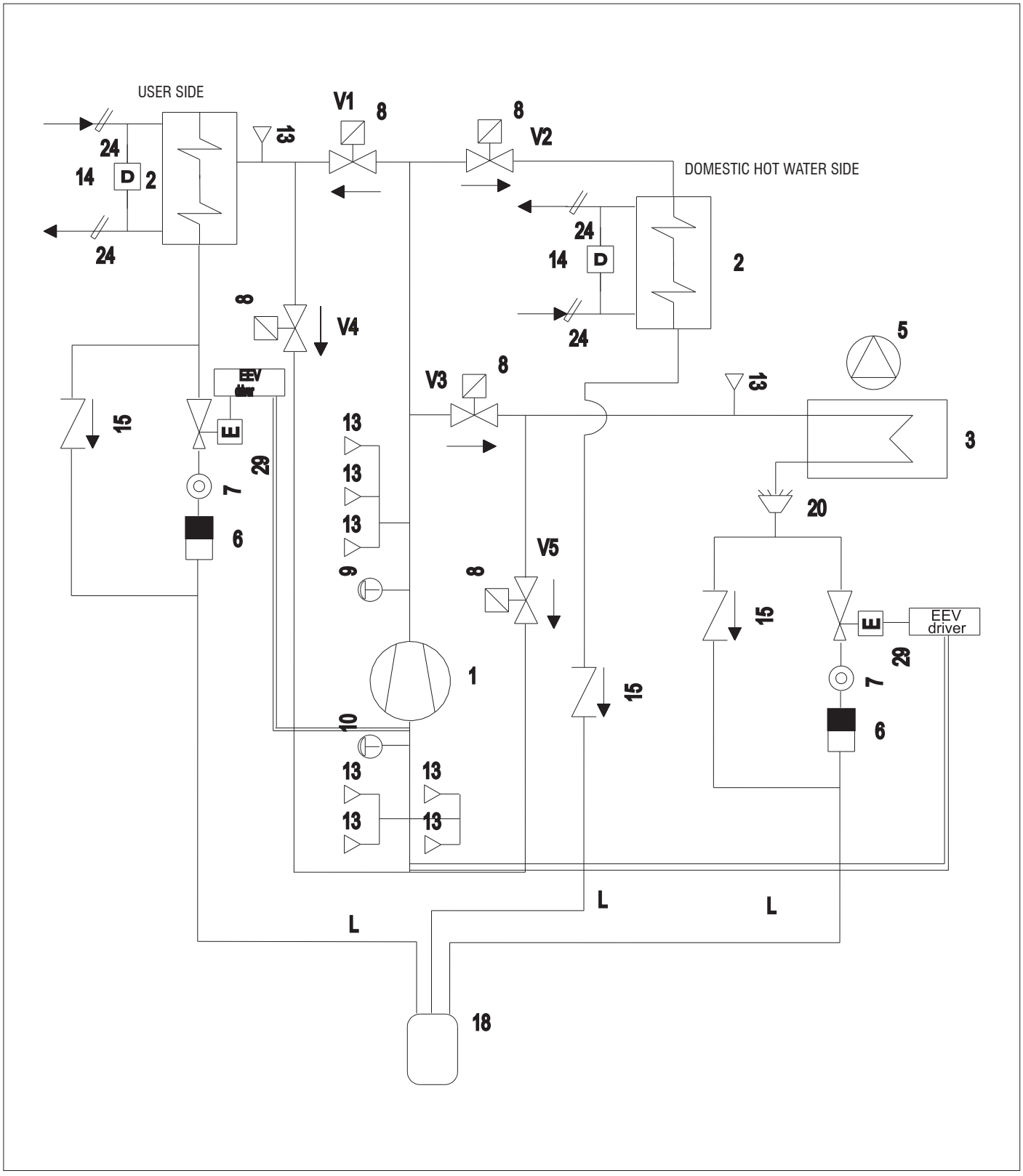
10.1 MCP WITH ELECTRONIC EXPANSION VALVE COOLING CIRCUIT SKECTH



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10 COOLING CIRCUIT

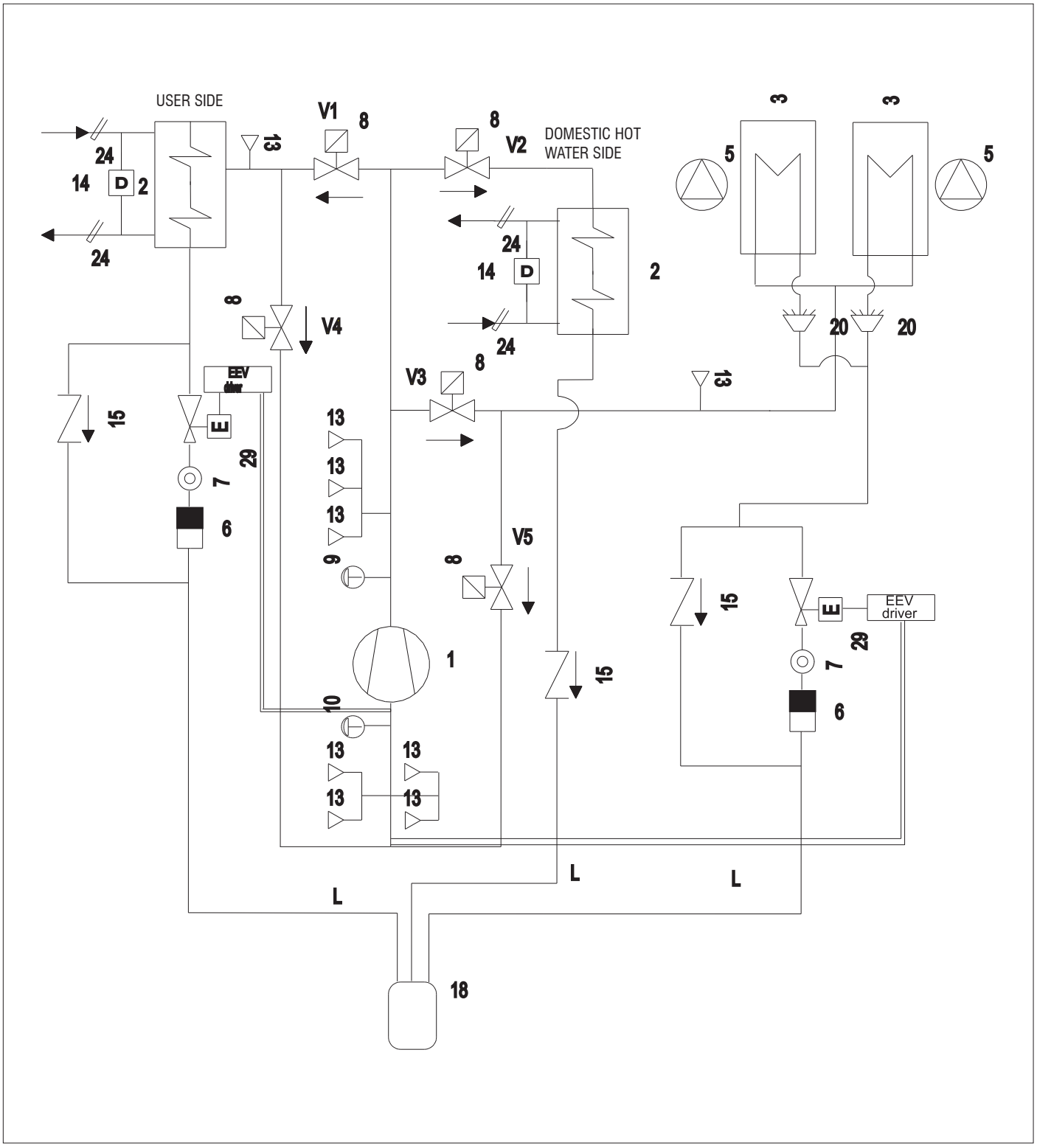
10.2 MCP 07 ÷ 27 WATER CHILLER COOLING CIRCUIT WITH ELECTRONIC VALVE



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10 COOLING CIRCUIT

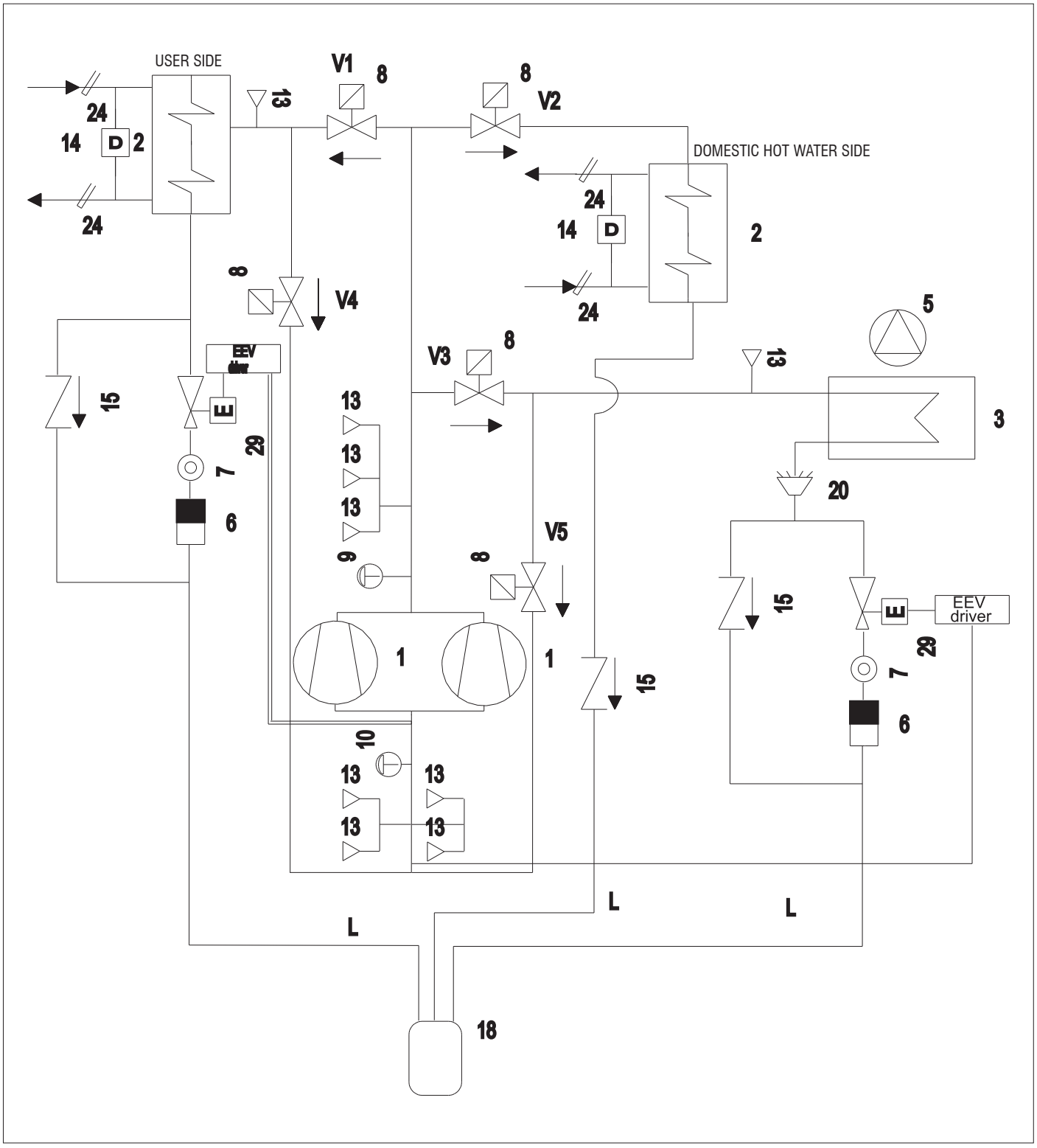
10.3 MCP 32 ÷ 40 WATER CHILLER COOLING CIRCUIT WITH ELECTRONIC VALVE



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10 COOLING CIRCUIT

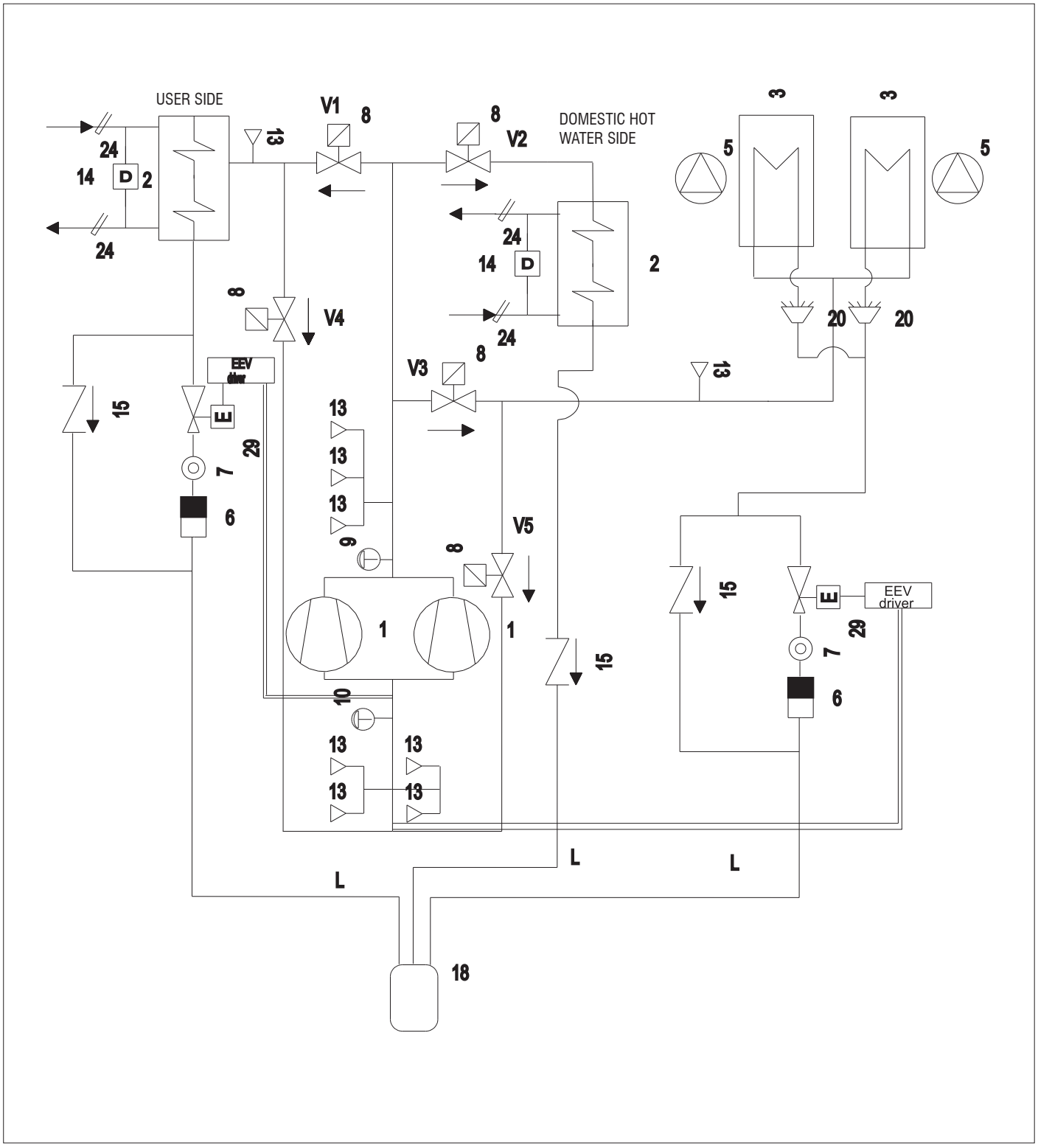
10.4 MCP 18 ÷ 24T WATER CHILLER COOLING CIRCUIT WITH ELECTRONIC VALVE



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10 COOLING CIRCUIT

10.5 MCP 30T WATER CHILLER COOLING CIRCUIT 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**	(1)	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**	**U**		Anti-recycle timer active	Wait 5 minutes until the timer enables operation
	X	**X**	**S**	(1)	Service thermostat sensor defective	Check and replace if necessary
	X	**X**	**U**		Not enabled by service thermostat.	System at the set temperature, no demand; check the setting
	X	**X**	**U**	(1)	Not enabled by antifreeze thermostat	Check the water temperature Checking the antifreeze setting
	X	**X**	**S**	(1)	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**	**S**	(1)	Not enabled by high or low pressure switch	See items D-E
	X	**X**	**S**		Compressor defective	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**		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
C The compressor starts up and stops repeatedly	**X**	**X**	**S**	(1)	Minimum pressure switch has tripped	See item E
	X	**X**	**S**		Compressor contactor defective	Check and replace if necessary
	X	**X**	**U**		Wrong set-point or differential setting	Change them according to the indications given in the tables.
	X	**X**	**S**		Lack of refrigerant	See item G

Legend:
(1) See control panel manual

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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	①	Pressure switch failure	Check and replace
	X	X	S	①	Excessive refrigerant charge	Discharge the excess gas
	X		U	①	Finned coil obstructed, insufficient air flow	Remove dirt from the coil and any obstacles to air flow.
	X		S	①	Fan not working	See item F
		X	U	①	Water circulation pump blocked	Release the pump
		X	S	①	Water circulation pump defective	Check the pump and replace it if necessary.
	X	X	S	①	Presence of incondensable gas in the cooling circuit	Recharge the circuit after having drained and evacuated it
	X	X	S	①	Refrigerant filter clogged	Check and replace
E The compressor does not start because the minimum pressure switch has tripped	X	X	S	①	Pressure switch failure	Check and replace
	X	X	S	①	Unit completely empty	See item G
		X	U	①	Finned coil obstructed, insufficient air flow	Remove dirt from the coil
	X		S	①	Water circulation pump blocked	Release the pump
	X		S	①	Water circulation pump blocked defective	Check the pump and replace it if necessary.
		X	S	①	Presence of frost on the evaporating coil	See item O
		X	S	①	Evaporator fan not working	See item F
	X	X	S	①	Refrigerant filter clogged	Check and replace
	X	X	S	①	Expansion valve is not working properly	Check and replace if necessary
	X	X	S	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	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	①	No power output by the fan speed control card	Check the contacts and replace if necessary
	X	X	S	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	①	Fan motor defective	Check and replace if necessary
	X	X	S	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**	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**	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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NOTES

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AIR CONDITIONING

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