

INSTALLATION, USE AND MAINTENANCE MANUAL

MPE

Chillers and heat pumps
4 kW - 76 kW



Axial fan



Scroll compressor

Refrigerant
R-410A

Cooling only



Heating/Cooling

Packaged
executionRotary
compressor

PLUS

- » Completely configurable
- » Dual-compressor version that guarantees high efficiency at partial loads
- » Production of chilled water up to an air temperature of 47 °C
- » Incorporable hydraulic kit

CE



Dear Customer,

Thank you for placing your trust in one of the products of Galletti S.p.a

This product is the result of our work and our commitment to design, research, and production and has been made from the finest materials, employing state-of-the-art components and production technology.

The CE marking of the product ensures its compliance with the safety requirements of the following directives: the Machinery Directive, the Electromagnetic Compatibility Directive, the Electrical Safety Directive, and the Pressure Equipment Directive. Fulfillment of the Ecodesign requirements is fully in keeping with the environmental awareness that has always guided our company.

The company certification of the Quality and Safety management system ensures that product quality is constantly checked and improved, and that the product is manufactured in full compliance with the highest standards.

By choosing our product, you have opted for Quality, Reliability, Safety, and Sustainability.

At your disposal, once again.

Galletti S.p.a

TRANSLATION BY ORIGINAL INSTRUCTIONS

The water chillers and heat pumps comply with directive 2014/68/EC (PED).

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

For any information , please contact the company: info@galletti.it



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

IMPORTANT: NEVER REMOVE THE LABEL

- Unit serial number
- 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

 	Galletti S.p.A. - Via L.Romagnoli 12/a 40010 Bentivoglio (BO) Italy Made in Italy CATEGORY 1
Serial number Code Date of production Cooling capacity (W) Heating capacity (W) Power supply Power input (kW) Weight (kg) Max power input (kW) Max running amperage (A) HP power input (kW) Refrigerant Max refrigerant pressure Max refrigerant temperature (°C)	

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 S.p.A. (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 it self.
- It's mandatory to install filters heat exchangers protection will immediately invalidate the warranty.

SAFETY SYMBOLS



Carefully read this manual.



Warning



Use personal protective equipment



Warning:

Electrical and electronic products may not be mixed with unsorted household waste. Do NOT try to dismantle the system yourself: the dismantling of the system, treatment of the refrigerant, of oil and of other parts must be done by an authorized installer and must comply with applicable legislation. Units must be treated at a specialized treatment facility for reuse, recycling and recovery. By ensuring this product is disposed of correctly, you will help to prevent potential negative consequences for the environment and human health. For more information, contact your installer or local authority.

USE SUITABLE PPE (GLOVES FOR REFRIGERANT, PROTECTIVE GOGGLES)

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1 THE MPE SERIES

1.1 FIELD OF APPLICATION

MPE air-condensed water chillers and heat pumps have been designed to cool and heat water for air conditioning and heating systems in residential or commercial buildings.

The MPE range units are intended for outdoor installation (IP24 protection degree), in a position not accessible to the public.

If protection grids are not provided (accessory) and if the machine can be reached by non-specialised personnel, access to the finned coil must be prohibited using appropriate barriers.

Do not install the unit in environments with gas or flammable dusts.

1.2 MAIN FEATURES

MPE water chillers and heat pumps are designed for outdoor installation in both residential and industrial applications. The range uses R410A refrigerant, which assures high levels of performance with relatively low energy consumption and features 10 models in the chiller version and 29 models in the heat pump version, with cooling capacities ranging from 9 to 76 kW and heating capacities from 5 to 85 kW.

The finned block heat exchangers have been optimised for R410A and use 8 mm copper pipes, which permit a better heat exchange and quiet operation of the fans. Their generous sizing guarantees the production of chilled water even with outdoor air temperatures as high as 47°C.

In the MPET models, with a double compressor on the same cooling circuit, the working temperature range is extended further and efficiency at partial loads increases.

In demanding working conditions the microprocessor controller activates the capacity control mode, doubling the condensing surface available to the single compressor.

The self-adaptive logic allows the setpoint to be adjusted automatically according to the outdoor temperature in order to reduce consumption and broaden the working temperature range.

The unit can also function in systems with a low water content, even without the use of a storage reservoir, thanks to the automatic adjustment which limits the number of compressor starts and thus extends the life of the compressors themselves.

The exclusive Smart Defrost System (optional feature available with the advanced controller) can correctly identify an impairment of performance in the outdoor exchanger due to the formation of ice and minimise the process time in relation to normal operation of the unit.

1.3 MODELS AND VERSIONS

The MPE series consists of 11 models only cooling mode and 28 models in heat pumps with different powers. All models

» Configuration options

1	Expansion valve
0	Mechanical
A	Electronic
2	Water pump and accessories
1	LP pump + expansion vessel
2	LP run and standby double pump + expansion vessel (advanced controller required)
3	Water buffer tank
0	Absent
S	Selected
4	Partial heat recovery
0	Absent
D	Desuperheater with pump activation contact
5	Air flow modulation
C	Condensation control by phase-cut fans
E	Condensation control performed by EC fans
6	Antifreezing kit
0	Absent
E	Evaporator (tandem unit advanced controller required)
P	Evaporator and pump (tandem unit advanced controller required)
S	Evaporator, water pump and water buffer tank (tandem unit advanced controller required)
7	Acoustic insulation and attenuation
0	Absent
1	Compressor compartment acoustic insulation
2	Compressor sound blanket
3	Compressor compartment acoustic insulation and sound blanket
8	Refrigerant pipework accessories
0	Absent
M	Refrigerant pressure gauges
9	Remote control / Serial communication
0	Absent
2	RS485 serial board (Carel / Modbus protocol)
B	BACNET IP / PCOWEB serial board (advanced controller required)
F	BACNET MS/TP / PCONET board (advanced control required)
G	BACNET IP / PCOWEB serial board + supervision software Gweb (advanced controller required)
L	LON FTT10 serial board (advanced controller required)
S	Remote simplified user panel
X	Remote user panel for advanced controller
10	Special coils / Protective treatments
0	Standard
B	Pre-painted fins with epoxy painting
C	Cataphoresis
I	Hydrophilic
R	Copper-copper
11	Outdoor finned coil heat exchanger protection
0	Absent
G	Outdoor finned coil heat exchanger protection grille
12	Compressors options
0	Absent
1	Power factor capacitors
2	Soft starter
3	Power factor capacitors + soft starter
4	Crankcase compressor heater (CHILLER), outdoor coil trace heater (HP)
13	Onboard controller
1	Basic

operates with R410A refrigerant.

NOTE: The choice of some options can make the choice of some others forbidden or make some selection (fields) mandatory. Please contact Galletti S.p.A. for verification.

2	Advanced
4	Advanced + clock card

Chiller accessories	
1701546	Remote simplified user panel
RYKAMF	Spring anti vibration shock mounts
RYMCL	MyChiller Plus (RS485 serial board and advanced controller required)
RYMCM	MyChiller Base (RS485 serial board and advanced controller required)
RYPAM	Rubber anti vibration shock mounts
RYRT40	Tank module connection kit
RYT40	Inertial tank module for under-base installation

2 CONSTRUCTIVE FEATURES

STRUCTURE

Galvanised sheet steel structure treated with a polyester powder coating (RAL9002) suitable for outdoor applications, for an attractive look and effective resistance to corrosive agents. Fastening devices are made of non-oxidizable materials, or carbon steel that has undergone surface-passivating treatments. The compressor compartment is completely sealed and may be accessed on 3 sides thanks to easy-to-remove panels that greatly simplify maintenance and/or inspection. On request acoustic insulation can reduce the unit noise emissions

CUSTOMISED HYDRAULIC KIT

- High head pump made entirely of stainless steel, already configured for use with mixtures of water and ethylene glycol up to 25% and provided with internal thermal protection.
- Expansion tank.
- Safety valve.
- Filling cock (included).
- Automatic vent valve.
- Water differential pressure switch and outlet water temperature probe with anti-freeze thermostat function.
- Mechanical Y filter supplied as a standard feature on all models to protect the evaporator (included).

COOLING CIRCUIT

- Scroll type compressors in a tandem configuration that can be sound insulated (Frame 3 e 4). The adopted components' efficiency, reliability, and noise emission levels represent the

state of the art for scroll compressors.

- Brazed plate heat exchangers made of stainless steel and optimised for use with R410A.
- Finned block condenser with 8 mm copper piping and aluminium fins, characterised by ample heat exchange surfaces.
- Dehydrating filter.
- Flow indicator with humidity indicator.
- Thermostatic valve with external equalisation and integrated MOP function.
- Cycle reversing valve (only MPE H)
- Check valve (MPE H)
- Liquid receiver (MPE H)
- High and low pressure switch
- Water safety valve
- Schrader valves for checks and/or maintenance
- Refrigerant pressure gauges (optional)

FINNED BLOCK HEAT EXCHANGER

Made of 8 mm diameter copper pipes and aluminium fins, generously sized.

The special engineering of the heat exchangers allows defrost cycles to be carried out at maximum speed in the models with heat pump operation, which brings clear benefits in terms of the integrated efficiency of the whole cycle.

ELECTRONIC MICROPROCESSOR CONTROL

The electronic control enables the complete control of the **MPE** unit. It can be easily accessed through a polycarbonate flap with IP65 protection rating.

The basic controller comes complete with the MODBUS.



Main functions:

- Control over the temperature of water entering the evaporator.
- Complete alarm management.
- Dynamic control of the setpoint according to the outdoor air temperature.
- Can be connected to an RS485 serial line for supervisory / teleassistance operation

Devices controlled

- Compressor
- Fans
- Water circulation pump
- Antifreeze heating element (optional)
- Alarm signalling relay

ELECTRIC CONTROL BOARD

The electric control board is constructed and wired in accordance with EEC Directive 73/23, Directive 89/336 on electromagnetic compatibility and related standards. Made of steel sheet, it is also protected by the enclosing panels of the machine.

OPTIONS

- Incorporable hydraulic kit
- Condensation control
- Low noise execution
- Refrigerant pressure gauges
- Antifreeze heating elements on the water circuit
- Electronic thermostatic valve

- Heat recovery 25% (chiller)
- Special exchangers (hydrophilic treatment, copper-copper, cataphoresis, anti-corrosion)

2.8 FAN DRIVE ASSEMBLY

Electric fan with 6/8-pole external rotor motor directly keyed to the axial fan, with internal thermal protection on the windings, complete with safety grille and dedicated supporting structure. The fan is housed in a special compartment having a profile designed to optimise ventilation.

The use of finned block heat exchangers with 8 mm diameter pipes reduces pressure drops on the air side, thus significantly improving the noise levels of the units.

The condensation control system continuously and automatically regulates the fan speed, further limiting the noise emissions of the unit during nighttime operation and under partial load conditions.

3 INSPECTION, CONVEYANCE DIMENSIONAL AND SITING

3.1 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 (68 pagine).

3.2 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. Before lifting, remove the screws fastening the base of the unit to the wood platform.

The unit must be lifted using $\varnothing 1''$ steel pipes at least 5mm thick, to be inserted in the round holes on the base side members (see figure) and identified by means of stickers. Piping must protrude of at least 250-300 mm from each side, be slung with ropes of equal length and secured to the lifting hook (provide stops at the ends of the pipes to prevent the ropes from slipping off due to the weight).

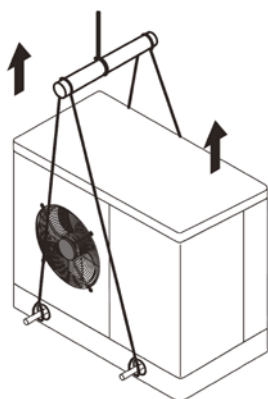
Use ropes and belts sufficiently long to extend beyond the height of the machine and place spacer bars and boards on the top to prevent damaging the sides and the top of the unit.

In this phase, before the definitive position, vibration damping supports can be installed (optional).

⚠ WARNING In all lifting operations make sure that the unit is securely anchored in order to prevent accidental falls or overturning.

Use all available lifting points.

» Lifting points



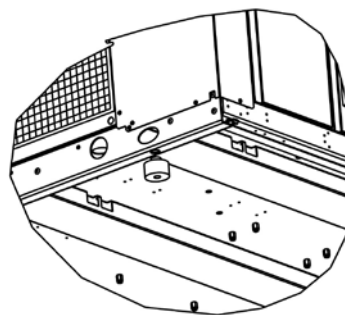
3.3 SITING AND DAMPERS

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 3.5 Dimensions p. 14);
- 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;
- 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 3.5 Dimensions p. 14).

This appliance is not intended to be used by children or persons with physical, sensorial or mental problems, inexpert or unprepared, without supervision. Be careful that children do not approach the appliance.

» Vibration dampers



MPE	DAMPERS
04 - 08	4
09 - 15	4
18 - 27 - T18 - T25	4
28 - 66	6
T30 - T45	6
T54 - T76	6

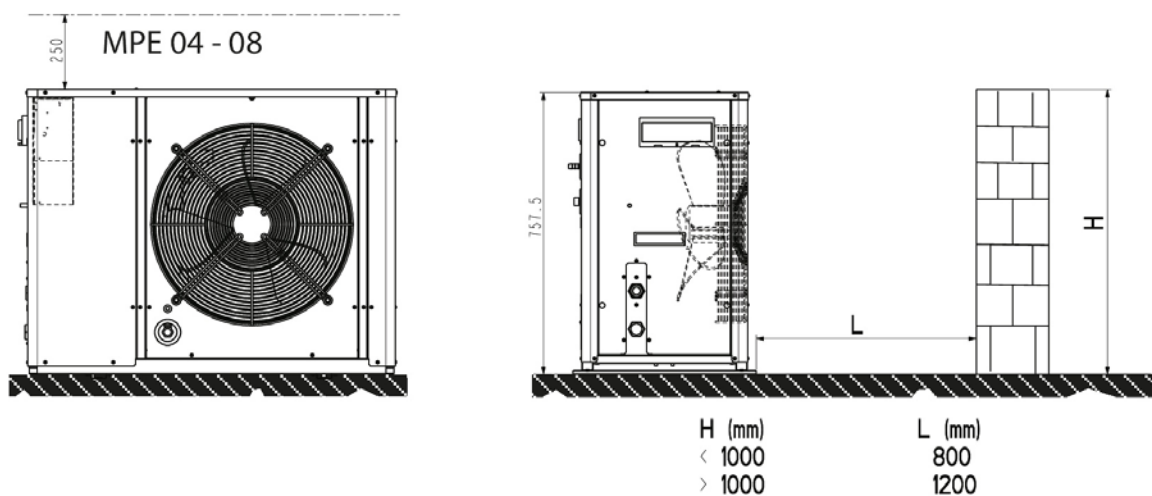
3.4 INSTALLATION CLEARANCE REQUIREMENTS

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 Spazi installazione MPE H 04 - 08 , spazi installazione MPE 09-15 , spazi installazione MPE H 18-27; MPE C T18-T25 , spazi installazione MPE 28-40 - T30 - T42 and spazi installazione MPE T54 - T76 .

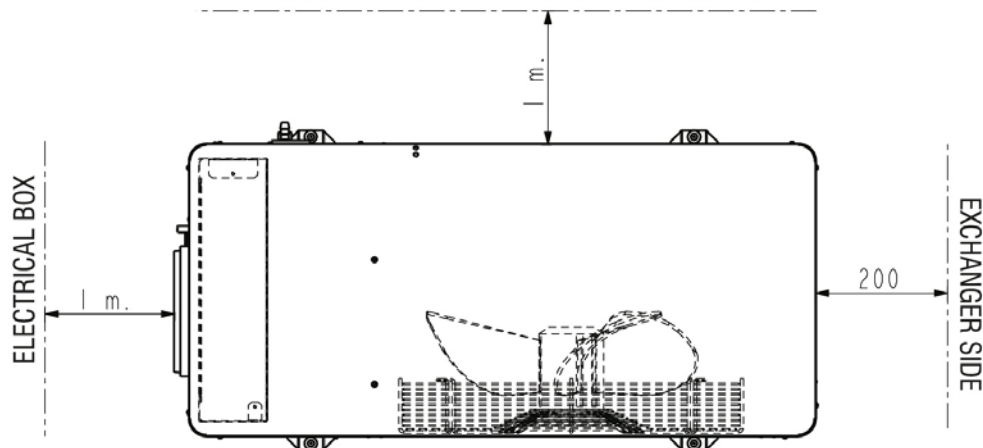
- Verify that there are no obstacles in front of the fans air outlet.
- Avoid any and all situations of backflow of hot air between air outlet and inlet of the unit.
- If even only one of the above conditions is not fulfilled, please contact the manufacturer to check for feasibility.
- In the design of the MPE 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.

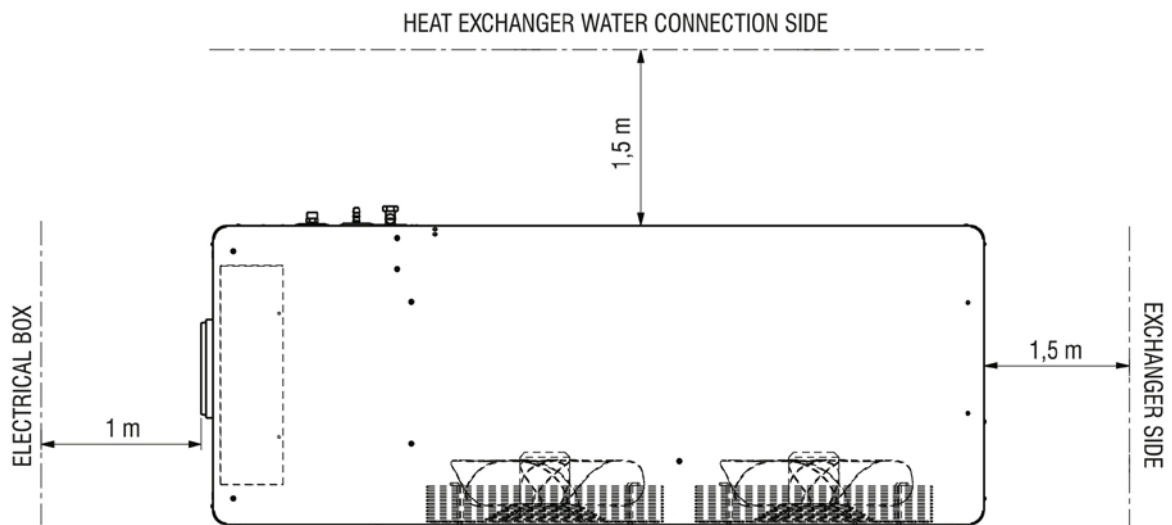
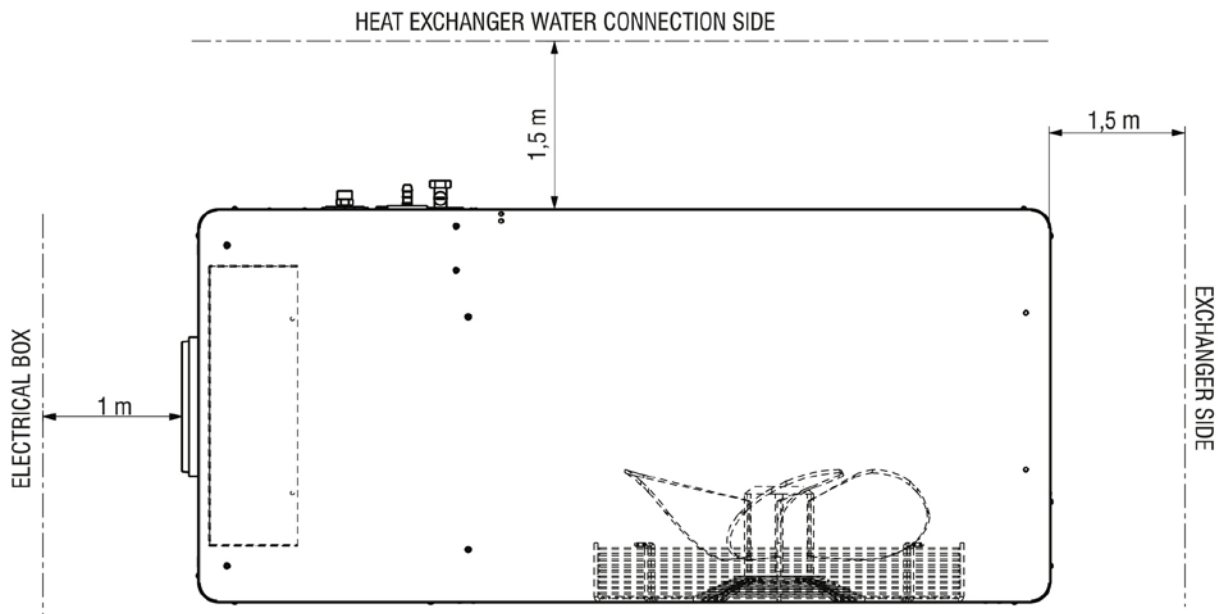
⚠ WARNING Heat pump units produce condensation while operating in the heating mode.

» MPE H 04 - 08

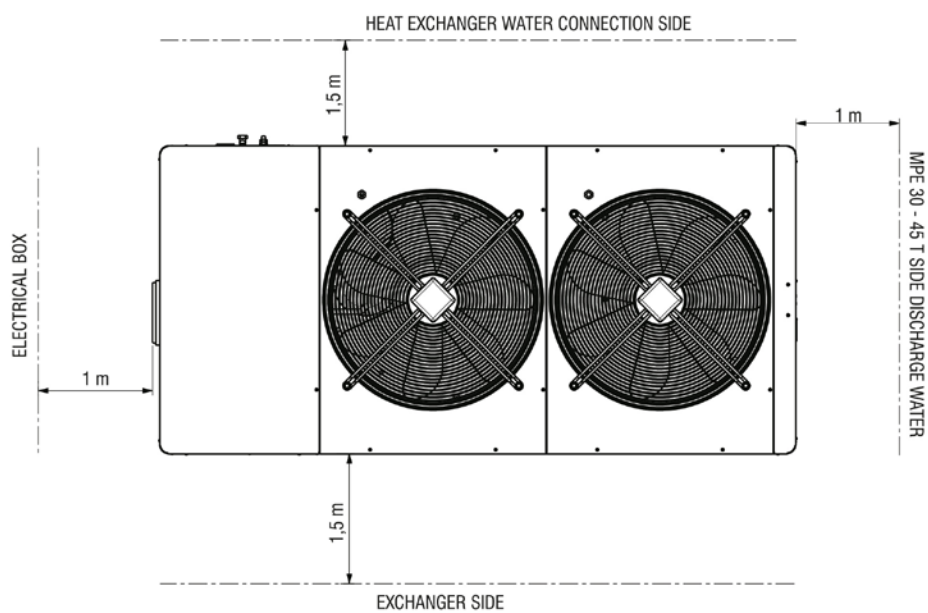


HEAT EXCHANGER WATER CONNECTION SIDE

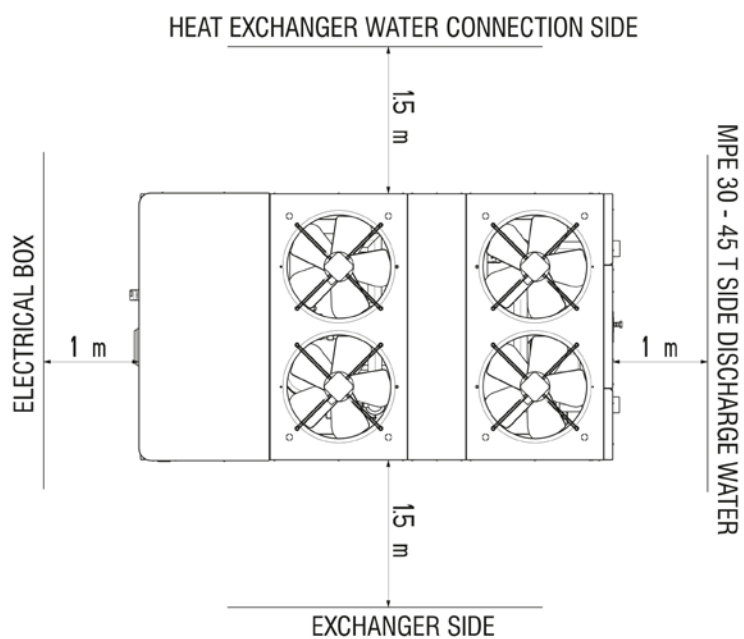




» MPE 28 - 40 - T30 - T42

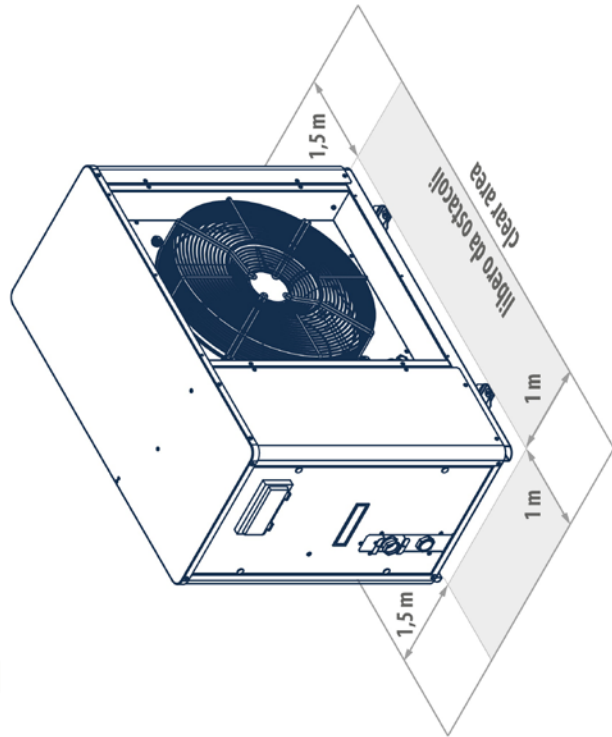
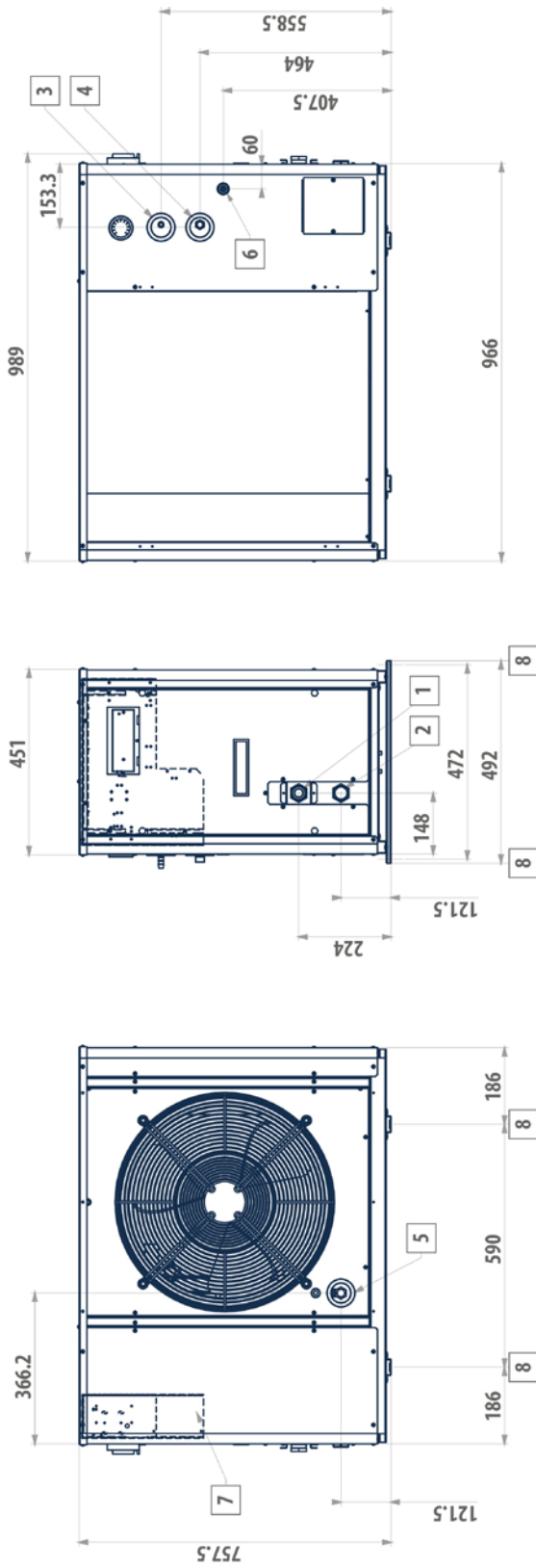


» MPE T54 - T76



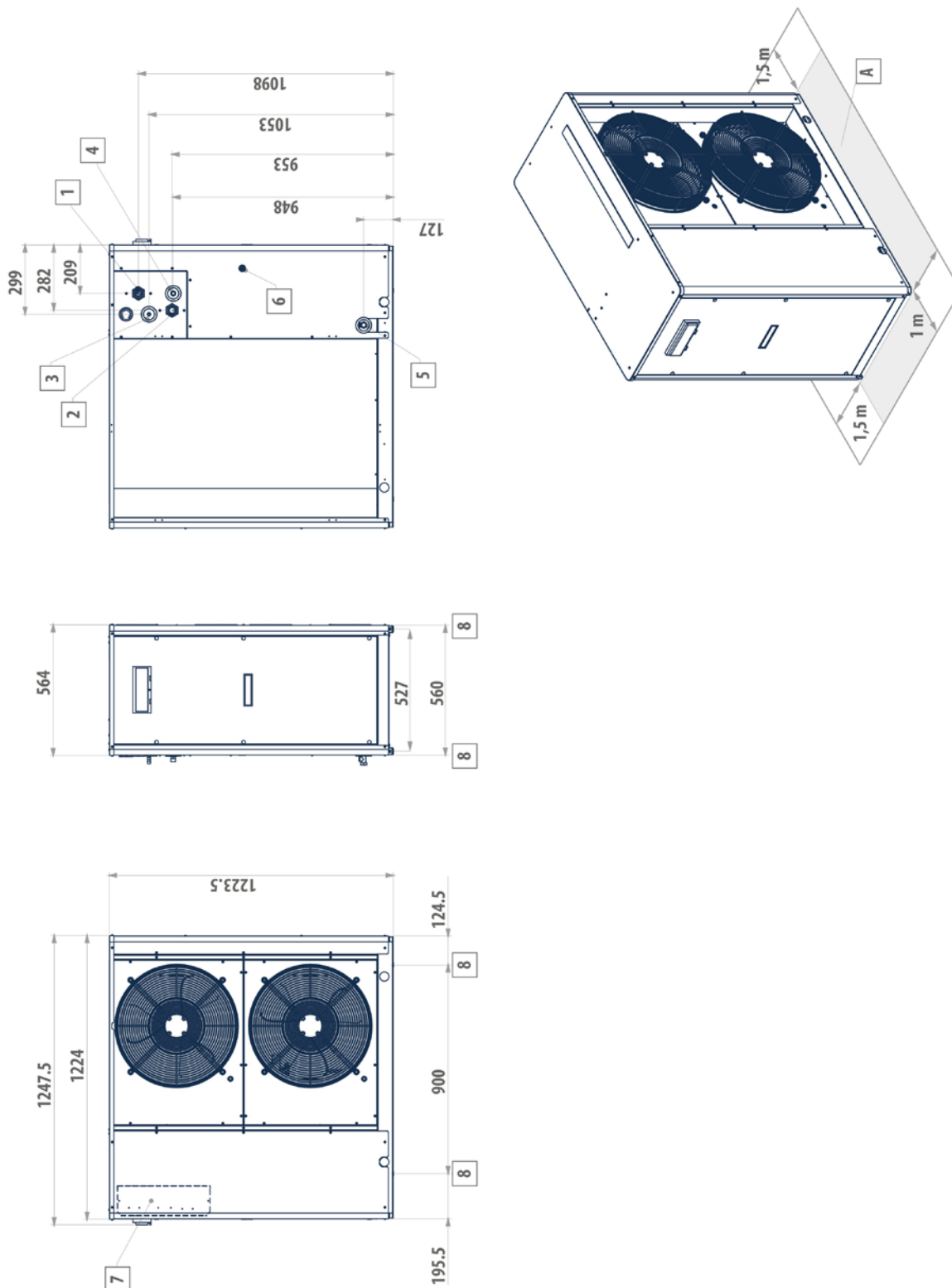
3.5 DIMENSIONS

» MPE H 04 - 08



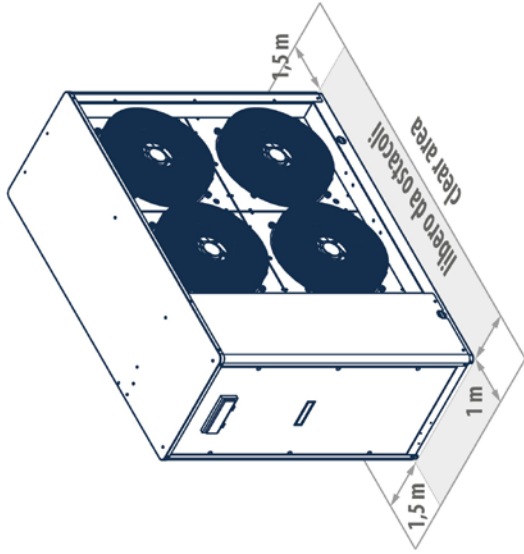
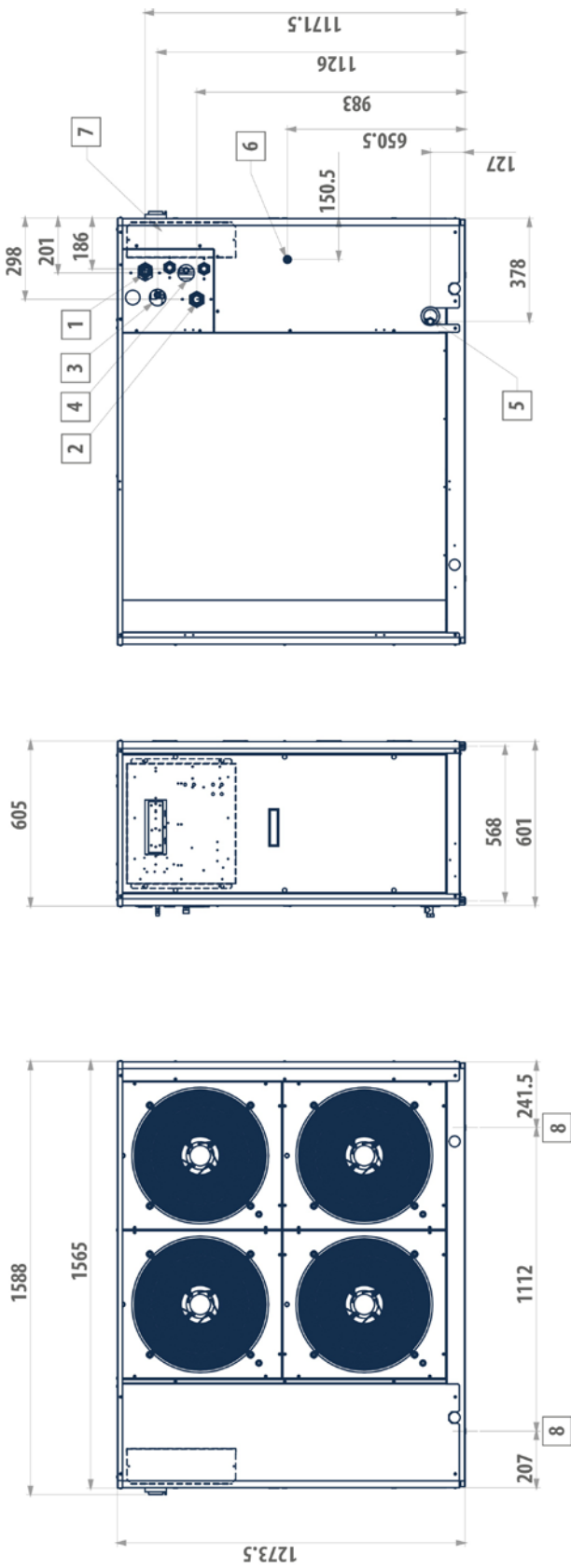
- LEGEND**
- 1** Water inlet 1" female
 - 2** Water outlet 1" female
 - 3** Safety valve discharge outlet provided with rubber ring holder
 - 4** Water supply 1/2" female (optional tap)
 - 5** Water drainage 1/2" female
 - 6** Power supply ϕ 28 mm
 - 7** Electric control board
 - 8** Vibration dumpers

» MPE 09 -15



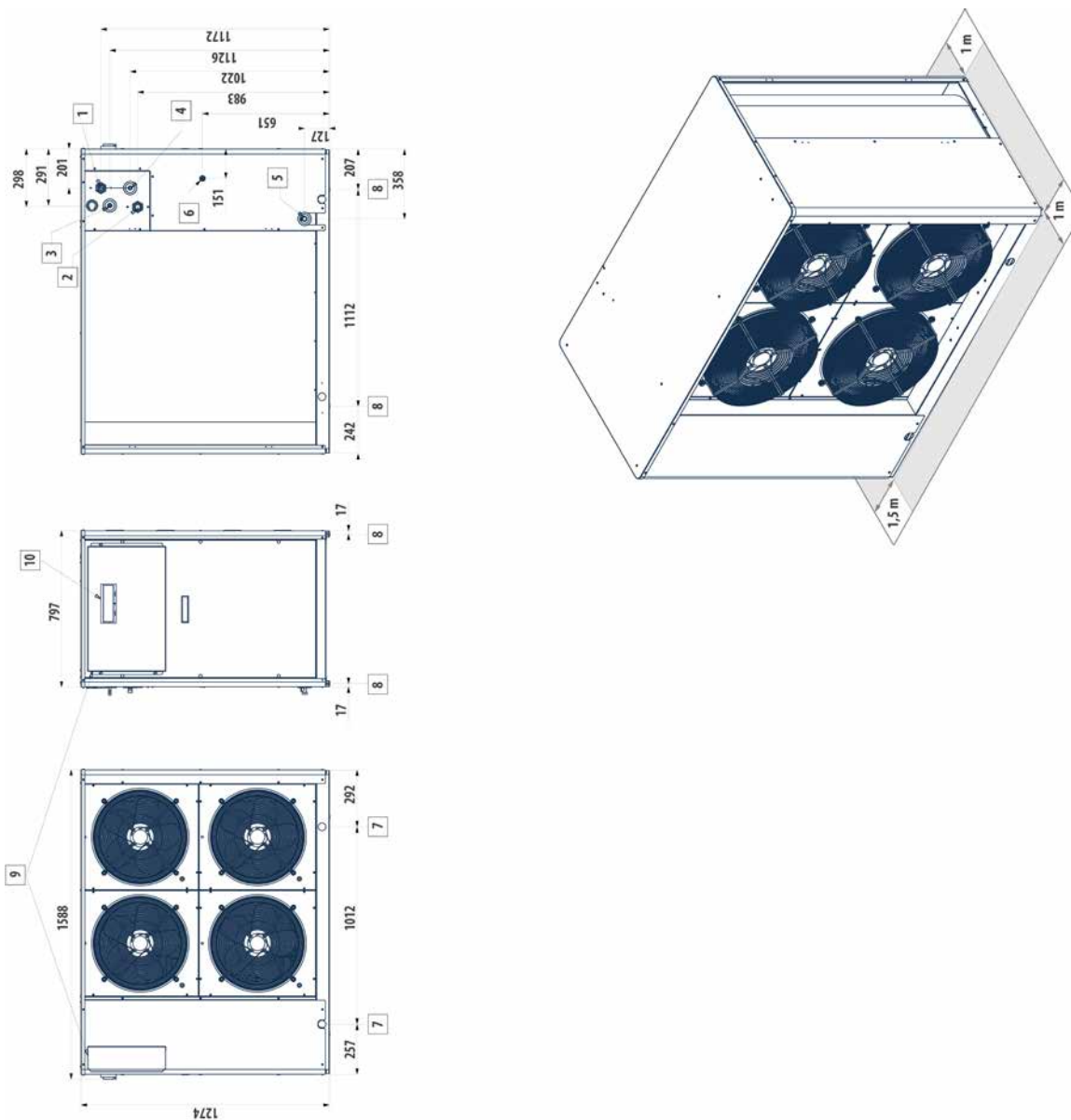
LEGEND

- 1** Water inlet 1" female
- 2** Water outlet 1" female
- 3** Safety valve discharge outlet provided with rubber ring holder
- 4** Water supply 1/2" female (optional tap)
- 5** Water drainage 1/2" female
- 6** Power supply \varnothing 28 mm
- 7** Electric control board
- 8** Vibration dumpers



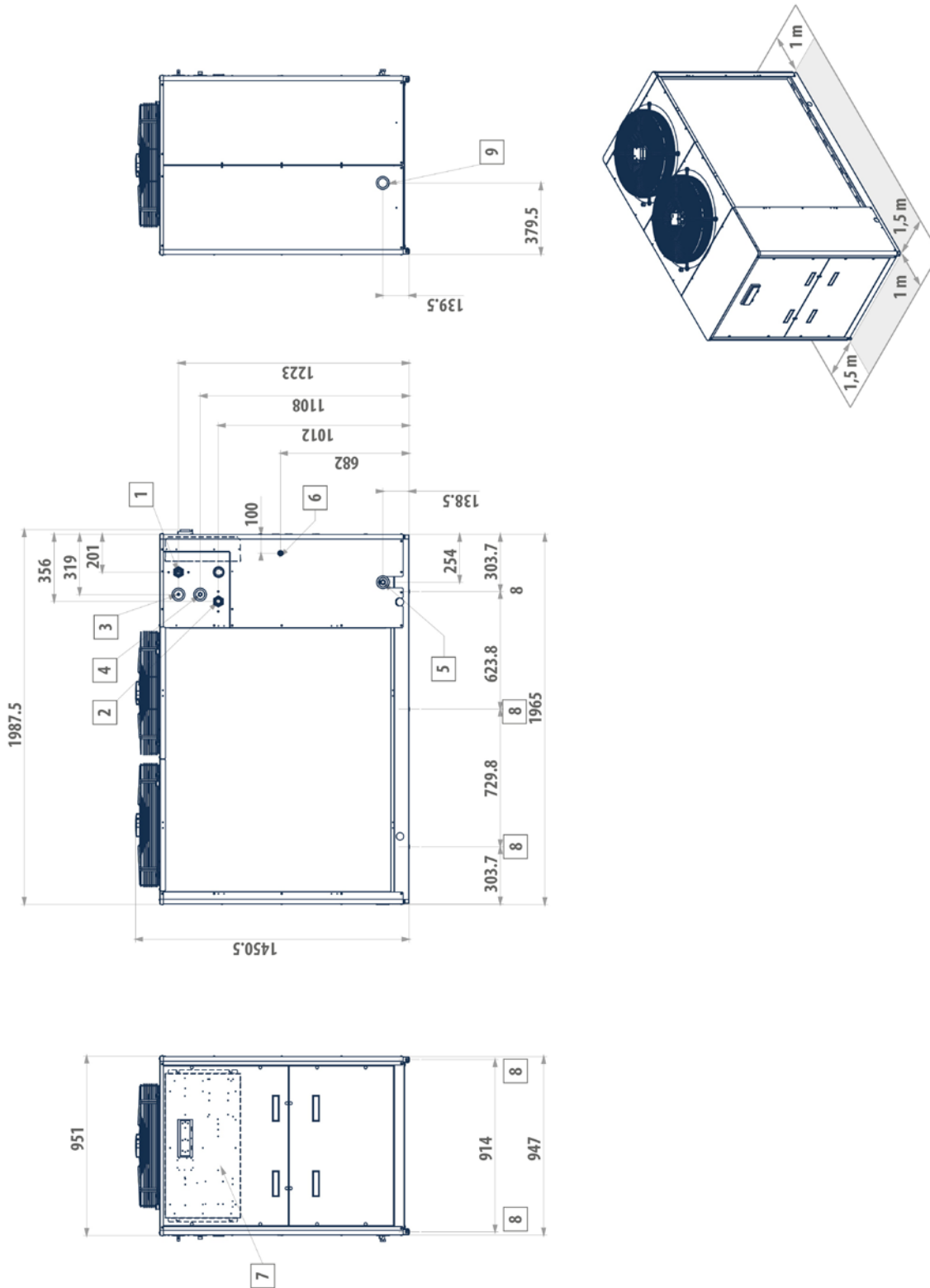
- LEGEND**
- 1 Water inlet 1" 1/4 female
 - 2 Water outlet 1" 1/4 female
 - 3 Safety valve discharge outlet provided with rubber ring holder
 - 4 Water supply 1/2" male (optional tap)
 - 5 Water drainage 1/2" female
 - 6 Power supply ø 28 mm
 - 7 Electric control board
 - 8 Vibration dampers

» MPE CT18-T23-T25



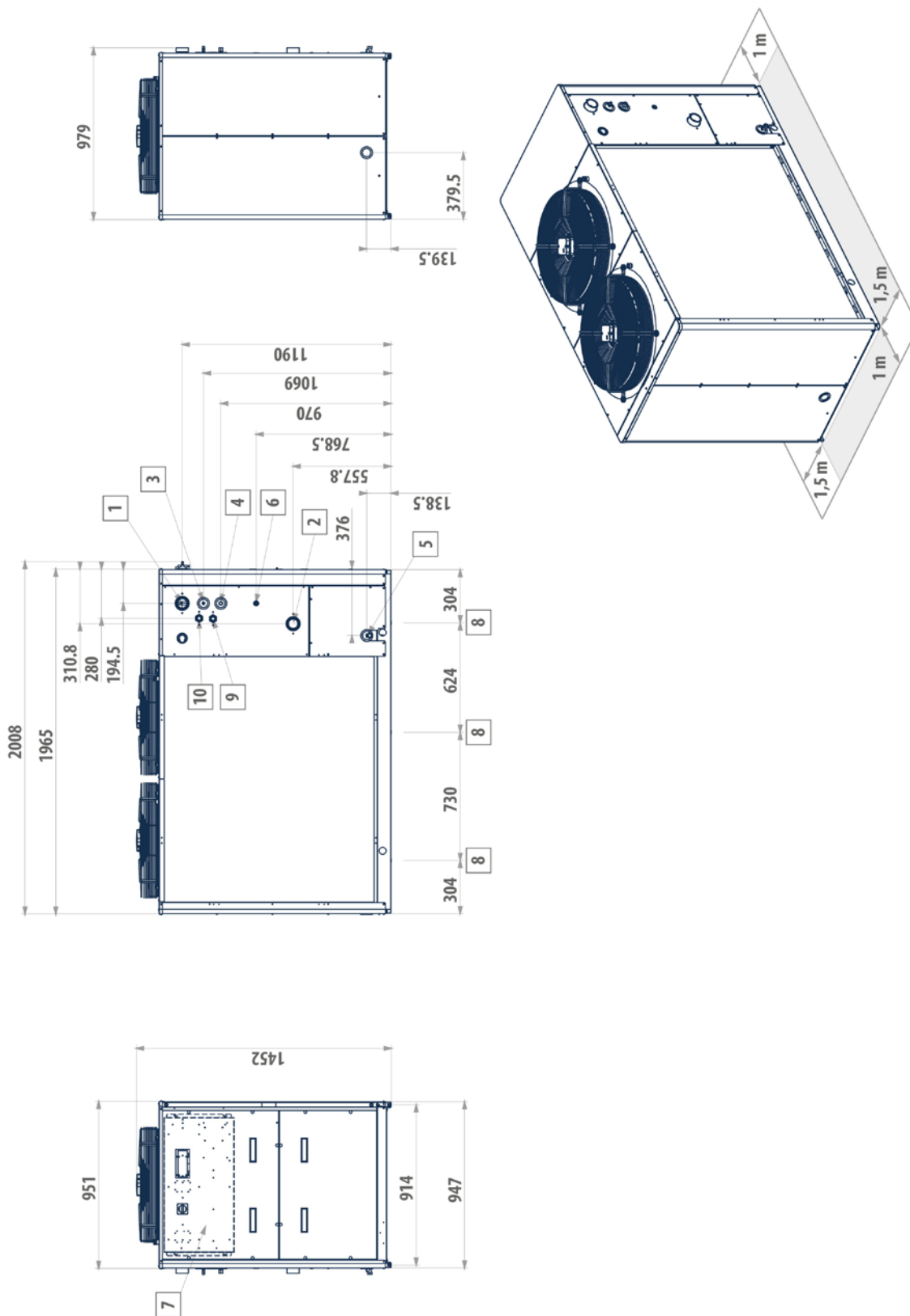
LEGEND

- 1** Water inlet 1" 1/4 female
- 2** Water outlet 1" 1/4 female
- 3** Safety valve discharge outlet provided with rubber ring holder
- 4** Water supply 1/2" male (optional tap)
- 5** Water drainage 1/2" female
- 6** Power supply ø 28 mm
- 7** Lifting points
- 8** Vibration dumpers
- 9** Electric control board
- 10** User interface



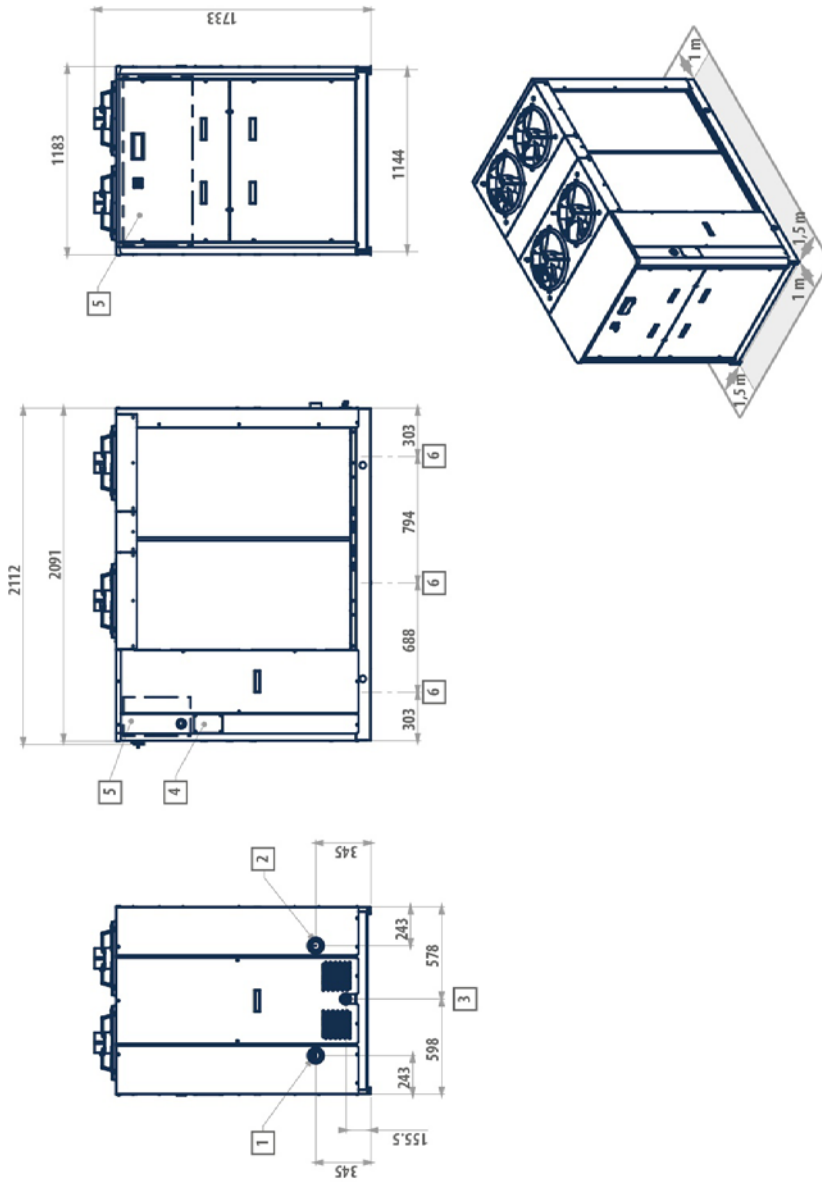
- LEGEND**
- 1 Water inlet 1" 1/4 female
 - 2 Water outlet 1" 1/4 female
 - 3 Safety valve discharge outlet provided with rubber ring holder
 - 4 Water supply 1/2" male (optional tap)
 - 5 Water drainage 1/2" female
 - 6 Power supply \varnothing 37 mm
 - 7 Electric control board
 - 8 Vibration dampers

» MPE H 54 - 66



LEGEND

- 1 Water inlet 2" female
- 2 Water outlet 2" female
- 3 Safety valve discharge outlet provided with rubber ring holder
- 4 Water supply 1/2" male
- 5 Water drainage 1/2" female
- 6 Power supply
- 7 Electric control board
- 8 Fastening points for vibration dampers (accessory)



- LEGEND**
- 1 Water inlet 2" female
 - 2 Water outlet 2" female
 - 3 Safety valve discharge outlet provided with rubber ring holder
 - 4 Water supply 1/2" male
 - 5 Water drainage 1/2" female
 - 6 Vibration dampers

4 TECHNICAL FEATURES

4.1 MPE C WATER CHILLERS RATED TECHNICAL DATA

» MPE C water chillers rated technical data

MPE			T18	T23	T25	T30	T34	T42	T54	T57	T64	T71
Power supply		V-ph-Hz	400 - 3N - 50									
Cooling capacity	(1)(E)	kW	19,9	23,4	26,0	31,9	35,9	42,5	54,6	56,9	65,8	71,5
Total power input	(1)(E)	kW	7,80	8,70	8,90	10,7	12,8	15,0	18,7	19,9	22,6	26,2
Absorbed rated current	(1)	A	13,6	15,2	15,4	19,9	23,2	26,7	34,4	36,4	40,7	46,4
EER	(1)(E)		2,56	2,68	2,94	2,97	2,79	2,83	2,93	2,86	2,91	2,73
SEER	(2)(E)		4,10	4,10	4,10	4,10	4,11	4,10	4,10	4,11	4,10	4,12
Eurovent efficiency class	(1)(E)		D	D	B	B	C	C	B	C	C	C
Maximum current absorption		A	16,2	25,5	25,8	33,5	39,1	34,8	43,3	45,2	58,7	56,8
Start up current		A	85	95	96	100	116	164	177	182	196	238
Startup current with soft starter		A	65	73	74	78	90	123	134	138	149	179
Compressors / circuits			2 / 1									
no. of axial fans			4	4	4	2	2	2	4	4	4	4
Air flow rate	(1)	m ³ /h	11600	117600	20100	20100	20100	19600	23900	23900	23500	23500
Water flow	(1)	l/h	3435	4041	4480	5489	6181	7320	9400	9795	11335	12306
Water pressure drop	(1)(E)	kPa	52	48	35	34	42	37	41	37	37	37
Available pressure head - LP pumps	(1)	kPa	111	92	96	126	101	98	145	147	142	136
Buffer tank volume		dm ³	50	50	50	125	125	125	125	125	125	125
Expansion vessel volume		dm ³	5	5	5	8	8	8	8	8	8	8
Unit connections diameter		"	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2
Height		mm	1274	1274	1274	1489	1489	1489	1733	1733	1733	1733
Depth		mm	797	797	797	947	947	947	1183	1183	1183	1183
Length		mm	1588	1588	1588	1988	1988	1988	2091	2091	2091	2091
Sound power level	(3)(E)	dB(A)	72	73	73	73	73	74	81	81	81	81
Sound power level, low-noise version	(3)	dB(A)	70	71	71	70	70	72	79	79	79	79
Sound pressure level	(4)	dB(A)	36	37	37	45	45	46	53	53	53	53
Refrigerant charge	(5)	kg	3,80	5,80	6,00	7,80	7,80	10,9	12,8	12,8	16,3	16,3
Transport weight unit with pump and tank		kg	232	256	260	448	484	521	643	665	685	786
Operating weight unit with pump and full tank		kg	282	306	309	555	591	663	751	773	793	894

(1) Outdoor air temperature 35°C, water temperature 12°C / 7°C (EN14511:2018)

(2) η efficiency values for heating and cooling are respectively calculated by the following formulas: $[\eta = SCOP / 2,5 - F(1) - F(2)]$ e $[\eta = SEER / 2,5 - F(1) - F(2)]$. For further information, please refer to the technical document "ErP 2009/125/EC DIRECTIVE" in the catalogue introducing pages, or to the EN14825:2017 regulation.

(3) Sound power level measured according to ISO 9614

(4) Sound pressure measured at a distance of 10 m in a free field with a directivity factor of 2

(5) Kg gas value is estimated. For the exact value refer to the plate data on the unit.

(E) EUROVENT certified data

4.2 MPE H HEAT PUMPS RATED TECHNICAL DATA

» MPE H heat pumps rated technical data

MPE		V-ph-Hz	004M	005M	007M	008	008M	009	010
Power supply		V-ph-Hz	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	400 - 3N - 50	230 - 1 - 50	400 - 3N - 50	400 - 3N - 50
Cooling capacity	(1)(E)	kW	4,00	5,00	6,70	8,30	8,10	9,20	9,10
Total power input	(1)(E)	kW	1,30	1,70	2,20	3,09	3,10	3,00	3,30
Absorbed rated current	(1)	A	6,49	8,17	10,5	5,37	14,0	5,40	6,01
EER	(1)		2,98	2,94	3,03	2,64	2,41	3,08	2,76
SEER	(2)		3,16	3,02	3,22	3,17	2,98	3,54	3,15
Heating capacity	(3)(E)	kW	4,70	5,90	7,50	9,90	10,3	10,5	10,9
Absorbed rated current	(3)	A	7,02	8,75	10,4	5,59	14,2	6,00	6,64
COP	(3)(E)		3,23	3,18	3,46	2,97	2,81	3,12	3,02
Eurovent efficiency class	(3)		B	B	A	B	C	B	C
Total power input	(3)(E)	kW	1,50	1,80	2,20	3,30	3,70	3,40	3,60
SCOP	(2)(E)		3,45	3,59	3,57	3,51	3,26	3,30	3,05
Energy efficiency			136	141	140	138	128	129	131
Heating energy efficiency class	(4)(E)		A+						
Maximum current absorption		A	9,00	11,0	11,0	9,00	17,6	8,00	12,0
Start up current		A	38	44	44	49	88	43	49
Startup current with soft starter		A	26	30	30	34	66	29	33
Air flow rate	(1)	m ³ /h	3635	3635	3400	3406	3406	7000	7385
Water flow	(1)	l/h	687	858	1151	1424	1401	1585	1568
Water pressure drop	(1)(E)	kPa	5	5	9	6	6	16	33
Available pressure head - LP pumps	(1)	kPa	77	74	55	67	67	146	115
Air flow rate	(3)	m ³ /h	3635	3635	3500	3406	3406	7000	7385
Water flow	(3)	l/h	815	1017	1307	1717	1781	1823	1890
Water pressure drop	(3)	kPa	5	5	11	8	8	21	46
Compressors / circuits			1 / 1						
Buffer tank volume		dm ³	20	20	20	20	20	30	30
Expansion vessel volume		dm ³	1	1	1	1	1	5	5
Unit connections diameter		"	1	1	1	1	1	1 1/4	1
Height		mm	758	758	758	758	758	1224	1224
Depth		mm	451	451	451	451	451	564	564
Length		mm	989	989	989	989	989	1248	1248
Sound power level	(5)(E)	dB(A)	66	66	68	67	82	69	69
Sound power level, low-noise version	(5)	dB(A)	64	64	65	65	65	67	67
Sound pressure level	(6)	dB(A)	38	38	40	39	71	41	41
Refrigerant charge	(7)	kg	1,50	1,50	2,00	2,10	2,10	2,90	2,90
Transport weight unit with pump and tank		kg	114	118	123	127	120	211	211
Operating weight unit with pump and full tank		kg	123	127	132	136	129	227	227

(1) Outdoor air temperature 35°C, water temperature 12°C / 7°C (EN14511:2018)

(2) η efficiency values for heating and cooling are respectively calculated by the following formulas: $[\eta = SCOP / 2,5 - F(1) - F(2)]$ e $[\eta = SEER / 2,5 - F(1) - F(2)]$. For further information, please refer to the technical document "ErP 2009/125/EC DIRECTIVE" in the catalogue introducing pages, or to the EN14825:2017 regulation.

(3) Outdoor air temperature dry bulb 7°C / wet bulb 6°C, water temperature 40°C / 45°C (EN14511:2018)

(4) Seasonal energy efficiency class for LOW TEMPERATURE room heating under AVERAGE climatic conditions [EUROPEAN REGULATION No 811/2013]

(5) Sound power level measured according to ISO 9614

(6) Sound pressure measured at a distance of 10 m in a free field with a directivity factor of 2

(7) Kg gas value is estimated. For the exact value refer to the plate data on the unit.

(E) EUROVENT certified data

» MPE H heat pumps rated technical data

MPE			010M	013	014	015	018	020	021	024	027
Power supply		V-ph-Hz	230 - 1 - 50	400 - 3N - 50	400 - 3N - 50	400 - 3N - 50	400 - 3N - 50	400 - 3N - 50	400 - 3N - 50	400 - 3N - 50	400 - 3N - 50
Cooling capacity	(1)(E)	kW	9,00	12,6	14,0	14,6	16,7	20,8	20,1	23,2	26,0
Total power input	(1)(E)	kW	3,31	4,31	4,70	5,31	6,40	7,90	7,00	8,19	9,49
Absorbed rated current	(1)	A	15,6	7,51	8,80	9,12	11,9	13,1	13,7	14,7	16,7
EER	(1)(E)		2,75	2,98	3,01	2,78	2,61	2,66	2,88	2,83	2,74
SEER	(2)(E)		3,15	3,45	3,25	3,39	3,17	3,14	3,38	3,32	3,32
Heating capacity	(3)(E)	kW	11,0	15,3	15,9	17,7	20,1	23,9	24,6	27,3	30,0
Absorbed rated current	(3)	A	17,4	8,37	9,40	9,63	12,3	13,2	13,9	14,7	15,9
COP	(3)(E)		3,04	3,19	3,17	3,16	2,94	2,99	3,39	3,28	3,32
Eurovent efficiency class	(3)(E)		B	B	B	B	C	C	A	A	A
Total power input	(3)(E)	kW	3,60	4,80	5,00	5,60	6,80	8,00	7,30	8,30	9,00
SCOP	(2)(E)		3,05	3,34	3,62	3,47	3,22	3,22	3,55	3,44	3,57
Energy efficiency			131	131	142	136	126	126	139	135	140
Heating energy efficiency class	(4)(E)		A+								
Maximum current absorption		A	24,0	15,0	11,0	18,0	22,0	24,0	24,0	26,0	32,0
Start up current		A	98	64	67	67	76	105	158	159	133
Startup current with soft starter		A	68	44	46	46	51	72	110	110	91
Air flow rate	(1)	m ³ /h	7385	6939	11600	6939	9990	9990	11900	9307	9307
Water flow	(1)	l/h	1554	2174	2409	2516	2886	3592	3459	4000	4469
Water pressure drop	(1)(E)	kPa	33	59	10	36	49	57	18	47	32
Available pressure head - LP pumps	(1)	kPa	115	81	139	102	130	109	140	109	118
Air flow rate	(3)	m ³ /h	7385	6939	11600	6939	9990	9990	11900	9307	9307
Water flow	(3)	l/h	1896	2642	2764	3060	3479	4139	4264	4720	5189
Water pressure drop	(3)	kPa	46	86	12	52	70	75	27	63	43
Compressors / circuits			1 / 1								
Buffer tank volume		dm ³	30	30	50	30	50	50	50	50	50
Expansion vessel volume		dm ³	5	5	5	5	5	5	5	5	5
Unit connections diameter		"	1	1	1 1/4	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
Height		mm	1224	1224	1274	1224	1274	1274	1274	1274	1274
Depth		mm	564	564	605	564	605	605	605	605	605
Length		mm	1248	1248	1588	1248	1588	1588	1588	1588	1588
Sound power level	(5)(E)	dB(A)	69	69	71	69	71	71	74	72	72
Sound power level, low-noise version	(5)	dB(A)	67	67	69	67	69	69	72	70	70
Sound pressure level	(6)	dB(A)	41	41	43	41	43	43	46	44	44
Refrigerant charge	(7)	kg	2,90	4,00	4,10	4,10	3,70	4,20	4,20	5,80	6,00
Transport weight unit with pump and tank		kg	211	216	219	219	265	281	281	297	313
Operating weight unit with pump and full tank		kg	227	232	236	236	301	317	317	333	350

- (1) Outdoor air temperature 35°C, water temperature 12°C / 7°C (EN14511:2018)
- (2) η efficiency values for heating and cooling are respectively calculated by the following formulas: [$\eta = SCOP / 2,5 - F(1) - F(2)$] e [$\eta = SEER / 2,5 - F(1) - F(2)$]. For further information, please refer to the technical document "ErP 2009/125/EC DIRECTIVE" in the catalogue introducing pages, or to the EN14825:2017 regulation.
- (3) Outdoor air temperature dry bulb 7°C / wet bulb 6°C, water temperature 40°C / 45°C (EN14511:2018)
- (4) Seasonal energy efficiency class for LOW TEMPERATURE room heating under AVERAGE climatic conditions [EUROPEAN REGULATION No 811/2013]
- (5) Sound power level measured according to ISO 9614
- (6) Sound pressure measured at a distance of 10 m in a free field with a directivity factor of 2
- (7) Kg gas value is estimated. For the exact value refer to the plate data on the unit.
- (E) EUROVENT certified data

» MPE H heat pumps rated technical data

MPE			028	T30	032	T34	035	040	054	066
Power supply		V-ph-Hz	400 - 3N - 50							
Cooling capacity	(1)(E)	kW	27,4	29,4	30,8	33,3	34,1	38,8	51,8	62,5
Total power input	(1)(E)	kW	8,81	10,6	10,2	12,8	11,6	13,1	18,2	24,6
Absorbed rated current	(1)	A	16,4	19,2	18,6	22,6	20,9	22,9	31,9	42,0
EER	(1)(E)		3,11	2,80	3,02	2,62	2,91	3,00	2,86	2,55
SEER	(2)(E)		3,71	3,85	3,58	3,78	3,58	3,66	3,57	3,18
Heating capacity	(3)(E)	kW	31,4	34,5	35,8	39,3	39,3	44,3	61,2	75,5
Absorbed rated current	(3)	A	17,1	19,9	19,2	23,0	21,0	23,5	32,7	40,4
COP	(3)(E)		3,37	3,12	3,34	3,03	3,34	3,31	3,24	3,18
Eurovent efficiency class	(3)(E)		A	B	A	B	A	A	A	B
Total power input	(3)(E)	kW	9,30	11,1	10,7	13,0	11,8	13,4	18,9	23,8
SCOP	(2)(E)		3,60	3,66	3,64	3,70	3,70	3,64	3,58	3,48
Energy efficiency			141	139	143	146	146	143	141	137
Heating energy efficiency class	(4)(E)		A+							
Maximum current absorption		A	32,0	37,0	34,0	43,0	38,0	40,0	40,0	41,0
Start up current		A	134	86	166	96	162	164	163	165
Startup current with soft starter		A	91	64	114	71	111	112	110	112
Air flow rate	(1)	m ³ /h	16276	16276	16276	16276	16276	15776	20048	20048
Water flow	(1)	l/h	4722	5062	5309	5736	5873	6686	8938	10763
Water pressure drop	(1)(E)	kPa	39	29	49	37	39	42	56	53
Available pressure head - LP pumps	(1)	kPa	139	146	120	130	126	115	107	89
Air flow rate	(3)	m ³ /h	16276	16276	16276	16276	16276	15776	20048	20048
Water flow	(3)	l/h	5438	5975	6190	6801	6809	7675	10578	13063
Water pressure drop	(3)	kPa	50	39	64	51	51	53	82	81
Compressors / circuits			1 / 1	2 / 1	1 / 1	2 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Buffer tank volume		dm ³	125	125	125	125	125	125	125	125
Expansion vessel volume		dm ³	8	8	8	8	8	8	8	8
Unit connections diameter		"	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2
Height		mm	1451	1451	1451	1451	1451	1451	1452	1452
Depth		mm	951	951	951	951	951	951	951	951
Length		mm	1988	1988	1988	1988	1988	1988	2008	2008
Sound power level	(5)(E)	dB(A)	73	76	73	72	73	75	78	78
Sound power level, low-noise version	(5)	dB(A)	71	70	71	70	71	73	76	76
Sound pressure level	(6)	dB(A)	45	44	45	44	45	47	50	50
Refrigerant charge	(7)	kg	7,50	7,80	7,50	7,80	7,80	10,8	13,0	15,0
Transport weight unit with pump and tank		kg	427	448	456	484	487	516	521	558
Operating weight unit with pump and full tank		kg	534	555	563	591	595	624	630	665

(1) Outdoor air temperature 35°C, water temperature 12°C / 7°C (EN14511:2018)

(2) η efficiency values for heating and cooling are respectively calculated by the following formulas: $\eta = SCOP / 2,5 - F(1) - F(2)$ e $\eta = SEER / 2,5 - F(1) - F(2)$. For further information, please refer to the technical document "ErP 2009/125/EC DIRECTIVE" in the catalogue introducing pages, or to the EN14825:2017 regulation.

(3) Outdoor air temperature dry bulb 7°C / wet bulb 6°C, water temperature 40°C / 45°C (EN14511:2018)

(4) Seasonal energy efficiency class for LOW TEMPERATURE room heating under AVERAGE climatic conditions [EUROPEAN REGULATION No 811/2013]

(5) Sound power level measured according to ISO 9614

(6) Sound pressure measured at a distance of 10 m in a free field with a directivity factor of 2

(7) Kg gas value is estimated. For the exact value refer to the plate data on the unit.

(E) EUROVENT certified data

» MPE H heat pumps rated technical data

MPE			T42	T54	T61	T69	T76
Power supply		V-ph-Hz	400 - 3N - 50				
Cooling capacity	(1)(E)	kW	42,5	53,2	60,5	68,5	74,5
Total power input	(1)(E)	kW	15,3	18,7	21,7	24,1	28,0
Absorbed rated current	(1)	A	27,0	34,0	38,6	42,5	48,7
EER	(1)(E)		2,79	2,86	2,79	2,85	2,66
SEER	(2)(E)		3,76	3,77	3,78	3,42	3,97
Heating capacity	(3)(E)	kW	48,0	60,3	67,8	76,6	85,2
Absorbed rated current	(3)	A	28,4	34,3	39,1	42,2	47,6
COP	(3)(E)		2,98	3,19	3,07	3,21	3,11
Eurovent efficiency class	(3)(E)		C	B	B	A	B
Total power input	(3)(E)	kW	16,1	18,9	22,1	23,9	27,4
SCOP	(2)(E)		3,68	3,55	3,47	3,67	3,56
Energy efficiency			147	139	136	144	140
Heating energy efficiency class	(4)(E)		A+				
Maximum current absorption		A	44,0	48,0	53,0	57,0	69,0
Start up current		A	164	177	187	202	229
Startup current with soft starter		A	123	130	138	149	169
Air flow rate	(1)	m ³ /h	19600	24930	24930	24354	24354
Water flow	(1)	l/h	7320	9173	10425	11800	12837
Water pressure drop	(1)(E)	kPa	37	51	64	50	58
Available pressure head - LP pumps	(1)	kPa	98	138	122	129	115
Air flow rate	(3)	m ³ /h	19600	24930	24930	24354	24354
Water flow	(3)	l/h	8308	10440	11736	13266	14740
Water pressure drop	(3)	kPa	47	58	74	56	69
Compressors / circuits			2 / 1				
Buffer tank volume		dm ³	125	125	125	125	125
Expansion vessel volume		dm ³	8	8	8	8	8
Unit connections diameter		"	1 1/4	2	2	2	2
Height		mm	1489	1733	1733	1733	1733
Depth		mm	947	1183	1183	1183	1183
Length		mm	1988	2112	2112	2112	2112
Sound power level	(5)(E)	dB(A)	74	81	81	81	81
Sound power level, low-noise version	(5)	dB(A)	72	79	79	79	79
Sound pressure level	(6)	dB(A)	46	53	53	53	53
Refrigerant charge	(7)	kg	10,9	11,0	11,0	16,0	16,0
Transport weight unit with pump and tank		kg	521	643	665	685	786
Operating weight unit with pump and full tank		kg	629	751	773	793	894

- (1) Outdoor air temperature 35°C, water temperature 12°C / 7°C (EN14511:2018)
(2) η efficiency values for heating and cooling are respectively calculated by the following formulas: $[\eta = SCOP / 2,5 - F(1) - F(2)]$ e $[\eta = SEER / 2,5 - F(1) - F(2)]$. For further information, please refer to the technical document "ErP 2009/125/EC DIRECTIVE" in the catalogue introducing pages, or to the EN14825:2017 regulation.
(3) Outdoor air temperature dry bulb 7°C / wet bulb 6°C, water temperature 40°C / 45°C (EN14511:2018)
(4) Seasonal energy efficiency class for LOW TEMPERATURE room heating under AVERAGE climatic conditions [EUROPEAN REGULATION No 811/2013]
(5) Sound power level measured according to ISO 9614
(6) Sound pressure measured at a distance of 10 m in a free field with a directivity factor of 2
(7) Kg gas value is estimated. For the exact value refer to the plate data on the unit.
(E) EUROVENT certified data

5 MICROPROCESSOR CONTROL

Below are specified the microprocessor control functions in the basic version.

The advanced control instructions are described in service manual.

5.1 USER INTERFACE

The control panel of the unit enables the user to display and set the unit's operating parameters and read the main operating data. In addition it indicates what mode (cooling or heating) the unit is operating in and signals any alarms that may have

been triggered. Any new settings saved are stored in the card and used the next time the unit is switched on, even following a power failure.



5.1.1 Display

Available information on display

- Upper digits (red color): display water inlet temperature inside the unit
- Lower digits (yellow color): configurable, see currently parameter

The display visualizes chiller set point when the unit is on and in chiller mode, heating set point when the unit is on and in heat pump mode, and OFF when the unit is in standby.

The display visualizes OnC when the unit is on and in chiller mode, OnH when the unit is on and in heat pump mode, and OFF when the unit is in standby.

5.1.2 Display icon

°C -°F BAR-PSI	ON when the display visualizes a temperature or a pressure
🕒	On when the display visualizes the RTC, working hours, etc.
⚠️	Lit and flashing with alarm
Vset	On if the Energy Saving, dynamic set-point or function for units without water storage tank are active. OFF if a function above is enabled but not active.
menu	On during function menu
🔥	On if heaters are activated (antifreeze heaters or/ and boiler)
❄️	On flashing during defrost delay time. On during defrost

Flow!	On flashing if water flow switch is activated. When the pump is OFF, the led is on flashing to indicate the correct status of the digital input
👁️	On if at least one of the 2 water pumps is on (evaporator pump or condensator pump)
🌀	On if fans are on
1 2	On if a compressor is on. On flashing during the delay time for compressor activation.
🔌	On if open collector output is active
❄️ ☀️	On if the controller is on in Heat or Cool mode according to the logic set in parameter CF 31
LP HP	HP and LP icons are on flashing in case of Low pressure alarm or High pressure alarm.

5.2 KEYS FUNCTIONS

KEYS	FUNCTION
	Push and release in main display: allows to display chiller (label SetC) or pdc (label SetH) set point
	Push and release for 2 times in main display: 1st time is visualized the setpoint (the value of the parameter), 2nd time is visualized the real setpoint (when Energy saving, Dynamic setpoint or function for units without water storage tank are enabled)
	Push for 3 seconds in main display: allows to modify chiller / pdc set point
	Push and release in scheduling: to enter in parameter modification; to confirm the changes of the parameter
	Push and release in ALrM menu: allows the alarm reset (if available) by ALrM menu
	Push and release: to main display allows to display configured probe value (temperatures/pressures) in upper display and label in lower display
	Push and release in scheduling: allows to scrolls the parameter lists folders (ST, CF,etc); allows to scrolls the parameters list. In modify phase increases the value of the parameters.
	Push and release: to main display allows to display configured probe value (temperatures/pressures) in upper display and label in lower display
	Push and release in scheduling: allows to scrolls the parameter lists folders (ST, CF,etc); allows to scrolls the parameters list. In modify phase decreases the value of the parameters.
	Push and release: to switch on/off the machine (chiller or heat pump) or to select std-by mode.
	Push and release: to switch on/off the machine (chiller or heat pump) or to select std-by mode.
	Push and release: allows to access in function menu.
	Push for 3 seconds and release: allows to set the clock in model where is intended
	Push and release in scheduling: allows to exit to the programming parameters

5.2.1 Keys combined functions

+	Simultaneous push of keys for 3 seconds: allows to access on parameters scheduling
+	Simultaneous push of keys: 1. allows to exit to parameters scheduling 2. push and hold to activate manual defrost

5.3 PROGRAMMING BY KEY

The control parameters were collected in functional groups (CF=configuration, CO=compressor) each identified with a label; general group ALL contain all control's parameters.

5.3.1 How to access the "Pr1" (user level)

How to access the "Pr1" parameters menu

1. push for some seconds the keys **SET** and ;
2. The icons flashing and the upper display shows "ALL" (first family of parameters);
3. Using and arrows scroll the other family labels parameters;
4. for all parameters group the last parameter is the password for the access at Pr2 level; in lower display appears Pr2 and in upper display appears the value.

5.3.2 How to access the "Pr2" parameters (Factory level)

How to access the "Pr2" parameters menu

- Enter the "Pr1" programming parameters level (see previous paragraph)
 - for each parameters the last parameter is password to access in Pr2 level; lower display visualizes "Pr2 and upper display visualizes "PAS";
 - push SET key; lower display visualizes PAS and upper display visualizes 0 flashing;
 - enter the password value using keys and ;
 - Push SET key to confirm the value;
- the display visualizes all parameters inside folder in which the password was entered

5.4 HOW TO CHANGING A PARAMETER VALUE

1. Access the parameters menu;
2. select the desired parameter;
3. push SET key to confirm the new value;
4. Use and keys to modify the value;
5. Push SET key to confirm the new value; after some seconds next parameter will be displayed
6. Exit the programming mode: push SET and when a parameter label is displayed, (not during programming with flashing value) or for time-out

NOTE: The new parameter value is also confirmed if, after changing it, no SET key is pressed for the time-out to exit.

ATTENTION: CF parameters (Configuration parameters) can be modified only if the controller is in OFF (digital input) or STD-BY. dF parameters can't be modified during defrost.

5.5 SWITCHING ON THE UNIT IN CHILLER - HEAT PUMP MODE

Push key or for more than 3 seconds allows turning on the unit in cooling or heat pump mode (depending to set of parameter CF31). During the 3 seconds the operating mode led is flashing.

It isn't possible to change operating mode directly, but to move from Chiller mode to Heat Pump mode or vice versa, it is necessary to stop the current cycle and then restart the new.

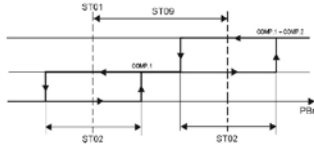
If wanted to set ON/OFF and SUMMER/WINTER from digital contact in terminal block.

- Connect ON/OFF signal in terminal block on 18/30

(close=ON)

- Connect summer/winter signal in terminal block on 19/30 (close =Summer)
- Enable the contacts through parameters CF8 = 4 e CF10 = 3

» Temperature control logic: bicompressor unit



5.6 HOW TO SET THE UNIT STAND-BY

If the controller is ON, the prolonged pressure of key active mode in that moment (chiller or heat pump) force STD-BY mode. It is possible to choose what visualize when the control is in STD-BY, by CF 46 = 0 parameter.

In STD-BY it is however possible to access in menu for navigation or for parameters modify.

Alarm management is enable in STD-BY mode; the present alarms are indicated normally.

5.7 THE FUNCTION MENU (KEY MENU)

Access on function menu allows to:

- Display and reset the active alarms;
- Display and reset working hours of compressors and water pumps;
- Display delay time for the start of defrost cycle (only heat pump configuration)
- Upload the parameters map from the controller to the Hot Key;
- Display/reset the alarm log.

Access to the functions menu is shown on display when the "menu" icon lights up.

5.7.1 Access to Function menu





Push and release the "menu" key. The "menu" icon is on.

5.7.2 Exit from Function Menu

Push and release the "menu" key or wait the time out.

5.7.3 How to display the alarms

Access to Function menu:

- select the "ALrM" function through  and  keys;
- Push and release the SET key.
- Push  or  keys;
- allows to display the active alarm.

To exit the alarm display push menu key or wait the time-out.

5.7.4 How to reset alarm

- Access to Function menu;
- select the "ALrM" function;
- push SET; lower display visualizes alarm code and upper display visualizes the rSt label if the alarm is resettable or the NO label, if isn't it. Scroll alla the presents alarms with keys

 or 

- push SET key near rSt label for reset the alarm and move to the next;
- to exit push menu key or wait the time-out.



5.8 OTHER FUNCTIONS AVAILABLE BY KEY:

5.8.1 How to display set point

Push and release the "SET" key allows to display set point, "SetC" (set chiller) set point for chiller mode; "SetH" (set point HP) set point for heat pump mode.

The push and release "SET" key with device in STD-BY allows to display all two set-point.

5.8.2 How to modify the set point

- Push "SET" key for about 3 seconds;
- the setpoint value is flashing;
- Use  and  keys to modify the new value;
- to memorize the new set point push the SET key or wait for the time out time to exit scheduling.

5.9 NO POWER OUTPUT

Reset after a black-out;

1. take controller at black-out previous status
2. During a defrost cycle, the procedure would be canceled
3. All delay time in progress are canceled and reinitialized.

5.10 PARAMETERS AND ALARMS LIST

Consult the supplied manual dedicated to controller for alarms and parameters lists

6 START-UP

The first start up must be carried out exclusively by qualified personnel and authorized by Galletti S.p.A. (see warranty sheet attached).

At first start-up of the installation make sure to comply with current national regulations.

In order to hold the condensate that the unit normally produces during operation in winter mode (and during defrosting), it is advisable to prepare a technical tank below the base of the unit, with sufficient capacity to collect and discharge the water produced. The adoption of a drip tray may be mandatory (check the local legislation in force) in case of the use of glycol or additives such as ethylene glycol that cannot be released into the environment in case of possible leakage of the circuit. The installer is responsible for the construction of such a drip tray.

6.1 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 $\pm 5\%$ 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.

In order to avoid soiling that could result in the breakage of the plate heat exchangers and hydronic pumps, it is necessary to wash the hydraulic system properly, before allowing water to circulate inside the unit. More specifically:

1. The hydraulic system must be flushed out, with a flow of water (which is then to be disposed of) and without passing through the filter at the inlet of the unit, in order to eliminate large-diameter impurities, debris, and any dirt present

as residue from the work carried out (e.g. welding). Continue flushing until the water (to be disposed of) becomes clear.

2. The system can then be connected to the chiller, on which the inlet water filter must be installed. In this phase it is necessary to let the water circulate inside the unit (through the filter) without starting the compressors in any case. Perform this operation for a sufficient time to allow the water to circulate in the system a few times.
3. At the end of the previous phase, clean the inlet filter, refit the cartridge in place, and circulate the water by starting the unit. In case of a flow alarm, check whether there is air in the circuit.

The fluid in the hydraulic circuit must not contain:

- dirt or solids in suspension;
- acids or bases or corrosive liquids in general;
- sea water;
- liquids that are flammable and generally dangerous.

⚠ CAUTION: during the start-up phase, maximum attention must be paid to the filling pressure of the system and in particular to the pressure of the intake water to the pump (under operating flow rate conditions) in order to AVOID CAVITATION phenomena that could seriously compromise the reliability of the pump. The intake pressure value must be higher than the minimum value indicated in the manuals. The cavitation phenomenon can also be identified by the anomalous noise produced by the pump when it is running; this noise disappears if the pressure returns to its proper value.

⚠ 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 7.3 Electrical data p. 33 to select the cooling or heating mode.

⚠ ATTENZIONE 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 the section 7.3 Electrical data p. 33.

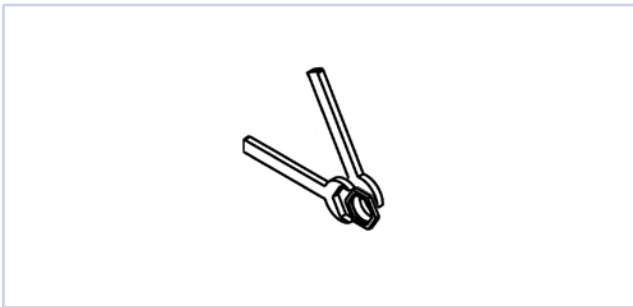
⚠ WARNING do not cut off power using the main switch: the latter device serves to disconnect the unit from the power supply when there is no passage of current, i.e. when the unit is already turned OFF.

7 PLUMBING AND ELECTRICAL CONNECTIONS

7.1 PLUMBING CONNECTION

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

⚠ WARNING! During the connections, hold unit hydraulic connections with a hexagonal wrench or make sure that don't rotate, to avoid damage the tubes inside the unit.



7.1.1 General guidelines for plumbing connections

When you are getting ready to set up the water circuit for the evaporator you should follow the directions below and in any case make sure you comply with national or local regulations (use the diagrams included in this manual as your reference).

1. Connect the pipes to the chiller using flexible couplings to prevent the transmission of vibrations and to compensate for thermal expansions. These units are all configured for installation of the water inlet-outlet pipes outside the unit (on the rear) and these pipes are supplied as standard accessories at no extra cost for the customer.
2. Install the following components on the piping:
 - Pair of quick-connection couplings with pipe section to be welded (optional item that may be selected from the price list). They facilitate the connecting operations to the plumbing system, greatly speeding up installation
 - temperature and pressure indicators for routine maintenance and monitoring of the unit. Pressure control on the water side allows to assess the correct functioning of the expansion tank and to detect water leakage in advance.
 - sumps on inlet and outlet piping for temperature detection, for a direct view of operating temperatures. They can also be consulted on the microprocessor on board the unit.
 - cut-off valves (gate valves) to isolate the unit from the hydraulic circuit.
 - metal net filter compulsory (inlet piping) with mesh no large than 1 mm, to protect the heat exchanger from slag or impurities inside the piping. If the machine is combined with process cycles, it is recommended to install a readily serviceable uncoupling exchanger to prevent possible operation blockages and/or breakage of the plate evaporator.
 - air vent valve placed on the higher parts of the hydraulic circuit to bleed the air. The internal pipes of the unit are fitted with small air vent valves for bleeding the unit itself: this operation should be conducted when the unit is disconnected from the power supply - make sure that the circuit is completely full of water and check again to make sure there is no air before starting the pump for the first time.

- discharge cock and, where needed, drain tank in order to empty the system for maintenance or seasonal stops. Drainage valve is provided on the optional water buffer tank: this operation may only be carried out when the unit is disconnected from the power supply.

⚠ WARNING! Failure to use anti-freezing solutions may cause serious damage of the free-cooling coils and to the hydraulic/cooling circuit in general.

Requirements for the heat transfer fluid and maintenance of the system

In order to avoid problems of reliability and/or operation of the hydronic system, it is necessary to take into consideration the characteristics of the heat transfer fluid (water or mixtures of water and glycol) and the hydraulic circuit.

The use of an unsuitable fluid can cause sludge deposits, algae growth, scale build-up, or corrosion and in some cases even erosion.

The Manufacturer does not accept any responsibility for damage caused by the use of untreated water, water containing particles or debris in suspension, water that has been incorrectly treated or admixed, or salt water.

By way of example, some (non-exhaustive) advice is given below (contact a specialist and consult specific standards such as UNI 8065)

- Ammonium ions (NH_4^+) dissolved in water should be eliminated due to their high reactivity with copper.
- Chlorine ions (Cl^-) pose a risk of holes developing due to corrosion.
- Sulfate ions (SO_4^{--}) must be eliminated because they may present a risk of corrosion.
- Limit for fluoride ions: 0.1 mg/l.
- Silicon may pose a risk of corrosion. Limit: < 1 mg/l.
- Electrical conductivity: the higher the specific resistivity, the lower the tendency of corrosion. Therefore, the following limit must be observed: Electrical conductivity: < 3,500 $\mu\text{S}/\text{cm}$
- pH: neutral pH at 20 °C ($7 < \text{pH} < 8$)
- Fixed residue (at 180 °C): < 2 000 mg/kg
- Conditioners Present within the concentrations prescribed by the supplier

The water must be analysed: it is advisable to contact a qualified water treatment specialist to determine the most suitable type of treatment according to the materials used in the hydraulic system.

The installed hydraulic circuit must include all the necessary devices for water treatment: mesh filter (immediately at the inlet to the unit), additive dosing systems if necessary, any intermediate heat exchangers, vent valves at all points of possible air accumulation, air intakes, isolation valves, etc., and anything else necessary according to best practice.

⚠ CAUTION! in case of regular shut-down, if it is necessary to empty the hydraulic circuit, the system must be flushed internally with nitrogen, making sure to leave it pressurized (at a pressure approximately equal to half the maximum pressure of the hydraulic circuit) in order to avoid the entry of oxygen and to protect the parts of the system from the risk of corrosion.

7.1.2 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 pipe 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 things, (**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 the water circuit (or the water chiller only) must be emptied to prevent damage 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	-3
20	-8
30	-15
40	-25

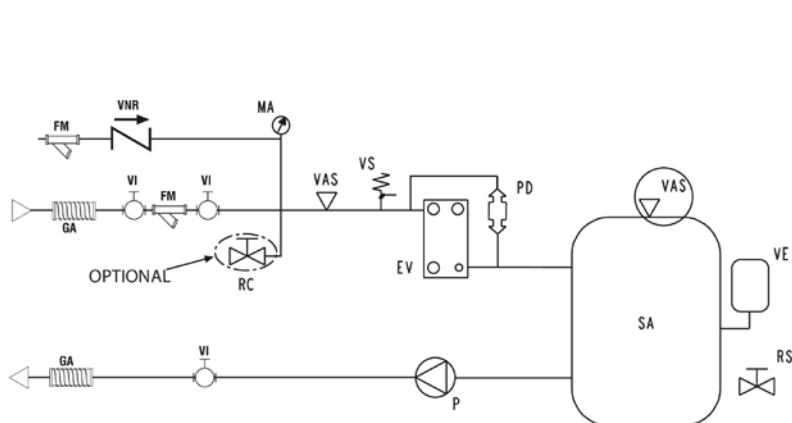
NOTE: The percentage shown in the upper table are indicative. Always refer to your glycol supplier for the right freezing temperatures.

NOTE: For choice of glycol percentage to use, in case of low temperature water produced, is recommended keeping a edge of 5K on outlet water temperature in order to consider any temperature fluctuations inside the heat exchanger. Example: water temperature produced: -10°C, minimum water temperature during the fluctuations: -10-5=-15°C, recommended ethylene glycol percentage: >30%.

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.

» Recommended water circuit



LEGEND

- VS** Safety valve
- EV** Evaporator
- PD** Differential pressure switch
- MA** Water gauge
- VAS** Air bleed hole
- SA** Storage tank
- VE** Expansion vessel
- RS** Drain
- RC** Water charge
- VI** Shut-off valve (not supplied)
- GA** Vibration-damping coupling (not supplied)
- FM** Mechanical filter (MANDATORY)
- VNR** Check valve (not supplied)

7.1.3 Filling the system

- Before you start filling, make sure that the system draining tap 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.

7.2 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 $\pm 5\%$ 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.

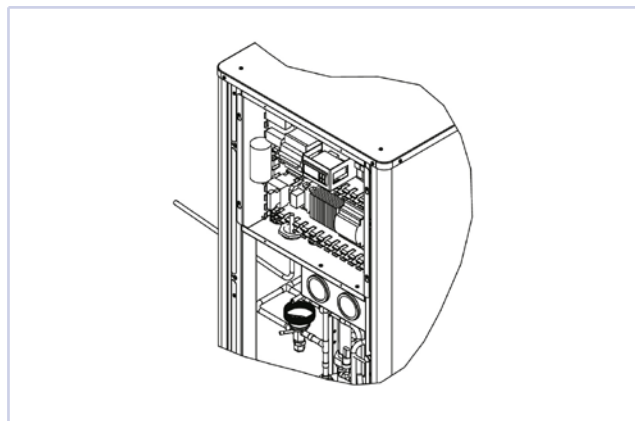
⚠ WARNING Never attempt to modify internal electrical connections: any undue modifications will immediately invalidate the warranty.

An all-pole circuit breaker must be used on the electric panel upstream, conform to IEC Standards (contacts must be open at least of 3 mm), with suitable interruption capacity and differential protection, according to the electrical data table described below, and installed as close as possible to the device.

For the unit power supply line use H07RN-F-type flexible rubber cables with the cross-section shown in the tables included in section p. 33. Use cable ducts and conduits suitable for outdoor installation to route the cables. Provide a switch and delayed fuses meeting the specifications given in the tables included in section p. 32. To access the electric control board it is necessary to remove the inspection panel by unscrewing the relevant screws; insert the power cable into the unit through the hole with cable gland on the side panel, then insert it into the electric control board through the appropriate cable gland.

Tighten the wires securely to the terminals and clamp the cable in place with the cable holder (figure p. 32).

To preserve the protection degree of the machine, use a cable gland compatible with the sheath or power cable diameter, in correspondence to the unit side panel hole.



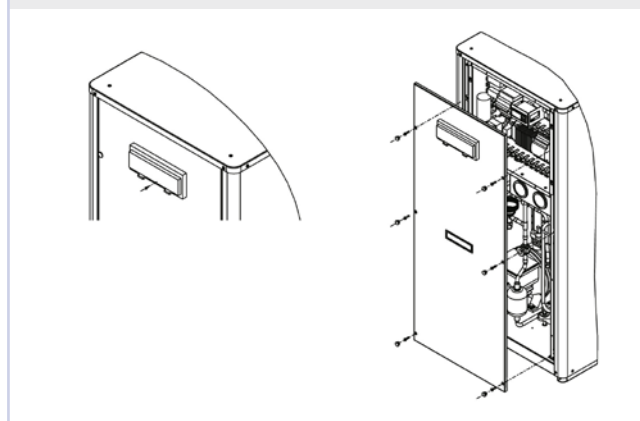
An earth connection is mandatory: connect the earthing wire to the terminal provided on the electric control board (see the electric control board layout supplied with the unit), marked \perp .

If you wish to include:

- a remote on/off switch
- a remote switch for changing over between the cooling and heating mode (MPE H only),
- a remote alarm indicator

It is a good idea to do so at this stage of the installation procedure, by connecting the switches or PCDS remote control (accessory) to the electric control board terminals as directed in section 7.3 Electrical data p. 33 and using the unit wiring diagram as your reference.

» Access to electrical control board



7.3 ELECTRICAL DATA

» MPE C

MPE			T18	T23	T25	T30	T34	T42	T54	T57	T64	T71
Maximum power input		kW	10,1	15,9	16,1	20,9	24,4	21,7	27,0	28,2	31,6	35,4
Maximum current absorption		A	16,2	25,5	25,8	33,5	39,1	34,8	43,3	45,2	58,7	56,8
Start up current		A	85	95	96	100	116	164	177	182	196	238
Startup current with soft starter		A	65	73	74	78	90	123	134	138	149	179
Fan motor rated power		kW	0,14	0,14	0,14	0,32	0,32	0,32	0,40	1,80	1,80	1,80
Pump motor rated power - LP pumps		kW	0,37	0,37	0,37	0,55	0,55	0,55	1,30	1,30	1,30	1,30
Pump motor rated current - LP pumps		A	2,72	2,72	2,72	3,00	3,00	3,00	5,90	5,90	5,90	5,90
Power supply		V-ph-Hz	400 - 3N - 50									
Auxiliary power supply		V-ph-Hz	230 - 1 - 50									
PCDS connecting cables		mm ²	1	1	1	1	1	1	1	1	1	1
PCD connecting cables		mm ²	AWG22									
Cross-section area of power cables	(1)	mm ²	10,0	16,0	16,0	10,0	16,0	16,0	16,0	16,0	16,0	25,0
Safety fuse F		A	40	50	50	40	50	63	63	63	63	80
Circuit breaker IL		A	40	50	50	50	50	63	63	63	63	80

(1) The shown section is to be considered as the minimum recommended section. The cables must be chosen in compliance with CEI - UNEL 35024/1. standard.

- 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). Cross-section area of cables: 4 A/mm² approx.

» MPE H

MPE		004M	005M	007M	008	008M	009	010	010M	013	014	015	
Maximum power input		kW	2,00	2,30	3,00	5,00	5,00	-	7,20	5,10	8,90	-	10,5
Maximum current absorption		A	9,00	11,0	11,0	9,00	17,6	8,00	12,0	24,0	15,0	11,0	18,0
Start up current		A	38	44	44	49	88	43	49	98	64	67	67
Startup current with soft starter		A	26	30	30	34	66	29	33	68	44	46	46
Fan motor rated power		kW	0,14	0,14	0,14	0,14	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	-	0,64	0,64	0,64	-	0,64
Pump motor rated power - LP pumps		kW	0,14	0,14	0,14	0,14	0,14	-	0,37	0,37	0,37	-	0,37
Pump motor rated current - LP pumps		A	0,58	0,58	0,58	0,58	0,58	-	2,00	2,00	2,00	-	2,00
Power supply		V-ph-Hz	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	400 - 3N - 50	230 - 1 - 50	400 - 3N - 50	400 - 3N - 50	230 - 1 - 50	400 - 3N - 50	400 - 3N - 50	400 - 3N - 50
Auxiliary power supply		V-ph-Hz	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50
Cross-section area of power cables	(1)	mm ²	4,00	4,00	6,00	4,00	6,00	-	4,00	6,00	4,00	-	4,00
PCD connecting cables		mm ²	AWG22										
PCDS connecting cables		mm ²	1	1	1	1	1	-	1	1	1	-	1
Safety fuse F		A	16	16	20	10	25	-	16	32	20	-	20
Circuit breaker IL		A	20	20	25	16	25	-	20	32	25	-	25

(1) The shown section is to be considered as the minimum recommended section. The cables must be chosen in compliance with CEI - UNEL 35024/1. standard.

MPE		018	020	021	024	027	028	032	035	040	054	
Maximum power input		kW	12,5	13,6	-	14,5	18,0	18,3	18,9	21,8	22,4	22,7
Maximum current absorption		A	22,0	24,0	24,0	26,0	32,0	32,0	34,0	38,0	40,0	40,0
Start up current		A	76	105	158	159	133	134	166	162	164	163
Startup current with soft starter		A	51	72	110	110	91	91	114	111	112	110
Fan motor rated power		kW	0,14	0,14	-	0,14	0,14	0,32	0,32	0,32	0,32	0,61
Fan motor rated current		A	0,64	0,64	-	0,64	0,64	1,75	1,75	1,75	1,75	2,65
Pump motor rated power - LP pumps		kW	0,37	0,37	-	0,37	0,37	0,55	0,55	0,55	0,55	0,90
Pump motor rated current - LP pumps		A	2,00	2,00	-	2,00	2,00	3,00	3,00	3,00	3,00	4,90
Power supply		V-ph-Hz	400 - 3N - 50									
Auxiliary power supply		V-ph-Hz	230 - 1 - 50									
PCD connecting cables		mm ²	AWG22									
PCDS connecting cables		mm ²	1	1	-	1	1	1	1	1	1	1
Safety fuse F		A	25	25	-	32	32	32	32	40	40	50
Circuit breaker IL		A	25	25	-	32	32	32	40	40	50	63
Cross-section area of power cables	(1)	mm ²	6,00	6,00	-	10,0	10,0	10,0	10,0	10,0	10,0	16,0

(1) The shown section is to be considered as the minimum recommended section. The cables must be chosen in compliance with CEI - UNEL 35024/1. standard.

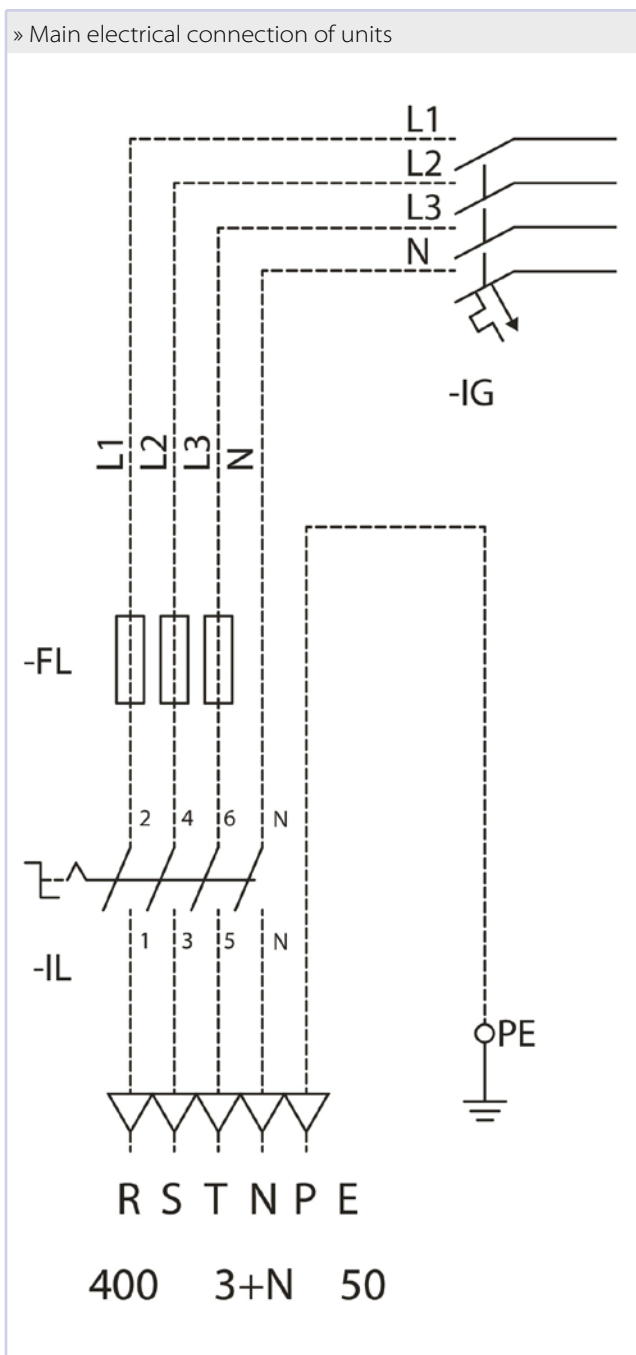
MPE		T30	T34	T42	T54	T61	066	T69	T76	
Maximum power input		kW	20,9	24,4	21,7	27,0	29,9	23,3	32,3	39,4
Maximum current absorption		A	37,0	43,0	44,0	48,0	53,0	41,0	57,0	69,0
Start up current		A	86	96	164	177	187	165	202	229
Startup current with soft starter		A	64	71	123	130	138	112	149	169
Fan motor rated power		kW	0,32	0,32	0,32	0,40	0,40	0,61	0,40	0,40
Fan motor rated current		A	1,75	1,75	-	1,80	1,80	2,65	1,80	1,80
Pump motor rated power - LP pumps		kW	0,55	0,55	0,55	1,30	1,30	0,90	1,30	1,30
Pump motor rated current - LP pumps		A	3,00	3,00	3,00	5,90	5,90	4,90	5,90	5,90
Power supply		V-ph-Hz	400 - 3N - 50							
Auxiliary power supply		V-ph-Hz	230 - 1 - 50							
PCD connecting cables		mm ²	AWG22							
PCDS connecting cables		mm ²	1	1	1	1	1	1	1	1
Safety fuse F		A	40	50	63	63	63	50	63	80
Circuit breaker IL		A	50	50	63	63	63	63	63	80
Cross-section area of power cables	(1)	mm ²	10,0	16,0	16,0	16,0	16,0	16,0	16,0	25,0

(1) The shown section is to be considered as the minimum recommended section. The cables must be chosen in compliance with CEI - UNEL 35024/1. standard.

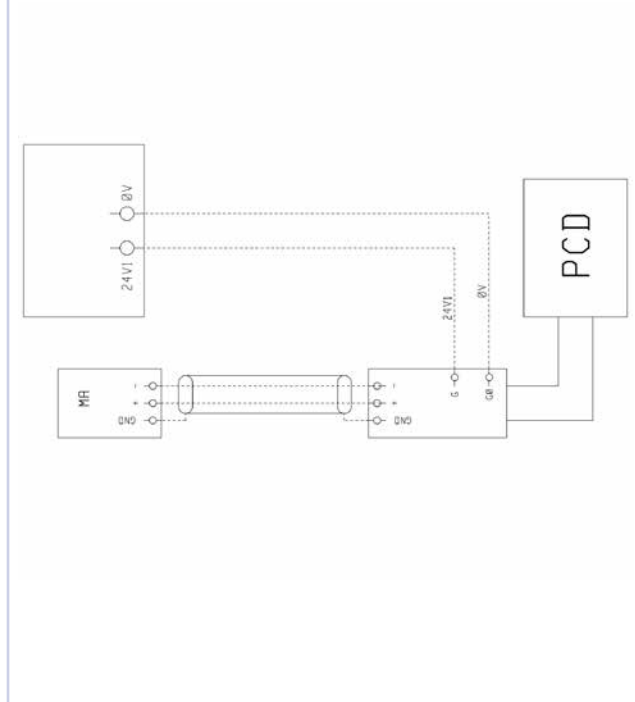
- The maximum input power is the mains power that must be available in order for the unit to work.
- The maximum current absorption refers to the current that will trigger the internal safety devices of the unit. It is the

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). Cross-section area of cables: 4 A/mm² approx.

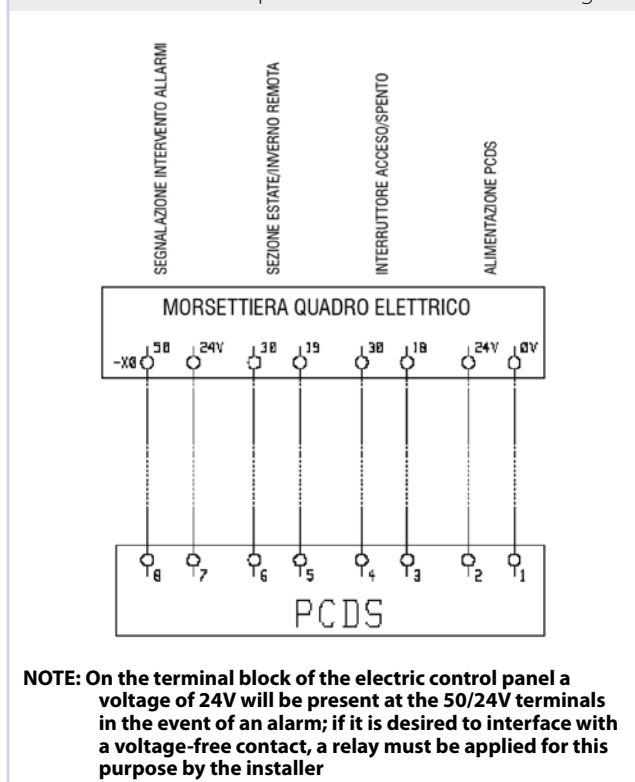
» Main electrical connection of units



» PCD remote control panel electrical connection diagram

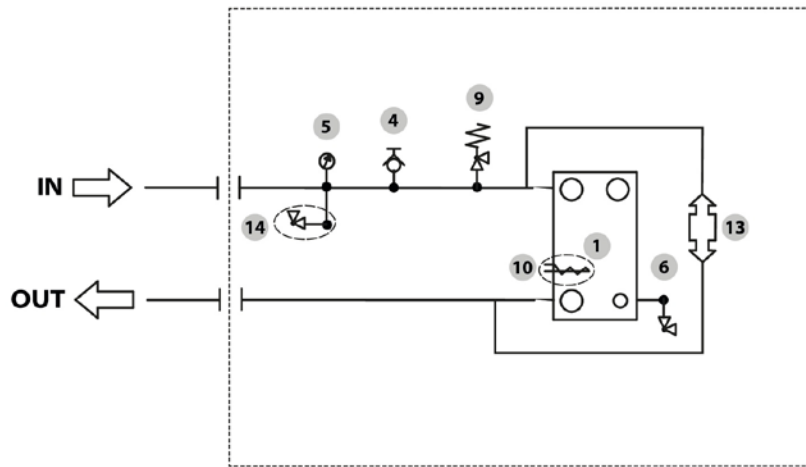


» PCDS remote control panel electrical connection diagram



7.4 WATER CIRCUIT

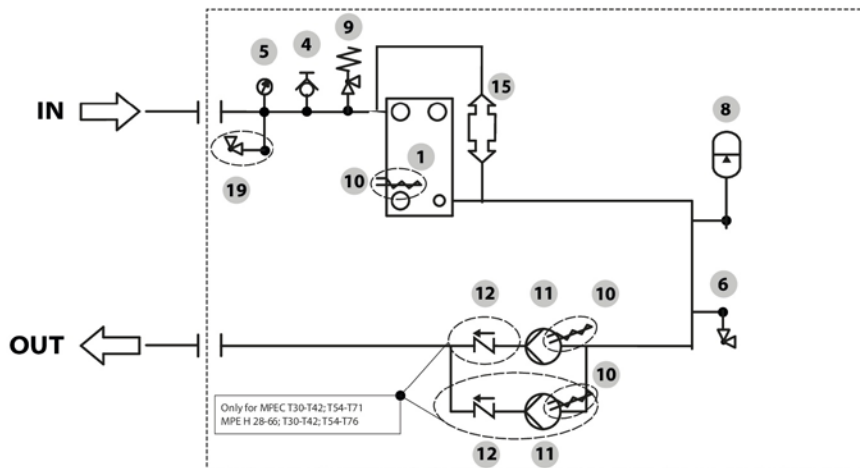
» MPE (evaporator)



LEGEND

1 Evaporator	6 Drain	11 -
2 -	7 -	12 -
3 -	8 -	13 Differential pressure switch
4 Air purge valve	9 Safety valve	----- Internal and external borderline
5 Pressure gauge	10 Antifreeze electric heating	----- OPTIONAL

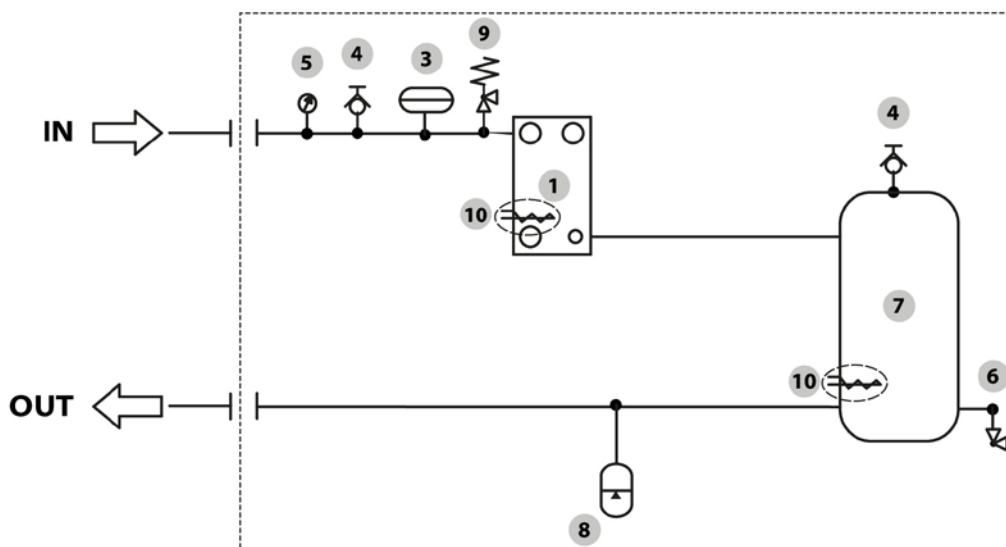
» MPE (evaporator and pump)



LEGEND

1 Evaporator	8 Expansion tank	15 Differential pressure switch
2 -	9 Safety valve	16 -
3 -	10 Antifreeze electric heating	17 -
4 Air purge valve	11 Hydraulic pump	18 -
5 Pressure gauge	12 Clapet valve	19 Water charge
6 Drain	13 -	----- Internal and external borderline
7 -	14 -	----- OPTIONAL

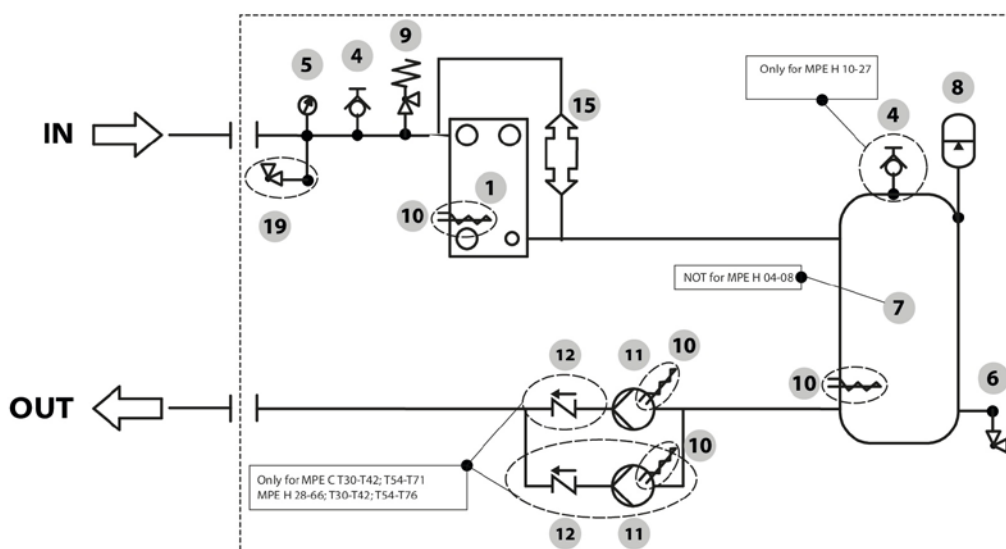
» MPE (evaporator and tank)



LEGEND

- | | | | | | |
|---|-----------------|---|----------------|-------|----------------------------------|
| 1 | Evaporator | 5 | Pressure gauge | 9 | Safety valve |
| 2 | - | 6 | Drain | 10 | Antifreeze electric heating |
| 3 | Flow switch | 7 | Buffer tank | ----- | Internal and external borderline |
| 4 | Air purge valve | 8 | Expansion tank | ----- | OPTIONAL |

» MPE (evaporator, pump and tank)



LEGEND

- | | | | | | |
|---|-----------------|----|-----------------------------|-------|----------------------------------|
| 1 | Evaporator | 8 | Expansion tank | 15 | Differential pressure switch |
| 2 | - | 9 | Safety valve | 16 | - |
| 3 | - | 10 | Antifreeze electric heating | 17 | - |
| 4 | Air purge valve | 11 | Hydraulic pump | 18 | - |
| 5 | Pressure gauge | 12 | Clapet valve | 19 | Water charge |
| 6 | Drain | 13 | - | ----- | Internal and external borderline |
| 7 | - | 14 | - | ----- | OPTIONAL |

8 OPERATING LIMITS

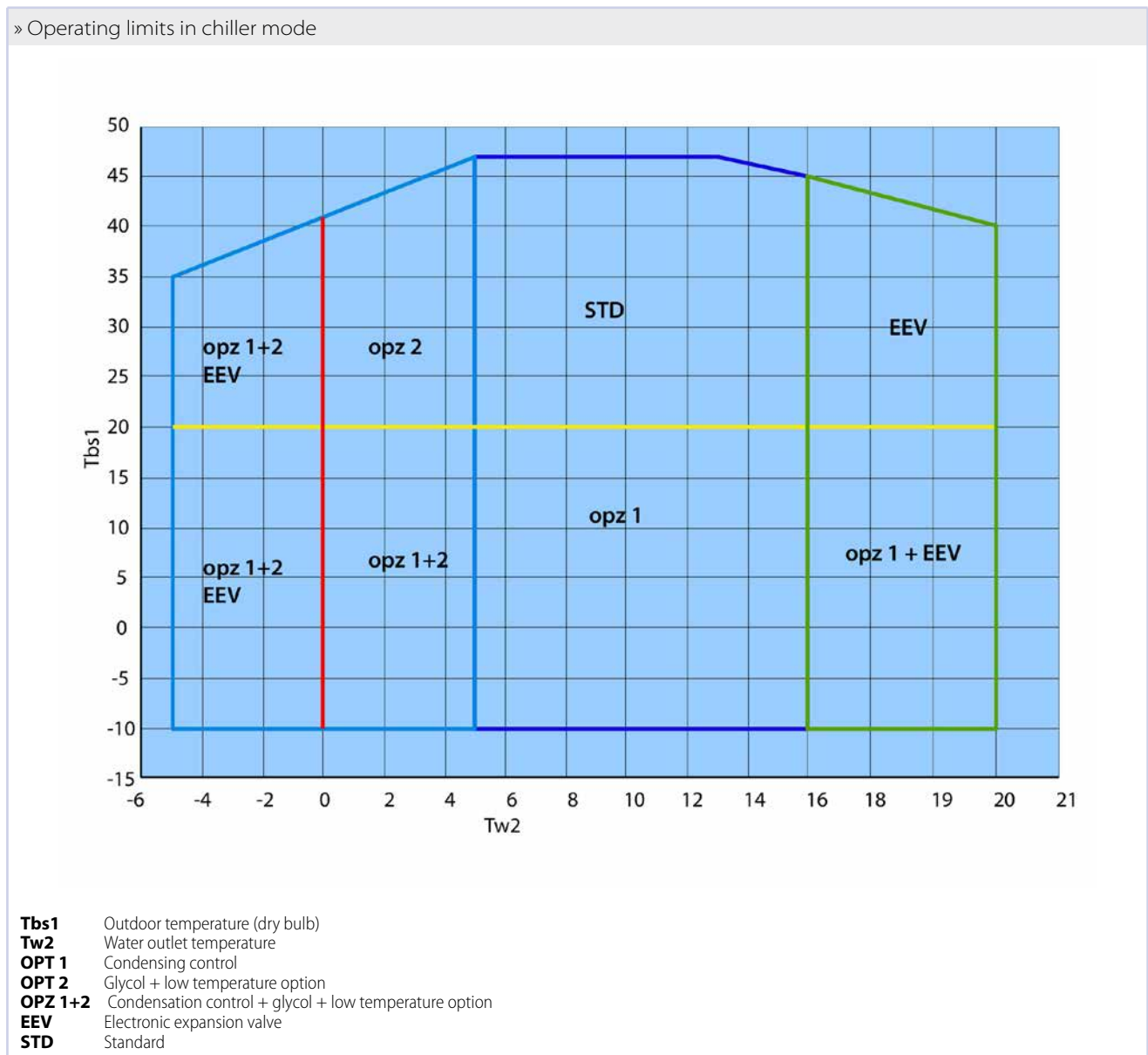
The graphs below illustrate the operating limits of MPE units (in the case of continuous operation) in relation to the outlet water temperature and outdoor air temperature.

Operating limits	Water chiller		Heat pump	
	MIN	MAX	MIN	MAX
Inlet water temperature (°C)	8	20	22	42
Outlet water temperature (°C)	5	16	25	53 ¹
Temperature difference on the water side (°C)	3	8	3	8
Outdoor air temperature (°C)	20 ²	47	-10	20 ³

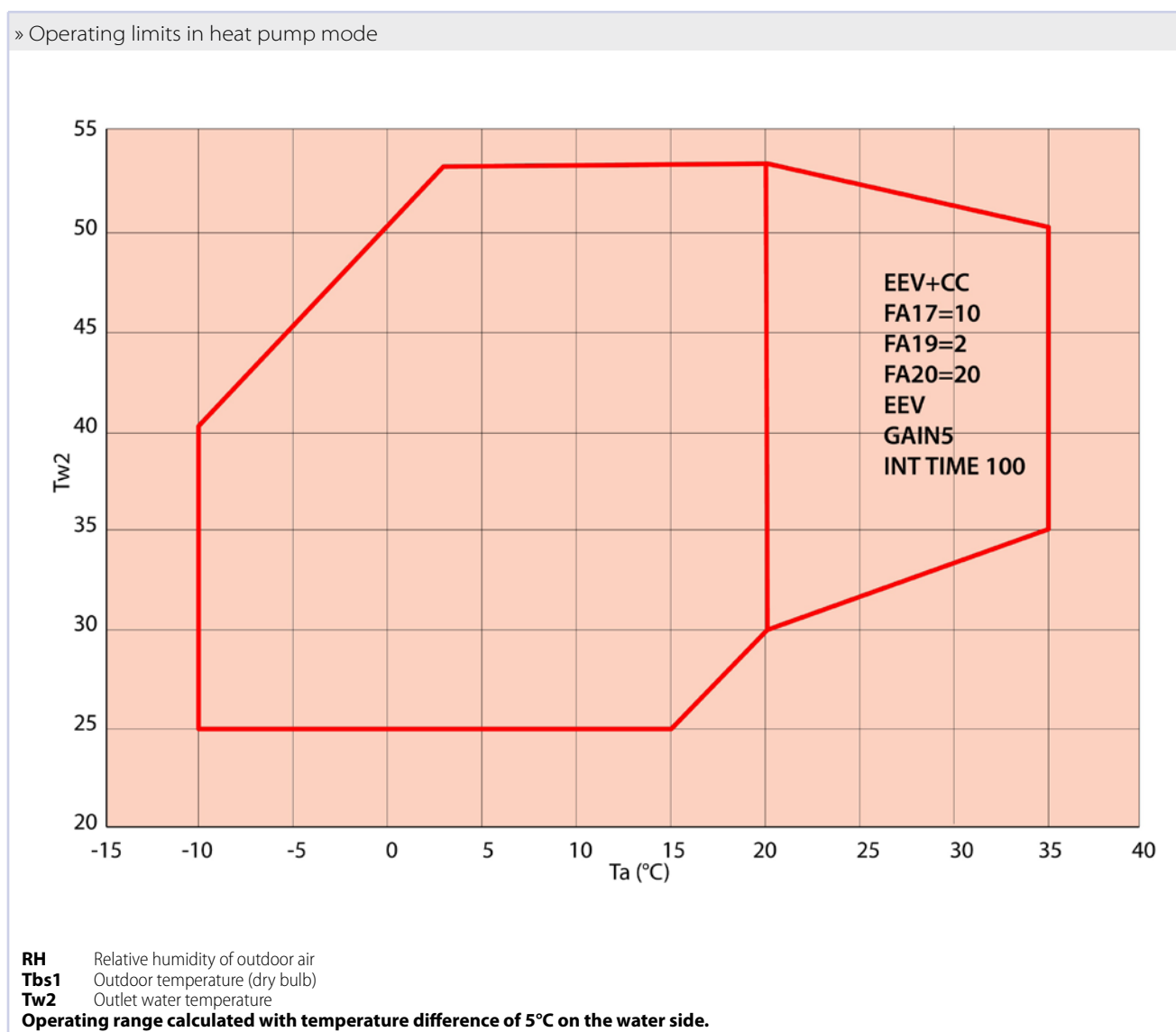
1. Value achievable only for outdoor air temperatures above 0 °C.
2. Condensation control: T external air min -10 °C.
3. Evaporation control. outdoor air temperature max 35°C

⚠ 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.

8.1 OPERATING LIMITS IN CHILLER MODE



8.2 OPERATING LIMITS IN HEAT PUMP MODE



Extended operating envelope in heat pump mode

Heat pump operation within the right area of the extended operating envelope (beyond standard limits) can be allowed only for units equipped with condensation control (or EC fans) and electronic expansion valve

For fans, the parameters to be modified on iChill control are the following: FA17-FA19-FA20.

Parameters GAIN and INT TIME are regulation parameters; they have to be modified inside the electronic expansion valve driver. Both modifications should only be made in the factory or implemented on the field, but only by Galletti S.p.A. authorized personnel.

8.3 THERMAL CARRYING FLUID

The units belonging to the MPEseries can work with mixtures of water and up to 25% ethylene glycol.

9 CONTROL AND SAFETY DEVICES

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

9.1 CONTROL DEVICES

9.1.1 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 chapter regarding the microprocessor).

9.1.2 Control device settings

CONTROL DEVICES	SET POINT	MIN	MAX	DIFFERENTIAL
Service thermostat (outlet water temp. cooling mode)	11,5 °C	8 °C	20 °C	2 °C
Service thermostat (outlet water temp. heat pump mode)	45 °C	25 °C	47 °C	3 °C

9.2 SAFETY DEVICES

9.2.1 High pressure switch

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

9.2.2 Low pressure switch

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

9.2.3 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).

9.2.4 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).

9.2.5 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)

9.2.6 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.

9.2.7 Safety device settings

Safety device	Start up	Differential	Resetting
Maximum pressure switch (bars)	42	-	Manual
Pressure safety valve (bars)	45	-	Manual
Minimum pressure switch (bars)	2	-	Automatic
Antifreeze thermostat (°C)	3	3	Manual
Water safety valve (bars)	4	-	-

⚠ WARNING: In order not to exceed the maximum allowable pressure in the low pressure branch, the unit must be stored at an ambient temperature not exceeding 50 °C.

10 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.

10.1 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 p. 6.
- Check that the noise emissions of the unit are regular (monthly).
- If necessary, release the pump rotor.

10.2 CHECKS AND MAINTENANCE TO BE PERFORMED BY SPECIALISED PERSONNEL

REQUIREMENTS

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 power 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.

⚠ ATTENTION In case of extraordinary weather events, the unit must be stopped; prior to putting it back into operation,

it must be inspected by qualified personnel who must first check the integrity of the cooling circuit (pipes and components) and electrical connections, and verify that the safety devices are working properly.

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

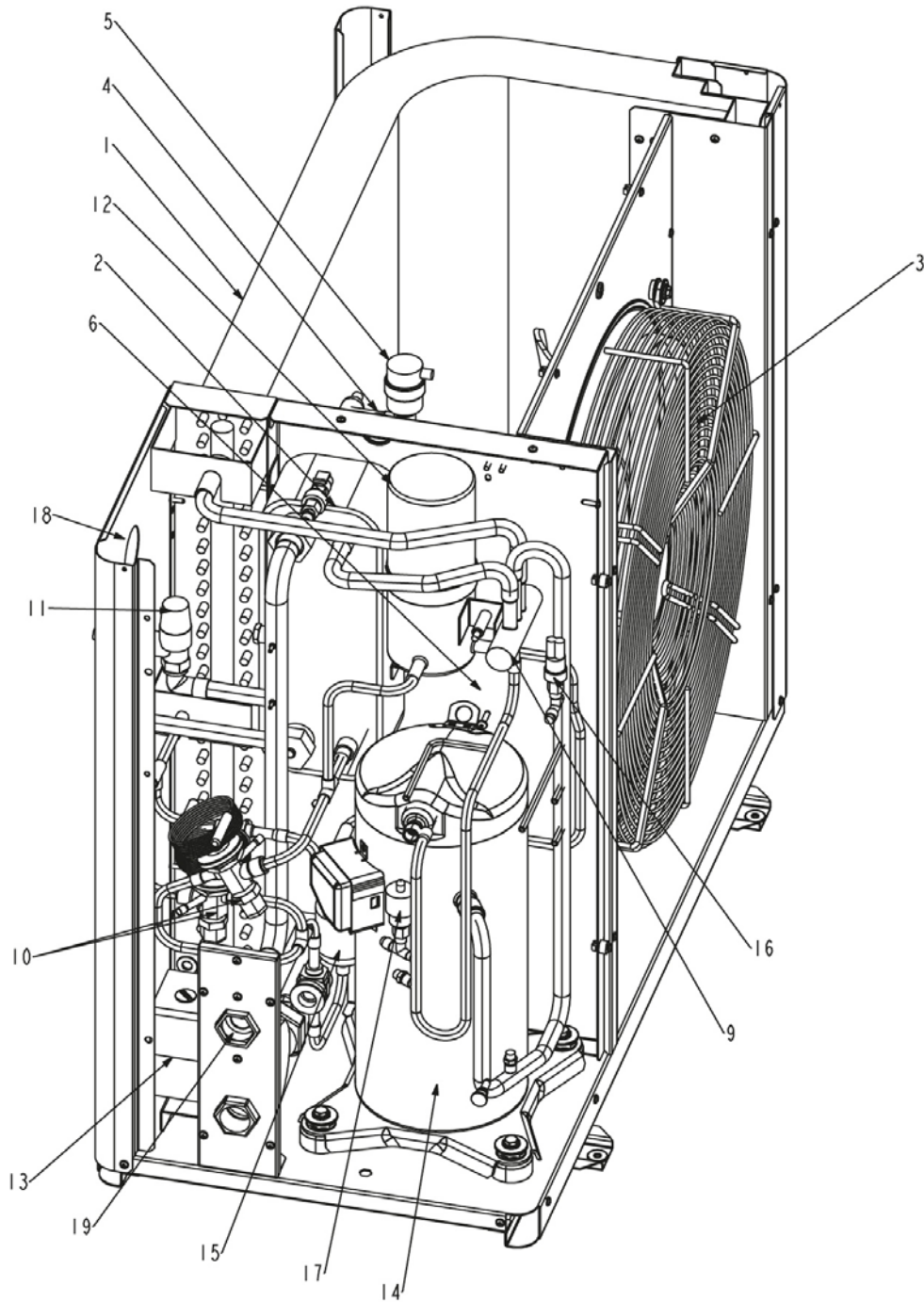
The checks and operations described in this section must be carried out on a yearly basis by specialised personnel.

- 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.

⚠ CAUTION: Installation and maintenance activities performed on heat pumps may only be carried out by personnel and companies holding the appropriate certificate in compliance with Regulation (EU) no. 2015/2067, which establishes, in accordance with Regulation (EU) no. 517/2014 of the European Parliament and of the Council, minimum requirements for companies and personnel with regard to stationary refrigeration equipment, air conditioning equipment, and heat pumps containing certain fluorinated greenhouse gases.

11 COMPONENTS DESCRIPTION

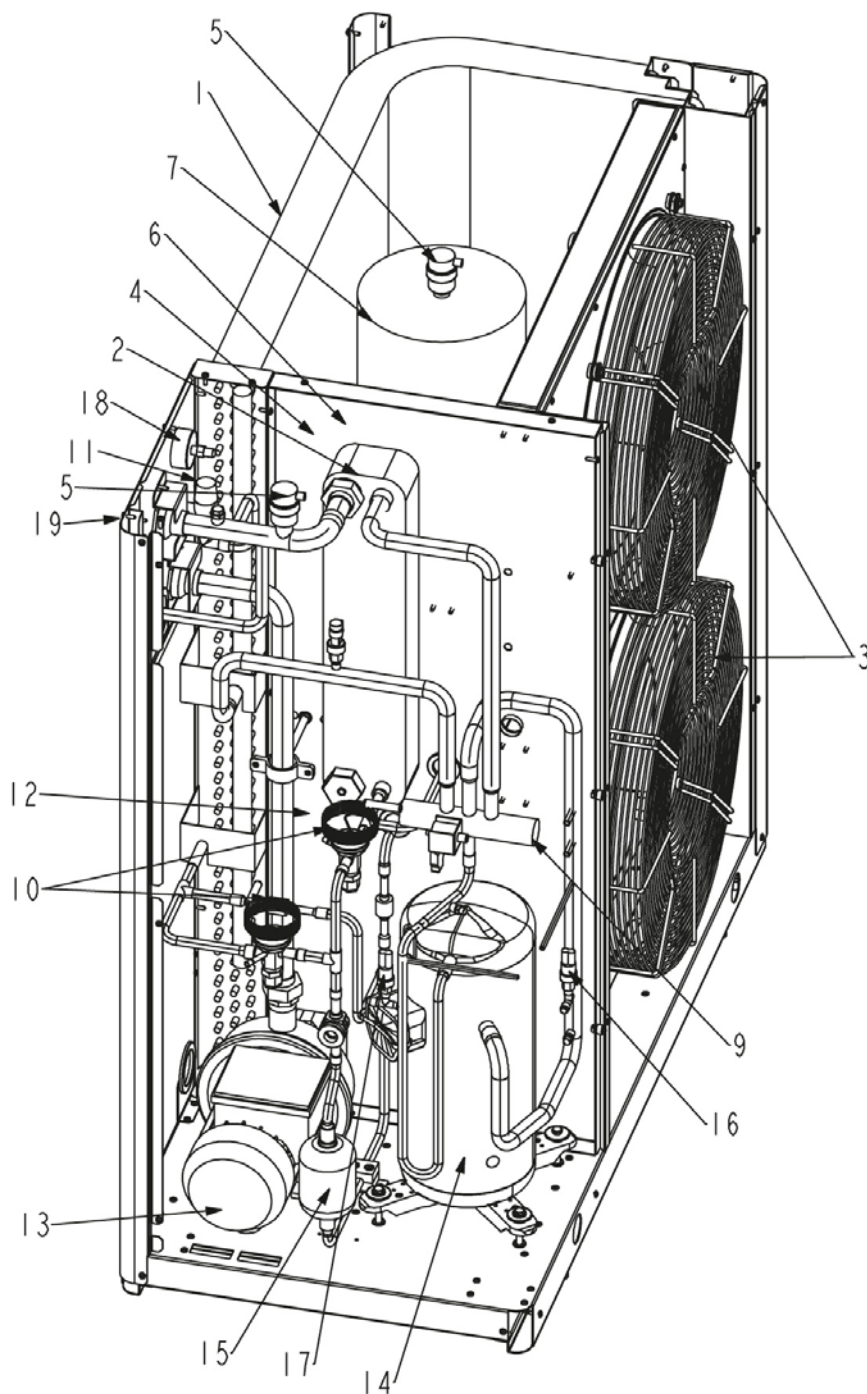
» MPE H 04 - 08



DESCRIPTION

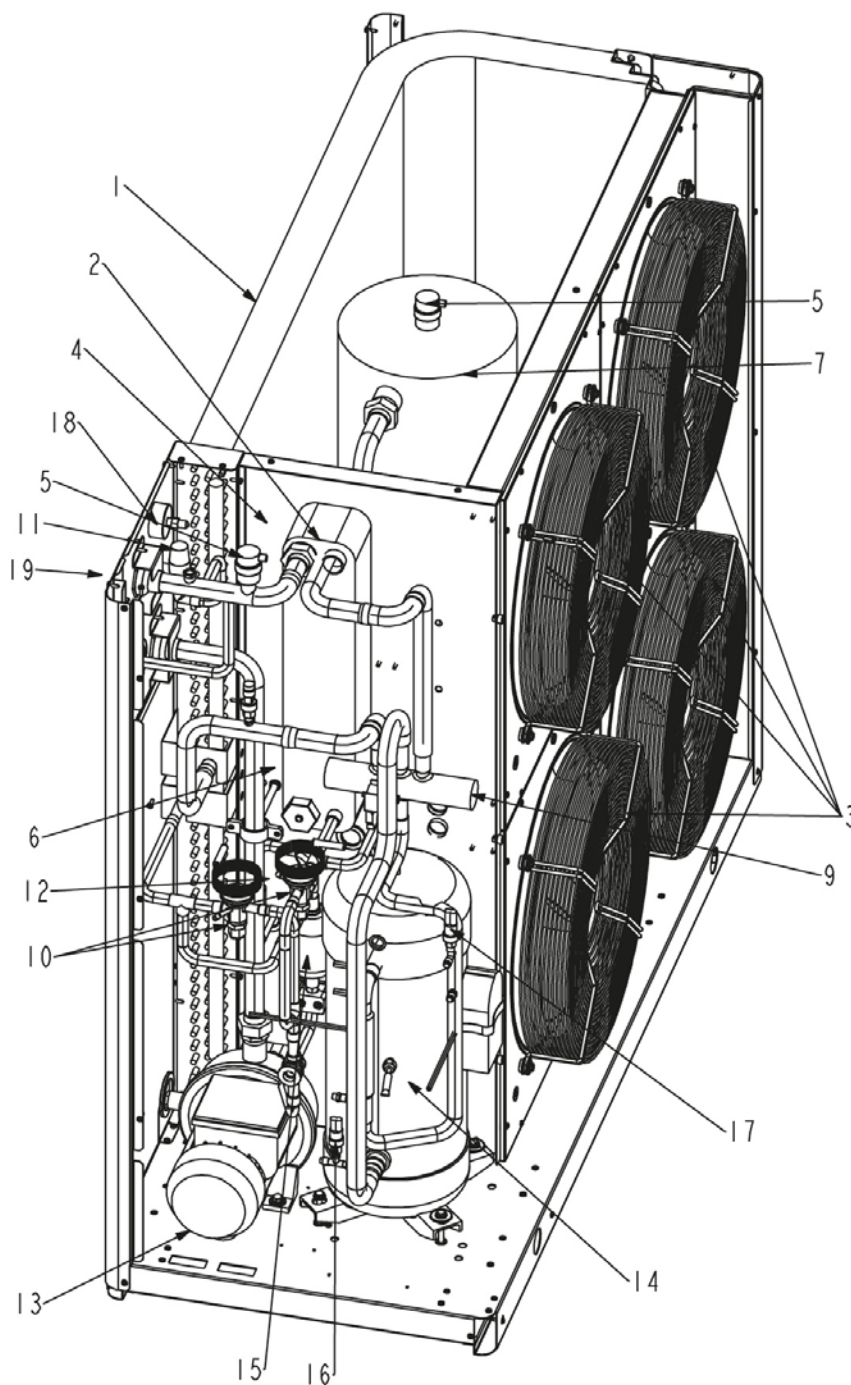
- | | |
|---|---|
| <ul style="list-style-type: none"> 1 R410A-air heat-exchanger 2 R410A-water heat-exchanger 3 Fans 4 Water differential pressure switch (fan housing) 5 Automatic air purge valve 6 Expansion vessel (fan housing) 7 Buffer tank (accessory) 8 - 9 4 Way valve (MPE H) 10 Thermostatic valve | <ul style="list-style-type: none"> 11 Water safety valve 12 Liquid receiver (MPE H) 13 Circulation pump 14 Compressor 15 Refrigerant filter 16 Low pressure switch and charge port 17 High pressure switch and charge port 18 Water gauge 19 Water charge |
|---|---|

» MPE C 09 - 14; MPE H 10 - 15



DESCRIPTION

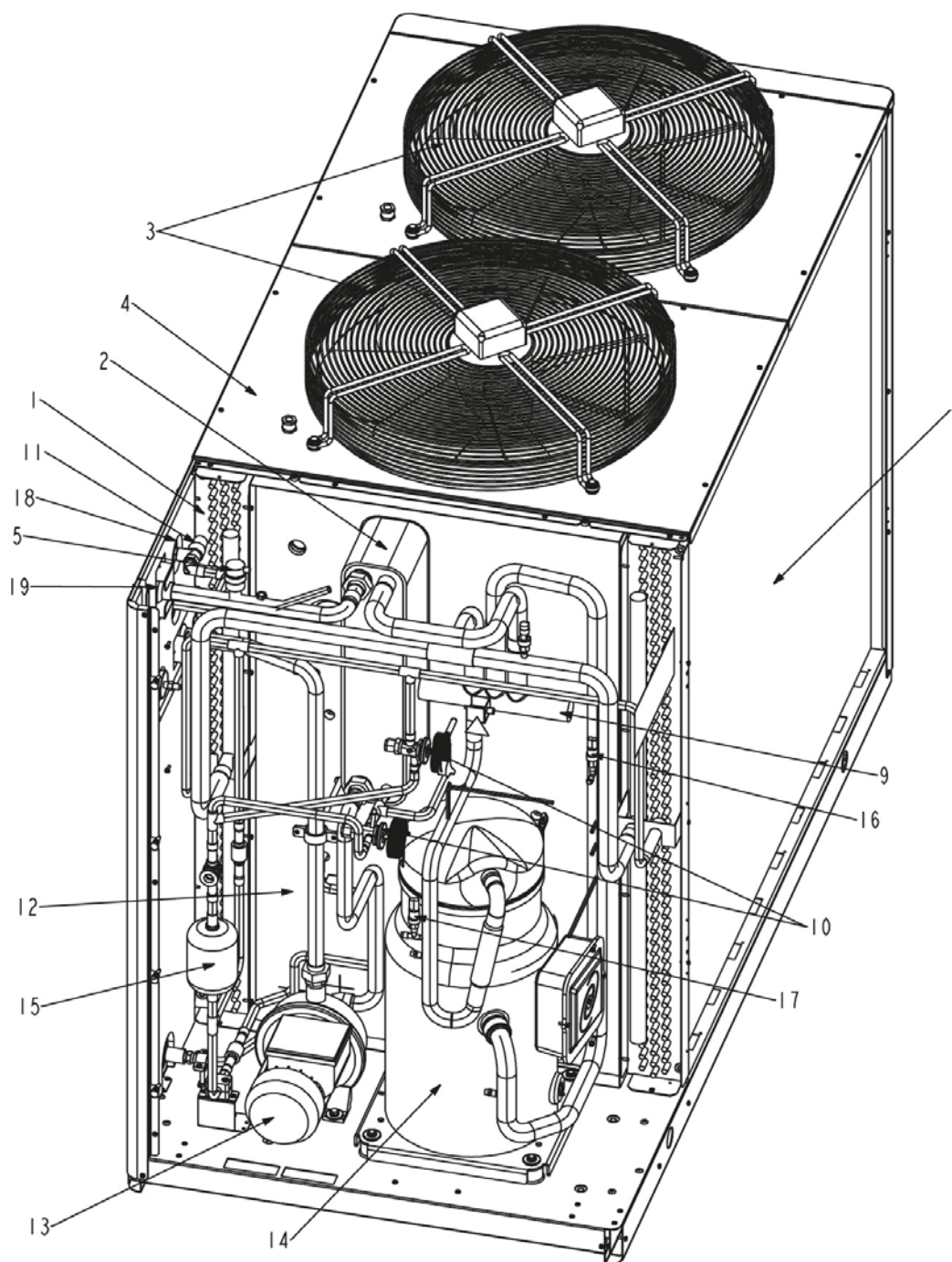
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|-----------|--|-----------|--------------------------------------|
| 1 | R410A-air heat-exchanger | 11 | Water safety valve |
| 2 | R410A-water heat-exchanger | 12 | Liquid receiver (MPE H) |
| 3 | Fans | 13 | Circulation pump |
| 4 | Water differential pressure switch (fan housing) | 14 | Compressor |
| 5 | Automatic air purge valve | 15 | Refrigerant filter |
| 6 | Expansion vessel (fan housing) | 16 | Low pressure switch and charge port |
| 7 | Buffer tank (accessory) | 17 | High pressure switch and charge port |
| 8 | - | 18 | Water gauge |
| 9 | 4 Way valve (MPE H) | 19 | Water charge |
| 10 | Thermostatic valve | | |



DESCRIPTION

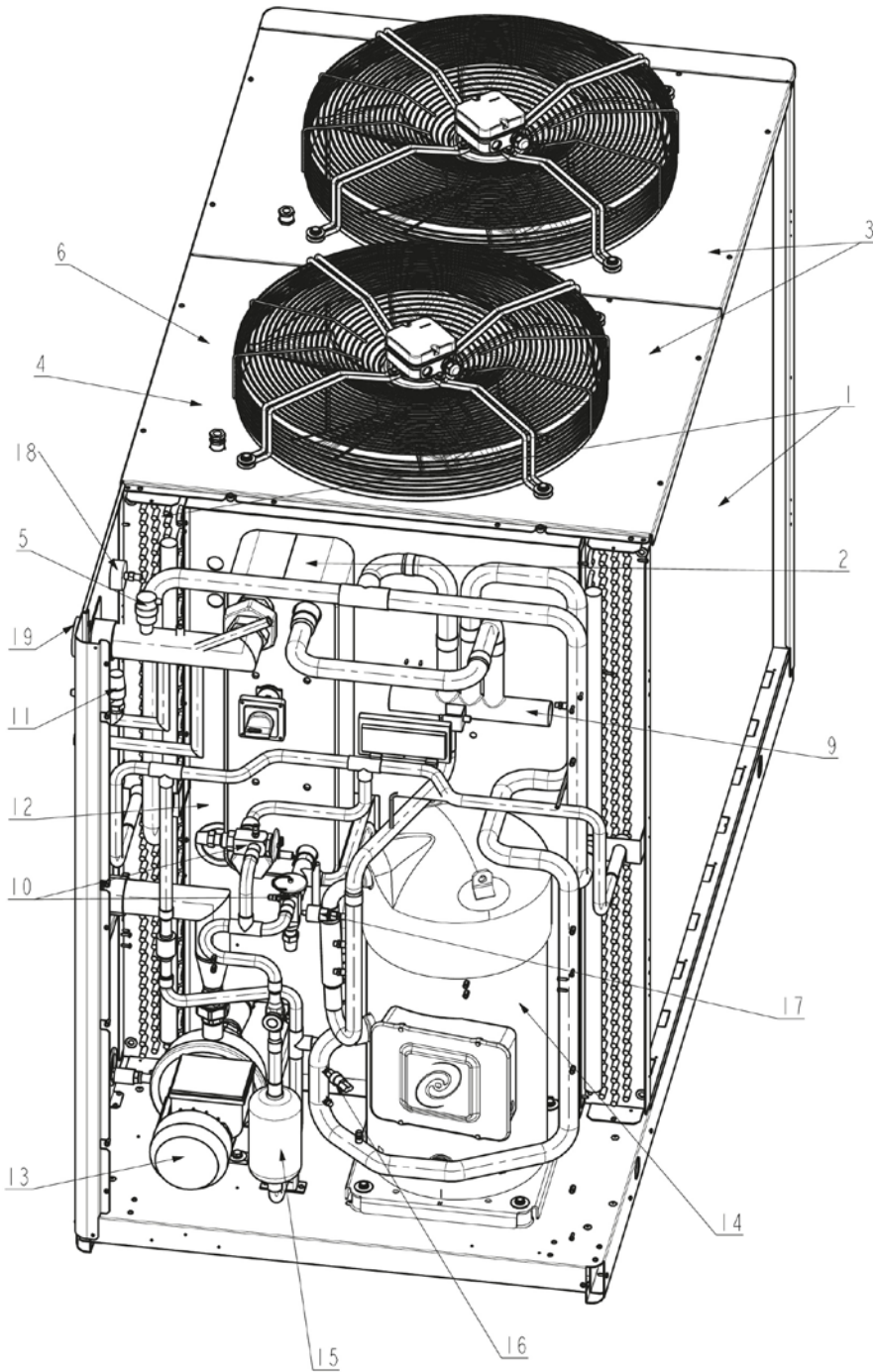
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|--|--|
| <p>1 R410A-air heat-exchanger
 2 R410A-water heat-exchanger
 3 Fans
 4 Water differential pressure switch (fan housing)
 5 Automatic air purge valve
 6 Expansion vessel (fan housing)
 7 Buffer tank (accessory)
 8 -
 9 4 Way valve (MPE H)
 10 Thermostatic valve</p> | <p>11 Water safety valve
 12 Liquid receiver (MPE H)
 13 Circulation pump
 14 Compressor
 15 Refrigerant filter
 16 Low pressure switch and charge port
 17 High pressure switch and charge port
 18 Water gauge
 19 Water charge</p> |
|--|--|

» MPE 28 - 40



DESCRIPTION

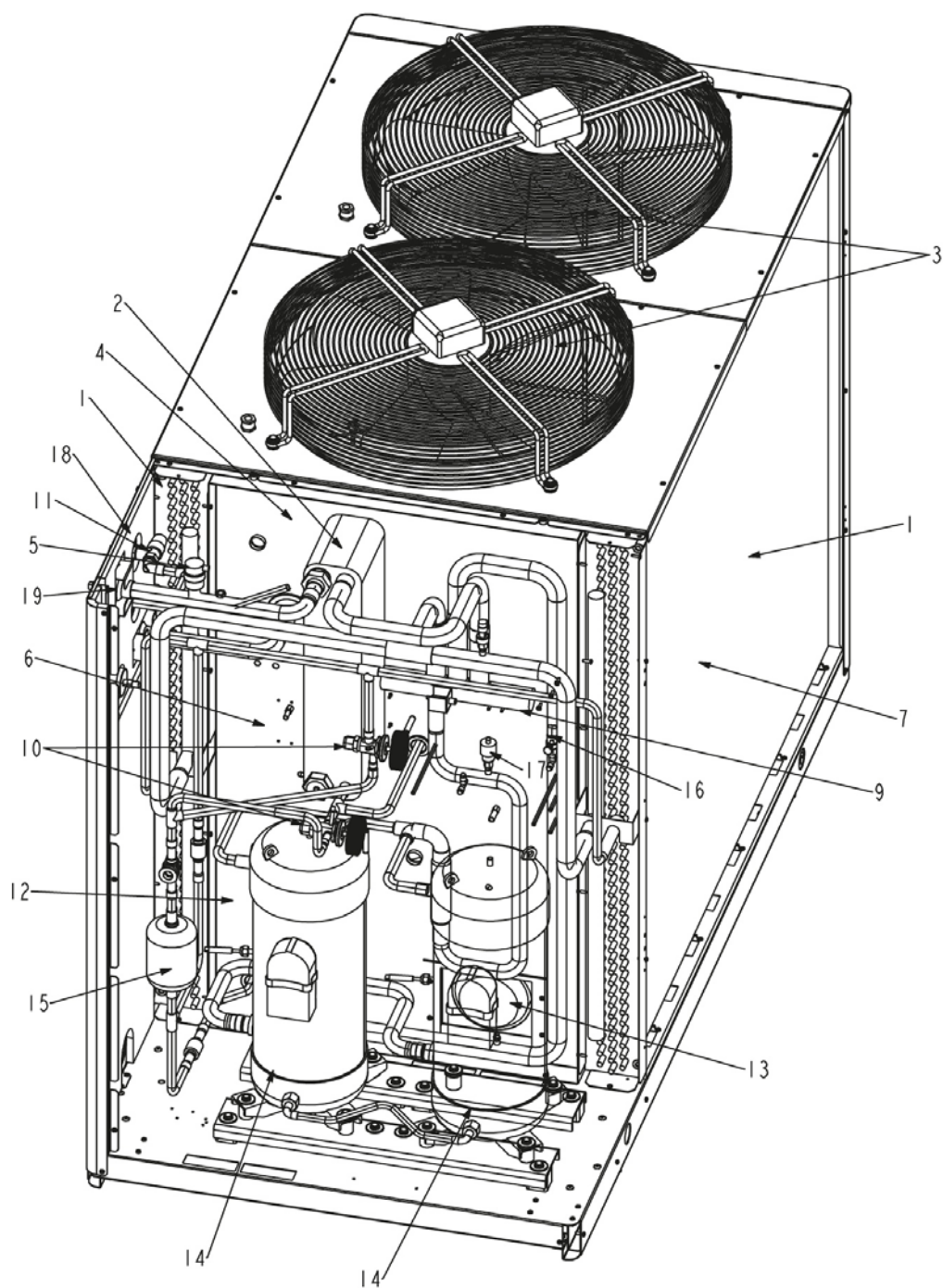
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|-----------|--|-----------|--------------------------------------|
| 1 | R410A-air heat-exchanger | 11 | Water safety valve |
| 2 | R410A-water heat-exchanger | 12 | Liquid receiver (fan housing)(MPE H) |
| 3 | Fans | 13 | Circulation pump |
| 4 | Water differential pressure switch (fan housing) | 14 | Compressor |
| 5 | Automatic air purge valve | 15 | Refrigerant filter |
| 6 | Expansion vessel (fan housing) | 16 | Low pressure switch and charge port |
| 7 | Buffer tank (accessory) | 17 | High pressure switch and charge port |
| 8 | - | 18 | Water gauge |
| 9 | 4 Way valve (MPE H) | 19 | Water charge |
| 10 | Thermostatic valve | | |



DESCRIPTION

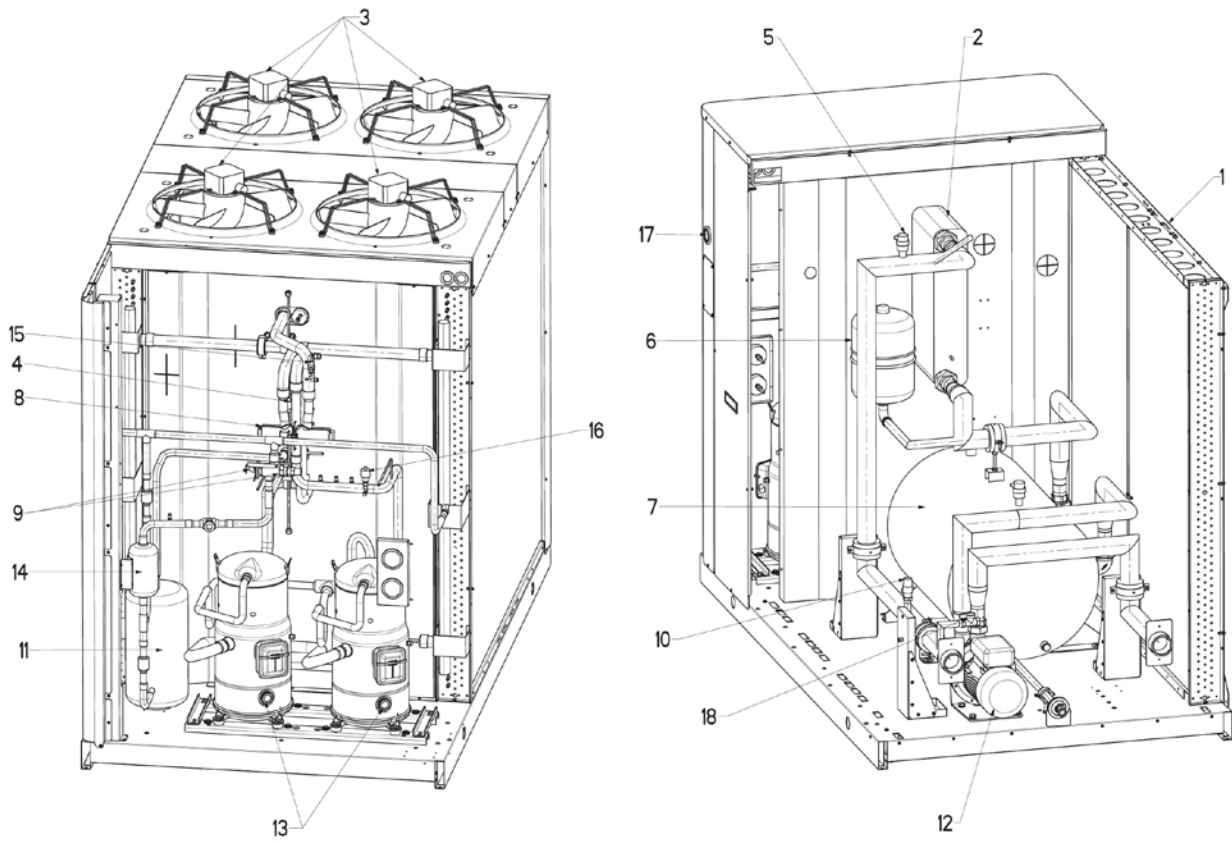
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|--|---|
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 2 R410A-water heat-exchanger
 3 Fans
 4 Water differential pressure switch (fan housing)
 5 Automatic air purge valve
 6 Expansion vessel (fan housing)
 7 Buffer tank (accessory)
 8 -
 9 4 Way valve (MPE H)
 10 Thermostatic valve</p> | <p>11 Water safety valve
 12 Liquid receiver (fan housing)(MPE H)
 13 Circulation pump
 14 Compressor
 15 Refrigerant filter
 16 Low pressure switch and charge port
 17 High pressure switch and charge port
 18 Water gauge
 19 Water charge</p> |
|--|---|

» MPE C T30 - T44 ; MPE H T30 - T45



DESCRIPTION

- | | |
|---|--|
| <ul style="list-style-type: none"> 1 R410A-air heat-exchanger 2 R410A-water heat-exchanger 3 Fans 4 Water differential pressure switch (fan housing) 5 Automatic air purge valve 6 Expansion vessel (fan housing) 7 Buffer tank (accessory) 8 - 9 4 Way valve (MPE H) 10 Thermostatic valve | <ul style="list-style-type: none"> 11 Water safety valve 12 Liquid receiver (fan housing)(MPE H) 13 Circulation pump 14 Compressor 15 Refrigerant filter 16 Low pressure switch and charge port 17 High pressure switch and charge port 18 Water gauge 19 Water charge |
|---|--|
































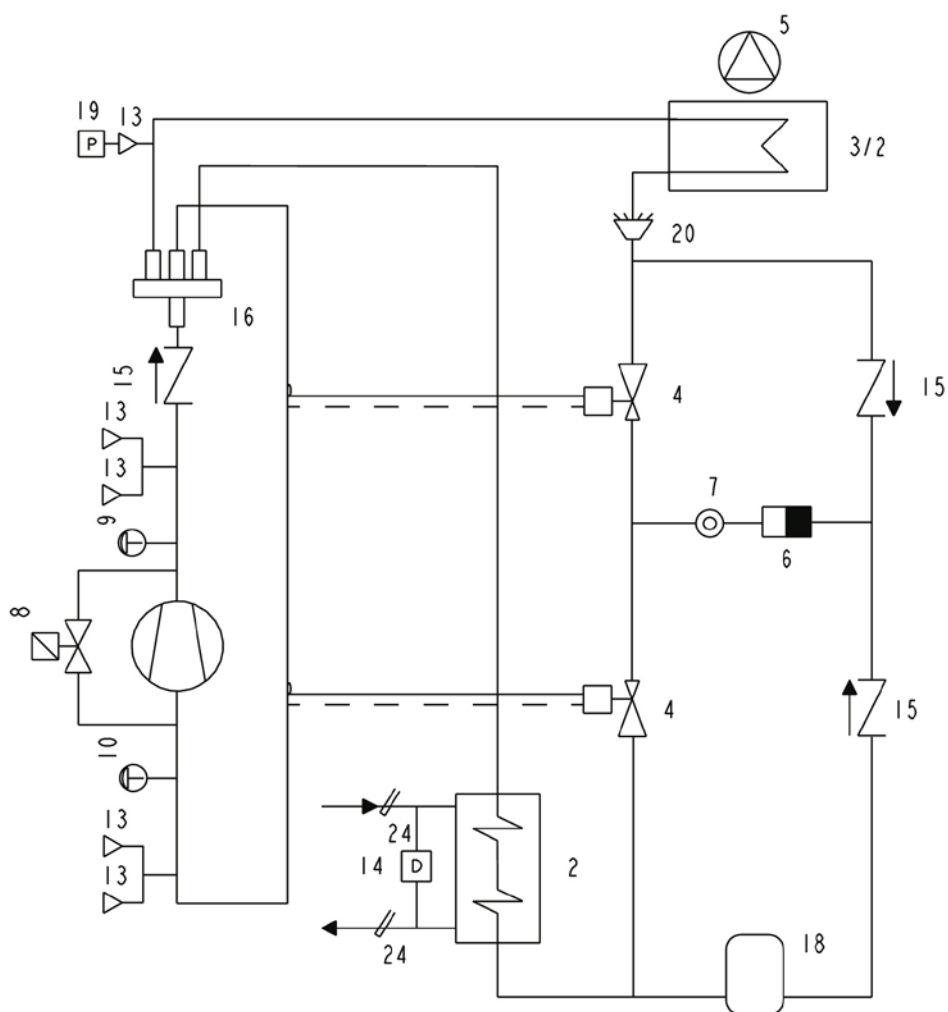
DESCRIPTION

- | | |
|---|---|
| <p>1 R410A-air heat-exchanger
 2 R410A-water heat-exchanger
 3 Fans
 4 Water differential pressure switch (fan housing)
 5 Automatic air purge valve
 6 Expansion vessel (fan housing)
 7 Buffer tank (accessory)
 8 4 Way valve (MPE H)
 9 Thermostatic valve</p> | <p>10 Water safety valve
 11 Liquid receiver (fan housing)(MPE H)
 12 Circulation pump
 13 Compressor
 14 Refrigerant filter
 15 Low pressure switch and charge port
 16 High pressure switch and charge port
 17 Water gauge
 18 Water charge</p> |
|---|---|

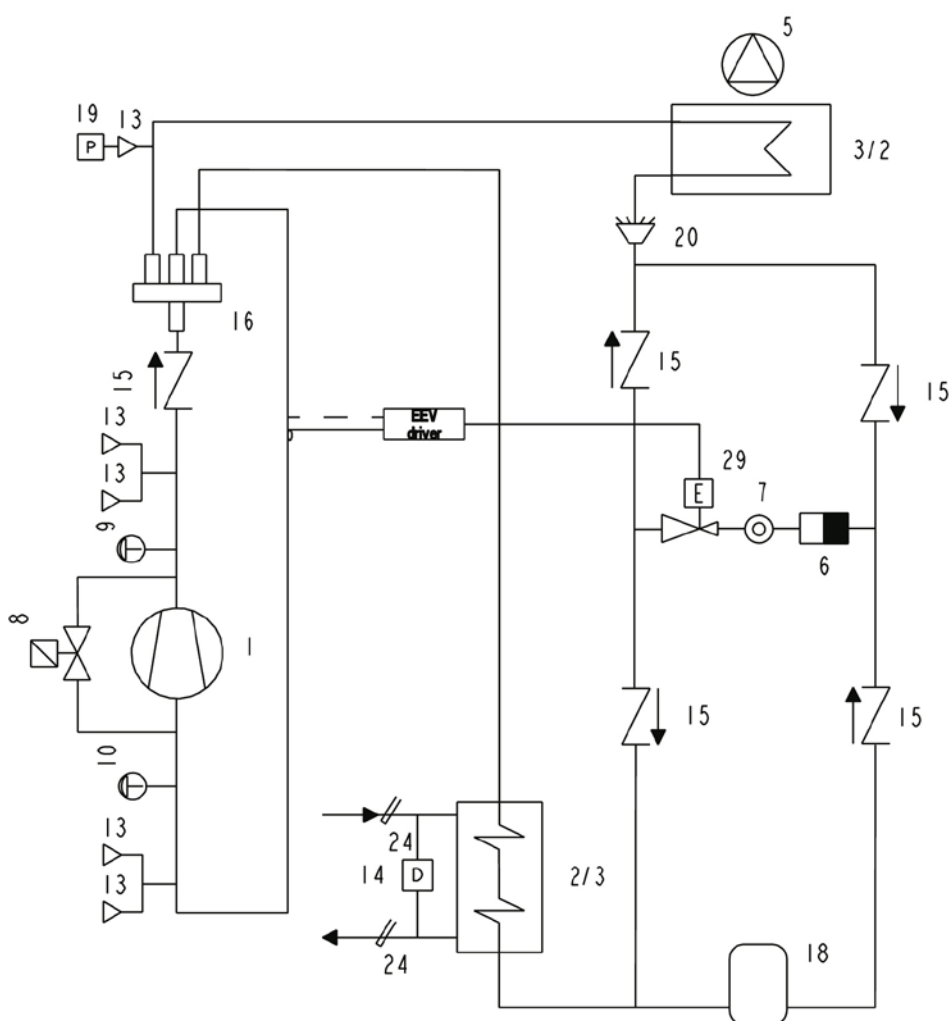
12 COOLING CIRCUITS

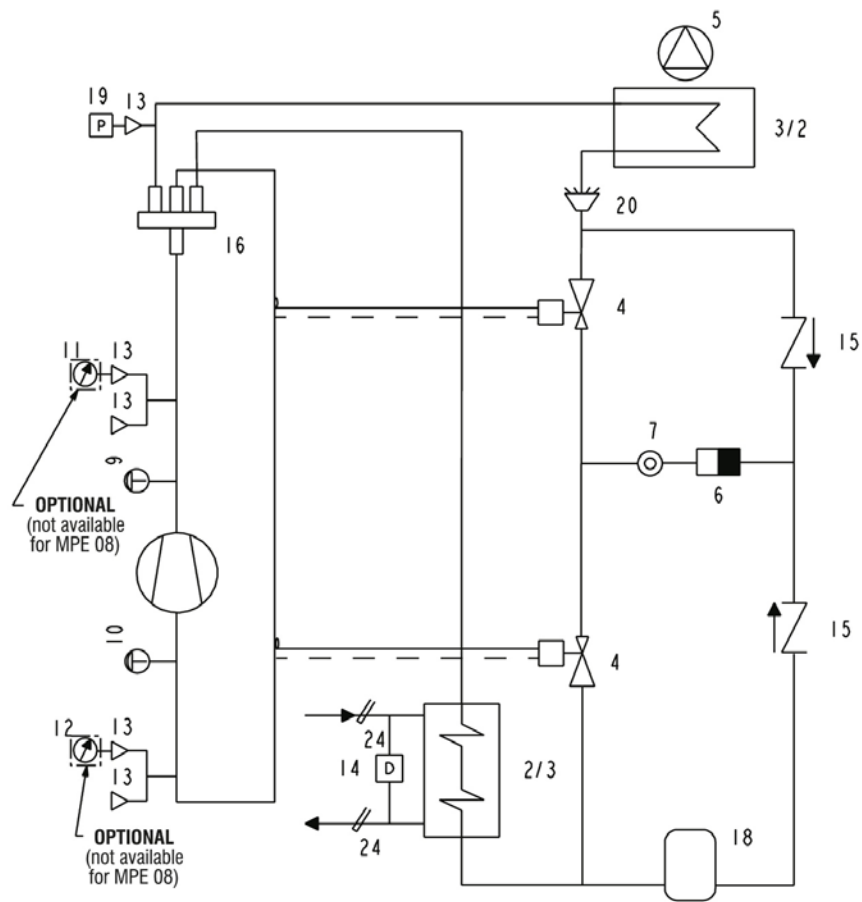
» Legend

N°	COMPONENT	SYMBOL
1	Compressor	
2	Evaporator	
3	Condenser	
4	Thermostatic valve	
5	Electrical 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	4Way diversion valve	
17	Liquid separator	
18	Liquid receiver	
19	Pressure transducer	
20	Liquid distributor	
21	Oil pressure switch	
22	De-superheater	
23	Shut-Off valve	
24	Pocket	
25	Safety valve	
26	Fusible plug	
27	Flow switch	
28	Restrictor	
29	Electronic expansion valve	

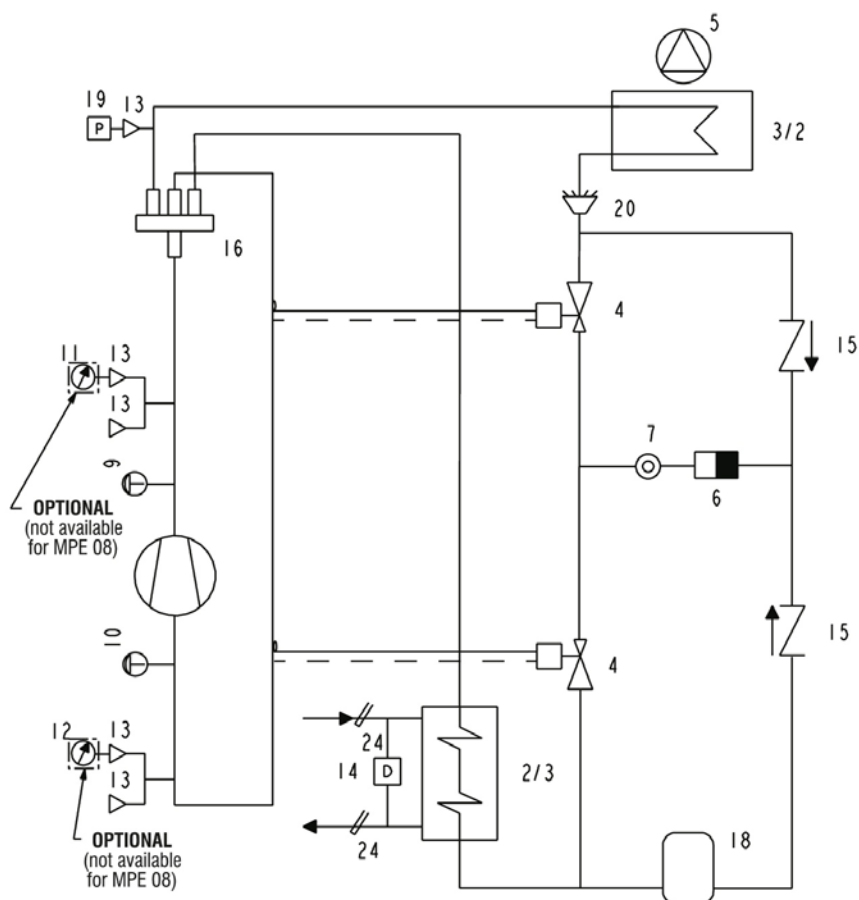


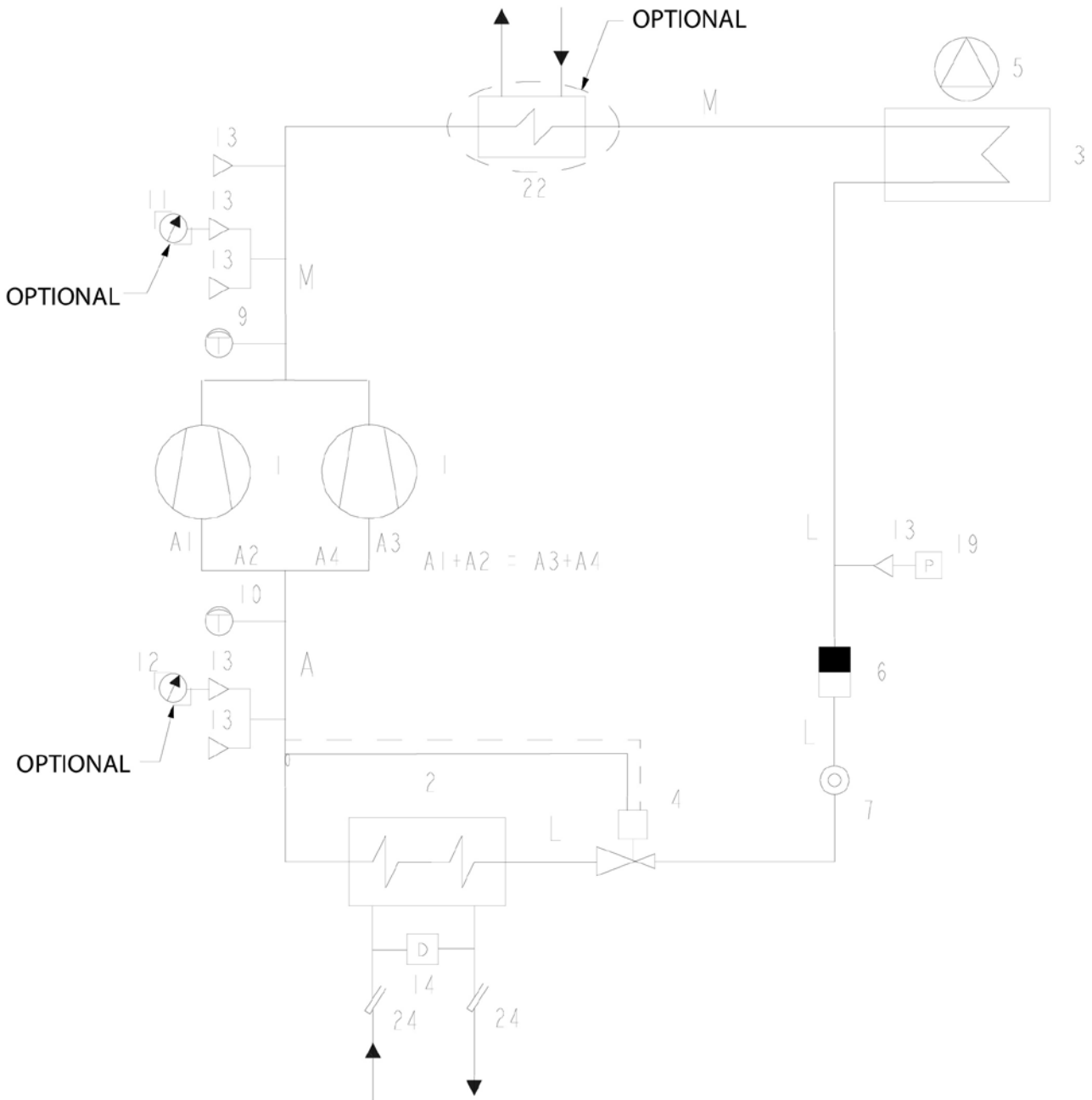
» MPE H 04 - 07 Cooling circuit with electronic valve



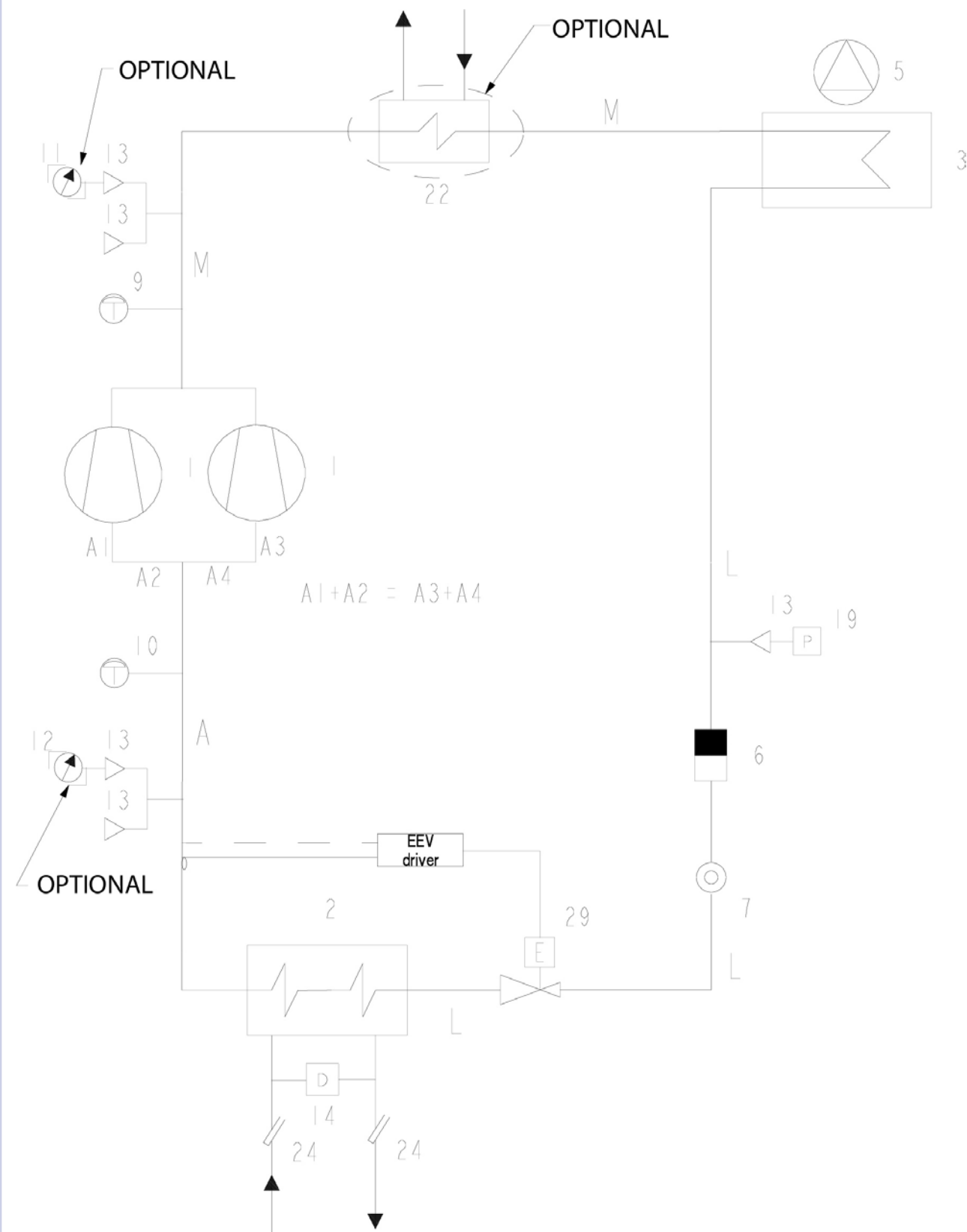


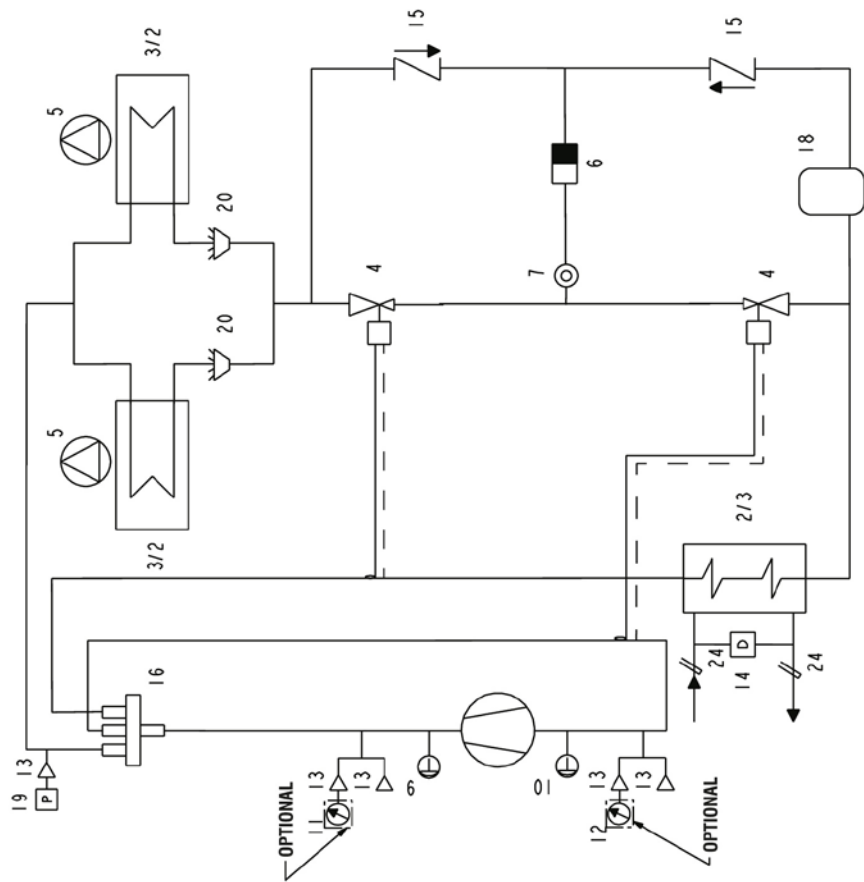
» MPE H 08 - 27 Cooling circuit with electronic valve



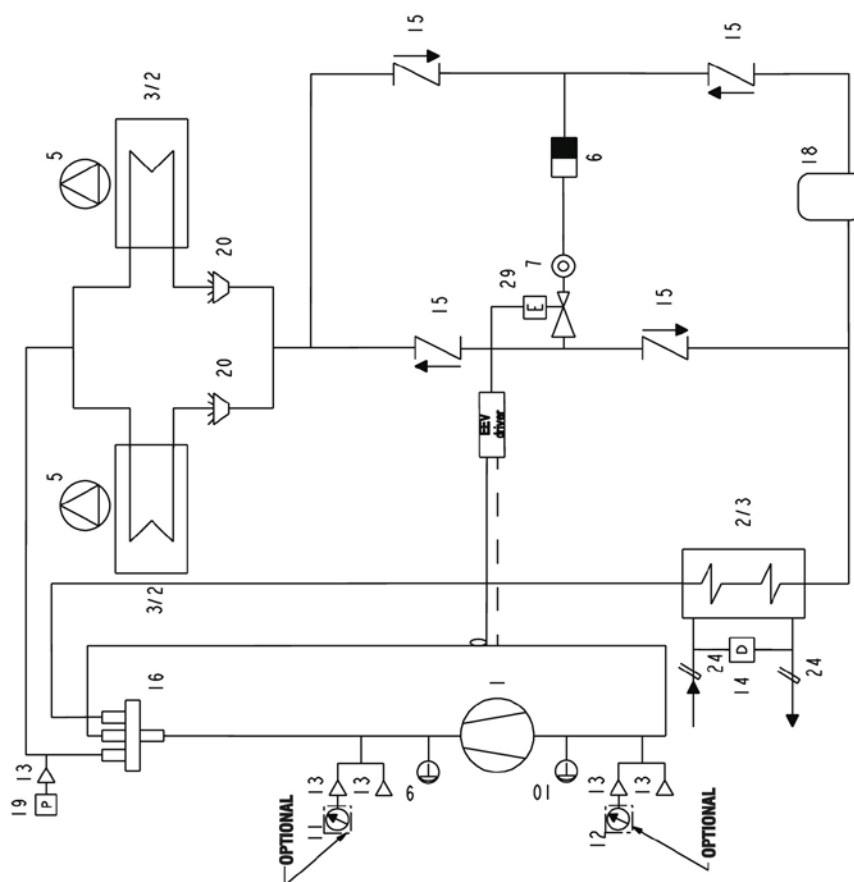


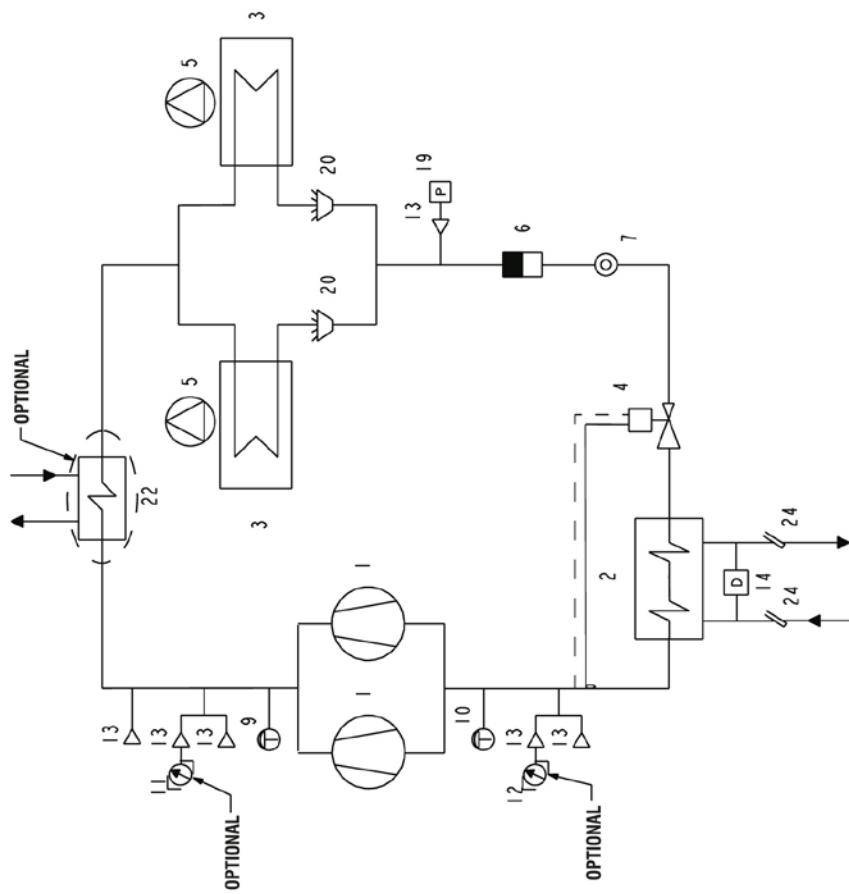
» MPE CT18-T23-T25 Cooling circuit with electronic valve



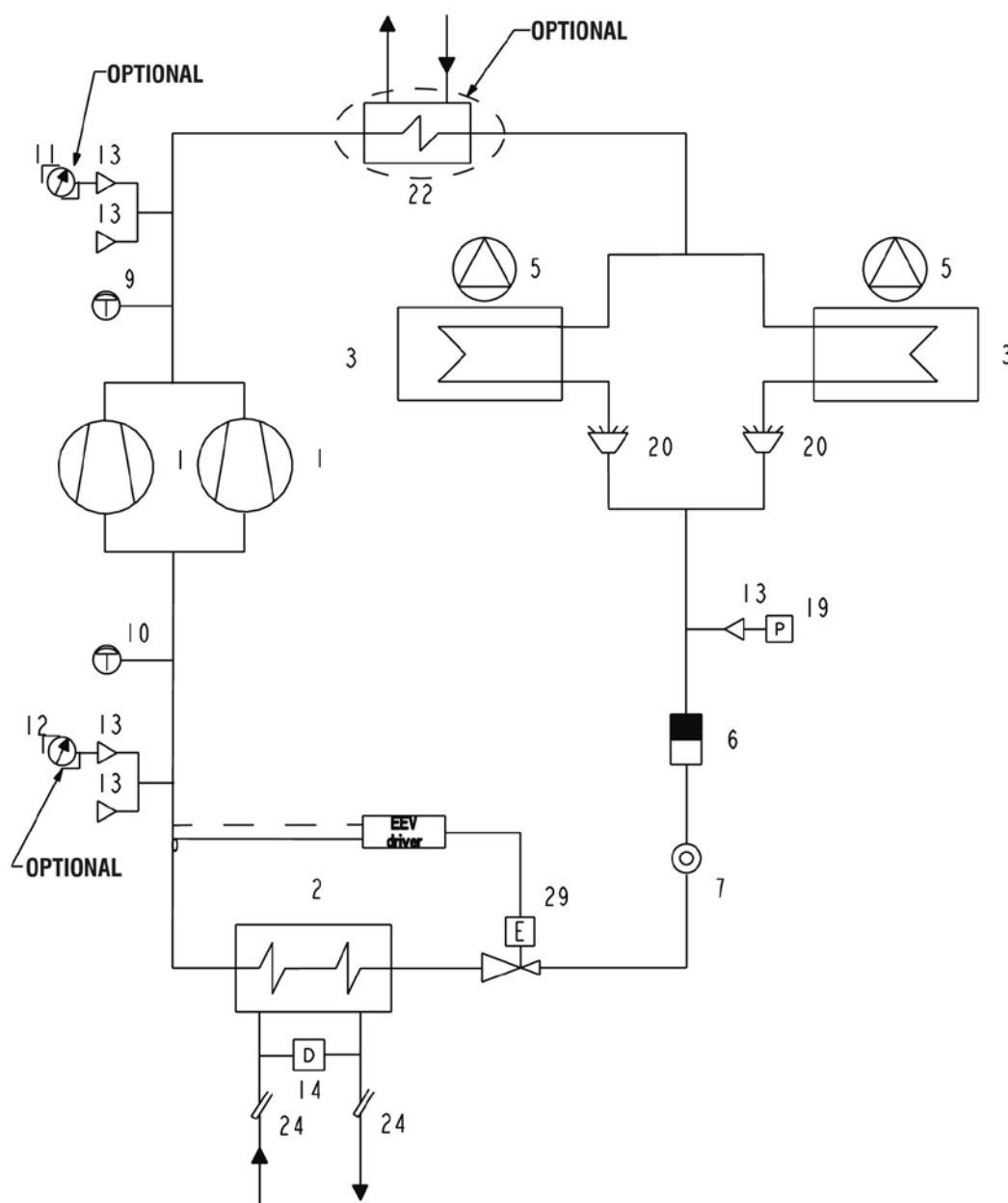


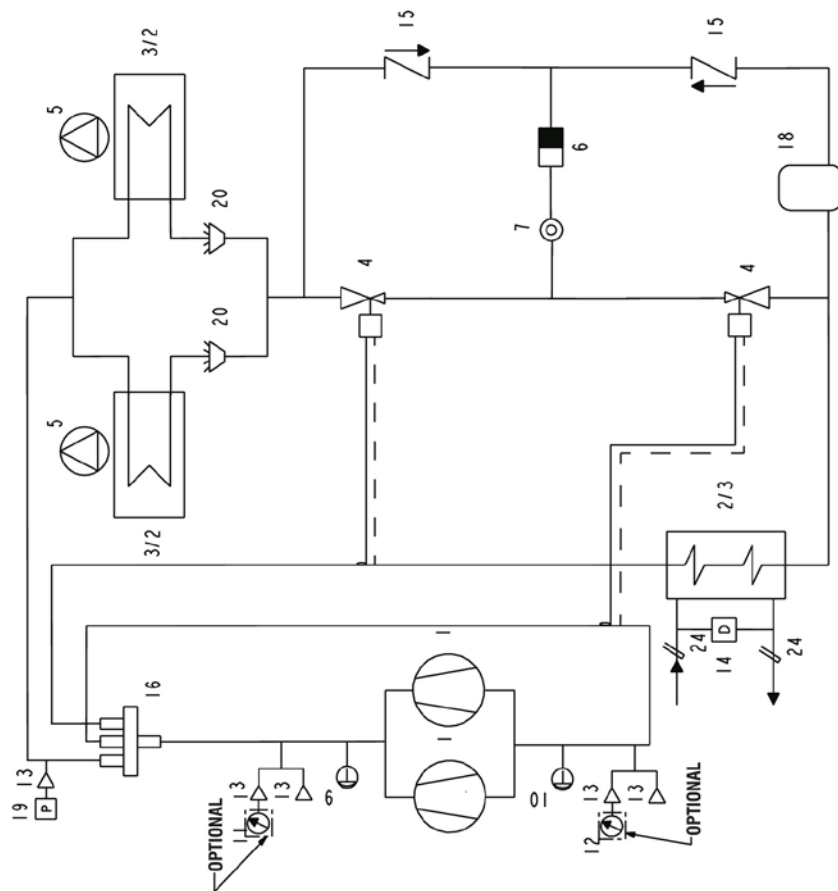
» MPE H 28 - 66 Cooling circuit with electronic valve



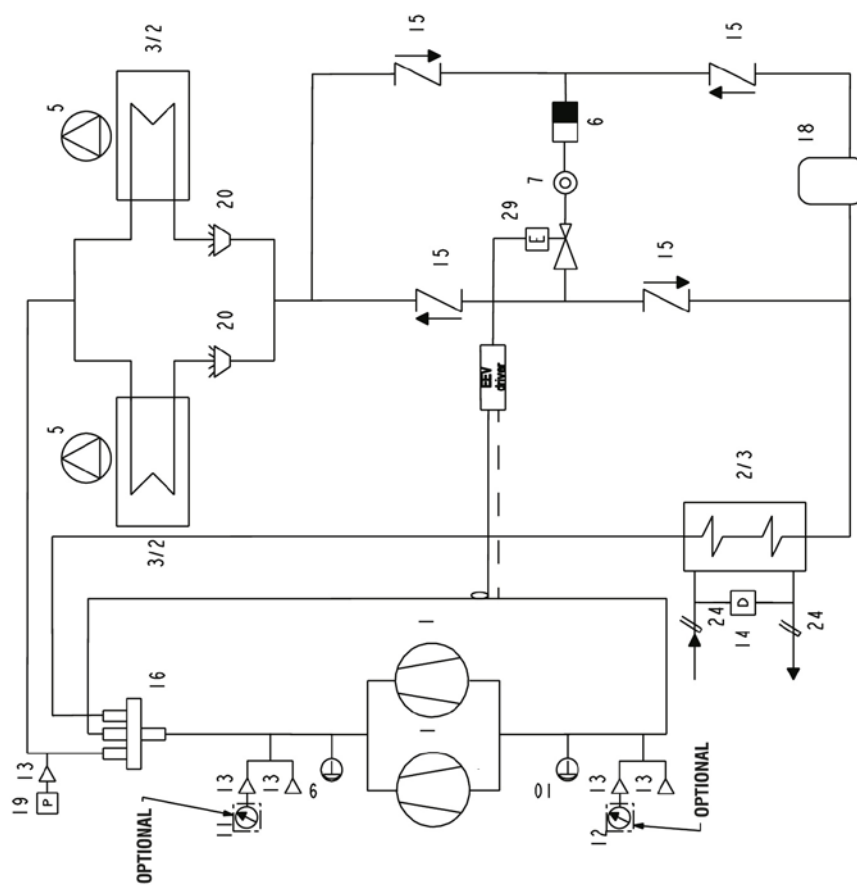


» MPE CT30 - T71 Cooling circuit with electronic valve







» MPE H T30 - T76 Cooling circuit with electronic valve





13 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 inexperienced 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 S.p.A. service centre or a qualified technician for help.

SYMPTOM			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		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	S	P1 P2 P3 P4	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	A04	Not enabled by antifreeze thermostat	Check the water temperature Check the antifreeze setting
	X	X	S	P2	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	A01 (high pressure) A02 (low pressure)	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		Power circuit 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	A02	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
D The compressor does not start because the maximum pressure switch has tripped	X	X	S	A01 A02	Pressure switch failure	Check and replace
	X	X	S	A01	Excessive refrigerant charge	Discharge the excess gas
	X		U	A01 A02	Finned coil obstructed, insufficient air flow	Remove dirt from the coil and any obstacles to air flow
	X	X	S	A01	Fan not working	See item F
		X	U	A08	Water circulation pump blocked	Release the pump
		X	S	A08	Water circulation pump defective	Check the pump and replace it if necessary.
	X	X	S	A01	Presence of incondensable gas in the cooling circuit	Recharge the circuit after having drained and evacuated it
	X	X	S	A01	Refrigerant filter clogged	Check and replace

SYMPTOM			Who can take corrective action U = User S = specialised personnel	Possible control panel indication	Probable cause	Possible remedy
E The compressor does not start because the minimum pressure switch has tripped	X	X	S	A02	Unit completely empty	See item G
	X		S	A08	Water circulation pump blocked	Release the pump
	X		S	A08	Water circulation pump blocked defective	Check the pump and replace it if necessary.
		X	S	A02	Presence of frost on the evaporating coil	See item O
		X	S	A02	Evaporator fan not working	See item F
	X	X	S	A02	Refrigerant filter clogged	Check and replace
	X	X	S	A02	Expansion valve is not working properly	Check and replace if necessary
F The fans do not start	X	X	S	A01 A02	Fan contactor deenergized	Check the voltage at either end of the compressor contactor coil and verify the continuity of the coil itself
	X	X	S	A01 A02	No power output by the fan speed control card	Check and replace if necessary
	X	X	S	A01 A02	The fan's internal thermal protection has tripped	Check the fan conditions and the air temperature while the unit is running
	X	X	S	A01 A02	Fan motor defective	Check and replace if necessary
	X	X	S	A01 A02	Loose electrical connections	Check and fasten securely
G Lack of gas	X	X	S	A02	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	A01 A02	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	S		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 and 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 coil 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

14 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

The manual are subject to changes, in any times, without prior notice aimed at improving the product.

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.



Galletti S.p.A Organization has a Management System Certified by Kiwa Cermet Italia S.p.A, according to the UNI EN ISO 9001:2015, UNI EN ISO 14001:2015 and UNI ISO 45001:2018 standards.

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