Galletti
AIR CONDITIONING

EN

TECHNICAL MANUAL FOR CHILLERS AND HEAT PUMPS

MPE

4 kW - 76 kW

Air condensed water chillers and heat pumps
PERFORMA MPE series

CE

eco R410A

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

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DECLARATION OF CONFORMITY

Galletti S.p.A. with head office in Via Romagnoli 12/a Bentivoglio (Bologna) - Italia, declares herewith under its own responsibility that all water chillers and heat pumps series: (see table below) units for air-conditioning systems for civil conditioning application, are produced in accordance with following directives: **CEE 73/23, 89/392, 91/368, 93/44, 93/68, 89/336, 97/23 (PED)**.

These units are made by assembly of components (compressors, heat exchangers with braze welded plates, liquid receiver, pipelines , regulating and safety valves), each component, if requested by the law, has its own declaration in accordance with the directives in force: the determination of the units belonging category is the result of the analyse of all components subjected to the **PED** directive and correspond to the highest class between the used components.

For each unit series the conformity of the assembly has been evaluated by notified bodies through the application of procedure for evaluation (forms) according to the annex II of the **97/23 PED** directive, as reported in the following table:

Bentivoglio, 02/07/2014
Galletti S.p.A.
Luca Galletti

CE

Serie Range	Grandezza Size	Organismo Notificato Notified body	N° certificato certificate	Procedura di valutazione di conformità Conformity Compliance Module	Categoria PED PED category	Marcatura Marking
MCC - MCC H	6 - 7 - 9 - 12 - 15	0425	2422/0	Modulo D1	I	CE
MCC - MCC H	18 - 22 - 25 - 33 - 37	0425		Modulo D1	II	CE + PED
MCW - MCW / H	5 - 7 - 10 - 12 - 15 - 18 - 20	0425		Modulo D1	I	CE
MCW - MCW / H	22 - 27 - 31 - 39	0425		Modulo D1	II	CE + PED
MPE - MPEH	4 - 5 - 7 - 8 - 10 - 13 - 15 - 18	0425		Modulo D1	I	CE
MPE - MPEH	20-24-27-28-32-35-40-54-66	0425		Modulo D1	II	CE + PED
MPE - MPEH	T30-T34-T40-T45-T54-T61-T69-T76	0425		Modulo D1	II	CE + PED
MPI	15	0425		Modulo D1	I	CE
MPI	27	0425		Modulo D1	II	CE + PED
MPI DC	8 - 10 - 14 - 15 - 18	0425		Modulo D1	I	CE
MPI DC	23 - 27 - 29	0425		Modulo D1	II	CE + PED
HWMC	10	0425		Modulo D1	I	CE
HWMC	13 - 18 - 23 - 29	0425		Modulo D1	II	CE + PED
MCP	7 - 9	0425		Modulo D1	I	CE
MCP	10-13-15-18-27-32-40-T18-T22-T24-T30	0425		Modulo D1	II	CE + PED
LCE - LCE H	42 - 52 - 62 - 72 - 82 91/2/4 - 101/2/4 - 121/2/4 141/2/4 - 161/2/4 - 174 - 194 - 214	0425		Modulo D1	II	CE + PED
LEW	41-42-51-52-61-62-71-72-81-82-91-92-111-112- 131-132-141-142-144-161-162-164-181-182	0425		Modulo D1	II	CE + PED

Galletti

AIR CONDITIONING

Galletti S.p.A. via L.Romagnoli 12/a
40010 Bentivoglio (BO) Italia

CE

Made in Italy
CATEGORIA 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 (bar)
Max refrigerant temperature (°C)

UNIT IDENTIFICATION

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

THE LABEL SHOWS THE FOLLOWING DATA:

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

IMPORTANT: NEVER REMOVE THE LABEL

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

TRANSLATION OF ORIGINAL INSTRUCTIONS

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

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

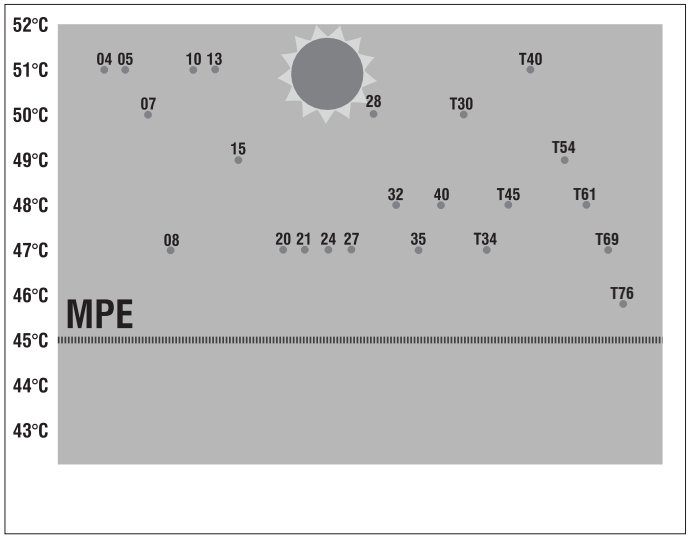
- for any information , please contact the company info@galletti.it
- In order to know the operating weight of any unit, refer to the table Rated technical data

1 THE SERIES

PERFORMA (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 19 models in the chiller and heat pump version, with cooling capacities ranging from 4 to 45 kW and heating capacities from 5 to 53 kW.

BEYOND CONVENTIONAL WORKING LIMITS

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 51°C and all models of the range assure an average energy efficiency ratio (EER) of 2.95 in the cooling mode and heating efficiency (COP) of 3.25, corresponding to the Eurovent Energy Efficiency Class A.



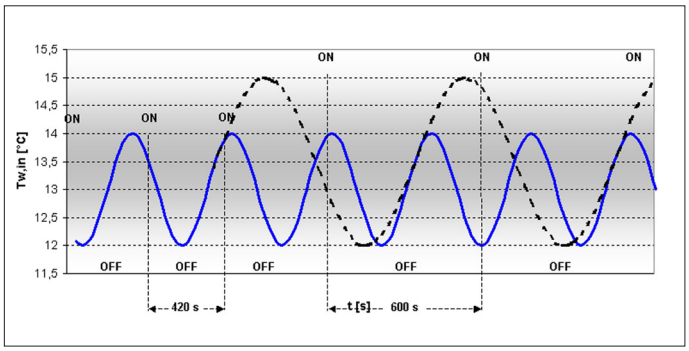
EFFICIENCY IN ALL CONDITIONS

The actual thermal load of an air conditioning system is less than 60% of the rated load capacity 90% of the time; the MPE T version with single-circuit dual compressor answers this demand by offering high efficiency during operation under partial load conditions (ESEER>4) and also guarantees the unit's operation at the worst temperature conditions.
In such conditions the microprocessor controller activates the capacity control mode, doubling the condensing surface available to the single compressor.

The axial-type fans with airfoil-shaped blades and 6- and 8-pole motors with electronic speed control (optional) guarantee quiet operation and optimal performance of the unit in all conditions.

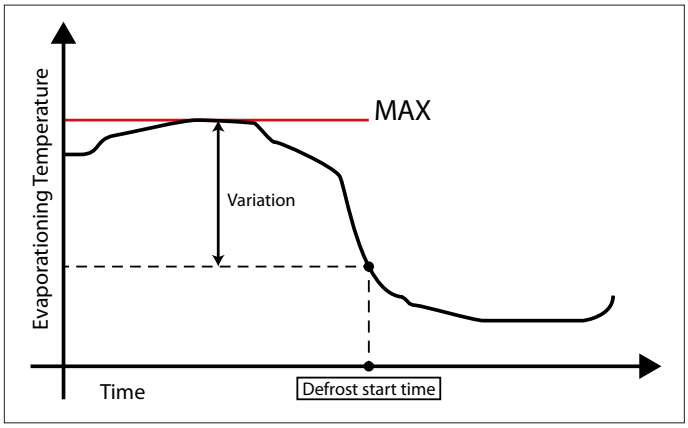
SELF-ADAPTIVE

The electronic control system 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.



SMART DEFROST SYSTEM

The exclusive 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.



2 CONSTRUCTIVE FEATURES

STRUCTURE
Painted galvanised sheet steel structure (RAL9002) 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.
Sound insulation, available on request, can further reduce the noise emissions of the unit.

CUSTOMISED HYDRAULIC KIT
- High head pump made entirely of stainless steel, already configured for use with mixtures of water and ethylene glycol up to 35% and provided with internal thermal protection.
  It is housed in the compressor compartment and is easy to reach thanks to the removable perimeter panels.
- 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 compressor (rotary up to 7 kW) housed in a compartment that can be sound insulated.
- 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 (MPE H).
- Single-acting valves (MPE H).
- Liquid receiver (MPE H)
- High and low pressure switches.
- Safety valve.
- Schrader valves for checks and/or maintenance.
- Refrigerant pressure gauges (optional)

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 8mm 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.

FINNED BLOCK HEAT EXCHANGER
Made of 8mm 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 self-adaptive logic enables the unit to operate even in systems where the water content is low, without the use of an inertial water storage reservoir. By reading the outdoor air temperature, it can automatically change the setpoint to adapt it to the outdoor load conditions or keep the unit running even in the harshest winter conditions.
The basic controller comes complete with the MODBUS protocol and enables an immediate connection to ERGO networks.
Main functions
- Control over the temperature of water entering the evaporator.
- Management of the defrosting function (MPE-H)
- Control of fan speed (optional)
- 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;
- Option of connecting a remote terminal that duplicates the control functions.

Devices controlled:
- Compressor
- Fans
- Cycle-reversing valve (MPE-H).
- Water circulation pump.
- Antifreeze heating elements (optional)
- Alarm signalling relay

On request, it is possible to install the advanced controller whose functions extend to:
- LAN networks
- Smart Defrost System

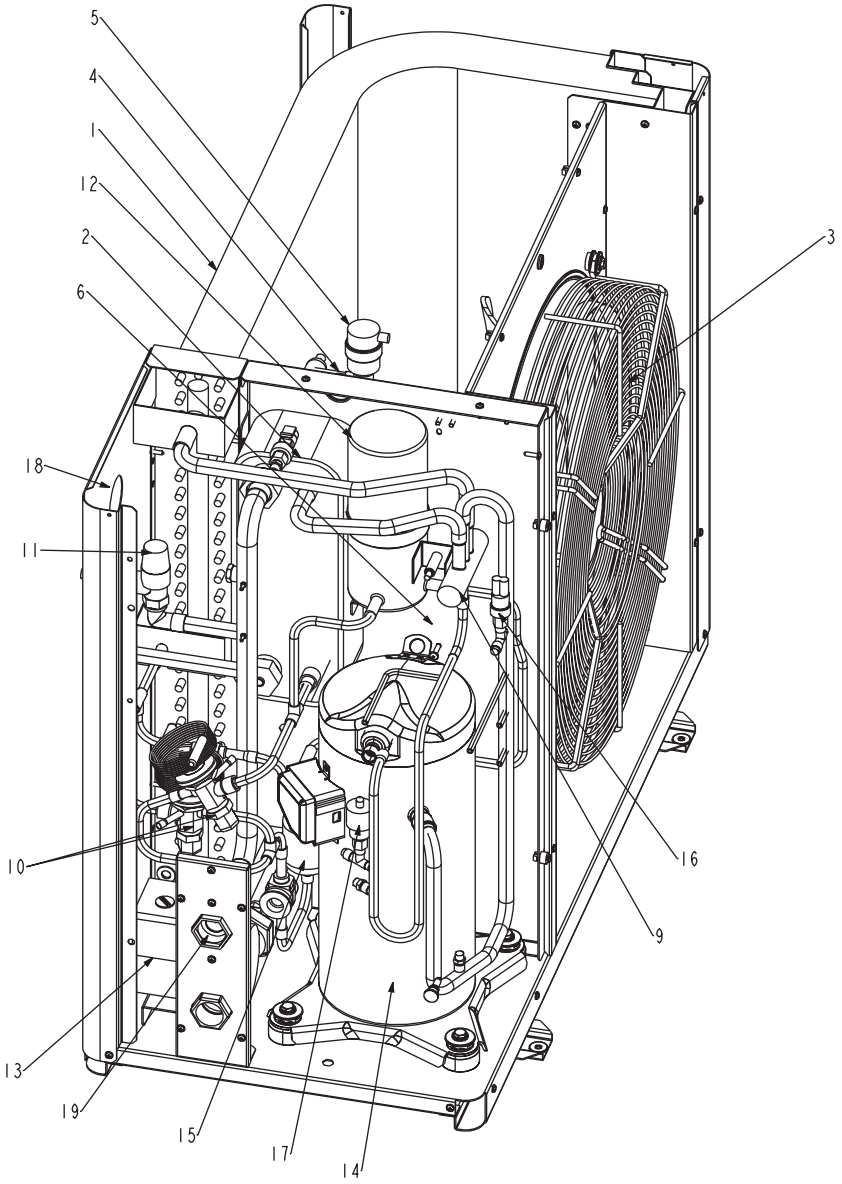
ELECTRIC CONTROL BOARD
The electric control board is constructed and wired in accordance with EEC Directive 73/23, Directive 89/336 on electromagnetic compatibility and related standards. Made of steel sheet, it is also protected by the enclosing panels of the machine.

OPTIONS
Incorporable hydronic kits
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)

ACCESSORIES AVAILABLE
Remote control boards
Base vibration dampers
Metal grilles to protect exchangers

3 LAYOUT OF COMPONENTS

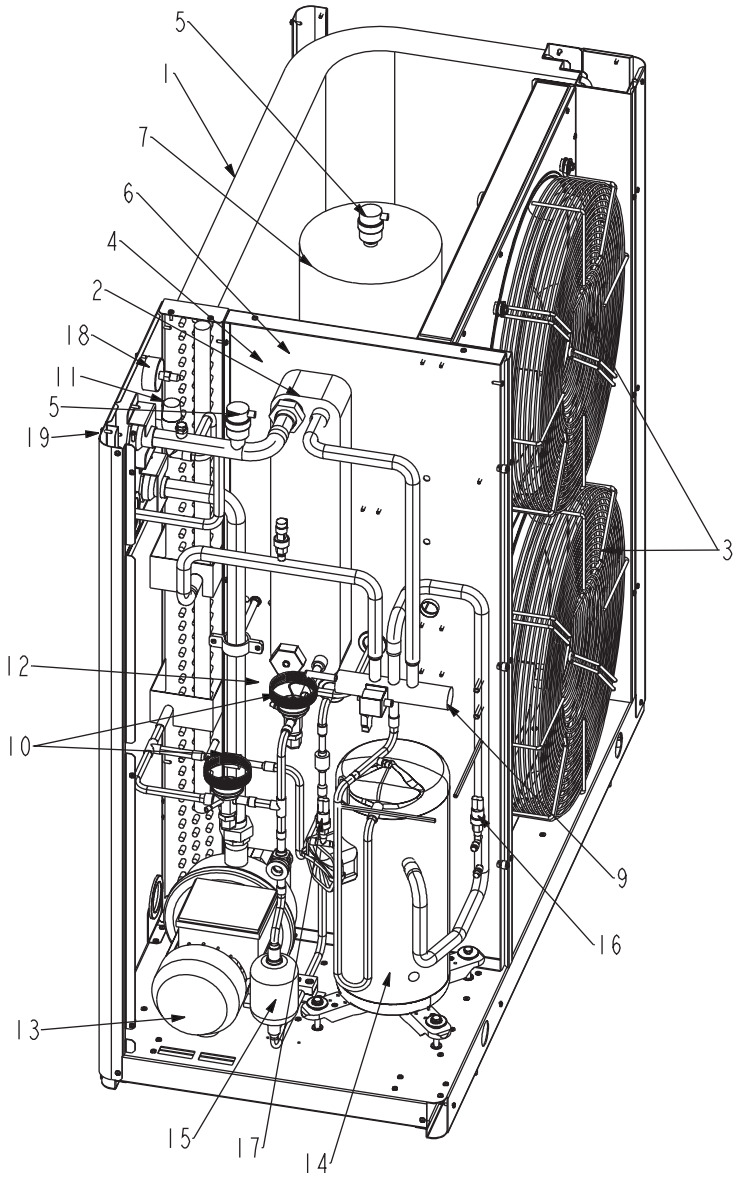
MPE 04 - 08



	DESCRIPTION		
1.	R410A-air heat-exchanger	**11.**	Water safety valve
2.	R410A-water heat-exchanger	**12.**	Liquid receiver
3.	Fans	**13.**	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.	Water tank (accessory)	**17.**	High pressure switch and charge port
9.	4-way valve (MPE H)	**18.**	Water gauge
10.	Thermostatic valve	**19.**	Water charge

3 LAYOUT OF COMPONENTS

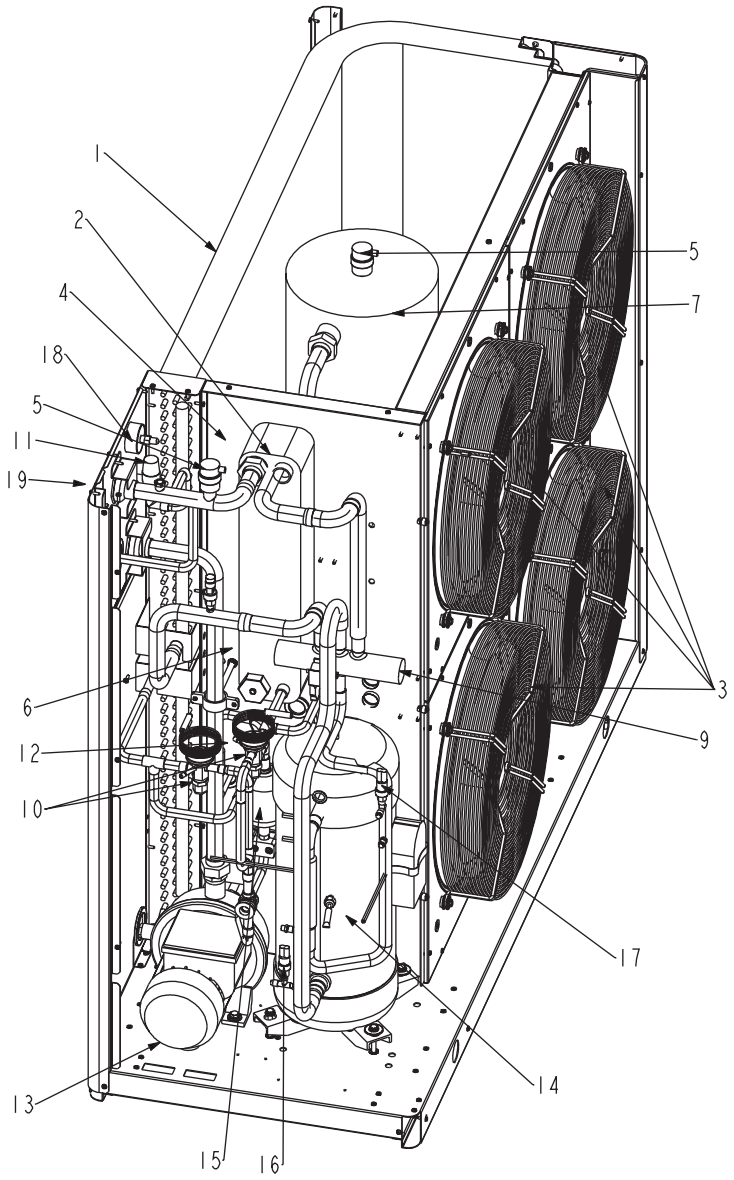
MPE 10 - 15



	DESCRIPTION		
1.	R410A-air heat-exchanger	**11.**	Water safety valve
2.	R410A-water heat-exchanger	**12.**	Liquid receiver (fan housing)
3.	Fans	**13.**	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.	Water tank (accessory)	**17.**	High pressure switch and charge port
9.	4-way valve (MPE H)	**18.**	Water gauge
10.	Thermostatic valve	**19.**	Water charge

3 LAYOUT OF COMPONENTS

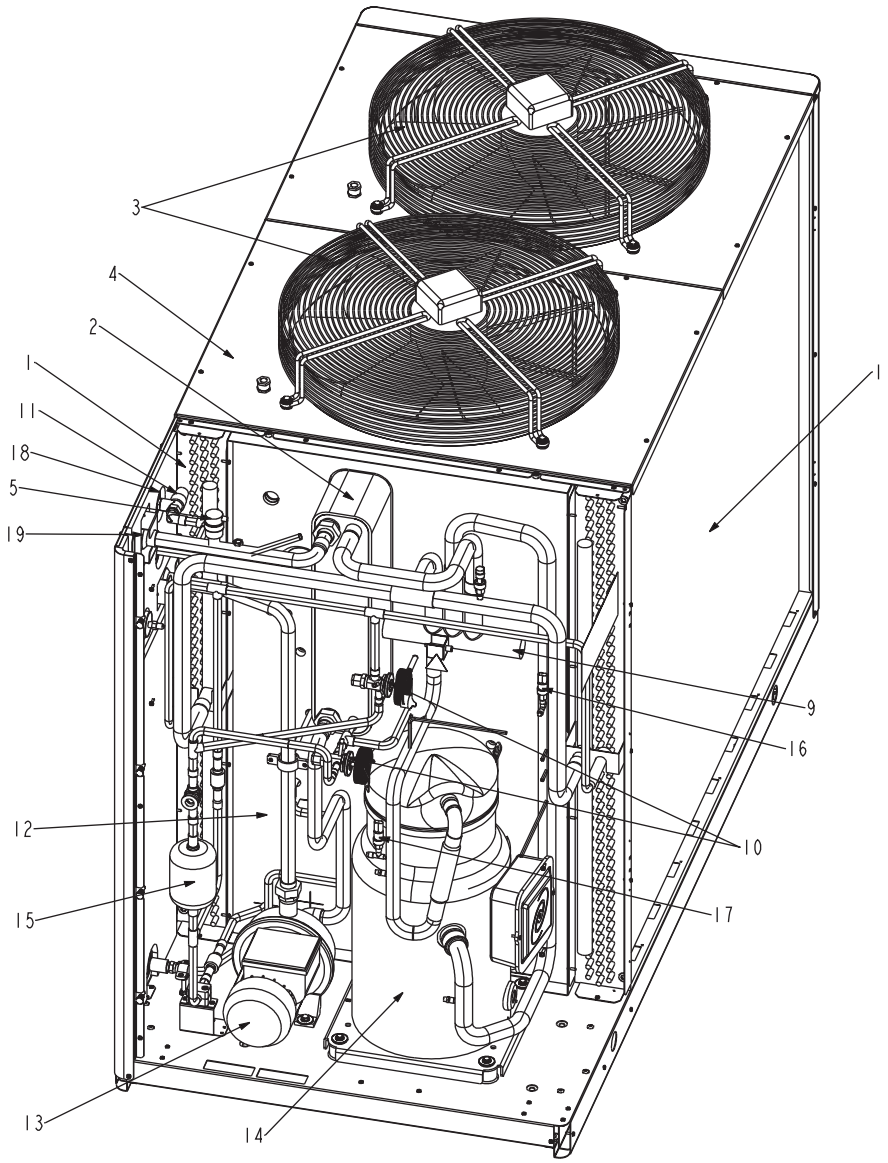
MPE 18 - 27



	DESCRIPTION		
1.	R410A-air heat-exchanger	**11.**	Water safety valve
2.	R410A-water heat-exchanger	**12.**	Liquid receiver (fan housing)
3.	Fans	**13.**	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.	Water tank (accessory)	**17.**	High pressure switch and charge port
9.	4-way valve (MPE H)	**18.**	Water gauge
10.	Thermostatic valve	**19.**	Water charge

3 LAYOUT OF COMPONENTS

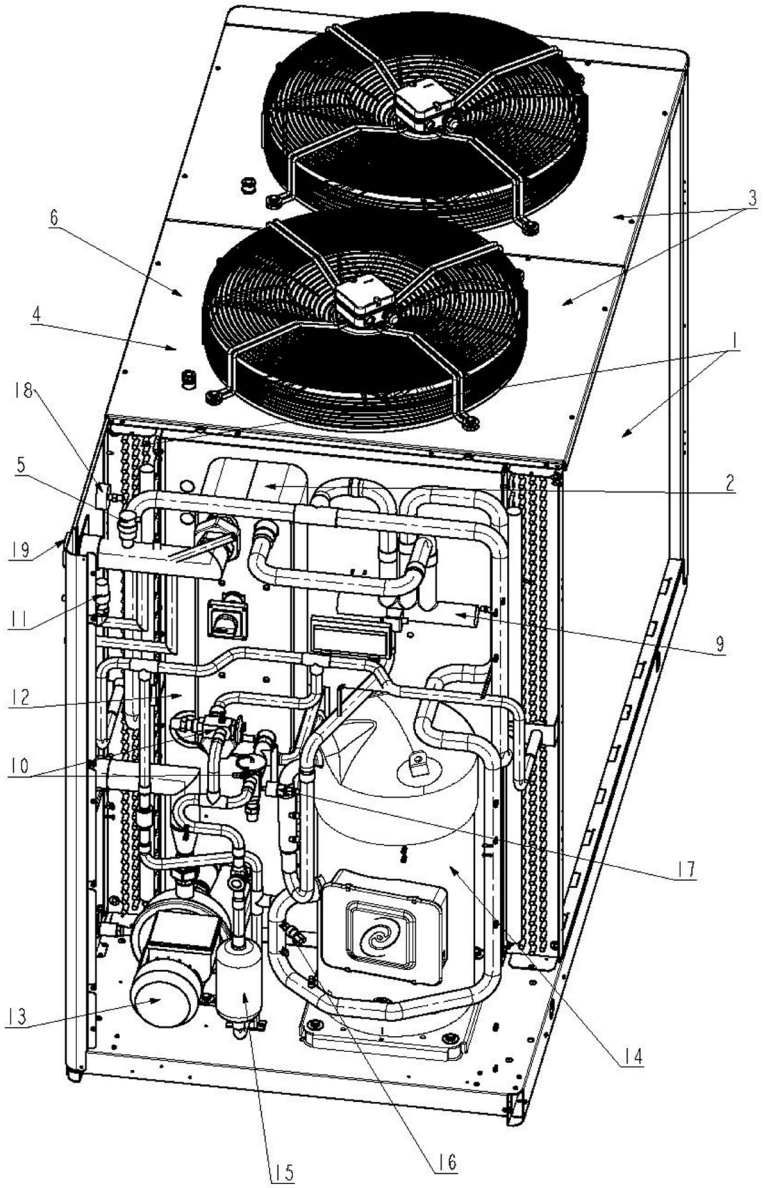
MPE 28 - 40



	DESCRIPTION		
1.	R410A-air heat-exchanger	**11.**	Water safety valve
2.	R410A-water heat-exchanger	**12.**	Liquid receiver (fan housing)
3.	Fans	**13.**	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.	Water tank (accessory)	**17.**	High pressure switch and charge port
9.	4-way valve (MPE H)	**18.**	Water gauge
10.	Thermostatic valve	**19.**	Water charge

3 LAYOUT OF COMPONENTS

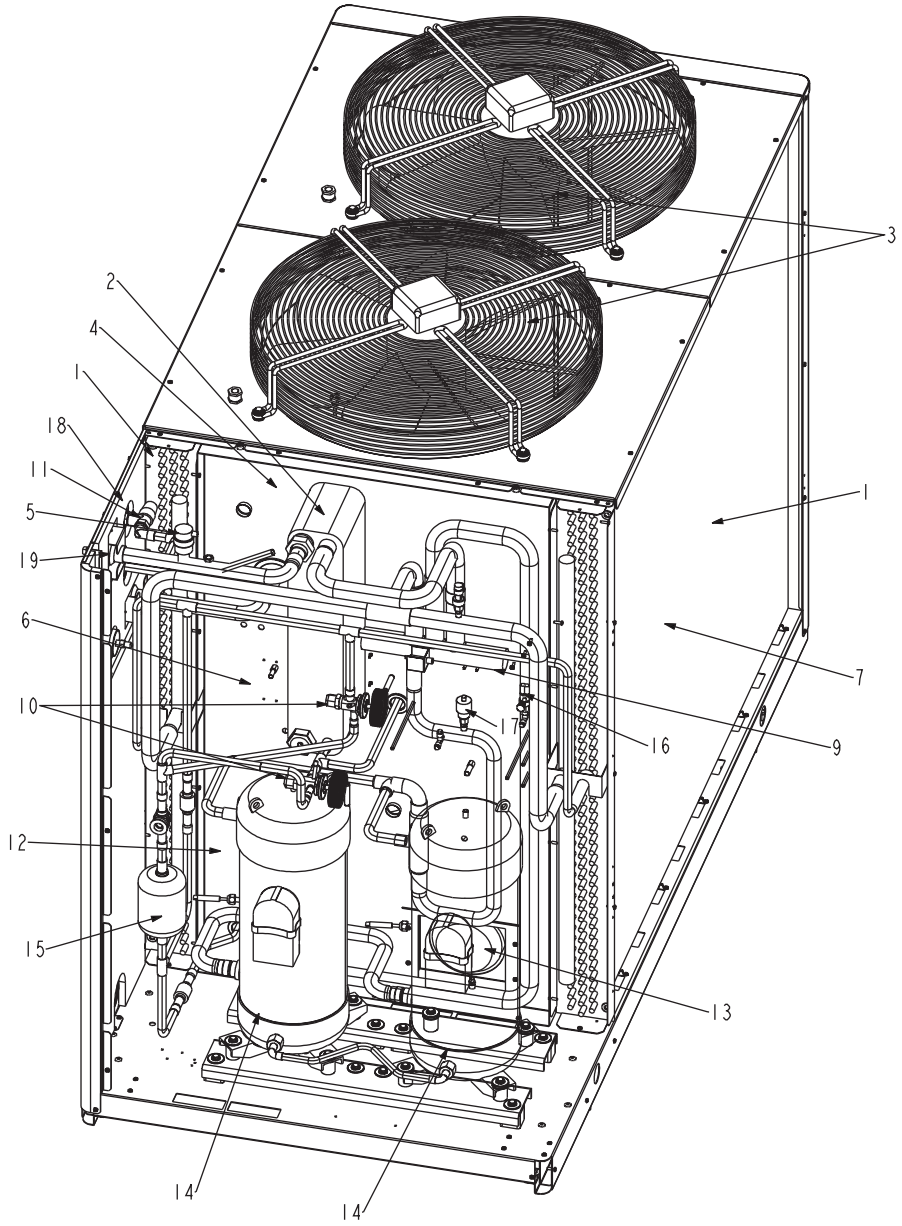
MPE 54 - 66



	DESCRIPTION		
1.	R410A-air heat-exchanger	**11.**	Water safety valve
2.	R410A-water heat-exchanger	**12.**	Liquid receiver (fan housing)
3.	Fans	**13.**	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.	Water tank (accessory)	**17.**	High pressure switch and charge port
9.	4-way valve (MPE H)	**18.**	Water gauge
10.	Thermostatic valve	**19.**	Water charge

3 LAYOUT OF COMPONENTS

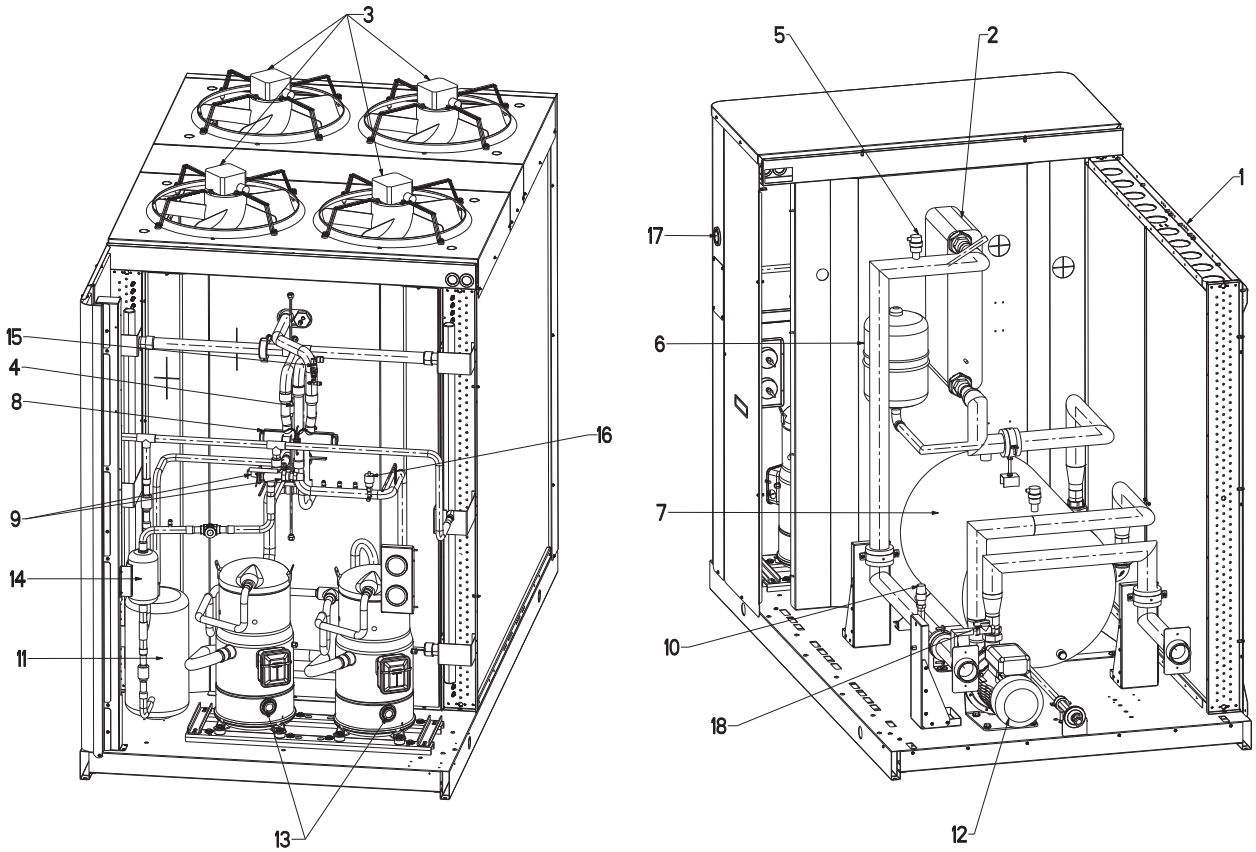
MPE 30 - 45T



	DESCRIPTION		
1.	R410A-air heat-exchanger	**11.**	Water safety valve
2.	R410A-water heat-exchanger	**12.**	Liquid receiver (fan housing)
3.	Fans	**13.**	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.	Water tank (accessory)	**17.**	High pressure switch and charge port
9.	4-way valve (MPE H)	**18.**	Water gauge
10.	Thermostatic valve	**19.**	Water charge

3 LAYOUT OF COMPONENTS

MPE 54T - 76T



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

4 MODELS AND CONFIGURATIONS

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.

MODELS AND VERSIONS

The MPE series features 25 models of varying capacity in both heat pump and cooling only versions.
All models are charged with R410A refrigerant.
N.B. The choice of some options may preclude the choice of others or make some other fields become mandatory. Contact Galletti S.p.A. for verification.

Complete Unit Code	M	P	E	0	0	9	C	0	0	0	0	0	0	0	0	0	0	0	0	1

Version 0
Single compressor **0**
Tandem **T**

Model (size) 0 9

Operation C
Chiller **C**
Heat pump **H**

Power Supply 0
Standard 400 - 3N - 50 **0**
Single phase **M**
400 - 3N - 50 + thermalmagnetic **2**
Single Phase + thermalmagnetic **4**

Expansion Valve 0
Standard valve **0**
Electronic expansion valve **A**
FLOOR PACK (Including electronic valve and C/C) **B**

Pump and accessories 0
Not present **0**
Pump - vessel - water charge valve **1**
Double pump - vessel - water charge valve **2**

Buffer tank 0
Not present **0**
Present **S**

Partial heat recovery (the condensation control must be added) 0
Not present **0**
Desuperheater with pump contact **D**

Air flow modulation 0
Not present **0**
Condensation control with fans adjusted by potentiometer **C**
Condensation control with "EC brushless" electronically controlled fans **E**

Antifreeze kit 0
Not present **0**
Present, standard unit **E**
Present, unit with pump and vessel **P**
Present, unit with pump, vessel and tank **S**

Acoustic insulation 0
Not present **0**
Compressor compartment soundproofing **1**
Compressor silencing housings **2**
Opt. 1 + Opt.2 **3**

Refrigerant circuit accessoires 0
Not present **0**
Refrigerant gauge **M**

Remote control 0
Not present **0**
Output RS485 (Modbus or Carel protocol **2**
Simplified remote control **S**
BASE microprocessor remote control (modbus disabling) **M**
ADVANCED Remote microprocessor control **X**
LON FTT10 serial card **L**

Special coil 0
Standard **0**
Copper / copper heat exchanger **R**
Cataphoresis **C**
Fins pre-coated with epoxy paint **B**

Protection grille 0
Not present **0**
Present **G**

Compressor options 0
Not present **0**
Power factor correction capacitors **1**
Soft starter **2**
Power factor correction capacitors + soft starter **3**
Low air/water temperature (crankcase heating element) **4**

Control microprocessor 1
BASE control microprocessor **1**
ADVANCED control microprocessor **2**
ADVANCED control microprocessor + GSM kit **3**
ADVANCED control microprocessor + clock card **4**

5 TECHNICAL CHARACTERISTICS

5.1 RATED TECHNICAL DATA OF WATER CHILLERS

MPE-C		004 M	005 M	007 M	008 M	008	010 M	010	013	015	018	020	024	027	028
Power supply	V-ph-Hz	230-1-50				400-3-50	230-1-50	400-3-50							
Cooling capacity	kW	4,10	5,09	6,64	8,43	8,30	9,17	9,16	12,7	14,8	17,0	19,4	23,6	26,4	27,9
Total power input	kW	1,35	1,71	2,28	3,11	3,38	3,31	3,31	4,32	5,29	6,52	7,31	8,31	9,52	8,87
EER		3,03	2,98	2,92	2,71	2,45	2,77	2,76	2,95	2,81	2,61	2,66	2,84	2,77	3,14
ESEER		3,54	3,39	3,32	3,36	2,98	3,38	3,38	3,69	3,53	3,30	3,21	3,42	3,36	3,77
Eurovent Class Efficiency		B	B	B	C	E	C	C	B	C	D	D	C	C	A
Maximum power input	kW	2,0	2,3	3,0	5,0	5,0	5,1	7,2	8,9	10,5	12,5	13,6	14,5	18,0	18,3
Maximum current absorption	A	9	11	15	9	24	12	24	15	18	22	24	26	32	33
Starting absorbed current	A	38	44	63	49	98	49	98	64	67	76	105	159	133	134
n° of compressors / circuits		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Refrigerant charge	kg	1,5	1,5	2,0	2,1	2,1	2,9	2,9	4,0	4,1	3,7	4,2	5,8	6,0	7,5
Low/high pressure switch	bar	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42
n° of axial fan		1	1	1	1	1	2	2	2	2	4	4	4	4	2
Air flow	m^3/h	3635	3635	3406	3406	3406	7385	7385	6939	6939	9990	9990	9307	9307	16276
Water flow	l/h	706	876	1145	1452	1429	1590	1588	2217	2571	2952	3373	4090	4565	4823
Diameter of hydrualic connections	"	1	1	1	1	1	1	1	1	1	1,25	1,25	1,25	1,25	1,25
Water side pressure drop	kPa	<5	<5	6	6	6	34	34	61	38	51	51	49	34	40
Available pressure head	kPa	77	74	70	67	67	115	115	81	102	130	123	113	123	141
Water content escluding optionals	dm^3	1,5	1,5	1,5	1,5	1,5	3,0	3,0	3,0	3,0	4,0	4,0	4,0	4,0	5,5
Buffer tank	dm^3	20	20	20	20	20	30	30	30	30	50	50	50	50	125
Expansion tank	dm^3	1	1	1	1	1	5	5	5	5	5	5	5	5	8
Height	mm	758	758	758	758	758	1250	1250	1250	1250	1300	1300	1300	1300	1485
Length	mm	960	960	960	960	960	1220	1220	1220	1220	1565	1565	1565	1565	1990
Depth	mm	450	450	450	450	450	560	560	560	560	600	600	600	600	950
Sound power level	dB(A)	66	66	67	67	67	69	69	69	69	71	71	72	72	73
Sound pressure level	dB(A)	38	38	39	39	39	41	41	41	41	43	43	44	44	45
Unit with pump and tank transport weight	kg	114	118	123	127	127	211	211	216	219	265	281	297	313	427
Unit with pump and full tank operating weight	kg	123	127	132	136	136	227	227	232	236	301	317	333	350	534

- Cooling capacity: outdoor air temperature 35°C, water temperature 12°C / 7°C
- Sound power level measured according to standards ISO 3741 - ISO 3744 and EN 29614-1
- Sound pressure level measured at a distance of 10 m and a height of 1.5 m above the ground in a free field (fan side).
- The maximum electrical input is the mains electricity that must be available in order for the unit to work.
- The maximum current absorption refers to the current that will trigger the internal safety devices of the unit. It is the maximum current allowed in the unit. This value may never be exceeded; it must be used as a reference for determining the size of the power supply line and the related safety devices (refer to the wiring diagram supplied with the units).

5 TECHNICAL CHARACTERISTICS

5.1 RATED TECHNICAL DATA OF WATER CHILLERS

MPE-C		032	035	040	054	066	T30	T34	T40	T45	T54	T61	T69	T76
Power supply	V-ph-Hz	400-3-50												
Cooling capacity	kW	31,3	34,7	39,4	51,0	65,6	29,8	33,9	39,3	44,2	54,2	61,4	69,3	75,6
Total power input	kW	10,3	11,7	13,0	18,2	24,6	10,6	12,8	13,9	16,8	18,7	21,7	24,1	28,0
EER		3,03	2,96	3,02	2,81	2,66	2,82	2,64	2,82	2,64	2,90	2,83	2,88	2,70
ESEER		3,63	3,61	3,68	3,60	3,30	4,17	4,11	4,15	4,04	4,03	4,01	4,18	4,16
Eurovent Class Efficiency		B	B	B	C	D	C	D	C	D	B	C	C	C
Maximum power input	kW	18,9	21,8	22,4	22,7	23,3	20,9	24,4	26,6	30,8	27,0	29,9	32,3	39,4
Maximum current absorption	A	34	39	40	40	41	37	43	47	63	48	53	57	69
Starting absorbed current	A	167	162	164	163	165	86	96	127	150	177	187	202	229
n° of compressors / circuits		1/1	1/1	1/1	1/1	1/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Refrigerant charge	kg	7,5	7,8	10,8	13,0	15,0	7,8	7,8	10,9	10,9	11,0	11,0	16,0	16,0
Low/high pressure switch	bar	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42
n° of axial fan		2	2	2	2	2	2	2	2	2	2	2	2	2
Air flow	m^3/h	16276	16276	15776	20048	20048	16276	16276	15776	15776	24930	24930	24354	24354
Water flow	l/h	5415	6008	6816	8829	11342	5156	5854	6799	7648	9378	10629	11989	13075
Diameter of hydraulic connections	"	1,25	1,25	1,25	1,25	1,25	1,25	1,25	1,25	1,25	2	2	2	2
Water side pressure drop	kPa	51	40	43	55	59	30	38	45	57	53	66	52	60
Available pressure head	kPa	123	128	117	107	92	148	133	116	94	136	119	127	115
Water content escluding optionals	dm^3	5,5	5,5	5,5	5,5	7,0	8,0	5,5	5,5	5,5	5,5	7,0	8,0	11,0
Buffer tank	dm^3	125	125	125	125	125	125	125	125	125	125	125	125	125
Expansion tank	dm^3	8	8	8	8	8	8	8	8	8	8	8	8	8
Height	mm	1485	1485	1485	1485	1485	1485	1485	1485	1485	1735	1735	1735	1735
Length	mm	1990	1990	1990	1990	1990	1990	1990	1990	1990	2091	2091	2091	2091
Depth	mm	950	950	950	950	950	950	950	950	950	1183	1183	1183	1183
Sound power level	dB(A)	73	73	75	78	78	72	72	72	72	81	81	81	81
Sound pressure level	dB(A)	45	45	47	50	50	44	44	44	44	53	53	53	53
Unit with pump and tank transport weight	kg	456	487	516	521	558	448	484	521	555	643	665	685	786
Unit with pump and full tank operating weight	kg	563	595	624	630	665	555	591	629	663	751	773	793	894

- Cooling capacity: outdoor air temperature 35°C, water temperature 12°C / 7°C
- Sound power level measured according to standards ISO 3741 - ISO 3744 and EN 29614-1
- Sound pressure level measured at a distance of 10 m and a height of 1.5 m above the ground in a free field (fan side).
- The maximum electrical input is the mains electricity that must be available in order for the unit to work.
- The maximum current absorption refers to the current that will trigger the internal safety devices of the unit. It is the maximum current allowed in the unit. This value may never be exceeded; it must be used as a reference for determining the size of the power supply line and the related safety devices (refer to the wiring diagram supplied with the units).

5 TECHNICAL CHARACTERISTICS

5.2 RATED TECHNICAL DATA OF HEAT PUMPS

MPE-H		004 M	005 M	007 M	008 M	008	010 M	010	013	015	018	020	024	027	028
Power supply	V-ph-Hz	230-1-50				400-3-50	230-1-50	400-3-50							
Cooling capacity	kW	4,02	4,99	6,51	8,26	8,13	8,99	8,98	12,5	14,5	16,7	19,1	23,1	25,9	27,3
Cooling power input	kW	1,35	1,71	2,28	3,11	3,38	3,31	3,31	4,31	5,28	6,51	7,30	8,31	9,51	8,86
EER		2,97	2,92	2,86	2,65	2,41	2,72	2,71	2,90	2,75	2,56	2,61	2,78	2,72	3,08
ESEER		3,47	3,32	3,26	3,29	2,92	3,31	3,31	3,62	3,46	3,23	3,15	3,35	3,29	3,70
Eurovent Class Efficiency		B	B	C	D	E	C	C	B	C	D	D	C	C	B
Heating capacity	kW	4,73	5,88	7,79	9,93	10,3	11,0	11,0	15,4	17,8	20,3	23,1	27,4	30,1	31,5
Heating power input	kW	1,47	1,83	2,44	3,26	3,66	3,73	3,73	4,92	5,66	6,87	7,42	8,38	9,11	9,38
COP		3,22	3,22	3,19	3,05	2,82	2,94	2,94	3,12	3,14	2,96	3,12	3,28	3,30	3,36
Eurovent Class Efficiency		A	A	B	B	C	C	C	B	B	C	B	A	A	A
SCOP		3,45	3,59	3,59	3,51	3,26	3,05	3,05	3,34	3,47	3,22	3,22	3,44	3,57	3,60
Energy Efficiency		136	141	141	138	128	120	120	131	136	126	126	135	140	141
Energy Efficiency Class		A+	A+	A+	A+	A+	A	A	A+	A+	A+	A+	A+	A+	A+
Maximum power input	kW	2,00	2,30	3,00	5,00	5,00	5,10	7,20	8,90	10,5	12,5	13,6	14,5	18,0	18,3
Maximum current absorption	A	9	11	15	9	24	12	24	15	18	22	24	26	32	33
Starting absorbed current	A	38	44	63	49	98	49	98	64	67	76	105	159	133	134
n° of compressors / circuits		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Refrigerant charge	kg	1,5	1,5	2,0	2,1	2,1	2,9	2,9	4,0	4,1	3,7	4,2	5,8	6,0	7,5
Low/high pressure switch	bar	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42
n° of axial fan		1	1	1	1	1	2	2	2	2	4	4	4	4	2
Air flow	m3/h	3635	3635	3406	3406	3406	7385	7385	6939	6939	9990	9990	9307	9307	16276
Water flow in cooling mode	l/h	692	859	1122	1423	1400	1559	1557	2172	2520	2894	3306	4008	4474	4727
Water flow in heat pump	l/h	820	1020	1348	1720	1788	1884	1884	2628	3053	3493	3976	4721	5187	5431
Diameter of hydrualic connections	"	1	1	1	1	1	1	1	1	1	1,25	1,25	1,25	1,25	1,25
Water pressure drop (cooling)	kPa	<5	<5	6	6	6	33	33	59	36	49	49	47	32	39
Water pressure drop (heating)	kPa	<5	<5	8	8	8	46	46	85	52	71	70	63	43	50
Available pressure head (cooling)	kPa	77	74	70	67	67	115	115	81	102	130	123	113	123	141
Available pressure head (heating)	kPa	75	73	66	63	63	104	104	59	87	107	101	93	106	127
Water content escluding optionals	dm3	1,5	1,5	1,5	1,5	1,5	3,0	3,0	3,0	3,0	4,0	4,0	4,0	4,0	5,5
Expansion tank	dm3	1	1	1	1	1	5	5	5	5	5	5	5	5	8
Buffer tank	dm3	20	20	20	20	20	30	30	30	30	50	50	50	50	125
Height	mm	758	758	758	758	758	1250	1250	1250	1250	1300	1300	1300	1300	1485
Length	mm	960	960	960	960	960	1220	1220	1220	1220	1565	1565	1565	1565	1990
Depth	mm	450	450	450	450	450	560	560	560	560	600	600	600	600	950
Sound power level	dB(A)	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Sound pressure level	dB(A)	38	38	39	39	39	41	41	41	41	43	43	44	44	45
Unit with pump and tank transport weight	kg	117	121	126	130	130	215	215	220	224	270	286	302	318	433
Unit with pump and full tank operating weight	kg	126	130	135	139	139	232	232	237	241	306	322	338	355	540

- Cooling capacity: outdoor air temperature 35°C, water temperature 12°C / 7°C
- Heating capacity: outdoor air temperature 7°C dry bulb and 6.2°C wet bulb, water temperature 40°C/45°C
- Sound power level measured according to standards ISO 3741 - ISO 3744 and EN 29614-1
- Sound pressure level measured at a distance of 10 m and a height of 1.5 m above the ground in a free field (fan side).
- The maximum electrical input is the mains electricity that must be available in order for the unit to work.
- The maximum current absorption refers to the current that will trigger the internal safety devices of the unit. It is the maximum current allowed in the unit. This value may never be exceeded; it must be used as a reference for determining the size of the power supply line and the related safety devices (refer to the wiring diagram supplied with the units).

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

5 TECHNICAL CHARACTERISTICS

5.2 RATED TECHNICAL DATA OF HEAT PUMPS

MPE-H		032	035	040	054	066	T30	T34	T40	T45	T54	T61	T69	T76
Power supply	V-ph-Hz	400-3-50												
Cooling capacity	kW	30,6	34,0	38,6	51,6	62,3	29,3	33,2	38,5	43,3	53,1	60,2	68,1	74,1
Cooling power input	kW	10,3	11,7	13,0	18,2	24,6	10,6	12,8	13,9	16,7	18,7	21,7	24,0	28,0
EER		2,97	2,90	2,97	2,84	2,54	2,76	2,59	2,77	2,59	2,84	2,78	2,83	2,65
ESEER		3,56	3,54	3,61	3,50	3,20	4,09	4,03	4,06	3,96	4,03	4,01	4,18	4,16
Eurovent Class Efficiency		B	B	B	C	D	C	D	C	D	C	C	C	D
Heating capacity	kW	35,9	39,5	45,2	61,4	75,8	34,6	39,5	46,7	53,2	60,4	68,1	77,0	85,4
Heating power input	kW	10,8	11,9	13,5	18,9	23,8	11,1	13,1	14,3	16,7	19,0	22,1	23,9	27,4
COP		3,34	3,33	3,36	3,25	3,19	3,12	3,02	3,25	3,18	3,19	3,08	3,22	3,11
Eurovent Class Efficiency		A	A	A	A	B	B	B	A	B	B	B	A	B
SCOP		3,64	3,70	3,64	3,58	3,48	3,66	3,70	3,73	3,68	3,55	3,47	3,67	3,56
Energy Efficiency		143	146	143	141	137	144	146	147	145	139	136	144	140
Energy Efficiency Class*		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
Maximum power input	kW	18,9	21,8	22,4	22,7	23,3	20,9	24,4	26,6	30,8	27,0	29,9	32,3	39,4
Maximum current absorption	A	34	39	40	40	41	37	43	47	63	48	53	57	69
Starting absorbed current	A	167	162	164	163	165	86	96	127	150	177	187	202	229
n° of compressors / circuits		1/1	1/1	1/1	1/1	1/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Refrigerant charge	kg	7,5	7,8	10,8	13,0	16,0	7,8	7,8	10,9	10,9	13,0	13,0	19,5	19,5
Low/high pressure switch	bar	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42	2 / 42
n° of axial fan		2	2	2	2	2	2	2	2	2	2	2	2	2
Air flow	m3/h	16276	16276	15776	20048	20048	16276	16276	15776	15776	24930	24930	24354	24354
Water flow in cooling mode	l/h	5307	5888	6681	8932	10776	5053	5737	6663	7495	9189	10423	11766	12818
Water flow in heat pump	l/h	6173	6813	7800	10575	13063	5976	6818	8042	9155	10412	11733	13292	14730
Diameter of hydrualic connections	"	1,25	1,25	1,25	1,25	1,25	1,25	1,25	1,25	1,25	2	2	2	2
Water pressure drop (cooling)	kPa	49	39	42	56	54	29	37	44	55	51	64	50	58
Water pressure drop (heating)	kPa	64	51	54	82	81	39	52	58	74	58	74	56	69
Available pressure head (cooling)	kPa	123	128	117	107	92	148	133	116	94	136	119	127	115
Available pressure head (heating)	kPa	109	114	99	76	52	131	113	95	65	126	100	110	87
Water content escluding optionals	dm3	5,5	5,5	5,5	7,0	8,0	5,5	5,5	5,5	5,5	7,0	8,0	11,0	12,0
Expansion tank	dm3	8	8	8	8	8	8	8	8	8	8	8	8	8
Buffer tank	dm3	125	125	125	125	125	125	125	125	125	125	125	125	125
Height	mm	1485	1485	1485	1485	1485	1485	1485	1485	1485	1735	1735	1735	1735
Length	mm	1990	1990	1990	1990	1990	1990	1990	1990	1990	2091	2091	2091	2091
Depth	mm	950	950	950	950	950	950	950	950	950	1183	1183	1183	1183
Sound power level	dB(A)	80	81	82	83	84	85	86	87	88	89	90	91	92
Sound pressure level	dB(A)	45	45	47	50	50	44	44	44	44	53	53	53	53
Unit with pump and tank transport weight	kg	462	493	522	530	570	455	491	528	562	653	674	695	796
Unit with pump and full tank operating weight	kg	569	601	630	640	680	562	598	636	670	761	782	803	904

- Cooling capacity: outdoor air temperature 35°C, water temperature 12°C / 7°C
- Heating capacity: outdoor air temperature 7°C dry bulb and 6.2°C wet bulb, water temperature 40°C/45°C
- Sound power level measured according to standards ISO 3741 - ISO 3744 and EN 29614-1
- Sound pressure level measured at a distance of 10 m and a height of 1.5 m above the ground in a free field (fan side).
- The maximum electrical input is the mains electricity that must be available in order for the unit to work.
- The maximum current absorption refers to the current that will trigger the internal safety devices of the unit. It is the maximum current allowed in the unit. This value may never be exceeded; it must be used as a reference for determining the size of the power supply line and the related safety devices (refer to the wiring diagram supplied with the units).

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

6 PERFORMANCES

In order to define the performances of MPE subject to conditions different from rated conditions, a computer program for the correct choice of the units is provided by Galletti SpA.

With a few input data it will be possible to get information on the behaviour of a MPE referring to the desired operating conditions.

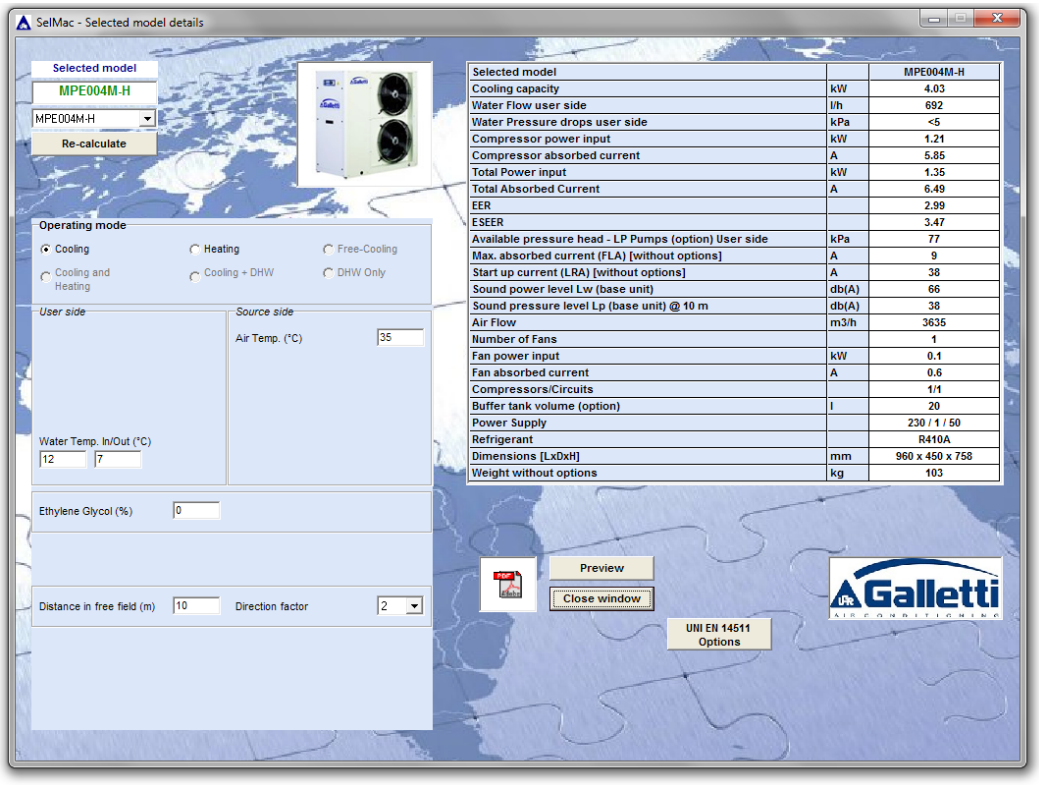
It will be sufficient to enter the following data:
- Inlet air temperature
- Inlet water temperature
- Outlet water temperature
- Ethylene glycol percentage (default 0)
- Directivity factor and distance

Output data
- Cooling / heating capacity
- Water flow rate on user side
- Water pressure drop on user side
- Total power input
- Total Absorbed current
- Compressor Power Input
- Compressor Absorbed current
- EER
- ESEER
- COP
- Pump available head

- Maximum current (FLA)
- Inrush current (LRA)
- Inrush Current with Soft Starter kit
- Sound power level LW
- Sound pressure level Lp

- Air flow rate
- Number of fans
- Fan input power
- Fan input current
- Compressors/Circuits
- Tank Capacity (optional)
- Power supply

The selection report generated by the software includes the drawing with overall dimensions.



Selected model		MPE004M-H
Cooling capacity	kW	4.03
Water Flow user side	l/h	692
Water Pressure drops user side	kPa	<5
Compressor power input	kW	1.21
Compressor absorbed current	A	5.85
Total Power input	kW	1.35
Total Absorbed Current	A	6.49
EER		2.99
ESEER		3.47
Available pressure head - LP Pumps (option) User side	kPa	77
Max. absorbed current (FLA) [without options]	A	9
Start up current (LRA) [without options]	A	38
Sound power level Lw (base unit)	db(A)	66
Sound pressure level Lp (base unit) @ 10 m	db(A)	38
Air Flow	m3/h	3635
Number of Fans		1
Fan power input	kW	0.1
Fan absorbed current	A	0.6
Compressors/Circuits		1/1
Buffer tank volume (option)	l	20
Power Supply		230 / 1 / 50
Refrigerant		R410A
Dimensions [LxDxH]	mm	960 x 450 x 758
Weight without options	kg	103

6.1 INTEGRATED CAPACITIES

In the heat pump operation (heating mode), the actual heating capacities of units may be lower than the values shown in the table, due to defrosting cycles. To obtain the actual heating capacity, multiply the capacity values by the corrective coefficients given below.

Control	Air temperature- dry bulb (°C)			
	-5	0	5	>5
mchiller2	0,89	0,88	0,94	1
PCO XS	0,91	0,9	0,94	1

7 SOUND LEVEL

LEGEND

Lp_A Total sound pressure level, weighted A, measured in an open field, at a distance of 10 m, with a directivity factor of 2.
Lw Sound power level by octave band, not weighted
Lw_A Total sound power level, weighted A

Model	Lw							Lw A		Lp A	
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Total	Low-noise version	Total	Low-noise version
	dB	dB	dB	dB	dB	dB	dB	dB (A)	dB (A)	dB (A)	dB (A)
MPE 004 M	72,0	65,7	65,1	61,0	53,8	48,8	45,0	66,0	64,0	38,0	36,0
MPE 005 M	71,8	65,5	64,9	60,8	53,6	48,6	44,8	66,0	64,0	38,0	36,0
MPE 007 M	73,0	66,6	66,0	62,0	54,7	49,7	46,0	67,0	65,0	39,0	37,0
MPE 008 M	73,0	66,6	66,0	62,0	54,7	49,7	46,0	67,0	65,0	39,0	37,0
MPE 008	72,6	66,3	65,7	61,6	54,4	49,4	45,6	67,0	65,0	39,0	37,0
MPE 010 M	74,4	68,0	67,4	63,4	56,1	51,1	47,4	69,0	67,0	41,0	39,0
MPE 010	74,4	68,0	67,4	63,4	56,1	51,1	47,4	69,0	67,0	41,0	39,0
MPE 013	74,6	68,3	67,7	63,6	56,4	51,4	47,6	69,0	67,0	41,0	39,0
MPE 015	75,3	69,0	68,4	64,3	57,1	52,1	48,3	69,0	67,0	41,0	39,0
MPE 018	76,8	70,5	69,9	65,8	58,6	53,6	49,8	71,0	69,0	43,0	41,0
MPE 020	76,6	70,3	69,7	65,6	58,4	53,4	49,6	71,0	69,0	43,0	41,0
MPE 024	77,5	71,1	70,5	66,5	59,2	54,2	50,5	72,0	70,0	44,0	42,0
MPE 027	77,8	71,4	70,8	66,8	59,6	54,6	50,8	72,0	70,0	44,0	42,0
MPE 028	78,4	72,1	71,5	67,4	60,2	55,2	51,5	73,0	71,0	45,0	43,0
MPE 032	78,4	72,1	71,5	67,4	60,2	55,2	51,5	73,0	71,0	45,0	43,0
MPE 035	78,8	72,4	71,8	67,8	60,5	55,6	51,8	73,0	71,0	45,0	43,0
MPE 040	80,4	74,0	73,4	69,4	62,1	57,2	53,4	75,0	73,0	47,0	45,0
MPE 054	82,0	79,0	78,4	75,0	68,0	62,2	58,4	80,0	78,0	52,0	50,0
MPE 066	82,0	79,0	78,4	75,0	68,0	62,2	58,4	80,0	78,0	52,0	50,0
MPE 030 T	78,3	72,0	71,4	67,3	60,1	55,1	51,3	72,0	70,0	44,0	42,0
MPE 034 T	78,3	72,0	71,4	67,3	60,1	55,1	51,3	72,0	70,0	44,0	42,0
MPE 040 T	78,0	71,7	71,1	67,0	59,8	54,8	51,0	72,0	70,0	44,0	42,0
MPE 045 T	78,0	71,7	71,1	67,0	59,8	54,8	51,0	72,0	70,0	44,0	42,0
MPE 054 T	77,7	81,5	75,5	74,9	68,0	61,7	60,2	79,0	77,0	51,0	49,0
MPE 061 T	77,7	81,5	75,5	74,9	68,0	61,7	60,2	79,0	77,0	51,0	49,0
MPE 069 T	77,7	81,5	75,5	74,9	68,0	61,7	60,2	79,0	77,0	51,0	49,0
MPE 076 T	18,7	82,5	76,5	75,9	69,0	62,7	62,1	80,0	78,0	52,0	50,0

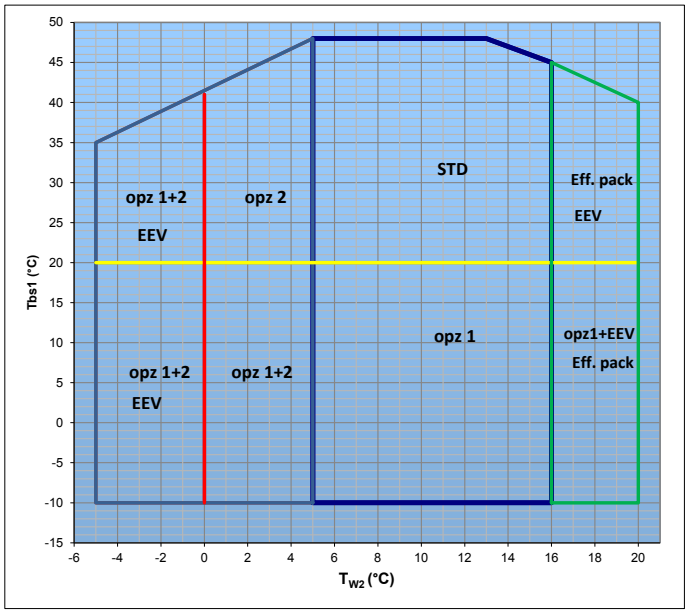
8 OPERATING LIMITS

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

OPERATING LIMITS	CHILLER		HEAT PUMP	
	MIN	MAX	MIN	MAX
Inlet water temperature (°C)	8	20 [1]	25	42
Outlet water temperature (°C)	5	15	28	50 [2]
Thermal differential of water (°C)	3	8	3	8
Outdoor air temperature (°C)	15 [3]	45	-5	20

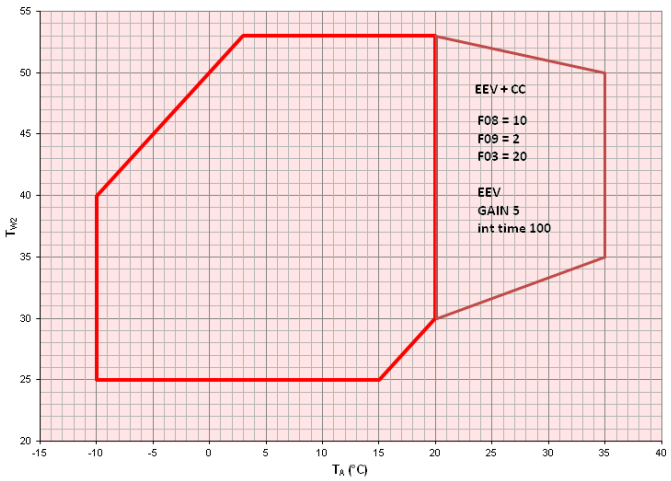
1. For transitory periods (e.g. equipment start up) values up to 25 °C are allowed
2. Value that may be reached only for outdoor air temperatures exceeding 0°C.
3. With condensation control: outdoor air T min - 10°C

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

TBS1 Outdoor temperature (dry bulb)
Tw2 Water outlet temperature
OPZ 1 Condensation control
OPZ 2 Glycol + low temperature option
OPZ 1+2 Condensation control + glycol + low temperature option
EEV Electronic valve
STD Standard



8.2 OPERATING LIMITS IN HEAT PUMP MODE

RH Relative humidity of outdoor air
Tbs1 Outdoor temperature (dry bulb)
Tw2 Water outlet temperature

8.3 THERMAL CARRIER FLUID

The units belonging to the **MPE** series can work with mixtures of water and up to 35% ethylene glycol.

9 CALCULATION FACTORS

9.1 CHANGE IN OPERATING PARAMETERS WITH DT OTHER THAN 5°C

After identifying the unit's performance in the terms of the desired outlet water temperature, correct the value by multiplying it by the following corrective coefficients.

ΔT_W	$C_{PF/PT}$	C_{PA}	C_{Qw}	$C_{\Delta pw1}$
3	0,975	1	1,63	2,64
4	0,99	1	1,24	1,53
5	1	1	1	1
6	1,015	1	0,85	0,72
7	1,03	1	0,74	0,54
8	1,04	1	0,65	0,42

ΔT_W Difference between water inlet temperature and water outlet temperature
$C_{PF/PT}$ Corrective coefficient of cooling/heating capacity
C_{PA} Correction coefficient of electrical input
C_{Qw} Correction coefficient of water flow rate
$C_{\Delta pw1}$ Correction coefficient of pressure drop

9.2 WATER AND GLYCOL MIXTURE

Based on the minimum outlet water temperature, you can derive the percentage of ethylene glycol and the corrective coefficient using the table below.

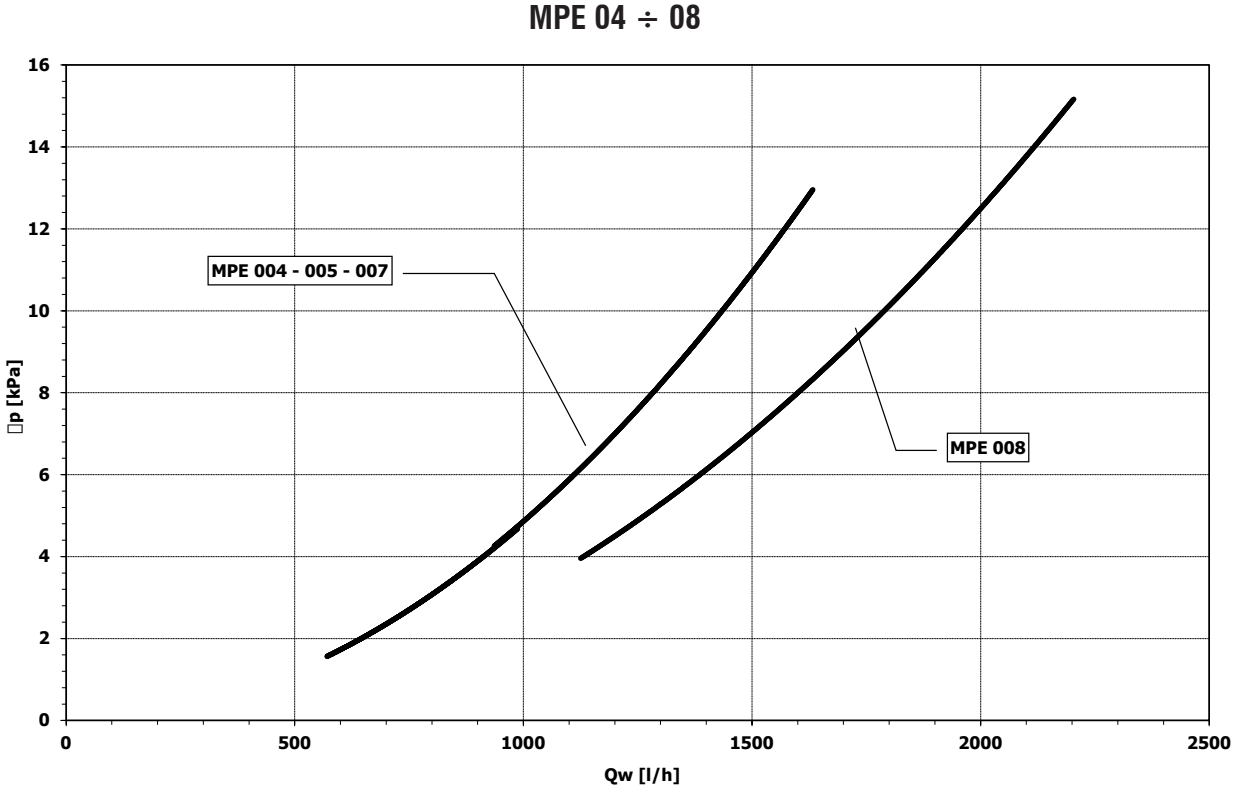
PERCENTAGE OF ETHYLENE GLYCOL	0%	10%	20%	30%	40%
Minimum temp. of water produced	5°C	2°C	-5°C	-10°C	-15°C
Mixture freezing temp. (°C)	0°C	-4°C	-14°C	-18°C	-24°C
Capacity correction factor	1,000	0,998	0,994	0,989	0,983
Water flow rate correction factor	1,000	1,047	1,094	1,140	1,199
Pressure drop correction factor	1,000	1,157	1,352	1,585	1,860

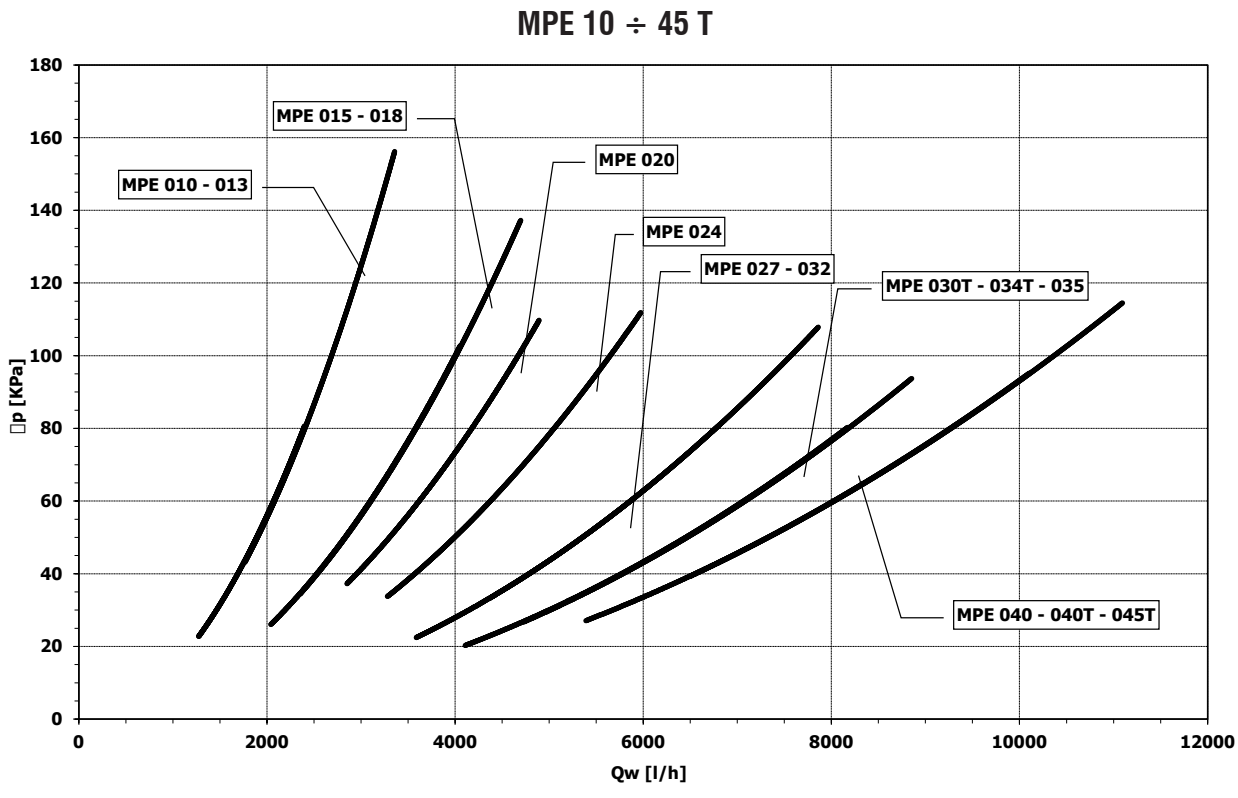
Warning ⚠ The use of propylene glycol is not admitted with standard pumps. For further information, contact the manufacturer.

10 PRESSURE DROPS

10.1 PRESSURE DROPS ON THE WATER SIDE

The diagram shows the evaporator pressure drops (**Δp**) as a function of the water flow rate (**Qw**), assuming an average water temperature of 10°C.





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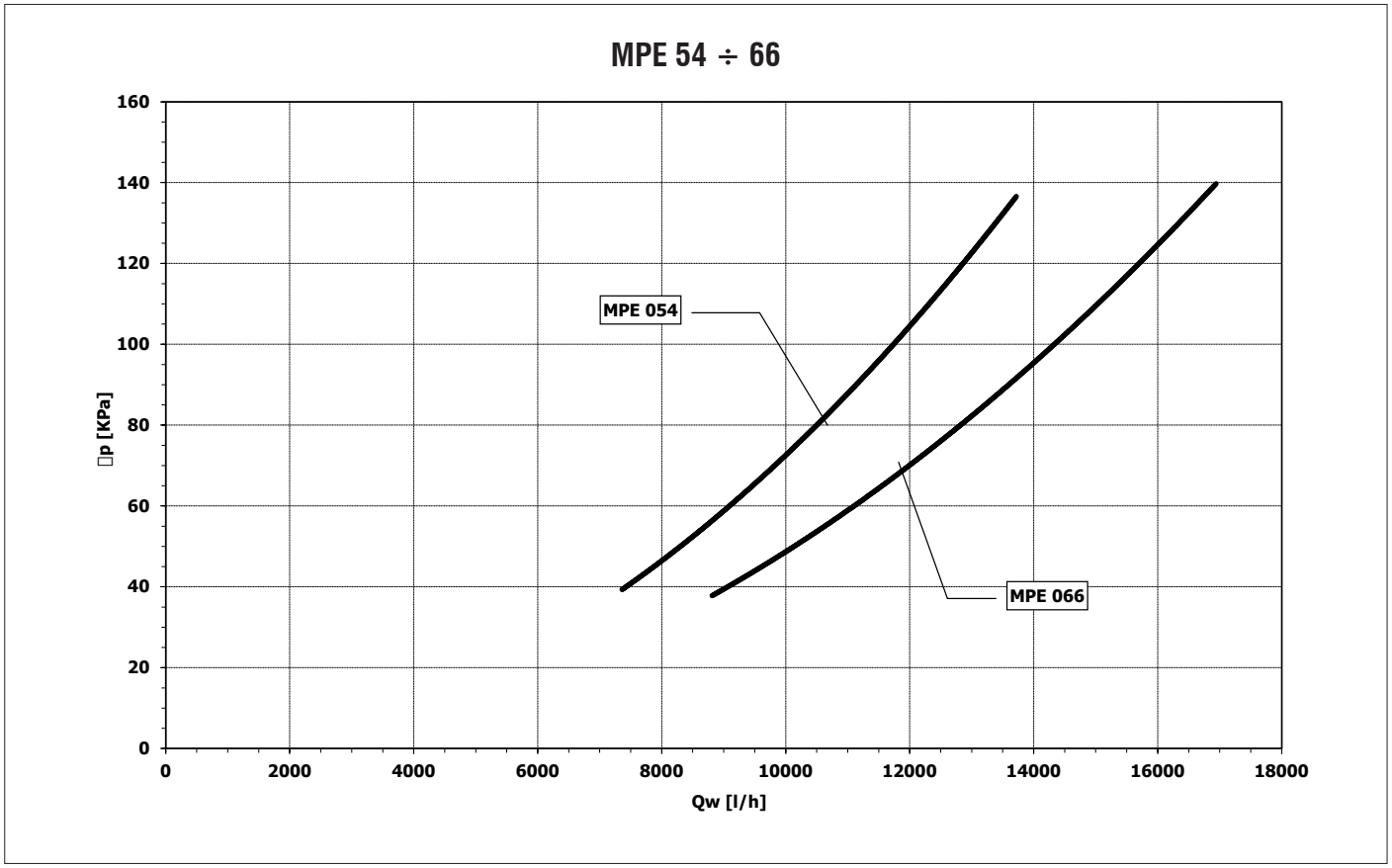
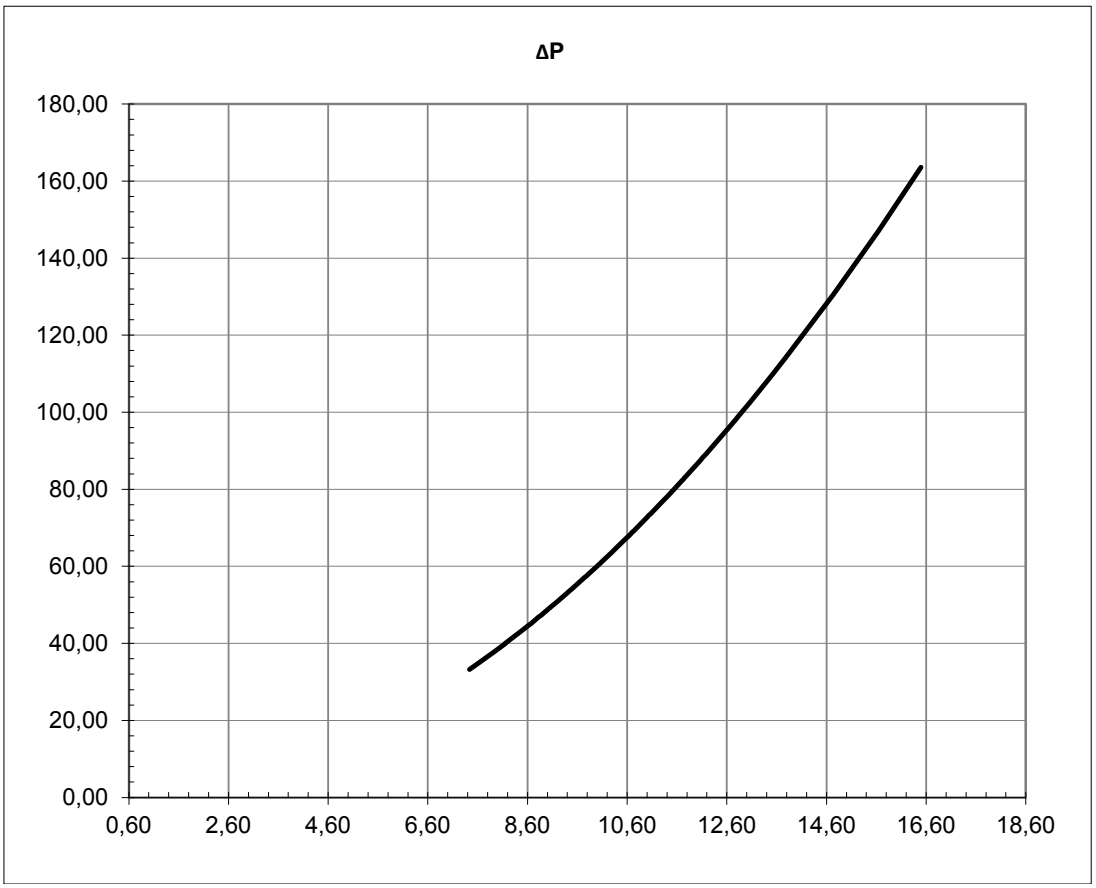


10 PRESSURE DROPS

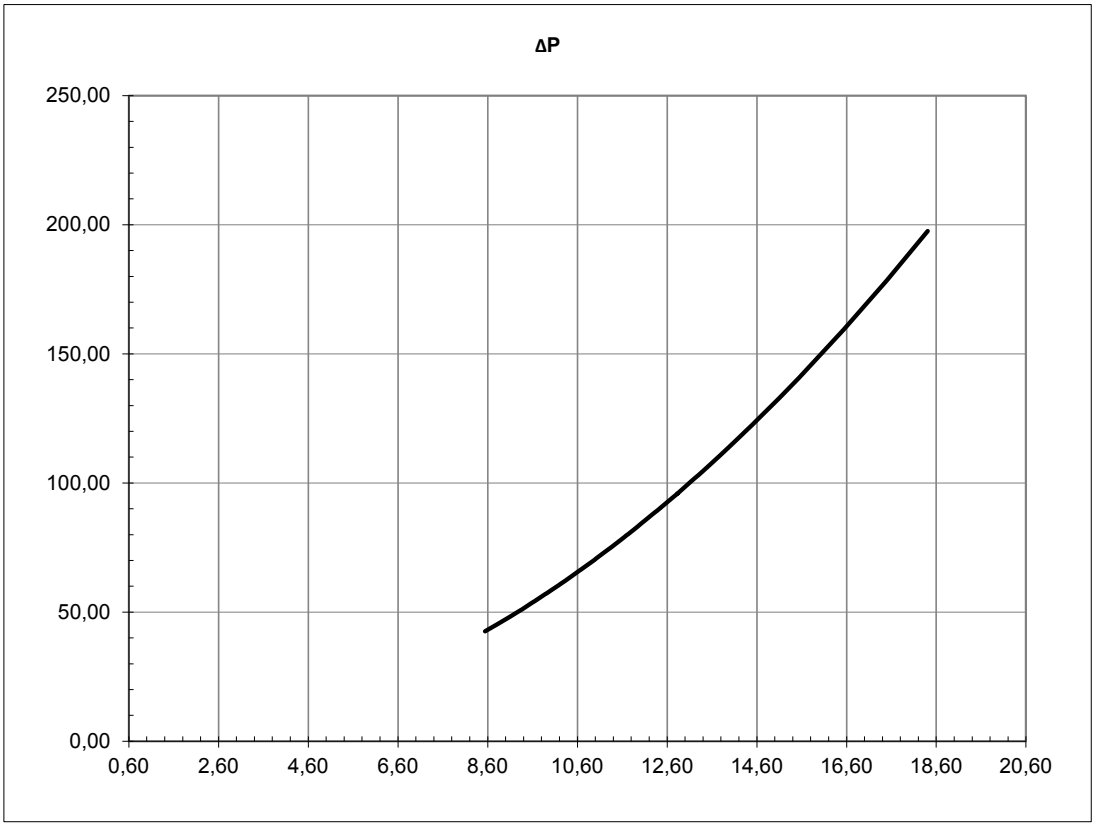
10.1 PRESSURE DROPS ON THE WATER SIDE

The diagram shows the evaporator pressure drops (**Δp**) as a function of the water flow rate (**Qw**), assuming an average water temperature of 10°C.

MPET 54



MPET 61

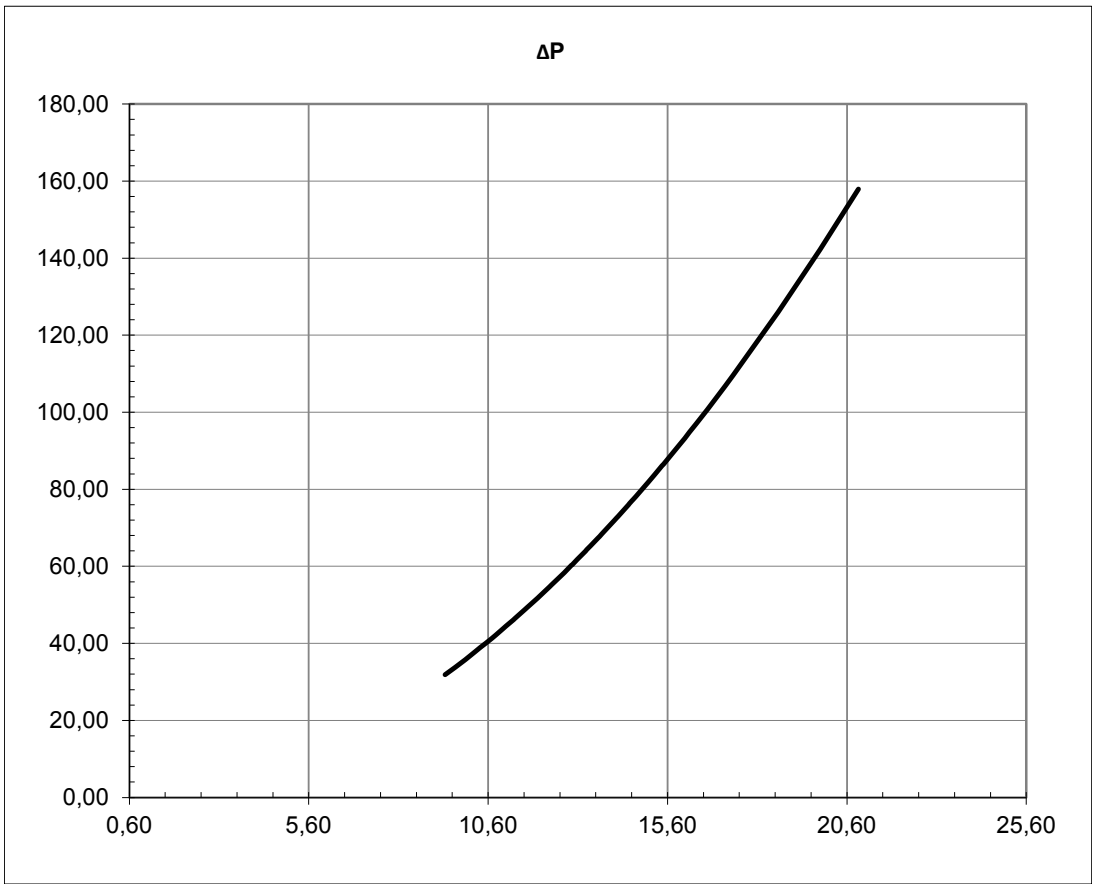


10 PRESSURE DROPS

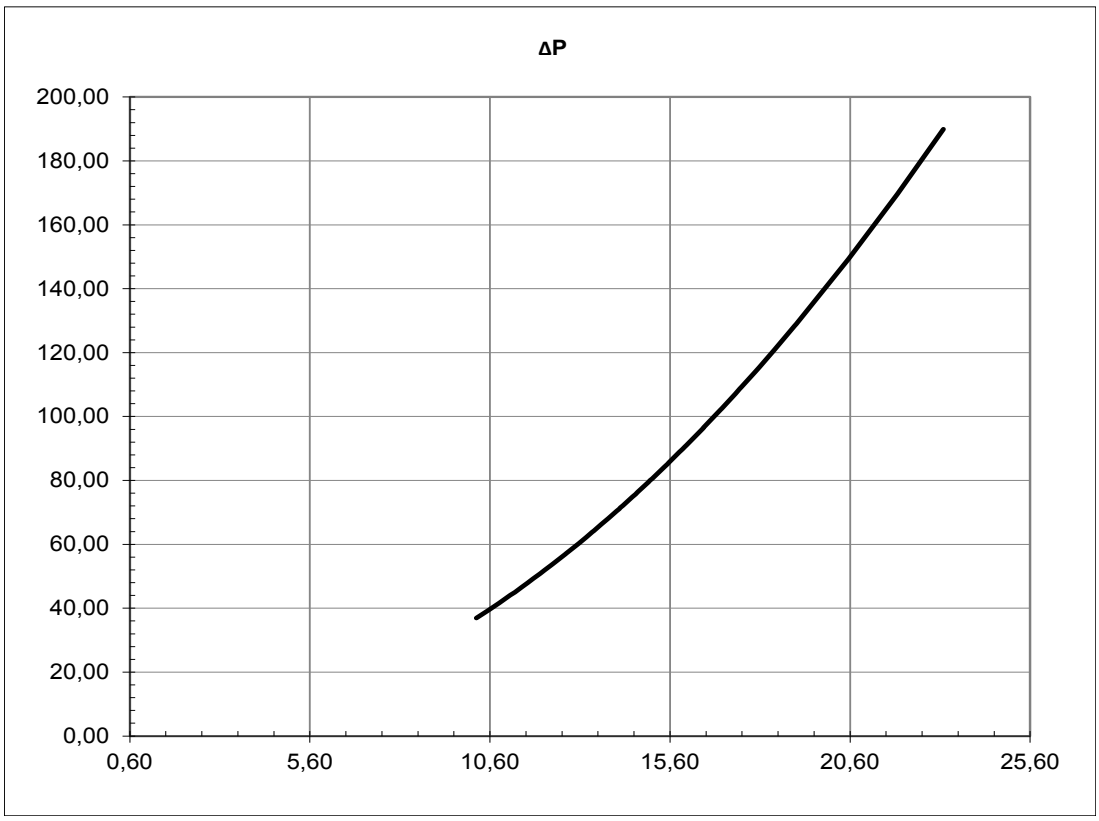
10.1 PRESSURE DROPS ON THE WATER SIDE

The diagram shows the evaporator pressure drops (**Δp**) as a function of the water flow rate (**Qw**), assuming an average water temperature of 10°C.

MPET 69



MPET 76

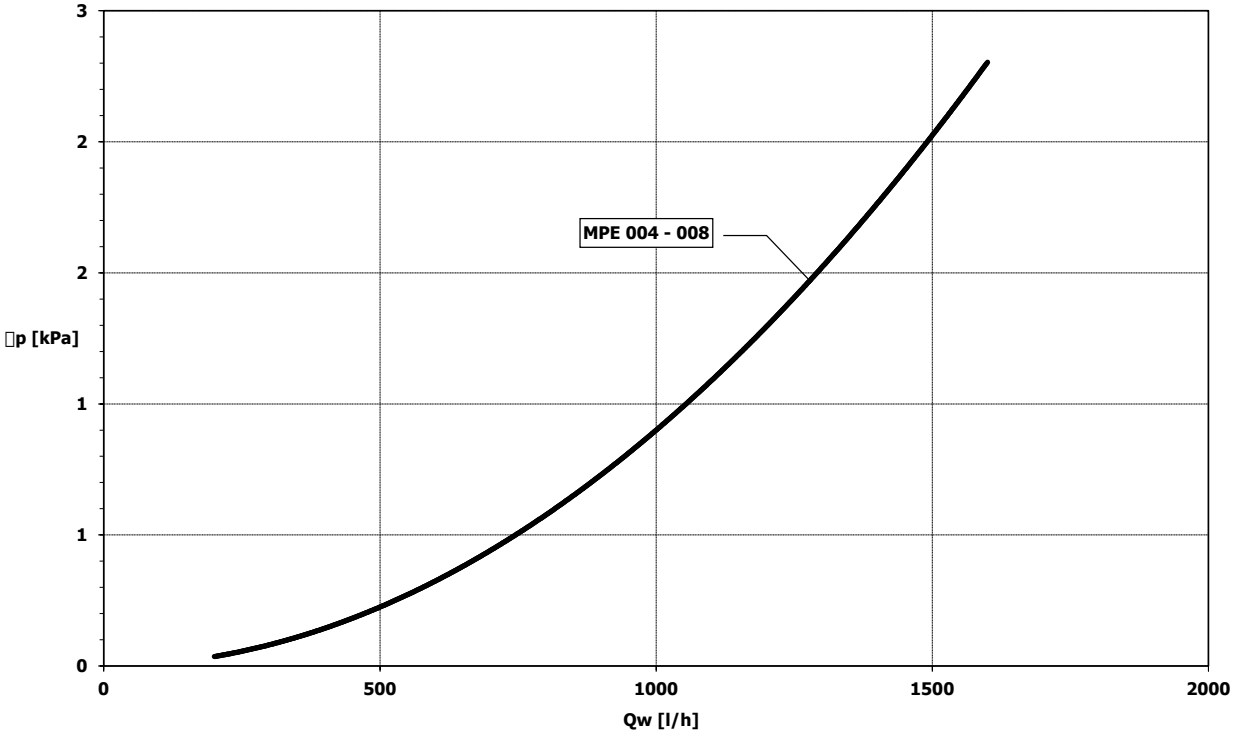


10 PRESSURE DROPS

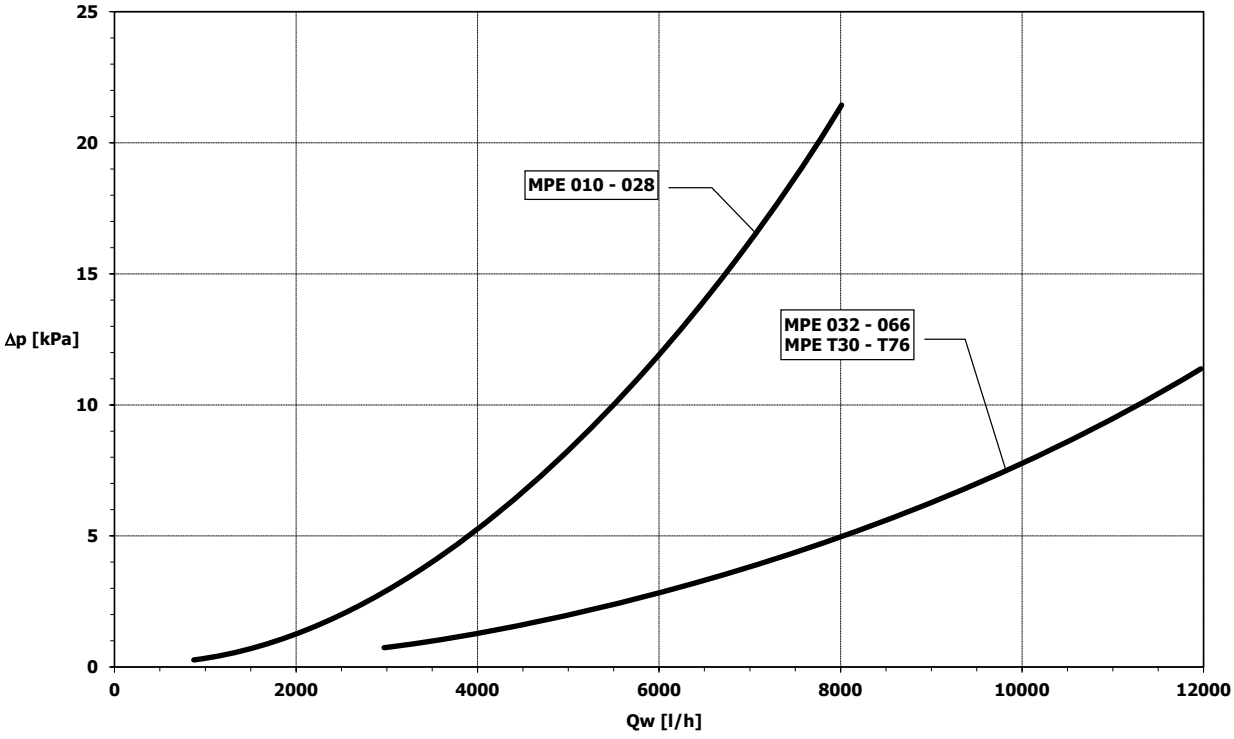
10.2 PRESSURE DROPS OF Y FILTER

The diagram shows the Y filter pressure drops (**Δp**) as a function of the water flow rate (**Qw**), assuming an average water temperature of 10°C.

MPE 04 ÷ 08



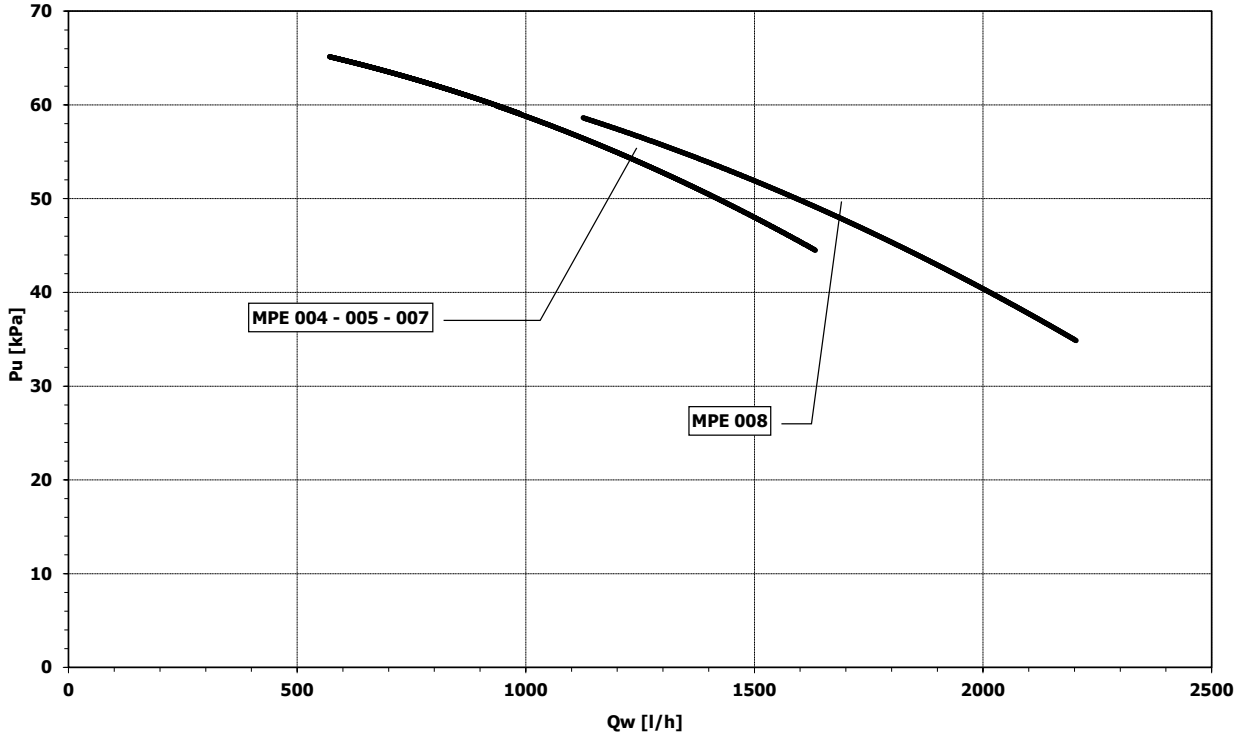
MPE 10 ÷ 66 - MPE 30 ÷ 45 T



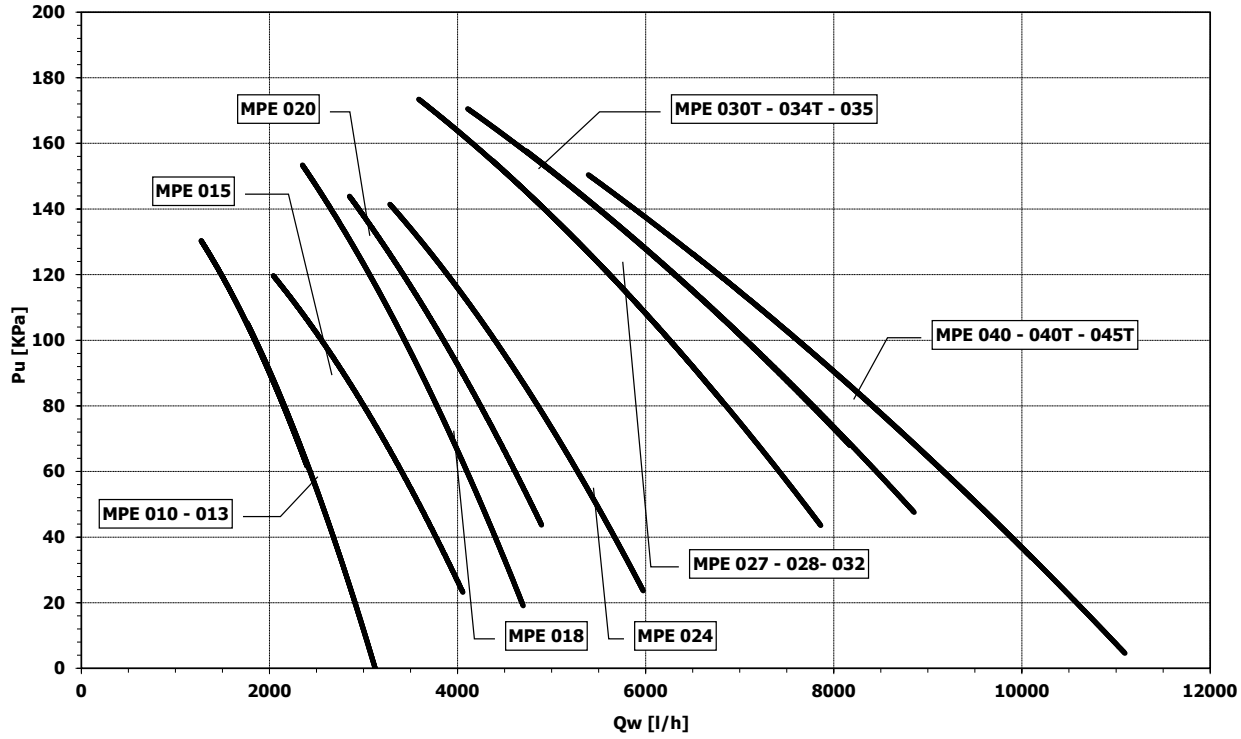
11 AVAILABLE HEAD OF THE UNIT

The diagram below shows the available head (**Pu**) of the unit as a function of the water flow rate (**Qw**), assuming an average water temperature of 10°C, net of pressure drops. Pressure drops of the Y filter are not counted.

MPE 04 ÷ 08



MPE 10 ÷ 45 T



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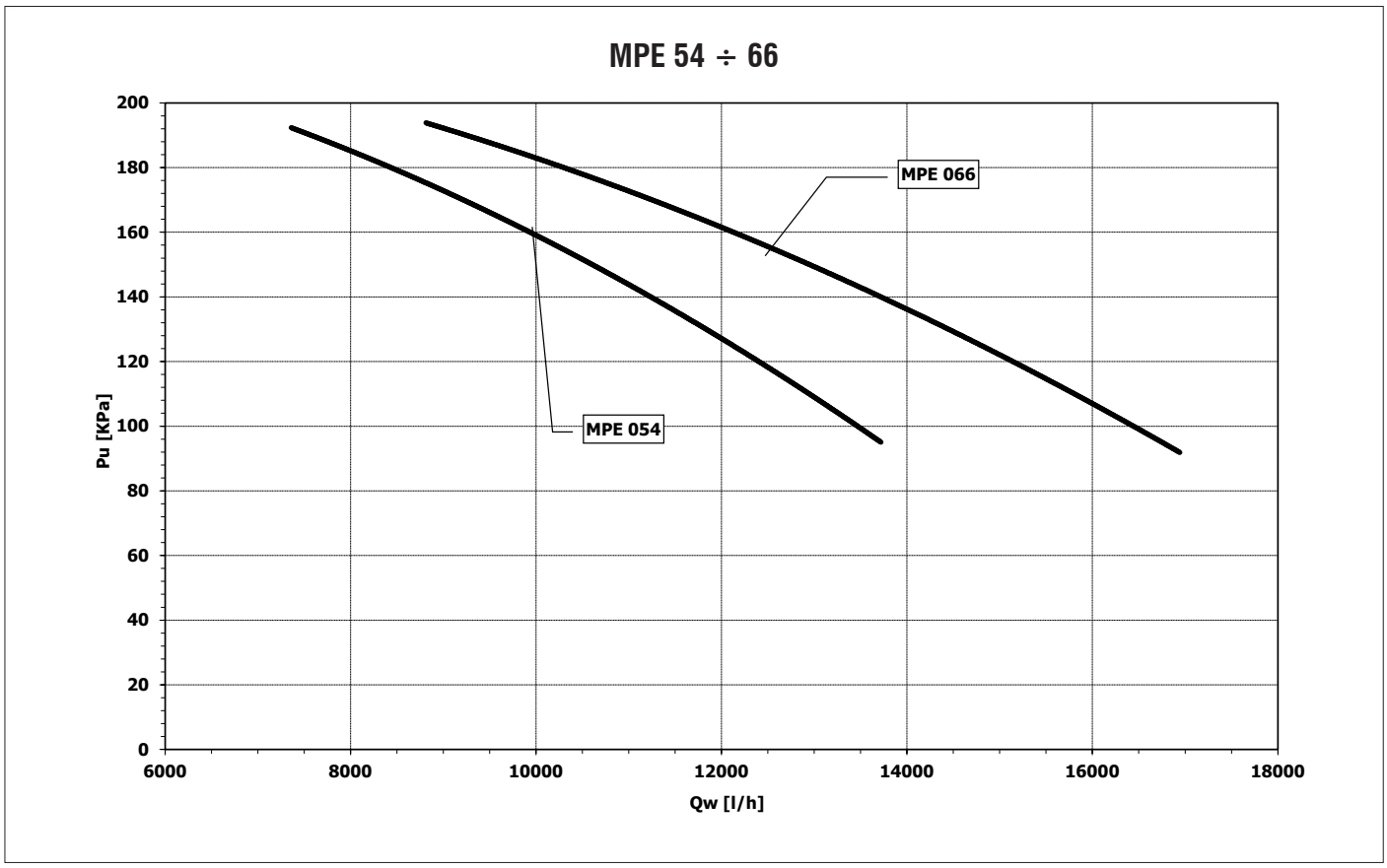

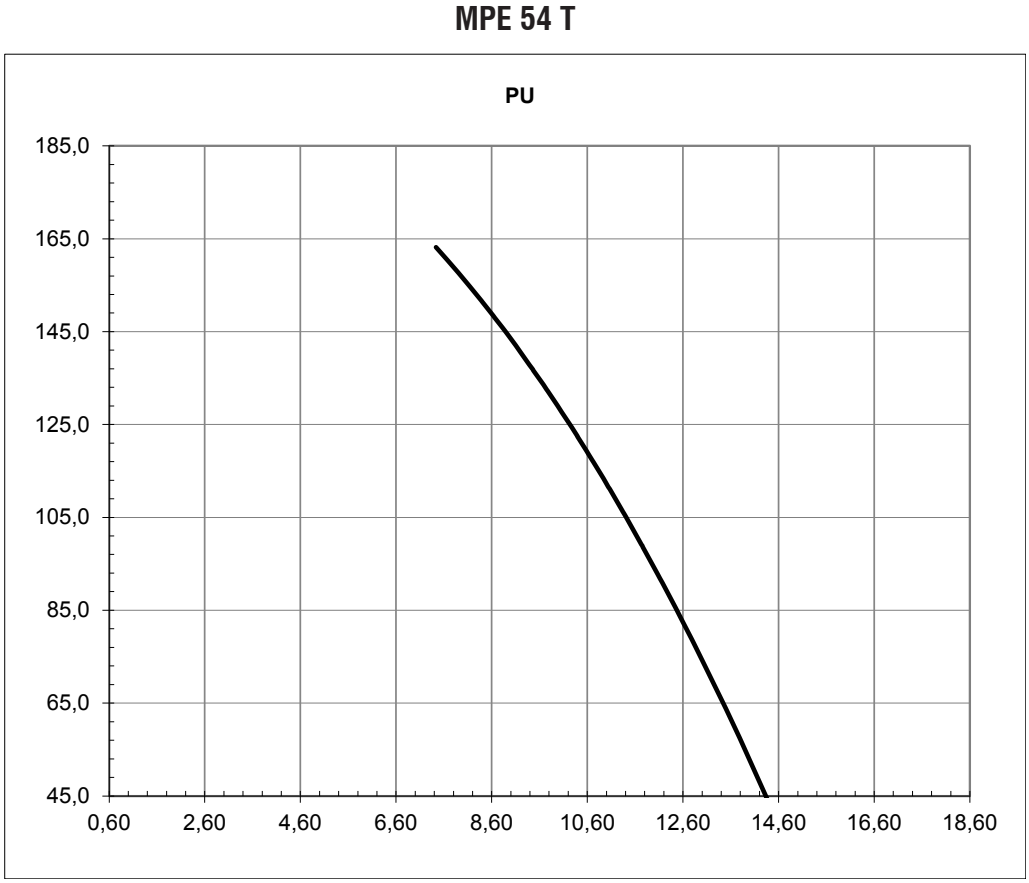

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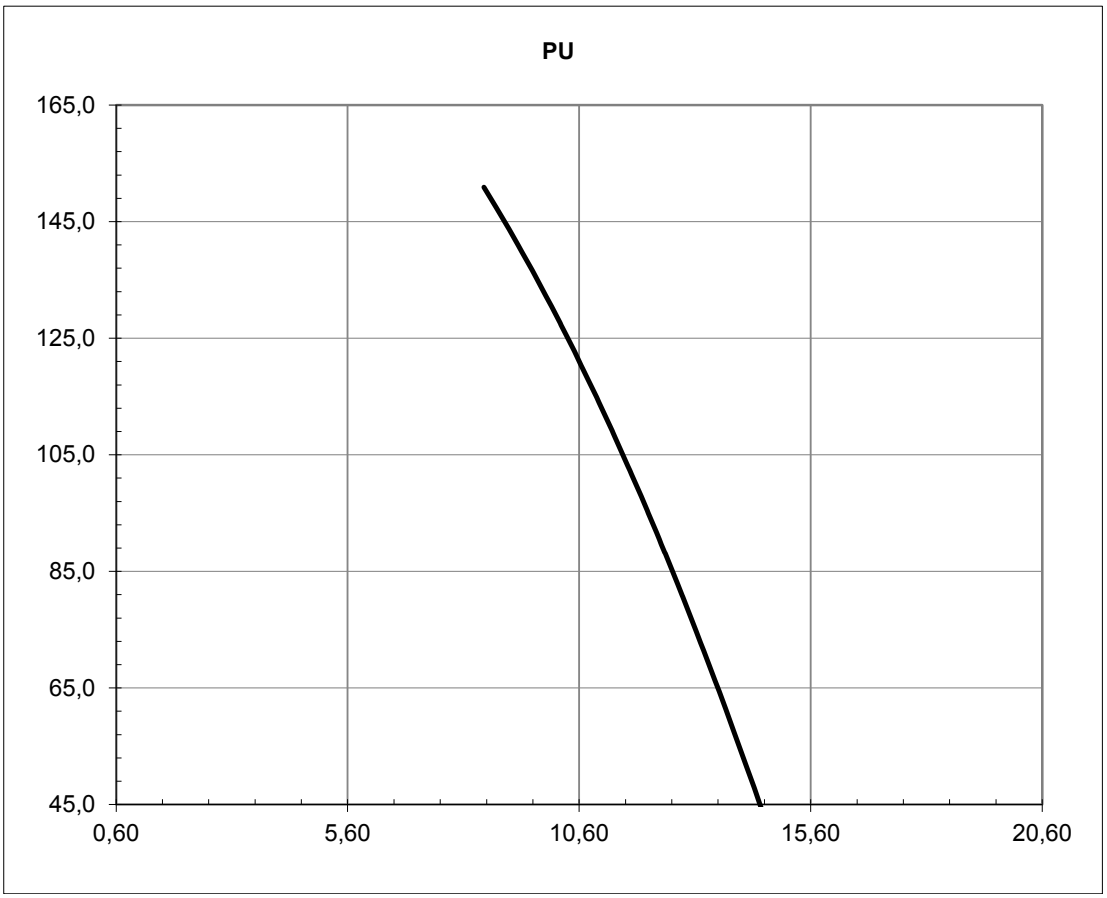
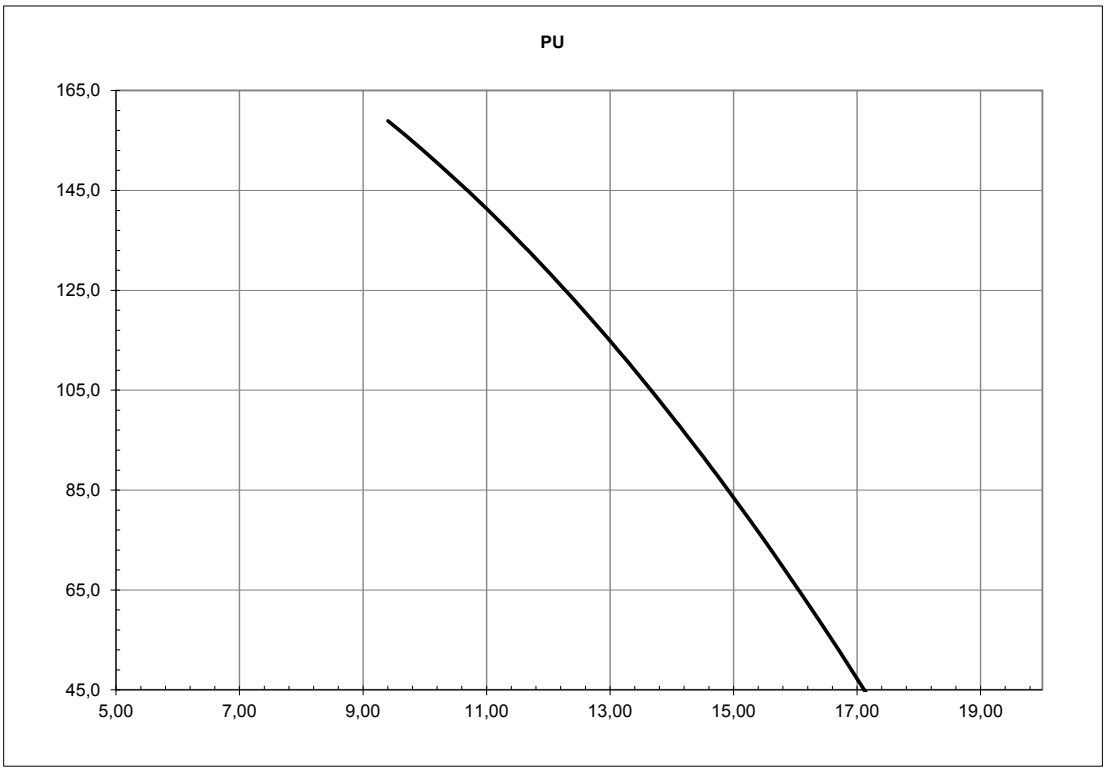
MPE 61 T



MPE 69 T



11 AVAILABLE HEAD OF THE UNIT

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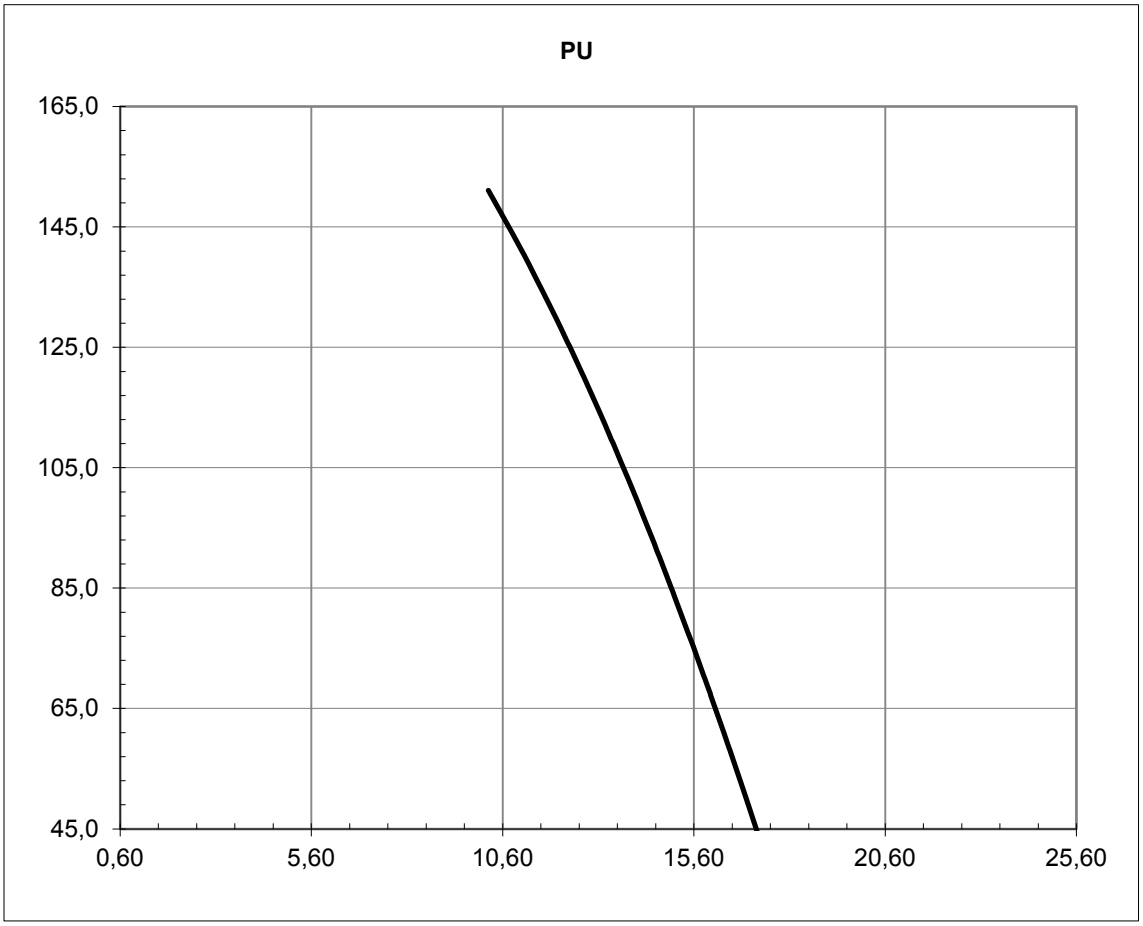
MPE 76 T



12 WATER CIRCUIT

When setting up the water circuit of the unit, it is advisable to follow the directions below and in any case comply with local or national regulations.
Connect the pipes to the chiller using flexible couplings to prevent the transmission of vibrations and to compensate thermal expansions.

It is recommended to install the following components on the pipes:
- Temperature and pressure indicators for routine maintenance and monitoring of the unit. Checking the pressure on the water side will enable you to verify whether the expansion tank is working efficiently and to promptly detect any water leaks within the equipment.
- Traps on incoming and outgoing pipes for temperature measurements, which can provide a direct reading of the operating temperatures.
- Regulating valves (gate valves) for isolating the unit from the water circuit.
- Metal mesh filter (supplied), with a mesh size no greater than 1 mm, to be fitted on the inlet pipe to protect the exchanger from scale or impurities present in the pipes.
- Air vent valves, to be placed at the highest points of the water circuit for the purpose of bleeding air. (The internal pipes of the unit are fitted with small air vent valves for bleeding the unit itself: this operation may only be carried out when the unit is disconnected from the power supply).
- Drainage valve and, where necessary, a drainage tank for emptying out the equipment for maintenance purposes or when the unit is taken out of service at the end of the season. (A 1" 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).

It is of fundamental importance that the incoming water supply is hooked up to the connection marked "Water Inlet".
Otherwise the evaporator would be exposed to the risk of freezing since the antifreeze thermostat would not be able to perform its function; moreover the reverse cycle would not be respected in the cooling mode, resulting in additional risks of malfunctioning.

The dimensions and position of plumbing connections are shown in the dimension tables at the end of the manual.

The water circuit must be set up in such a way as to guarantee that the nominal flow rate of the water supplied to the evaporator remains constant (+/- 15%) in all operating conditions. A standard feature of MPE units is a device for controlling the flow rate (flow switch or differential pressure switch) in the water circuit in the immediate vicinity of the evaporator.

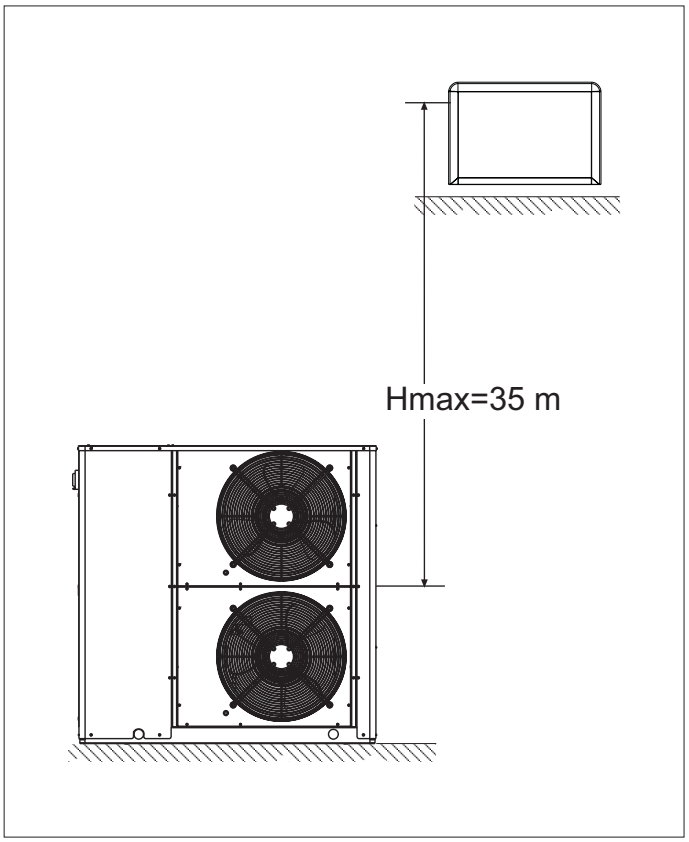
12.1 SYSTEM WATER CONTENT AND CHARGING OF EXPANSION TANK

In models without a water storage reservoir it is necessary to assure that the content of water within the system does not fall below 3.5 litres/kW in the case of cooling-only models and 4.5 litres/kW in the case of heat pump models. This level is necessary to prevent the water temperature from falling below the indoor unit enabling threshold during defrost cycles.

N.B. kW in reference to rated capacity
The expansion tank is pre-charged to a pressure of 1.5 bars, sufficient for systems with a maximum height difference (H in the figure at the side) of 13 metres. For greater height differences, refer to the table below in order to adjust the charging pressure of the expansion tank accordingly.
In no case should you exceed the maximum height difference Hmax = 35 m.

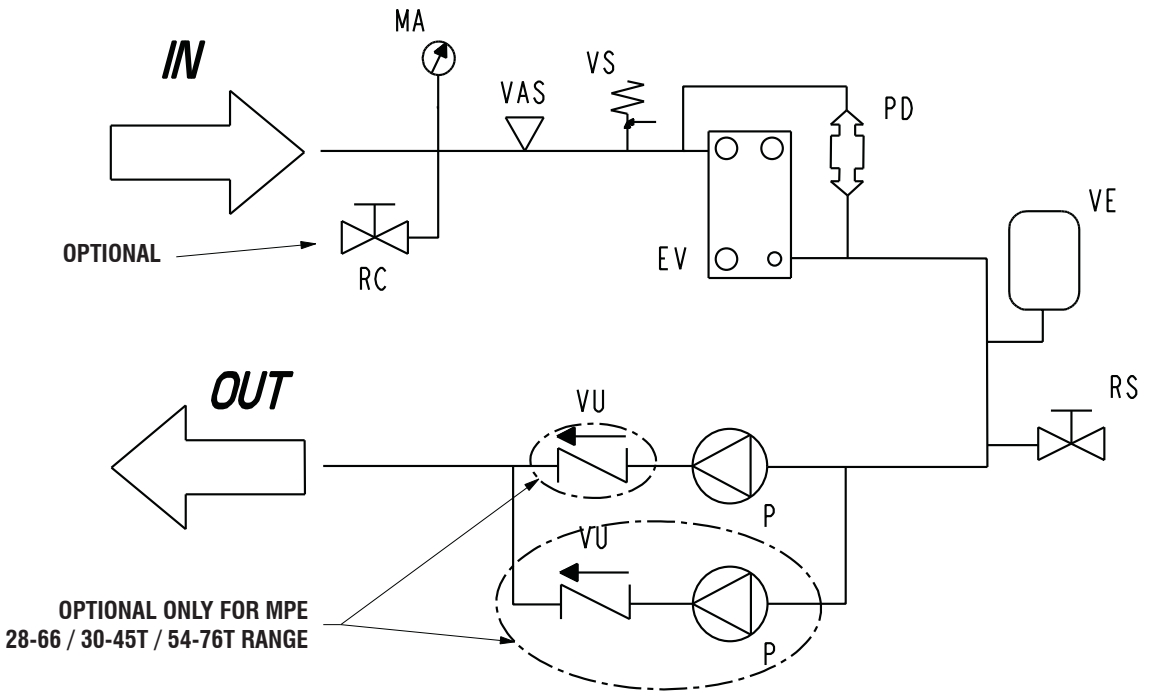
Models	H (m)	pi (bar)	Cmax (l)
MPE 004-008	<5	0,7	38
	7	0,9	36
	10	1,2	32
	13	1,5	29
	15	1,7	27
MPE 010-027	<13	1,5	145
	15	1,7	133
	20	2,2	105
	25	2,7	77
	30	3,1	49
MPE 028-066 T30-T45	<13	1,5	231
	15	1,7	213
	20	2,2	168
	25	2,7	124
	30	3,1	79

	LEGEND
H	Height difference of system
p_i	Charging pressure of expansion tank
C_{max}	Maximum system water content

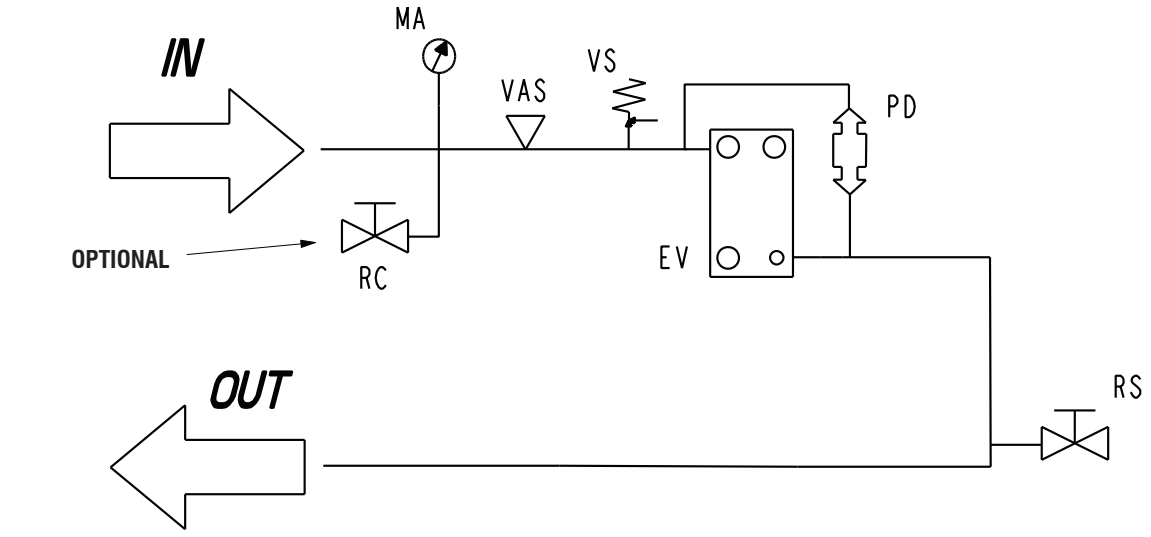


12 WATER CIRCUIT

MPE (EVAPORATOR AND PUMP)



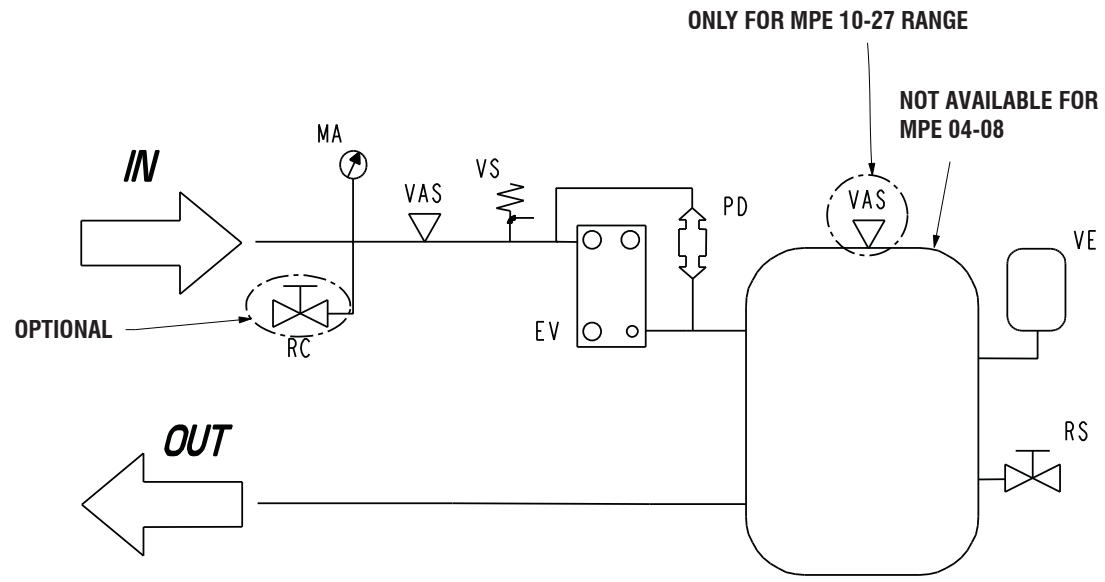
MPE (EVAPORATOR)



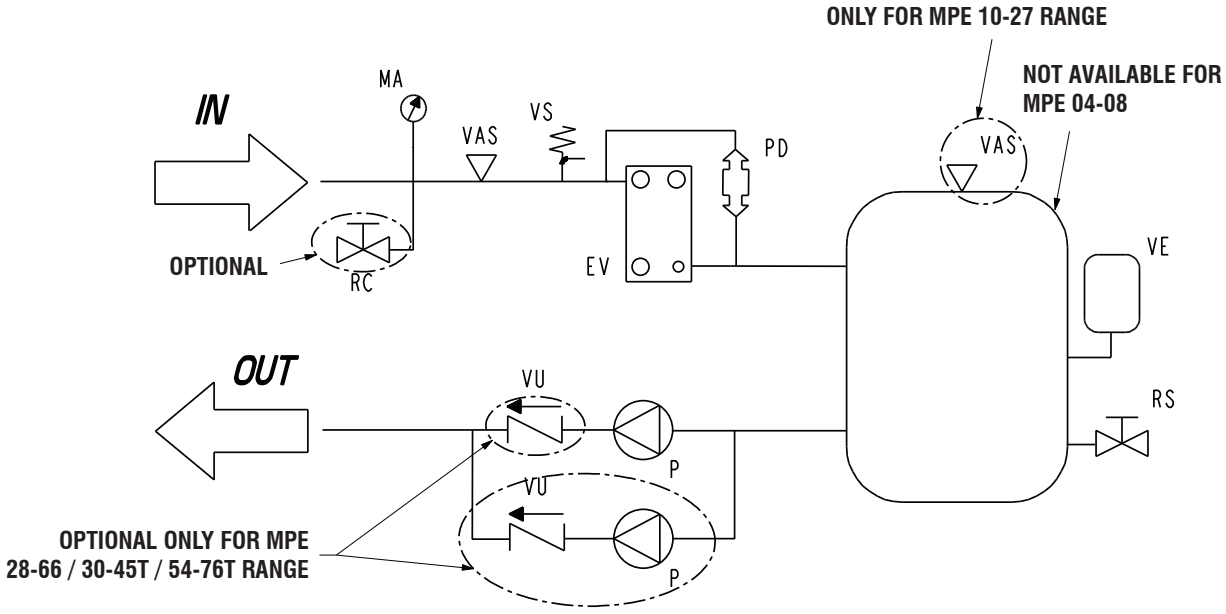
	LEGEND		
VS	Safety valve	**VE**	Expansion vessel
EV	Evaporator	**P**	Pump
PD	Water differential pressure switch	**RS**	Drain
MA	Water gauge	**RC**	Water charge
VAS	Air bleed hole	**VU**	Check valve

12 WATER CIRCUIT

MPE (EVAPORATOR AND BUFFER TANK)



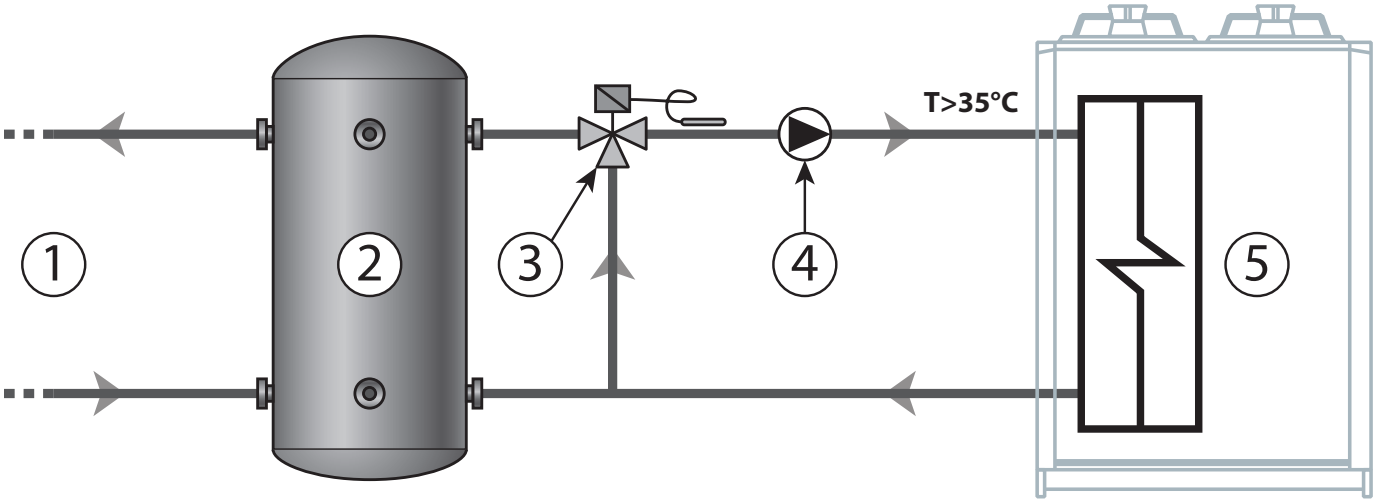
MPE (EVAPORATOR, PUMP AND BUFFER TANK)



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

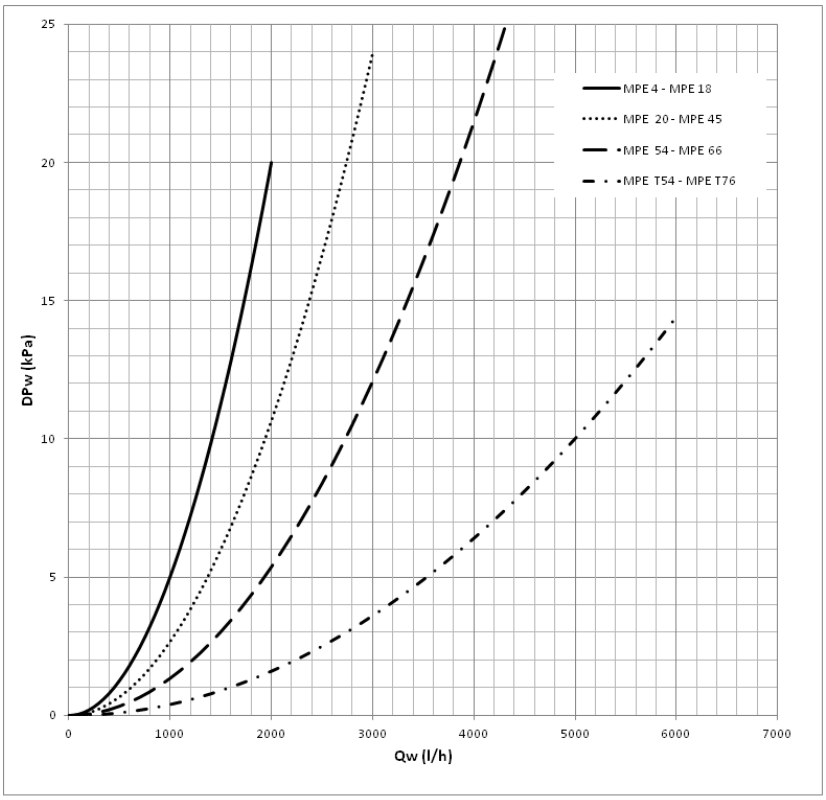
12.2 DE-SUPERHEATER FOR PARTIAL HEAT RECOVERY

The partial heat recovery option is provided by a braze-welded plate heat exchanger placed in series on the compressor delivery (typically in series in relation to the finned pack condenser). Its size is designed to limit pressure drops on the refrigerant side to a minimum.
All machines configured with heat recovery use as per standard modulating condensation control. In order to avoid any unbalance in the cooling circuit, if there are start-ups with very low water temperatures at recovery (<35°C), the hydraulic recovery circuit must be set up as indicated in the following figure: a low water temperature at recovery would cause a drop in the condensation temperature and therefore an insufficient pressure jump on the expansion valve with the ensuing risk of the safety devices being triggered.



1 Utility side
2 Storage tank
3 Mixing valve
4 Circulation pump
5 On-board de-superheater

The bulb of the 3-way mixer valve is placed at the de-superheater exchanger inlet. By mixing the hot water produced by the recovery with colder water from the tank, it reduces the time needed for the system to reach full operating capacity to a few moments.
A buffer tank must be placed between the unit and the utility since the demand for hot water and its availability are not simultaneous, because it needs the compressors to be running.
It should be pointed out that the heat recovery output is linked to the dispensed cooling output and that, therefore, in partial load situations it is also reduced just the same; this aspect must be taken into consideration for the dimensions of the buffer tank.
The partial heat recovery option is supplied only with the de-superheater exchanger. The other components of the circuit laid out in the previous figure are not included in the supply.



13 ELECTRICAL DATA AND CONNECTIONS

MPE		004M	005M	007M	008 M	008	010 M	010	013	015	018	020	024	027	028
Maximum power input	kW	2,00	2,30	3,00	5,00	5,00	5,10	7,20	8,90	10,5	12,5	13,6	14,5	18,0	18,3
Maximum current absorption	A	9	11	15	24	9	24	12	15	18	22	24	26	32	33
Starting absorbed current	A	38	44	63	49	98	49	98	64	67	76	105	159	133	134
Fan motor rated power	kW	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,320
Fan motor rated current	A	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	1,75
Pump motor rated power	kW	0,14	0,14	0,14	0,14	0,14	0,37	0,37	0,37	0,37	0,37	0,37	0,37	0,37	0,55
Pump motor rated current	A	0,58	0,58	0,58	0,58	0,58	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	3,00
Power supply	V/f/Hz	230-1-50				400-3N-50	230-1-50	400-3N-50							
Auxiliary power supply	V/f/Hz	230-1-50													
Power cables	mm2	4	4	6	6	4	6	4	4	4	6	6	10	10	10
PCD connecting cables	mm2	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22
PCDS connecting cables	mm2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Safety fuse F	A	16	16	20	25	10	32	16	20	20	25	25	32	32	32
Circuit breaker IL	A	20	20	25	25	16	32	20	25	25	25	25	32	32	32

MPE		032	035	040	054	066	T30	T34	T40	T45	T54	T61	T69	T76
Maximum power input	kW	18,9	21,8	22,4	22,7	23,3	20,9	24,4	26,6	30,8	27,0	29,9	32,3	39,4
Maximum current absorption	A	34	39	40	40	41	37	43	47	63	48	53	57	69
Starting absorbed current	A	167	162	164	163	165	86	96	127	150	177	187	202	229
Fan motor rated power	kW	0,320	0,320	0,320	0,610	0,610	0,320	0,320	0,320	0,320	0,400	0,400	0,400	0,400
Fan motor rated current	A	1,75	1,75	1,75	2,65	2,65	1,75	1,75	1,75	1,75	1,80	1,80	1,80	1,80
Pump motor rated power	kW	0,55	0,55	0,55	0,90	0,90	0,55	0,55	0,55	0,55	1,30	1,30	1,30	1,30
Pump motor rated current	A	3,00	3,00	3,00	4,90	4,90	3,00	3,00	3,00	3,00	5,90	5,90	5,90	5,90
Power supply	V/f/Hz	400-3N-50												
Auxiliary power supply	V/f/Hz	230-1-50												
Power cables	mm2	10	10	10	16	16	10	16	16	16	16	16	16	25
PCD connecting cables	mm2	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22
PCDS connecting cables	mm2	1	1	1	1	1	1	1	1	1	1	1	1	1
Safety fuse F	A	32	40	40	50	50	40	50	63	63	63	63	63	80
Circuit breaker IL	A	40	40	50	63	63	50	50	63	63	63	63	63	80

- 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.

13 ELECTRICAL DATA AND CONNECTIONS

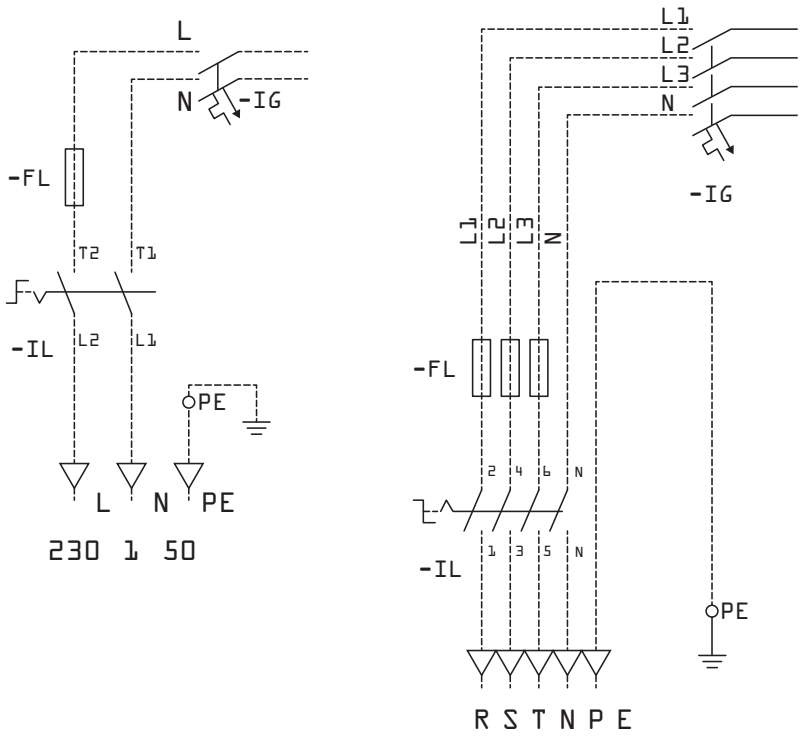
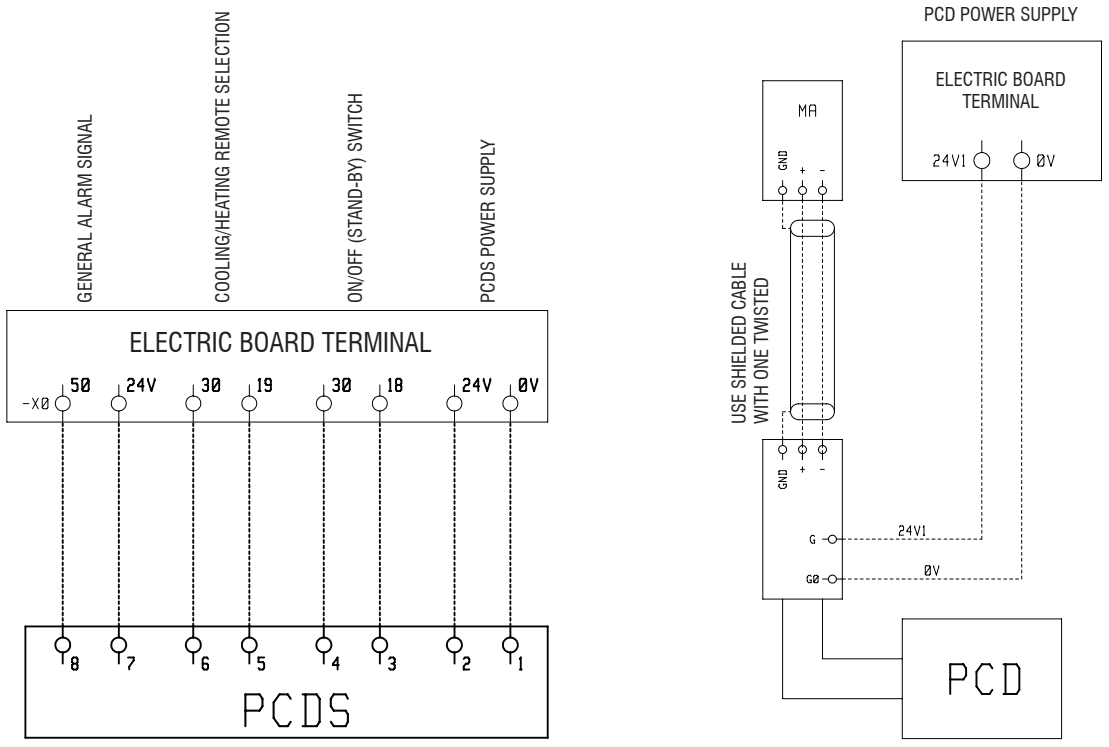


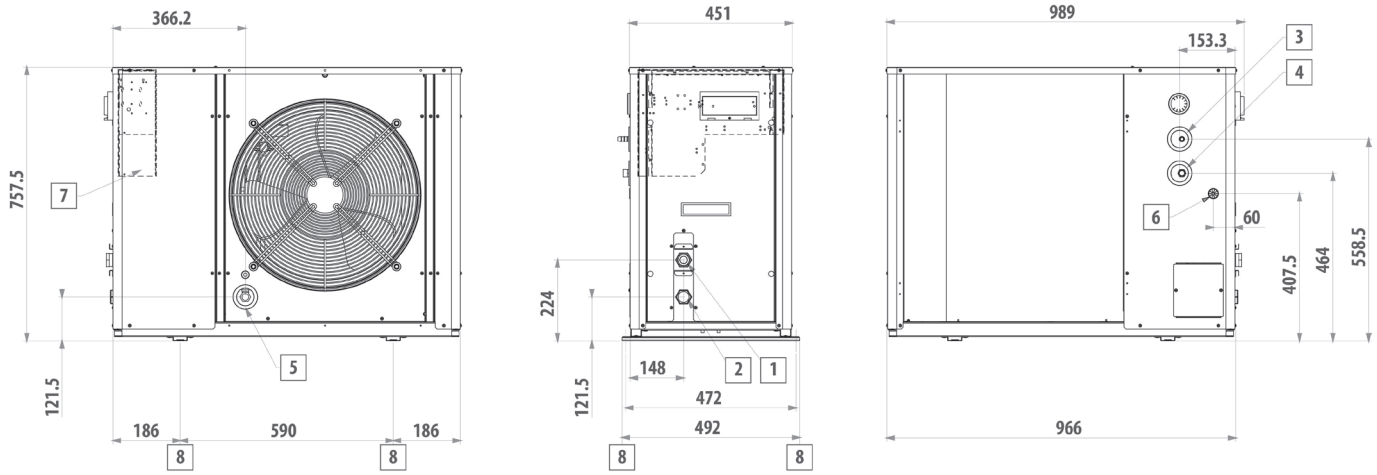
DIAGRAM SHOWING ELECTRICAL CONNECTIONS BETWEEN MPE AND PCDS / PCD REMOTE CONTROL PANEL

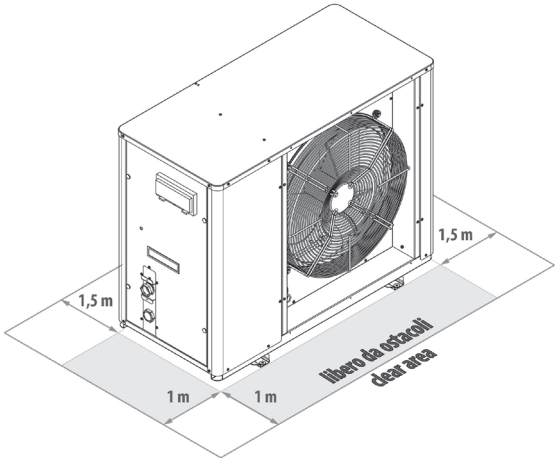


NOTE: On the terminal block of the electric control panel a voltage of 24V will be present at the 50/24V terminals in the event of an alarm; if it is desired to interface with a voltage-free contact, a relay must be applied for this purpose by the installer.

14 OVERALL DIMENSIONS

MPE 04 - 08

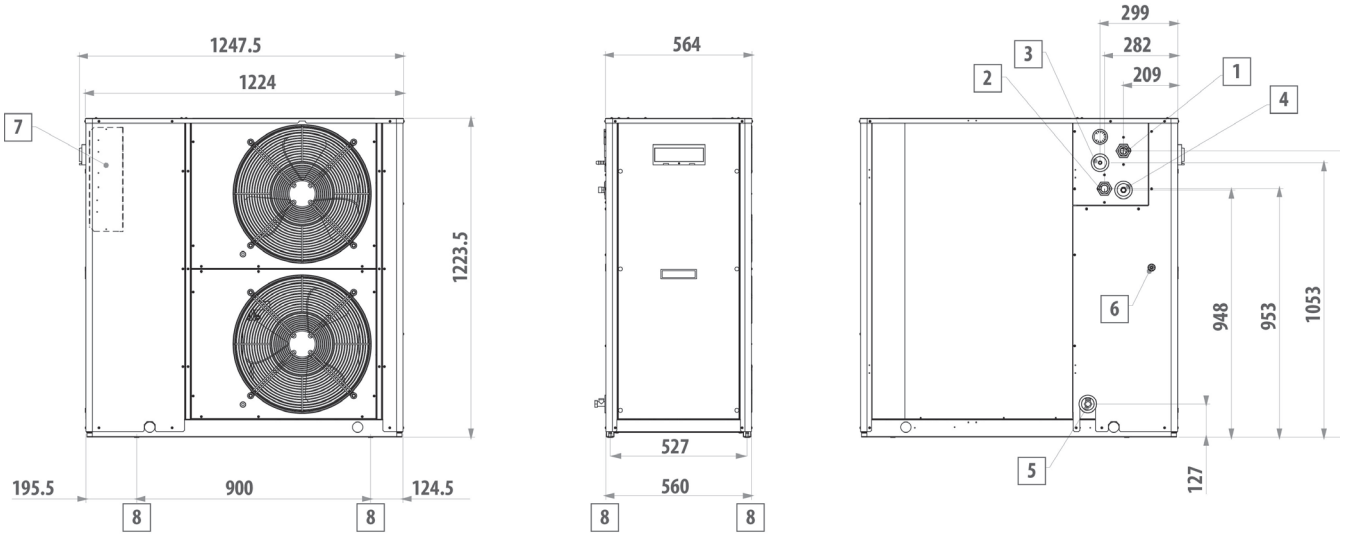




LEGEND	
1	Water in 1" female
2	Water out 1" female
3	Safety valve discharge outlet provided with rubber ring holder
4	Water supply $^1/_2$" male (optional tap)
5	Drain manifold $^1/_2$" female
6	Power supply Ø 28 mm
7	Electrical control board
8	Dampers fastening points (accessory)

14 OVERALL DIMENSIONS

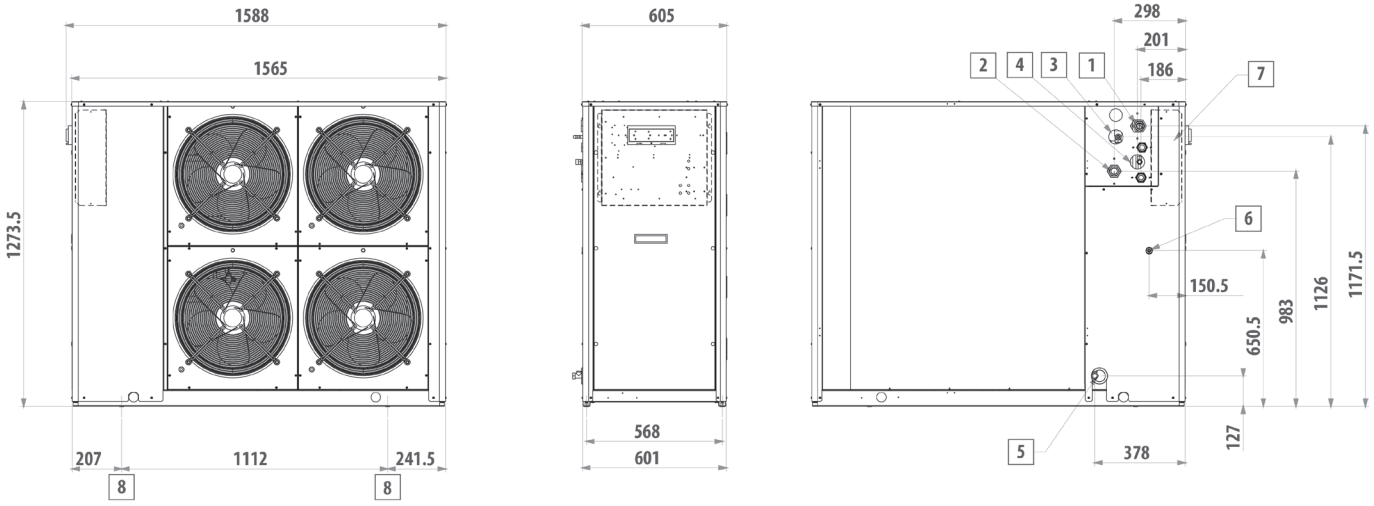
MPE 10 - 15

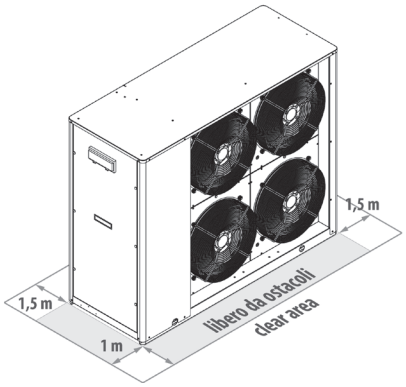


LEGEND	
1	Water in 1" female
2	Water out 1" female
3	Safety valve discharge outlet provided with rubber ring holder
4	Water supply $^1/_2$" male (optional tap)
5	Drain manifold $^1/_2$" female
6	Power supply Ø 28 mm
7	Electrical control board
8	Dampers fastening points (accessory)

14 OVERALL DIMENSIONS

MPE 18 - 27



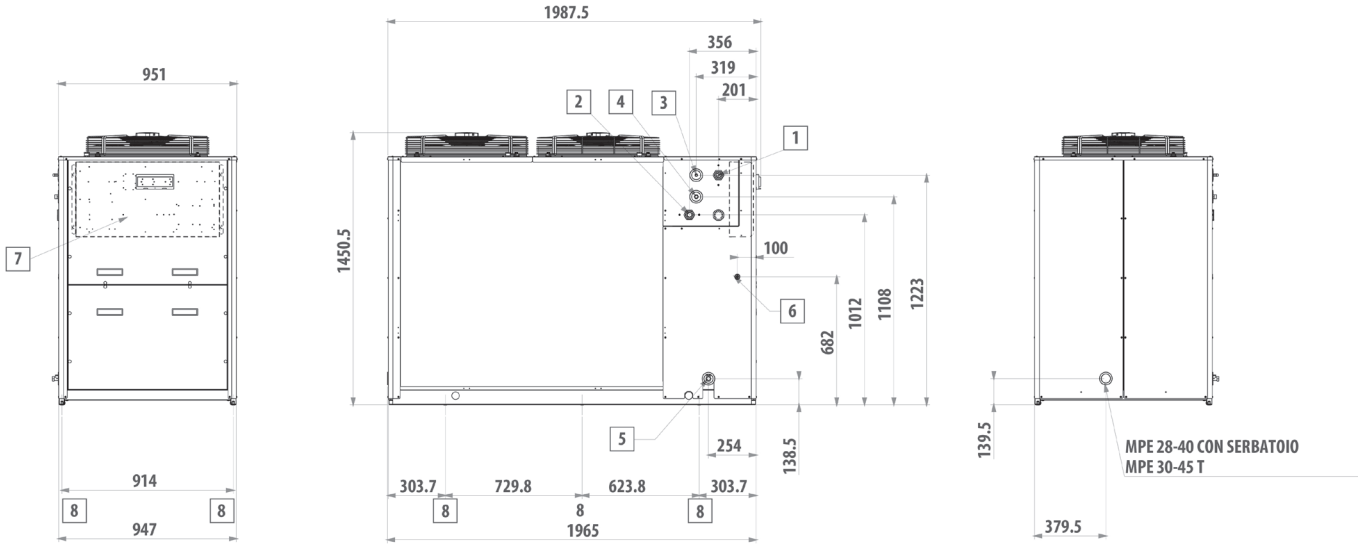


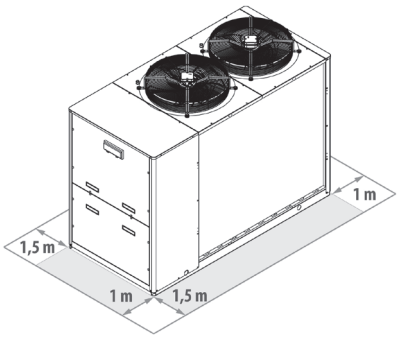
LEGEND	
1	Water in 1" $^1/_4$ female
2	Water out 1" $^1/_4$ female
3	Safety valve discharge outlet provided with rubber ring holder
4	Water supply $^1/_2$" male (optional tap)
5	Drain manifold $^1/_2$" female
6	Power supply Ø 28 mm
7	Electrical control board
8	Dampers fastening points (accessory)

14 OVERALL DIMENSIONS

MPE 28 - 40 / MPE 30 - 45 T

MPE 28-45 WITH BUFFER TANK
MPE 30-45 T

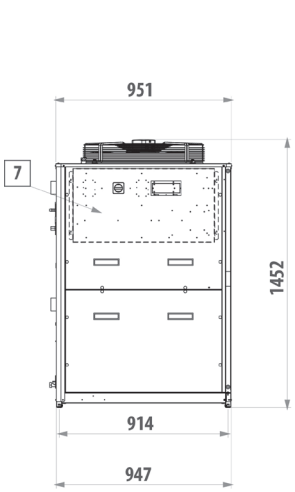


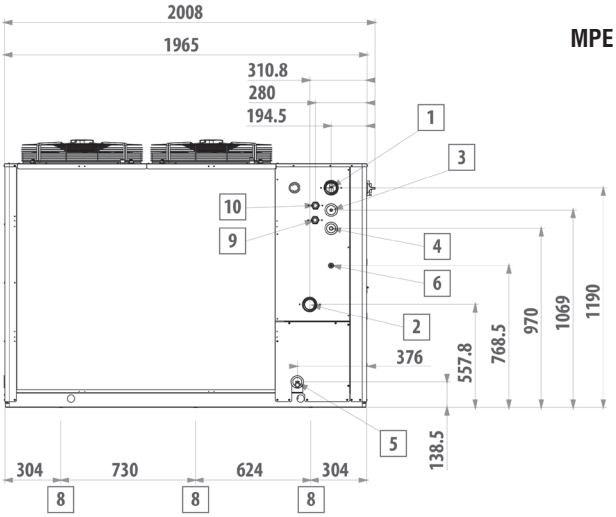


LEGEND	
1	Water in 1" $^1/_4$ female
2	Water out 1" $^1/_4$ female
3	Safety valve discharge outlet provided with rubber ring holder
4	Water supply $^1/_2$" male (optional tap)
5	Drain manifold $^1/_2$" female
6	Power supply Ø 37 mm
7	Electrical control board
8	Dampers fastening points (accessory)

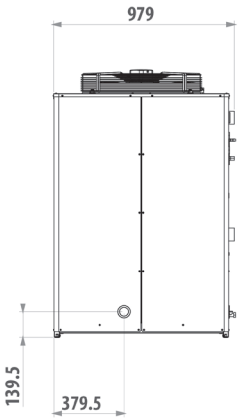
14 OVERALL DIMENSIONS

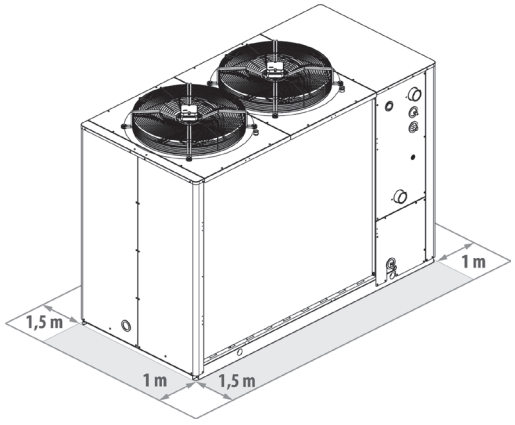
MPE 54 - 66





MPE 54-66 WITH BUFFER TANK

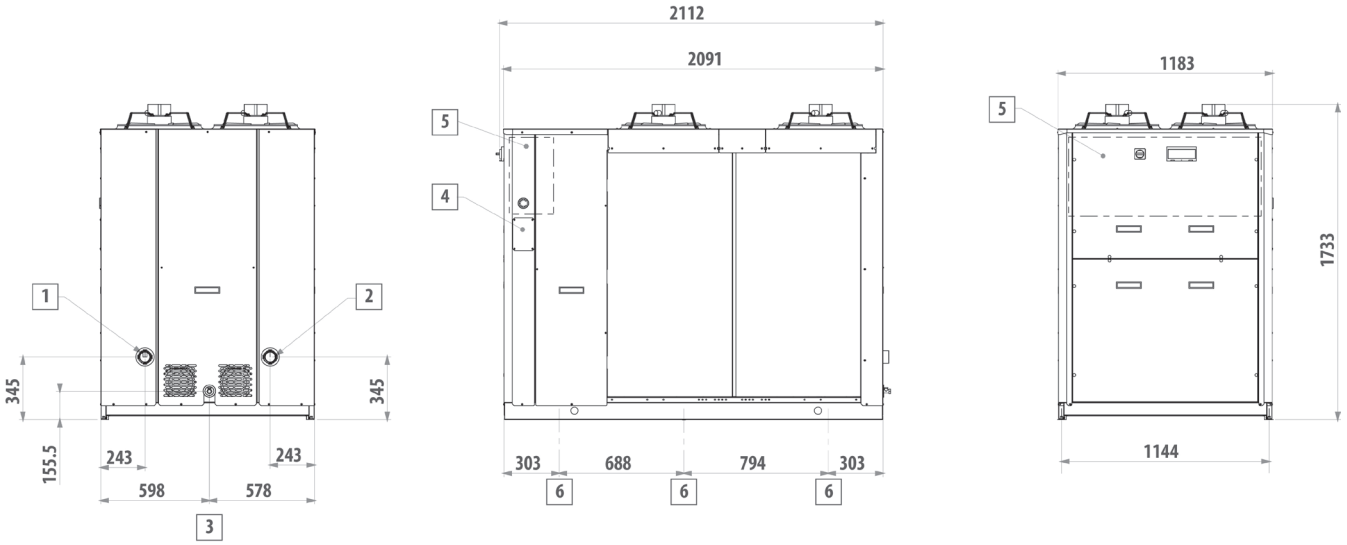


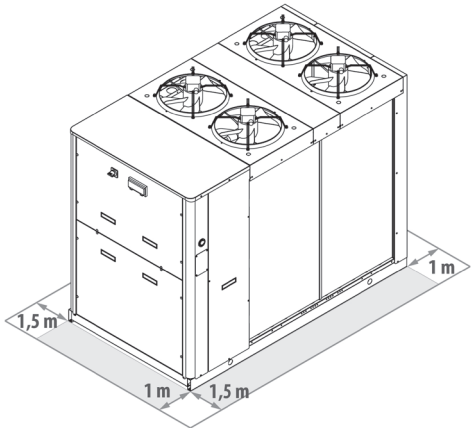


LEGEND	
1	Water inlet 2" female
2	Water outlet 2" female
3	Safety valve discharge outlet provided with rubber ring holder
4	Water supply ½" male
5	Water drainage ½" female
6	Power supply
7	Electric control board
8	Fastening points for vibration dampers (accessory)
9	Desuperheater water inlet 1" female
10	Desuperheater water outlet 1" female

14 OVERALL DIMENSIONS

MPE 54 - 76T





LEGEND	
1	Water inlet 2" female
2	Water outlet 2" female
3	Safety valve discharge outlet provided with rubber ring holder
4	Water supply ½” male
5	Water drainage ½" female
6	Power supply

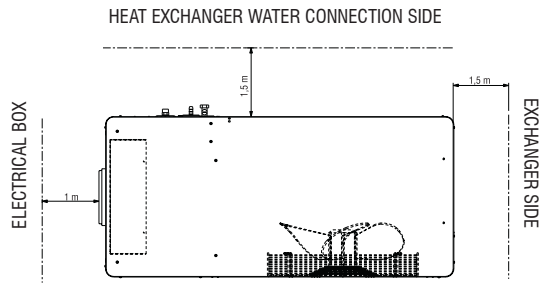
15 INSTALLATION CLEARANCE REQUIREMENTS

To guarantee the proper functioning of the unit and access for maintenance purposes, it is necessary to comply with the minimum installation clearance requirements shown in figures 1, 2, 3 and 4.
There must be no obstacles blocking the path of the air flow from the fans.
Avoid any and all situations of backflow of hot air between air outlet and inlet of the unit.
If even only one of the above conditions is not fulfilled, please contact the manufacturer to check for feasibility.

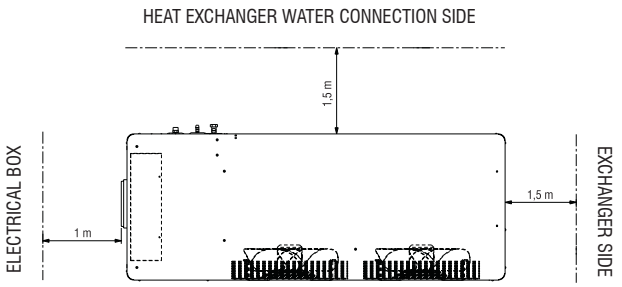
In the design of the MPE series, special care has been taken to minimise noise and vibrations transmitted to the ground.
Even greater insulation may be obtained, however, by using vibration damping base supports (available as optional accessories).
If vibration damping base supports are adopted, it is 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.

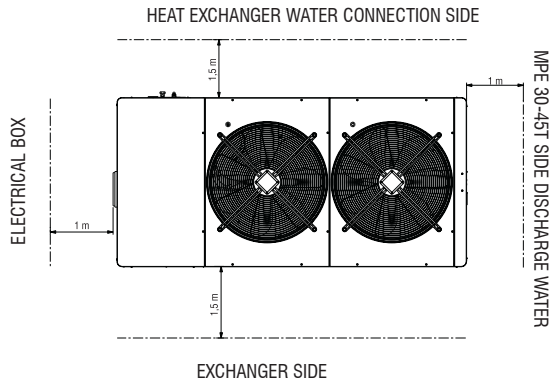
MPE 10 - 15



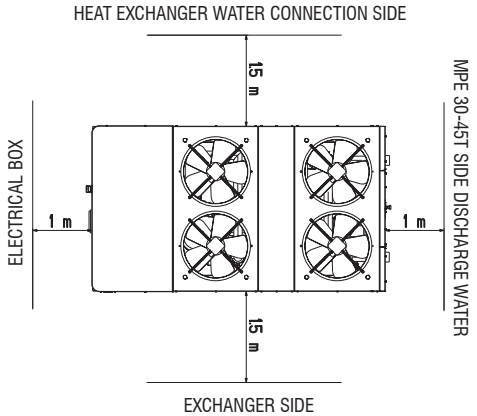
MPE 18 - 27



MPE 28 - 66 / 30 - 45 T



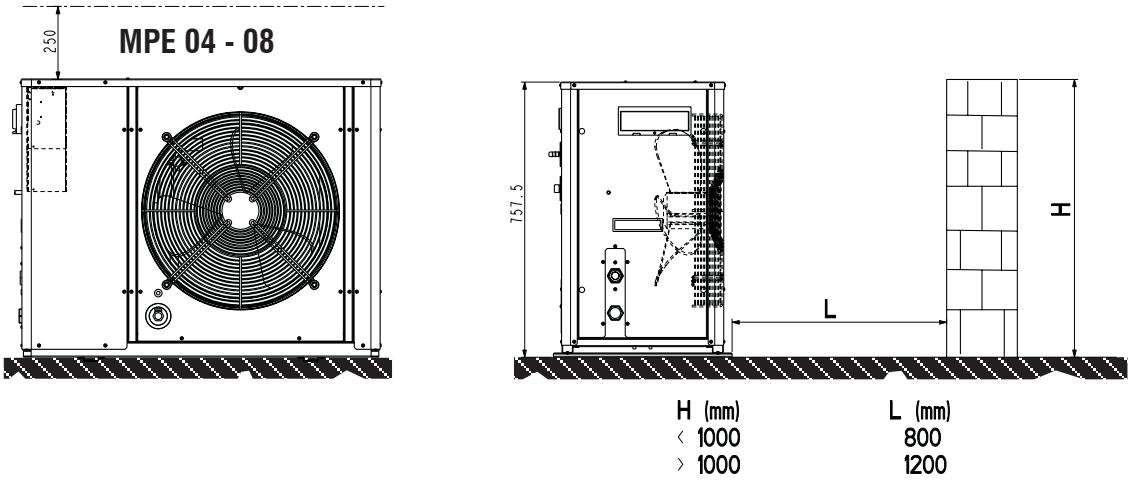
MPE 54 - 76 T

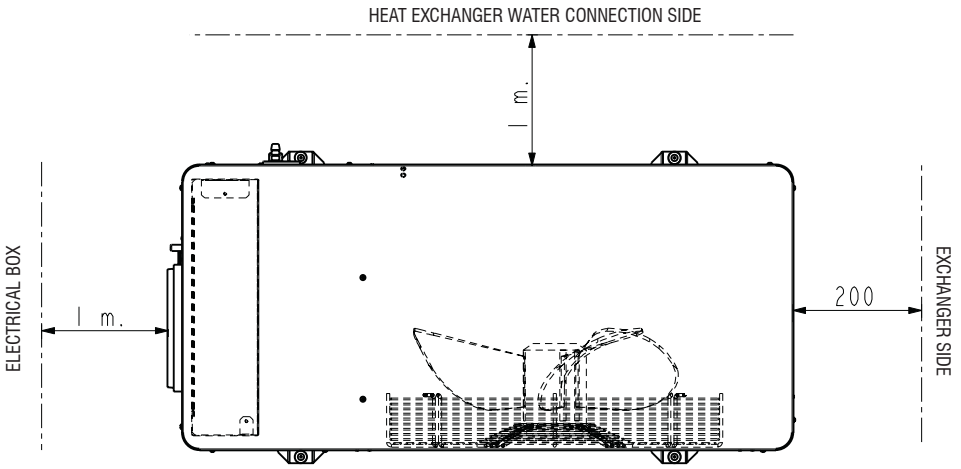


16 SITING

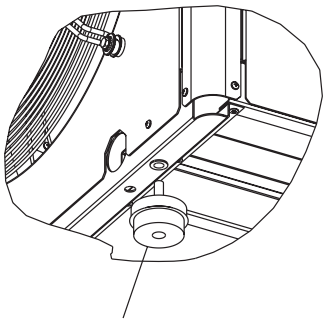
It is important to bear in mind the following aspects when choosing the best site for installing the unit:
- size and origin of water pipes;
- location of the power supply;
- solidity of the supporting surface;
- avoid obstacles to the outflow of air from the fan which could cause back suction (see section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

1





16.1 POSITIONING OF VIBRATION DAMPERS (ACCESSORY)



MPE	CODE	N° DAMPERS
04 - 08	1701552	4
10 - 15	RYPAMCA10	4
18 - 27	RYPAMCA10	4
28 - 66 / 30 - 45 T	RYPAMCA50	6
54 - 76 T	RYPAMCA50	6

NOTES

NOTES

NOTES

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AIR CONDITIONING

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