MCE

Technical manual for chillers and heat pumps

GB

9 kW - 39 kW

R410A

CE

COMPANY
WITH QUALITY SYSTEM
CERTIFIED BY DNV
=ISO 9001/2000=

Galletti
AIR CONDITIONING

TABLE OF CONTENTS

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

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

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

Made in Italy
CATEGORIA 1

Matricola - Serial number

Codice articolo - Code

Data di produzione - Date of production

Pot.Raffreddamento - Cooling Capacity (W)

Pot.Riscaldamento - Heating Capacity (W)

Alimentazione - Power supply (kW)

Assorbimento elettrico - Power input (kW)

Peso - Weight (kg)

Max assorbimento elettrico - Max power input (kW)

Max corrente esercizio - Max running ampere (kW)

Assorbimento elettrico PdC - HP Power input (kW)

Refrigerante - Refrigerant

Max pressione refrigerante - Max refrigerant press (bar)

Max temperature refrigerant - Max refrigerant temperature (°C)

DICHIARAZIONE DI CONFORMITÀ CE

La Società Galletti S.p.A. con sede in Via Romagnoli 12/a Bentivoglio (Bologna) - Italia, dichiara, sotto la propria responsabilità, che i refrigeratori d'acqua e pompe di calore delle serie:
ECH2O, ECH2O H, MCA, MCA H, LCA, LCA H, MCC, MCC H, MCW, MCW-H, MPE, MPEH, MCE, MCEH, MFE, MXE apparecchi per impianti di condizionamento dell'aria destinati ad applicazioni per il condizionamento in ambito civile, sono conformi a quanto prescritto dalle Direttive **CEE 89/392, 91/368, 93/44, 89/336, 2006/95/CE,97/23/CE (PED)**.
Tali apparecchi sono il risultato dell'assemblaggio di componenti [compressori, scambiatori di calore a piastre saldobrasate, ricevitori di liquido, tubazioni, valvole di regolazione e di sicurezza] singolarmente dotati, quando previsto, di certificazione ai sensi delle direttive vigenti: la determinazione della categoria d'appartenenza delle macchine è il frutto dell'analisi dei componenti soggetti alla **PED** e corrisponde alla categoria più alta fra i componenti utilizzati.
Per ogni serie di macchine, la conformità dell'assieme è stata valutata da organismi notificati ed in applicazione delle procedure di valutazione (moduli) ai sensi dell'allegato II della direttiva **97/23 PED**, come riportato nella tabella seguente:

DECLARATION OF CONFORMITY CE

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:
ECH2O, ECH2O H, MCA, MCA H, LCA, LCA H, MCC, MCC H, MCW, MCW-H, MPE, MPEH, MCE, MCEH, MFE, MXE units for air-conditioning systems for civil conditioning application, are produced in accordance with following directives: **CEE 89/392, 91/368, 93/44, 89/336, 2006/95/CE,97/23/CE (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:

Gli apparecchi LCA ed LCA H (115-300) sono prodotti negli stabilimenti di Hiref S.p.a - Galletti Group, Viale Spagna 31/33 Tribano (Padova)
Units LCA ed LCA H (115-300) are manufactured by Hiref S.p.a - Galletti Group, Viale Spagna 31/33 Tribano (Padova) Italy

Bentivoglio li, 16/07/2008

Galletti S.p.A.
Luigi Galletti
Presidente / President

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
ECH_2O - ECH_2O H	4-5-6-7	1115	N°006 rev. 4 del 06/02/2008	Modulo D1	I	CE
MCA - MCA H	10-12-14	1115		Modulo D1	I	CE
MCA - MCA H	16-21-25-30-37-50-60	1115		Modulo D1	II	CE + PED
LCA - LCA H	045-050-060-070-080-090-105	1115		Modulo D1	II	CE + PED
MCC - MCC H	6-7-9-12-15	1115		Modulo D1	I	CE
MCC - MCC H	18-22-25-33-37	1115		Modulo D1	II	CE + PED
MCW - MCW / H	5-7-10-12-15	1115		Modulo D1	I	CE
MCW - MCW / H	18-20-22-27-31-39	1115		Modulo D1	II	CE + PED
MPE - MPEH - MCE - MCEH	4-5-7-8	1115		Modulo D1	I	CE
MPE - MPEH - MCE - MCEH	9-10-11-13-15-18	1115		Modulo D1	I	CE
MPE - MPEH - MCE - MCEH	19-20-21-23-24-26-27-28-31-32-34-35-39-40	1115		Modulo D1	II	CE + PED
MPE - MPEH - MCE - MCEH	T30-T34-T40-T45	1115		Modulo D1	II	CE + PED
MFE	5-6-8-11-13-16-17-20-23	1115		Modulo D1	I	CE
MXE	9-11-14-16	1115		Modulo D1	I	CE
MXE	19-21	1115		Modulo D1	II	CE + PED
LCA - LCA H	115-130-150-180-205-220-235-250-280-300	0398	B.05.0600AP-0101-01-2005	Modulo D1	II	CE + PED

ATTESTATO APPROVAZIONE SISTEMA GARANZIA QUALITA' PRODUZIONE

Production Quality System Approval Certificate

N° 006 Rev. 4 – 97/23/CE- D1

PASCAL
ORGANISMO NOTIFICATO N. 1115

Notified Body n. 1115

Pascal, visto l'esito delle verifiche condotte in conformità all'allegato III della direttiva 97/23/CE, Modulo D1, attesta che il sistema qualità applicato dal fabbricante per la fabbricazione, l'ispezione finale e la prova delle attrezzature a pressione di seguito elencate, soddisfa le richieste della direttiva stessa.

Pascal, on the basis of the assessment performed in accordance to the annex III of the directive 97/23/EC, Module D1, attests that the Quality Management System operated by the Manufacturer for manufacture, final inspection and tests of the under listed pressure equipment satisfies the applicable directive provisions

Fabbricante/*Manufacture*

GALLETTI S.p.A.
Via L. Romagnoli, 12/a
40010 Bentivoglio (BO)

Per i seguenti prodotti/ *for the following products*

REFRIGERATORI D'ACQUA e POMPE DI CALORE
Serie: MCE; MPE; MFE; MXE;
MCC; MCW; ECH$_2$O; MCA; LCA; UGR S; UGR SE; UGR VE

Prima emissione **12/03/2003**
First emission data/*date*

Emissione corrente **06/02/2008**
Current issue data/*date*

Dr. Maurizio Brancaleoni
PASCAL NB 1115

PASCAL 1115 Milano

1 THE SERIES

MCE water chillers and heat pumps are specifically designed to work with **R410A** refrigerant, in terms of the components used, and in particular insofar as the sizing of the heat exchangers and operating logics are concerned.
The studies and trials conducted have enabled us to develop a series of highly energy efficient, extremely quiet units.
The range includes 11 models with a cooling function only and equipped with a heat pump; the cooling capacity ranges from 9 to 39 kW and the heating capacity from 10 to 44 kW

ADAPTABLE TO EVERY NEED

The wide array of possible configurations - in terms both of the number of models (sizes) included in the range and the available options and accessories - make the MCE series an ideal solution for satisfying every design/installation need and reducing on-site installation times.
All optional features can be installed without modifying the overall unit dimensions.
Optionals include

- Incorporated hydronic kits
- Electronic expansion valve, which quickly adapts the unit's operation according to variations in load and maximises efficiency under partial load conditions.
- Heat recovery, which enables hot water to be produced in the summertime operating mode, thus enhancing the effective efficiency of the system.

PLUG&PLAY

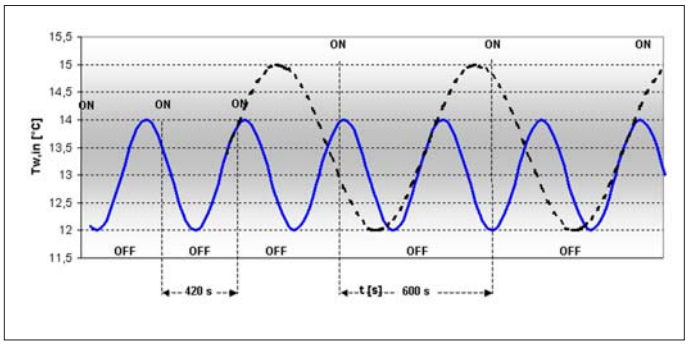
MCE offers the option of incorporating hydronic kits complete with circulation pump (stainless steel casing and rotor), expansion tank, inertial water storage reservoir, safety valve, pressure gauge and water filter.
All units are submitted to final testing at the end of the production process in order to limit the required startup operations.

EXTREMELY LOW NOISE LEVELS

The use of extremely quiet fans, which are housed in compartments with an optimised profile and work with low pressure drops thanks to the use of finned block exchangers with 8mm diameter copper pipes, makes it possible to achieve extremely low-noise ventilation.
In partial load conditions, the condensation control function (under pressure) makes the unit run even more quietly.
The technical compartment and compressor can also be sound insulated to obtain exceptionally quiet units.

SELF-ADAPTIVE

The control logic enables MCE units to be used even with extremely low volumes of water by adjusting the effective temperature setpoint according to actual instantaneous thermal loads.
The design philosophy enables the flexibility of self-adaptive logic to be combined with the benefits of an inertial water storage reservoir, which may be incorporated without changing the unit's overall dimensions.
A sensor measures the outdoor air temperature and automatically changes the setpoint of the unit to adapt it to actual system requirements.



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 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 (MCE H).
- Single-acting valves (MCE H).
- Liquid receiver (MCE 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-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.

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.

ELECTRONIC MICROPROCESSOR CONTROL

The electronic control enables the complete control of the MCE 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 (MCE-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.

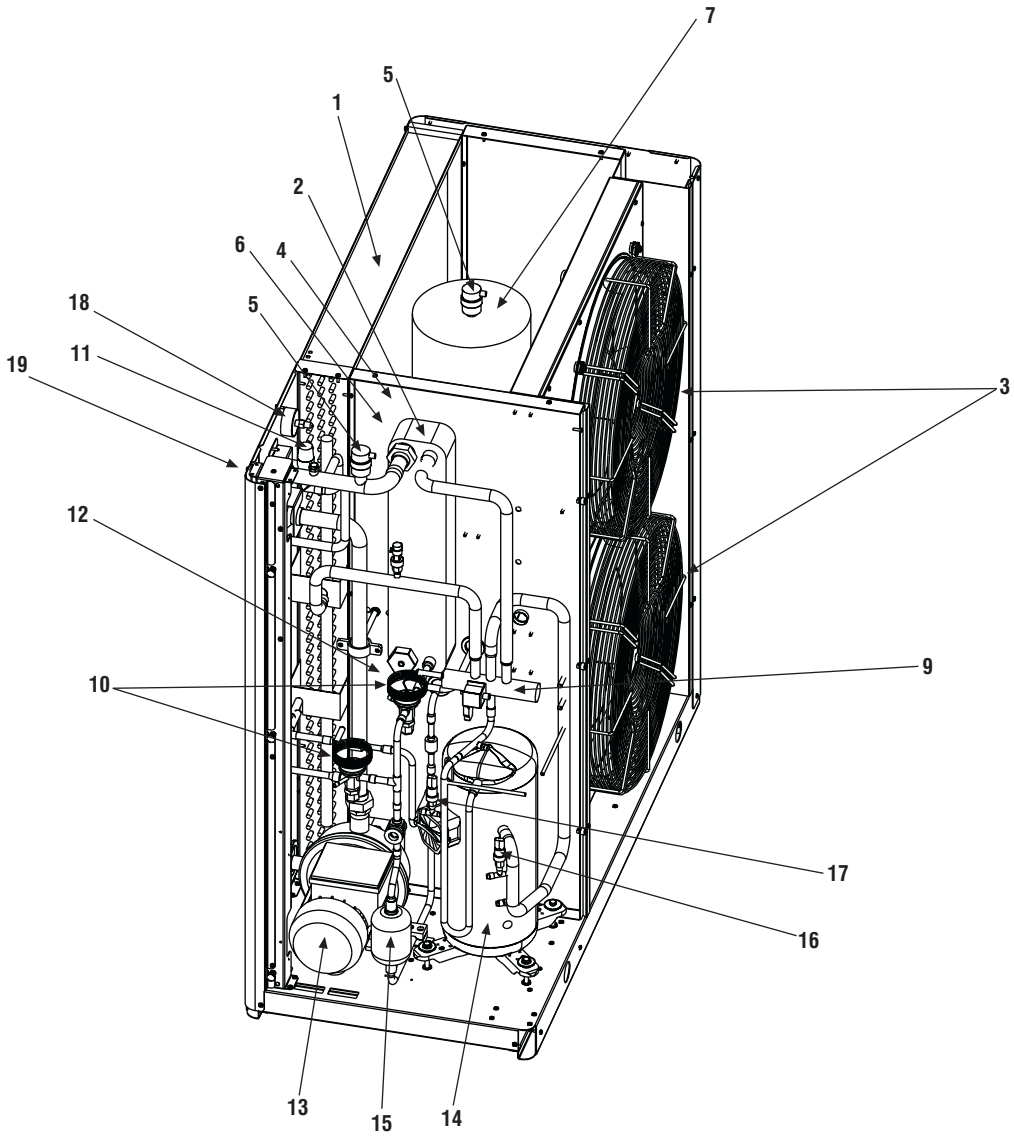
Devices controlled :
- Compressor
- Fans
- Cycle-reversing valve (MCE-H).
- Water circulation pump.
- Antifreeze heating elements (optional)
- Alarm signalling relay

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

MCE 09 - 15

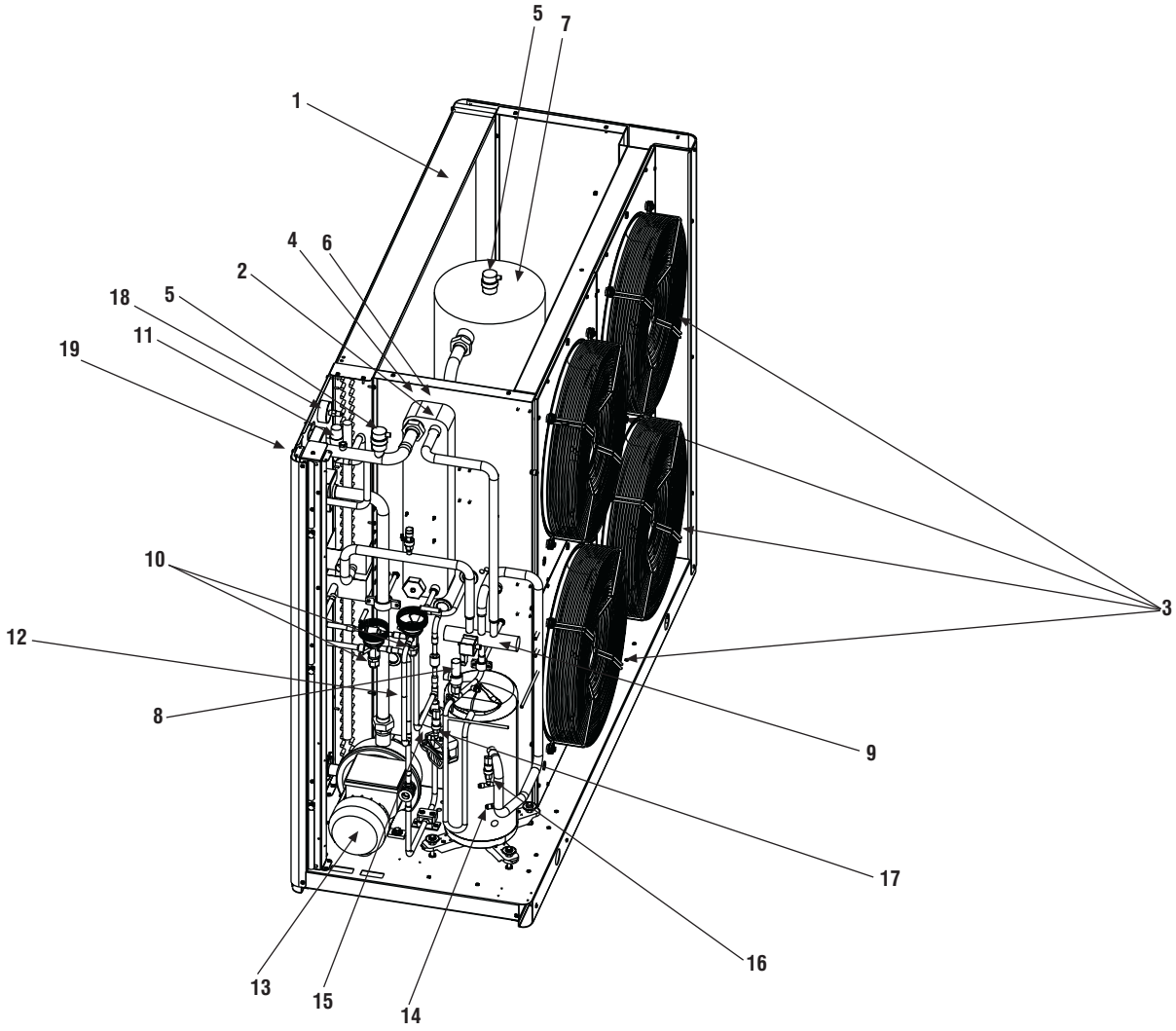


MCE 09 - 15

LEGEND	Description
1	R410A - air exchanger
2	R410A - water exchanger
3	Fans
4	Water differential pressure switch (fan compartment)
5	Automatic air vent valve
6	Expansion tank (fan compartment)
7	Buffer tank (accessory)
8	R410A safety valve
9	4-way valve (MCE H)
10	Thermostatic valves
11	Water safety valve
12	Liquid receiver (fan compartment)
13	Circulation pump
14	Compressor
15	Refrigerant filter
16	Low pressure switch and charge inlet
17	High pressure switch and charge inlet
18	Water pressure gauge
19	Water filling point

3 LAYOUT OF COMPONENTS

MCE 18 - 26

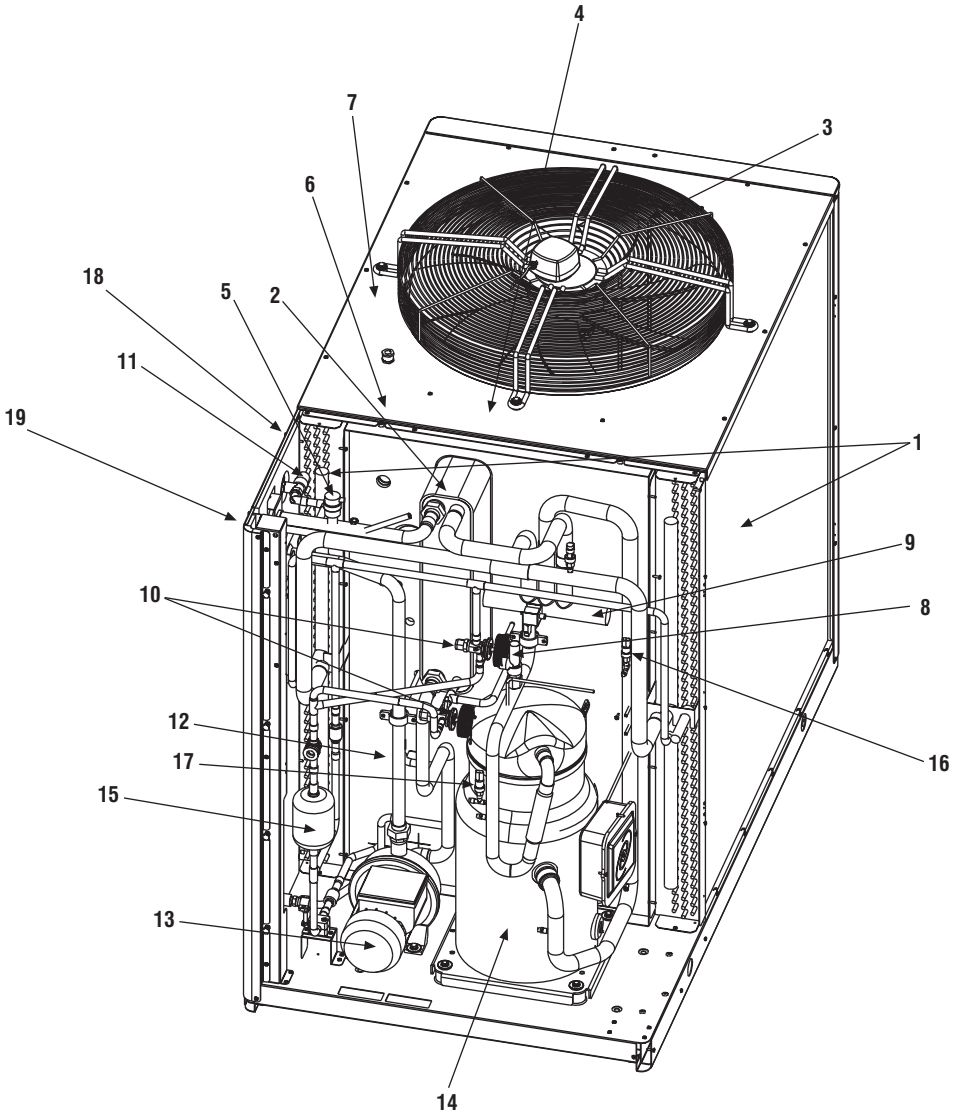


MCE 18 - 26

LEGEND	Description
1	R410A - air exchanger
2	R410A - water exchanger
3	Fans
4	Water differential pressure switch (fan compartment)
5	Automatic air vent valve
6	Expansion tank (fan compartment)
7	Buffer tank (accessory)
8	R410A safety valve
9	4-way valve (MCE H)
10	Thermostatic valves
11	Water safety valve
12	Liquid receiver (fan compartment)
13	Circulation pump
14	Compressor
15	Refrigerant filter
16	Low pressure switch and charge inlet
17	High pressure switch and charge inlet
18	Water pressure gauge
19	Water filling point

3 LAYOUT OF COMPONENTS

MCE 31 -39



MCE 31 -39

LEGEND	Description
1	R410A - air exchanger
2	R410A - water exchanger
3	Fans
4	Water differential pressure switch (fan compartment)
5	Automatic air vent valve
6	Expansion tank (fan compartment)
7	Buffer tank (accessory)
8	R410A safety valve
9	4-way valve (MCE H)
10	Thermostatic valves
11	Water safety valve
12	Liquid receiver (fan compartment)
13	Circulation pump
14	Compressor
15	Refrigerant filter
16	Low pressure switch and charge inlet
17	High pressure switch and charge inlet
18	Water pressure gauge
19	Water filling point

4 MODELS AND CONFIGURATIONS

FIELD OF APPLICATION

MCE 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 MCE series features 12 models of varying capacity in both cooling only and heat pump 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	C	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**
Pump and accessories **0**
Not present **0**
Pump - vessel - water charge valve **1**
Buffer tank **0**
Not present **0**
Present **S**
Heat Recover **0**
Not present **0**
Present with contact for pump **D**
Condensing control **0**
Not present **0**
With modulating air flow **C**
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**
Sound proofing insulation for compressor housing **1**
Refrigerant circuit accessoires **0**
Not present **0**
Refrigerant gauge **M**
Remote control **0**
Not present **0**
RS485 port (modbus + carel protocol) **2**
Simplified **S**
Base microprocessor remote control (modbus excluded) **M**
Special coil **0**
Standard **0**
Copper / copper heat exchanger **R**
Cataphoresis **C**
"Blygold" **B**
Protection grille **0**
Not present **0**
Present **G**
Compressor options **0**
Not present **0**
Low temperature air water pressure switch carter heater (chiller), coil cable (PDC) **4**
Control panel **1**
Basic microprocessor **1**

5 TECHNICAL CHARACTERISTICS

5.1 RATED TECHNICAL DATA OF WATER CHILLERS

MCE-C		009M	009	011	013	015	018	019	023	026	031	034	039
Power supply	V-ph-Hz	230-1-50	400-3N-50										
Cooling capacity	kW	8,92	8,92	11,32	12,62	14,55	16,90	19,37	22,48	25,77	31,16	34,13	39,19
MCE CB Total power input	kW	3,36	3,36	4,37	4,41	5,35	6,57	7,42	8,54	9,40	10,71	12,19	13,38
EER		2,66	2,65	2,59	2,86	2,72	2,57	2,61	2,63	2,74	2,91	2,80	2,93
ESEER		3,16	3,16	3,15	3,45	3,33	3,13	3,05	3,09	3,11	3,38	3,33	3,47
MCE CP CS Total power input	kW	3,73	3,73	4,74	4,78	5,72	6,94	7,79	8,91	9,77	11,26	12,74	13,93
Maximum power input	kW	5,1	7,2	8,6	8,9	10,5	12,5	13,6	15,7	17,4	19,1	22,1	22,7
Maximum current absorption	A	26,3	14,4	16,9	17,4	20,0	24,3	26,2	29,7	32,6	34,6	39,6	40,6
Starting absorbed current	A	99	50	65	65	68	75	104	104	132	166	161	163
n° of scroll 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
Refrigerant charge	kg	2,3	2,3	2,3	3,0	3,1	3,1	3,7	4,8	5,0	6,4	6,6	9,1
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
n° of axial fan		2	2	2	2	2	4	4	4	4	1	1	1
Air flow	m^3/h	6.686	6.686	6.686	5.986	5.986	9.304	9.304	8.450	9.861	15.255	15.255	14.973
Water flow	l/h	1.534	1.534	1.948	2.170	2.502	2.906	3.331	3.866	4.432	5.360	5.870	6.740
Diameter of hydrualic connections	"	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
Water side pressure drop	kPa	33	33	53	60	37	51	49	45	61	51	40	43
Available pressure head	kPa	118	118	94	84	104	130	126	123	99	127	133	121
Water content escluding optionals	dm^3	3	3	3	3	3	4	4	4	4	5	5	5
Expansion tank	dm^3	5	5	5	5	5	5	5	5	5	8	8	8
Buffer tank	dm^3	30	30	30	30	30	50	50	50	50	125	125	125
Height	mm	1225	1225	1225	1225	1225	1275	1275	1275	1275	1300	1300	1300
Length	mm	1220	1220	1220	1220	1220	1565	1565	1565	1565	1665	1665	1665
Depth	mm	550	550	550	550	550	601	601	601	601	950	950	950
Sound power level	dB(A)	69	69	69	69	71	71	71	71	73	77	77	77
Sound pressure level	dB(A)	41	41	41	41	43	43	43	43	45	49	49	49
Transport weight *	kg	202	202	202	209	209	260	260	280	285	310	330	330
Operating weight *	kg	227,5	227,5	227,5	234,5	234,5	306,3	306,3	327,3	332,3	432	453	453

* Weights refer to model with pump and storage reservoir
- Cooling capacity: outdoor air temperature 35°C, water temperature 12°C / 7°C
- Sound power measured according to standards ISO 3741 - ISO 3744 and EN 29614-1
- Sound pressure measured at a distance of 10 m and a height of 1.5 m above the ground in a clear 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

MCE-H		009M	009	011	013	015	018	019	023	026	031	034	039
Power supply	V-ph-Hz	230-1-50	400-3N-50										
Cooling capacity	kW	8,74	8,74	11,10	12,36	14,26	16,56	18,98	22,03	25,25	30,54	33,45	38,40
MCE HB Cooling power input	kW	3,36	3,36	4,37	4,41	5,35	6,57	7,42	8,54	9,40	10,71	12,19	13,38
EER		2,60	2,60	2,54	2,80	2,67	2,52	2,56	2,58	2,69	2,85	2,74	2,87
ESEER		3,09	3,09	3,09	3,38	3,27	3,07	2,99	3,03	3,05	3,31	3,26	3,40
MCE HP - HS Cooling power input	kW	3,73	3,73	4,74	4,78	5,72	6,94	7,79	8,91	9,77	11,26	12,74	13,93
Heating capacity	kW	10,52	10,52	13,19	14,50	16,69	19,67	22,43	26,24	29,47	35,15	38,62	44,05
MCE HB Heating power input	kW	3,64	3,64	4,46	4,60	5,50	6,68	7,23	8,32	9,01	10,69	11,93	13,50
COP		2,89	2,89	2,96	3,15	3,04	2,95	3,10	3,16	3,27	3,29	3,24	3,26
MCE HP - HS Heating power input	kW	4,01	4,01	4,83	4,97	5,87	7,05	7,60	8,69	9,38	11,24	12,48	14,05
Maximum power input	kW	5,1	7,2	8,6	8,9	10,5	12,5	13,6	15,7	17,4	19,1	22,1	22,7
Maximum current absorption	A	26,3	14,4	16,9	17,4	20,0	24,3	26,2	29,7	32,6	34,6	39,6	40,6
Starting absorbed current	A	99	50	65	65	68	75	104	104	132	166	161	163
n° of scroll compressor / 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
Refrigerant charge	kg	2,3	2,3	2,3	3,0	3,1	3,1	3,7	4,8	5,0	6,4	6,6	9,1
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
n° of axial fan		2	2	2	2	2	4	4	4	4	1	1	1
Air flow	m^3/h	6.686	6.686	6.686	5.986	5.986	9.304	9.304	8.450	9.861	15.255	15.255	14.973
Water flow in cooling mode	l/h	1.534	1.534	1.948	2.170	2.502	2.906	3.331	3.866	4.432	5.360	5.870	6.740
Water flow in heat pump	l/h	1.809	1.809	2.269	2.495	2.871	3.383	3.859	4.514	5.069	6.045	6.643	7.576
Diameter of hydrualic connections	"	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
Water pressure drop (cooling)	kPa	33	33	53	60	37	51	49	45	61	51	40	43
Water pressure drop (heating)	kPa	44	44	71	83	49	69	66	61	81	63	50	54
Available pressure head (cooling)	kPa	118	118	94	84	104	130	126	123	99	127	133	121
Available pressure head (heating)	kPa	148	148	144	141	138	174	168	159	151	171	164	154
Water content escluding optionals	dm^3	3	3	3	3	3	4	4	4	4	5	5	5
Expansion tank	dm^3	5	5	5	5	5	5	5	5	5	8	8	8
Buffer tank	dm^3	30	30	30	30	30	50	50	50	50	125	125	125
Height	mm	1225	1225	1225	1225	1225	1275	1275	1275	1275	1300	1300	1300
Length	mm	1220	1220	1220	1220	1220	1565	1565	1565	1565	1665	1665	1665
Depth	mm	550	550	550	550	550	601	601	601	601	950	950	950
Sound power level	dB(A)	69	69	69	69	71	71	71	71	73	77	77	77
Sound pressure level	dB(A)	41	41	41	41	43	43	43	43	45	49	49	49
Transport weight *	kg	212	212	212	219	220	273	273	295	300	330	350	350
Operating weight *	kg	237,5	237,5	237,5	244,5	245,5	319,3	319,3	342,3	347,3	452	473	473

* Weights refer to model with pump and storage reservoir
- 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 measured according to standards ISO 3741 - ISO 3744 and EN 29614-1
- Sound pressure measured at a distance of 10 m and a height of 1.5 m above the ground in a clear 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).

6 PERFORMANCE

6.1 MCE-C COOLING CAPACITIES

Tbs_1 Air inlet temperature (dry bulb)
Tw in/out Water inlet/outlet temperature
PF Cooling capacity
PA Total power input including pump

	Tbs_1		20		25		30		35		40		45	
	Tw in	Tw out	PF	PA	PF	PA	PF	PA	PF	PA	PF	PA	PF	PA
	[°C]	[°C]	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
MCE 009 MC	10	5	10,34	2,90	9,61	3,12	8,93	3,39	8,29	3,70	7,70	4,06	7,16	4,47
	11	6	10,72	2,90	9,97	3,12	9,26	3,40	8,60	3,71	7,99	4,08	7,43	4,49
	12	7	11,11	2,91	10,33	3,13	9,60	3,41	8,92	3,73	8,29	4,10	7,70	4,51
	13	8	11,51	2,91	10,71	3,14	9,96	3,42	9,25	3,74	8,59	4,11	7,98	4,53
	14	9	11,93	2,91	11,10	3,15	10,32	3,43	9,59	3,75	8,91	4,13	8,27	4,55
	15	10	12,36	2,92	11,50	3,16	10,70	3,44	9,94	3,77	9,23	4,15	8,57	4,57
	16	11	12,80	2,92	11,92	3,16	11,09	3,45	10,30	3,78	9,57	4,16	8,88	4,59
	17	12	13,25	2,93	12,34	3,17	11,49	3,46	10,67	3,80	9,91	4,18	9,19	4,61
MCE 009 C	10	5	10,34	2,90	9,61	3,12	8,93	3,39	8,29	3,70	7,70	4,06	7,16	4,47
	11	6	10,72	2,90	9,97	3,12	9,26	3,40	8,60	3,71	7,99	4,08	7,43	4,49
	12	7	11,11	2,91	10,33	3,13	9,60	3,41	8,92	3,73	8,29	4,10	7,70	4,51
	13	8	11,51	2,91	10,71	3,14	9,96	3,42	9,25	3,74	8,59	4,11	7,98	4,53
	14	9	11,93	2,91	11,10	3,15	10,32	3,43	9,59	3,75	8,91	4,13	8,27	4,55
	15	10	12,36	2,92	11,50	3,16	10,70	3,44	9,94	3,77	9,23	4,15	8,57	4,57
	16	11	12,80	2,92	11,92	3,16	11,09	3,45	10,30	3,78	9,57	4,16	8,88	4,59
	17	12	13,25	2,93	12,34	3,17	11,49	3,46	10,67	3,80	9,91	4,18	9,19	4,61
MCE 011 C	10	5	13,28	3,51	12,31	3,83	11,41	4,22	10,56	4,67	9,78	5,18	9,05	5,75
	11	6	13,73	3,53	12,74	3,86	11,81	4,25	10,94	4,71	10,13	5,22	9,38	5,79
	12	7	14,21	3,55	13,18	3,89	12,22	4,29	11,32	4,74	10,49	5,26	9,72	5,83
	13	8	14,69	3,58	13,64	3,92	12,65	4,32	11,72	4,78	10,87	5,30	10,07	5,88
	14	9	15,19	3,61	14,11	3,95	13,09	4,36	12,14	4,82	11,25	5,34	10,44	5,92
	15	10	15,71	3,63	14,59	3,98	13,54	4,39	12,56	4,86	11,65	5,39	10,81	5,97
	16	11	16,24	3,66	15,09	4,02	14,01	4,43	13,00	4,90	12,07	5,43	11,20	6,02
	17	12	16,78	3,69	15,60	4,05	14,49	4,47	13,46	4,94	12,49	5,48	11,60	6,07
MCE 013 C	10	5	14,87	3,61	13,77	3,92	12,75	4,29	11,79	4,72	10,91	5,22	10,10	5,78
	11	6	15,35	3,62	14,23	3,94	13,18	4,31	12,20	4,75	11,29	5,25	10,45	5,81
	12	7	15,84	3,64	14,70	3,96	13,62	4,34	12,62	4,78	11,68	5,28	10,82	5,85
	13	8	16,35	3,66	15,18	3,98	14,08	4,36	13,05	4,81	12,09	5,32	11,20	5,89
	14	9	16,88	3,68	15,68	4,00	14,55	4,39	13,49	4,84	12,50	5,36	11,59	5,93
	15	10	17,42	3,70	16,19	4,03	15,03	4,42	13,95	4,88	12,93	5,39	11,99	5,97
	16	11	17,97	3,72	16,72	4,05	15,53	4,45	14,42	4,91	13,38	5,43	12,40	6,02
	17	12	18,54	3,74	17,26	4,08	16,04	4,48	14,90	4,95	13,83	5,47	12,83	6,06
MCE 015 C	10	5	17,34	4,21	16,01	4,61	14,77	5,08	13,61	5,64	12,55	6,27	11,58	6,99
	11	6	17,89	4,24	16,53	4,63	15,26	5,11	14,07	5,68	12,98	6,32	11,98	7,04
	12	7	18,46	4,26	17,07	4,67	15,76	5,15	14,55	5,72	13,42	6,36	12,39	7,09
	13	8	19,04	4,29	17,62	4,70	16,28	5,19	15,04	5,76	13,88	6,41	12,81	7,15
	14	9	19,64	4,32	18,19	4,73	16,82	5,23	15,54	5,80	14,35	6,46	13,25	7,20
	15	10	20,26	4,34	18,77	4,76	17,37	5,27	16,06	5,85	14,84	6,51	13,70	7,26
	16	11	20,90	4,37	19,37	4,80	17,94	5,31	16,59	5,90	15,33	6,57	14,17	7,32
	17	12	21,55	4,41	19,99	4,84	18,52	5,35	17,14	5,95	15,85	6,62	14,65	7,38
MCE 018 C	10	5	20,15	5,15	18,60	5,61	17,16	6,18	15,82	6,84	14,58	7,60	13,46	8,45
	11	6	20,79	5,18	19,20	5,65	17,72	6,22	16,35	6,89	15,08	7,65	13,92	8,52
	12	7	21,44	5,21	19,82	5,69	18,31	6,27	16,90	6,94	15,59	7,71	14,39	8,58
	13	8	22,12	5,24	20,46	5,73	18,91	6,31	17,46	6,99	16,12	7,77	14,88	8,65
	14	9	22,81	5,27	21,12	5,77	19,53	6,36	18,04	7,05	16,66	7,83	15,38	8,71
	15	10	23,53	5,31	21,79	5,81	20,16	6,41	18,64	7,11	17,22	7,90	15,91	8,78
	16	11	24,26	5,35	22,49	5,86	20,82	6,46	19,25	7,16	17,80	7,96	16,44	8,86
	17	12	25,01	5,38	23,20	5,90	21,49	6,52	19,89	7,23	18,39	8,03	16,99	8,94

6 PERFORMANCE

6.1 MCE-C COOLING CAPACITIES

Tbs_1 Air inlet temperature (dry bulb)
Tw in/out Water inlet/outlet temperature
PF Cooling capacity
PA Total power input including pump

	Tbs_1		20		25		30		35		40		45	
	Tw in	Tw out	PF	PA	PF	PA	PF	PA	PF	PA	PF	PA	PF	PA
	[°C]	[°C]	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
MCE 019 C	10	5	21,62	5,81	20,44	6,34	19,33	6,95	18,28	7,65	17,31	8,43	16,40	9,29
	11	6	22,27	5,83	21,05	6,38	19,90	7,01	18,82	7,72	17,81	8,51	16,87	9,39
	12	7	22,93	5,86	21,67	6,42	20,49	7,06	19,37	7,79	18,32	8,60	17,33	9,49
	13	8	23,61	5,89	22,31	6,47	21,08	7,13	19,92	7,87	18,83	8,69	17,81	9,59
	14	9	24,30	5,94	22,96	6,52	21,69	7,19	20,49	7,94	19,36	8,78	18,30	9,69
	15	10	25,01	5,98	23,63	6,58	22,32	7,26	21,07	8,02	19,90	8,87	18,80	9,80
	16	11	25,73	6,03	24,31	6,64	22,95	7,33	21,67	8,11	20,45	8,97	19,30	9,90
	17	12	26,47	6,09	25,00	6,71	23,60	7,41	22,27	8,20	21,01	9,06	19,81	10,01
MCE 023 C	10	5	25,09	6,60	23,72	7,22	22,43	7,93	21,22	8,74	20,09	9,65	19,04	10,65
	11	6	25,84	6,63	24,43	7,26	23,10	8,00	21,84	8,82	20,67	9,75	19,58	10,76
	12	7	26,62	6,66	25,16	7,31	23,78	8,06	22,48	8,91	21,26	9,85	20,12	10,88
	13	8	27,40	6,70	25,90	7,37	24,47	8,13	23,13	8,99	21,86	9,95	20,68	11,00
	14	9	28,21	6,75	26,66	7,43	25,18	8,21	23,79	9,08	22,47	10,05	21,24	11,12
	15	10	29,03	6,80	27,43	7,50	25,91	8,29	24,46	9,18	23,10	10,16	21,82	11,24
	16	11	29,87	6,86	28,22	7,57	26,64	8,38	25,15	9,28	23,74	10,27	22,40	11,36
	17	12	30,73	6,93	29,02	7,65	27,39	8,47	25,85	9,38	24,38	10,38	23,00	11,49
MCE 026 C	10	5	29,51	7,67	27,77	8,37	25,92	9,15	23,98	10,03	21,94	11,01	19,79	12,08
	11	6	30,43	7,75	28,62	8,46	26,71	9,25	24,69	10,14	22,57	11,12	20,35	12,20
	12	7	31,36	7,84	29,49	8,55	27,50	9,35	25,41	10,25	23,21	11,24	20,91	12,32
	13	8	32,31	7,92	30,36	8,64	28,30	9,46	26,13	10,36	23,86	11,36	21,47	12,45
	14	9	33,27	8,01	31,24	8,74	29,11	9,56	26,86	10,48	24,50	11,48	22,03	12,58
	15	10	34,23	8,10	32,14	8,84	29,92	9,67	27,59	10,60	25,15	11,61	22,59	12,71
	16	11	35,21	8,20	33,03	8,95	30,74	9,79	28,32	10,72	25,79	11,74	23,14	12,85
	17	12	36,20	8,29	33,94	9,06	31,56	9,91	29,06	10,85	26,43	11,87	23,69	12,99
MCE 031 C	10	5	34,98	8,56	33,18	9,28	31,28	10,12	29,28	11,06	27,19	12,11	25,00	13,27
	11	6	36,11	8,63	34,25	9,37	32,28	10,21	30,21	11,16	28,05	12,22	25,78	13,39
	12	7	37,27	8,70	35,33	9,45	33,30	10,30	31,16	11,26	28,92	12,33	26,57	13,50
	13	8	38,44	8,78	36,44	9,53	34,33	10,40	32,12	11,36	29,80	12,44	27,38	13,62
	14	9	39,64	8,86	37,56	9,62	35,38	10,49	33,09	11,47	30,70	12,55	28,19	13,74
	15	10	40,85	8,94	38,70	9,71	36,45	10,59	34,08	11,58	31,60	12,67	29,01	13,86
	16	11	42,08	9,02	39,86	9,81	37,53	10,70	35,08	11,69	32,52	12,79	29,84	13,99
	17	12	43,33	9,11	41,03	9,90	38,62	10,80	36,09	11,80	33,44	12,91	30,68	14,12
MCE 034 C	10	5	39,09	9,47	36,98	10,34	34,67	11,35	32,17	12,51	29,48	13,82	26,60	15,28
	11	6	40,33	9,56	38,13	10,43	35,74	11,45	33,15	12,62	30,35	13,94	27,37	15,40
	12	7	41,59	9,65	39,30	10,53	36,82	11,56	34,13	12,73	31,23	14,06	28,14	15,53
	13	8	42,86	9,74	40,49	10,63	37,91	11,67	35,12	12,85	32,12	14,18	28,91	15,66
	14	9	44,16	9,83	41,70	10,74	39,02	11,78	36,13	12,97	33,01	14,31	29,69	15,80
	15	10	45,47	9,93	42,92	10,84	40,14	11,90	37,14	13,10	33,91	14,45	30,47	15,94
	16	11	46,80	10,04	44,15	10,96	41,27	12,02	38,15	13,23	34,81	14,59	31,24	16,09
	17	12	48,15	10,15	45,39	11,08	42,40	12,15	39,18	13,37	35,72	14,74	32,02	16,25
MCE 039 C	10	5	44,63	10,38	42,16	11,34	39,55	12,46	36,78	13,73	33,87	15,15	30,81	16,73
	11	6	46,08	10,44	43,54	11,42	40,83	12,55	37,98	13,83	34,96	15,26	31,80	16,84
	12	7	47,56	10,52	44,94	11,50	42,14	12,64	39,19	13,93	36,07	15,37	32,79	16,95
	13	8	49,08	10,59	46,36	11,59	43,47	12,74	40,42	14,04	37,19	15,48	33,78	17,07
	14	9	50,62	10,67	47,81	11,68	44,82	12,84	41,66	14,15	38,31	15,60	34,79	17,20
	15	10	52,19	10,75	49,28	11,77	46,19	12,95	42,91	14,27	39,45	15,73	35,80	17,34
	16	11	53,78	10,83	50,78	11,87	47,58	13,06	44,18	14,39	40,59	15,86	36,81	17,48
	17	12	55,41	10,92	52,29	11,98	48,98	13,18	45,47	14,52	41,75	16,00	37,82	17,63

6 PERFORMANCE

6.2 MCE-H COOLING CAPACITIES

Tbs_1 Air inlet temperature (dry bulb)
Tw in/out Water inlet/outlet temperature
PF Cooling capacity
PA Total power input including pump

	Tbs_1		20		25		30		35		40		45	
	Tw in	Tw out	PF	PA	PF	PA	PF	PA	PF	PA	PF	PA	PF	PA
	[°C]	[°C]	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
MCE 009 MH	10	5	10,13	2,90	9,42	3,12	8,75	3,39	8,13	3,70	7,55	4,06	7,02	4,47
	11	6	10,50	2,90	9,77	3,12	9,07	3,40	8,43	3,71	7,83	4,08	7,28	4,49
	12	7	10,89	2,91	10,13	3,13	9,41	3,41	8,74	3,73	8,12	4,10	7,54	4,51
	13	8	11,28	2,91	10,50	3,14	9,76	3,42	9,06	3,74	8,42	4,11	7,82	4,53
	14	9	11,69	2,91	10,88	3,15	10,12	3,43	9,40	3,75	8,73	4,13	8,10	4,55
	15	10	12,11	2,92	11,27	3,16	10,48	3,44	9,74	3,77	9,05	4,15	8,40	4,57
	16	11	12,54	2,92	11,68	3,16	10,86	3,45	10,10	3,78	9,37	4,16	8,70	4,59
	17	12	12,99	2,93	12,10	3,17	11,26	3,46	10,46	3,80	9,71	4,18	9,01	4,61
MCE 009 H	10	5	10,13	2,90	9,42	3,12	8,75	3,39	8,13	3,70	7,55	4,06	7,02	4,47
	11	6	10,50	2,90	9,77	3,12	9,07	3,40	8,43	3,71	7,83	4,08	7,28	4,49
	12	7	10,89	2,91	10,13	3,13	9,41	3,41	8,74	3,73	8,12	4,10	7,54	4,51
	13	8	11,28	2,91	10,50	3,14	9,76	3,42	9,06	3,74	8,42	4,11	7,82	4,53
	14	9	11,69	2,91	10,88	3,15	10,12	3,43	9,40	3,75	8,73	4,13	8,10	4,55
	15	10	12,11	2,92	11,27	3,16	10,48	3,44	9,74	3,77	9,05	4,15	8,40	4,57
	16	11	12,54	2,92	11,68	3,16	10,86	3,45	10,10	3,78	9,37	4,16	8,70	4,59
	17	12	12,99	2,93	12,10	3,17	11,26	3,46	10,46	3,80	9,71	4,18	9,01	4,61
MCE 011 H	10	5	13,01	3,51	12,06	3,83	11,18	4,22	10,35	4,67	9,58	5,18	8,87	5,75
	11	6	13,46	3,53	12,48	3,86	11,57	4,25	10,72	4,71	9,92	5,22	9,19	5,79
	12	7	13,92	3,55	12,92	3,89	11,98	4,29	11,10	4,74	10,28	5,26	9,53	5,83
	13	8	14,40	3,58	13,36	3,92	12,39	4,32	11,49	4,78	10,65	5,30	9,87	5,88
	14	9	14,89	3,61	13,82	3,95	12,83	4,36	11,89	4,82	11,03	5,34	10,23	5,92
	15	10	15,39	3,63	14,30	3,98	13,27	4,39	12,31	4,86	11,42	5,39	10,60	5,97
	16	11	15,91	3,66	14,79	4,02	13,73	4,43	12,74	4,90	11,82	5,43	10,98	6,02
	17	12	16,45	3,69	15,29	4,05	14,20	4,47	13,19	4,94	12,24	5,48	11,37	6,07
MCE 013 H	10	5	14,57	3,61	13,50	3,92	12,49	4,29	11,56	4,72	10,69	5,22	9,90	5,78
	11	6	15,04	3,62	13,94	3,94	12,91	4,31	11,95	4,75	11,06	5,25	10,25	5,81
	12	7	15,52	3,64	14,40	3,96	13,35	4,34	12,36	4,78	11,45	5,28	10,60	5,85
	13	8	16,02	3,66	14,87	3,98	13,80	4,36	12,79	4,81	11,84	5,32	10,97	5,89
	14	9	16,54	3,68	15,36	4,00	14,26	4,39	13,22	4,84	12,25	5,36	11,35	5,93
	15	10	17,07	3,70	15,86	4,03	14,73	4,42	13,67	4,88	12,67	5,39	11,75	5,97
	16	11	17,61	3,72	16,38	4,05	15,22	4,45	14,13	4,91	13,11	5,43	12,16	6,02
	17	12	18,17	3,74	16,91	4,08	15,72	4,48	14,60	4,95	13,56	5,47	12,58	6,06
MCE 015 H	10	5	16,99	4,21	15,69	4,61	14,47	5,08	13,34	5,64	12,30	6,27	11,35	6,99
	11	6	17,53	4,24	16,20	4,63	14,95	5,11	13,79	5,68	12,72	6,32	11,74	7,04
	12	7	18,09	4,26	16,72	4,67	15,45	5,15	14,26	5,72	13,16	6,36	12,14	7,09
	13	8	18,66	4,29	17,27	4,70	15,96	5,19	14,74	5,76	13,60	6,41	12,56	7,15
	14	9	19,25	4,32	17,82	4,73	16,48	5,23	15,23	5,80	14,06	6,46	12,99	7,20
	15	10	19,86	4,34	18,40	4,76	17,02	5,27	15,74	5,85	14,54	6,51	13,43	7,26
	16	11	20,48	4,37	18,98	4,80	17,58	5,31	16,26	5,90	15,03	6,57	13,88	7,32
	17	12	21,12	4,41	19,59	4,84	18,15	5,35	16,80	5,95	15,53	6,62	14,35	7,38
MCE 018 H	10	5	19,74	5,15	18,23	5,61	16,81	6,18	15,50	6,84	14,29	7,60	13,19	8,45
	11	6	20,37	5,18	18,82	5,65	17,37	6,22	16,02	6,89	14,78	7,65	13,64	8,52
	12	7	21,01	5,21	19,43	5,69	17,94	6,27	16,56	6,94	15,28	7,71	14,10	8,58
	13	8	21,68	5,24	20,05	5,73	18,53	6,31	17,11	6,99	15,80	7,77	14,58	8,65
	14	9	22,36	5,27	20,70	5,77	19,14	6,36	17,68	7,05	16,33	7,83	15,08	8,71
	15	10	23,06	5,31	21,36	5,81	19,76	6,41	18,27	7,11	16,88	7,90	15,59	8,78
	16	11	23,77	5,35	22,04	5,86	20,40	6,46	18,87	7,16	17,44	7,96	16,11	8,86
	17	12	24,51	5,38	22,74	5,90	21,06	6,52	19,49	7,23	18,02	8,03	16,65	8,94

6 PERFORMANCE

6.2 MCE-H COOLING CAPACITIES

Tbs_1 Air inlet temperature (dry bulb)
Tw in/out Water inlet/outlet temperature
PF Cooling capacity
PA Total power input including pump

	Tbs_1		20		25		30		35		40		45	
	Tw in	Tw out	PF	PA	PF	PA	PF	PA	PF	PA	PF	PA	PF	PA
	[°C]	[°C]	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
MCE 019 H	10	5	21,19	5,81	20,03	6,34	18,94	6,95	17,92	7,65	16,96	8,43	16,08	9,29
	11	6	21,82	5,83	20,63	6,38	19,50	7,01	18,44	7,72	17,45	8,51	16,53	9,39
	12	7	22,47	5,86	21,24	6,42	20,08	7,06	18,98	7,79	17,95	8,60	16,99	9,49
	13	8	23,14	5,89	21,87	6,47	20,66	7,13	19,53	7,87	18,46	8,69	17,46	9,59
	14	9	23,82	5,94	22,51	6,52	21,26	7,19	20,08	7,94	18,98	8,78	17,93	9,69
	15	10	24,51	5,98	23,16	6,58	21,87	7,26	20,65	8,02	19,50	8,87	18,42	9,80
	16	11	25,22	6,03	23,82	6,64	22,49	7,33	21,23	8,11	20,04	8,97	18,91	9,90
	17	12	25,94	6,09	24,50	6,71	23,13	7,41	21,82	8,20	20,59	9,06	19,42	10,01
MCE 023 H	10	5	24,59	6,60	23,25	7,22	21,98	7,93	20,80	8,74	19,69	9,65	18,66	10,65
	11	6	25,33	6,63	23,94	7,26	22,64	8,00	21,41	8,82	20,26	9,75	19,18	10,76
	12	7	26,08	6,66	24,65	7,31	23,30	8,06	22,03	8,91	20,83	9,85	19,72	10,88
	13	8	26,85	6,70	25,38	7,37	23,98	8,13	22,66	8,99	21,42	9,95	20,26	11,00
	14	9	27,64	6,75	26,12	7,43	24,68	8,21	23,31	9,08	22,02	10,05	20,82	11,12
	15	10	28,45	6,80	26,88	7,50	25,39	8,29	23,97	9,18	22,64	10,16	21,38	11,24
	16	11	29,27	6,86	27,65	7,57	26,11	8,38	24,65	9,28	23,26	10,27	21,95	11,36
	17	12	30,11	6,93	28,44	7,65	26,85	8,47	25,33	9,38	23,89	10,38	22,54	11,49
MCE 026 H	10	5	28,92	7,67	27,21	8,37	25,41	9,15	23,50	10,03	21,50	11,01	19,40	12,08
	11	6	29,82	7,75	28,05	8,46	26,17	9,25	24,20	10,14	22,12	11,12	19,94	12,20
	12	7	30,74	7,84	28,90	8,55	26,95	9,35	24,90	10,25	22,75	11,24	20,49	12,32
	13	8	31,66	7,92	29,75	8,64	27,74	9,46	25,61	10,36	23,38	11,36	21,04	12,45
	14	9	32,60	8,01	30,62	8,74	28,53	9,56	26,32	10,48	24,01	11,48	21,59	12,58
	15	10	33,55	8,10	31,49	8,84	29,32	9,67	27,04	10,60	24,64	11,61	22,13	12,71
	16	11	34,51	8,20	32,37	8,95	30,12	9,79	27,76	10,72	25,27	11,74	22,68	12,85
	17	12	35,47	8,29	33,26	9,06	30,93	9,91	28,47	10,85	25,90	11,87	23,21	12,99
MCE 031 H	10	5	34,28	8,56	32,51	9,28	30,65	10,12	28,69	11,06	26,64	12,11	24,50	13,27
	11	6	35,39	8,63	33,56	9,37	31,63	10,21	29,61	11,16	27,49	12,22	25,26	13,39
	12	7	36,52	8,70	34,63	9,45	32,63	10,30	30,54	11,26	28,34	12,33	26,04	13,50
	13	8	37,67	8,78	35,71	9,53	33,65	10,40	31,48	11,36	29,21	12,44	26,83	13,62
	14	9	38,84	8,86	36,81	9,62	34,68	10,49	32,43	11,47	30,08	12,55	27,63	13,74
	15	10	40,03	8,94	37,93	9,71	35,72	10,59	33,40	11,58	30,97	12,67	28,43	13,86
	16	11	41,24	9,02	39,06	9,81	36,78	10,70	34,38	11,69	31,87	12,79	29,25	13,99
	17	12	42,46	9,11	40,21	9,90	37,85	10,80	35,37	11,80	32,78	12,91	30,07	14,12
MCE 034 H	10	5	38,31	9,47	36,24	10,34	33,98	11,35	31,53	12,51	28,89	13,82	26,07	15,28
	11	6	39,52	9,56	37,37	10,43	35,02	11,45	32,48	12,62	29,75	13,94	26,82	15,40
	12	7	40,75	9,65	38,52	10,53	36,08	11,56	33,45	12,73	30,61	14,06	27,57	15,53
	13	8	42,00	9,74	39,68	10,63	37,15	11,67	34,42	12,85	31,48	14,18	28,33	15,66
	14	9	43,27	9,83	40,86	10,74	38,24	11,78	35,40	12,97	32,35	14,31	29,09	15,80
	15	10	44,56	9,93	42,06	10,84	39,33	11,90	36,39	13,10	33,23	14,45	29,86	15,94
	16	11	45,87	10,04	43,27	10,96	40,44	12,02	37,39	13,23	34,12	14,59	30,62	16,09
	17	12	47,19	10,15	44,49	11,08	41,55	12,15	38,39	13,37	35,00	14,74	31,38	16,25
MCE 039 H	10	5	43,73	10,38	41,32	11,34	38,75	12,46	36,05	13,73	33,20	15,15	30,20	16,73
	11	6	45,16	10,44	42,66	11,42	40,02	12,55	37,22	13,83	34,27	15,26	31,16	16,84
	12	7	46,61	10,52	44,04	11,50	41,30	12,64	38,40	13,93	35,35	15,37	32,13	16,95
	13	8	48,10	10,59	45,43	11,59	42,60	12,74	39,61	14,04	36,44	15,48	33,11	17,07
	14	9	49,61	10,67	46,86	11,68	43,93	12,84	40,82	14,15	37,55	15,60	34,09	17,20
	15	10	51,15	10,75	48,30	11,77	45,27	12,95	42,06	14,27	38,66	15,73	35,08	17,34
	16	11	52,71	10,83	49,76	11,87	46,63	13,06	43,30	14,39	39,78	15,86	36,07	17,48
	17	12	54,30	10,92	51,25	11,98	48,00	13,18	44,56	14,52	40,91	16,00	37,07	17,63

6 PERFORMANCE

6.3 MCE-H HEATING CAPACITIES

Tbs_1 Air inlet temperature (dry bulb)
Tw in/out Water inlet/outlet temperature
PT Heating capacity
PA Total power input including pump
RH Relative humidity

	Tbs_1 / RH		-5 °C / 90 %		0 °C / 90 %		7 °C / 88 %		15 °C / 80 %		20°C / 70 %	
	Tw in	Tw out	PT	PA	PT	PA	PT	PA	PT	PA	PT	PA
	[°C]	[°C]	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
MCE 009 MH	25	30	7,14	3,00	9,31	3,07	11,54	3,08	13,10	3,08	14,23	3,07
	30	35	6,98	3,26	9,02	3,32	11,11	3,34	12,57	3,34	13,64	3,34
	35	40	6,92	3,56	8,82	3,63	10,77	3,65	12,13	3,66	13,13	3,66
	40	45	-	-	8,71	3,97	10,52	4,01	11,79	4,02	12,72	4,02
	45	50	-	-	-	-	10,36	4,41	11,53	4,42	12,39	4,43
MCE 009 H	25	30	7,14	3,00	9,31	3,07	11,54	3,08	13,10	3,08	14,23	3,07
	30	35	6,98	3,26	9,02	3,32	11,11	3,34	12,57	3,34	13,64	3,34
	35	40	6,92	3,56	8,82	3,63	10,77	3,65	12,13	3,66	13,13	3,66
	40	45	-	-	8,71	3,97	10,52	4,01	11,79	4,02	12,72	4,02
	45	50	-	-	-	-	10,36	4,41	11,53	4,42	12,39	4,43
MCE 011 H	25	30	8,93	3,40	11,69	3,52	14,54	3,60	16,46	3,64	17,88	3,67
	30	35	8,73	3,75	11,31	3,86	13,98	3,95	15,78	3,99	17,12	4,02
	35	40	8,61	4,15	11,03	4,27	13,53	4,36	15,21	4,40	16,48	4,44
	40	45	-	-	10,85	4,74	13,19	4,83	14,77	4,88	15,96	4,91
	45	50	-	-	-	-	12,96	5,36	14,44	5,41	15,56	5,45
MCE 013 H	25	30	10,26	3,64	13,20	3,71	16,22	3,76	18,23	3,78	19,72	3,80
	30	35	9,91	3,98	12,67	4,05	15,52	4,10	17,42	4,13	18,84	4,15
	35	40	9,68	4,38	12,27	4,45	14,95	4,51	16,75	4,54	18,09	4,56
	40	45	-	-	11,99	4,91	14,50	4,97	16,19	5,01	17,46	5,04
	45	50	-	-	-	-	14,19	5,50	15,77	5,55	16,96	5,58
MCE 015 H	25	30	11,85	4,20	15,23	4,29	18,68	4,35	20,97	4,38	22,68	4,41
	30	35	11,44	4,62	14,61	4,71	17,86	4,77	20,02	4,81	21,63	4,84
	35	40	11,20	5,12	14,15	5,21	17,19	5,28	19,23	5,32	20,75	5,36
	40	45	-	-	13,86	5,79	16,69	5,87	18,60	5,92	20,03	5,95
	45	50	-	-	-	-	16,36	6,54	18,13	6,59	19,47	6,63
MCE 018 H	25	30	13,96	5,08	17,94	5,19	22,02	5,26	24,72	5,30	26,73	5,33
	30	35	13,48	5,58	17,21	5,68	21,04	5,76	23,60	5,81	25,50	5,84
	35	40	13,19	6,17	16,67	6,27	20,26	6,36	22,66	6,41	24,46	6,44
	40	45	-	-	16,32	6,96	19,67	7,05	21,92	7,10	23,61	7,15
	45	50	-	-	-	-	19,27	7,83	21,37	7,90	22,95	7,94
MCE 019 H	25	30	16,78	6,87	20,03	6,14	23,82	5,87	26,42	5,82	28,37	5,82
	30	35	16,26	7,01	19,54	6,51	23,22	6,36	25,71	6,36	27,56	6,39
	35	40	15,89	7,22	19,19	6,96	22,75	6,94	25,13	6,99	26,90	7,03
	40	45	-	-	18,98	7,49	22,43	7,60	24,71	7,69	26,38	7,76
	45	50	-	-	-	-	22,26	8,34	24,42	8,48	26,00	8,58

6 PERFORMANCE

6.3 MCE-H HEATING CAPACITIES

Tbs_1 Air inlet temperature (dry bulb)
Tw in/out Water inlet/outlet temperature
PT Heating capacity
PA Total power input including pump
RH Relative humidity

	Tbs_1 / RH		-5 °C / 90 %		0 °C / 90 %		7 °C / 88 %		15 °C / 80 %		20°C / 70 %	
	Tw in	Tw out	PT	PA	PT	PA	PT	PA	PT	PA	PT	PA
	[°C]	[°C]	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
MCE 023 H	25	30	19,59	7,80	23,42	6,96	27,88	6,66	30,93	6,61	33,22	6,61
	30	35	18,99	7,97	22,84	7,40	27,17	7,24	30,09	7,24	32,27	7,27
	35	40	18,55	8,23	22,43	7,93	26,62	7,92	29,42	7,97	31,48	8,03
	40	45	-	-	22,19	8,56	26,24	8,69	28,91	8,79	30,86	8,88
	45	50	-	-	-	-	26,03	9,55	28,56	9,71	30,41	9,82
MCE 026 H	25	30	18,97	6,83	25,50	7,12	31,86	7,36	35,86	7,50	38,75	7,59
	30	35	18,63	7,46	24,89	7,75	30,94	8,01	34,74	8,16	37,48	8,27
	35	40	18,36	8,18	24,30	8,49	30,02	8,76	33,60	8,92	36,18	9,03
	40	45	-	-	23,74	9,33	29,10	9,61	32,45	9,77	34,86	9,89
	45	50	-	-	-	-	28,18	10,56	31,29	10,72	33,51	10,84
MCE 031 H	25	30	22,83	8,07	30,63	8,40	38,18	8,67	42,91	8,82	46,32	8,92
	30	35	22,45	8,79	29,94	9,13	37,16	9,42	41,68	9,58	44,93	9,70
	35	40	22,14	9,61	29,29	9,97	36,15	10,27	40,44	10,45	43,52	10,58
	40	45	-	-	28,67	10,92	35,15	11,24	39,20	11,43	42,10	11,56
	45	50	-	-	-	-	34,16	12,32	37,95	12,52	40,67	12,66
MCE 034 H	25	30	25,57	8,99	33,95	9,20	42,15	9,41	47,33	9,56	51,07	9,67
	30	35	25,18	9,86	33,21	10,07	41,01	10,29	45,93	10,44	49,48	10,55
	35	40	24,85	10,87	32,47	11,09	39,84	11,31	44,47	11,46	47,81	11,57
	40	45	-	-	31,75	12,26	38,62	12,48	42,95	12,63	46,06	12,74
	45	50	-	-	-	-	37,38	13,80	41,36	13,95	44,22	14,06
MCE 039 H	25	30	29,56	10,43	38,93	10,46	48,30	10,57	54,28	10,66	58,61	10,73
	30	35	28,81	11,48	37,88	11,46	46,87	11,58	52,58	11,68	56,71	11,76
	35	40	28,23	12,68	36,91	12,63	45,45	12,73	50,87	12,84	54,78	12,93
	40	45	-	-	36,02	13,96	44,05	14,05	49,13	14,15	52,79	14,24
	45	50	-	-	-	-	42,66	15,52	47,37	15,62	50,76	15,71

6.4 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
µchiller2	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)
MCE 009M	74,4	68,0	67,4	63,4	56,1	51,1	47,4	69	67	41	39
MCE 009	74,4	68,0	67,4	63,4	56,1	51,1	47,4	69	67	41	39
MCE 011	74,4	68,0	67,4	63,4	56,1	51,1	47,4	69	67	41	39
MCE 013	74,6	68,3	67,7	63,6	56,4	51,4	47,6	69	67	41	39
MCE 015	75,3	69,0	68,4	64,3	57,1	52,1	48,3	69	67	41	39
MCE 018	76,8	70,5	69,9	65,8	58,6	53,6	49,8	71	69	43	41
MCE 019	76,6	70,3	69,7	65,6	58,4	53,4	49,6	71	69	43	41
MCE 023	76,6	70,3	69,7	65,6	58,4	53,4	49,6	71	69	43	41
MCE 026	78,5	72,1	71,5	67,5	60,2	55,2	51,5	73	71	45	43
MCE 031	82,4	76,1	75,5	71,4	64,2	59,2	55,4	77	75	49	47
MCE 034	82,5	76,2	75,6	71,5	64,3	59,3	55,6	77	75	49	47
MCE 039	83,3	76,9	76,3	72,3	65,1	60,1	56,3	77	75	49	47

8 OPERATING LIMITS

The graphs below illustrate the operating limits of MCE (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

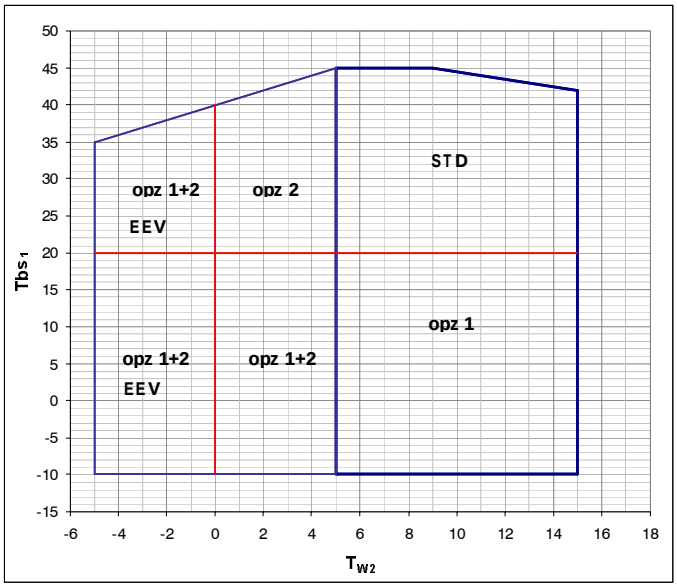
1 For transitory periods (e.g. equipment start up) values up to 25 °C are allowed
2 Value that may be reached only for outdoor air temperatures exceeding 0°C.
3 With condensation control: outdoor air T min - 15°C

Warning!

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

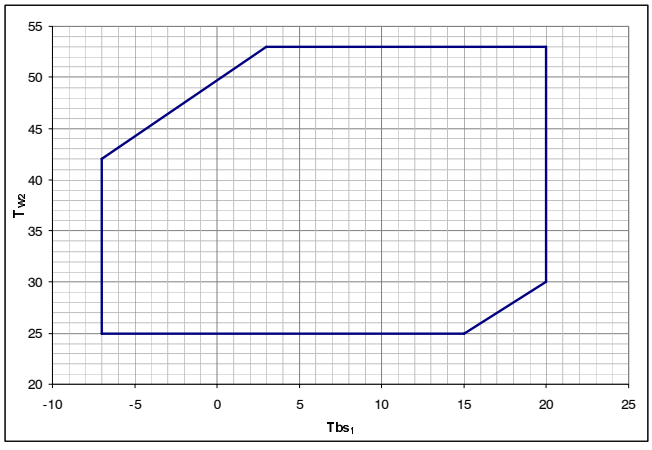
8.1 OPERATING LIMITS IN CHILLER MODE

TBS1 Outdoor temperature (dry bulb)
Tw2 Water outlet temperature
OPZ 1 Operation enabled with condensation control
OPZ 2 Operation enabled with glycol + low temperature option
OPZ 1+2 Operation enabled with condensation control + glycol + low temperature option
EEV Operation enabled with electronic valve
STD Standard operating mode



8.2 OPERATING LIMITS IN HEAT PUMP MODE

Tbs1 Outdoor temperature (dry bulb)
Tw2 Water outlet temperature



8.3 THERMAL CARRIER FLUID

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

9 CALCULATION FACTORS

9.1 CHANGE IN OPERATING PARAMETERS WITH ΔT 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

LEGEND

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

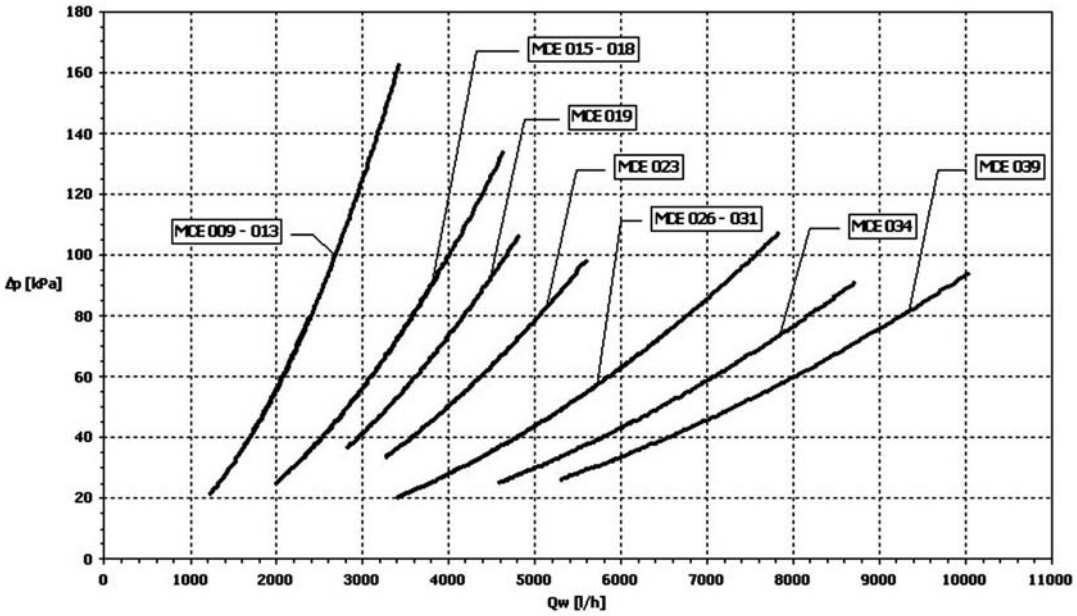
Based on the minimum outlet water temperature, you can derive the percentage of glycol and the corrective coefficient using the table below.

Percentage of 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

10 PRESSURE DROPS

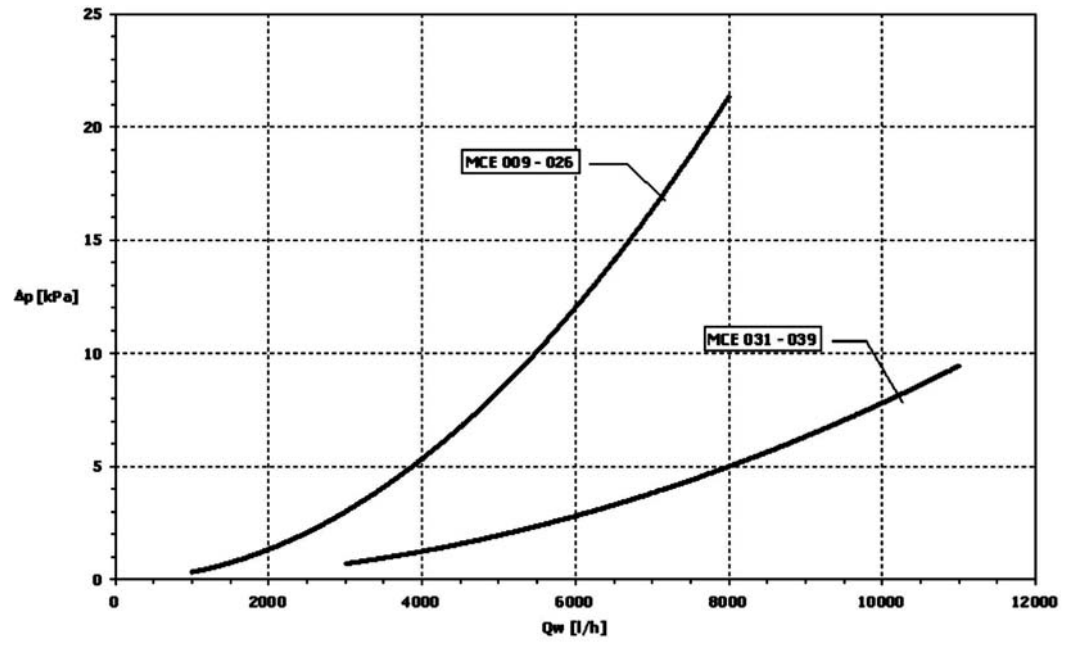
The diagram shows the evaporator pressure drops (Δ**pw**) as a function of the water flow rate (**Qw**), assuming an average water temperature of 10°C.

10.1 PRESSURE DROPS ON THE WATER SIDE



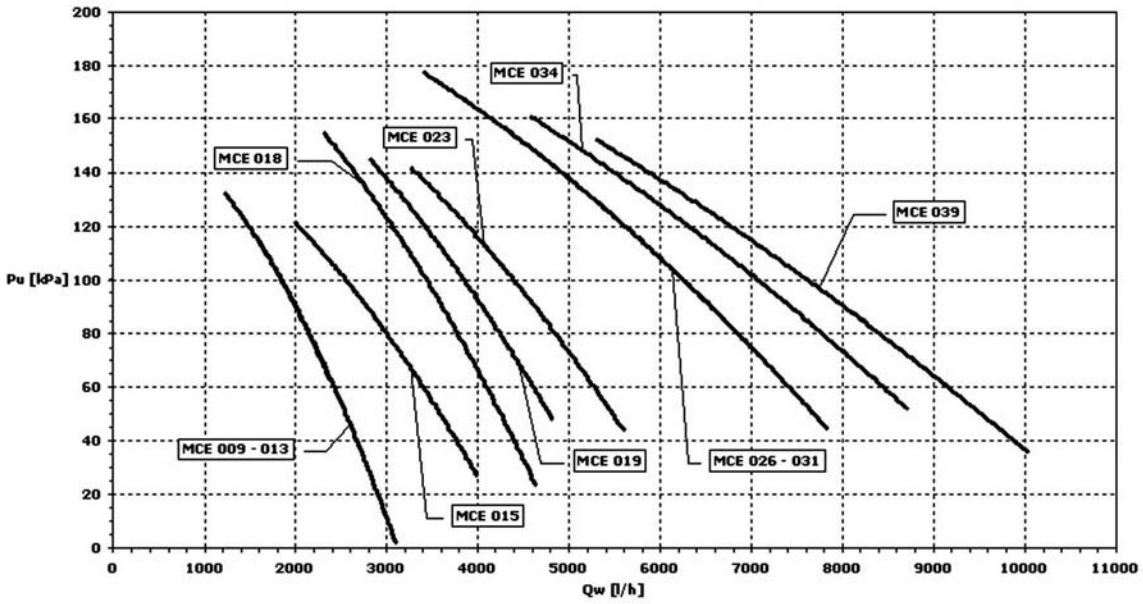
10.2 PRESSURE DROPS OF Y FILTER

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



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.



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.

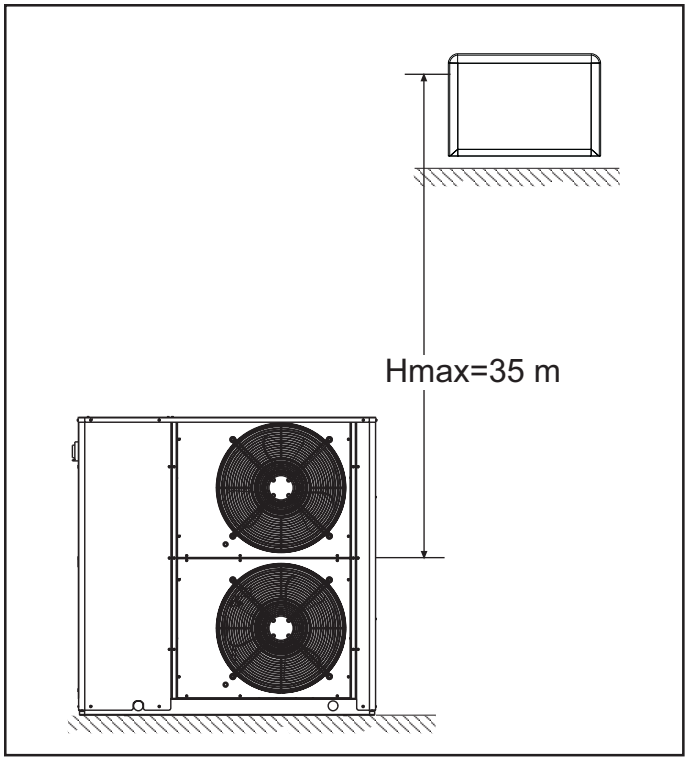
The dimensions and position of plumbing connections are shown in the dimension tables at the end of the manual.

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 MCE 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.

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.



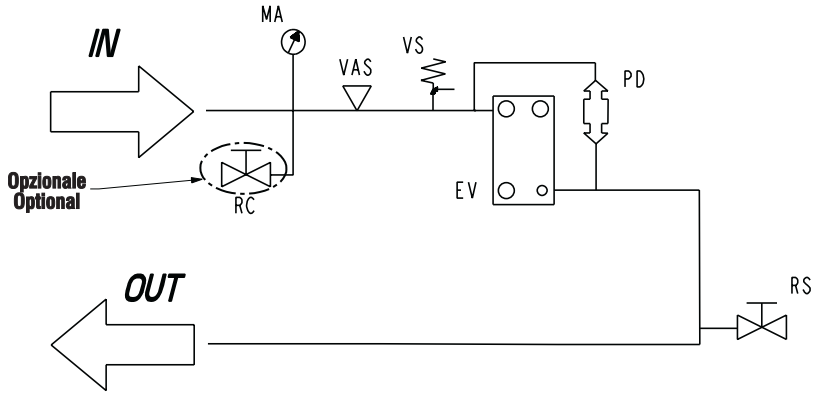
Models	H (m)	p_i (bar)	C_{max} (l)
MCE009-026	<13	1,5	145
	15	1,7	133
	20	2,2	105
	25	2,7	77
	30	3,1	49
MCE031-039	<13	1,5	231
	15	1,7	213
	20	2,2	168
	25	2,7	124
	30	3,1	79

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

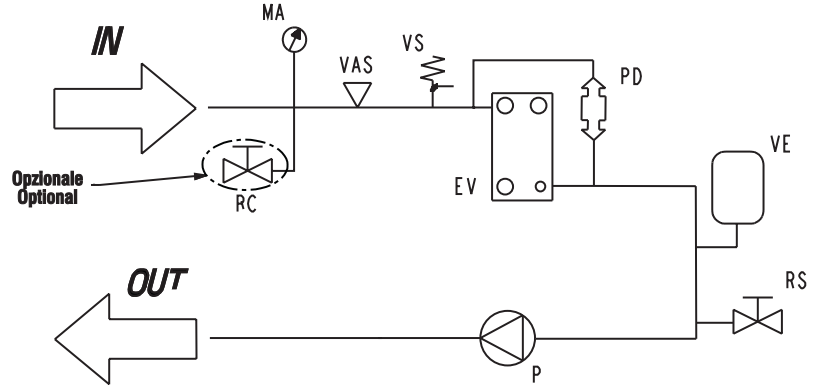
12 WATER CIRCUIT

PLUMBING DIAGRAMS

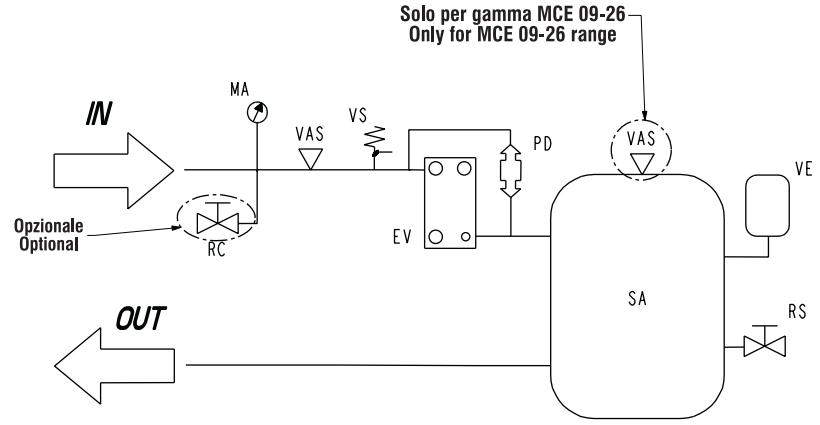
MCE (EVAPORATOR)



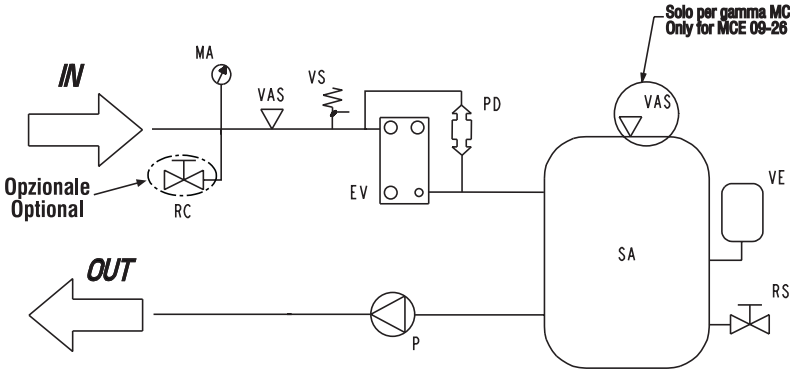
MCE (EVAPORATOR AND PUMP)



MCE (EVAPORATOR AND TANK)



MCE (EVAPORATOR, PUMP AND TANK)



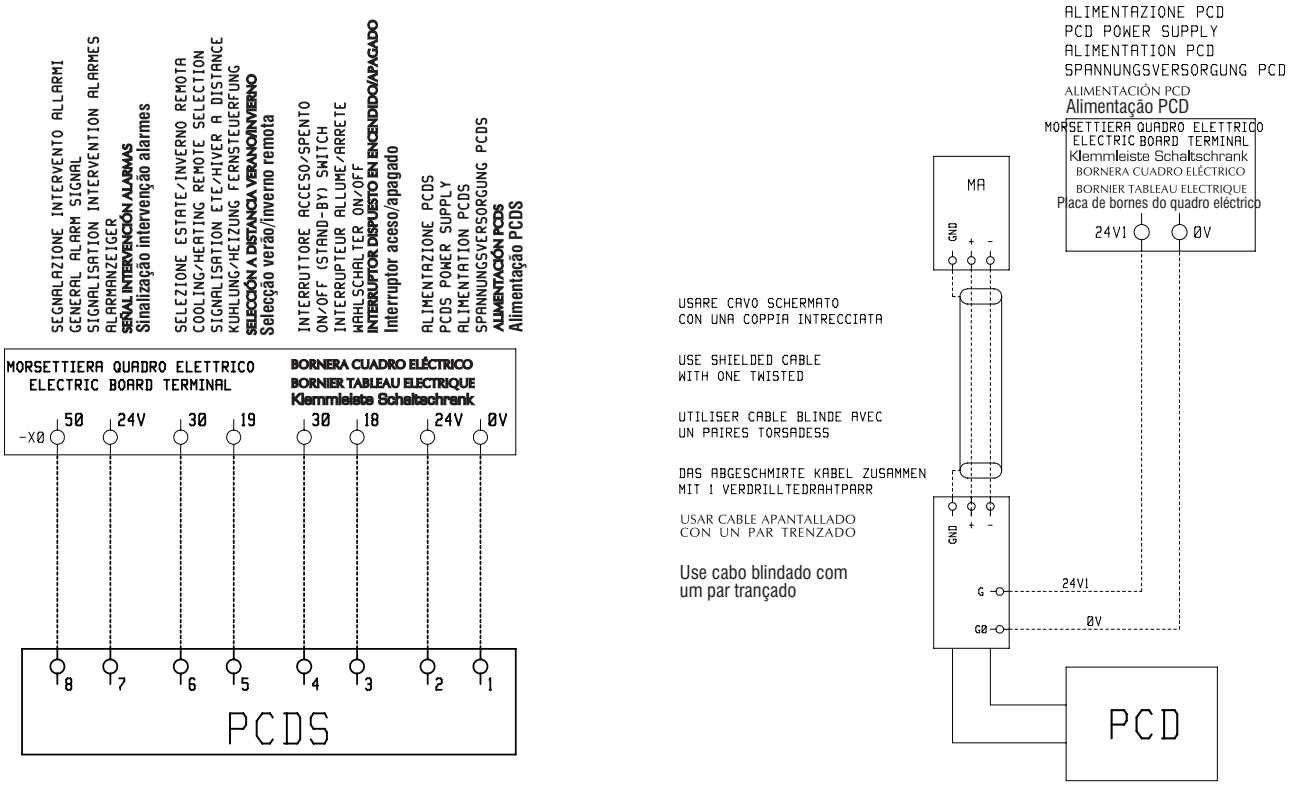
LEGEND OF PLUMBING DIAGRAMS	
VS	Safety valve
EV	Evaporator
PD	Differential pressure switch
MA	Water pressure gauge
VAS	Air vent valve
VE	Expansion tank
P	Pump
RS	Drainage valve
RC	Water filling cock
FM	Mechanical filter

13 ELECTRICAL DATA AND CONNECTIONS

MCE		009M	009	011	013	015	018	019	023	026	031	034	039
Maximum power input	kW	5,1	7,2	8,6	8,9	10,5	12,5	13,6	15,7	17,4	19,1	22,1	22,7
Maximum current absorption	A	26,3	14,4	16,9	17,4	20,0	24,3	26,2	29,7	32,6	34,6	39,6	40,6
Starting absorbed current	A	99	50	65	65	68	75	104	104	132	166	161	163
Fan motor rated power	kW	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,135	0,900	0,900	0,900
Fan motor rated current	A	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	1,62	1,62	1,624
Pump motor rated power	kW	0,37	0,37	0,37	0,37	0,37	0,37	0,37	0,37	0,37	0,55	0,55	0,55
Pump motor rated current	A	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	3,00	3,00	3,00
Power supply	V/f/Hz	230-1-50	400-3N-50										
Auxiliary power supply	V/f/Hz	230-1-50											
Power cables	mm^2	6	4	4	4	4	6	6	10	10	10	10	10
PCD connecting cables	mm^2	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22	AWG22
PCDS connecting cables	mm^2	1	1	1	1	1	1	1	1	1	1	1	1
Safety fuse F	A	32	16	20	20	20	25	25	32	32	32	40	40
Circuit breaker IL	A	32	20	25	25	25	25	25	32	40	40	50	50

- 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).
  Cross-section area of cables: 4 A/mm^2 approx.

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

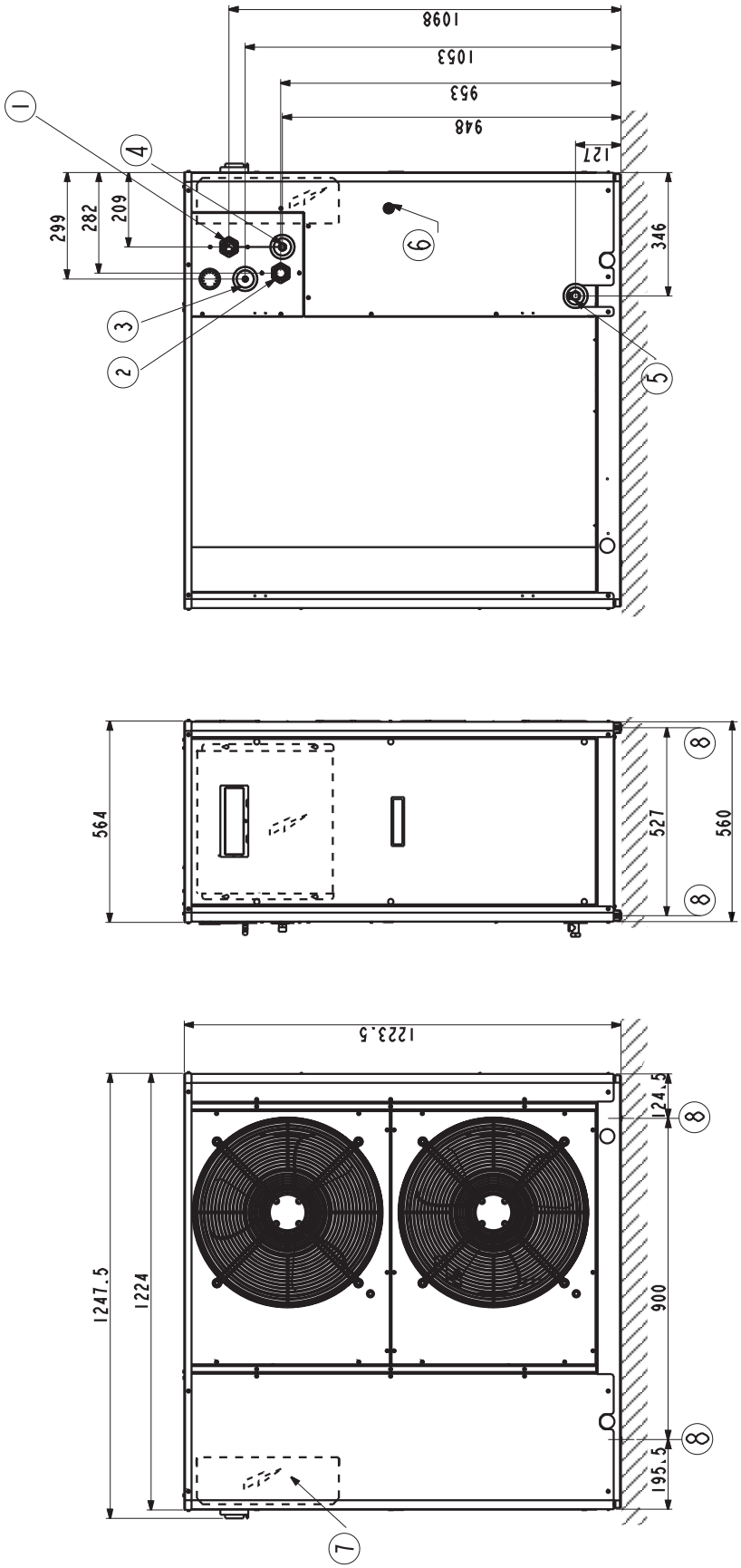


Note: Should the unit go into an alarm status, a voltage of 24V will be present on the terminals of the electric control panel; where an interface with a voltage-free contact is desired, a relay must be fitted by the installer.

14 OVERALL DIMENSIONS McE 09 ÷ 15

Legend:

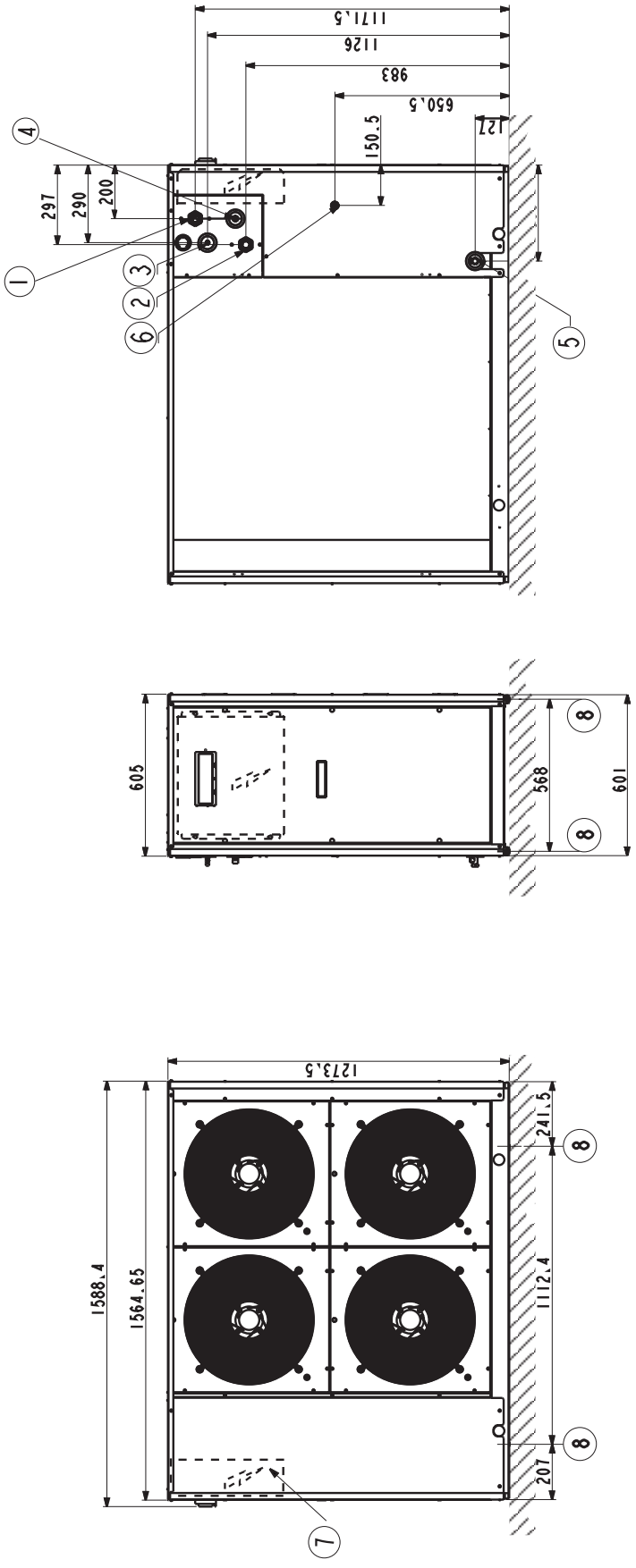
1 Water inlet 1" ¼ female
2 Water outlet 1" ¼ female
3 Safety valve discharge outlet provided with rubber ring holder
4 Water supply ½" male (optional tap)
5 Water drainage ½" female
6 Power supply Ø 28 mm
7 Electric control board
8 Fastening points for vibration dampers (accessory)



14 OVERALL DIMENSIONS MCE 18 ÷ 26

Legend:

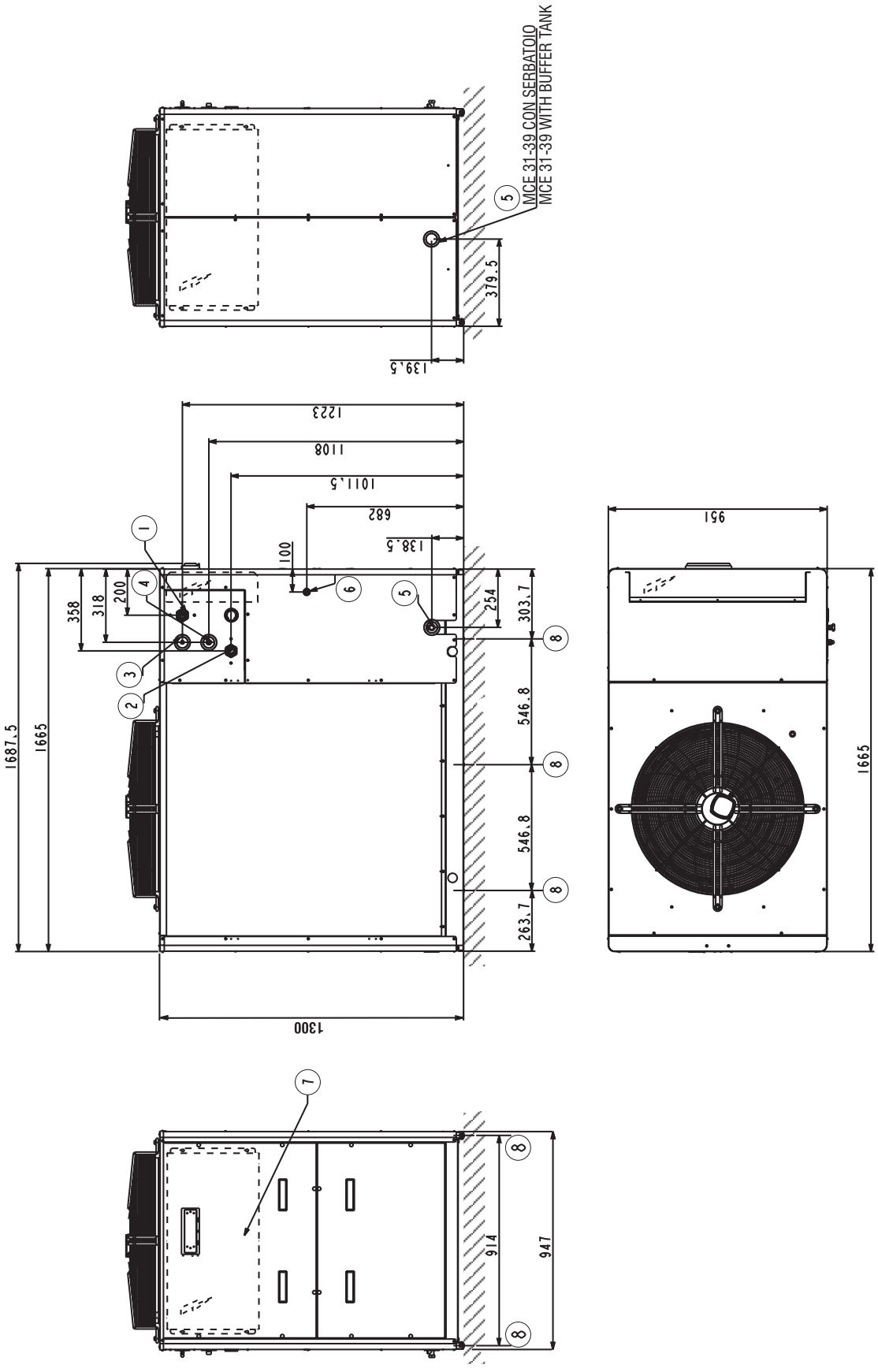
1 Water inlet 1" ¼ female
2 Water outlet 1" ¼ female
3 Safety valve discharge outlet provided with rubber ring holder
4 Water supply ½" male (optional tap)
5 Water drainage ½" female
6 Power supply Ø 28 mm
7 Electric control board
8 Fastening points for vibration dampers (accessory)



14 OVERALL DIMENSIONS MCE 31 ÷ 39

Legend:

1 Water inlet 1" ¼ female
2 Water outlet 1" ¼ female
3 Safety valve discharge outlet provided with rubber ring holder
4 Water supply ½" male (optional tap)
5 Water drainage ½" female
6 Power supply Ø 37 mm
7 Electric control board
8 Fastening points for vibration dampers (accessory)



15 INSTALLATION CLEARANCE REQUIREMENTS

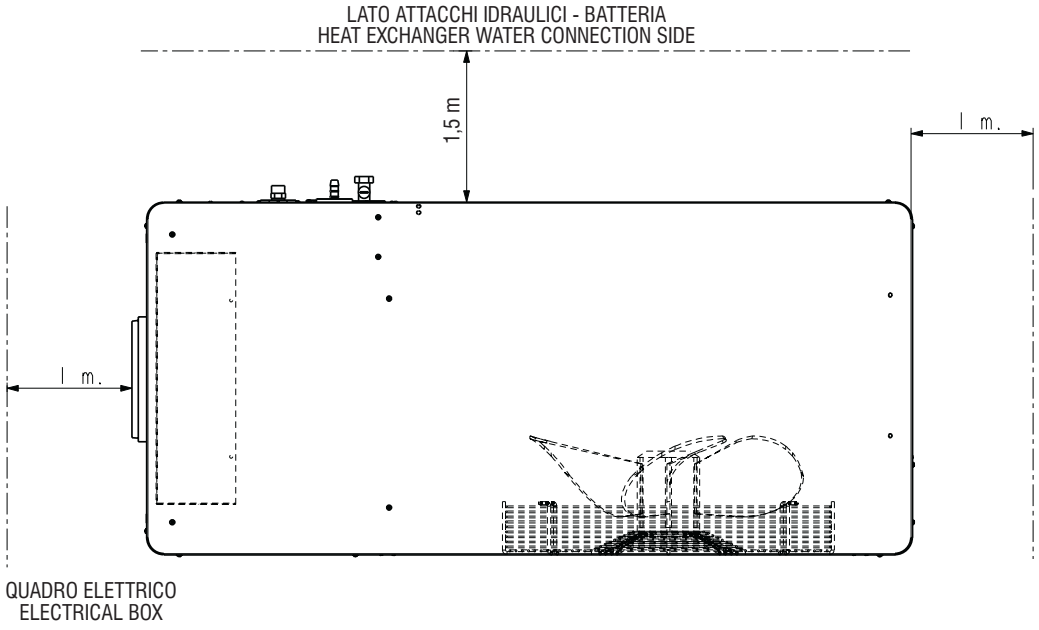
To guarantee the proper functioning of the unit and access for maintenance purposes, it is necessary to comply with the minimum installation clearance requirements shown in figures 1, 2 and 3.
There must be no obstacles blocking the path of the air flow from the fans.
Avoid any and all situations of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

In the design of the MCE 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.

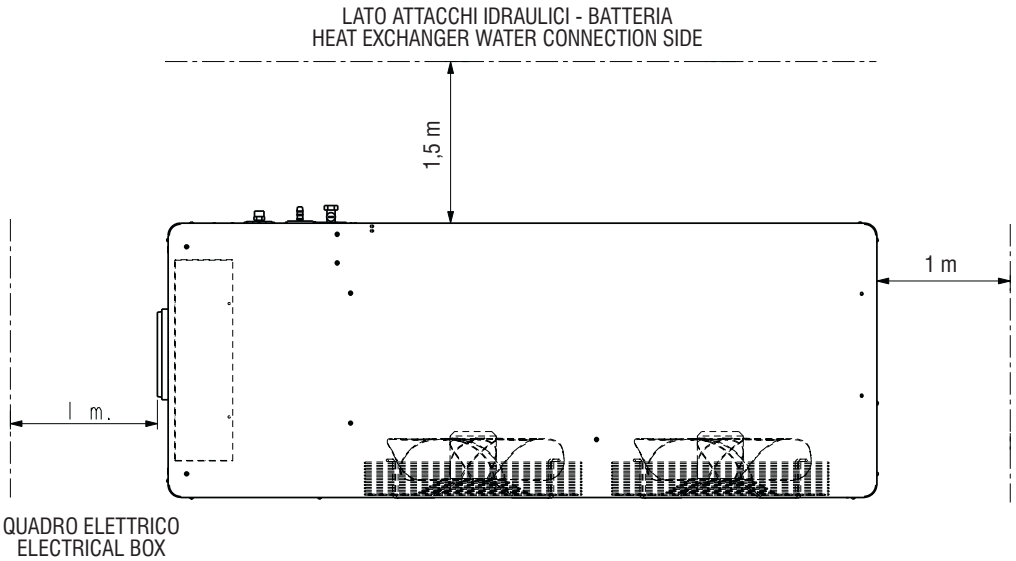
1

MCE 09 ÷ 15



2

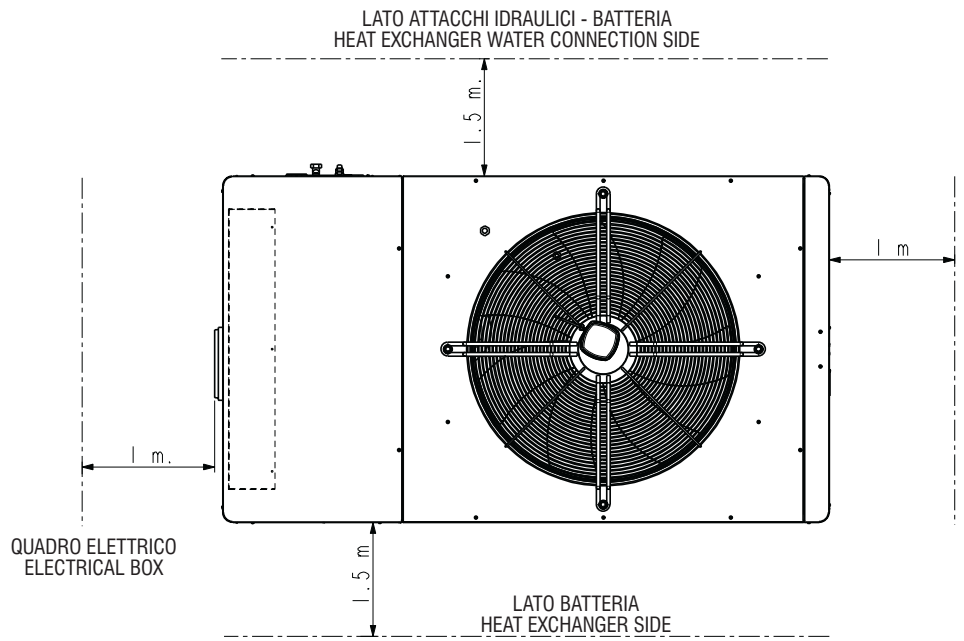
MCE 18 ÷ 26



15 INSTALLATION CLEARANCE REQUIREMENTS

3

MCE 31 ÷ 39

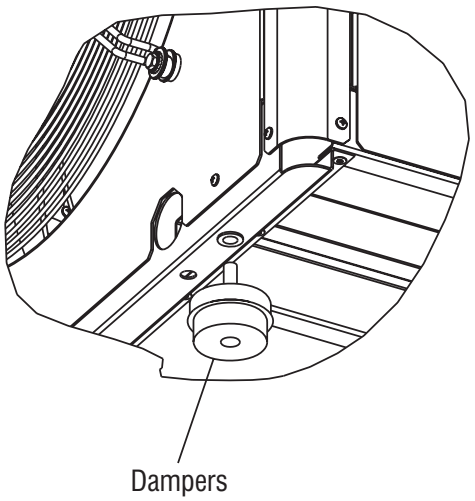


16 SITING

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”).

16.1 POSITIONING OF VIBRATION DAMPERS (ACCESSORY)



MCE	CODE	NO. OF VIBRATION DAMPERS
09 - 15	RYPAMCA10	4
18 - 26	RYPAMCA10	4
31 - 39	RYPAMCA50	6

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