

## FLOOR: RADIANT COOLING AND HEATING

- > R410A
- > COMPRESSOR
- > ELECTRONIC EXPANSION VALVE AS STANDARD
- > CONDENSATION CONTROL ON PRESSURE
- > AUTO ADAPTIVE SET POINT
- > OPERATION WITH LOW WATER CONTENT (BUFFER TANK NOT NEEDED)
- > EXTREMELY LOW SOUND LEVEL
- > HYDRAULIC PLUG&PLAY
- > SMART DEFROST SYSTEM
- > LAN AND ERGO INTERCONNECTIVITY

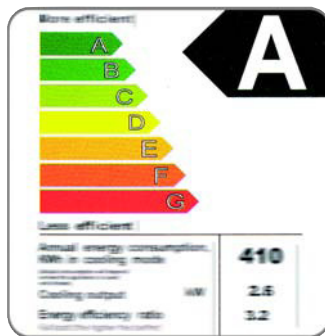


MFE range is a specific product for the production of cold and hot water for radiant panels plants. It is made of 7 different models, available in cooling and heating versions.

The range is characterised by high efficiency level both in cooling mode and in heating mode:

**Average EER 3,83 (Eurovent Energy Efficiency Class A)**

**Average COP 4,02**



The oversized finned pack heat exchanger and the oversized electronic expansion valve give higher energy efficiency level also with high evaporating temperature;

Plate heat exchanger with counter current operation in the heating mode. The production of hot water for radiant systems with low temperature allows you to reach high energy efficiency values.

The electronic expansion valve and the condensing control, allow to the unit to work in heating mode, with external air temperature up to  $-10^{\circ}\text{C}$  and in cooling mode up to  $+45^{\circ}\text{C}$ . In this way you can extend the operation range of the unit.



It is possible to produce chilled water up to  $20^{\circ}\text{C}$  for radiant floor for sensible cooling thanks to the electronic expansion valve.

It is also possible to change the set point reducing, it for the dehumidification operation.

The electronic control panel automatically adjusts the unit set point as a function of the outdoor temperature to reduce power consumption and enlarge the range of working temperature .

The operation in systems with low water content now is possible even without the buffer tank thanks to the microprocessor control logic that reduce the compressor start up numbers and increase its working time.

## CONSTRUCTIVE FEATURES

### STRUCTURES

Structure and base built from galvanised sheet steel coated with corrosion-proof paint, RAL 9002 colour.

All bolts and screws and fastening devices are made of non-oxidisable 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 inspection.

The compressor compartment can be acoustically insulated on request in order to reduce the sound emission of the unit.

### BUILT-IN HYDRONIC KIT

- High performance pump completely (body and rotor) made of stainless steel suitable ready to operate with glycol mix up to 35%. The pump motor is complete with internal thermal protection. The pump is located in the compressor compartment and is easily reachable thanks to the openable panels.
- The water pump is cooled by fresh air through a suitable grille.
- Expansion vessel.
- Safety valve.
- Filling valve.
- Automatic air purge.
- Differential pressure switch and antifreeze thermostat with probe on leaving water side.
- Buffer tank downstream to the evaporator, best solution to reduce the chilled water variation due to the compressor ON/OFF operation.
- The Mechanical Y Filter is standard for all the versions to protect the plate evaporator.

### REFRIGERANT CIRCUIT

- Scroll compressor (rotary up to 7 kW).
- Heat exchanger with stainless steel braze-welded plates optimised for type of plate and distribution for R410A.
- Finned block condenser coil with 8 mm copper piping and aluminium fins, characterized by large dimensions.
- Mechanical drier filter.
- Refrigerant sight glass with humidity indicator.
- Thermostatic valve with external equalization and integrated MOP function.
- 4-way reversing valve (heat pump only).
- Check valves (heat pump only).
- Liquid receiver (heat pump only).
- High and low pressure switches.
- Safety valve.
- Schrader valves for checks and/or maintenance.
- Refrigerant manometers (options).

### FAN MOTOR ASSEMBLY

Fan of axial type with airfoil shapes blades provided with protection grille and housed in a nozzle with special shape that increase its performance. Fans are housed in nozzles with special shape to increase performance. Fans are directly coupled with low speed (6/8 poles) motors, protected with a thermal cutout.

Fan motor assembly is connected to the unit through rubber vibration dampers and its supported by a dedicated frame.

The use of finned pack coils with 8mm diameter copper pipe reduce the pressure drop on air side decreasing the sound level.

The condensation control (on pressure base) adjust automatically the fan speed, reducing the noise emission of the unit in the night operation and when the unit runs at partial loads.

### FINNED PACK

Finned pack heat exchangers with 8mm diameter copper tube, characterised by a large surface and specially designed to speed up the defrost cycle and to maximize the integrate capacity of the unit.

### ELECTRIC BOX

The electric box is built and wired according to the EEC 73/23 (LVD), to the 89/336 (EMCD) and related standards. Built with steel panels is protected by the unit's panels.

### MICROPROCESSOR CONTROL

The control panel enables the complete control of MFE unit and can be easily accessed through a polycarbonate flap with IP 65 protection class.

The controller autoadaptive function allowed the unit operation with low water content avoiding the use of the buffer tank.

The outdoor temperature measure allows to adjust automatically the unit set point to the real thermal load in cooling operation and to keep the unit operate even at the most critical condition in winter time.

The controller is complete with MODBUS for an immediate connected to ERGO network.

Main functions:

- Control of the entering water temperature.
- Defrosting management (MFE-H)
- fan speed control on pressure base (opzionale)
- Complete alarm management
- Automatic set point adjustment depending on the outdoor air temperature
- Can be connected to an RS485 serial line (optional) for supervision/teleassistance operation
- A remote terminal that reproduces the control functions is available as optional (not compatible with ERGO).

Controlled devices:

- Compressor
- Fans
- 4-way reversing valve (MFE-H)
- Water pump
- Antifreeze kit (optional)
- Alarm relay

Advanced controller available on request to carry out the following functions:

- LAN up to 4 units
- Smart Defrost System



### AVAILABLE OPTIONS

Compressor compartment insulation

Refrigerant gauges

Antifreeze kit

Partial heat recovery system 25% complete with on/off contact for circulation pump (not supplied)

Special treatment on finned coil (copper/copper, cataphoresys/ blygold)

Remote control panels

Dampers

Condensing coil protection grille

**How to place an order**

MFE water chillers and heat pumps can be configured in order to meet many possible installation requirements.

**Code**

Commercial name of the series	
MFE	Air condensed water chiller and reversible heat pumps
Model	
005	
006	
008	Give information on the cooling capacity of the standard model
013	
017	
020	
023	
Operation	
C	Cooling only
H	Heat pump
Power supply	
0	400V 3N 50 Hz
M	230V - 1 - 50Hz
2	400V 3N 50 Hz + magnetic breaker
4	230V - 1 - 50Hz + magnetic breaker

**Options and unit configuration**

13 digits which customise the unit complying with the customer's requirements

Digit	Name	Description
<b>1</b>	<b>Expansion valve</b>	
	A	Electronic
<b>2</b>	<b>Water pump</b>	
	1	Pump, ex. vessel, water charge valve
<b>3</b>	<b>Water tank</b>	
	0	Not present
	S	Present
<b>4</b>	<b>Heat recovery</b>	
	0	Not present
	D	Partial (25%) with auxiliary contact for pump (cooling only models)
<b>5</b>	<b>Condensation control</b>	
	C	Modulating with fan speed control
<b>6</b>	<b>Antifreeze kit</b>	
	0	Not present
	P	Present, unit with pump and vessel
	S	Present, unit with pump, vessel and tank
<b>7</b>	<b>Acoustic insulation</b>	
	0	Not present
	1	Sound proofing insulation for compressor housing
<b>8</b>	<b>Refrigerant circuit accessories</b>	
	0	Not present
	M	Refrigerant gauges
<b>9</b>	<b>Remote control panel</b>	
	0	Not present
	2	RS485 port (Modbus + Carel protocol)
	S	Simplified
	M	BASE microprocessor (modbus excluded)
	X	ADVANCED microprocessor
<b>10</b>	<b>Special coil</b>	
	0	Standard
	R	Copper / Copper
	C	Cataphoresis
	B	Blygold
<b>11</b>	<b>Protection grille</b>	
	0	Not present
	G	Present
<b>12</b>	<b>Compressor option</b>	
	0	Not present
	1	Power factor correction capacitor
	2	Soft starter
	3	Power factor correction capacitor + soft starter
<b>13</b>	<b>Control Panel</b>	
	1	Base microprocessor
	2	Advanced microprocessor

**N.B.** The choice of some options can prevent the choice of other options or oblige the selection of other digit. Please contact Galletti for verification

Air condensed water chiller for radiant floor MFE C - Rated technical data												
MFE C		005 M	006 M	008 M	011	011 M	013	013 M	016	017	020	023
Power supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	400-3-50	230-1-50	400-3-50	230-1-50	400-3-50	400-3-50	400-3-50	400-3-50
Cooling capacity	kW	5,24	6,62	8,62	11,15	11,10	12,46	12,48	16,00	17,10	19,78	23,16
Total power input	kW	1,52	1,84	2,49	3,23	3,39	3,54	3,55	4,58	4,72	5,90	6,95
EER		3,76	3,78	3,58	3,76	3,38	3,88	3,93	3,74	3,86	3,47	3,57
ESEER		3,39	3,36	3,16	3,61	3,19	3,38	3,40	3,49	3,59	3,35	3,40
Maximum current absorbed	A	9,79	11,62	15,30	13,00	24,86	14,40	26,28	16,88	17,38	21,26	25,26
Starting ampere	A	38	44	63	49	98	50	99	65	65	68	76
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
High/low 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
n° of axial fans		1	1	1	2	2	2	2	2	2	4	4
Air flow	m <sup>3</sup> /h	3.635	3.406	3.406	7.385	7.385	6.939	6.939	6.939	6.939	9.990	9.307
Water flow	l/h	901	1.139	1.483	1.918	1.909	2.150	2.150	2.752	2.941	3.402	3.984
Water connections	"	1	1	1	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 pump available head	kPa	61	58	49	48	48	84	84	79	62	102	94
Expansion vessel	dm <sup>3</sup>	1	1	1	5	5	5	5	5	5	5	5
Water tank	dm <sup>3</sup>	n.d.	n.d.	n.d.	30	30	30	30	30	30	50	50
Height	mm	760	760	760	1220	1220	1220	1220	1220	1220	1275	1275
Length	mm	990	990	990	1250	1250	1250	1250	1250	1250	1590	1590
Width	mm	450	450	450	560	560	560	560	560	560	600	600
Sound power level	dB(A)	66	66	67	69	69	69	69	69	69	71	71
Sound pressure level	dB(A)	38	38	39	41	41	41	41	41	41	43	43
Transport weight *	kg	98	100	107	200	200	202	202	209	209	260	260
Operation weight *	kg	92	94	101	220	220	228	228	235	235	306	306

Air/water reversible heat pumps for radiant floor - Rated technical data												
MFE H		005 M	006 M	008 M	011	011 M	013	013 M	016	017	020	023
Power supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	400-3-50	230-1-50	400-3-50	230-1-50	400-3-50	400-3-50	400-3-50	400-3-50
Cooling capacity	kW	5,10	6,40	8,30	10,94	10,88	12,23	12,23	15,49	16,64	19,14	22,57
Cooling operation total power input	kW	1,53	1,87	2,54	3,23	3,48	3,55	3,55	4,60	4,77	6,00	7,00
EER		3,76	3,78	3,58	3,76	3,38	3,88	3,93	3,74	3,86	3,47	3,57
ESEER		3,39	3,36	3,16	3,61	3,19	3,38	3,40	3,49	3,59	3,35	3,40
Heating capacity	kW	4,91	6,33	8,10	10,85	10,96	11,45	11,45	14,46	15,57	18,34	21,66
Heating operation total power input	kW	1,38	1,70	2,20	2,86	3,03	3,28	3,28	4,04	4,10	4,95	5,89
COP		4,00	4,06	3,93	4,00	3,64	3,93	3,93	4,02	4,17	3,95	4,06
Maximum current absorbed	A	9,79	11,62	15,30	13,00	24,86	14,40	26,28	16,88	17,38	21,26	25,26
Starting ampere	A	38	44	63	49	98	50	99	65	65	68	76
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
High/low 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
n° of axial fans		1	1	1	2	2	2	2	2	2	4	4
Air flow	m <sup>3</sup> /h	3.635	3.406	3.406	7.385	7.385	6.939	6.939	6.939	6.939	9.990	9.307
Cooling operation water flow	l/h	901	1.139	1.483	1.918	1.909	2.150	2.150	2.752	2.941	3.402	3.984
Heating operation water flow	l/h	845	1.088	1.393	1.865	1.885	1.969	1.969	2.487	2.679	3.154	3.726
Water connections	"	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
Cooling operation available head	kPa	61	58	49	48	48	84	84	79	62	102	94
Heating operation available head	kPa	61	57	51	44	44	93	93	57	36	137	111
Expansion vessel	dm <sup>3</sup>	1	1	1	5	5	5	5	5	5	5	5
Water tank	dm <sup>3</sup>	n.d.	n.d.	n.d.	30	30	30	30	30	30	50	50
Height	mm	760	760	760	1220	1220	1220	1220	1220	1220	1275	1275
Length	mm	990	990	990	1250	1250	1250	1250	1250	1250	1590	1590
Width	mm	450	450	450	560	560	560	560	560	560	600	600
Sound power level	dB(A)	66	66	67	69	69	69	69	69	69	71	71
Sound pressure level	dB(A)	38	38	39	41	41	41	41	41	41	43	43
Transport weight *	kg	103	105	112	210	210	212	212	219	219	275	275
Operation weight *	kg	97	99	106	230	230	238	238	245	245	321	321

\* Weights referred to the version with pump and tank  
 - Cooling capacity: external air temperature 35°C, water temperature 23°C / 18°C  
 - Heating capacity: external air temperature with dry bulb 7°C and 6,2°C with wet bulb, water temperature 30°C / 35°C  
 - Sound power detected according to ISO 3741 - ISO 3744 and EN 29614-1  
 - Sound pressure detected 10 m away and with a height of 1,5 m from the ground in a free space (fan side).