



## MAGIS M AND INTEGRATED SYSTEMS

with Heat pumps  
air-water block  
reversible with inverter  
single and three-phase





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## 1

## DESCRIPTION OF THE MAGIS M RANGE



Range of hydronic heat pumps for outdoor use, reversible air-water block with inverter technology, which is available in MAGIS M4, MAGIS M6, MAGIS M8, MAGIS M12, MAGIS M14 and MAGIS M16 models in the single-phase versions, to fulfil the heating and cooling requirements in new homes, offices, shops, etc.; whereas, in the three-phase versions, it is available in the MAGIS M12, MAGIS M14, MAGIS M16, MAGIS M18, MAGIS M22, MAGIS M26 and MAGIS M30 models, to fulfil the heating and cooling requirements in large volume domestic systems (large new homes, such as two-family homes, three-family homes, condominiums) both for offices, shops, craft businesses, etc. These Heat Pumps are distinguished by high energy efficiency values as well as guaranteeing greater comfort with minimal environmental impact and for their extremely low sound levels; they are all preloaded with the ecological low GWP R32 refrigerant gas and are hermetically sealed. The entire range is distinguished by the several technical advantages; primarily, for the simplicity of installation since it is a block unit, as well as for the system flexibility; they can be used as a single generator that serves the system (it is also possible to set up simple cascade installations of up to 6 devices), with machine electronics that, together with a Control Panel (standard) and without adding

additional electrical control units, allows thermal systems distributed over two zones with differentiated temperatures to be managed; as well as being the ideal solution to be combined within an integrated system (example: heat pump + boiler + thermal solar): these are system solutions in which the various generators can be perfectly integrated with each other, thereby allowing the maximum benefit to be achieved from the different energy production systems, based on their respective efficiency parameters. For the entire system to operate correctly, Immergas offers a Smart system manager capable of identifying the most economical energy source at a given time and therefore choose the right appliance to activate. All MAGIS M series models are equipped with a system side plate heat exchanger and high head low energy consumption circulation pump, which facilitate installation. The maximum flow temperature set point is 65 °C in heating, (60 °C for models over 16 kW); the latter temperatures facilitate integration on systems with radiators, as well as with fan coils and/or more so on radiant systems.

The entire range complies with the requirements of ErP Directive (2009/125/EC) and ELD (2010/30/EC). Various hydraulic, electric and electronic kits are available, which enable flexible use in all circumstances.

# MAGIS M

2

## MAGIS M4 - 6 - 8 - 12 - 14 - 16 FEATURES (SINGLE-PHASE)

4 kW, 6 kW, 8 kW, 12 kW, 14 kW and 16 kW single-phase inverter air-water block heat pumps for winter and summer air conditioning. The galvanised steel structure makes the machines particularly suitable for outdoor installation.

### Main components:

- Control Panel - standard supply, which must always be connected - which allows you to program the machine and is also a room temperature On-Off sensor; it also displays the error codes in the event of malfunctions;
- R32 refrigerant gas (pre-loaded in the machine);
- Twin Rotary compressor with inverter drive to offer low energy consumption and vibration-free operation in all operating conditions and acoustically insulated with sound-absorbing materials with guard oil electrical resistance;
- system to detect the min and max pressure for correct compressor operation;
- refrigerant air-gas heat exchanger with hydrophilic treatment on the external coil fins to improve condensate water draining and flowing;
- metal protection grid of the finned coil;
- two-way electronic throttle valve;
- insulated stainless steel plate refrigerant/water gas heat exchanger and anti-freeze resistance to prevent ice from forming in the heat exchanger;
- 4-way inversion valve (reversible functioning with heat pump cycle or cooling cycle);
- axial fan with brushless DC motor at variable speed with a 3-blade impeller characterised by an innovative profile designed to guarantee better distribution of air and significantly contained sound levels;
- system pump with low energy consumption brushless DC motor and flow switch to ensure there is sufficient water circulation to guarantee correct operation of the hydronic and cooling circuits;
- 8 litre internal expansion vessel;
- 3 bar system safety valve;
- the 1-1/4" Y-shaped metal mesh filter for water is included and supplied as standard (only for 4-6 kW models the connections are 1") and the condensate drain fitting;
- 1-1/4" M flow and return hydraulic connections (only for 4-6 kW models the connections are 1" M) found at the rear;
- electronic management system equipped with various sensors situated in key positions of the cooling circuit to electronically detect the system's operating status. The system's flow and return water temperature is detected by means of a probes;
- probe to control the DHW temperature together with a storage tank unit or alternatively to manage the system mixed zone flow, or to control the thermostated puffer/inertial storage tank temperature;
- maximum system water flow temperature up to 65 °C;
- operation up to an outdoor temperature of -25 °C in winter and +43 °C in summer.

### Additional "Stand Alone" functions:

- MAGIS M electronics are set up to manage 2 zones directly and respective pumps; a direct one that can work in both hot and cold, and a mixed one that can work only in hot and relative climatic curves (standard external probe);
- set up to manage the DHW production by activating diverter valves;
- set up to manage the activation of any integrative electrical resistances for both the system and the DHW;
- the electronics of MAGIS M are also preset to manage a thermal solar system;
- it includes a 230 V output to control summer/winter diverter valves in heating systems with fan coil cold/radiant panels; switching occurs with the change of mode (Summer/Winter) from the Control panel;
- MAGIS M electronics are set up to manage the anti-legionella function and a recirculation pump;
- it includes an input for forcing activation with a photovoltaic system and a contact for Smart Grid function/signal;
- sound emission attenuation function with SILENT MODE (can be set on 2 levels with time programming);
- antifreeze function up to -25 °C (with power supply), as a result of periodic activation of the pump and MAGIS M cooling circuit;
- possible connection to the System manager (optional) to manage systems with more than 2 zones;
- IP24 electrical insulation rating.

### System solutions with MAGIS M:

- "Stand alone" system with the addition of an integrative resistance for DHW and an integrative resistance for system heating;
- can be coupled with a separate DHW storage tank and possibly with the integration of a solar thermal system;
- can be coupled to a boiler via the System manager;
- can be coupled to a boiler and the solar heating system via the System manager;
- can be installed in a simple cascade (up to 6) without combining with the System manager;
- can be installed in a set configuration (up to 4) combined with the System manager.

### It is available in the model:

• MAGIS M4	cod. 3.032372
• MAGIS M6	cod. 3.032373
• MAGIS M8	cod. 3.032374
• MAGIS M12	cod. 3.032375
• MAGIS M14	cod. 3.032376
• MAGIS M16	cod. 3.032377

EC Declaration Of Conformity.

## 3 MAGIS M12 - 14 - 16 - 18 - 22 - 26 - 30 FEATURES (THREE-PHASE)

12 kW, 14 kW, 16 kW, 18 kW, 22 kW, 26 kW and 30 kW three-phase inverter air-water block heat pumps for winter and summer air conditioning. The galvanised steel structure makes the machines particularly suitable for outdoor installation.

### Main components:

- Control Panel - standard supply, which must always be connected - which allows you to program the machine and is also a room temperature On-Off sensor; it also displays the error codes in the event of malfunctions;
- R32 refrigerant gas (pre-loaded in the machine);
- Twin Rotary compressor with inverter drive to offer low energy consumption and vibration-free operation in all operating conditions and acoustically insulated with sound-absorbing materials with guard oil electrical resistance;
- system to detect the min and max pressure for correct compressor operation;
- refrigerant gas/air heat exchanger with hydrophilic treatment on the external coil fins to improve water draining and flowing;
- metal protection grid of the finned coil;
- two-way electronic throttle valve;
- insulated stainless steel plate refrigerant/water gas heat exchanger and anti-freeze resistance to prevent ice from forming in the heat exchanger;
- 4-way inversion valve (reversible functioning with heat pump cycle or cooling cycle);
- axial fan with brushless DC motor at variable speed with a 3-blade impeller characterised by an innovative profile designed to guarantee better distribution of air and significantly contained sound levels;
- system pump with low energy consumption brushless DC motor and flow switch to ensure there is sufficient water circulation to guarantee correct operation of the hydronic and cooling circuits;
- 8 litre internal expansion vessel;
- 3 bar system safety valve;
- the 1-1/4" Y-shaped metal mesh filter for water is included and supplied as standard (only for models from 18 to 30 kW there is also an adapter to align the system flow and return pipes) and two condensate drain connections;
- flow and return 1-1/4" M hydraulic connections found at the back;
- electronic management system equipped with various sensors situated in key positions of the cooling circuit to electronically detect the system's operating status. The system's flow and return water temperature is detected by means of a probes;
- probe to control the DHW temperature together with a storage tank unit or alternatively to manage the system mixed zone flow, or to control the thermostated puffer/inertial storage tank temperature;
- maximum system water flow temperature up to 65 °C (up to 16 kW and 60 °C (over 16 kW);
- operation up to an outdoor temperature of -25 °C in winter and +43 °C (up to 16 kW) and + 46 °C (over 16 kW) in summer.

### Additional "Stand Alone" functions:

- MAGIS M electronics are set up to manage 2 zones directly and respective pumps; a direct one that can work in both hot and cold, and a mixed one that can work only in hot and relative climatic curves (standard external probe);
- set up to manage the DHW production by activating diverter valves;
- set up to manage the activation of any integrative electrical resistances for both the system and the DHW;
- the electronics of MAGIS M are also preset to manage a thermal solar system;
- it includes a 230 V output to control summer/winter diverter valves in heating systems with fan coil cold/radiant panels; switching occurs with the change of mode (Summer/Winter) from the Control panel;
- MAGIS M electronics are set up to manage the anti-legionella function and a recirculation pump;
- it includes an input for forcing activation with a photovoltaic system and a contact for Smart Grid function/signal;
- sound emission attenuation function with SILENT MODE (can be set on 2 levels with time programming);
- antifreeze function up to -25 °C (with power supply), as a result of periodic activation of the pump and MAGIS M cooling circuit;
- possible connection to the System manager (optional) to manage systems with more than 2 zones;
- IP24 electrical insulation rating.

### System solutions with MAGIS M:

- "Stand alone" system with the addition of an integrative resistance for DHW and an integrative resistance for system heating;
- can be coupled with a separate DHW storage tank and possibly with the integration of a solar thermal system;
- can be coupled to a boiler via the System manager;
- can be coupled to a boiler and the solar heating system via the System manager;
- can be installed in a simple cascade (up to 6) without combining with the System manager;
- can be installed in a set configuration (up to 4) combined with the System manager.

### It is available in the model:

• MAGIS M12T	cod. 3.032378
• MAGIS M14T	cod. 3.032379
• MAGIS M16T	cod. 3.032380
• MAGIS M18T	cod. 3.032381
• MAGIS M22T	cod. 3.032382
• MAGIS M26T	cod. 3.032383
• MAGIS M30T	cod. 3.032384

EC Declaration Of Conformity.

# MAGIS M and Integrated Systems



## 4

### INTEGRATED SYSTEM FOR AIR CONDITIONING AND D.H.W. PRODUCTION

Comprised of a boiler – solar heating – heat pump and possibly photovoltaic – etc, they are the natural evolution of air-conditioning systems: with very high seasonal efficiency, low energy consumption and reduced polluting emissions.

They are engineering solutions that can be perfectly integrated with each other, which allow to attain maximum benefit from the various energy production systems on the basis of the respective efficiency parameters.

For the entire system to operate correctly, Immergas offers a System Manager, able to:

- always make use of the most convenient heat source;
- keep the system performance high in every circumstance;
- control and command the entire system with a unique "brain" (i.e. the System Manager);
- promote heat pump activation with a system that generates electricity from renewable sources.

Basically, the System Manager is a supervisor that can control the entire system.

Amongst other things, the following main operations are necessary:

- to acquire the outdoor temperature (from the external probe, inserted as per standard on the heat pump);
- set the heating side and cooling side (if provided) climatic curve operation to determine the system's flow temperature;
- configure the fuel cost (e.g. methane);
- configure the electric energy cost;
- set the MAGIS M minimum integration (cut off) T.

The point of economic balance between the gas boiler and the heat pump changes based on the cost of electrical power and gas, in the specific installation zone.

With sufficient  $T_{\text{outdoor}}$  to fulfil minCOP economical convenience, or  $T_{\text{outdoor}}$  is higher than  $T_{\text{minimum integration (cut off)}}$ , the heat pump starts and the performance efficiency conditions are constantly monitored. On the contrary, if the environmental conditions are such that the MAGIS M coefficient of performance tends towards lower values than  $COP_{\text{min}}$  for economical convenience, or  $T_{\text{outdoor}}$  is less than  $T_{\text{minimum integration (cut off)}}$ , the system Manager starts the boiler (or integrative resistance).

## MAGIS M and Integrated Systems

Each time MAGIS M is operating, the Manager enables an additional control, which checks the time it takes the system to reach full operation: when a maximum time is exceeded (can be set differently between C.H. and D.H.W.) for the heat pump to reach the  $flowT$ , the boiler or integrative electrical resistance is started.

It is also possible to choose the integration operation method (boiler/resistance) between simultaneous or alternative Heat pump.

In all cases where radiant panels are also included for summer cooling, alongside dehumidifiers (see previous picture), the System Manager will also monitor the dew point through the installation of room probes (Immergas). Thanks to this smart function the System manager can increase the flow temperature to the radiant panels by about 1 °C (up to a  $maxT$  of 18 °C - maximum limit of the cooling heat pump), avoiding the phenomenon of condensation on the surface of the structure. This function can only be activated with an Immergas accessory kit that controls humidity. In some cases, for example, the System Manager can turn the heat pump off if the flow temperature to the radiant panels is not sufficiently corrected.

If on the other hand, there is a high temperature zone in the system, in addition to the low temperature one, it will be served exclusively by the boiler through an accordingly configured dedicated expansion connected to the System Manager.

DHW operation: amongst the possible configurations with integrated systems is the option to connect the boiler and MAGIS M parallel with the same coil, and use a storage tank probe with one DHW set for the entire storage tank, and set it in the System manager. If the System manager is connected to the boiler on external probe clamps (pre-set models), if the set DHW temperature is < 50 °C, the heat pump starts (always checking the aforesaid convenience); however, if it is > 50 °C, MAGIS M heats up to 50 °C, then the boiler starts; if there is no boiler but there is storage tank integrative electrical resistance, the water is brought to 50 °C via the heat pump and MAGIS M is then disabled, leaving the resistance to integrate to the pre-set value. In systems where there is a boiler or an integrative electrical resistance on the storage tank, in addition to the heat pump, it is also possible to enable the anti-legionella function.



# MAGIS M

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## MAGIS M CONTROL PANEL IN STAND ALONE APPLICATIONS



The Control panel (standard supply with MAGIS M) enables programming of several operating options and relative temperature control of the system. For example, the Control panel acquires data relating to the outdoor temperature (from the external probe on the machine), to the system flow temperature (relating to the preset climatic curve). The Control panel supplied as standard is connected to the specific terminal block on MAGIS M: it allows the machine to be set and also acts as a temperature sensor (NOT humidity); it displays the operating status and error codes in case of malfunctions. The room sensor function can be disabled in order to use it only to display the heat pump statuses and leave MAGIS M external control management on-off. The user interface consists of an LCD display and push-buttons.

**N.B.:** In applications with a System Manager, the Control panel (standard) must always be connected and acts as a Modbus interface (Gateway) to communicate with the System manager itself. In this case, some parameters must be set according to the instruction booklet.

5.1

## FEATURES

The Control panel - supplied as standard and which must always be connected - allows you to set the machine and is also a room temperature On-Off sensor; in Stand Alone mode, it allows the following to be controlled:

- Operation with variable flow temperature according to outdoor temperature in heating and cooling (through the standard external probe supplied);
- machine time band operation (in heating and cooling) in Comfort or Economy mode;
- any operation anomalies with error codes via system self-diagnosis displayed on the screen.

The Control panel also manages the following data:

- outdoor temperature (via the standard external probe);
- system flow temperature settings (in heating and cooling);
- DHW temperature setting to maintain a DHW storage tank temperature;

Remember that MAGIS M together with the Control panel can:

- manage 2 zones directly and respective pumps; a direct one that can work in both hot and cold, and a mixed one that can work only in hot and relative climatic curves (standard external probe);
- manage the temperature of a DHW storage tank directly;
- directly pilot one-two three-way diverter valves for heating a domestic water boiler;
- manage activation of an auxiliary heat source (electrical resistance);
- manage the anti-legionella function via weekly cycles (in the presence of a DHW integrative resistance);
- manage the operation of a solar system on the DHW storage tank and the management of a DHW recirculation pump;
- function that can be activated manually, which allows priority to be given to the DHW, bringing the DHW storage tank to the set point in the shortest possible time;

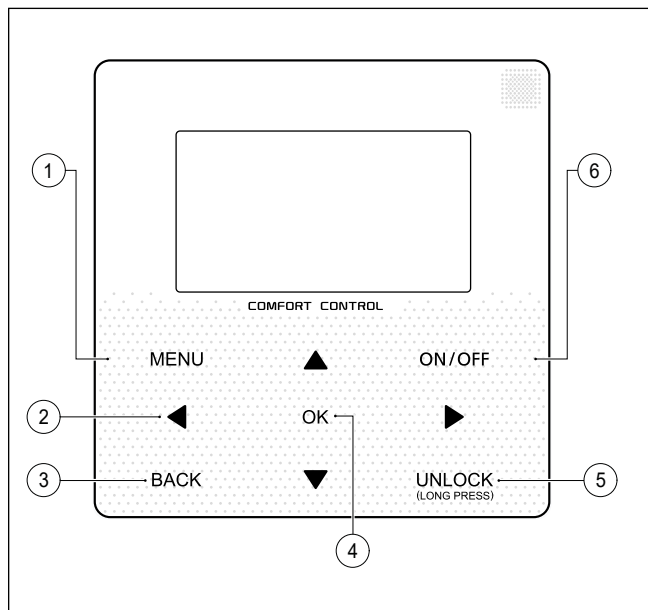
- ECO MODE with variation of the setpoint or climatic curve over time bands (only for heating);
- send an external alarm signal;
- use the SILENT MODE function to limit the frequency of the machine compressor (to reduce noise), on two levels that can be activated on an hourly setting;
- Modbus input (on the Control panel), for communication and remote control and/or for interfacing with Domotics systems;
- AUTO mode allows automatic adjustment of the operating mode, based on the detected outdoor temperature and the set operating thresholds;
- anti-freeze protection function guaranteed up to an outdoor air temperature of -25 °C, thanks to the heat pump itself running (in heating mode) and to the electric anti-freeze resistance (supplied as standard);
- possibility to manage up to 6 units in cascade (1 Master + 5 Slave) even with different powers, with a single controller connected to the "Master" (dedicated to DHW production). If a fault occurs with a "Slave" machine, the other machines can function regularly.

## TECHNICAL DATA

- Dimensions: 120 x 120 x 20 mm (H x L x D);
- Power Supply: 13.5 Vac (directly from the Heat pump terminal block);
- 5-pole cable connection (type H03VV-F 5 x 0.75 mm<sup>2</sup>), max length 50 m. Use wires having minimum sections of 0.5 mm<sup>2</sup> and maximum 1.5 mm<sup>2</sup>;
- Protection rating of the panel: IP20 (indoor only).

## 5.2

## PROGRAMMING MENU



Ref.	Keys	Function
1	MENU	<ul style="list-style-type: none"> <li>Go to main menu</li> </ul>
2	◀ ▶ ▼ ▲	<ul style="list-style-type: none"> <li>Move the cursor on the display</li> <li>Move inside the menu</li> <li>Adjust the settings</li> </ul>
3	BACK	<ul style="list-style-type: none"> <li>Go back to higher level</li> </ul>
4	OK	<ul style="list-style-type: none"> <li>Go to the next step when programming a schedule in the menu</li> <li>Confirm a selection to access a submenu</li> </ul>
5	UNLOCK	<ul style="list-style-type: none"> <li>Long press to unlock/lock the control panel</li> <li>Unlock/lock some functions such as "DHW temperature adjustment"</li> </ul>
6	ON/OFF	<ul style="list-style-type: none"> <li>Activate/deactivate the space heating/cooling operation or DHW mode</li> <li>Activate or deactivate the functions inside the menu</li> </ul>

### MAIN MENU

OPERATION MODE

PRESET TEMPERATURE

DOMESTIC HOT WATER(DHW)

SCHEDULE

OPTIONS

CHILD LOCK

SERVICE INFORMATION

OPERATION PARAMETER

FOR SERVICEMAN

WLAN SETTING

SN VIEW

By entering the main menu, you can access the main menus displayed above (some are password-protected), and in turn you can access other drop-down submenus.

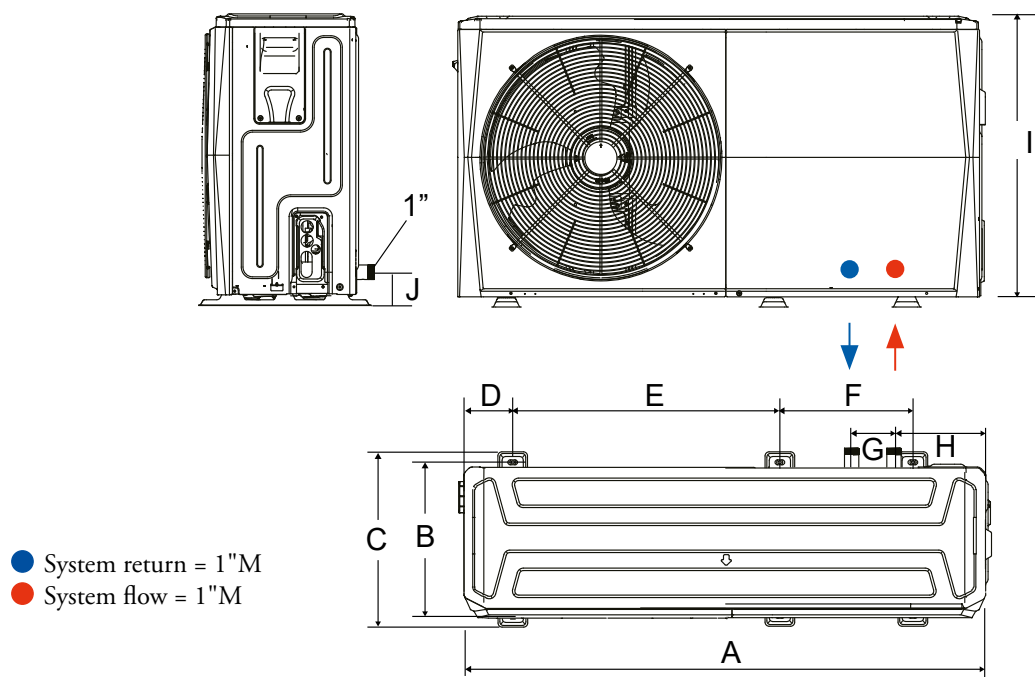
Refer to the Control panel instruction booklet for all potential settings.

# MAGIS M

6

## MAGIS M4 - 6 DIMENSIONS AND CONNECTIONS

### 4 - 6 kW Models

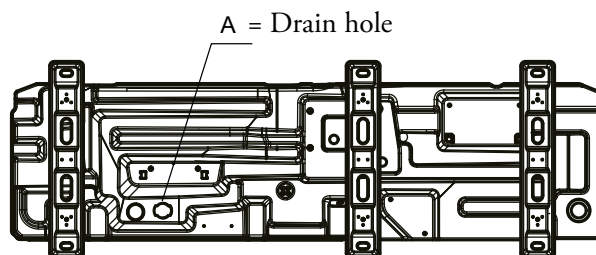


Model	A	B	C	D	E	F	G	H	I	J
4 kW	1295 mm	375 mm	429 mm	120 mm	640 mm	380 mm	105 mm	225 mm	712 mm	81 mm
6 kW	1295 mm	375 mm	429 mm	120 mm	640 mm	380 mm	105 mm	225 mm	712 mm	81 mm

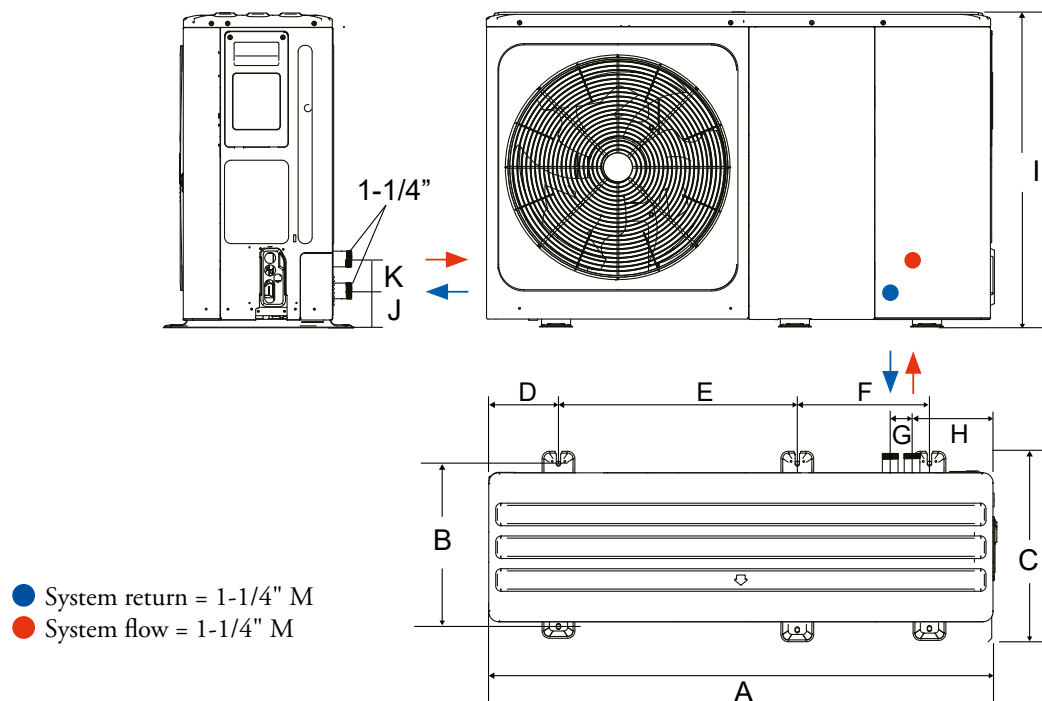
#### Condensate drain pipe and pre-cut holes in the base.

If draining is carried out through the drain pipe, connect the drain fitting supplied, and use the drain pipe (internal diameter: 32 mm) available on the market. In the event of installation in very cold zones or zones subject to heavy snow where the condensate drain pipe can freeze, check the draining capacity of the pipe.

**N.B.:** The above figure shows the variables to secure the machine; anti-vibration devices must be inserted between the MAGIS M4 - 6 and the support base; Immergas suggests a kit that consists of 3 anti-vibration feet (optional) cod. 3.032854.



## 8 - 16 kW Models

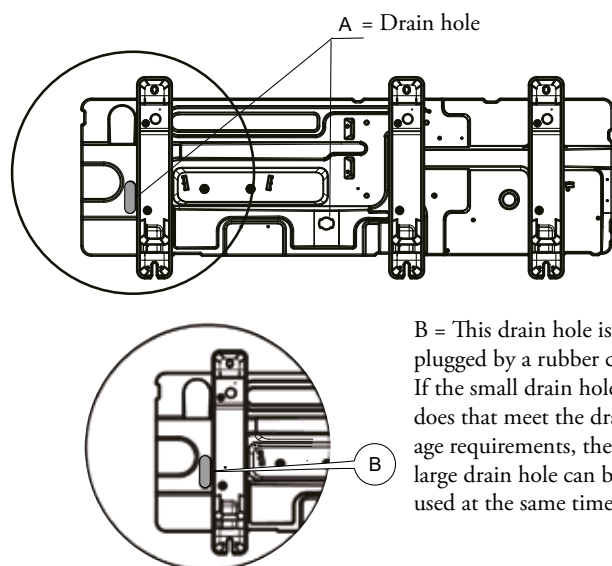


Model	A	B	C	D	E	F	G	H	I	J	K
8 kW	1385 mm	460 mm	526 mm	192 mm	656 mm	363 mm	60 mm	221 mm	865 mm	102 mm	81 mm
12 kW	1385 mm	460 mm	526 mm	192 mm	656 mm	363 mm	60 mm	221 mm	865 mm	102 mm	81 mm
14 kW	1385 mm	460 mm	526 mm	192 mm	656 mm	363 mm	60 mm	221 mm	865 mm	102 mm	81 mm
16 kW	1385 mm	460 mm	526 mm	192 mm	656 mm	363 mm	60 mm	221 mm	865 mm	102 mm	81 mm

### Condensate drain pipe and pre-cut holes in the base.

If draining is carried out through the drain pipe, connect the drain fitting supplied, and use the drain pipe (internal diameter: 32 mm) available on the market. In the event of installation in very cold zones or zones subject to heavy snow where the condensate drain pipe can freeze, check the draining capacity of the pipe.

**N.B.:** The above figure shows the variables to secure the machine; anti-vibration devices must be inserted between the MAGIS M8 - 12 - 14 - 16 and the support base; Immergas suggests a kit that consists of 3 anti-vibration feet (optional) cod. 3.032854.

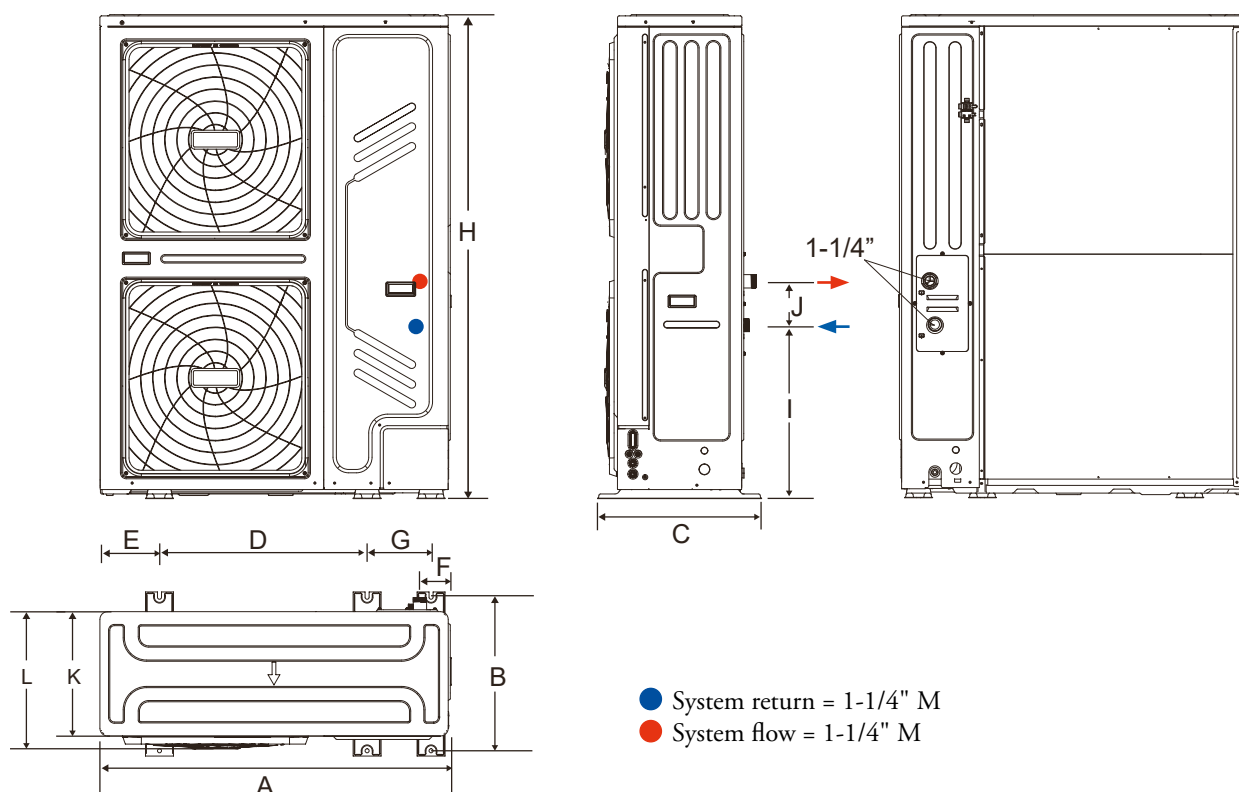


# MAGIS M

8

## MAGIS M18 - 22 - 26 - 30 DIMENSIONS AND CONNECTIONS

### 18 - 30 kW Models

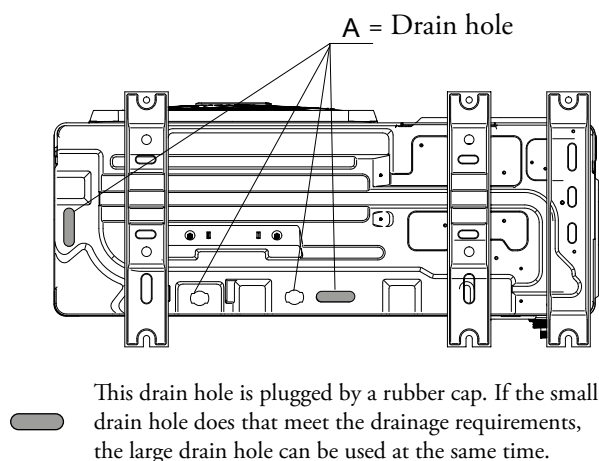


Model	A	B	C	D	E	F	G	H	I	J	L	K
18 - 22 - 26 - 30 kW	1129 mm	494 mm	528 mm	668 mm	192 mm	98 mm	206 mm	1558 mm	558 mm	143 mm	400 mm	440 mm

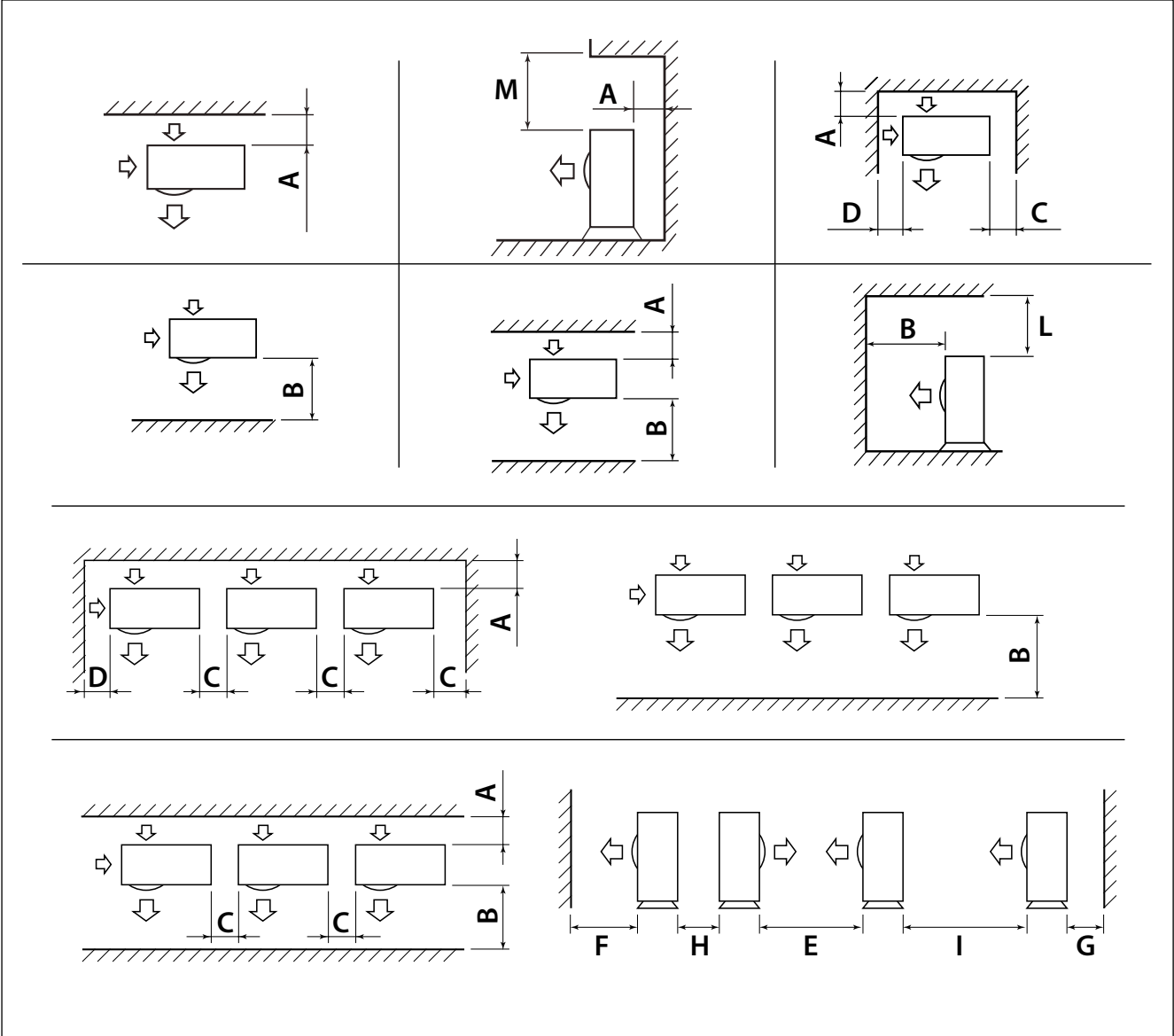
#### Condensate drain pipe and pre-cut holes in the base.

If draining is carried out through the drain pipe, connect the drain fitting supplied, and use the drain pipe (internal diameter: 32 mm) available on the market. In the event of installation in very cold zones or zones subject to heavy snow where the condensate drain pipe can freeze, check the draining capacity of the pipe.

**N.B.:** The above figure shows the variables to secure the machine; anti-vibration devices must be inserted between the MAGIS M18 - 22 - 26 - 30 and the support base; Immergas suggests a kit that consists of 3 anti-vibration feet (optional) cod. 3.032854.



**9                      MAGIS M MINIMUM INSTALLATION DISTANCES**



Model	A	B	C	D	E	F	G	H	I	L	M
4 kW	300	1000	500	300	2500	1000	300	600	2500	1000	600
6 kW	300	1000	500	300	2500	1000	300	600	2500	1000	600
8 kW	300	1500	500	300	3000	1500	300	600	2500	1000	600
12 kW	300	1500	500	300	3000	1500	300	600	2500	1000	600
14 kW	300	1500	500	300	3000	1500	300	600	2500	1000	600
16 kW	300	1500	500	300	3000	1500	300	600	2500	1000	600
18 kW	300	3000	600	300	6000	3000	300	1000	4000	1000	600
22 kW	300	3000	600	300	6000	3000	300	1000	4000	1000	600
26 kW	300	3000	600	300	6000	3000	300	1000	4000	1000	600
30 kW	300	3000	600	300	6000	3000	300	1000	4000	1000	600

## Place of installation:

The place of installation is very important and must be established by the system's designer or by a specifically qualified person, and must consider the technical requirements, standards and laws in force.

- Choose an installation site where the following conditions are met and which is approved by the customer;
- The unit must be installed outdoors only;
- It is recommended to avoid:
  - positioning in basement windows;
  - obstacles or barriers that cause recirculation of exhaust air;
  - places with aggressive atmospheres;
  - limited spaces or anyhow in places where sound levels from the appliance can be enhanced through reverberations or resonance;
  - positioning in corners where there is an accumulation of dust, leaves and anything else that can reduce the appliance's efficiency due to blocked passageways;
  - prevent exhaust air from the device from coming into the rooms through doors or windows, thus disturbing people and neighbours;
- The appliances must:
  - be placed on a level surface that is able to withstand its weight;
  - prepare a water discharge channel around the foundation, to drain the water around the unit;
  - be placed on a slab that is hard enough and which does not transfer any vibrations to the underlying or adjacent rooms;
  - use anti-vibration devices; Immergas offers a kit consisting of 3 anti-vibration feet (optional).
- If the unit is installed in zones subject to heavy snow, it will be necessary to raise the machine by at least 200 mm above the normal level reached by the snow, or alternatively use suitable wall support brackets (NOT supplied by Immergas).
- If there are deflectors to protect the unit from strong winds, these must be designed so as to prevent obstructing normal air circulation, or install the unit with the intake side facing the wall, respecting the minimum distances required.
- When installing the unit in a place that is exposed to strong wind, pay particular attention to the following: strong winds 5 m/sec or more that blow against the air outlet of the unit cause a short circuit (suction of exhaust air) which could have the following consequences:
  - deterioration of operating capacity;
  - frequent acceleration of icing in heating mode;
  - interruption of operation due to the high pressure increase;
  - when a strong wind continuously blows on the front of the unit, the fan can begin to spin so quickly that it breaks.
- If the machine is installed in an area with a particularly hot climate, since the outside temperature is measured by the air thermistor of the heat pump, (external probe in the rear of the machine) make sure to install the unit in the shade or to build a roof so that it is not exposed to direct sunlight and is not affected by the heat of the sun. Otherwise the unit will need to be protected.

**NOTE:** MAGIS M is equipped with a antifreeze protection system against up to -25 °C (with power supply), as a result of periodic activation of the pump and machine cooling circuit. If MAGIS M is installed in areas having temperatures below 0 °C, it is recommended to provide special antifreeze systems in order to guarantee the machine's integrity, especially the water-gas heat exchanger, when there is a blackout.

For example, insert an appropriate top quality, non-hazardous antifreeze liquid into the heating system. In this case, the instructions of the manufacturer of this liquid must be followed scrupulously regarding the percentage necessary with respect to the minimum temperature at which the system must be kept. An aqueous solution must be made with potential pollution class of water 2 (EN 1717:2002).

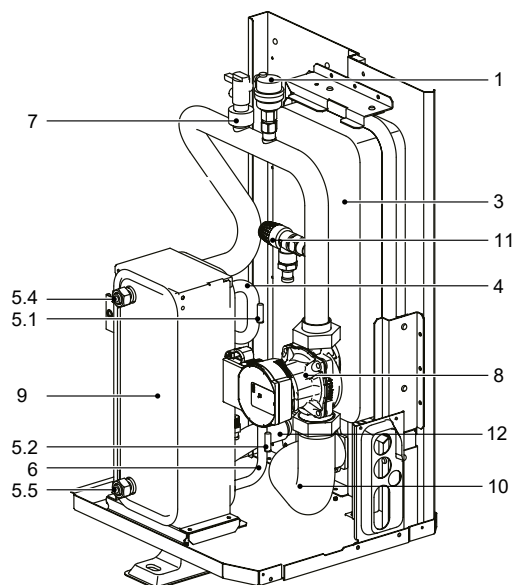
With no power supply and if no antifreeze liquid has been inserted, you must drain the water from the machine.

Avoid using automatic filling systems.

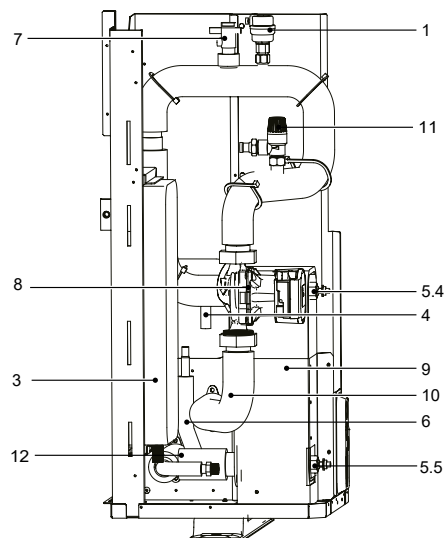
## 11

## MAGIS M4 -16 HYDRAULIC CIRCUIT COMPONENTS

4 - 6 kW Models



8 - 16 kW Models



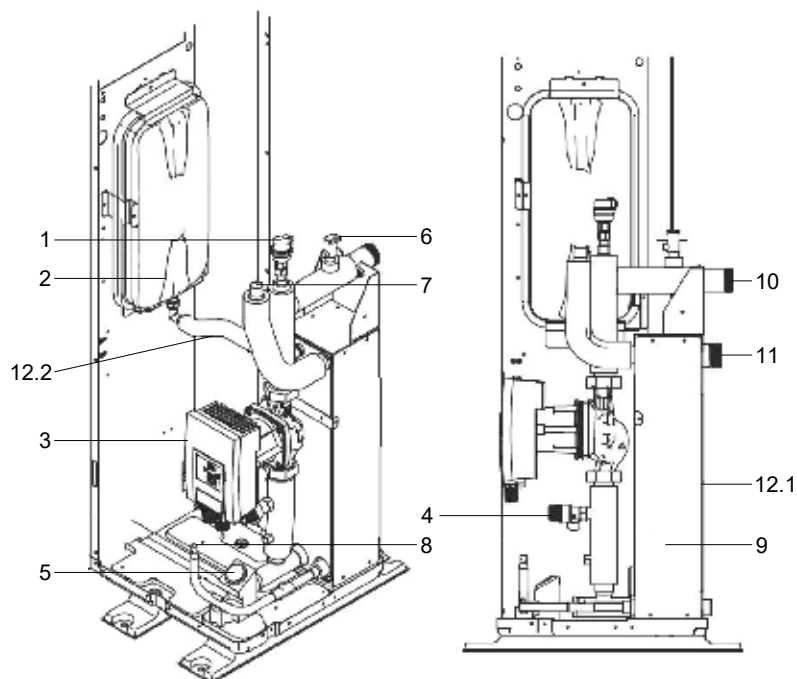
Code	Assembly unit	Explanation
1	Automatic air purge valve	The residual air in the water circuit will be removed automatically from the water circuit.
3	Expansion vessel	Balances the pressure of the water system (volume of the expansion vessel is 8 litres).
4	Refrigerant gas pipe	-
5	Temperature sensors	Four temperature sensors determine the temperature of the water and of the refrigerant at the various points of the water circuit. 5.1-T2B; 5.2-T2; 5.4-TW_out; 5.5-TW_in.
6	Refrigerant liquid pipe	-
7	Flow switch	Detects the water flow rate to protect the compressor and the water pump in case of insufficient water flow.
8	Circulation pump	Circulates the water in the hydronic circuit.
9	Plate heat exchanger	Transfers the heat of the refrigerant (R32) to the hydronic circuit.
10	Water outlet pipe	-
11	Pressure relief valve	Prevents overpressure of the water by opening at 3 bar and draining water from the water circuit.
12	Water inlet pipe	-

# MAGIS M

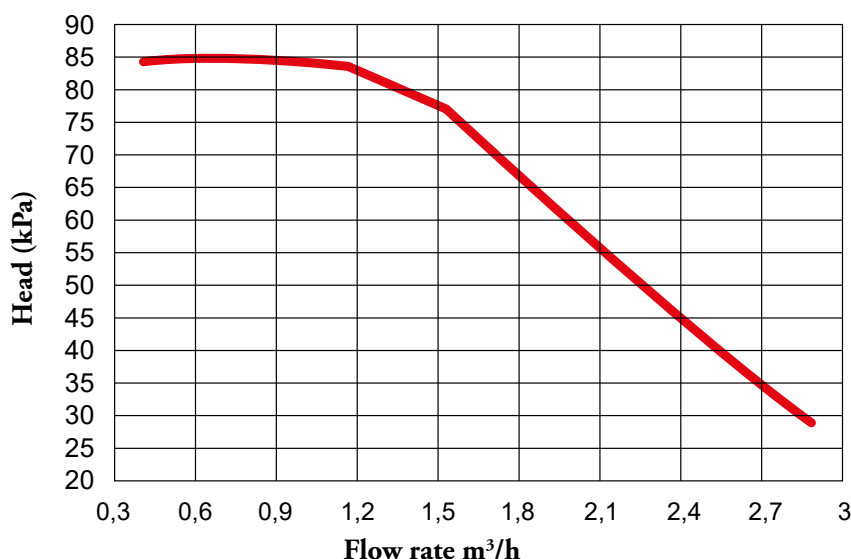
12

## MAGIS M18 - 30 HYDRAULIC CIRCUIT COMPONENTS

18 - 30 kW Models



Code	Assembly unit	Explanation
1	Automatic air purge valve	The air left in the water circuit will be removed automatically from the water circuit.
2	Expansion vessel	Balances the pressure of the water system; (Volume of expansion vessel 8 litres).
3	Circulation pump	Circulates the water in the water circuit.
4	Pressure relief valve	Prevents overpressure of the water by opening at 3 bar and draining water from the water circuit.
5	Pressure gauge	Revises the pressure reading of the water circuit.
6	Flow switch	Detects the water flow rate to protect the compressor and the water pump in case of insufficient water flow.
7	Refrigerant gas connection	-
8	Refrigerant liquid connection	-
9	Plate heat exchanger	Transfers the heat of the refrigerant (R32) to the hydronic circuit.
10	Water outlet connection	-
11	Water inlet connection	-
12.1	Electrical heating tape	For heating plates heat exchanger.
12.2	Electrical heating tape	For the connection pipe heating the expansion vessel.
/	Temperature sensors	Four temperature sensors determine the temperature of the water and of the refrigerant at the various points of the water circuit. (T2B; T2; TW_out; TW_in).



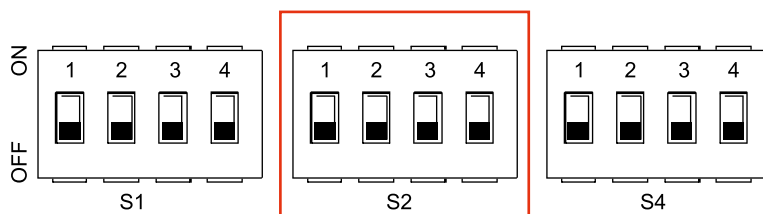
**NOTE: for proper system operation, make sure that the minimum flow rate in operating conditions never drops below 400 l/h.**

Treating the feed water allows you to prevent problems and maintain the function and efficiency of the generator over time. It. Legislative Decree 26/06/2015 requires a chemical treatment of the thermal system water, in compliance with the UNI 8065

standard, in the cases provided for by the Decree.

**Setting of the pump operating mode.** The DIP switches S1, S2 and S4 are located on the board of the main hydraulic control module. Switch off power before making any changes to the DIP switch settings.

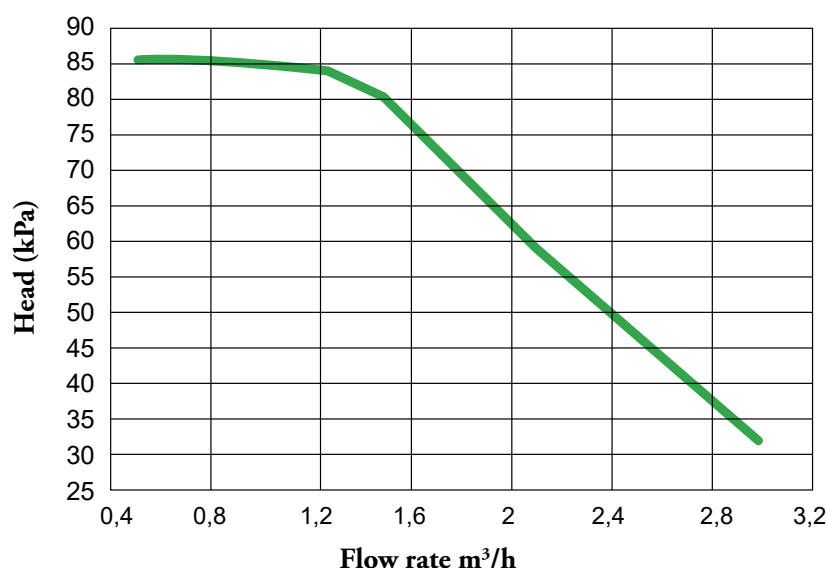
**NOTE:** Switches 3 and 4 of DIP switch S2 must be kept as default (ON-ON).



DIP Switch		ON=1	OFF=0	Default values
S2	1	The start-up of the pump after 24 hours will not be valid	The start-up of the pump after 24 hours will not be valid	OFF
	2	without TBH	with TBH	OFF
	3/4	0/0= variable speed pump, maximum head: 8.5 m 0/1= constant speed pump 1/0= variable speed pump, maximum head: 10.5 m 1/1= variable speed pump, maximum head: 9 m		ON / ON (4-16 kW) OFF / ON (18-30 kW)

#### TECHNICAL NOTE: System minimum water content:

To facilitate proper execution of the heat pump defrost cycles, a minimum water content in the system is required, which must be **40 litres** for all kinds of system. So attention must be paid to the systems divided over several zones, where the water content available to the machine changes continuously. This is why it may be necessary to provide a heating flywheel that guarantees normal operation with systems divided into zones (with variable water content in circulation). This minimum content also guarantees proper operation with fan coils used for cooling (a condition in which the flow temperature is very low and has significant heat load variations that vary the number of active fan coils). It is also important to check that the dehumidifier line has a minimum of **3 l/kW** of the machine (dehumidifier hydraulic circuit connection).



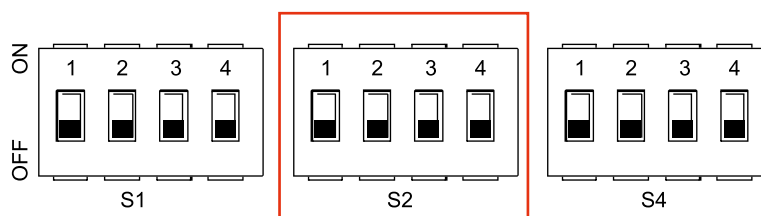
**NOTE:** for proper system operation, make sure that the minimum flow rate in operating conditions never drops below 700 l/h.

Treating the feed water allows you to prevent problems and maintain the function and efficiency of the generator over time. Italian L.D. 26/06/2015 requires a chemical treatment of the thermal system water, in compliance with the UNI 8065

standard, in the cases provided for by the Decree.

**Setting of the pump operating mode.** The DIP switches S1, S2 and S4 are located on the board of the main hydraulic control module. Switch off power before making any changes to the DIP switch settings.

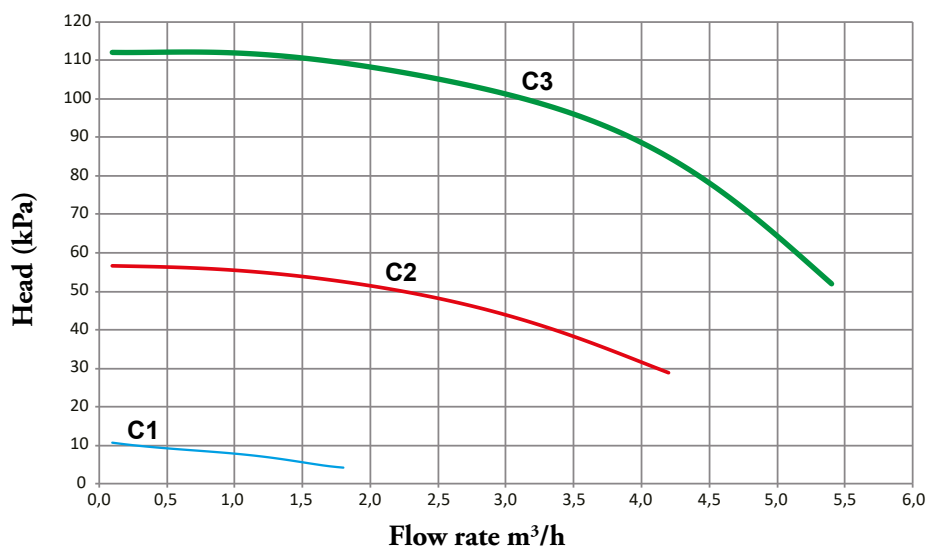
**NOTE:** Switches 3 and 4 of DIP switch S2 must be kept as default (ON-ON).



DIP Switch		ON=1	OFF=0	Default values
S2	1	The start-up of the pump after 24 hours will not be valid	The start-up of the pump after 24 hours will not be valid	OFF
	2	without TBH	with TBH	OFF
	3/4	0/0= variable speed pump, maximum head: 8.5 m 0/1= constant speed pump 1/0= variable speed pump, maximum head: 10.5 m 1/1= variable speed pump, maximum head: 9 m		ON / ON (4-16 kW) OFF / ON (18-30 kW)

## TECHNICAL NOTE: System minimum water content:

To facilitate proper execution of the heat pump defrost cycles, a minimum water content in the system is required, which must be **40 litres** for all kinds of system. So attention must be paid to the systems divided over several zones, where the water content available to the machine changes continuously. This is why it may be necessary to provide a heating flywheel that guarantees normal operation with systems divided into zones (with variable water content in circulation). This minimum content also guarantees proper operation with fan coils used for cooling (a condition in which the flow temperature is very low and has significant heat load variations that vary the number of active fan coils). It is also important to check that the dehumidifier line has a minimum of **3 kW** of the machine (dehumidifier hydraulic circuit connection).



C1: Speed I C2: Speed II C3: Speed III

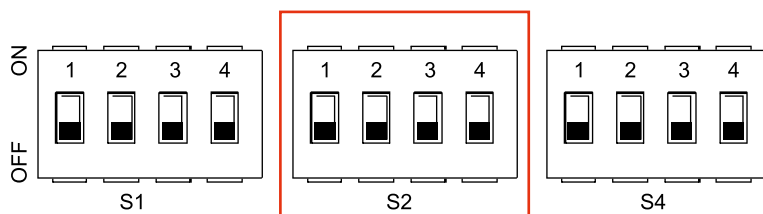
**NOTE: for proper system operation, make sure that the minimum flow rate in operating conditions never drops below 1600 l/h.**

Treating the feed water allows you to prevent problems and maintain the function and efficiency of the generator over time. It. Legislative Decree 26/06/2015 requires a chemical treatment of the thermal system water, in compliance with the UNI 8065

standard, in the cases provided for by the Decree.

**Setting of the pump operating mode.** The DIP switches S1, S2 and S4 are located on the board of the main hydraulic control module. Switch off power before making any changes to the DIP switch settings.

**NOTE:** Switches 3 and 4 of DIP switch S2 must be kept as default (OFF-ON).



DIP Switch		ON=1	OFF=0	Default values
S2	1	The start-up of the pump after 24 hours will not be valid	The start-up of the pump after 24 hours will not be valid	OFF
	2	without TBH	with TBH	OFF
	3/4	0/0= variable speed pump, maximum head: 8.5 m 0/1= constant speed pump 1/0= variable speed pump, maximum head: 10.5 m 1/1= variable speed pump, maximum head: 9 m		ON / ON (4-16 kW) OFF / ON (18-30 kW)

#### TECHNICAL NOTE: System minimum water content:

To facilitate proper execution of the heat pump defrost cycles, a minimum water content in the system is required, which must be **40 litres** for all kinds of system. So attention must be paid to the systems divided over several zones, where the water content available to the machine changes continuously. This is why it may be necessary to provide a heating flywheel that guarantees normal operation with systems divided into zones (with variable water content in circulation). This minimum content also guarantees proper operation with fan coils used for cooling (a condition in which the flow temperature is very low and has significant heat load variations that vary the number of active fan coils). It is also important to check that the dehumidifier line has a minimum of **3 l/kW** of the machine (dehumidifier hydraulic circuit connection).

# MAGIS M

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## MAGIS M4 - 6 - 8 TECHNICAL DATA (SINGLE-PHASE)

	MAGIS	M4	M6	M8
Energy class in heating at 55°C		A++	A++	A++
Energy class in heating at 35°C		A+++	A+++	A+++
<b>Heating circuit</b>				
Power in CH mode with water set at 35 °C <sup>(1)</sup>	kW	4.20	6.35	8.40
Power in CH mode with water set at 45 °C <sup>(2)</sup>	kW	4.30	6.30	8.10
Power in CH mode with water set at 55 °C <sup>(3)</sup>	kW	4.40	6.00	7.50
CH mode COP with water set at 35 °C <sup>(1)</sup>		5.10	4.95	5.51
CH mode COP with water set at 45 °C <sup>(2)</sup>		3.80	3.70	3.85
CH mode COP with water set at 55 °C <sup>(3)</sup>		2.95	2.95	3.18
Flow temperature range	°C	12 ÷ 65	12 ÷ 65	12 ÷ 65
Outdoor temp. limits for Heating mode operation	°C	- 25 ÷ 35	- 25 ÷ 35	- 25 ÷ 35
<b>DHW circuit</b>				
Flow temperature range	°C	12 ÷ 65	12 ÷ 65	12 ÷ 65
Outdoor temp. limits for DHW mode	°C	- 25 ÷ 43	- 25 ÷ 43	- 25 ÷ 43
<b>Cooling circuit</b>				
Power in cooling mode with water set at 18 °C <sup>(1)</sup>	kW	4.50	6.50	8.30
Power in cooling mode with water set at 7 °C <sup>(2)</sup>	kW	4.70	7.00	7.45
Cooling mode EER with water set at 18 °C <sup>(1)</sup>		5.50	4.80	5.05
Cooling mode EER with water set at 7 °C <sup>(2)</sup>		3.45	3.00	3.35
Flow temperature range	°C	5 ÷ 25	5 ÷ 25	5 ÷ 25
Outdoor temp. limits for Cooling mode operation	°C	-5 ÷ 43	-5 ÷ 43	-5 ÷ 43
<b>General data</b>				
Max hydraulic system operating	bar	3	3	3
Minimum flow rate (flow switch)	l/h	400	400	400
System expansion vessel capacity	litres	8	8	8
System expansion vessel pre-charged pressure	bar	1.0	1.0	1.0
Water circuit content	litres	3.2	3.2	3.2
C.H. sound power level	dB(A)	55	58	59
Hydronic module electric degree of protection	IP	24	24	24
Electric power supply	V - Hz	230-50	230-50	230-50
Permitted voltage range	V	198 ÷ 264	198 ÷ 264	198 ÷ 264
Absorbed nominal power	W	2300	2700	3400
Maximum absorbed current in normal operation	A	12	14	16
Power supply fuse (FMA)	A	25	25	25
Refrigerant fluid load (R32)	g	1400	1400	1400
Gross heat pump weight (net)	kg	109 (86)	109 (86)	132 (105)

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):

ROOM	CENTRAL HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) <sup>(1)</sup> - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) <sup>(2)</sup> - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) <sup>(3)</sup> - AIR (db/wb)	55/47 - 7/6	

	MAGIS	M12	M14	M16
Energy class in heating at 55°C		A++	A++	A++
Energy class in heating at 35°C		A+++	A+++	A+++
<b>Heating circuit</b>				
Power in CH mode with water set at 35 °C <sup>(1)</sup>	kW	11.70	14.50	15.90
Power in CH mode with water set at 45 °C <sup>(2)</sup>	kW	12.30	14.10	16.00
Power in CH mode with water set at 55 °C <sup>(3)</sup>	kW	11.90	13.80	16.00
CH mode COP with water set at 35 °C <sup>(1)</sup>		4.95	4.60	4.50
CH mode COP with water set at 45 °C <sup>(2)</sup>		3.70	3.60	3.50
CH mode COP with water set at 55 °C <sup>(3)</sup>		3.05	2.95	2.85
Flow temperature range	°C	12 ÷ 65	12 ÷ 65	12 ÷ 65
Outdoor temp. limits for Heating mode operation	°C	- 25 ÷ 35	- 25 ÷ 35	- 25 ÷ 35
<b>DHW circuit</b>				
Flow temperature range	°C	12 ÷ 65	12 ÷ 65	12 ÷ 65
Outdoor temp. limits for DHW mode	°C	- 25 ÷ 43	- 25 ÷ 43	- 25 ÷ 43
<b>Cooling circuit</b>				
Power in cooling mode with water set at 18 °C <sup>(1)</sup>	kW	12.00	13.50	14.20
Power in cooling mode with water set at 7 °C <sup>(2)</sup>	kW	11.50	12.40	14.00
Cooling mode EER with water set at 18 °C <sup>(1)</sup>		3.95	3.61	3.61
Cooling mode EER with water set at 7 °C <sup>(2)</sup>		2.75	2.50	2.50
Flow temperature range	°C	5 ÷ 25	5 ÷ 25	5 ÷ 25
Outdoor temp. limits for Cooling mode operation	°C	-5 ÷ 43	-5 ÷ 43	-5 ÷ 43
<b>General data</b>				
Max hydraulic system operating	bar	3	3	3
Minimum flow rate (flow switch)	l/h	700	700	700
System expansion vessel capacity	litres	8	8	8
System expansion vessel pre-charged pressure	bar	1.0	1.0	1.0
Water circuit content	litres	2.0	2.0	2.0
C.H. sound power level	dB(A)	65	65	68
Hydronic module electric degree of protection	IP	24	24	24
Electric power supply	V - Hz	230-50	230-50	230-50
Permitted voltage range	V	198 ÷ 264	198 ÷ 264	198 ÷ 264
Absorbed nominal power	W	5500	5800	6200
Maximum absorbed current in normal operation	A	25	26	27
Power supply fuse (FMA)	A	35	35	35
Refrigerant fluid load (R32)	g	1750	1750	1750
Heat Pump weight (net)	kg	155 (129)	155 (129)	155 (129)

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):

ROOM	CENTRAL HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) <sup>(1)</sup> - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) <sup>(2)</sup> - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) <sup>(3)</sup> - AIR (db/wb)	55/47 - 7/6	

# MAGIS M

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## MAGIS M12 T - 14 T - 16 T TECHNICAL DATA (THREE-PHASE)

	MAGIS	M12 T	M14 T	M16 T
Energy class in heating at 55°C		A++	A++	A++
Energy class in heating at 35°C		A+++	A+++	A+++
<b>Heating circuit</b>				
Power in CH mode with water set at 35 °C <sup>(1)</sup>	kW	11.70	14.50	15.90
Power in CH mode with water set at 45 °C <sup>(2)</sup>	kW	12.30	14.10	16.00
Power in CH mode with water set at 55 °C <sup>(3)</sup>	kW	11.90	13.80	16.00
CH mode COP with water set at 35 °C <sup>(1)</sup>		4.95	4.60	4.50
CH mode COP with water set at 45 °C <sup>(2)</sup>		3.70	3.60	3.50
CH mode COP with water set at 55 °C <sup>(3)</sup>		3.05	2.95	2.85
Flow temperature range	°C	12 ÷ 65	12 ÷ 65	12 ÷ 65
Outdoor temp. limits for Heating mode operation	°C	- 25 ÷ 35	- 25 ÷ 35	- 25 ÷ 35
<b>DHW circuit</b>				
Flow temperature range	°C	12 ÷ 65	12 ÷ 65	12 ÷ 65
Outdoor temp. limits for DHW mode	°C	- 25 ÷ 43	- 25 ÷ 43	- 25 ÷ 43
<b>Cooling circuit</b>				
Power in cooling mode with water set at 18 °C <sup>(1)</sup>	kW	12.00	13.50	14.20
Power in cooling mode with water set at 7 °C <sup>(2)</sup>	kW	11.50	12.40	14.00
Cooling mode EER with water set at 18 °C <sup>(1)</sup>		3.95	3.61	3.61
Cooling mode EER with water set at 7 °C <sup>(2)</sup>		2.75	2.50	2.50
Flow temperature range	°C	5 ÷ 25	5 ÷ 25	5 ÷ 25
Outdoor temp. limits for Cooling mode operation	°C	-5 ÷ 43	-5 ÷ 43	-5 ÷ 43
<b>General data</b>				
Max hydraulic system operating	bar	3	3	3
Minimum flow rate (flow switch)	l/h	700	700	700
System expansion vessel capacity	litres	8	8	8
System expansion vessel pre-charged pressure	bar	1.0	1.0	1.0
Water circuit content	litres	2.0	2.0	2.0
C.H. sound power level	dB(A)	65	65	68
Hydronic module electric degree of protection	IP	24	24	24
Electric power supply	V - Hz	400-50	400-50	400-50
Permitted voltage range	V	342 ÷ 456	342 ÷ 456	342 ÷ 456
Absorbed nominal power	W	5500	5800	6200
Maximum absorbed current in normal operation	A	10	11	12
Power supply fuse (FMA)	A	16	16	16
Refrigerant fluid load (R32)	g	1750	1750	1750
Heat Pump weight (net)	kg	172 (144)	172 (144)	172 (144)

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):

ROOM	CENTRAL HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) <sup>(1)</sup> - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) <sup>(2)</sup> - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) <sup>(3)</sup> - AIR (db/wb)	55/47 - 7/6	

## 19 MAGIS M18 T - 22 T TECHNICAL DATA (THREE-PHASE)

	MAGIS	M18 T	M22 T
Energy class in heating at 55°C		A++	A++
Energy class in heating at 35°C		A+++	A+++
<b>Heating circuit</b>			
Power in CH mode with water set at 35 °C <sup>(1)</sup>	kW	18.00	22.00
Power in CH mode with water set at 45 °C <sup>(2)</sup>	kW	18.00	22.00
Power in CH mode with water set at 55 °C <sup>(3)</sup>	kW	18.00	22.00
CH mode COP with water set at 35 °C <sup>(1)</sup>		4.70	4.40
CH mode COP with water set at 45 °C <sup>(2)</sup>		3.50	3.40
CH mode COP with water set at 55 °C <sup>(3)</sup>		2.75	2.65
Flow temperature range	°C	5 ÷ 60	5 ÷ 60
Outdoor temp. limits for Heating mode operation	°C	- 25 ÷ 35	- 25 ÷ 35
<b>DHW circuit</b>			
Flow temperature range	°C	5 ÷ 60	5 ÷ 60
Outdoor temp. limits for DHW mode	°C	- 25 ÷ 43	- 25 ÷ 43
<b>Cooling circuit</b>			
Power in cooling mode with water set at 18 °C <sup>(1)</sup>	kW	18.50	23.00
Power in cooling mode with water set at 7 °C <sup>(2)</sup>	kW	17.00	21.00
Cooling mode EER with water set at 18 °C <sup>(1)</sup>		4.75	4.60
Cooling mode EER with water set at 7 °C <sup>(2)</sup>		3.05	2.95
Flow temperature range	°C	5 ÷ 25	5 ÷ 25
Outdoor temp. limits for Cooling mode operation	°C	-5 ÷ 46	-5 ÷ 46
<b>General data</b>			
Max hydraulic system operating	bar	3	3
Minimum flow rate (flow switch)	l/h	1620	1620
System expansion vessel capacity	litres	8	8
System expansion vessel pre-charged pressure	bar	1.0	1.0
Water circuit content	litres	3.5	3.5
C.H. sound power level	dB(A)	71	72
Hydronic module electric degree of protection	IP	24	24
Electric power supply	V - Hz	400-50	400-50
Permitted voltage range	V	342 ÷ 456	342 ÷ 456
Absorbed nominal power	W	10600	12500
Maximum absorbed current in normal operation	A	16.8	19.6
Power supply fuse (FMA)	A	25	25
Refrigerant fluid load (R32)	g	5000	5000
Heat Pump weight (net)	kg	206 (177)	206 (177)

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):

ROOM	CENTRAL HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) <sup>(1)</sup> - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) <sup>(2)</sup> - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) <sup>(3)</sup> - AIR (db/wb)	55/47 - 7/6	

# MAGIS M

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## MAGIS M26 T - 30 T TECHNICAL DATA (THREE-PHASE)

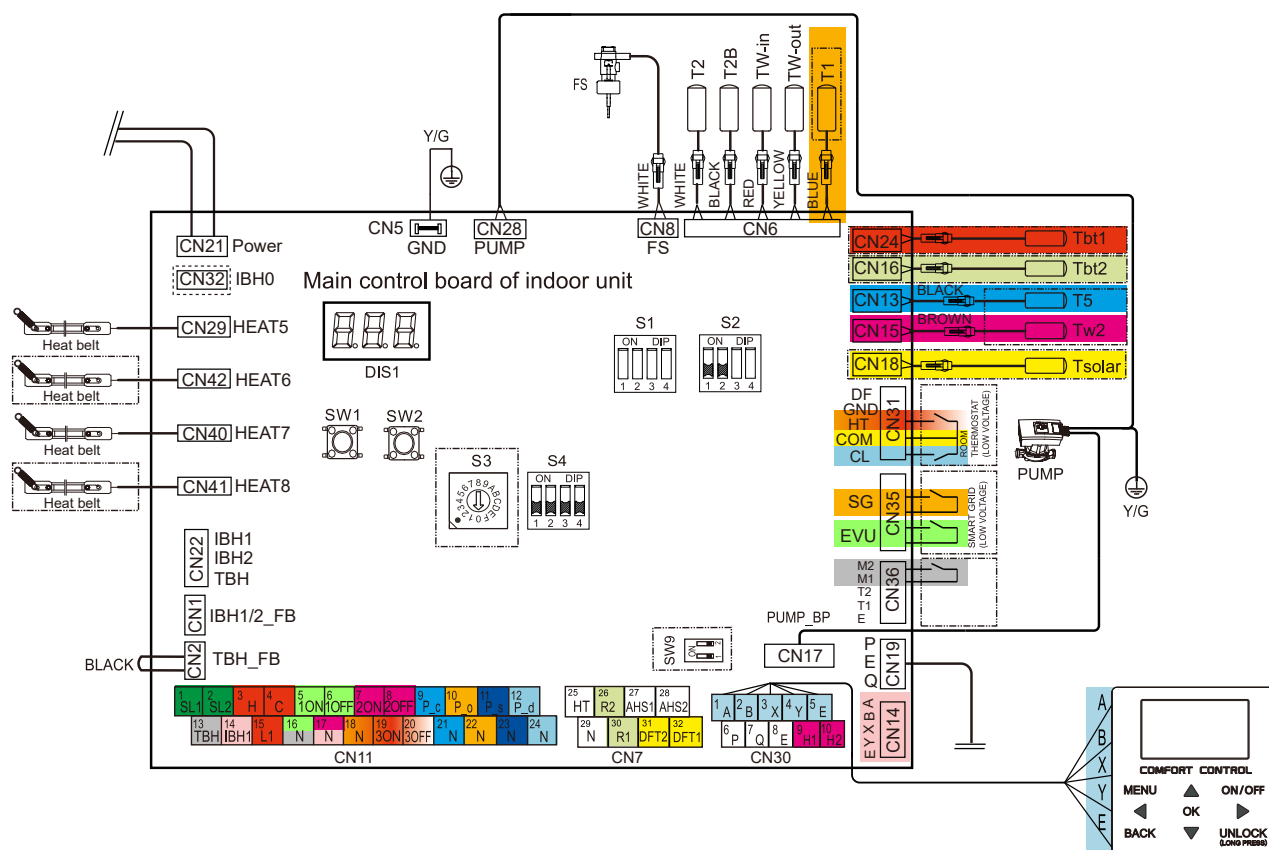
	MAGIS	M26 T	M30 T
Energy class in heating at 55°C		A+	A+
Energy class in heating at 35°C		A+++	A++
<b>Heating circuit</b>			
Power in CH mode with water set at 35 °C <sup>(1)</sup>	kW	26.00	30.10
Power in CH mode with water set at 45 °C <sup>(2)</sup>	kW	26.00	30.00
Power in CH mode with water set at 55 °C <sup>(3)</sup>	kW	26.00	30.00
CH mode COP with water set at 35 °C <sup>(1)</sup>		4.08	3.91
CH mode COP with water set at 45 °C <sup>(2)</sup>		3.10	2.90
CH mode COP with water set at 55 °C <sup>(3)</sup>		2.45	2.30
Flow temperature range	°C	5 ÷ 60	5 ÷ 60
Outdoor temp. limits for Heating mode operation	°C	- 25 ÷ 35	- 25 ÷ 35
<b>DHW circuit</b>			
Flow temperature range	°C	5 ÷ 60	5 ÷ 60
Outdoor temp. limits for DHW mode	°C	- 25 ÷ 43	- 25 ÷ 43
<b>Cooling circuit</b>			
Power in cooling mode with water set at 18 °C <sup>(1)</sup>	kW	27.00	31.00
Power in cooling mode with water set at 7 °C <sup>(2)</sup>	kW	26.00	29.50
Cooling mode EER with water set at 18 °C <sup>(1)</sup>		4.30	4.00
Cooling mode EER with water set at 7 °C <sup>(2)</sup>		2.70	2.55
Flow temperature range	°C	5 ÷ 25	5 ÷ 25
Outdoor temp. limits for Cooling mode operation	°C	-5 ÷ 46	-5 ÷ 46
<b>General data</b>			
Max hydraulic system operating	bar	3	3
Minimum flow rate (flow switch)	l/h	1620	1620
System expansion vessel capacity	litres	8	8
System expansion vessel pre-charged pressure	bar	1.0	1.0
Water circuit content	litres	3.5	3.5
C.H. sound power level	dB(A)	75	77
Hydronic module electric degree of protection	IP	24	24
Electric power supply	V - Hz	400-50	400-50
Permitted voltage range	V	342 ÷ 456	342 ÷ 456
Absorbed nominal power	W	13800	14500
Maximum absorbed current in normal operation	A	21.6	22.8
Power supply fuse (FMA)	A	32	32
Refrigerant fluid load (R32)	g	5000	5000
Heat Pump weight (net)	kg	206 (177)	206 (177)

THE REPORTED DATA REFERS TO THE FOLLOWING CONDITIONS (in compliance with EN 14511):

ROOM	CENTRAL HEATING PHASE (°C)	COOLING PHASE (°C)
Water TEMP. (F/R) <sup>(1)</sup> - AIR (db/wb)	35/30 - 7/6	18/23 - 35 (bs)
Water TEMP. (F/R) <sup>(2)</sup> - AIR (db/wb)	45/40 - 7/6	7/12 - 35 (bs)
Water TEMP. (F/R) <sup>(3)</sup> - AIR (db/wb)	55/47 - 7/6	



**NOTE:** The wiring image shown is for reference only; specifically, the wiring diagram refers to MAGIS M12-16 series heat pumps

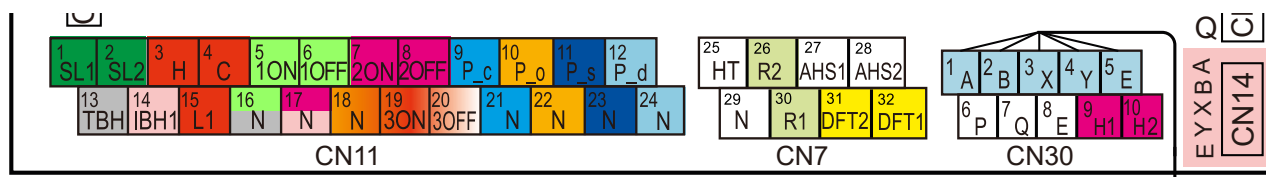


Port	Ref.	Assembly unit	Max. no. of conductors required
CN21	Output	Power supply port	-
S3	-	Not used	-
DIS1	-	Digital display	-
CN5	Earth	Earth port	-
CN28	Pump	Variable speed pump power input port	-
CN25	Debug	IC programming port	-

# MAGIS M

Port	Ref.	Assembly unit	Max. no. of conductors required
S1, S2 S4, SW9	-	DIP Switch	-
CN4	USB	USB programming port	-
CN8	FS	Flow switch port	-
CN6	T2	Port for refrigerant liquid side temperature sensors, unit temperature (heating mode)	2 x 0.5 mm <sup>2</sup>
	T2B	Port for refrigerant gas side temperature sensors, unit temperature (cooling mode)	2 x 0.5 mm <sup>2</sup>
	TW_in	Port for inlet water temperature sensors of plate heat exchanger	2 x 0.5 mm <sup>2</sup>
	TW_out	Port for outlet water temperature sensors of plate heat exchanger	2 x 0.5 mm <sup>2</sup>
	T1	Port for unit outlet water flow temperature sensors = <b>B1</b>	2 x 0.5 mm <sup>2</sup>
CN24	<b>Tbt1</b>	Port for the upper temperature sensor of the inertial tank / thermal flywheel = <b>B28</b>	2 x 0.5 mm <sup>2</sup>
CN16	<b>Tbt2</b>	Not used	
CN13	<b>T5</b>	Port for domestic hot water temperature sensor = <b>B2</b>	2 x 0.5 mm <sup>2</sup>
CN15	<b>Tw2</b>	Port for zone 2 flow water temperature sensor = <b>B3-2</b>	2 x 0.5 mm <sup>2</sup>
CN18	<b>solarT</b>	Port for solar panel lower temperature sensor	2 x 0.5 mm <sup>2</sup>
CN17	<b>POMPA_BP</b>	Port for variable speed pump communication	2 x 0.5 mm <sup>2</sup>
CN31	<b>HT</b>	Room thermostat control port (heating mode)	2 x 0.5 mm <sup>2</sup>
	<b>COM</b>	Room thermostat power supply port (low voltage)	2 x 0.5 mm <sup>2</sup>
	<b>CL</b>	Room thermostat control port (cooling mode)	2 x 0.5 mm <sup>2</sup>
CN35	<b>SG</b>	SMART GRID port (network signal)	2 x 0.5 mm <sup>2</sup>
	<b>EVU</b>	SMART GRID port (photovoltaic contact)	2 x 0.5 mm <sup>2</sup>
CN36	<b>M1 M2</b>	Port for Heat pump disabling switch	2 x 0.5 mm <sup>2</sup>
	T1 T2	Not used	-
CN2	TBH_FB	Feedback port for external thermostat (in default short-circuit)	-
CN19	P E Q	Not used	-
CN1	IBH1/2_FB	Feedback port for thermostat (in default short-circuit)	-
CN22	IBH1	Port for backup heater	-
	IBH2	Reserved	-
	TBH	Control port for DHW tank booster heater (integrative resistance)	-

## 21.1 HYDRONIC BOARD TERMINAL BLOCK ELECTRICAL CONNECTIONS

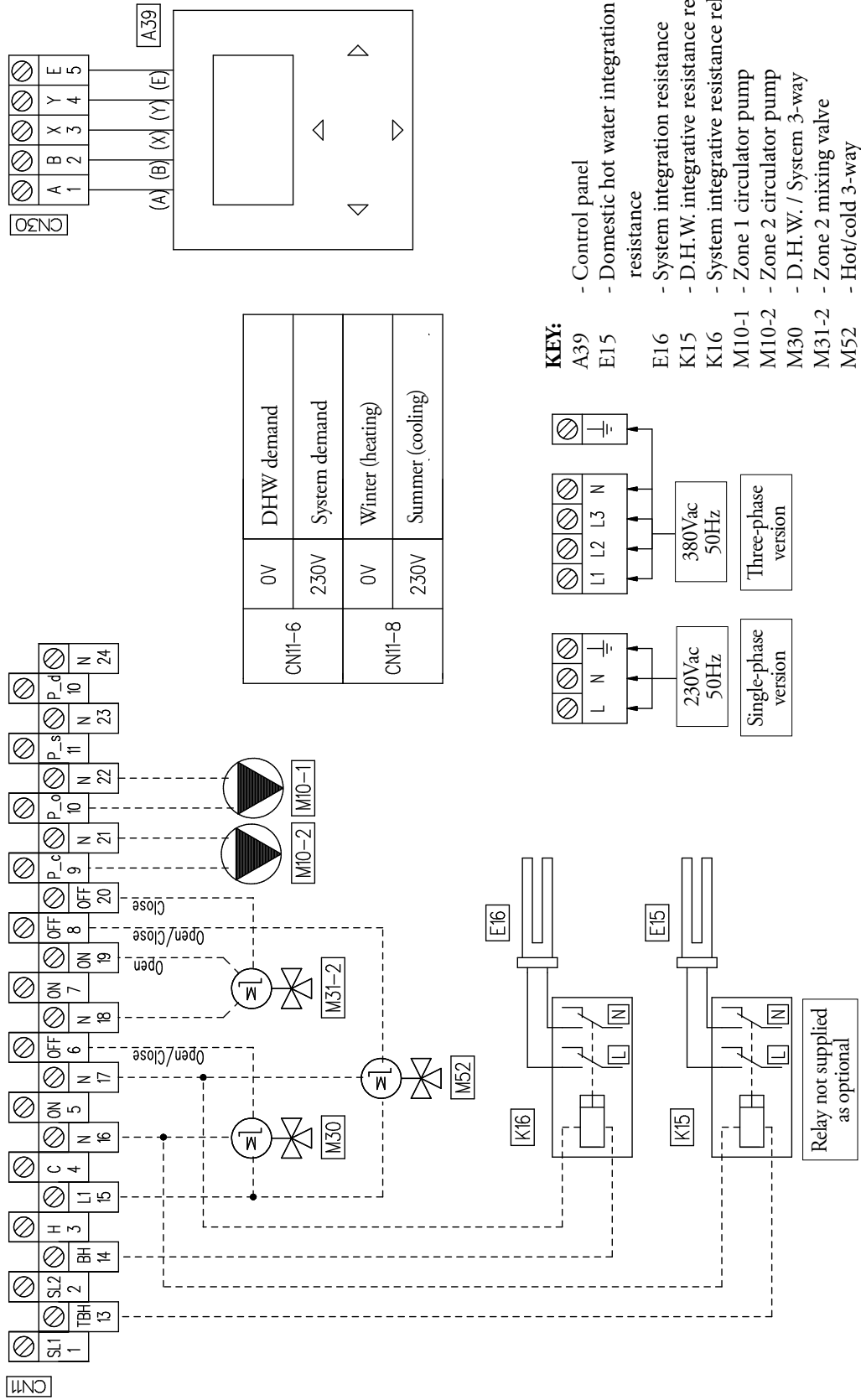


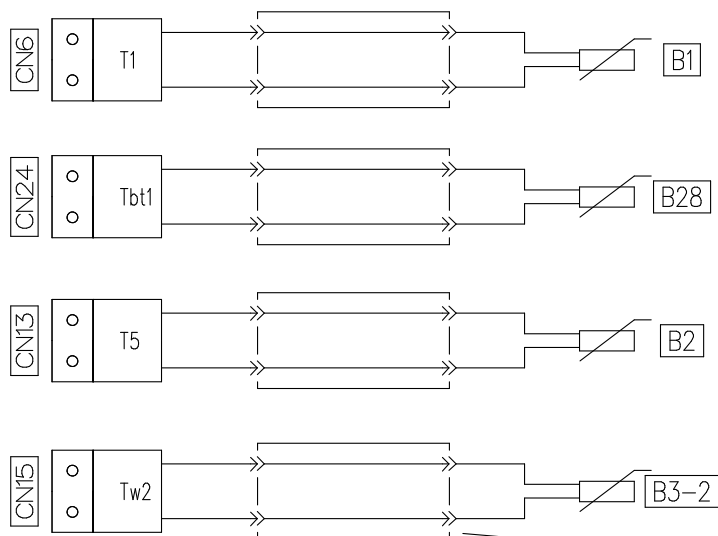
Port	Ref.	Number	Assembly unit	Max. no. of conductors required	Operating Voltage and Current
CN14	A B X Y E		Port for communication with the control panel (connector for quick coupling e.g. SERVICE)	5 x 0.75 mm <sup>2</sup> (2 + 3 BUS) shielded cable	A/B - 13.5 V AC, X/YE
CN30	A B X Y E	1 - 2 - 3 - 4 - 5	Port for communication with control panel	5 x 0.75 mm <sup>2</sup> (2 + 3 BUS) shielded cable	A/B - 13.5 V AC, X/YE
	P Q E	6 - 7 - 8	Not used	-	-
	H1 H2	9 - 10	Port for machines in cascade / Connection to the Immergas System manager	2 x 0.75 mm <sup>2</sup> BUS, shielded cable	Modbus - RTU
CN7	R2 R1	26 - 30	Compressor operation	2 x 0.75 mm <sup>2</sup>	Potential-free contact
	DFT2 DFT1	31 - 32	Port for alarm signal / Defrosting operation	2 x 0.75 mm <sup>2</sup>	Potential-free contact
	HT N	25 - 29	Not used	-	-
	AHS1 AHS2	27 - 28	Not used	-	-
CN11	SL1 SL2	1 - 2	Inlet port for thermal solar station activation	2 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	H C L1	3 - 4 - 15	Port for room thermostat (high voltage)	3 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	1ON OFF L	5 - 6 - 16	Port for SV1 (3-way valve) <b>DHW = M30</b>	3 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	2ON 2OFF L	7 - 8 - 17	Port for SV2 (3-way valve) <b>E/I = M52</b>	3 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	P_c N	9 - 21	Port for pump "c" = <b>zone 2 = M10-2</b>	2 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	P_o N	10 - 22	Port for pump "o" = <b>zone 1 = M10-1</b>	2 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	TBH-N	13 - 16	Port for <b>TBH</b> DHW integrative electrical resistance	2 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	P_d N	12 - 24	Port for pump "d" = DHW recirculation	2 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	P_s N	11 - 23	Port for pump "s" = thermal solar circuit	2 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	IBH1 N	14 - 17	Port for <b>IBH</b> system integrative electrical resistance	2 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
	N 3ON 3OFF	18 19 20	Port for SV3 (3-way valve) <b>Mix 2 = M31-2</b>	3 x 0.75 mm <sup>2</sup>	220 V AC Input / 0.2 A*
CN41	CALDO8		Port for anti-freeze electric heating tape (internal)	-	-
CN40	CALDO7		Port for anti-freeze electric heating tape (internal)	-	-
CN42	CALDO6		Port for anti-freeze electric heating tape (internal)	-	-
CN29	CALDO5		Port for anti-freeze electric heating tape (internal)	-	-
CN32	IBH0		Port for backup heater	-	-

\* If the load current is <0.2A, the load can be connected directly to the port/clamps.  
If the load current is ≥0.2A, an AC contactor must be connected for the load (relay in support).

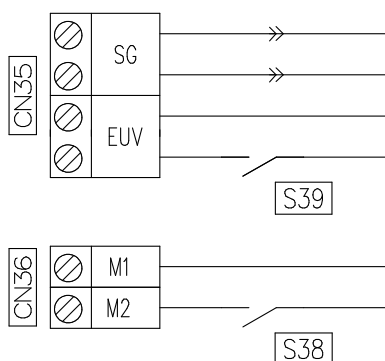
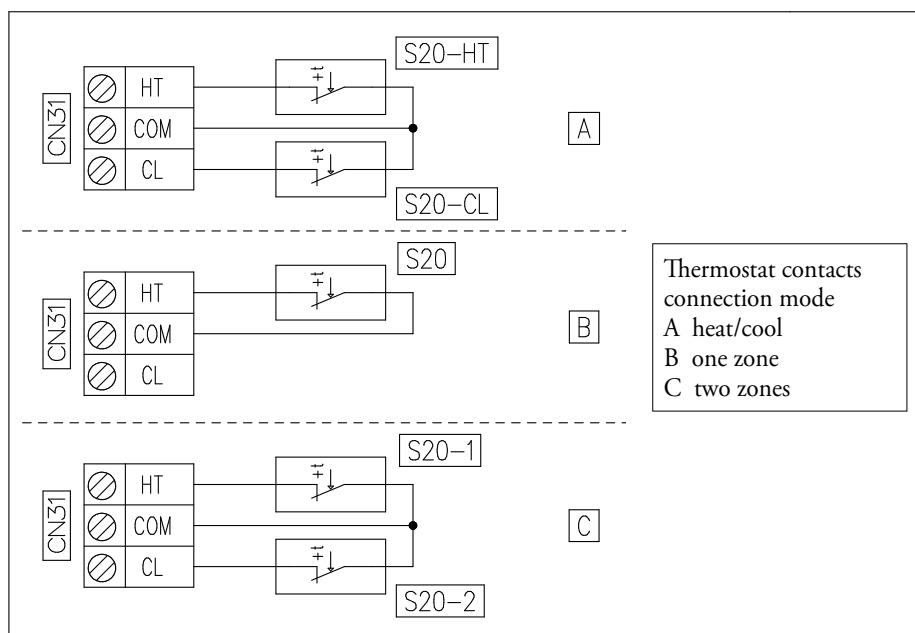
# MAGIS M

**NOTE:** The following electrical connection refers to the 3-way diverter valves supplied by Immergas being used as an optional kit





adapter wiring



Apply the SG bridge supplied as standard with the machine, but NOT already installed, to use only the photovoltaic contact.



## KEY:

- B1 - Flow probe
- B2 - DHW probe
- B3-2 - Zone 2 flow probe
- B28 - Inertial storage tank probe
- S20-1 - Zone 1 room thermostat
- S20-2 - Zone 2 room thermostat
- S20-HT - Room thermostat - heating
- S20-CL - Room thermostat - cooling
- S38 - MAGIS M deactivation selector
- S39 - Photovoltaic inlet

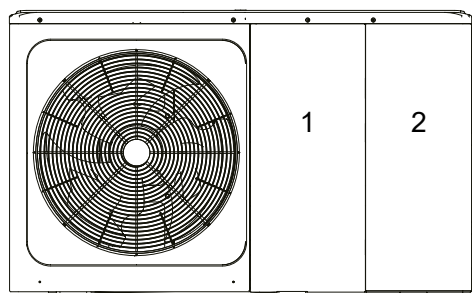
# MAGIS M

## 22 MAGIS M SINGLE-PHASE ELECTRIC CONNECTION CABLE FEATURES

MAGIS M4 - 6 - 8 (Single-phase)				
Unit		4 kW	6 kW	8 kW
Power supply	V - ph - Hz	230 - 1 - 50		
Permitted voltage range	V	198 ÷ 264		
Inlet absorbed power	kW	2.3	2.7	3.4
Rated operating current	A	12	14	16
Power supply fuses			gG Type	
	A	25	25	25
Power supply cable section	mm <sup>2</sup> (per phase)	3G x 4 mm <sup>2</sup>	3G x 4 mm <sup>2</sup>	3G x 4 mm <sup>2</sup>
Power supply cable type		H07RN-F		
Differential switch		Type A of adequate size, at high speed (less than 0.1 seconds)		
Maximum current for external loads (e.g. pumps, mixing valve, diverter valves, etc.)	A	0.2		
Use cables H03VV-F 5 x 0.75 - 1.25 mm <sup>2</sup> maximum cable length 50 m to connect the Control panel				

MAGIS M12 - 14 - 16 (Single-phase)				
Unit		12 kW	14 kW	16 kW
Power supply	V - ph - Hz	230 - 1 - 50		
Permitted voltage range	V	198 ÷ 264		
Inlet absorbed power	kW	5.5	5.8	6.2
Rated operating current	A	25	26	27
Power supply fuses		gG Type		
	A	35	35	35
Power supply cable section	mm <sup>2</sup> (per phase)	3G x 6 mm <sup>2</sup>	3G x 6 mm <sup>2</sup>	3G x 6 mm <sup>2</sup>
Power supply cable type		H07RN-F		
Differential switch		Type A of adequate size, at high speed (less than 0.1 seconds)		
Maximum current for external loads (e.g. pumps, mixing valve, diverter valves, etc.)	A	0.2		
Use cables H03VV-F 5 x 0.75 - 1.25 mm <sup>2</sup> maximum cable length 50 m to connect the Control panel				

- Port 1 To access the compressor and the electric components
- Port 2 To access the hydraulic compartment and the electric components



8/10/12/14/16kW

Remove the front panel (refer to the fig. on the side referred to as an example) to see the electrical components on the front. The electrical supply cables can be inserted in the holes set up. You must clamp the electrical cables using group cable ties in order to prevent them from touching the compressor and hot pipes. The unit can be controlled and set by means of:

- Control panel (standard).
- Switches or thermostats (not supplied).

**N.B.:** It is always necessary to install a type "A" differential switch, which must have 30mA high speed contacts (less than 0.1 seconds).

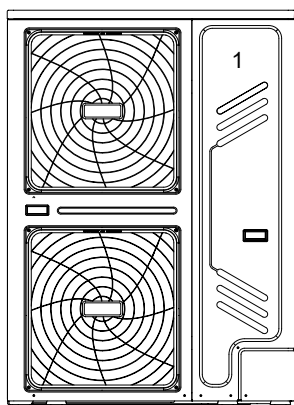
Circuit breaker with tripping curve "C" with magnetic release setting 5-10 In (rated current).

## 23 MAGIS M THREE-PHASE ELECTRIC CONNECTION CABLE FEATURES

MAGIS M12 - 14 - 16 (Three-phase)				
Unit		12 kW	14 kW	16 kW
Power supply	V - ph - Hz	400 - 3 +N - 50		
Permitted voltage range	V	342 ÷ 456	342 ÷ 456	342 ÷ 456
Inlet absorbed power	kW	5.5	5.8	6.2
Rated operating current	A	10	11	12
Power supply fuses		gG Type	gG Type	gG Type
	A	16	16	16
Power supply cable section	mm² (per phase)	5G x 2.5 mm²	5G x 2.5 mm²	5G x 2.5 mm²
Power supply cable type		H07RN-F		
Differential switch		Type A of adequate size, at high speed (less than 0.1 seconds)		
Maximum current for external loads (e.g. pumps, mixing valve, diverter valves, etc.)	A	0.2		
Use cables H03VV-F 5 x 0.75 - 1.25 mm² maximum cable length 50 m to connect the Control panel				

MAGIS M18 - 22 - 26 - 30 (Three-phase)					
Unit		18 kW	22 kW	26 kW	30 kW
Power supply	V - ph - Hz	400 - 3 +N - 50			
Permitted voltage range	V	342 ÷ 456	342 ÷ 456	342 ÷ 456	342 ÷ 456
Inlet absorbed power	kW	10.6	12.5	13.8	14.5
Rated operating current	A	16.8	19.6	21.6	22.8
Power supply fuses		gG Type		gG Type	gG Type
	A	25	25	32	32
Power supply cable section	mm <sup>2</sup> (per phase)	5G x 6 mm <sup>2</sup>	5G x 6 mm <sup>2</sup>	5G x 6 mm <sup>2</sup>	5G x 6 mm <sup>2</sup>
Power supply cable type		H07RN-F			
Differential switch		Type A of adequate size, at high speed (less than 0.1 seconds)			
Maximum current for external loads (e.g. pumps, mixing valve, diverter valves, etc.)	A	0.2			
Use cables H03VV-F 5 x 0.75 - 1.25 mm <sup>2</sup> maximum cable length 50 m to connect the Control panel					

Port 1 to access the compressor and the electric parts and the electric compartment



Remove the panel (refer to the fig. on the side) to see the electrical components on the front. The electrical supply cables can be inserted in the holes set up. You must clamp the electrical cables using group cable ties in order to prevent them from touching the compressor and hot pipes.

The unit can be controlled and set by means of:

- Control panel (standard).
- Switches or thermostats (not supplied).

Refer to the figure above for electrical connections.

**N.B.:** It is always necessary to install a type "A" differential switch, which must have 30mA high speed contacts (less than 0.1 seconds).

Circuit breaker with tripping curve "C" with magnetic release setting 5-10 In (rated current).

# MAGIS M

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## EXAMPLE ELECTRICAL POWER SUPPLY TERMINAL BLOCK

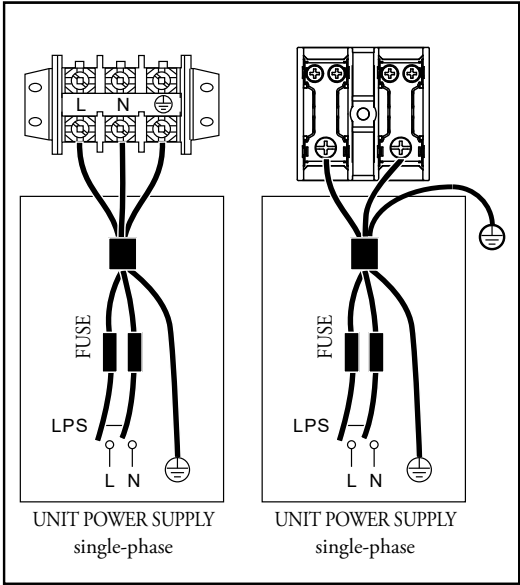
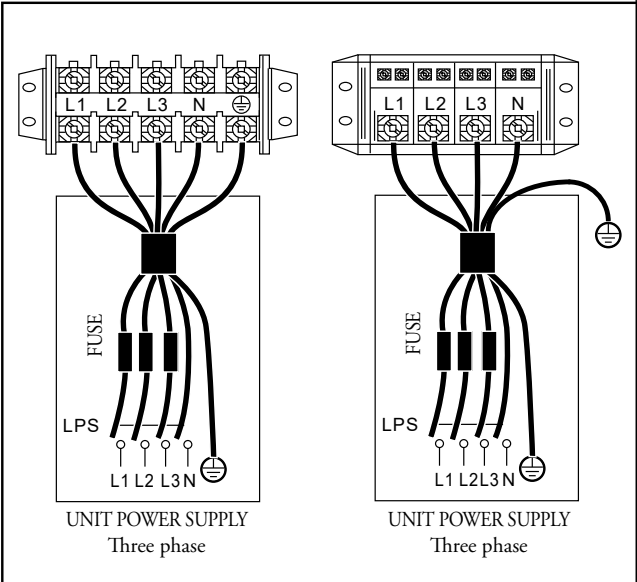


Photo example of terminal block with reference to MAGIS M4-6 Single-phase



Photo example of terminal block with reference to MAGIS M12-16 Three-phase



## 25 LIMITATION OF THE ABSORBED CURRENT OF THE MACHINE

The current absorbed by the machines can be limited, and consequently the contractual power used by the electricity meter, and therefore the fixed costs required by the electricity manager will also be limited.

There are 8 current limiting steps (in Ampere, see table below), the value of which changes depending on the size of the machine and the single-phase or three-phase power supply.

The power of the integrative system and DHW resistances can also be entered in the assistance menu so that they are counted.

Model	Set of parameters									
MAGIS M		0	1	2	3	4	5	6	7	8
MAGIS M4 - 6	A	18	18	16	15	14	13	12	12	12
MAGIS M8	A	19	19	18	16	14	12	12	12	12
MAGIS M 12 - 14	A	30	30	28	26	24	22	20	18	16
MAGIS M 16	A	30	30	29	27	25	23	21	19	17
MAGIS M12 T - 14 T	A	14	14	13	12	11	10	9	9	9
MAGIS M16 T	A	14	14	13	12	11	10	9	9	9
MAGIS M18	A	18	18	17	16	15	14	13	12.5	12
MAGIS M22	A	21	21	20	19	18	17	16	15	14
MAGIS M26	A	24	24	23	22	21	20	19	18	17
MAGIS M30	A	28	28	27	26	25	24	23	22	21

## 26 LIMITATION OF THE SOUND POWER OF THE MACHINE

The noise emissions of the heat pump can be reduced by actuating the SILENT MODE setting in the main "MENU" > "OPTIONS" > "SILENT MODE" > "SILENCE LEVEL".

There are 2 limiting levels of sound emissions by programming time bands (Start Time and End Time).

MAGIS M Model		kW	4	6	8	12	14	16	18	22	26	30
Sound power level	Heat. A7/W35 (Nom.)	dB(A)	55	58	59	65	65	68	71	72	75	77
	Max. Heating	dB(A)	60	61	61	65	65	69	-	-	-	-
	Silent Mode 1 - Heat.	dB(A)	55	56	57	62	62	63	68	69	71	73
	Silent Mode 2 - Heat.	dB(A)	53	53	55	56	56	56	65	66	68	69
	Cool. A35/W18 (Nom.)	dB(A)	56	58	60	64	64	69	70	72	74	77
	Max. Cooling	dB(A)	60	61	61	65	65	69	-	-	-	-
	Silent Mode 1 - Cool.	dB(A)	55	57	57	62	62	63	68	69	71	73
	Silent Mode 2 - Cool.	dB(A)	52	54	54	56	56	56	65	66	68	69

# MAGIS M

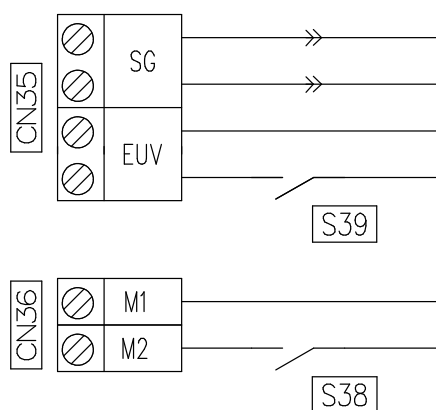
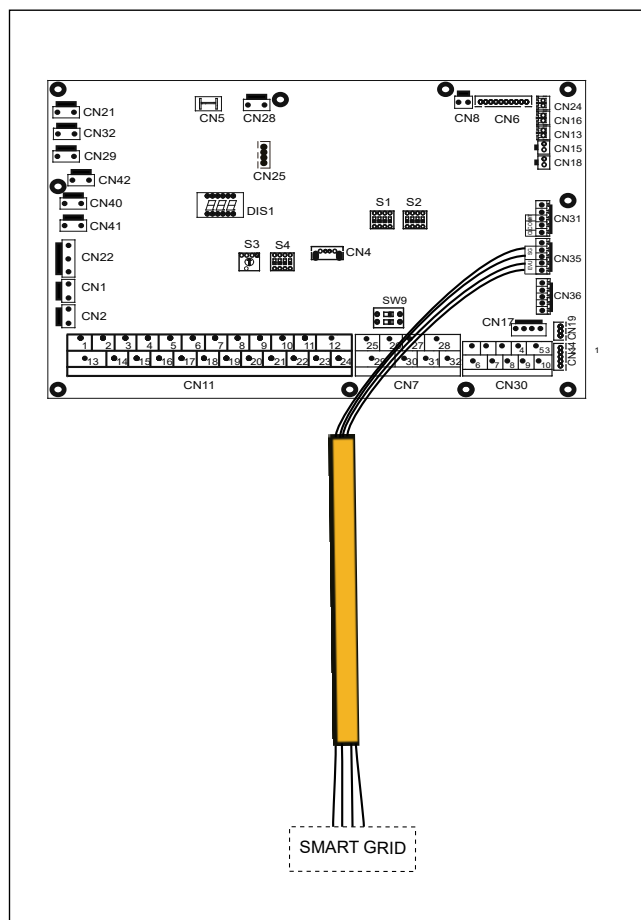
## 27 MANAGEMENT OF THE SMART GRID CONTACT AND PHOTOVOLTAIC CONTACT

The MAGIS M heat pump is designed to adjust electricity consumption so as to provide for integration with renewable energy generation systems or to maximise consumption in the presence of reduced electricity tariffs.

The unit has the smart network function; there are two ports on the P.C.B. (hydronic part) on connector CN35 to connect the SG (Smart Grid) signal and the EVU (photovoltaic) signal as follows:

1. When the EVU contact is closed and the SG contact is closed, as long as DHW is active, the heat pump gives DHW mode priority and the temperature setpoint of the DHW mode switches to 70 °C. If  $T5$  (DHW temperature probe)  $< 69$  °C, the TBH (DHW electrical resistance) is activated; if  $T5$  (DHW temperature probe)  $> 70$  °C, the TBH (DHW electrical resistance) is not active.
2. When the EVU contact is closed and the SG contact is open, as long as DHW mode is active and the mode is active, the heat pump gives DHW mode priority. If  $T5 < T5S-2$  (-2 setting), the TBH (DHW electrical resistance) is activated; if  $T5 \geq T5S+3$  (+3 setting), the TBH (DHW electrical resistance) is not activated.
3. When the EVU contact is open and the SG contact is closed, the unit runs normally (no forcing).
4. When the EVU contact is open and the SG contact is open, the unit runs as follows: the unit will not work in DHW mode and the TBH (DHW electrical resistance) will not be active; the disinfect function will not be active. The maximum operating time for cooling/heating is "SG RUNNING TIME", then the unit will switch off.

With the opposite mode to the photovoltaic contact on connector CN36 it is possible to bring a signal/contact (S38) to forcibly deactivate the MAGIS M.



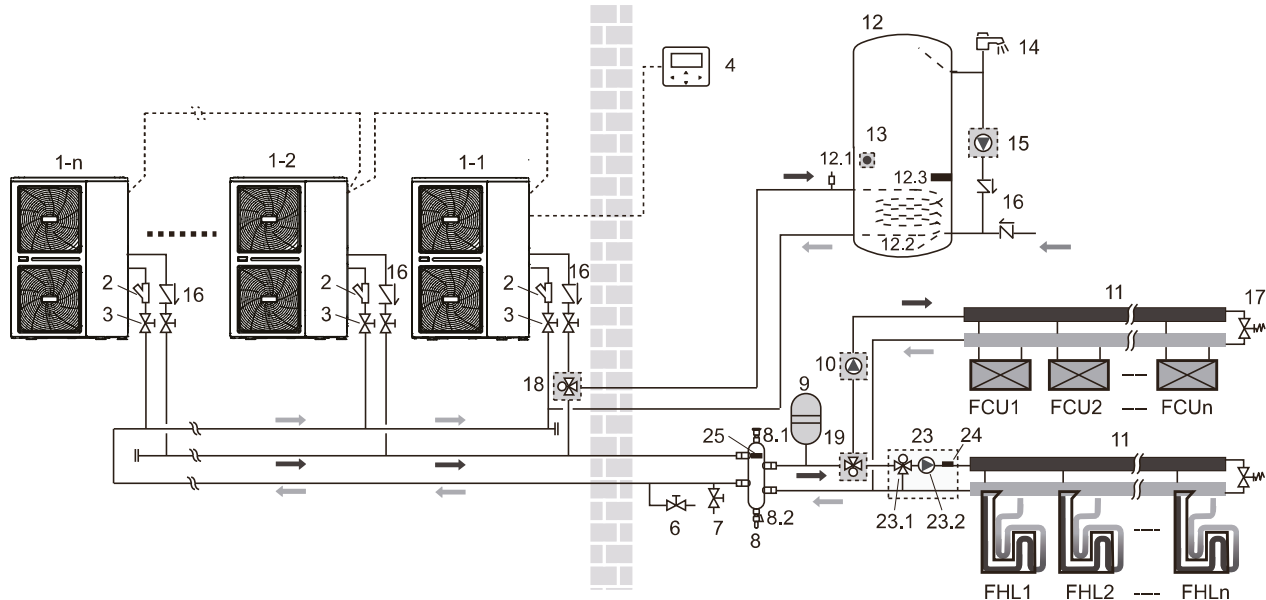
Apply the SG bridge supplied as standard with the machine, but NOT already installed, to use only the photovoltaic contact.



### KEY:

- S38 - MAGIS M deactivation selector
- S39 - Photovoltaic inlet

## 28 MAGIS M WITH SIMPLE CASCADE MANAGEMENT - WITHOUT A SYSTEM MANAGER



### KEY:

- |           |                                  |      |  |
|-----------|----------------------------------|------|--|
| 1-1       | - Heat pump: Master              | 13   | - T5: DHW tank temperature sensor                      |
| 1-2...1-n | - Heat pump: Slave               | 14   | - DHW cock   |
| 2         | - Y-filter                       | 15   | - P_d: DHW recirculation pump                          |
| 3         | - Cut-off valve                  | 16   | - One-way valve  |
| 4         | - Control panel                  | 17   | - By-pass valve  |
| 6         | - Discharge valve                | 18   | - SV1: 3-way valve for DHW tank                        |
| 7         | - Filling valve                  | 19   | - SV2: Summer/winter three-way valve                   |
| 8         | - Inertial tank / storage tank   | 23   | - Mixing unit (NOT supplied by Immergas)               |
| 8.1       | - Air purge valve                | 23.1 | - SV3: Zone 2 3-way mixing valve                       |
| 8.2       | - Discharge valve                | 23.2 | - P_c: Zone 2 circulation pump                         |
| 9         | - Expansion vessel               | 24   | - Tw2: Zone 2 flow temperature sensor                  |
| 10        | - P_o: Zone 1 circulation pump   | 25   | - Tbt1: Temperature sensor, tank/inertial storage tank |
| 11        | - Manifold/distributor           | FHL  | - Floor heating circuit                                |
| 12        | - Domestic hot water tank        | FCU  | - Fan coil cooling circuit                             |
| 12.1      | - Air purge valve                |      |  |
| 12.2      | - DHW storage tank coil          |      |  |
| 12.3      | - DHW tank electrical resistance |      |  |

Up to a maximum of 6 MAGIS M can be run in "Simple cascade" mode without having to use the System manager.

The units must be installed in parallel and can be used for heating, cooling and DHW.

Of the 6 potential machines set in parallel, only one of them must be set as a "Master" unit, whereas the other units will be set as "Slave".

The Control panel must be connected to the "Master" unit; at this point, the "Master" machine can control and display the operation of the entire system, whereas the "Slave" units must NOT be connected to the Control panel.

The system has the self-addressing function – after the initial start-up, the "Master" unit assigns the addresses for the "Slave" units, which will retain the addresses.

After restarting, the "Slave" units will still use the previous addresses, therefore there will NOT be an actual rotation of the units to share the operating hours (this function can only be obtained with the System manager).

If DHW production is required, only (and always) the "Master" unit will manage DHW production (thanks to 3-way valve 18); the power available in DHW is therefore, only that of the machine set as "Master".

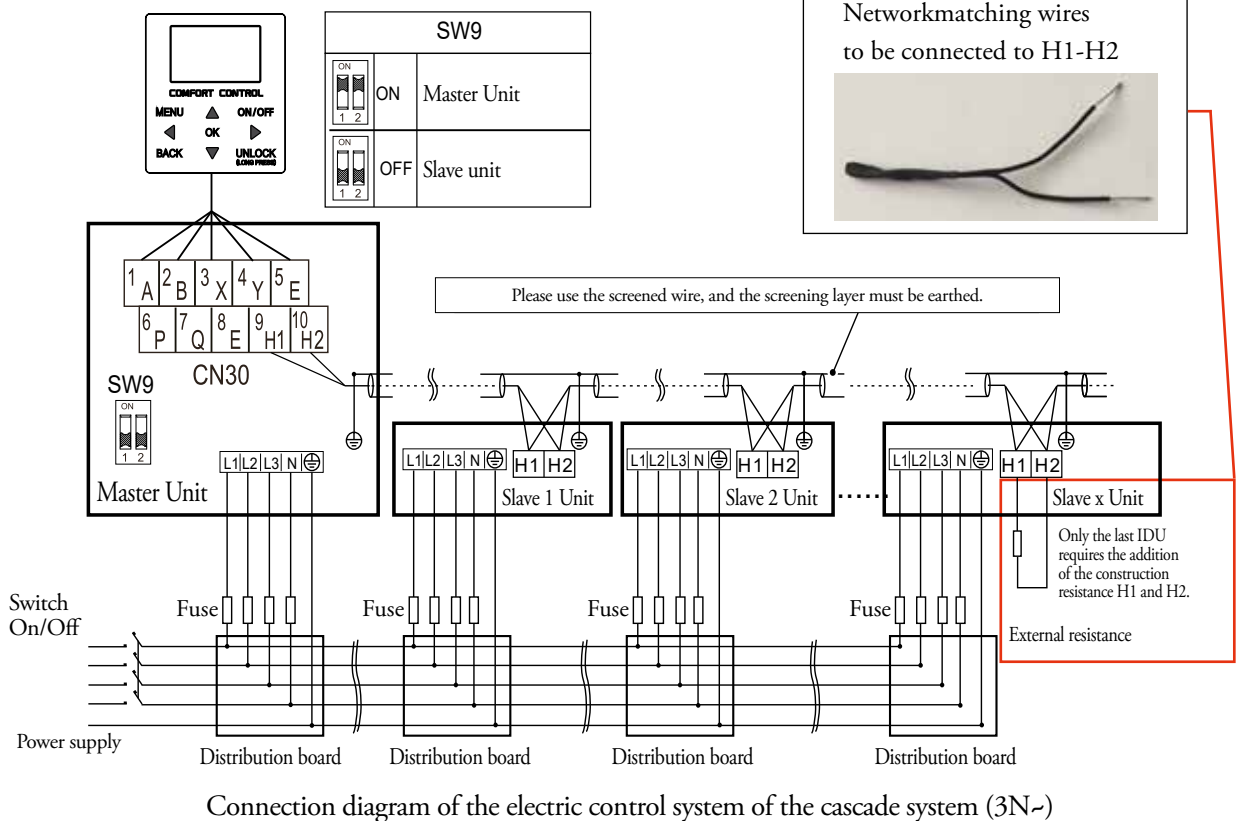
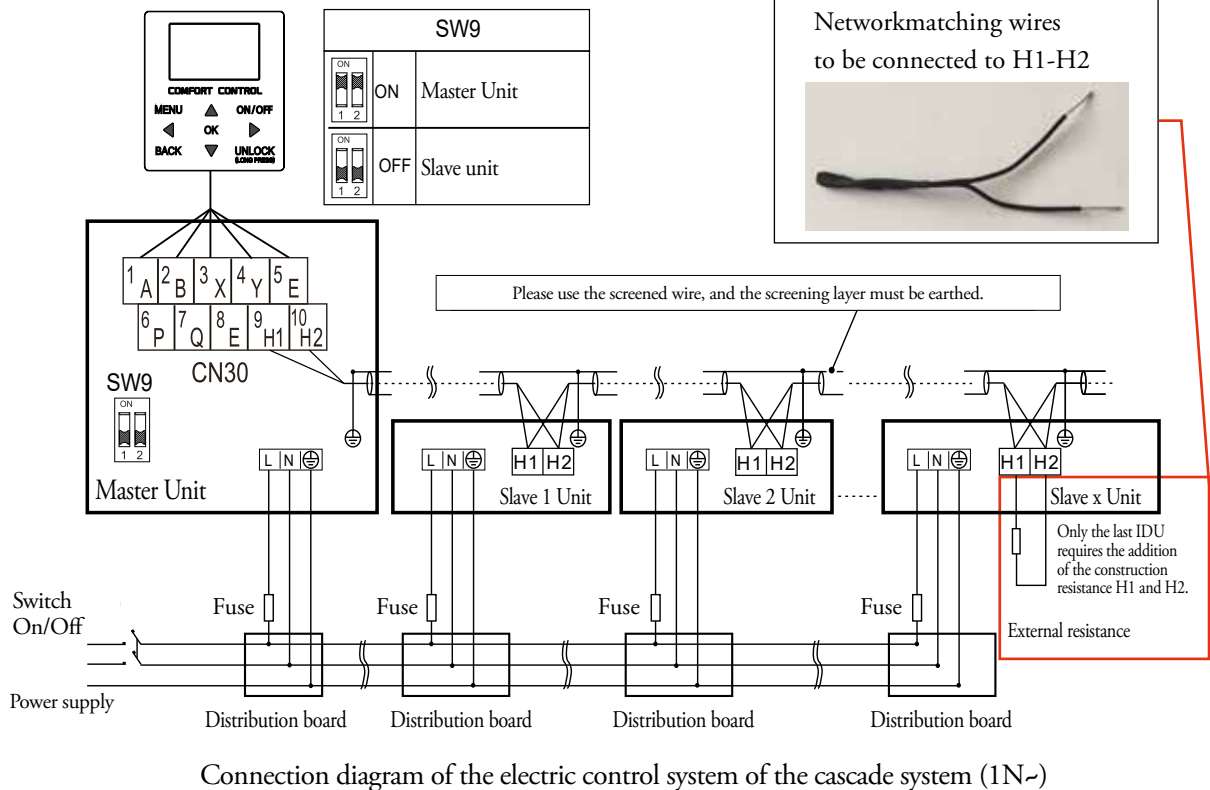
3-way diverter or mixing valves, pumps, temperature probes, any integrative electrical resistances and the Control panel must only be connected on the main board of the Master unit.

The 4-16 kW models can only be combined with each other.

The 18-30 kW models can only be combined with each other to achieve a system power of 18-180 kW.

# MAGIS M

## 28.1 EXAMPLE OF SIMPLE CASCADE ELECTRICAL CONNECTION MANAGEMENT





It is an electronic controller with microprocessor, realised with the objective of being a "unique manager" for integrated systems. Thanks to this innovative supervisor, it is possible to establish and activate the most convenient heat source depending on functional, environmental and "economic" parameters. In fact, to control everything, the System manager must acquire the data relative to the outdoor temperature (from the external probe) and the system flow temperature (relative to the pre-set climatic curve), after having configured the fuel cost parameter (e.g. methane gas) and that of the electric energy. Designed to enhance climatic comfort, it allows you to set different climatic curves for each zone, both for hot and cold. The user interface is made up from an LCD with matrix and a 6-key membrane keyboard. Installation takes place on a guide for electric components from control board.

## 29.1

## TECHNICAL FEATURES

Using the system manager (integrated with the relative expansion kits) it is possible to control:

- up to 4 MAGIS M heat pumps in a set configuration;
- Immergas boiler;
- storage tank for D.H.W. production (the D.H.W. temperature is managed by the NTC probe);
- room C.H. storage tank (the temperature inside the tank is managed by the NTC probe);
- up to 2 solar circulation units for systems with manifolds arranged on different slopes;
- temperature probes (NTC - PT1000);
- on-off request dry contact;
- integrative electric resistance for DHW;
- integrative electric resistance for heat system;
- variable flow temperature of the heat pump and the boiler (using the required models), depending on the outdoor temperature (a climatic curve is pre-selected);
- 8 expansion boards for the management of the air conditioning system the maximum number of manageable zones is 8, to which 2 expansions can be added for special functions (expansions with address 4 and 5). For each single zone, it is possible to decide whether it is a mixed zone, a direct zone, or a direct zone with water temperature probe (thus allowing the correction of the outlet temperature from the generator also according to the flow temperature detected on the direct zones, useful if upstream there is a hydraulic manifold in which mixing with the system return takes place);
- 2 expansion boards for the additional functions, namely:
  - hot/cold switch-over on distinct systems (for example systems with radiant panel heating and fan-coil cooling);
  - recirculation pump management for DHW;
  - acquisition of a signal from a system that generates electrical energy (e.g. photovoltaic system);

- signal acquisition by a biomass system;
- management of a pump downstream of the plate heat exchanger;
- management of a pump for thermal discharge;
- management of a remote activation or domotics remote control system via telephone dialer;
- as far as temperature/humidity control devices are concerned, a maximum of 4 Zone Remote Panels/Controls can be associated only in zones 1-3 and HT (high temperature) zone. The Temperature/Humidity Sensor Kit can be used instead in all zones 1-8; another set-up is for room thermostats and on-off room hygostats;
- up to 8 dehumidifiers.

On the other hand, in terms of the main settings that can/must be carried out, the System Manager allows you to acquire or programme:

- outdoor temperature (with a probe already installed on MAGIS M);
- system flow temperature;
- storage tank temperature (even through 2-3 probes, 1 of which refers to the solar-heated part of the boiler);
- by means of self-diagnosis, detection and display of error codes in the event of anomalies;
- date and time;
- differentiated selection and programming for each individual zone;
- programming the time periods for DHW production;
- anti-legionella program (in a system where there is a boiler or integrative resistance on the storage tank, in addition to the Heat pump);
- cost of combustion (Methane or LPG);
- cost of the electric energy;
- management of the heat/cooling sources.

• **System manager**

**cod. 3.021522**



# MAGIS M and Integrated Systems

## NOTE:

As regards the majority of Immergas boiler models, the electrical connection between them and the System manager is made directly via two cables; only in certain models must the electrical connection be made via the electronic relay (abbreviation EMR 12 Vdc cod. 3.023945);

Specifically, as regards the electrical connection between the System manager and the VICTRIX TERA and VICTRIX OMNIA series boilers, this must be made exclusively via the ModBus RS-485 P.C.B. kit cod. 3.029912; this board is also

used to optimise and expand certain particular functions, such as anti-legionella management on some boiler models.

The electrical connection on the entire range of Immergas boilers between the System Manager and the 2, 4 or 6 kW system integrative resistance kit must be set up using a solid state electronic relay (abbreviation SSR 6 Vdc code 3.023946).

## 30.1

## TECHNICAL DATA

The System manager can be powered exclusively via transformer or relevant generator:

- direct power supply: 48 Vdc (36 Vmin...72 Vmax.)
- alternating power supply: 24 Vac +10/-15 %, 50/60 Hz

The device has the following features:

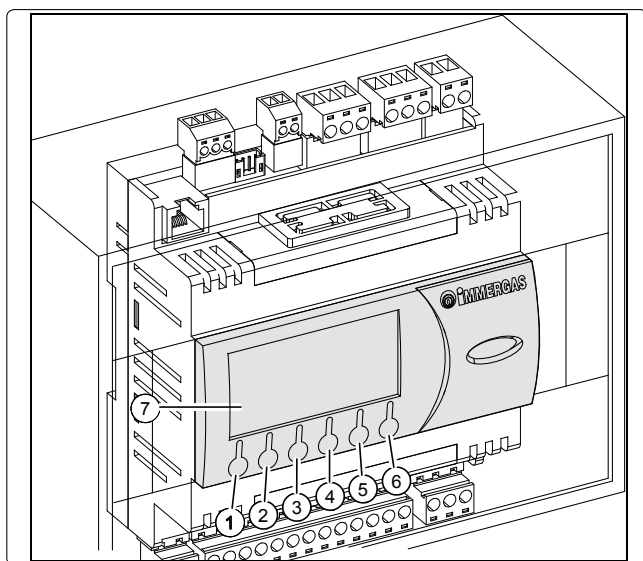
- user interface via LCD with matrix
- diaphragm keyboard with 6 keys
- installation on DIN guide for electric components from control board
- dimensions: L 105 x H 110 x D 60

Operating conditions	-10° T 60 °C, 90% RH non-condensing
Degree of protection	IP40 only on front panel
Class depending on protection against electric shock	to be integrated on Class I and/or II equipment
Period of electric stress of the isolating parts	long
Type of disconnection or micro switching	micro switching
Category of resistance to heat and fire	Category D (UL94-V0)
Immunity against surges	Category II
Ageing features (functioning hours)	80.000
No.° of automatic operation handling cycles	100,000 (EN 60730-1); 30,000 (UL 873)
Class and structure of the software	Class A
Surge immunity category	Category III (IEC EN 61000-4-5)

# MAGIS M and Integrated Systems

31

## DESCRIPTION AND CONTROLS OF SPECIAL FUNCTIONS



This **button (1)** allows you to change the operating mode of the system, specifically: Summer (only DHW and solar heating), Summer with cooling, Winter, Party (all zones are set in comfort mode), Standby (all requests are disabled: room antifreeze protection < 5°C only remains active, if Immergas room probe is installed).



















This **button (2)** allows you to access the submenus: Selection, Programming, Info, Alarms log, Assistance.

This **button (3)** allows you to move back from a current menu to the previous one.

These **buttons (4 and 5)** allow you to scroll through the menus on the screen cyclically or to increase or decrease the value of the various parameters.

The **button (6)** enables you to change the displayed data.

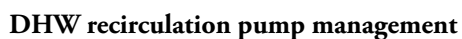
**DISPLAY (7)** description:

-  winter - room central heating and DHW production functions are enabled;
-  summer - DHW production only is enabled;
-  comfort temperature is active;
-  operating with automatic program;
-  operating with manual program;
-  operating with holiday timer program;
-  operation with energy savings programme;
-  symbol indicating anomaly;
-  room central heating request in progress;
-  request for DHW in progress;
-  DHW heating and cooling program;
-  operating in "Party" mode;
-  request to heat or cool room;
-  solar panel operation in progress;
-  system in Stand-by;
-  request for room cooling in progress;
-  dehumidifier with cooled air;
-  dehumidifier with neutral air;

The system Manager is equipped with several important functions and application options:

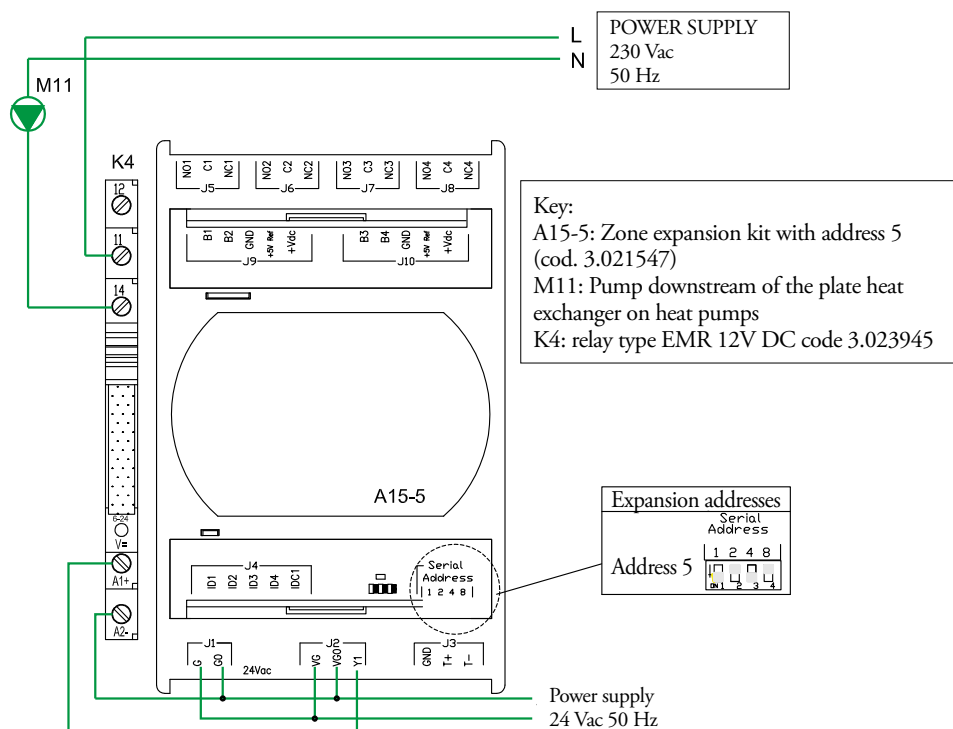
- Set climatic curves for each zone, both for hot and cold; maximum temperature of 85 °C, which can be selected for all zones;
- Identify each zone independently: only hot, hot/cold, hot/cold with dehumidifier and dew point calculation, cold only, cold only with dehumidifier and dew point calculation. The said dew point calculation function can also be enabled/disabled if dehumidifier management is disabled (e.g. with another dehumidifier system managed independently);
- Set the minimumT integration (cut off) or COP calculation to use the heat pump;
- Optimise the flow temperature to the system by means of probes situated on the secondary booster circuit (e.g. with a hydraulic manifold);
- Optimise the flow temperature to the system by means of probes situated on the hot and cold thermal flywheel / inertial storage tank;
- Management of an external probe in case MAGIS M is installed in unfavourable conditions to detect the outdoor temperature;
- In the event of boiler integration, it is also possible to keep MAGIS M permanently active if COP is advantageous. In general, the System manager must be connected to the boiler on the external probe terminals;
- DHW production storage tank management via the heat pump as opposed to the solar system (MAGIS M connected to the lower coil, boiler connected to the upper coil), in order to obtain renewable source coverage on DHW;
- Input on expansion address "5" to force activation of MAGIS M with the FV system, which generates electricity (refer to the diagram on the next page). By using an inverter/electronic device that supplies a signal when FV production exceeds a set value, a contact closes on expansion address "5", which:
  - Immediately brings the DHW storage tank to 50 °C, disabling any programmed DHW time bands;
  - The minimum COP functional convenience is reset and minimumT integration brought to -15 °C, thus removing integration from the boiler; the only thing that remains active is the maximum time for the system to be fully operational, beyond which the boiler is activated in order to guarantee climatic comfort;
- If a puffer system is configured in the menu, it is heated up to 55 °C, even without request from the system; also in this case, the only thing to remain active is the maximum time for the system to be fully operational.
- Input on expansion address "4" to disable the generators (e.g. boiler or electrical resistance remain on Standby) when a thermoflue operates;
- Possibility to have a remote-domotic management on the Manager with digital signals or Modbus communication protocol;
- Possibility of managing the system (with a maximum of three zones), using the DOMINUS interface board kit; this kit allows management via the DOMINUS App, which allows the user to program and view the main operating parameters via a smartphone and/or tablet.

## Photovoltaic contact management

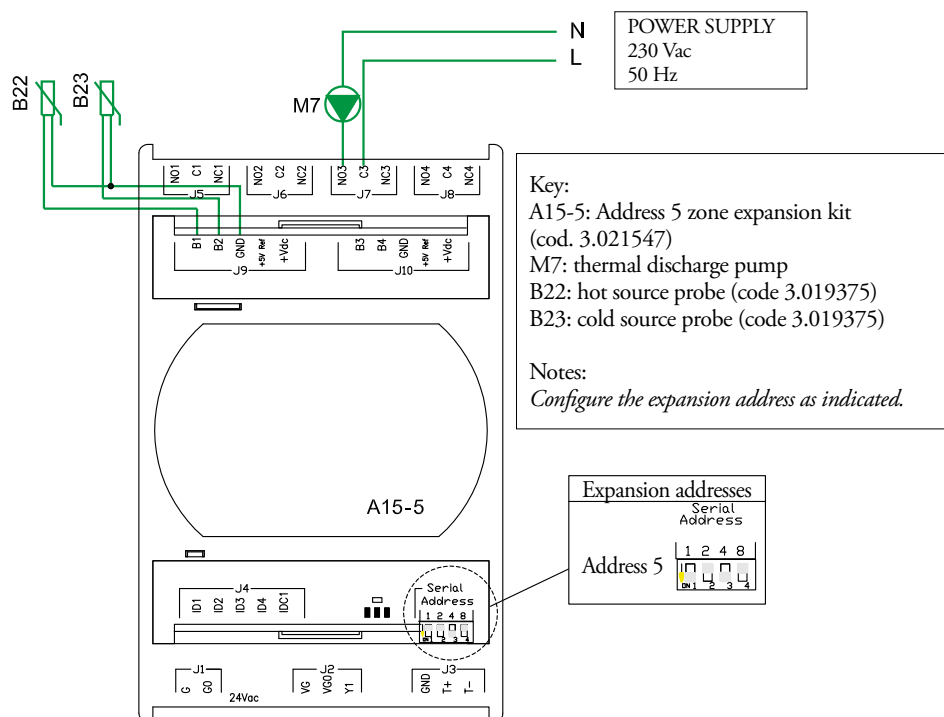


# MAGIS M and Integrated Systems

## Pump management downstream of the plate heat exchanger

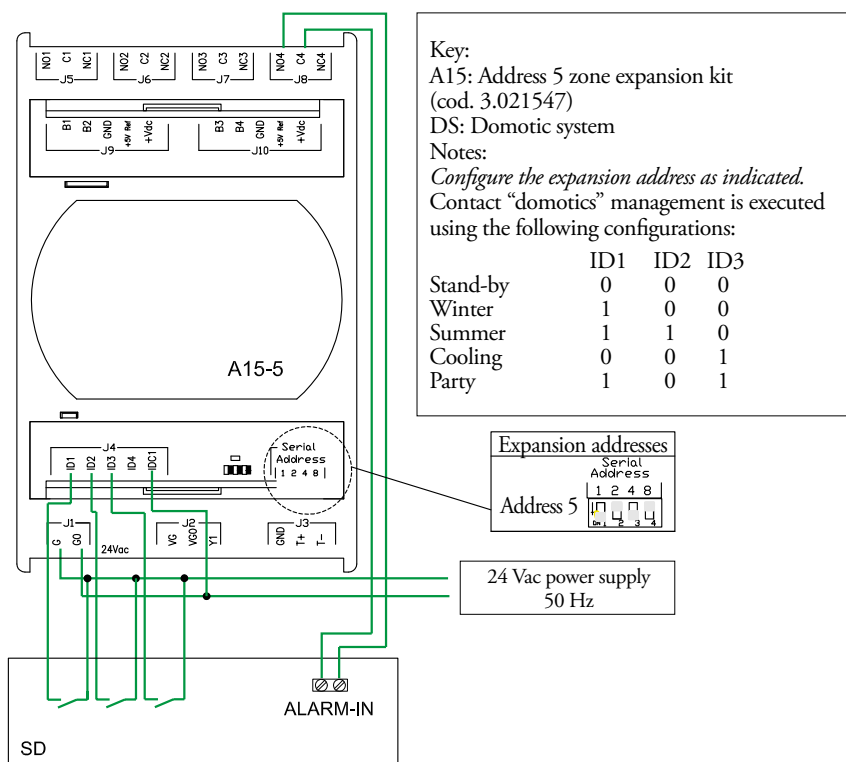


## Pump management for thermal discharge

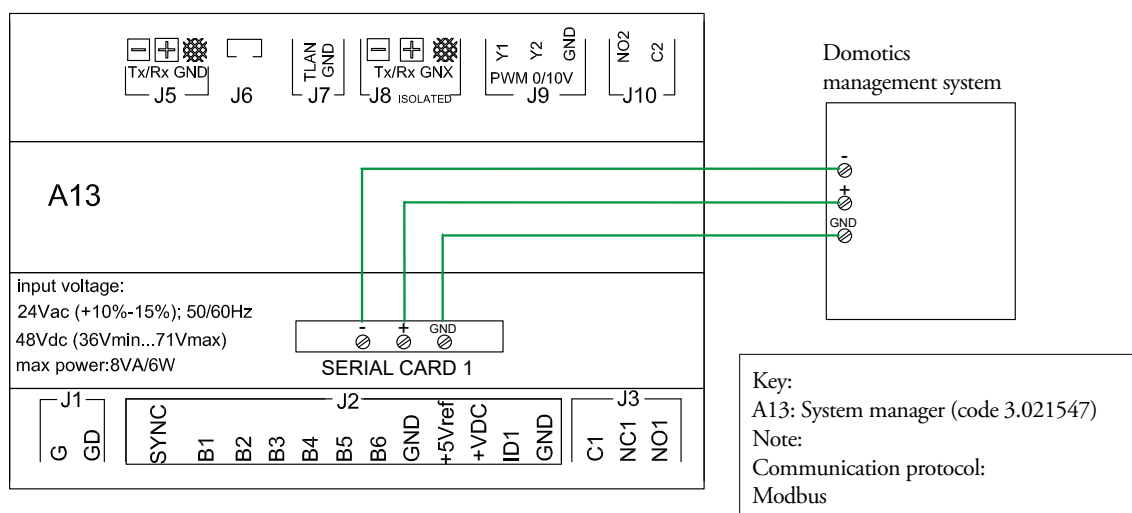


# MAGIS M and Integrated Systems

## Contact management from domotic system

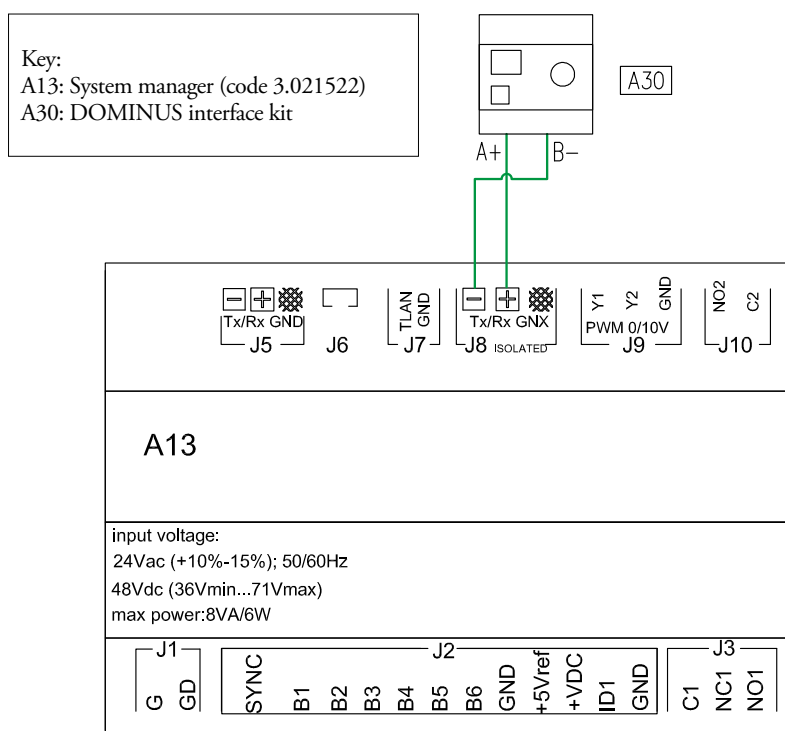


## Domotic system management with communication protocol

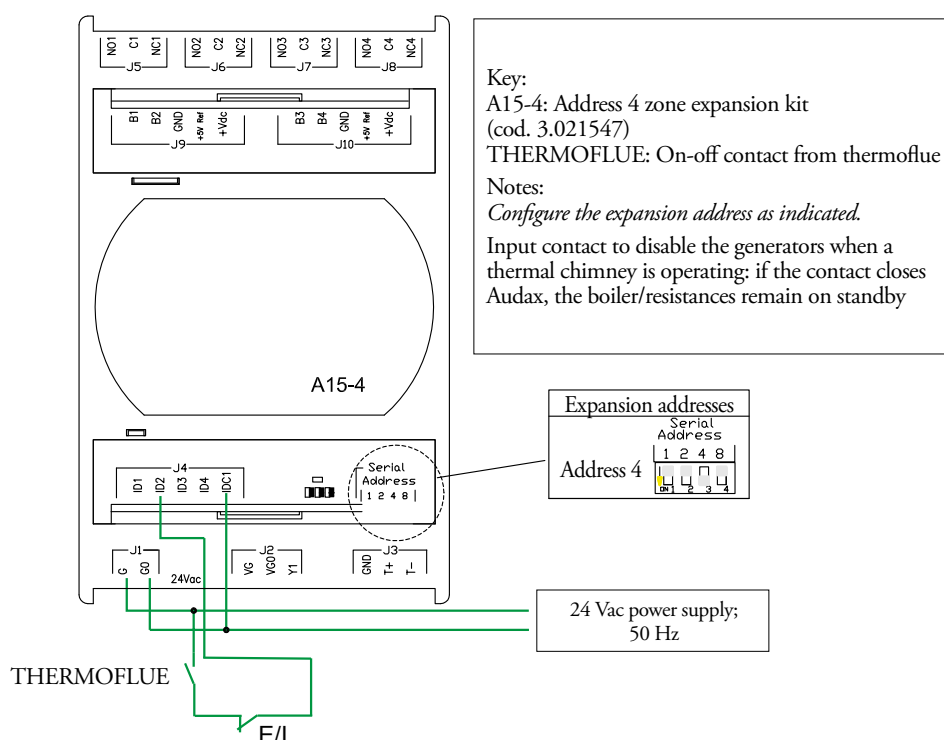


# MAGIS M and Integrated Systems

## Management with DOMINUS interface kit

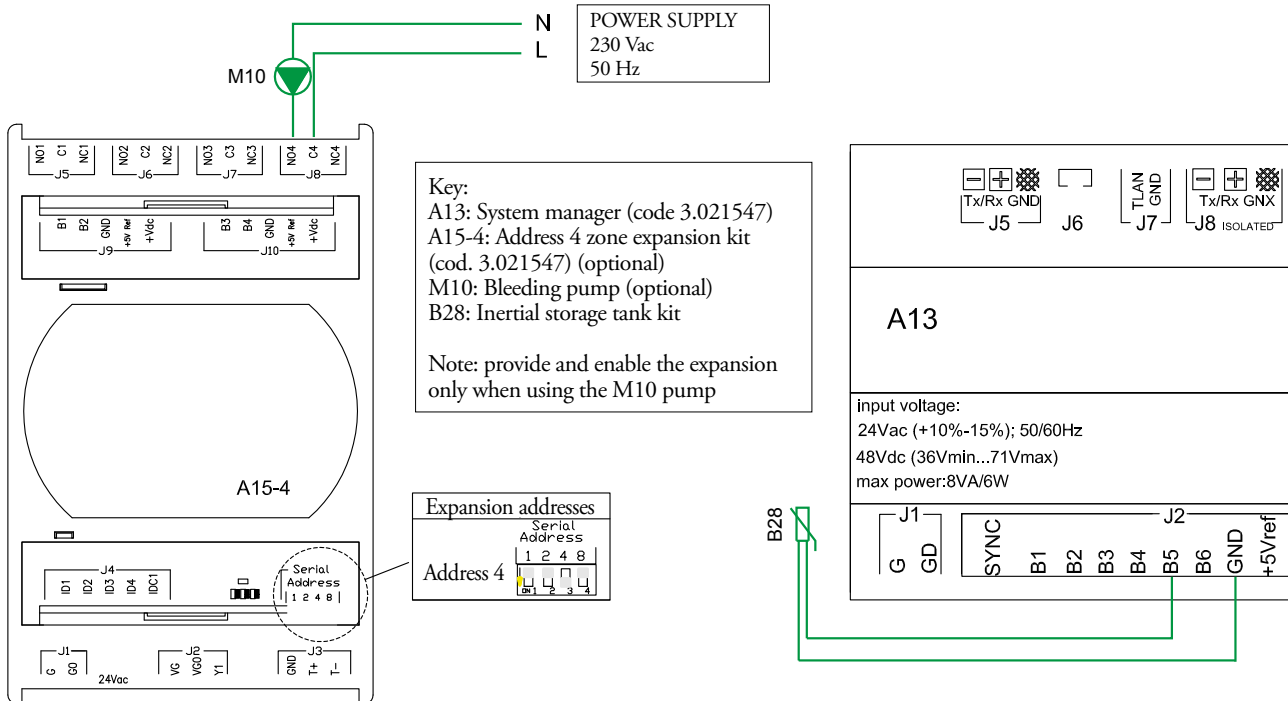


## Thermoflue contact management



# MAGIS M and Integrated Systems

## Inertial storage tank temperature control and possible bleeding pump



# MAGIS M and Integrated Systems

## 32 ZONE REMOTE PANEL (WITH SYSTEM MANAGER)



It is an electronic device equipped with a back-lit display to control and adjust the room's temperature and humidity. Connection to the System manager occurs via two BUS cables (the same of the MAGIS M connection).

It programs the relative room temperature control. It can be applied to the wall using the supplied screws and plugs. The kit is powered at 24 V (directly from the System manager).

• **OPTIONAL** **cod. 3.030863**

## 33 REMOTE CONTROL OF ZONE (WITH SYSTEM MANAGER)



It is an electronic device equipped with a back-lit display to control and adjust the room's temperature and humidity. Connection to the System manager occurs via two BUS cables (the same of the MAGIS M connection).

It programs the relative room temperature control. It can be applied to the wall using the supplied screws and plugs. The kit must be powered at 230 Vac (externally).

• **OPTIONAL** **cod. 3.023364**

## 34 TEMPERATURE/HUMIDITY SENSOR (WITH SYSTEM MANAGER)



It is a room temperature and humidity probe, to be applied to the wall.

Differently to the zone remote control kit, in this case, the settings of all room parameters take place on the System Manager. The kit must be connected directly to the expansion board for zone management.

The kit is powered at 24 V.

• **OPTIONAL** **cod. 3.021524**

## 35 EXPANSION BOARD FOR ZONE MANAGEMENT (WITH SYSTEM MANAGER)



This component must be powered at 24 Vac and is mainly used for system zone management; in particular n°1 expansion kit must be used for each zone. The expansion kit manages pump, mixing valve and the dehumidifier of the same zone, acquiring the room request (temperature and humidity) for a determined zone. The following can be connected to this kit:

- the room temperature and humidity sensor;
- an on-off type request contact.

Installation takes place on a DIN guide for electric components from control board. **This expansion board is envisioned as per standard in the 2 kits for zone systems** (see the following page).

• **OPTIONAL** **cod. 3.021547**

# MAGIS M and Integrated Systems

36

## DISTRIBUTION KIT TO THE SYSTEM (WITH SYSTEM MANAGER)

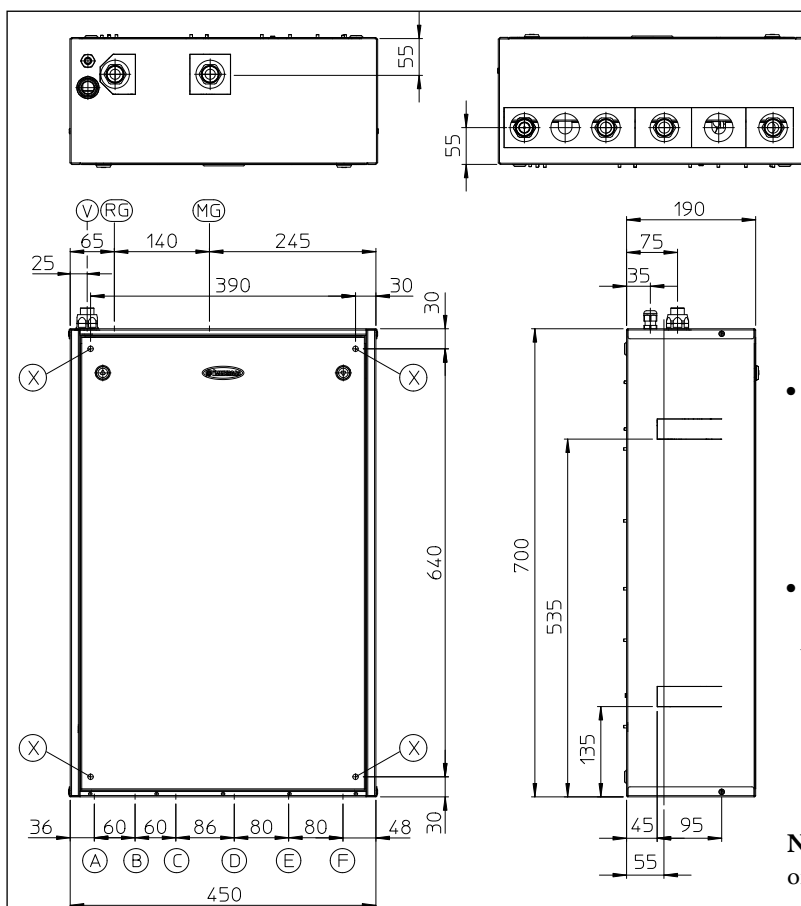


Two pre-packaged systems called: "2 mixed zone kit" and "2 mixed zones and 1 direct kit", **for combination with heat pumps of up to 8 kW**. They are comprised of 2 separate hydraulic manifolds (flow/return) + by-pass, thermometers to read the temperatures, motorised mixing valves, low energy consumption electro pumps and expansion boards for electric management. The pumps included in the kit are distinguished for being very elastic, also thanks to the operating modes that can be pre-set. All parts are already assembled and ready for operation exclusively in combination with the System Manager. With the aid of the expansions the 2 kits are governed by the System Manager during the central heating and cooling phases.

Acquisition of the outdoor temperature from system Manager enables you to select independent flow temperature curves for each of the 2 or 3 zones of the system (both with C.H. and cooling). Inserting these kits into the technological system enhance overall comfort and energy savings.

36.1

## DIMENSIONS AND CONNECTIONS



Height (mm)	Width (mm)	Depth (mm)
700	450	190

### KEY:

- AR - Appliance return (G 3/4")
- AF - Appliance flow (G 3/4")
- V - Electrical connection
- X - Holes for wall-hung installation of the kit

### • MIXED ZONES 2 KIT cod. 3.021528

- B - Zone 1 return (G 3/4")
- C - Zone 2 return (G 3/4")
- D - Zone 1 flow (G 3/4")
- E - Zone 2 flow (G 3/4")

### • 2 MIXED ZONES AND 1 DIRECT ZONE KIT cod. 3.021527

- A - Zone 3 return (G 3/4")
- B - Zone 1 return (G 3/4")
- C - Zone 2 return (G 3/4")
- D - Zone 1 flow (G 3/4")
- E - Zone 2 flow (G 3/4")
- F - Zone 3 flow (G 3/4")

**NOTE:** Suitable for combination with heat pumps of up to 8 kW

# MAGIS M and Integrated Systems

## 36.2

## TECHNICAL DATA

		Mixed zones 2 kit	2 mixed zones and 1 direct zone kit
Maximum nominal pressure	bar	3	3
Maximum operating pressure	°C	90*	90*
Low temperature circuit minimum set point regulation temperature	°C	25	25
Low temperature circuit maximum set point regulation temperature	°C	50 ÷ 85*	50 ÷ 85*
Water content in device	litres	1.5	1.9
Total head available in non-mixed zone with 1000 l/h flow rate (max.)	kPa (m c.a.)	--	43.18 (4.40)
Total head available in mixed zone (mixing valve closed) with 1000 l/h flow rate (max.)	kPa (m c.a.)	42.07 (4.29)	42.07 (4.29)
Empty device weight	kg	21.1	23.1
Full device weight	kg	22.6	25.0
Electrical connection	V/Hz	230/50	230/50
Maximum input	A	0.9	1.2
Installed electric power	W	105	150
Power in Stand-by	W	9.5	9.5
Electric plant protection	-	IPX4D	IPX4D
Hydraulic side generator - kit maximum distance	m	15	15

\* = temperature can only be reached in combination with a boiler.

## 36.3

## CIRCULATION PUMP SETTINGS AND CONFIGURATIONS

The kits are supplied with circulating pumps fitted with speed regulator. These settings are suitable for most systems.

For proper use one must select the most suitable type of operation for the system.

By rotation, it is possible to select the following pump control mode:

Fixed speed I, II, III.

Proportional head I, II, III.

Constant head I, II, III.

### - Fixed speed

Adjusts the pump speed in fixed mode.

It is possible to set 3 different speeds:

I: Minimum Speed.

II: Intermediate speed.

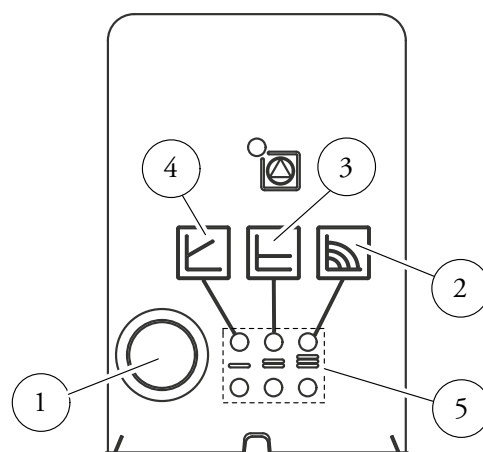
III: Maximum speed (factory set speed).

### - Proportional head ( $\Delta P-V$ )

This allows the pressure level (head) to be proportionally reduced as the system heat demand decreases (flow rate reduction). Thanks to this function, the electric power consumption of the pump is reduced further: the energy (power) used by the pump decreases according to the pressure level and flow rate. With this setting, the pump guarantees optimal performance in most heating systems, proving particularly suitable in single-pipe and two-pipe installations. Any noise originating from the water flow in the pipes, valves and radiators is eliminated by reducing the head. Optimal conditions for thermal comfort and acoustic well-being.

### - Constant head ( $\Delta P-C$ )

The pump maintains the pressure level (head) constant as the system heat demand decreases (flow rate reduction). With these settings, the pump is suitable for all floor systems where all the circuits must be balanced for the same drop in head.



#### KEY:

- 1 - Automatic vent mode operation
- 2 - Fixed speed operation
- 3 - Constant head operation
- 4 - Proportional head operation
- 5 - Functioning mode indicator LEDs

# MAGIS M and Integrated Systems

36.4

## GRAPHS OF CIRCULATION PUMP FLOW RATE-ABSORPTION-HEAD

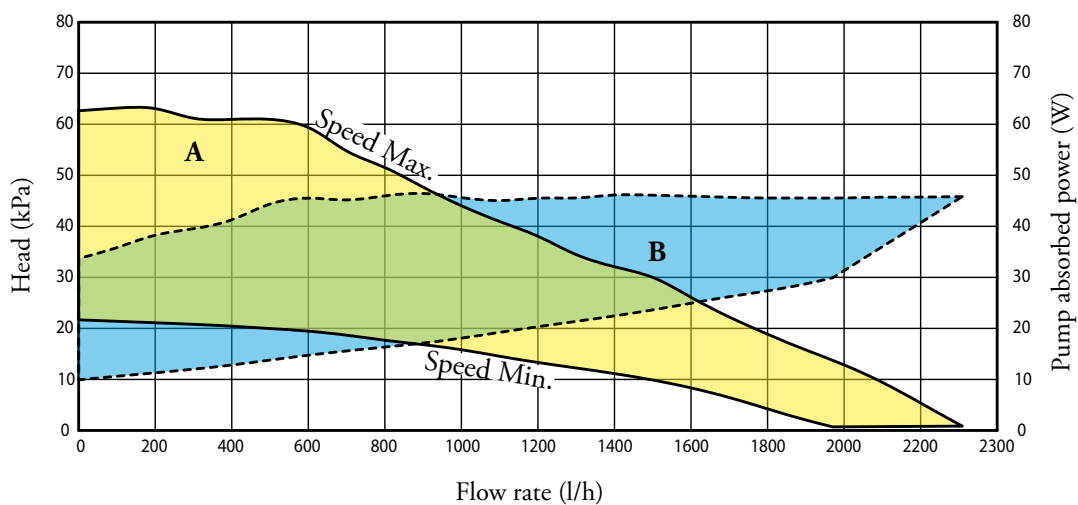
The kit contains an electronic low consumption circulation pump, whose flow rate/head features are shown in the graph below.

All pumps in the kit are suitable for operation with heat and cold carrying fluid.

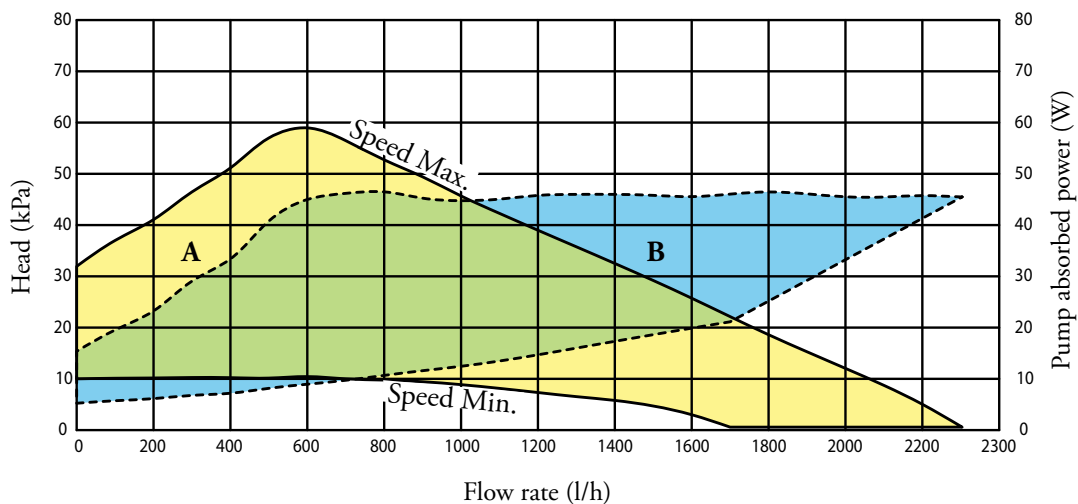
### ZONE MIXED WITH A CLOSED MIXING VALVE AND OPEN BY-PASS COCK

WILO PARA 15-7 CM 130

Constant head ( $\Delta P_C$ ).



Proportional head ( $\Delta P_V$ ).



EEI  $\leq 0.20$

#### KEY:

A = Head available at speed 2 ÷ 7

B = Power absorbed by the system pump (dotted area)

**NOTE:** In case of closed by-pass cock, the available head also depends on the upstream circuit of the kit. Starting from the available head shown in the figure, to determine the available pump head it is necessary to subtract the head losses of the circuit upstream of the kit.

# MAGIS M and Integrated Systems

## 36.5 GRAPHS OF CIRCULATION PUMP FLOW RATE-ABSORPTION-HEAD

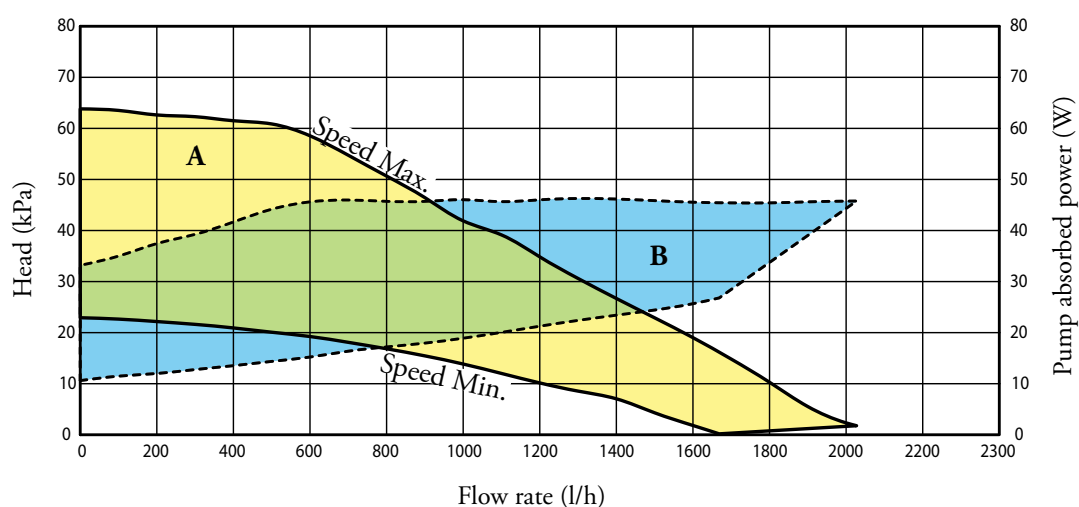
The kit contains an electronic low consumption circulation pump, whose flow rate/head features are shown in the graph below.

All pumps in the kit are suitable for operation with heat and cold carrying fluid.

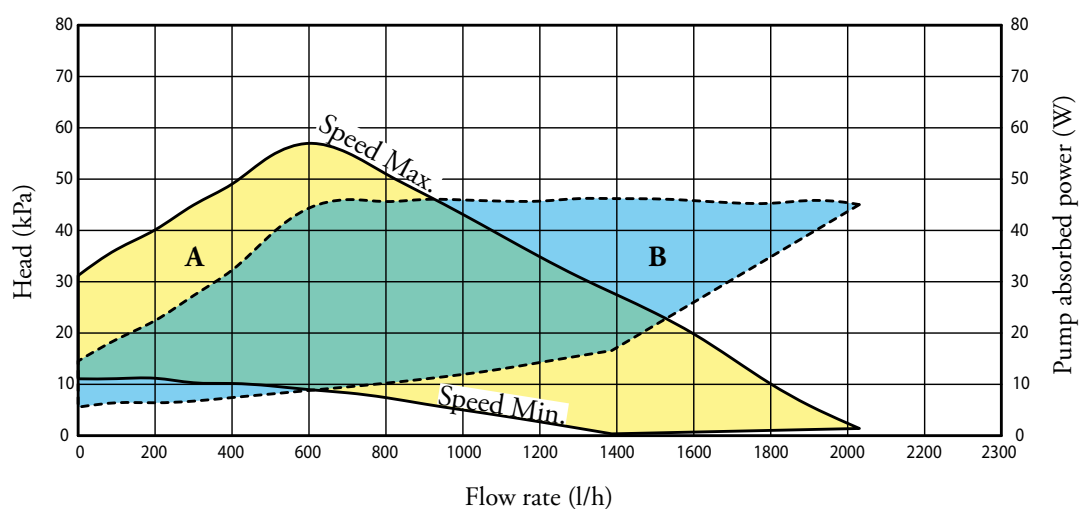
### ZONE MIXED WITH AN OPEN MIXING VALVE AND DIRECT ZONE AND OPEN BY-PASS COCK

WILO PARA 15-7 CM 130

#### Constant head ( $\Delta P C$ ).



#### Proportional head ( $\Delta P V$ ).



EEI  $\leq$  0.20

#### KEY:

**A** = Head available at speed 2 ÷ 7

**B** = Power absorbed by the system pump (dotted area)

**NOTE:** In case of closed by-pass cock, the available head also depends on the upstream circuit of the kit. Starting from the available head shown in the figure, to determine the available pump head it is necessary to subtract the head losses of the circuit upstream of the kit.

# MAGIS M and Integrated Systems

37

## DEHUMIDIFIER



Designed to be coupled to cooling plants with radiant panels, the dehumidifier allows to keep the percentage of relative humidity in the room within the comfort values, preventing the possible formation of condensate on the walls.

The dehumidifier, which is designed to be installed vertically on the wall (recessed), has pre- and post-cooling coils.

These components allow excellent control of the air temperature and humidity.

However, it can function without the aid of pre and post cooling water coils, thus allowing to dehumidify when the cooling system is off, typical of mid-season.

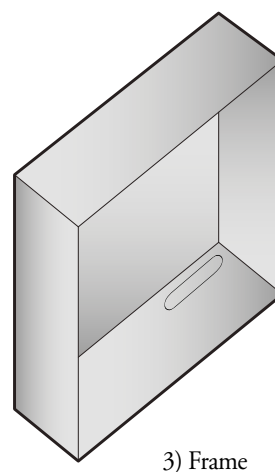
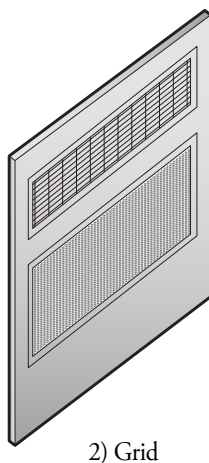
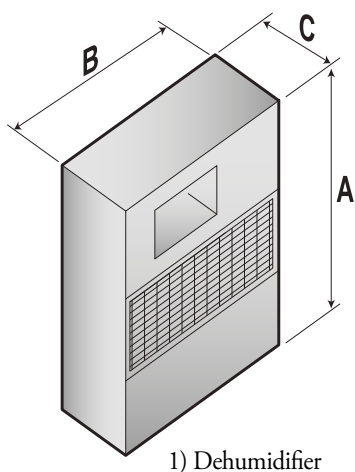
In compliance with European Directives, it has EC Declaration of Conformity.

Dehumidification can take place:

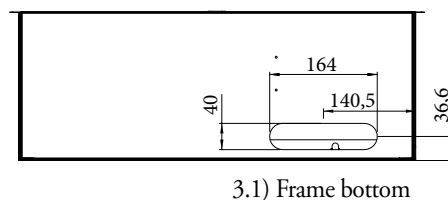
- with **neutral air**: without variation of the air temperature, dehumidifies internal rooms;
- with **cooled air**: contributes to cooling the rooms, as well as reducing the internal relative humidity.

### 37.1

### DIMENSIONS AND CONNECTIONS



Model	A (mm)	B (mm)	C (mm)
1	680	545	221
2	750	660	20
3	703	605	228



• **DEHUMIDIFIER** **cod. 3.021529**  
(frame and grid to be purchased separately)

Connect the F-R (female) 1/2" fittings of the dehumidifier to the cooling system, using the measurements in fig. 3.1

# MAGIS M and Integrated Systems

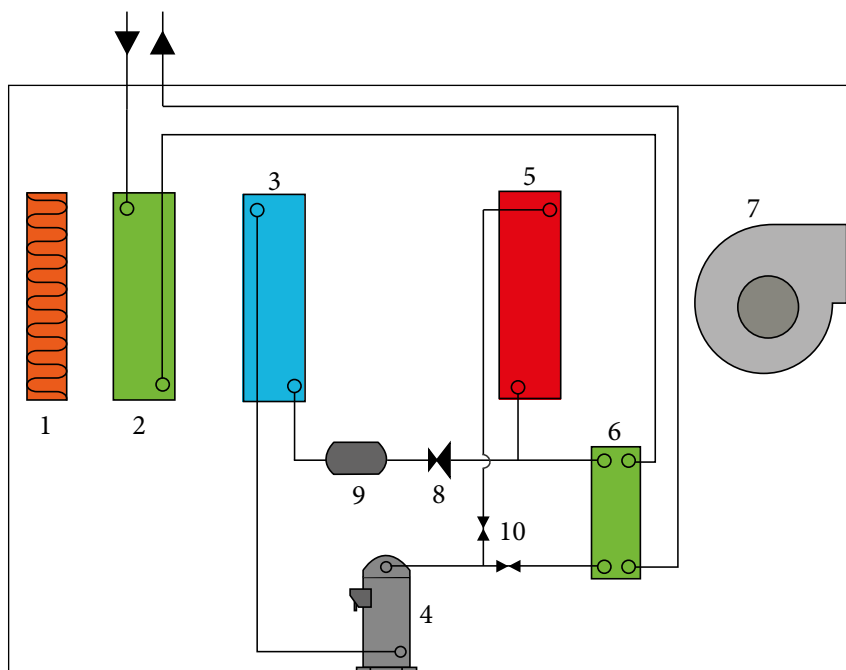
37.2

## OPERATING PRINCIPLE

The **humid air** is taken from the room through the fan (7) and made to pass through the filter (1) and the pre-cooling water coil (2), where the air itself is cooled and taken to a condition near to the saturation curve. It then passes through the evaporating coil (3) where air is further cooled and dehumidified.

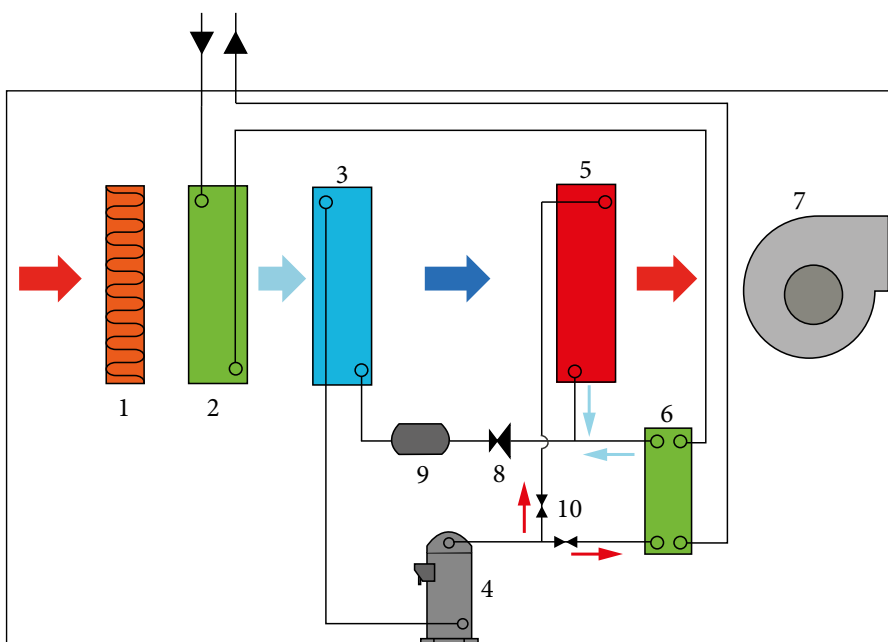
### KEY:

- 1 - Air filter
- 2 - Pre-cooling coil
- 3 - Evaporator
- 4 - Compressor
- 5 - Condenser
- 6 - Post-cooling coil
- 7 - Fan
- 8 - Throttle valve
- 9 - Dryer filter
- 10 - Cut-off valve



### Dehumidification mode with neutral air

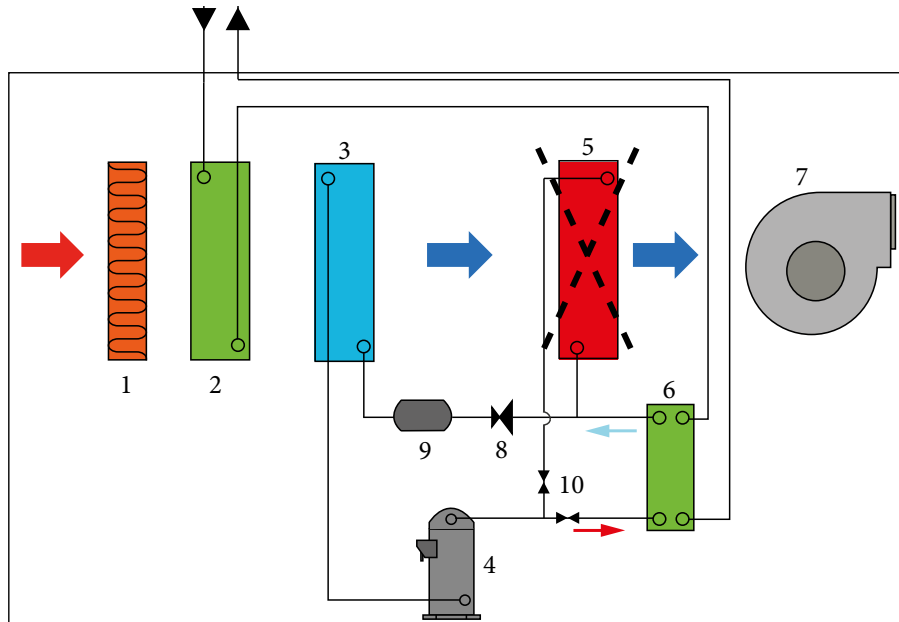
The cooling circuit works by partially condensing in water through the heat exchanger (6) and partially in air through the heat exchanger (5); accordingly air post-heating is performed and this air is sent into the room in thermally neutral conditions.



# MAGIS M and Integrated Systems

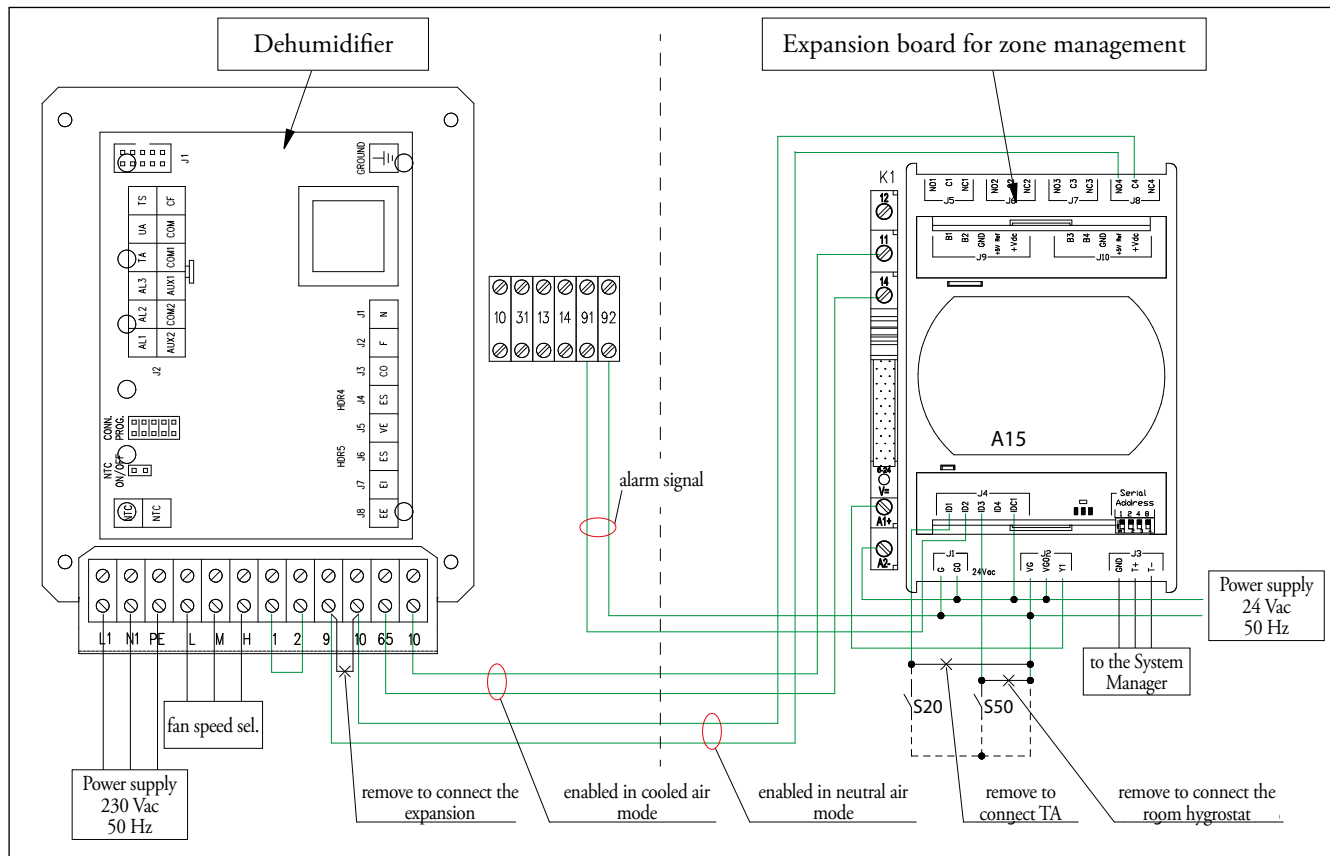
## Dehumidification mode with cooled air

In this case, the cooling circuit performs 100% of condensation in water via the heat exchanger (6). The condenser (5) is cut-off via the valve (10) and the air sent into the room is the same – cooled and dehumidified – at evaporator outlet (3)



### 37.3

## DEHUMIDIFIER LAYOUT AND WIRING DIAGRAMS (WITH SYSTEM MANAGER AND EXPANSION)



# MAGIS M and Integrated Systems

## 37.4

## TECHNICAL DATA

Coolant		R134a
Humidity removed in neutral air condition <sup>(1)</sup>	litres/24h	20.1
Cooling capacity <sup>(1)</sup>	W	1250
Nominal water input	l/h	150
Head losses	kPa	7.8
Water supply temperature operating field	°C	15 - 25
work humidity field	%	40 - 90
Air flow rate	m <sup>3</sup> /h	250
Fan useful static head (maximum speed)	Pa	43
Sound pressure <sup>(3)</sup>	dB(A)	35
Sound power	dB(A)	43
Power absorbed <sup>(1)</sup>	W	340
Power supply	V/Ph/Hz	230/1~/50
Maximum power absorbed <sup>(2)</sup>	W	450
Nominal current absorbed <sup>(1)</sup>	A	2.5
Maximum current absorbed <sup>(2)</sup>	A	2.8
Hydraulic F-R connections		1/2"F
Weight	kg	38

The data given refer to the following conditions:

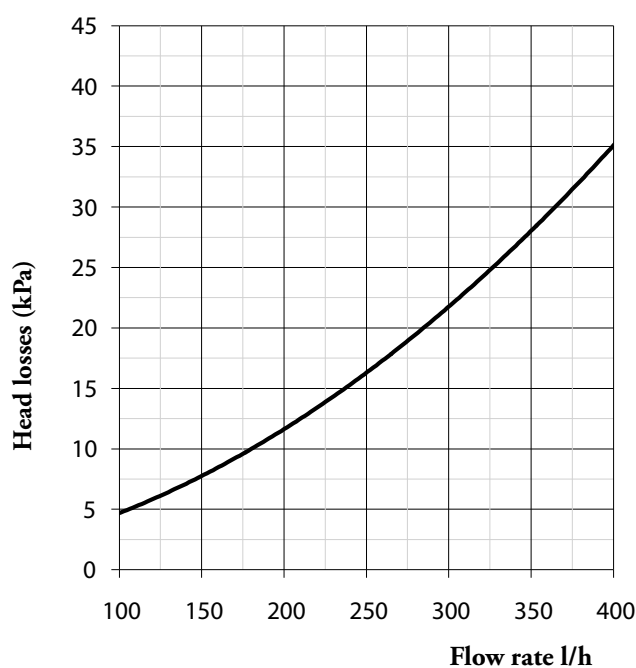
<sup>1)</sup> Room temperature 26 °C; relative humidity 65% with coil inlet water temperature of 15 °C.

<sup>2)</sup> Room temperature 35 °C; relative humidity 80%.

<sup>3)</sup> Sound pressure level measured in free field at 1 m from the machine, in compliance with UNI EN ISO 3746/97

## 37.5

## HEAD LOSS OF THE HYDRAULIC CIRCUIT



# MAGIS M and Integrated Systems

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## SEPARATE STORAGE TANK UNIT COUPLING FOR DHW PRODUCTION

The heat pumps are suitable for the air conditioning areas (hot/cold) but also for DHW production.

The storage tank units expressly designed for this combination are OMNISTOR and INOXSTOR V2.

OMNISTOR identifies a range of optimised boilers for combining with the MAGIS M range of heat pumps, which can be the ideal solution in applications where the HP is the main generator for heating the DHW thanks to enlarged coils. To allow a more efficient DHW production, even with a limited fluid temperature on the primary circuit, as occurs in the presence of heat pumps (max flow temperature 60-65 °C):

With OMNISTOR storage tanks there is the possibility of combining the thermal solar with a plate heat exchanger using a specific optional kit.

With the INOXSTOR storage tanks consisting of a double coil, the lower one can be used for the thermal solar.

There is also the possibility of inserting the integration electrical resistance for all boilers, which is important for installations in heat pump mode only.



### 38.1

### FEATURES

Stainless steel storage tank unit for the production of domestic hot water.

Ideal in combination with heat pumps in particular OMNISTOR (larger coil). They are ideal for containing DHW and equipped with an inspection flange in the lower part.

They have a 5-year conventional warranty.

They include:

- 1 single water/water heat exchanger in stainless steel with increased surface for OMNISTOR versions;
- 2 Stainless steel double concentric coil water/water heat exchangers for INOXSTOR V2 versions;
- 2 probe holders and NTC probe;

- Thermometer;
- Double magnesium anode;
- Suitable flexible and removable insulation (thickness 6 cm for OMNISTOR 300 and INOXSTOR 200/300 V2 and thickness 8 cm for OMNISTOR 500 and INOXSTOR 500 V2);
- Can be combined with optional double electronic anode kit code 3.025003.

**NOTE:** The use of this storage tank unit involves the installation of an appropriately sized expansion vessel and safety valve, not included in the supply.

Type	Code	Capacity (litres)	Thermal exchange coils	m <sup>2</sup> coil/s exchange surface	Dimensions (mm)		Energy efficiency class
					Height	Outdoor Di.	
OMNISTOR 300	3.027910	276.8	1 Increased	2.61	1715	620	C
OMNISTOR 500	3.027911	480.3	1 Increased	3.22	1735	810	C
INOXSTOR 200 V2	3.027746	202.6	2 Separate	0.70 + 1.30	1325	620	C
INOXSTOR 300 V2	3.027747	279.0	2 Separate	0.80 + 1.30	1715	620	C
INOXSTOR 500 V2	3.027748	480.3	2 Separate	1.23 + 1.84	1735	810	C

# MAGIS M and Integrated Systems

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## MAIN INERTIAL STORAGE TANK TECHNICAL FEATURES

A minimum water content always available in the system (not intercepted) is particularly important to facilitate the correct defrosting cycle efficiency of the MAGIS M heat pump (defrost). The flywheel naturally also guarantees normal operation of MAGIS M with systems divided into zones (therefore, with variable water content in circulation).

Improved operation with the thermal flywheel is obtained, for example, with fan coils used in cooling mode (a condition in which the flow temperature is very low and significant heat load changes vary according to the number of active fan coils).

**In this regard, the minimum amount/s of water must be 40 litres for any type of system.**

**If the machines are installed in a set configuration, the 40 litres must be multiplied by the number of machines in the set configuration.**

It is also important to check that the dehumidifier line has a minimum of **3 l/kW** of the machine (dehumidifier hydraulic circuit connection reference).

### MAIN FEATURES:

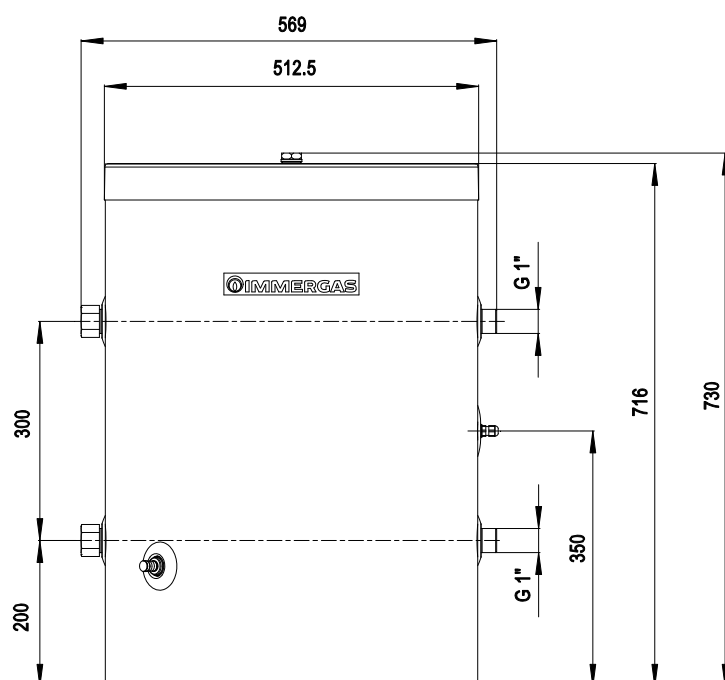
- Cylindrical storage tank made entirely in stainless steel Ø 415 with a capacity of 75 litres, fully insulated with 50 mm thick insulation, complete with visible PVC lining;

- For practical connection, the inertial storage tank has 4 M connections of G 1" and two plugs for unused fittings;
- G 1/2" fitting including cap on the top of the inertial storage tank for possible air vent;
- There is a probe point;
- A kit is available (optional) consisting of a bracket with 4 plugs to be able to hang it on the wall;
- Thanks to the 4 connections present, the storage tank can also be used as hydraulic separator, as well as thermal flywheel;
- The 50-litre vertical inertial storage tank is made of stainless steel and comes complete with a 40 mm K-FLEX ST insulation lining;
- The frame of the 50-litre vertical storage tank has been treated with the cataphoresis process and is painted in the same colour as MAGIS M;
- It is supplied with anti-vibration devices (to be placed between the thermal flywheel and support surface);
- All inertial storage tanks have a G 1/2" draining valve in the lower part and an earthing attachment;

**NOTE:** Any check valves must be provided separately.

39.1

## 75-LITRE INERTIAL STORAGE TANK (Code 3.027288)

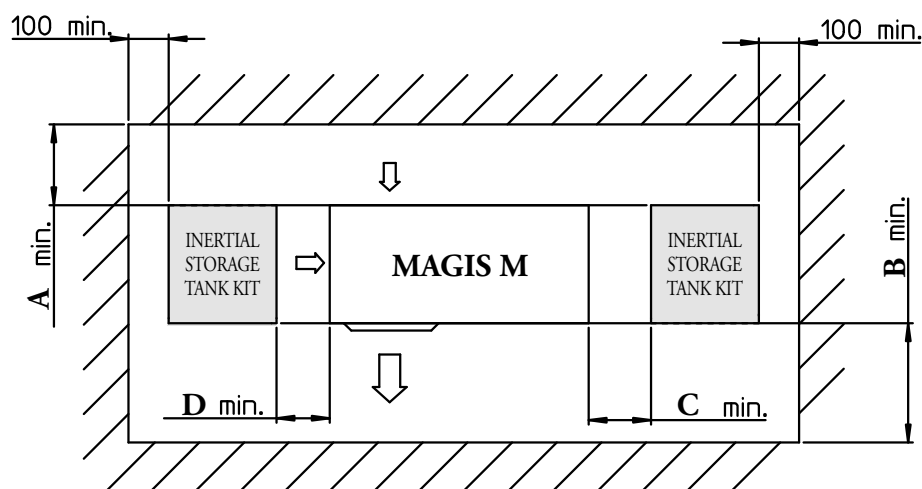
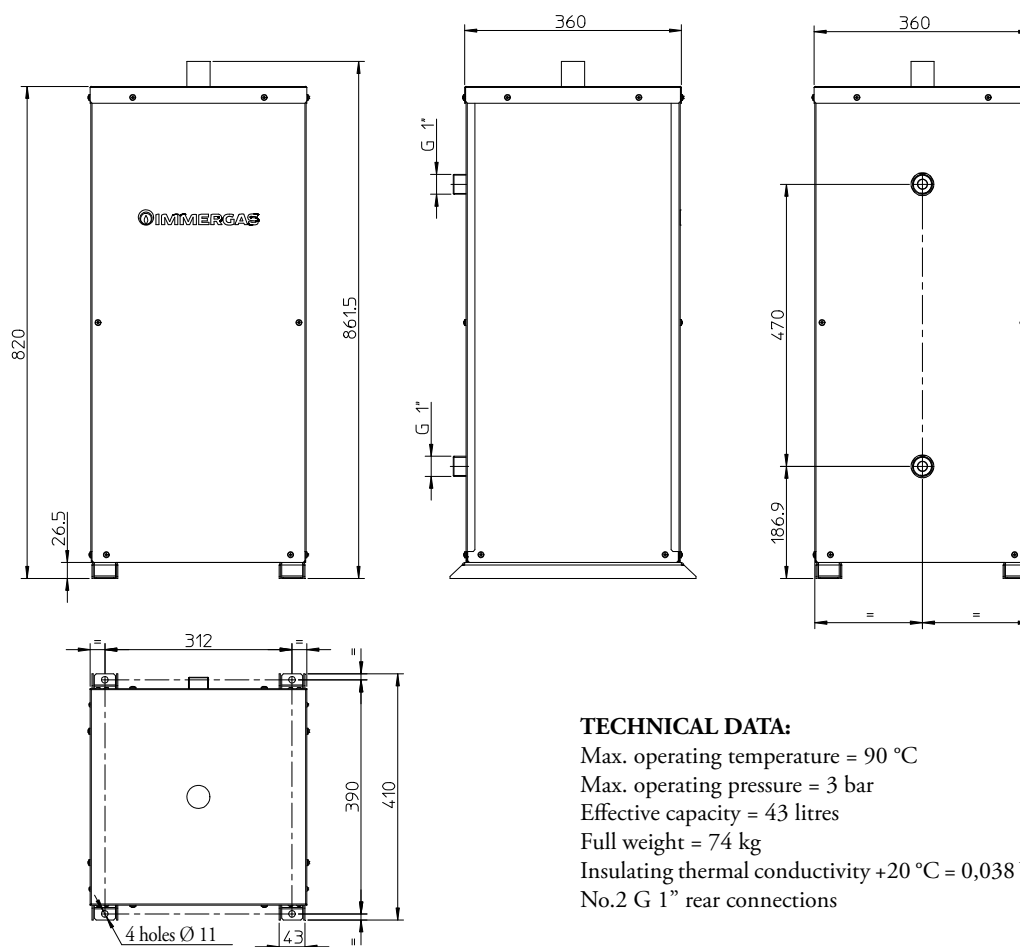


### TECHNICAL DATA:

Max. operating temperature = 90 °C  
 Max. operating pressure = 3 bar  
 Effective capacity = 77 litres  
 Full weight = 95 kg  
 Insulating thermal conductivity  
 +20 °C = 0,038 W/(m•K)  
 No.4 G 1" side connections

# MAGIS M and Integrated Systems

## 39.1 50 LITRE VERTICAL INERTIAL STORAGE TANK (Code 3.027539)



**NOTE:** For more information on the minimum installation distances to be applied, refer to the instruction manual of the dedicated heat pump model.  
 Also refer to the information and minimum distances given on page 14 of this document.

# MAGIS M and Integrated Systems

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OPTIONAL IN THE PRESENCE OF SYSTEM MANAGER

TEMPERATURE CONTROL OPTIONALS	Code
<b>System manager kit</b> - (device class VI* or VIII)	3.021522
<b>Zone remote panel</b> - (device class V* or VI)	3.030863
<b>DOMINUS interface board kit</b> - allows the appliance to be managed via the DOMINUS App.	3.026273
<b>CRONO 7 (Digital weekly chrono-thermostat)</b> - (device class IV* or VII)	3.021622
<b>CRONO 7 WIRELESS</b> - (device class IV* or VII)	3.021624
<b>Zone remote control kit</b> - (device class V or VI*)	3.023364
<b>External probe</b> - (device class II* or VI or VII)	3.015266
<b>Room hygrostat kit</b> - (operates on the Dehumidifier according to the humidity detected in the room and according to what is set on the device)	3.023302
<b>Temperature and humidity sensor kit</b> - (device class V or VI*)	3.021524
OTHER OPTIONALS	Code
<b>2 mixed zones kit for installations of up to 8 kW</b> (wall-hung or recessed)	3.021528
<b>2 mixed zones and 1 direct zone kit for installations of up to 8 kW</b> (wall-hung or recessed for mixed systems)	3.021527
<b>Expansion kit to manage zone or for auxiliaries</b>	3.021547
<b>Modbus RS-485 P.C.B. kit</b>	3.029912
<b>EMR 12 VDC relay kit</b> - to enable DHW integrative resistance kit, boiler On-Off contact management	3.023945
<b>SSR 6 VDC relay kit</b> - to enable thermal system integrative resistance kit	3.023946
<b>1" three-way deviator valve kit</b> - used as DHW priority or hot/cold system deviator, suitable up to model MAGIS M16	3.020632
<b>12 litre system expansion vessel kit</b>	3.011679
<b>System integrative electric resistance kit</b> - adjustable to 2 - 4 - 6 kW, to be installed inside the home	3.021525
<b>2 kW integrative resistance kit</b> - for INOXSTOR 200-300-500 and OMNISTOR 300-500	3.020861
<b>5 kW integrative resistance kit</b> - for 1000-1500 and 2000 litre storage tanks	3.020862
<b>Low temperature safety kit for low temperature systems and system distribution kit</b>	3.013794
<b>Dehumidifier kit</b> - for recessed installation only	3.021529
<b>Dehumidifier frame kit</b>	3.022146
<b>Dehumidifier grid kit</b>	3.022147
<b>Probe kit for solar collector temperature</b> (coupled with a system manager)	3.019374
<b>Contact NTC probe kit for storage tank</b> (can also be used to read the flow temperature on the system zones)	3.019375
<b>50 litre vertical inertial storage tank</b>	3.027539
<b>Inertial 75-Litre storage tank kit</b> (can be installed wall-hung vertically or on floor)	3.027288
<b>Bracket kit for wall mounting</b>	3.027290
<b>Inertial storage tank</b> (for wall-hung installation)	

## MAGIS M and Integrated Systems

<b>Anti-vibration feet kit for MAGIS M</b>	3.032854
<b>Cut-off cocks kit with 1" flexible hoses</b> - for MAGIS M4 - 6 models	3.025954
<b>Cut-off cocks kit with 1-1/4" flexible hoses</b> - for MAGIS M8 - 30 models	3.032846
<b>Condensate antifreeze heating cable kit</b> - suitable for the entire MAGIS M range	3.027385
<b>INOXSTOR 200 V2</b>	3.027746
<b>OMNISTOR 300 V2</b>	3.027910
<b>OMNISTOR 500 V2</b>	3.027911
<b>Double electronic anode kit for OMNISTOR and INOXSTOR 200 V2</b>	3.025003
<b>HYDRO 3 - 4 range</b> Wall-hung hydronic split, <b>HYDRO FS range</b> floor standing hydronic fan coil, <b>HYDRO IN range</b> recessed hydronic fan coil	Codes various
<b>ZENIT AIR MONO range</b> - bidirectional punctual mechanical ventilation system	Codes various
<b>Probe and wiring kit for MAGIS M for Stand Alone applications</b> - which can be used to control the DHW temperature together with a storage tank unit or alternatively to manage the system mixed zone flow, or to control the thermostated puffer/inertial storage tank temperature and also to manage a thermal solar system.	3.033324

# MAGIS M and Integrated Systems

## 41 INTRODUCTION WITH COMMENTARY TO INTEGRATED SYSTEMS: MAIN APPLICATIONS

### 42 Diagram with MAGIS M + Control panel (standard) + DHW solar pack

Description of system side operation:

- **Active heating/cooling phase** → Following a winter request from the zone thermostat (15) or a summer request from the fan coil unit remote control, the heat pump is activated (1).

During winter, if the steady operation time is greater than that set, the optional system integrative electrical resistance (13) is activated simultaneously as the heat pump.

The resistance is activated according to the flow temperature, with a delay after the heat pump has been activated. The activation of the integrative electrical resistance can also be forced under a certain outdoor temperature that can be set.

- **Domestic hot water phase** → The electronics of MAGIS M constantly monitors the homogeneity between the temperature of the domestic hot water in the boiler and that set, via the probe in the boiler, switching the 3-way DHW/system valves (14) if necessary, and activating the heat pump. The DHW integrative resistance (10) is activated according to the DHW temperature, with a delay after the heat pump has been activated. The DHW electrical resistance can be activated below a certain settable Outdoor temperature.

The DHW integrative resistance (10) is activated when the DHW steady time is greater than that set, working together with the heat pump.

**NOTE:** In this diagram the thermal flywheel is excluded from DHW operation, thanks to the positioning of the three-way diverter valve downstream flywheel. This avoids having to heat and cool the inertial storage tank when switching from DHW (Domestic hot water) to cooling.

### 43 Diagram with MAGIS M + boiler PLUS + system distributor kit + storage tank unit for DHW + System manager

Description of system functioning:

- **Active heating phase** → 1 or more room thermostats will manage the air conditioning of the 3 macro-areas. Based on the outdoor temperature and room temperature detected and according to the set climatic curve, the System Manager activates MAGIS M or the boiler based on the calculated COP (if > the minimum economical value, use of MAGIS M is favoured), or according to integration minimumT (cut off) set in the System Manager.

- **Cooling mode active** → 1 or more room thermostats, by acting on any fan-coils, enable a request in summer mode to the System Manager, which, in turn enables the heat pump.

- **DHW mode** → with this integrated system, the only source of renewable energy for DHW production is guaranteed from the heat pump. By means of the 3-way solenoid valve commutation between the system and storage tank, MAGIS M is connected to the lower coil in the storage tank, thus guaranteeing central heating of a large amount of DHW (e.g: approximately 40 °C - in both winter and summer). Integration is guaranteed by the boiler, which is connected to the high coil independently.

**NOTE:** In this diagram the thermal flywheel is excluded from DHW operation, thanks to the positioning of the three-way diverter valve downstream flywheel. This avoids having to heat and cool the inertial storage tank when switching from DHW (Domestic hot water) to cooling. In this system, the MAGIS M control panel is essential for the BUS dialogue between MAGIS M and the System manager.

# MAGIS M and Integrated Systems

## 44 Diagram with MAGIS M (in simple cascade) WITHOUT a System manager

The system allows you to connect a maximum of 6 HP in cascade or in a set configuration, even of different powers that will communicate with each other via Modbus and only one of which will always be set as "MASTER", whereas the others will always be set as "SLAVE" (the specific hydraulic diagram shows 5 HPs).

Description of system side operation:

- **Active heating/cooling phase** → Following a winter request from the zone thermostat (16) or a summer request from the fan coil unit remote control, the heat pump(s) is/are activated (1 and 3).

During winter, if the steady operation time is greater than that set, the optional system integrative electrical resistance (14) is activated simultaneously as the heat pump(s).

The resistance is activated according to the flow temperature, with a delay after the heat pump(s) has/have been activated. The activation of the integrative electrical resistance can also be forced under a certain outdoor temperature that can be set.

- **Domestic hot water phase** → The electronics of MAGIS M set as "MASTER" constantly monitors the homogeneity between the temperature of the domestic hot water in the boiler and that set, via the probe in the boiler, switching the 3-way DHW/system valves (15) if necessary, and activating the "Master" heat pump (1).

The DHW integrative resistance (11) is activated according to the DHW temperature, with a delay after the heat pump has been activated. The electrical resistance can be activated below a certain settable outdoor temperature.

The DHW integrative resistance (11) is activated when the DHW steady time is greater than that set, working together with the "Master" heat pump (1).

**NOTE:** In this diagram the thermal flywheel is excluded from DHW operation, thanks to the positioning of the three-way diverter valve downstream flywheel. This avoids having to heat and cool the inertial storage tank when switching from DHW (Domestic hot water) to cooling.

The only power available in DHW is that of the "MASTER" machine (1).

## 45 Diagram with MAGIS M in cascade (air conditioning only) + high-power boiler + thermal flywheel and mixed zone + solar heating for D.H.W. production + System manager

Description of winter and summer operation:

- **Heating/Cooling phase active** → 1 or more room thermostats, by acting on the apartment counters, enable a request to the expansion board that manages the upright column (mixed zone); by means of a temperature probe inserted in the storage tank, the System manager controls the temperature of the thermal flywheel/puffer, both in hot and cold.

Activation of the system (MAGIS M rather than a gas generator) is, by standard, delegated by request from the thermostats and then the System Manager, which assesses the economic convenience based on the calculated COP or compares outdoorT with integration minimumT (cut off).

**NOTE:** In this system the control panels of the MAGIS M are indispensable for the BUS dialogue between the machines and between them and the System manager.

- **Domestic hot water phase** → this system was designed to privilege DHW operation of the boiler only, obviously in addition to the solar heating system (governed by the System Manager along with the recirculation pump, through expansion adequately configured as "A13-5").

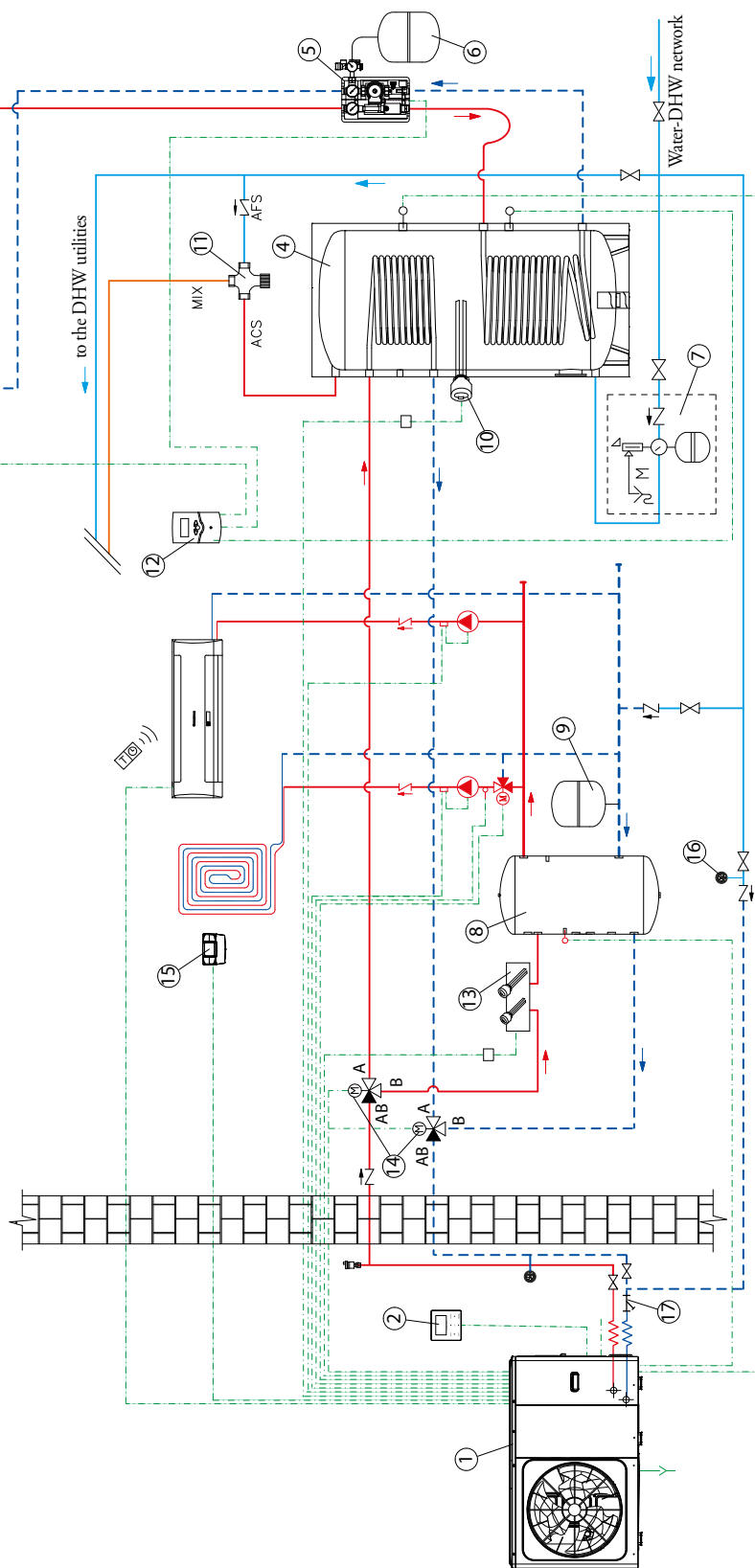
# MAGIS M and Integrated Systems

## 42 HYDRAULIC DIAGRAM: MAGIS M + Control panel (standard) + 2 differentiated zones for heating and cooling + thermal solar for DHW

### KEY:

- 1 - MAGIS M8 - 12 - 14 - 16
- 2 - Control panel (standard)
- 3 - Flat solar collector CP4 M/XL
- 4 - Double coil storage tank unit
- 5 - Solar ErP circulation unit with safety valve
- 6 - Solar expansion vessel
- 7 - Expansion valve and safety valve for DHW
- 8 - Inertial storage tank
- 9 - Heating system expansion vessel
- 10 - Integrative resistance for DHW storage tank

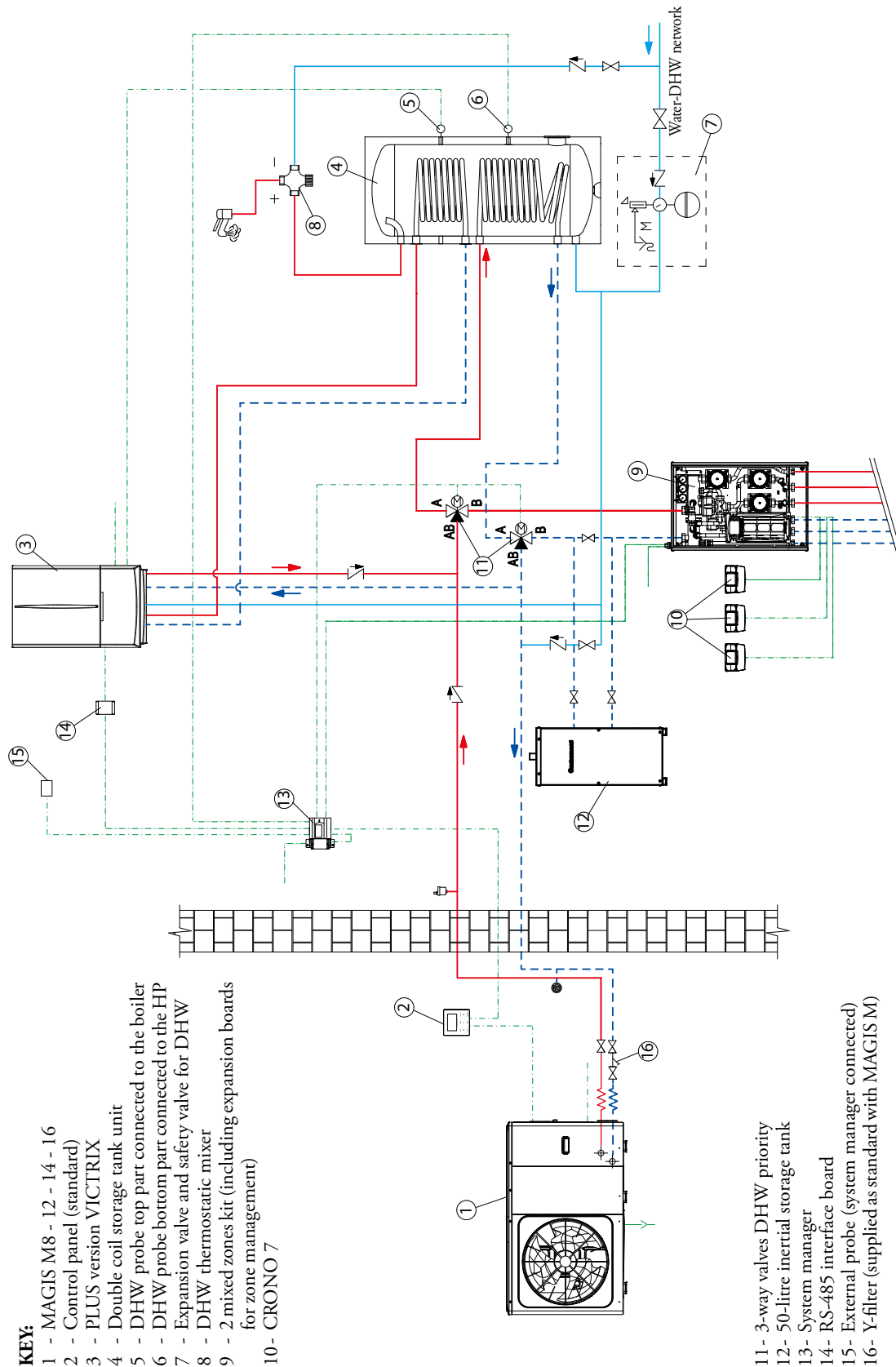
- 11 - DHW thermostatic mixer
- 12 - Solar control unit
- 13 - Integrative resistance for heating system kit (selectable powers: 2 - 4 - 6 kW)
- 14 - 3-way valves DHW priority
- 15 - CRONO 7
- 16 - System pressure gauge (to provide)
- 17 - Y-filter (supplied as standard with MAGIS M)



**NOTE:** This diagram is an example. It is also required to convey the heat pump's condensate drain. In order to guarantee proper Heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine)

# MAGIS M and Integrated Systems

## 43 HYDRAULIC DIAGRAM: MAGIS M + PLUS boiler + 2 mixed zone and 1 direct zone kit + Storage tank unit for DHW + System manager



**NOTE:** This diagram is an example. It is also required to convey the condensate drain of the heat pump and boiler. In order to guarantee proper heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine). In this specific diagram, the bypass is already installed in the zones kit (9).

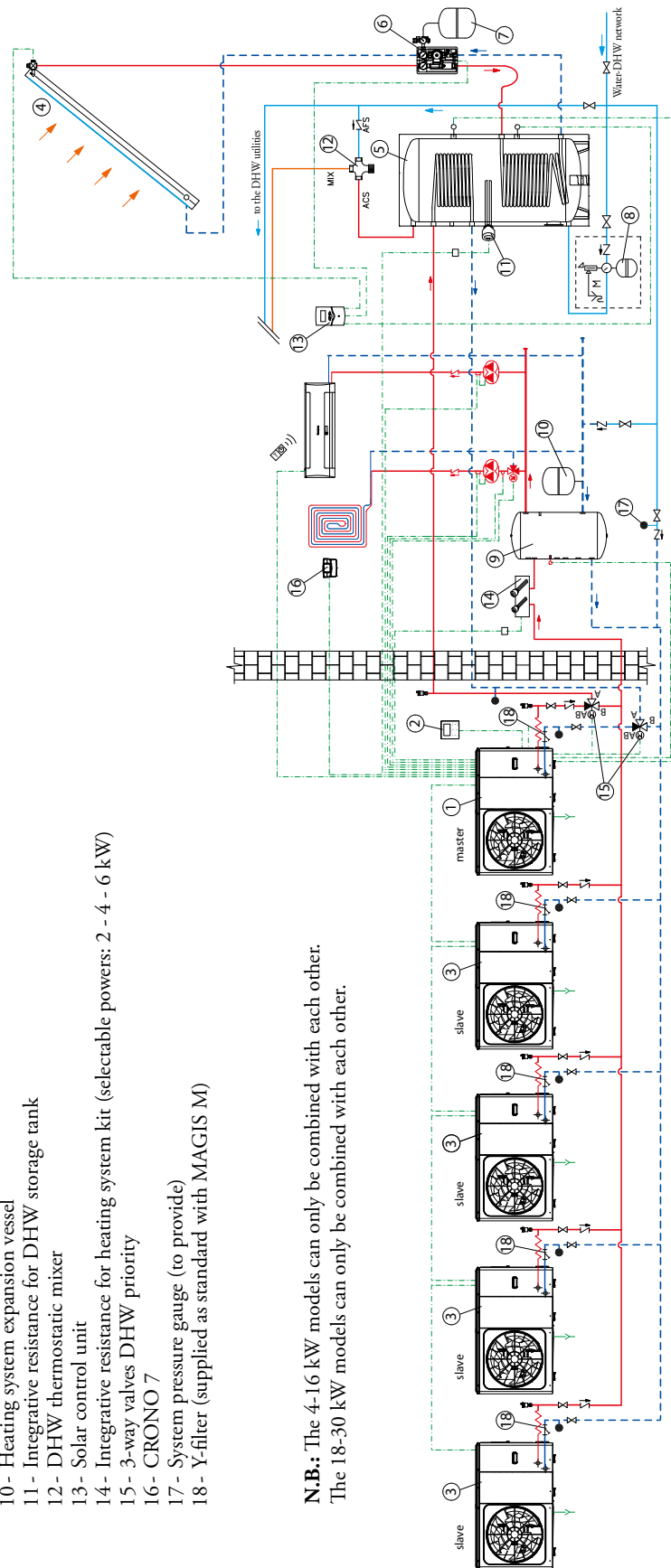
# MAGIS M and Integrated Systems

## 44 HYDRAULIC DIAGRAM: MAGIS M in “simple cascade” with Control panel on the “Master” zone + 2 differentiated zones for heating and cooling + thermal solar for DHW

### KEY:

- 1 - MAGIS M16 (MASTER)
- 2 - Control panel (supplied as standard, to be connected to the “MASTER” machine)
- 3 - MAGIS M8 (SLAVE)
- 4 - Flat solar collector CP4 M/XL
- 5 - Double coil storage tank unit
- 6 - Solar ErP circulation unit with safety valve
- 7 - Solar expansion vessel
- 8 - Expansion valve and safety valve for DHW
- 9 - Inertial storage tank
- 10 - Heating system expansion vessel
- 11 - Integrative resistance for DHW storage tank
- 12 - DHW thermostatic mixer
- 13 - Solar control unit
- 14 - Integrative resistance for heating system kit (selectable powers: 2 - 4 - 6 kW)
- 15 - 3-way valves DHW priority
- 16 - CRONO 7
- 17 - System pressure gauge (to provide)
- 18 - Y-filter (supplied as standard with MAGIS M)

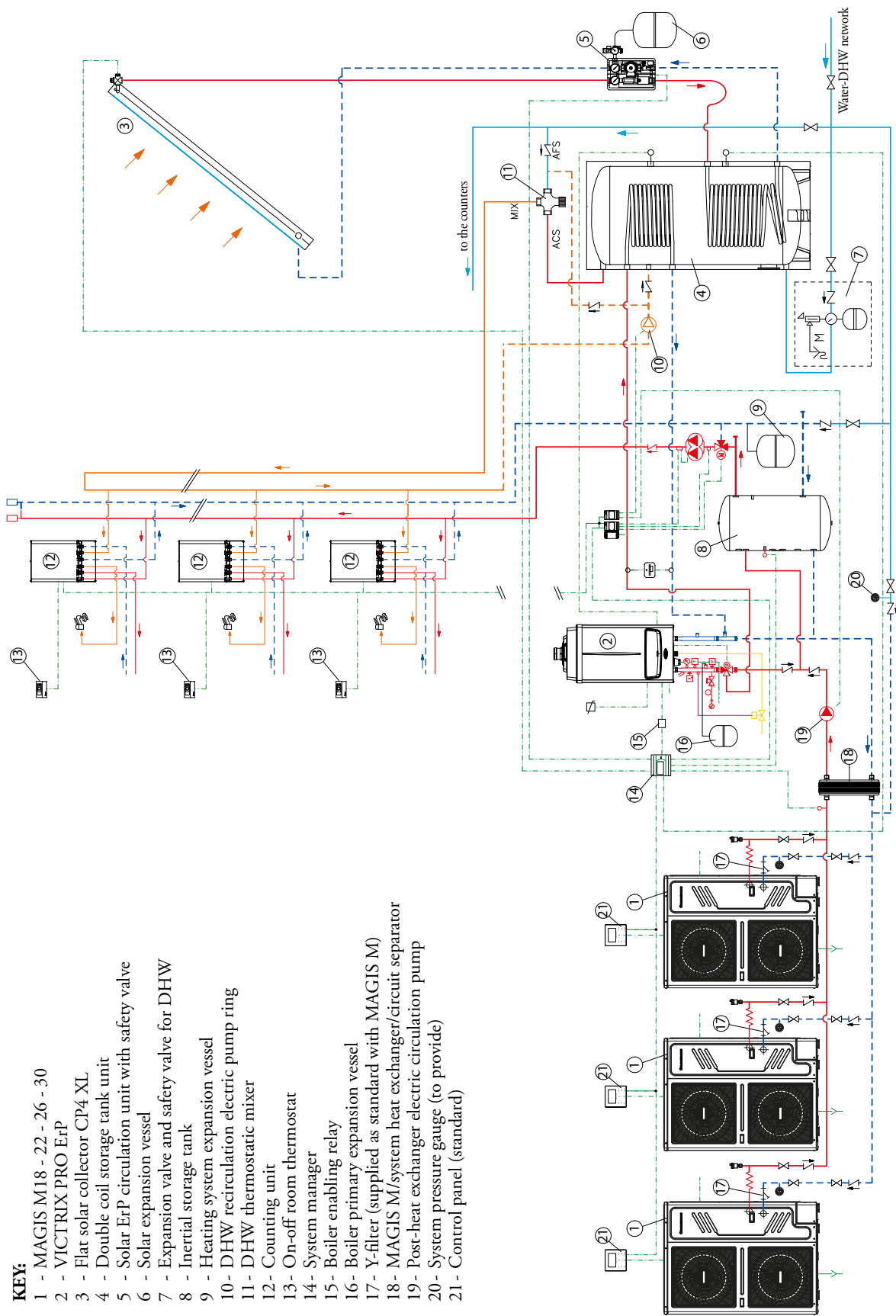
**N.B.:** The 4-16 kW models can only be combined with each other.  
The 18-30 kW models can only be combined with each other.



**NOTE:** This diagram is an example. It is also required to convey the heat pump's condensate drain. In order to guarantee proper Heat pump operation (also with antifreeze), each system must consider inserting a bypass to guarantee a minimum flow rate (see the technical data table according to the machine). A volume of 40 litres for every machine present must be considered when sizing the inertial storage tank (8).

# MAGIS M and Integrated Systems

## 45 HYDRAULIC DIAGRAM: MAGIS M in a set configuration (air conditioning only) + high boiler power boiler + thermal flywheel and mixed zone + solar heating for D.H.W. production + System manager



During the useful life of the products, performance is affected by external factors, e.g. the hardness of the DHW, atmospheric agents, deposits in the system and so on.

The declared data refer to new products that are correctly installed and used in observance of the Standards in force.

**N.B.:** correct periodic maintenance is highly recommended.

**NOTE:** Depending on the specific design and installation conditions, the diagrams and drawings provided in this documentation can require further integration or modifications, according to what is set forth by the Standards and technical regulations in force and applicable (as an example, the R stamp - edition 2009 is mentioned). It is the professional's responsibility to identify the applicable provisions, to evaluate compliance with these in each case and the necessity of any changes to diagrams and drawings.



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