COSMOGAS®

R32

INSTALLATION, USE AND MAINTENANCE MANUAL

Heat Pump ECOTWIN

62403900 - R00 23-05-2022_HU

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1 - GENERAL SAFETY WARNINGS

Installation, changes

- ☞The gas appliance must be installed, calibrated or modified by qualified installer, in compliance with national and local regulations, as well as the instructions in this manual.
- ☞Incorrect installation or poor maintenance can cause damage or injury to persons, animals or objects, for which the manufacturer cannot be deemed liable.
- ☞A water temperature higher than 51°C can also cause permanent damage to people, animals and objects. Above all, children, the older people and people with disabilities must be protected against potential risks of scalds, by inserting devices that limit the temperature of the DHW.
- ☞It is forbidden to leave any parts of the packaging or any replaced parts within the reach of children.
- ☞Before performing any cleaning or maintenance operations, disconnect the appliance from the power supply, water and gas supply, using the appropriate devices.
- ☞After having performed any cleaning or maintenance operations, make sure that all internal parts of the appliance are dry before reconnecting the electric power supply.
- ☞This appliance is not intended for use by persons (including children) with reduced physical, sensory and mental capabilities or a lack of experience or knowledge, unless they are supervised or have been instructed on use of the appliance by a person responsible for their safety.
- ☞This manual is an integral and essential part of the product and must be kept carefully by the user for future consultation. If the appliance needs to be transferred or if you should move and leave the unit to another user, always ensure that this manual remains with the new user and/or installer.
- ☞Any options or kits added later must be original Cosmogas products.
- ☞This appliance must be intended only for the use for which it has been expressly declared: central heating/cooling water for closed circuits intended for central heating/cooling of rooms for civil and domestic use, production of domestic hot water for civil use.
- ☞Any contractual and non-contractual liability on the part of the manufacturer is excluded for damage caused by installation errors or usage errors and, in all cases, following a failure to comply with the instructions given by the manufacturer or with applicable national and/or local laws.
- ☞For safety reasons and to safeguard the environment, the packaging components must be disposed of in the relevant separate waste collection centres.

R32 refrigerant

- ☞This appliance contains fluorinated greenhouse gases covered by the Kyoto Protocol: the installation must be carried out by an installer / company authorized in accordance with the European regulation EU 517/2014.
- ☞Vapors are heavier than air and can cause asphyxiation by reducing the amount of oxygen.
- ☞Liquefied gas: contact with liquid can cause frostbite and serious eye damage.
- ☞Product classification: this product is not classified as a “dangerous preparation” according to the European Community regulations and is classified as slightly flammable gas (A2L) refer to section 5.3.
- ☞If the refrigerant is mixed with air, it can cause pressure peaks in the refrigeration pipes and generate an explosion or other hazards.

Refrigerant and piping:

- ☞Use only refrigerant liquid compatible to fill the system.
- ☞Use tools and piping components specially designed for use with refrigerant liquid used.
- ☞Use phosphorus deoxidized copper pipes for transporting the refrigerant.
- ☞Store the refrigerant connection pipes away from dust and humidity (risk of damage to the compressor).
- ☞Do not use charging cylinders.
- ☞Protect the components of the heat pump, including insulation and structural elements. Do not overheat the pipes: the brazed elements can cause damage.
- ☞Contact of the refrigerant fluid with a flame can cause emanations of toxic gases.

Refrigerant leaks:

1. Shut off the appliance.
2. Open windows.
3. Do not use open flames.
4. Avoid any contact with the refrigerant.
5. Identify the probable leak and correct the problem immediately.

In case of failure

In the event of a fault and / or malfunction of the appliance, deactivate it, refraining from any attempt to repair. Contact a professionally qualified technician only. If components need to be replaced for repairs, they must be original spare parts only. Failure to comply with this may compromise the safety of the appliance.

Qualified installer.

A ‘qualified installer’ means a person with specific technical skill in sector of central heating system components and production of domestic hot water for sanitary and civil uses, electric installations, and systems for the use of combustible gas. Such people must have the skills envisaged by the law.

Technical drawings

All the drawings shown in this manual relating to electrical, hydraulic or gas installation systems must be understood to be purely illustrative. All the safety devices, auxiliary devices and the diameters of the electrical, hydraulic and gas pipes must always be checked by a qualified installer, to make sure they satisfy the applicable laws and regulations.

1.1 - National installation laws

Respect the national regulations, provisions, directives and laws in force.

2 - GENERAL INFORMATIONS

2.1 - Overview of the models

GS/STM XX

6 = Heat pump with modulating heat output between 2,35 and 7,45 kW
9 = Heat pump with modulating heat output between 3,11 and 9,21 kW
12 = Heat pump with modulating heat output between 3,95 and 11,7 kW

STM: Heat pump for outdoor installation, central heating/cooling and DHW production.

GS: Hydronic module for indoor installation, central heating/cooling and DHW production with buffer tank .

2.2 - Accessories

☞ The appliance is supplied with the following accessories:

GS UNIT		
Quantity N°.	Description	Figure
N°. 1	ROOM TEMPERATURE TR	
N°. 1	DHW TEMPERATURE SENSOR TW	
N°. 1	HEATING/COOLING TEMPERATURE SENSOR TC	
N°. 1	TV1 SENSOR HEATING/COOLING CIRCUIT	
N°. 1	TV2 SENSOR HEATING/COOLING CIRCUIT	
N°. 5	SENSOR EXTENSION CABLES	
N°. 1	SAFETY KIT	
N°. 1	COPPER PIPE SAFETY VALVE DRAIN (FROM SAFETY KIT)	

STM UNIT		
Quantity N°.	Description	Figure
N°. 1	CONDENSATE DRAIN CONNECTION	

2.3 - Distributor

COSMOGAS srl
Via L. da Vinci 16
47014 - Meldola (FC) Italia
Tel. 0543 498383
Fax. 0543 498393
www.cosmogas.com
info@cosmogas.com

2.4 - Key to symbols used

WARNING!!!
Electric shock hazard Failure to comply with these warnings may compromise the working order of the appliance or cause serious damage or injury to persons, animals or objects.

WARNING!!!
Failure to comply with these warnings may compromise the working order of the appliance or cause serious damage or injury to persons, animals or objects.

PROHIBITION !!!
Generic hazard. Failure to comply with these warnings may compromise the working order of the appliance or cause serious damage or injury to persons, animals or objects.

☞ Important indication symbol.

N/A : Not applicable.

2.5 - Maintenance

A regular annual maintenance check on the appliance is advised for the following reasons:

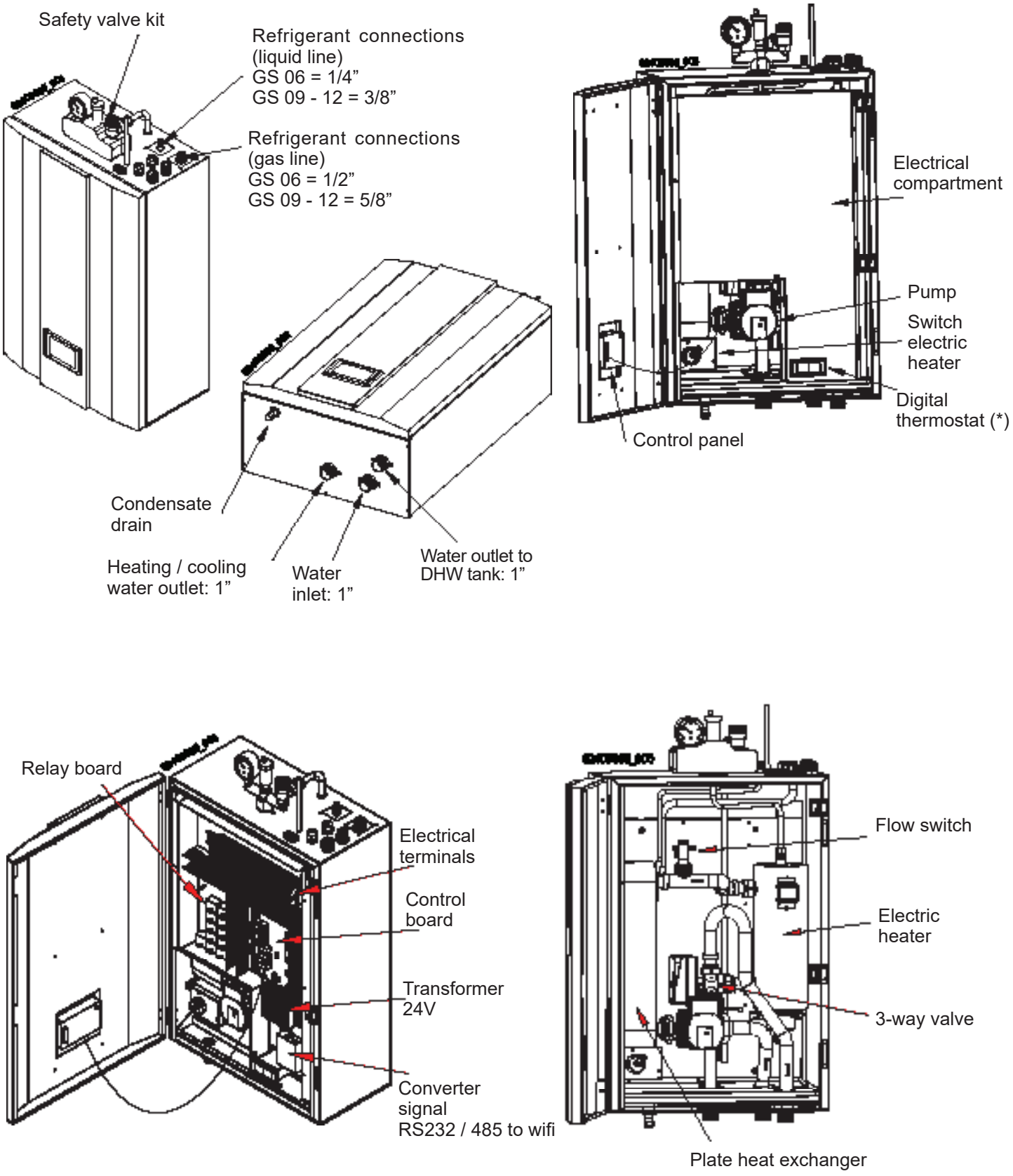
- to maintain high efficiency and manage the central heating system economically (with low fuel consumption);
- to achieve a high level of safety operation.
- to maintain a high level of environmental compatibility;

Offer your customer a periodic maintenance contract.

2.6 - Disposal

The crossed wheelie bin symbol means that the product must not be thrown away in the ordinary rubbish bin (i.e. in with “mixed urban rubbish”); it must be dealt with separately, in order to undergo suitable operations for it to be reused or threated, so that any substances that are dangerous for the environment can be removed and safely disposed. This will enable all the raw materials to be recycled. The user is responsible for getting rid of the boiler at the end of its life, delivering it to a recycling centre run by the local authority or city hygiene companies, or, when he/she buys a new appliance, giving the product that has been replaced to the dealer, who is obliged to take it under the terms of EU Directive 2012/19/EU. For further information regarding correct decommissioning of these units, users can contact the public service in charge or retailers.

3 - HYDRAULIC CONNECTIONS



(*) Digital thermostat = DHW emergency thermostat: if it is enabled, at a certain setpoint (max 75 ° C), it activates the internal pump and heats the domestic water to the setpoint. To use this thermostat refer to section 7.2.

WARNING !!! The digital thermostat can only be activated if there is a domestic hot water tank (Figure from 5-6 to 5-12).

Figure 3-1 - Main components and connection diameters of the GS unit

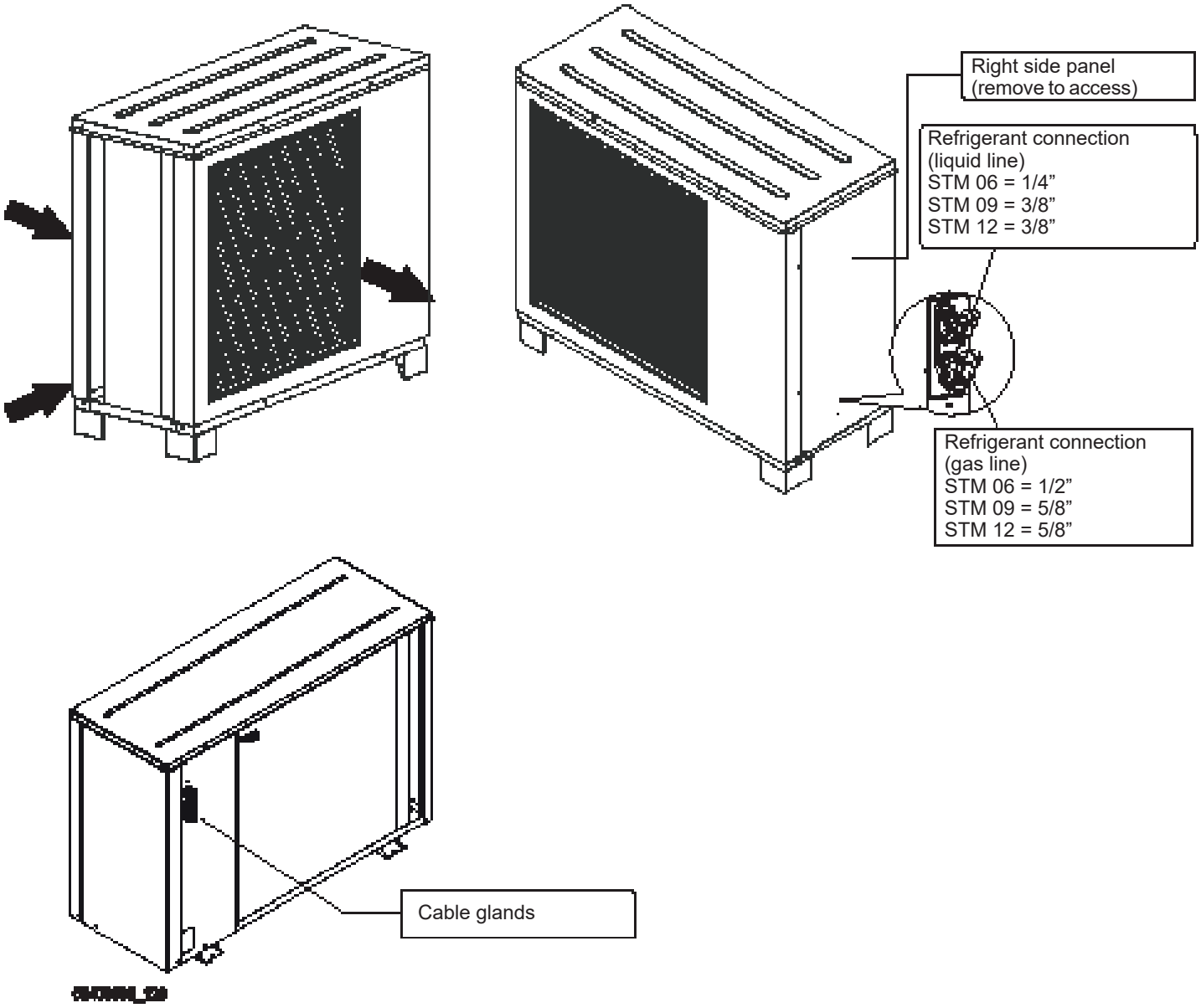
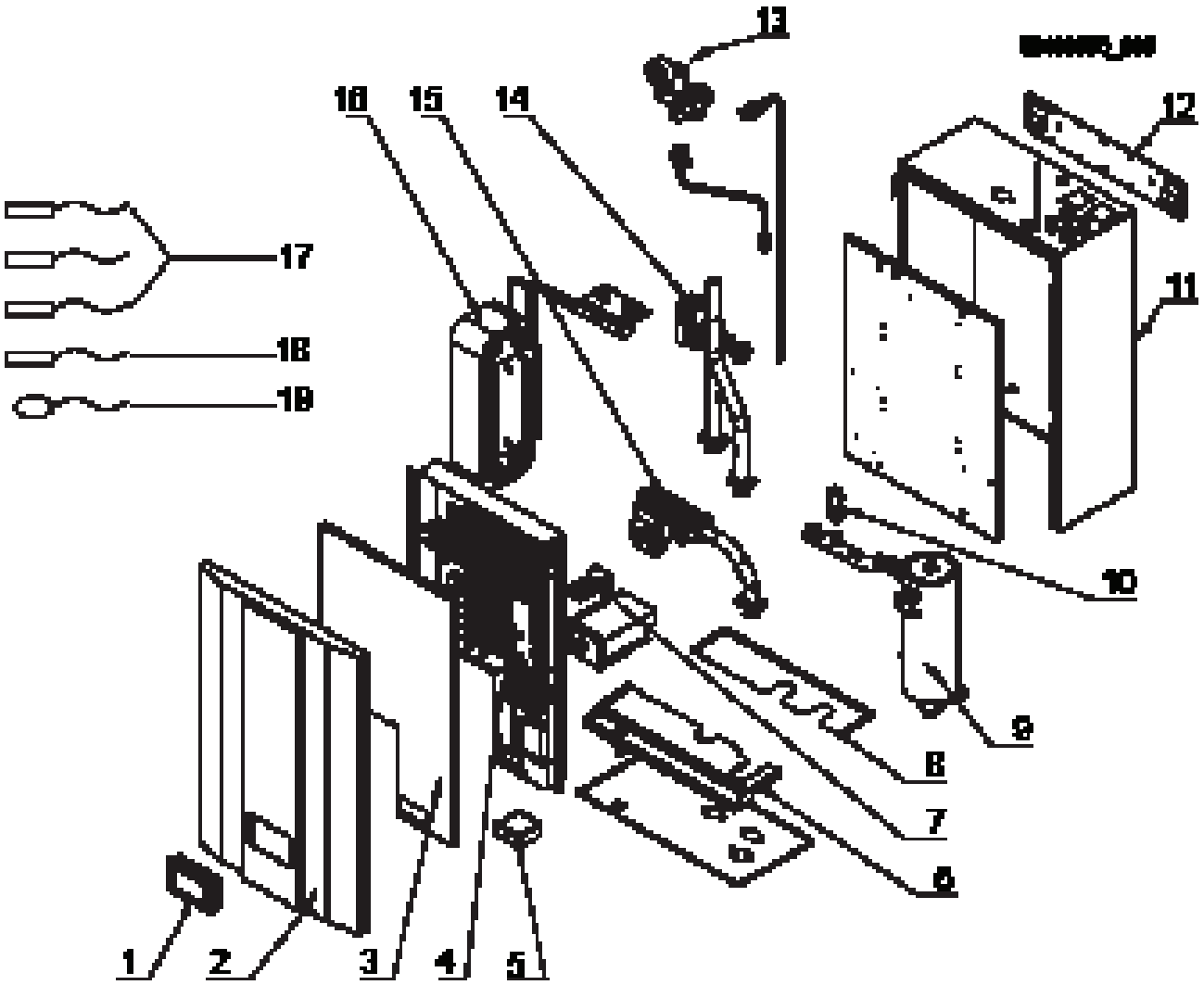
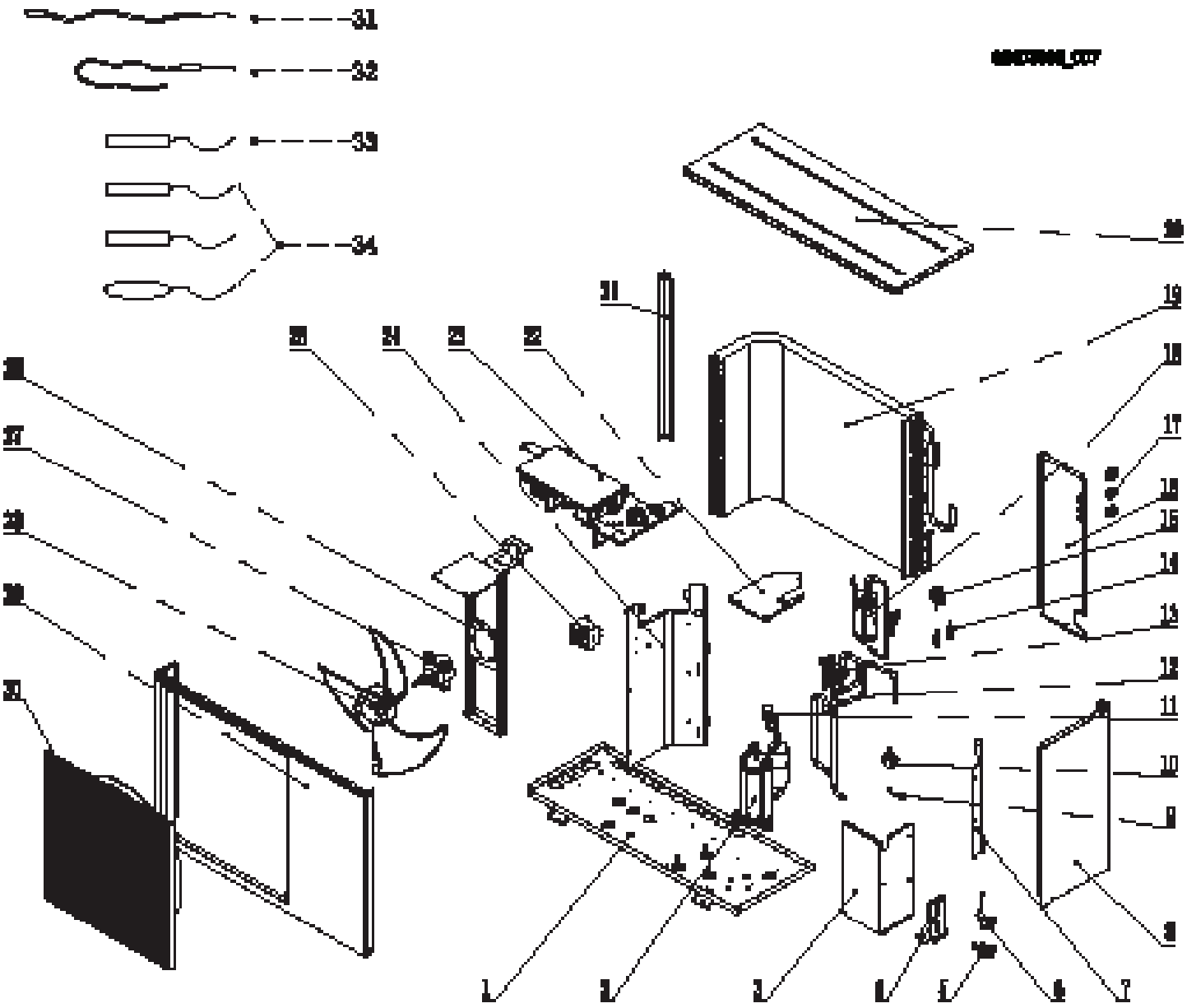


Figure 3-2 - Main components and connection diameters of the STM 06, 09 e 12 unit



1 - Control panel
2 - Door
3 - Cover of electrical compartment
4 - Electrical compartment
5 - Digital thermostat
6 - Condensate tray kit 1
7 - Emergency switch
8 - Condensate tray kit 2
9 - Electric heater
10 - Flow switch
11 - Casing
12 - Wall bracket
13 - Safety kit
14 - 3-way valve
15 - Pump
16 - Plate heat exchanger
17 - Heating/Cooling temperature sensor (Tc)
17 - Supply temperature sensor (TUO)
17 - Return temperature sensor (TUI)
18 - Temperature sensor
19 - Temperature sensor (Tr)

Figure 4-1 - GS unit internal components



1 - Lower panel
2 - Compressor
3 - Compressor acoustic insulation
4 - Compressor acoustic insulation
5 - Connessione refrigerante
6 - Connessione refrigerante
7 - Compressor bulkhead
8 - Right panel (repair board)
9 - Check valve body bend
10- Low pressure sensor
11 - High pressure sensor
12 - Copper tube
13 - 4-way valve
14 - Filter
15 - Electric expansion valve (EEV)
16 - Rear side panel
17 - Cable fixture
18 - Gas storage tank
19 - Evapo-condensing coil
20 - Upper cover
21 - Angle column
22 - Cover compressor acoustic insulation
23 - Control board
24 - Compressor acoustic insulation
25 - Single board power frequency inductance
26 - Motor support
27 - Fan motor
28 - Fan blade
29 - Front panel
30 - Fan grid
31 - Drip tray heater
32 - Riscaldatore compressore
33 - Evapo-condensing coil temperature sensor
34 - External temperature sensor
34 - Compressor intake temperature sensor
34 - Compressor discharge temperature sensor

Figure 4-2 - STM 06, 09 and 12 unit internal components

5.1 - Intended use and function

This product is a split heat pump, consisting of:
-STM: a reversible refrigerating outdoor unit, with inverter controller, to be combined with the indoor unit by means of refrigerant and electrical connections;
-GS: Hydronic module for indoor installation, central heating/ cooling and DHW production with tank.

Perform the adaptation between appliance and system considering the available head values in Figure 5-1. Temperature adjustments for heating, cooling and domestic hot water are carried out by following the appropriate procedures described in sections 8.2.1,8.2.2 and 8.2.3. The appliances can be connected to a room thermostat for heating regulation. Or, to refine the quality of the heating service, it is possible to use an outdoor temperature sensor (outdoor reset) to automatically adjust the supply temperature according to the outdoor temperature (already present on the STM unit).

- ☞ The air conditioner has a compressor that modulates the speed according to the heat output. However, the maximum speed is only guaranteed for an outdoor temperature below 14 ° C in heating and between 28 ° C and 41 ° C in cooling.
- ☞ This appliance must be connected to a heating / cooling system and to a domestic hot water net system, compatibly with the characteristics, performance and power of the appliance itself.
- ☞ Before installation, it is necessary to thoroughly wash the hydronic system, in order to remove any residues or impurities that could compromise the proper functioning of the appliance.
- ☞ This appliance can be installed indoor.
- ☞ This appliance must be installed in a place such that any water leaks coming from it, from the connections between the pipes or from the safety pressure relief valve drain, cannot cause damage to underlying materials or things.
- ☞ Check in Figures 6-2 and 6-3 the minimum clearances of installation and future maintenance.

WARNING !!! Do not subject the indoor unit to temperatures below 0.5 ° C and above 50 ° C.
It can be exposed to temperatures as low as -10 ° C (10 ° C below zero) if the heating circuit is protected with suitable antifreeze and electrically powered in such a way as to allow the electric heater to intervene (item "8" in Figure 4-1). These protections only cover the device and not the system.

5.2 - Available head to the heating / cooling system

The head available at the appliance connections is shown in the table in Figure 5-1.
When sizing the system, the installer must take into account these available head values to run the correct water flow.

Model	Minimum water flow	Available head
	l/h	kPa
6	1280	61
9	1584	63
12	2005	53

Figure 5-1 - Water flow and available head of the heating/cooling system

5.3 - R32 refrigerant gas

R32 refrigerant gas is classified as slightly flammable (A2L) and there are regulations governing its use in confined environments (**EN60335-2-40**). If the total refrigerant charge in the system is less than 1,84 kg, no minimum surfaces of the room hosting the appliance are required. In case the total charge is higher than 1,84 kg refer to table 1 of Figure 5-2. In case that the room in which the installation takes place does not have the required surface indicated in table 1 of Figure 5-2, it is necessary to prepare two ventilation openings with a minimum surface indicated in table 2 of Figure 5-3, which connect the place of installation with an adjacent room (ventilation holes to the outside are not allowed, but only to internal environments).

Local surface verification procedure for installation

START

▼

Value entered by the installer:
- Total refrigerant charge (m_c) (kg);
- Surface of the environment A ($A_{ambiente\ A}$) (m^2);

▼

Use the table 1 in section “Technical data” to calculate the maximum refrigerant charge (m_{max}) (kg) allowed for the environment A.

▼

$m_{max} \geq m_c$

YES ▼ — NO ▼

The unit can be installed in room A and without further requirements in terms of room size or of ventilation.

Value entered by the installer:
- Surface of the environment B adjacent ($A_{ambiente\ B}$) (m^2)

▼

Use the table 2 in section “Technical data” to calculate the minimum total floor area ($A_{min\ totale}$) (m^2) required for the total refrigerant charge (m_c).

▼

$A_{min\ totale} \leq A_{ambiente\ A} + A_{ambiente\ B}$

NO ► Room not suitable for installation.

YES ▼

Determine how much refrigerant it exceeds m_{max} (dm) (kg). ($dm = m_c - m_{max}$)

▼

Use the table 2 (Figure 5-3) and section “Technical data” to calculate the minimum ventilation area between environment A and environment B (VA_{min}) (cm^2)

▼

The unit can be installed in the environment A if:
- There are 2 ventilation openings (permanently open) between environment A and environment B, one at the top and one at the bottom;
- **Bottom opening**: The lower opening must meet the minimum surface requirements (VA_{min}). It must be as close to the floor as possible. If the ventilation opening starts from the floor , the height must be ≥ 20 mm. The bottom of the opening must be located to ≤ 100 mm from the floor. At least the 50% of the required opening surface must be located to < 200 mm from the floor. The entire surface of the opening must be located a < 300 mm from the floor;
- **Top opening**: The surface of the upper opening must be ≥ to that of the lower opening. The bottom of the upper opening must be located at least 1,5 meters above the top of the lower opening;
- The ventilation openings to the outside are NOT considered suitable ventilation openings (the user could block them in cold weather).

Table 1 - Maximum refrigerant charge allowed in a room: indoor unit

Environment area	Maximum refrigerant charge
1	1,03
2	1,45
3	1,78
4	2,06
5	2,30
6	2,52
7	2,72
8	2,91
9	3,09
10	3,25
11	3,41
12	3,56
13	3,71
14	3,85
15	3,98
16	4,11
17	4,24
18	4,36
19	4,48
20	4,60
21	4,71
22	4,82
23	4,93
24	5,04
25	5,14
26	5,24
27	5,34
28	5,44
29	5,54
30	5,63
31	5,73
32	5,82
33	5,91
34	6,00
35	6,08
36	6,17
37	6,26
38	6,34
39	6,42
40	6,50

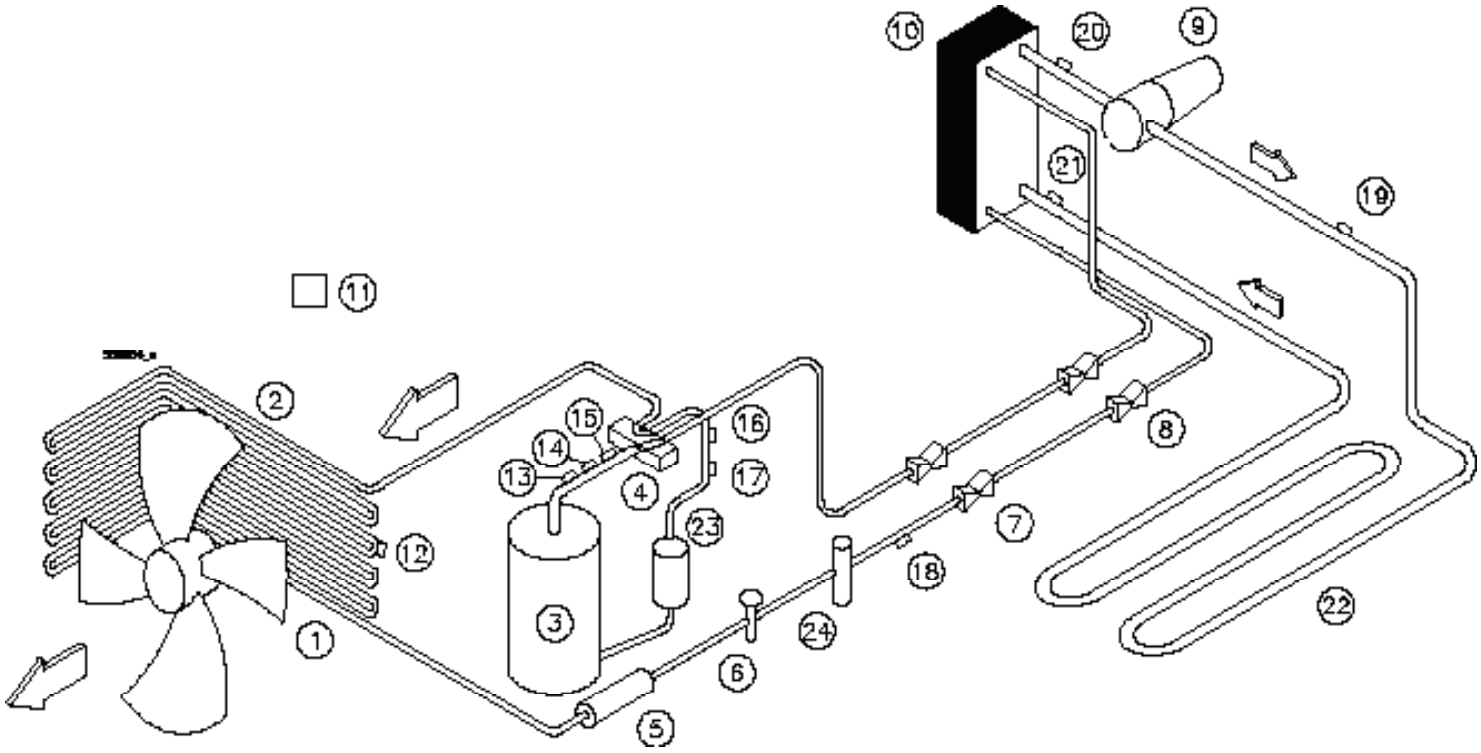
Figure 5-2 - Table 1

Table 2 - Minimum area of the opening for natural ventilation: indoor unit

m_c	m_{max}	$dm=m_c-m_{max}$ (kg)	Superficie (cm^2)
2,1	0,1	2	1256
2,1	0,3	1,8	1131
2,1	0,5	1,6	1005
2,1	0,7	1,4	879
2,1	0,9	1,2	754
2,1	1,1	1	628
2,1	1,3	0,8	503
2,1	1,5	0,6	377
2,1	1,7	0,4	251
2,1	1,9	0,2	126

Figure 5-3 - Table 2

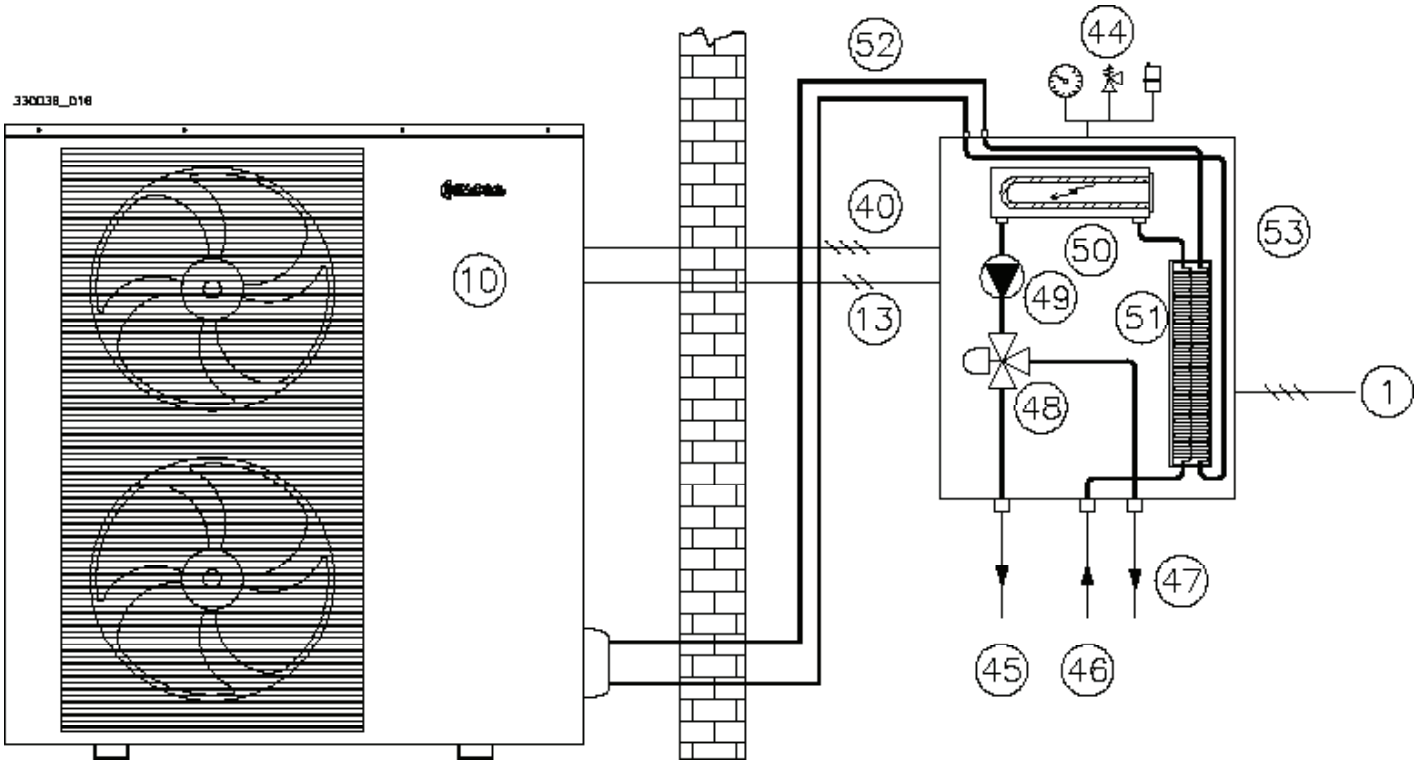
ATTENTION!!! The maximum refrigerant amount for Model 12 is 2.1 kg.



LEGEND of Figure 5-4:

1 - Fan
2 - Evapo-condensing battery
3 - Compressor
4 - 4-way valve
5 - Filter
6 - Expansion valve
7 - Outdoor connections of outdoor unit
8 - Outdoor connections of indoor unit
9 - Water pump
10 - Plate heat exchanger
11 - Outdoor temperature sensor
12 - Evapo-condensing battery temperature sensor
13 - High pressure switch
14 - Compressor discharge temperature sensor
15 - High pressure sensor
16 - Low pressure sensor
17 - Suction temperature sensor
18 - Refrigerant temperature sensor (TUP)
19 - Tc sensor (if there is a tank, connect it to the tank)
20 - Supply temperature sensor (TUO)
21 - Return temperature sensor (TUI)
22 - Heating system
23 - Liquid separator
24 - Liquid receiver

Figure 5-4 - Functional schematics

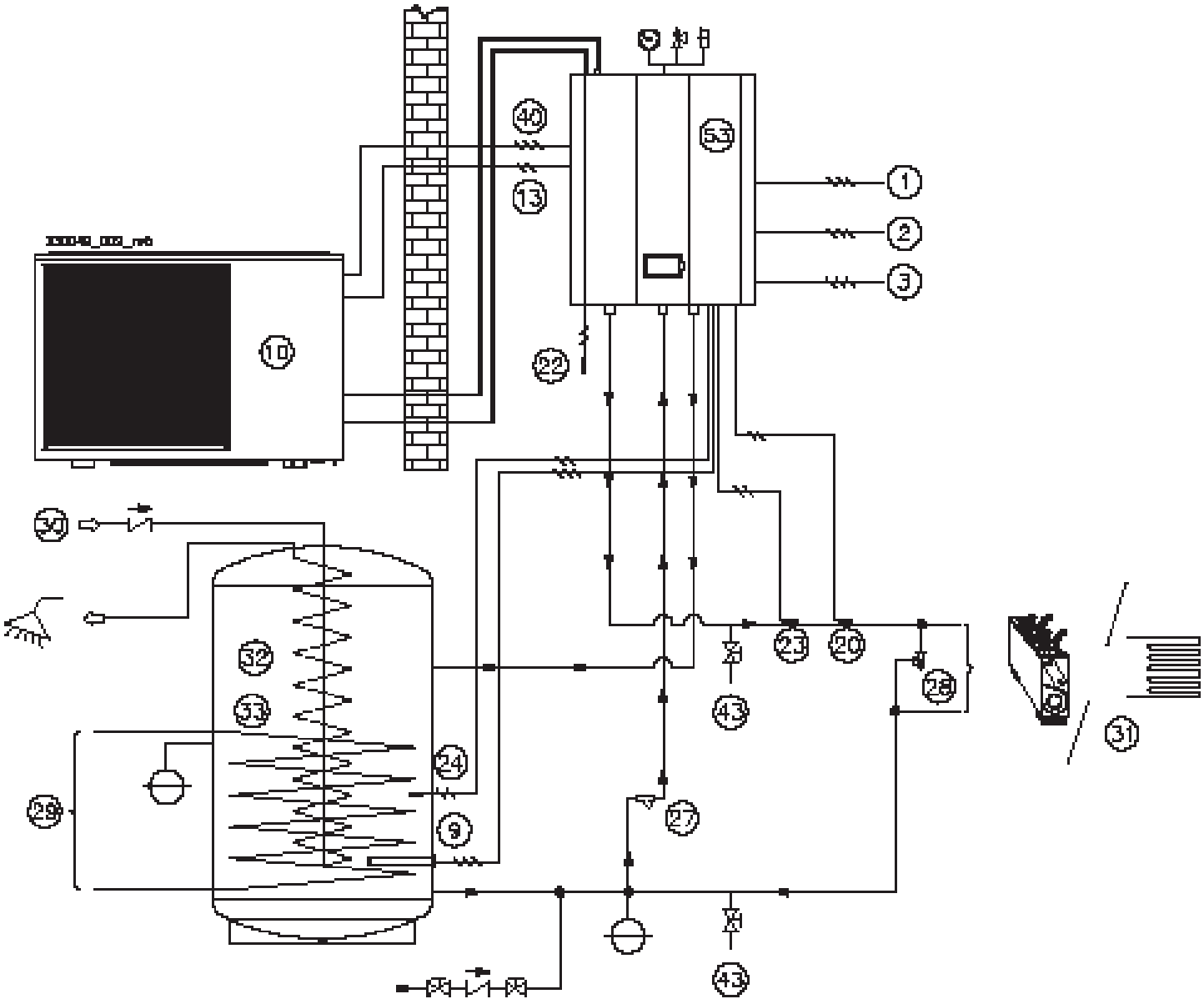


LEGEND of Figure 5-5:

1 - Main electrical supply
10 - Outdoor unit
13 - Modbus communication
40 - Electrical supply for outdoor unit
44 - Safety kit (hydrometer, safety pressure relief valve and automatic air vent valve) (supplied with accessories)
45 - Heating supply
46 - Return
47 - DHW supply
48 - 3-way diverter valve DHW/cooling-heating
49 - GS unit pump
50 - Electrical heater 230 V/50 HZ P = 3 kW
51 - Plate heat exchanger
52 - Refrigerant gas line
53 - Indoor unit

Figure 5-5 - Hydraulic diagram

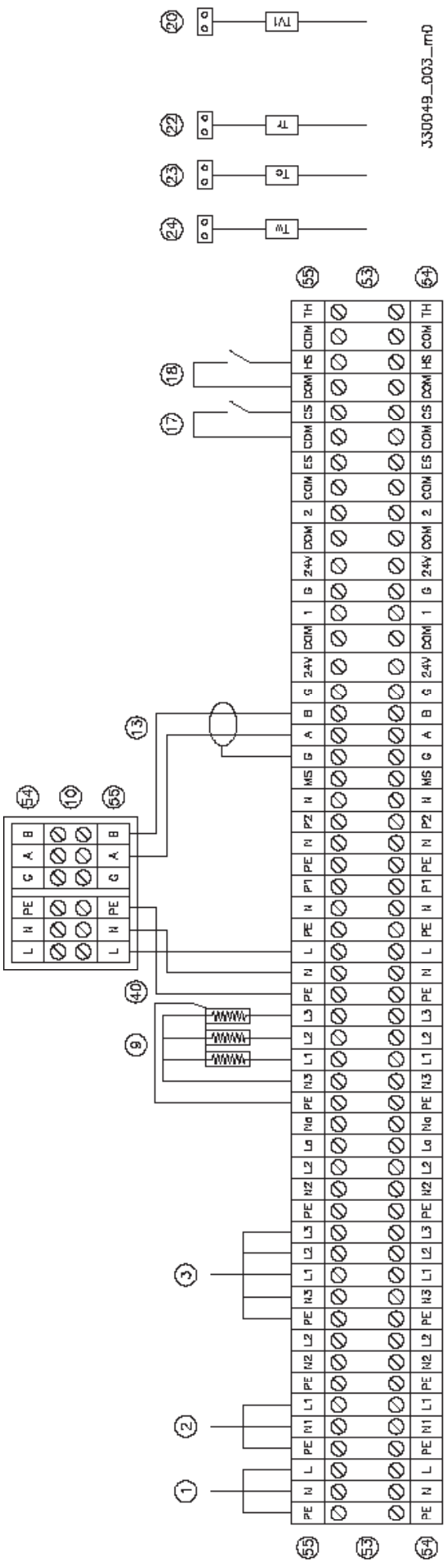
5.4 - Ecotwin with one heating/cooling circuit and DHW



LEGEND of Figure 5-6 and 5-7:

1 - Main electrical supply
2 - Internal electrical heater (3 kW)
3 - Electrical supply (Max 10A)
9 - DHW electrical heater
10 - Outdoor unit
13 - Modbus communication
17 - Cooling demand
18 - Heating demand
20 - Circuit 1 sensor (TV1)
22 - Room temperature sensor (Tr)
23 - Heating/Cooling thermoregulation sensor (Tc)
24 - DHW temperature sensor (Tw)
27 - Filter
28 - Differential by-pass valve
29 - Solar (optional)
30 - Domestic cold water
31 - Heating/Cooling system
32 - Buffer tank
33 - Auxiliary heat exchanger for solar or other
40 - Outdoor unit power supply
43 - Drain valve
53 - Indoor unit
54 - Terminal block side already connected (internal device)
55 - Terminal block side for installer connections

Figure 5-6 - Hydraulic diagram with one heating/cooling circuit and DHW



5.4.1- Configuration for one heating/cooling circuit and DHW

After creating the hydraulic system as shown in Figure 5-6 and the electrical system as shown in Figure 5-7, configure the appliance as follows:

WARNING !!! The unit can operate without a tank on the heating/ cooling side if the amount of water circulating in the circuit is at least equal to 10 l / kW of unit power.

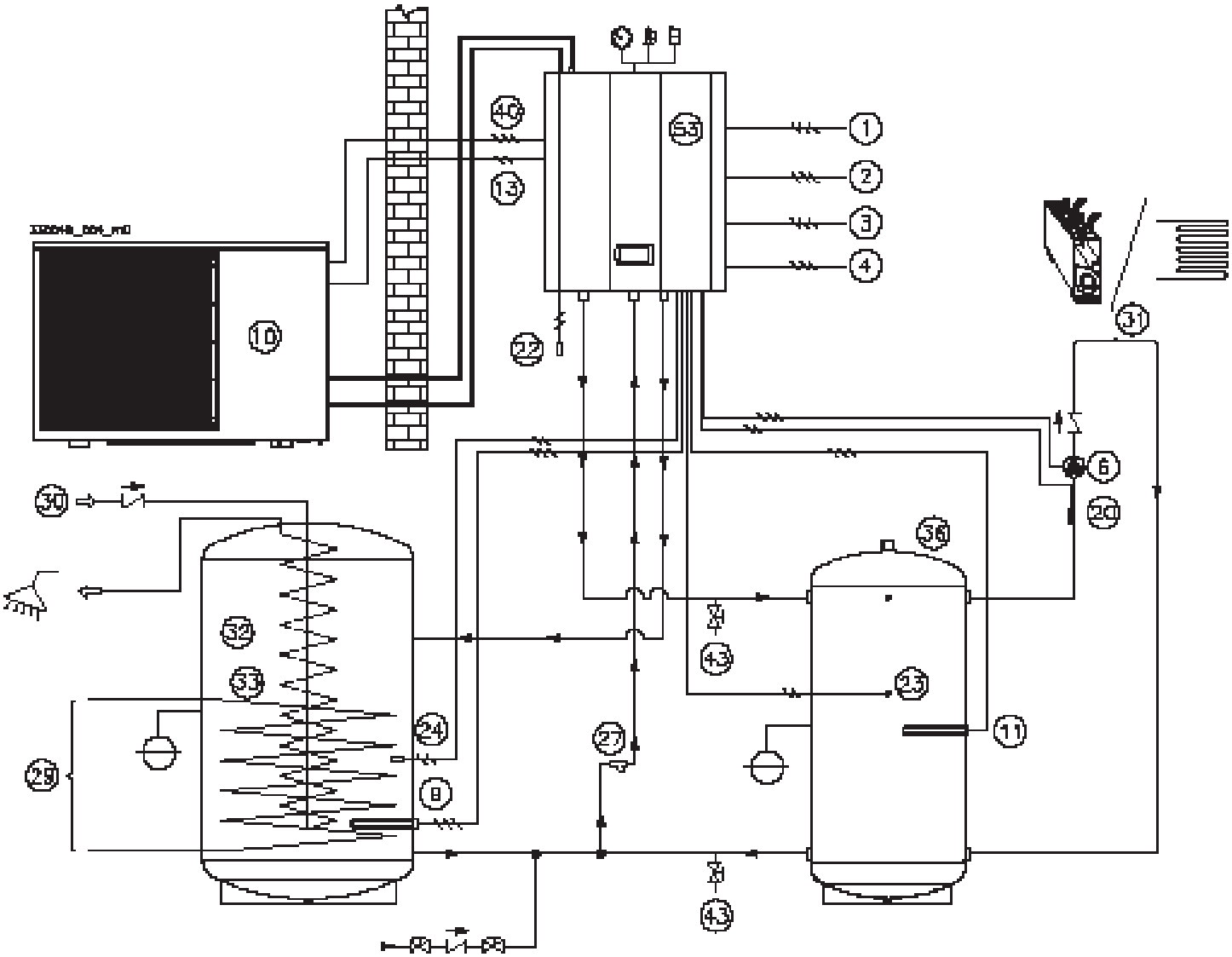
For example, in the case of the Ecotwin 09 unit (heat output 10 kW), the amount of water circulating in the system must be at least 10 l / kW = 100 liters.

1.- In the home page of the display, press the “Setting” icon (item “H” of Figure 8-1);
2.- Enter the “USER” menù (section 8.2.8) and select “Permission level”;
3.- Enter the password “87654321” for the Installer level and press OK;
4.- Go back and enter the “WORKING MODE” menù (section 8.2.9);
5.- Using the green tick, enable the unit to produce domestic hot water, heating and/or cooling;
6.- Go to second page of the menù and set “Heating / Cooling switch” to “External signal control”. Switching takes place only via remote command “17” for cooling or “18” for heating;
7.- Exit the “WORKING MODE” menù and press to the “WATER PUMPS” icon;
8.- To configure the pump outputs so that the circuits work according to the status of inputs “17” and “18”, it is necessary:
   a.- Select “Working mode of circulation pump P0” and set it to “ON Costantly”;
   b.- Go to the next page and remove the check mark from “Buffer tank”, disabling;
   c.- Put the check mark in “P1 for heating operation” and, if previously enabled, also enable “P1 for cooling operation” (pump P1 is not present, but for ECOTWIN work, it must in any case be enabled);
9.- Exit from “WATER PUMPS” and select “DHW”;
10.- Set the DHW setpoint temperature in “Setpoint DHW” parameter;
11.- Exit this menù and enter to “ZONE 1” menù:
   a.- If the cooling function is enabled, select “Set temp. for cooling (fix flow water temperature” and set the setpoint temperature;
   b.- If you want to adjust the heating temperature via outdoor reset, tick “Heating curve (HC1)” and complete the following parameters as described in section 8.2.1;
   c.- If the “Heating curve (HC1)” has not been selected, set the appropriate set point temperature on the “Set temp. for heating (fix flow water temperature)”;
12.- Exit this menù and select “BACK-UP”;
13.- Tick on “Backup heating sources for sanitary hot water” so that the heat pump can call electric heater “9” if it is unable to bring the domestic hot water tank to the required temperature within a certain number of minutes;
14.- Select “Priority for backup heating sources (HWTBH)” and set it to “Lower than AH” (in this way priority is given toelectric heater “9” and then to electric heater “35” which is inside the heat pump);
15.- In the same way and with the same criterion, you can choose the integration of alternative heating sources, setting the related parameters.

After this configuration, the unit is able to:
- Domestic hot water production in priority over heating / cooling;
- Be called in heating by closing contact “18”;
- Be called in cooling by closing contact “17”;
- Call the integrative electric heater “9” (Figure 5-6) or the internal electric heater “35” (Figure 6-22) whenever the appliance fails to reach the domestic hot water and / or heating set point within a certain period of time.

Figure 5-7 - Wiring diagram with one heating/cooling circuit and DHW

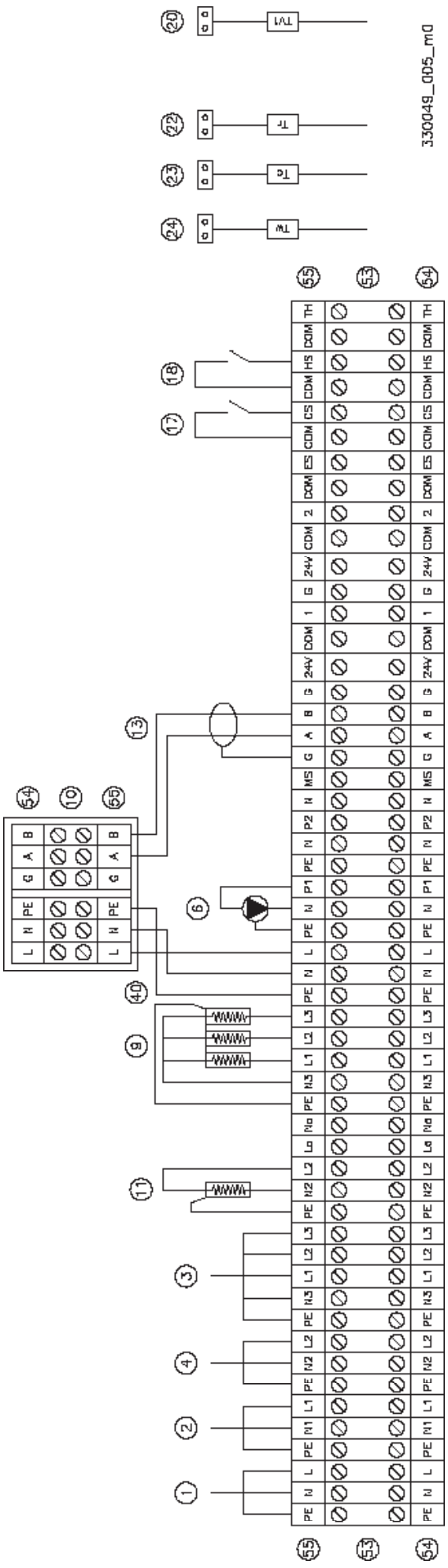
5.5 - Ecotwin with one heating/cooling circuit, DHW and a buffer tank



LEGEND of Figure 5-8 and 5-9:

1 - Main electrical supply
2 - Internal electrical heater (3 kW)
3 - Electrical supply (Max 10A)
4 - Electrical supply (Max 10A)
6 - Pump P1
9 - DHW electrical heater
10 - Outdoor unit
11 - Heating electrical heater
13 - Modbus communication
17 - Cooling demand
18 - Heating demand
20 - Circuit 1 temperature sensor (TV1)
22 - Room temperature sensor (Tr)
23 - Heating/Cooling thermoregulation sensor (Tc)
24 - DHW temperature sensor (Tw)
27 - Filter
29 - Solar (optional)
30 - Domestic cold water
31 - Cooling/heating system
32 - DHW buffer tank
33 - Auxiliary heat exchanger for solar or other
36 - Heating/cooling Buffer tank
40 - Outdoor unit power supply
43 - Drain valve
53 - Indoor unit
54 - Terminal block side already connected (internal device)
55 - Terminal block side for installer connections

Figure 5-8 - Hydraulic diagram with one heating/cooling circuit, DHW and a buffer tank



5.5.1- Configuration for one heating/cooling circuit, DHW and a buffer tank

After creating the hydraulic system as shown in Figure 5-8 and the electrical system as shown in Figure 5-9, configure the appliance as follows:

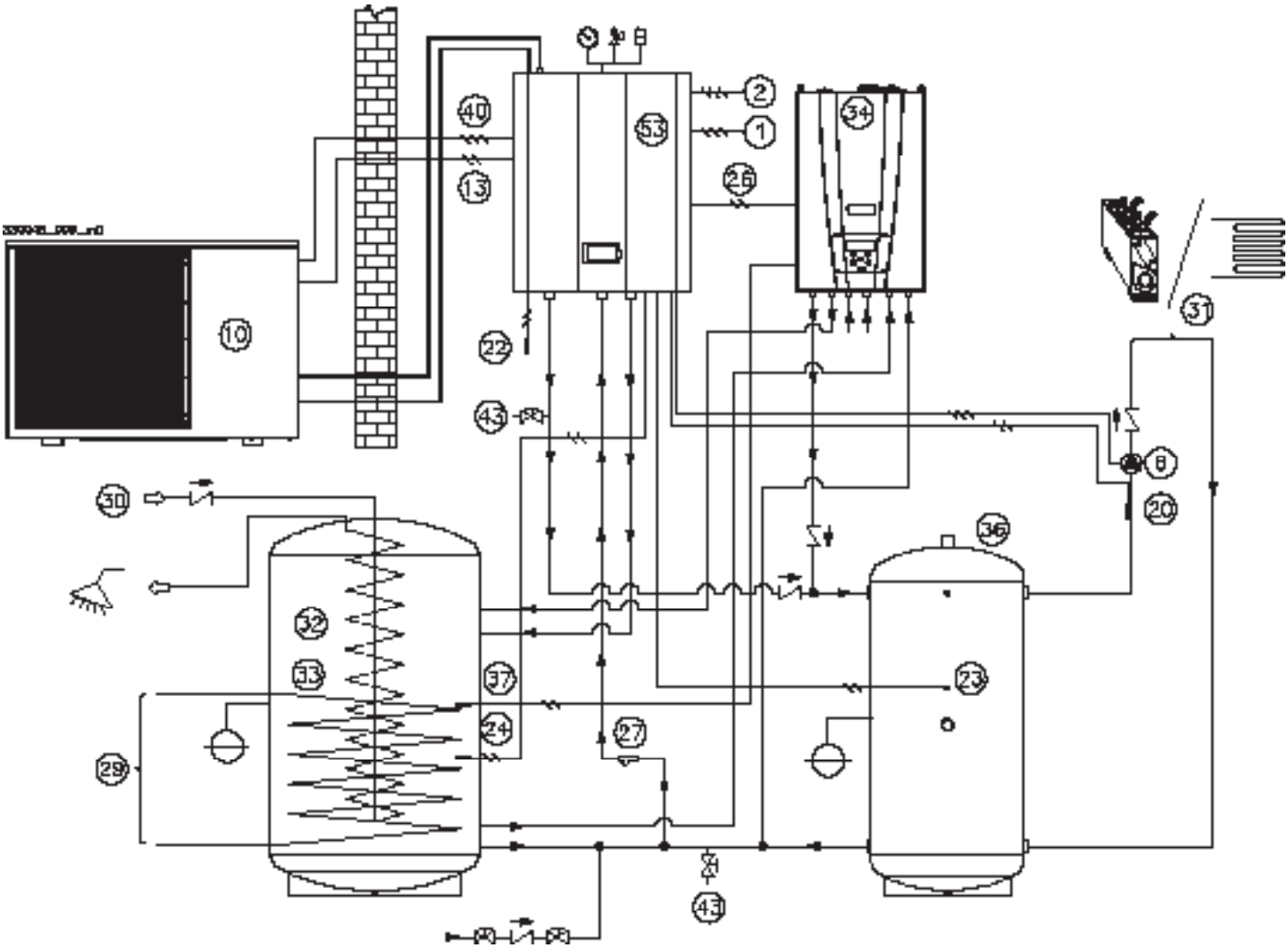
1.- In the home page of the display, press the "Settings" icon ("H" of Figure 8-1);
2.- Enter the "USER" menù (section 8.2.8) and select "Permission level";
3.- Enter the password "87654321" for the Installer level and press OK;
4.- Go back and enter the "WORKING MODE" menù (section 8.2.9);
5.- Using the green tick, enable the unit to produce domestic hot water, heating and/or cooling;
6.- Go to second page of the menù and set "Heating / cooling switch" to "External signal control". Switching takes place only via remote command "17" for cooling or "18" for heating;
7.- Exit the "WORKING MODE" menù and press to the "WATER PUMPS" icon;
8.- To configure the pump outputs so that the circuits work according to the status of inputs "17" and "18", it is necessary:
   a.- Select "Working mode of circulation pump P0" and set it to "OFF with compr.";
   b.- Go to the next page and put the check mark to "Buffer tank", enabling it;
   c.- Put the check mark in "P1 for heating operation" and, if previously enabled, also enable "P1 for cooling operation";
9.- Exit from "WATER PUMPS" and select "DHW";
10.- Set the DHW setpoint temperature in "Setpoint DHW" parameter;
11.- Exit this menù and enter to "ZONE 1" menù:
   a.- If the cooling function is enabled, select "Set temp. for cooling (fix flow water temperature)" and set the setpoint temperature;
   b.- If you want to adjust the heating temperature via outdoor reset, tick "Heating (HC1)" and complete the following parameters as described in section 8.2.1;
   c.- If the "Heating (HC1)" has not been selected, set the appropriate set point temperature on the "Set temp. for heating (fix flow water temperature)";
12.- Exit this menù and select "BACK-UP";
13.- Tick on "Backup heating sources for sanitary hot water" so that the heat pump can call electrical heater "9" if it is unable to bring the domestic hot water tank to the required temperature within a certain number of minutes;
14.- Select "Priority for backup heating sources (HWTBH)" and set it to "Higher than AH" (in this way, electrical heater "9" is given precedence and then electrical heater "35", shown in Figure 6-22, which is inside the heat pump);
15.- In the same way and with the same criterion you can choose the integration of alternative sources to heating.

After this configuration, the unit is able to:

- Domestic hot water production in priority over heating / cooling;
- Be called in heating by closing contact "18";
- Be called in cooling by closing contact "17";
- Call the integrative electrical heater "9" (Figure 5-6) or the internal electrical heater "35" (Figure 6-22) whenever the appliance fails to reach the domestic hot water and / or heating set point within a certain period of time.

Figure 5-9 - Wiring diagram with one heating/cooling circuit, DHW and a buffer tank

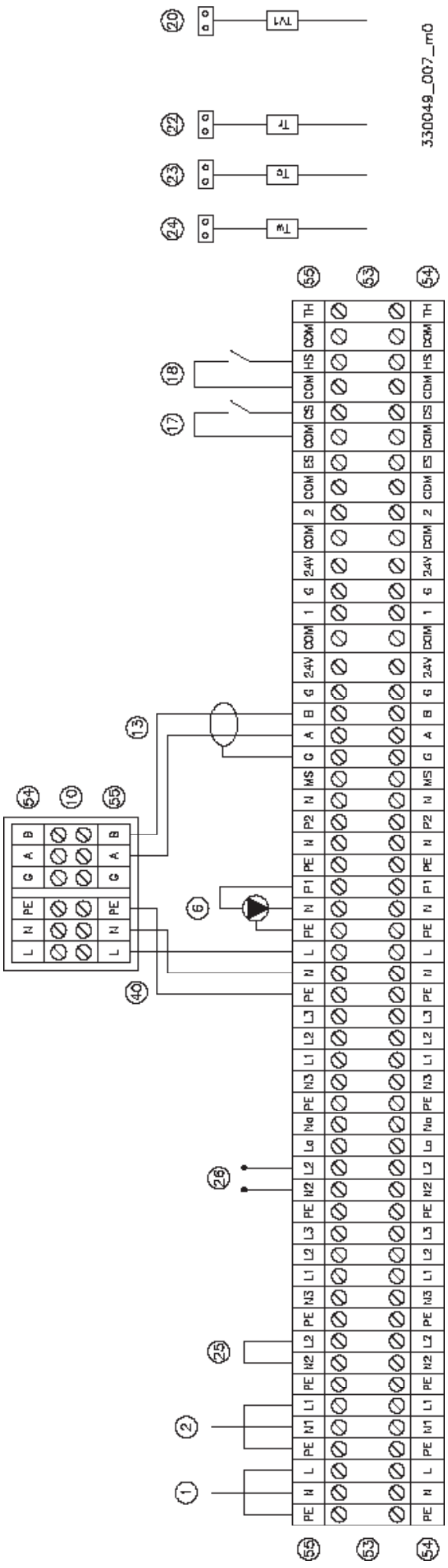
5.6 - Ecotwin with one heating/cooling circuit, DHW, a buffer tank and a boiler



LEGEND of Figure 5-10 e 5-11:

1 - Main electrical supply
2 - Internal electrical heater (3 kW)
6 - Pump P1
10 - Outdoor unit
13 - Modbus communication
17 - Cooling demand
18 - Heating demand
20 - Circuit 1 temperature sensor (TV1)
22 - Room temperature sensor (Tr)
23 - Heating/Cooling thermoregulation sensor (Tc)
24 - DHW temperature sensor (Tw)
25 - Jumper
26 - Connect to terminals “TA” of the boiler
27 - Filter
29 - Solar (optional)
30 - Domestic cold water
31 - Heating/Cooling system
32 - DHW buffer tank
33 - Auxiliary heat exchanger for solar or other
34 - Boiler
36 - Heating/cooling buffer tank
37 - Boiler sensor for buffer tank
40 - Electrical supply of outdoor unit
43 - Drain valve
53 - Indoor unit
54 - Terminal block side already connected (internal device)
55 - Terminal block side for installer connections

Figure 5-10 - Hydraulic diagram with one heating/cooling circuit, DHW, buffer tank and a boiler



5.6.1 - Configuration for one heating/cooling circuit, DHW, a buffer tank and a boiler

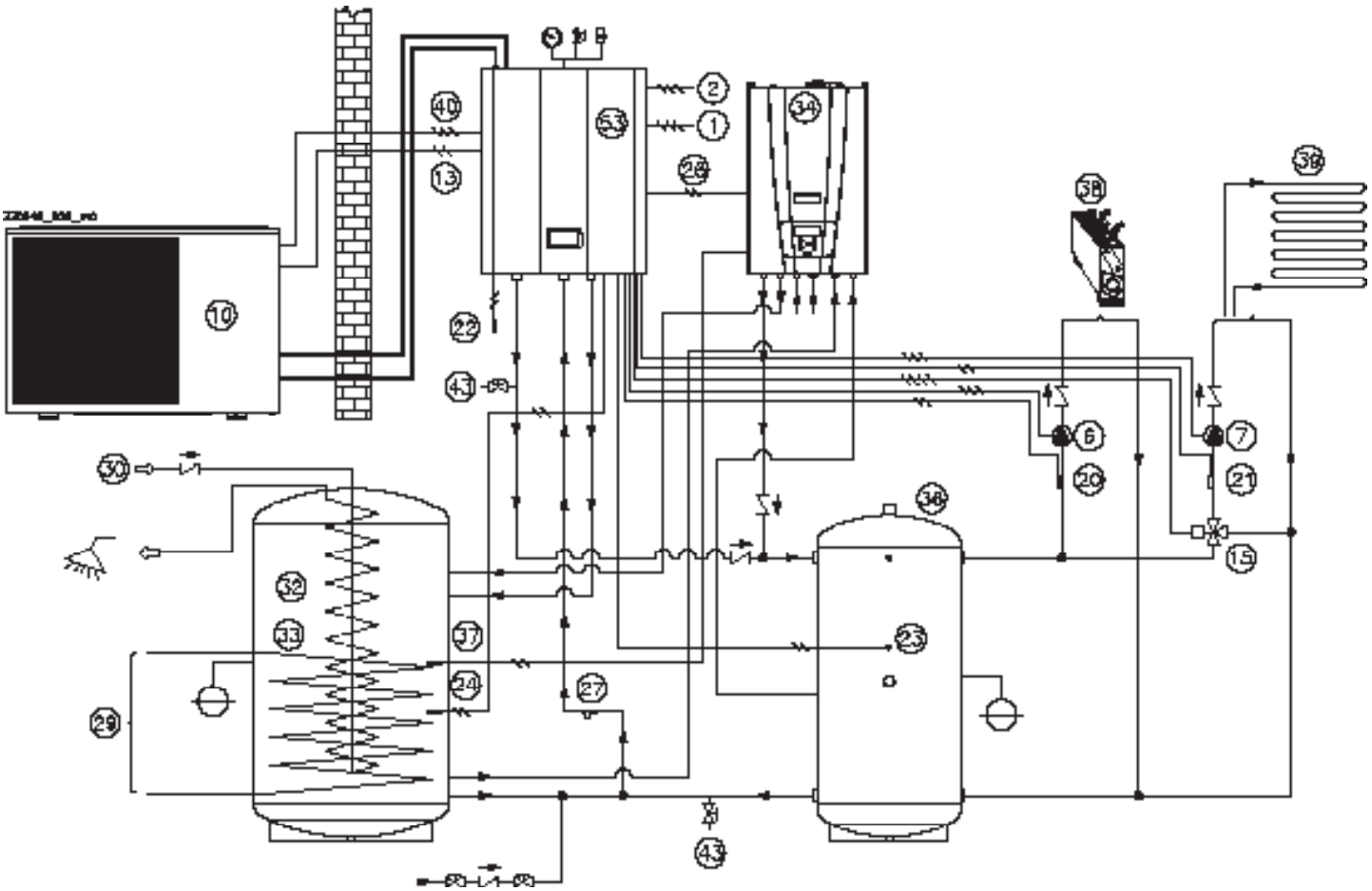
After creating the hydraulic system as shown in Figure 5-10 and the electrical system as shown in Figure 5-11, configure the appliance as follows:

1.- In the home page of the display, press the "Settings" icon ("H" of Figure 8-1);
2.- Enter the "USER" menù (section 8.2.8) and select "Permission level";
3.- Enter the password "87654321" for the Installer level and press OK;
4.- Go back and enter the "WORKING MODE" menù (section 8.2.9);
5.- Using the green tick, enable the unit to produce domestic hot water, heating and/or cooling;
6.- Go to second page of the menù and set "Heating / cooling switch" to "External signal control". Switching takes place only via remote command "17" for cooling or "18" for heating;
7.- Exit the "WORKING MODE" and select "WATER PUMPS" menù;
8.- To configure the pump outputs so that the circuits work according to the status of inputs "17" and "18", it is necessary:
   a.- Select "Working mode of circulation pump P0" and set it to "OFF with compr.";
   b.- Go to the next page and put the check mark to "Buffer tank", enabling it;
   c.- Put the check mark in "P1 for heating operation" and, if previously enabled, also enable "P1 for cooling operation";
9.- Exit "WATER PUMPS" and select "DHW" menù;
10.- Set the DHW setpoint temperature in " Setpoint DHW" parameter;
11.- Exit this menù and enter in "ZONE 1" menù:
   a.- If the cooling function is enabled, select "Set temp. for cooling (fix flow water temperature)" and set the setpoint temperature;
   b.- If you want to adjust the heating temperature via outdoor reset, select "Heating (HC1)" and complete the following parameters as described in section 8.2.1;
   c.- If the "Heating (HC1)" has not been selected, set the appropriate set point temperature on the "Set temp. for heating (fix flow water temperature)";
12.- Exit this menù and select "BACK-UP";
13.- Tick on "Backup heating sources for sanitary hot water" so that the heat pump can call electrical heater "9" if it is unable to bring the domestic hot water tank to the required temperature within a certain number of minutes;
14.- Select "Priority for backup heating sources (HWTBH)" and set it to "Higher than AH" (in this way, the electrical heater "35" in Figure 6-22 have priority, which is inside the heat pump);
15.- Access the boiler (Mydens B / Novadens B / Q30B) and set the domestic hot water to a set point 5 ° C lower than the domestic hot water set point as set in the previous step in point 10;
16.- Access the boiler (Mydens B / Novadens B / Q30B), disable the outdoor reset and set the heating to a set point greater than or equal to that of the heat pump as set in the previous step in point 11.

After this configuration, the unit is able to:
- Domestic hot water production in priority over heating / cooling;
- Be called in heating by closing contact "18";
- Be called in cooling by closing contact "17";
- Call the boiler as a supplement to heating and domestic hot water production whenever the heat pump fails to reach the domestic hot water set point and / or the heating set point within a certain period of time.

Figure 5-11 - Wiring diagram with one heating/cooling circuit, DHW, buffer tank and a boiler

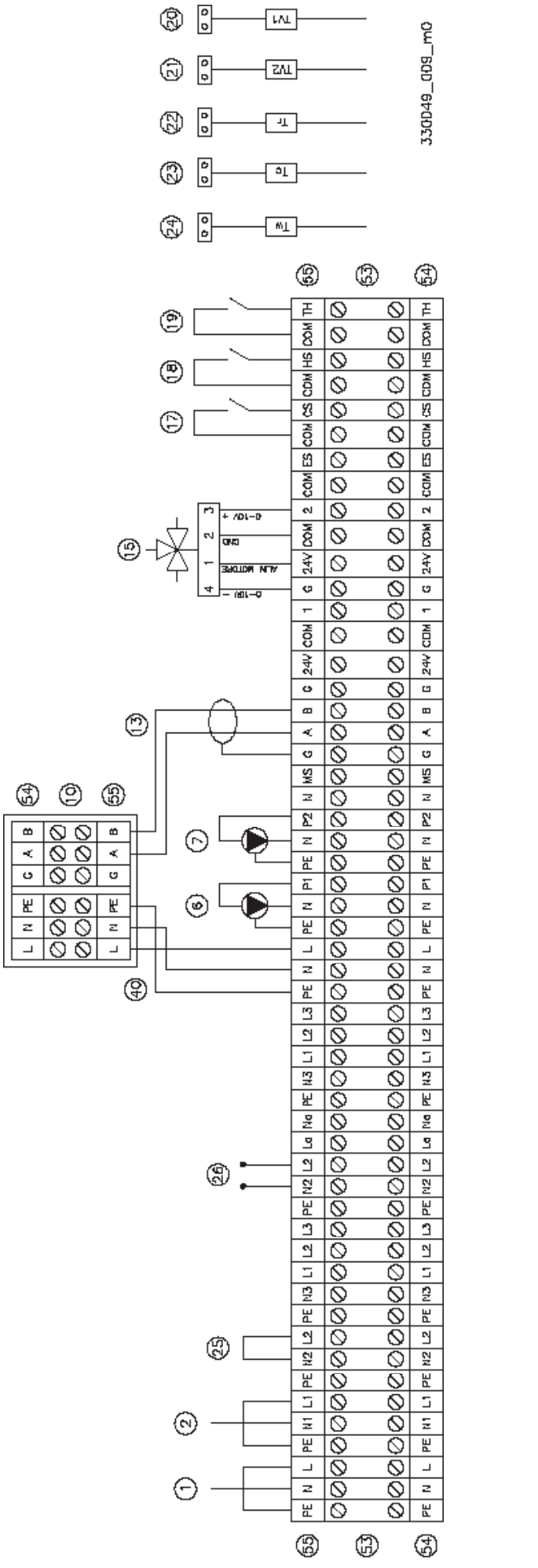
5.7 - Ecotwin with double heating/cooling circuit, DHW, a buffer tank and a boiler



LEGEND of Figure 5-12 and 5-13:

1 - Main electrical supply
2 - Internal electrical heater (3 kW)
6 - Pump P1
7 - Pump P2
10 - Outdoor unit
13 - Modbus communication
15 - Enable mixing valve (M51) circuit 2
17 - Cooling demand
18 - Heating demand
19 - Double setpoint demand
20 - Circuit 1 temperature sensor (TV1)
21 - Circuit 2 temperature sensor (TV2)
22 - Room temperature sensor (Tr)
23 - Heating/Cooling thermoregulation sensor (Tc)
24 - DHW temperature sensor (Tw)
25 - Jumper
26 - Connect to terminals “TA” of the boiler
27 - Filter
29 - Solar (optional)
30 - Domestic cold water
32 - DHW buffer tank
33 - Auxiliary heat exchanger for solar or other
34 - Boiler
36 - Heating/cooling buffer tank
37 - Boiler sensor for buffer tank
38 - Circuit 1, direct for heating/cooling
39 - Circuit 2, mixing for heating/cooling
40 - Electrical supply of outdoor unit
43 - Drain valve
53 - Indoor unit
54 - Terminal block side already connected (internal device)
55 - Terminal block side for installer connections

Figure 5-12 - Hydraulic diagram with double heating/cooling circuit, DHW, buffer tank and boiler



5.7.1 - Configuration for double heating/ cooling circuit, DHW, a buffer tank and a boiler

After creating the hydraulic system as shown in Figure 5-12 and the electrical system as shown in Figure 5-13, configure the appliance as follows:

1.- In the home page of the display, press the "Settings" icon (item "H" of Figure 8-1);
2.- Enter the "USER" menù (section 8.2.8) and select "Permission level";
3.- Enter the password "87654321" for the Installer level and press OK;
4.- Go back and enter the "WORKING MODE" menù (section 8.2.9);
5.- Using the green tick, enable the unit to produce domestic hot water, heating and/or cooling;
6.- Go to second page of the menù and set "Heating / cooling switch" to "External signal control". Switching takes place only via remote command "17" for cooling or "18" for heating;
7.- Exit the "WORKING MODE" menù and select "WATER PUMPS";
8.- To configure the pump outputs so that the circuits work according to the status of inputs "17" and "18", it is necessary:
   a.- Select "Working mode of circulation pump P0" and set it to "OFF with compr.";
   b.- Go to the next page and put the check mark to "Buffer tank", enabling it;
   c.- Put the check mark in "P1 for heating operation" and, if previously enabled, also enable "P1 for cooling operation";
   d.- Select "P1 with high temp. demand";
   e.- Select "P2 for heating operation" e se necessita metterla anche a "P2 for cooling operation".
9.- Exit the "WATER PUMPS" menù and select "DHW";
10.- Set the DHW setpoint temperature in " Setpoint DHW" parameter;
11.- Exit this menù and select "ZONE 1" menù:
   a.- If the cooling function is enabled, select "Set temp. for cooling (fix flow water temperature)" and set the setpoint temperature;
   b.- If you want to adjust the heating temperature via outdoor reset, select "Heating (HC1)" and complete the following parameters as described in section 8.2.1;
   c.- If the "Heating (HC1)" has not been selected, set the appropriate set point temperature on the "Set temp. for heating (fix flow water temperature)";
12.- Exit this menù and select "ZONE 2":
   a.- Select "Zone 2", set the "Set temp. for cooling (fix flow water temperature)" e "Set temp. for heating (fix flow water temperature)";
   b.- Select "Mixing valve";
   c.- Remove the check from the "Heating curve 2 (HC2)" line if you want the regulation at fixed point, or add the check and complete the following outdoor reset parameters as described in section 8.2.1;
13.- Exit this menù and select "BACK-UP";
14.- If present, remove the check from "Backup heating sources for sanitary hot water";
15.- Select "Priority for backup heating sources (HBH)" and set it to "Higher than AH" (in this way, the electrical heater "35" in Figure 6-22 have priority, which is inside the heat pump);
16.- Exit this menù and select " ELECTRIC LOCK";
17.- Enable the parameter "Heating ECO operation";
18.- Now, access the boiler (Mydens B / Novadens B / Q30B) and set the domestic hot water to a set point 5 ° C lower than the domestic hot water set point as set in the previous step in point 10;

Figure 5-13 - Wiring diagram with double heating/cooling circuit, DHW, buffer tank and boiler

19.- Access the boiler (Mydens B/Novadens B/Q30B), disable the outdoor reset and set the heating to a set point greater than or equal to that of the heat pump as set in the previous step in point 11.

After this configuration, the unit is able to:
- Carry out the Heating / Cooling switchover using the manual selector “41” (switch to be made at each season change). The call relating to “Zone 2” will be made by the room thermostat “42”.
- Be called in heating / cooling on “Circuit 1” by closing the room thermostat “42” and input “19”.
- Switch between heat pump and boiler when the outside temperature drops below a certain value.

☞ The closure of input “19” alone is unable to start Zone 1.

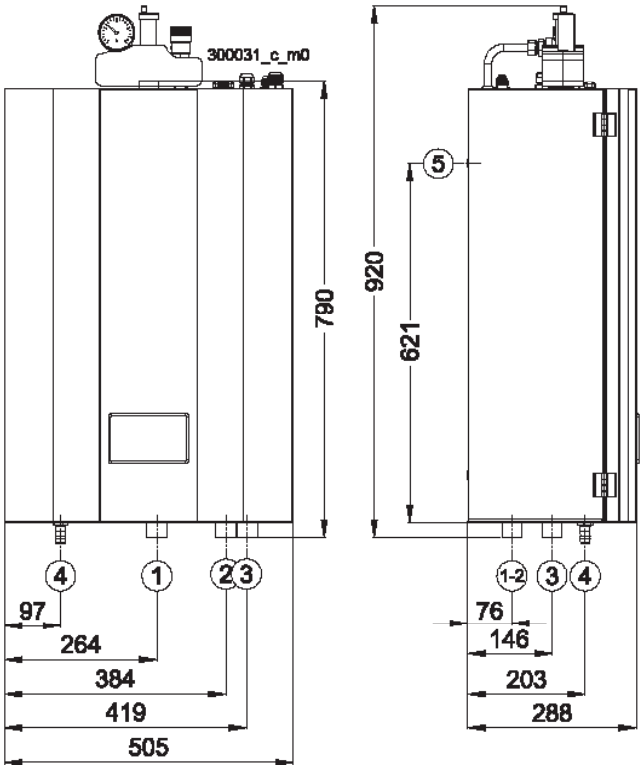
☞ Since it is necessary to close both the room thermostat “42” and the input “19”, the call of Zone 1 inevitably also starts Zone 2.
- Domestic hot water production in priority over heating / cooling;
- Call the boiler as a supplement to heating and domestic hot water production whenever the heat pump fails to reach the domestic hot water set point and / or the heating set point within a certain period of time.

6.1 - Opening the package

The device is supplied fixed to a pallet and protected by cardboard packaging. To open it, cut the fastening straps, remove the packaging upwards and detach the appliance from the pallet by unscrewing the fixing screws.

6.2 - GS indoor unit dimensions

Figure 6-1 shows the overall dimensions of the indoor unit, useful for installation purposes.



Key Figure 6-1

1 = Heating supply (1”);
2 = Return (1”)
3 = Supply to tank for DHW;
4 = Condensate drain;
5 = Wall hang connections;

☞All dimensions are in millimeters.

Figure 6-1 - GS indoor unit dimensions

6.3 - Minimum clearances of GS indoor unit

For installation and maintenance, it is necessary to leave free spaces around the appliance as shown in the Figure 6-2.

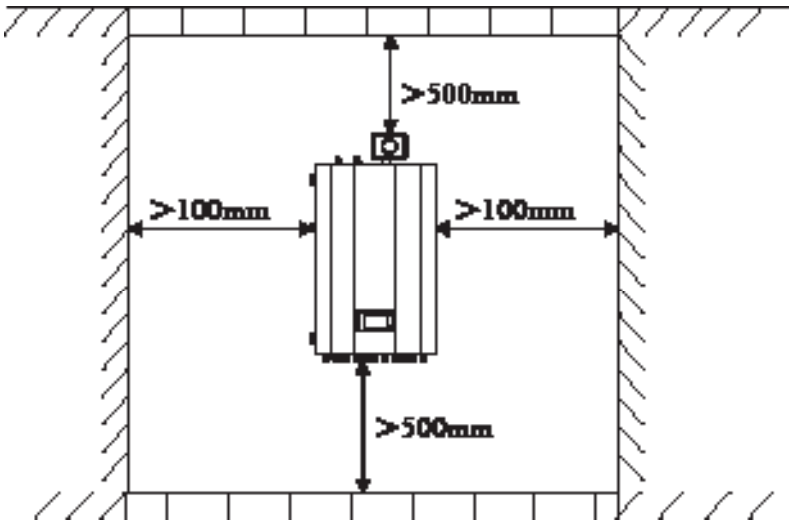


Figure 6-2 - Minimum clearances of GS indoor unit

6.4 - Minimum clearances of STM outdoor unit

WARNING !!! Carefully choose the position of the outdoor unit with respect to its vicinity, as it is a source of noise. For correct installation, observe the instructions highlighted in section 6.8.

For installation, maintenance and especially for proper ventilation, it is necessary to leave free spaces around the outdoor unit, as shown in the Figure 6-3.

WARNING !!! It is forbidden to install the units one above the other (Figure 6-4), to prevent the condensation produced by the one positioned above from falling onto the one below.

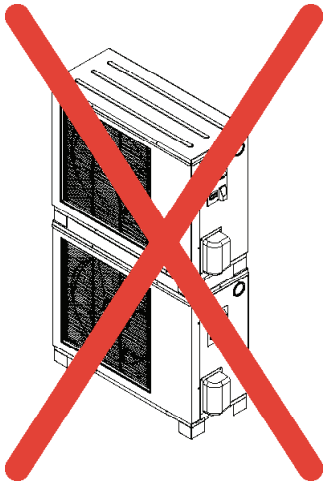
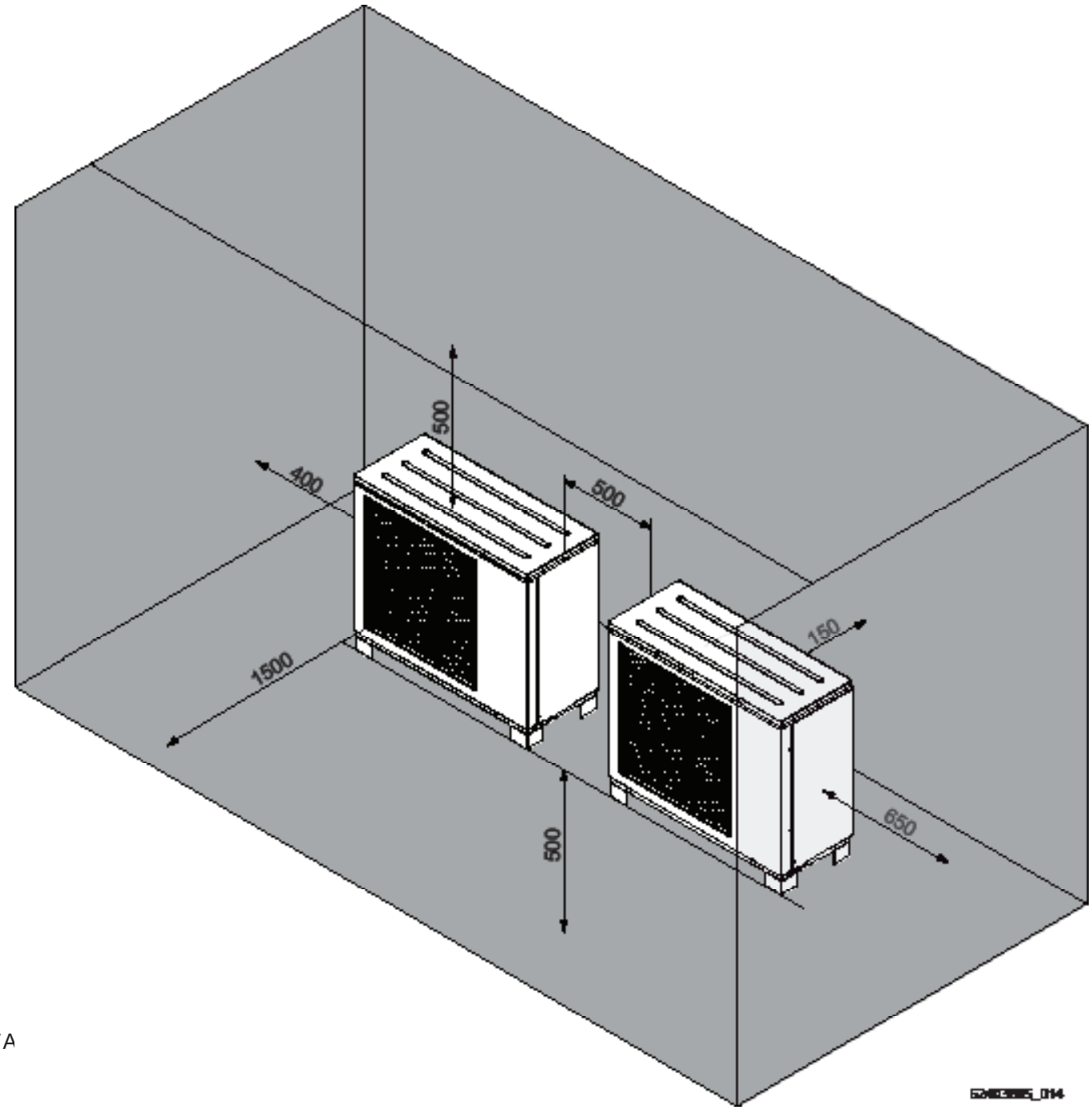


Figure 6-4 - Appliances uncorrect position

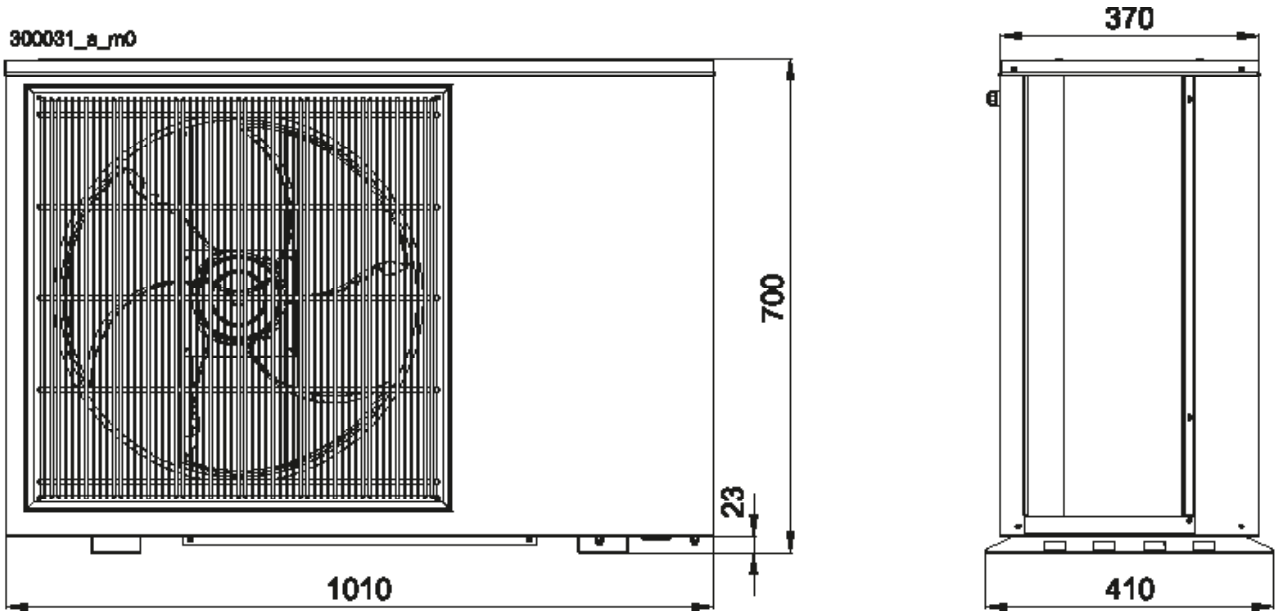


☞A

Figure 6-3 - Minimum clearances of STM outdoor unit

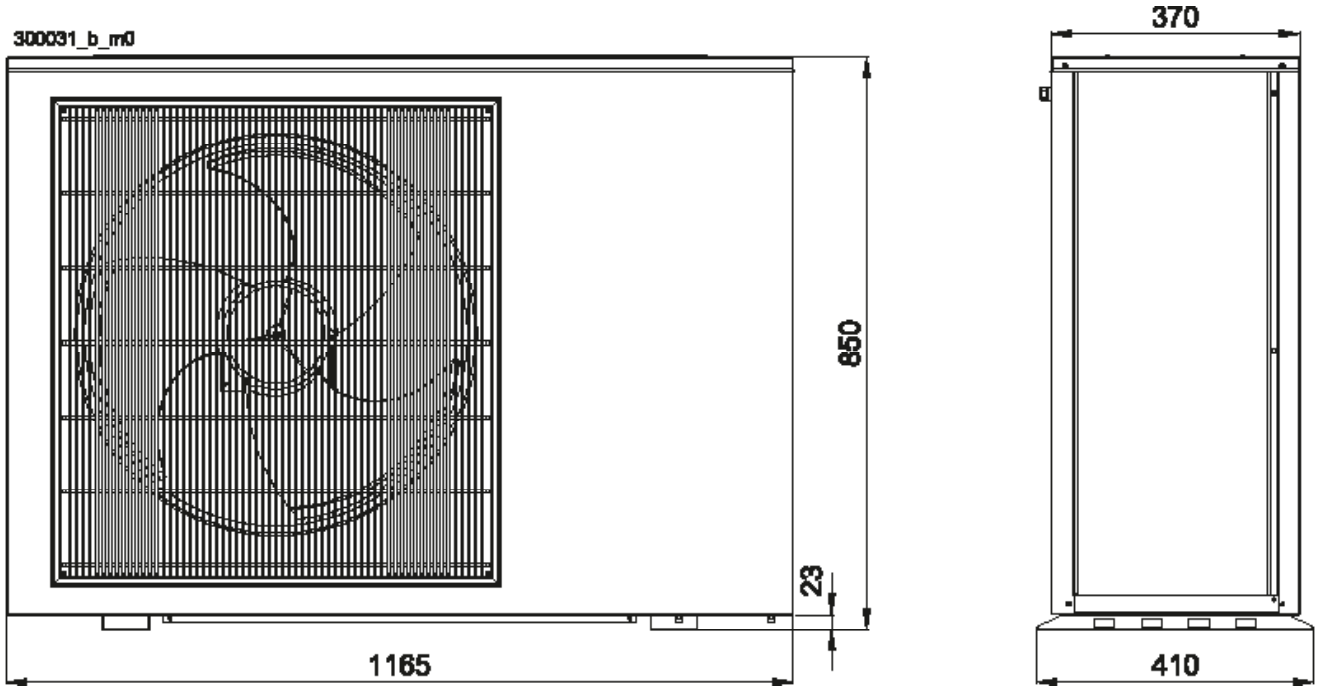
6.5 - STM outdoor unit dimensions

Figures 6-5 and 6-6 show the overall dimensions of the outdoor units, useful for installation purposes.



☞All dimensions are in millimeters.

Figure 6-5 - STM 06 outdoor unit dimensions



☞All dimensions are in millimeters.

Figure 6-6 - STM 9 and 12 outdoor unit dimensions

6.6 - Warnings before installation

WARNING!!! The installation must be carried out exclusively by a qualified technician pursuant to Ministerial Decree 22.01.2008 No. 37 and subsequent amendments. and, as regards the part relating to refrigerant gas, by a qualified technician pursuant to regulation (EU) 517/2014.

The installation, operation and maintenance of the system must be carried out in accordance with current legislation on thermal systems.

The installation must be carried out according to the application and compliance with the CEI installation standards indicated in section 1.1.

6.7 - Choosing the installation location of GS indoor unit

WARNING !!! The appliance must be installed exclusively on a solid and vertical wall, which can bear the weight.

- ☞ In case of installation of the indoor unit in a place with a temperature below 0 ° C, take the appropriate measures to avoid the formation of ice in the hydraulic units.
- ☞ The sections of the circuit will, in any case, be calculated according to the normal methods, taking into account the available flow-head characteristic (reported in section 5.2).
- ☞ The first ignition must be carried out by the authorized Technical Assistance Service.

Also consider the following types of connection for the indoor unit:

- connection to the net water system;
- connection to the central heating system;
- connection of the safety pressure relief valve drain;
- connection to the main electrical supply;
- connection of the refrigerant line with the outdoor unit.

Also provide for the connection between the indoor and outdoor unit of the communication bus via a 0.75 mm2 shielded bipolar cable (section 6.17.3).

WARNING !!! If the total refrigerant charge is greater than 1.84 kg, refer to the minimum ventilation surfaces for installation indicated in section 5.3.

6.8 - Choosing the installation location of STM outdoor unit

WARNING!!! Carefully choose the position of the outdoor unit with respect to its vicinity, as it is a source of noise.

For the installation of the outdoor unit it is good to keep in mind some first information:

- ☞ No obstacles must prevent the free circulation of air around the outdoor unit (Figure 6-3).
- ☞ Do not place the outdoor unit near the bedrooms.
- ☞ Do not place the unit in front of glass walls.
- ☞ Do not install the unit near balconies, etc.
- ☞ Choose a location sheltered from strong winds or install the outdoor unit at 90 ° with respect to the wind direction.
- ☞ Avoid proximity to heat sources and exposure to sunlight.
- ☞ Avoid proximity to combustible materials and air jets.
- ☞ Avoid installation in dirty and polluted places, where volatile, corrosive or flammable liquids or gases are present.
- ☞ Make sure there is drainage around the unit to evacuate condensate during the defrost function.
- ☞ The installation of the outdoor unit in an aggressive saline atmosphere decreases the useful life of the product.
- ☞ Place the outdoor unit on a support (concrete base, beam, concrete cubes, etc.) without fixed placements with the room served, in order to avoid any transmission of vibrations.
- ☞ Ensure a sufficient distance from the floor (500 mm as shown in Figure 6-9), in order to keep the unit above the condensation water..
- ☞ Always use a metal base, suitably raised from the ground, so as to allow the condensate to drain correctly. The width of the base must not exceed the width of the outdoor unit.
- ☞ In the case of wall mounting, check the dimensions and weight of the unit in order to choose the appropriate support.
- ☞ Tighten all the nuts after fixing the support bracket, to avoid damage to the unit.
- ☞ The installer must check that the unit is firmly fixed.
- ☞ The support bracket must be made of a material that does not degrade over time.
- ☞ Make slightly inclined holes for connecting the pipes (≥ 8°) to prevent rainwater from penetrating inside.

WARNING!!! In heating , if the outdoor temperature is above 14 ° C, the machine begins to reduce the power. In cooling, the power is reduced if the outdoor temperature is below 28 ° C or above 41 ° C.

6.8.1 - Mounting the appliance

Observe the following instructions during installation (Figure 6-7):

- Install the appliance on a concrete floor or masonry blocks or a metal bracket;
- If use a metal bracket, it must ensure a support weight of at least 5 times that of the appliance;
- The bracket can be made of galvanized steel, aluminum or other materials that do not degrade over time;
- In the case of wall mounting, choose a support suitable for the weight of the appliance;

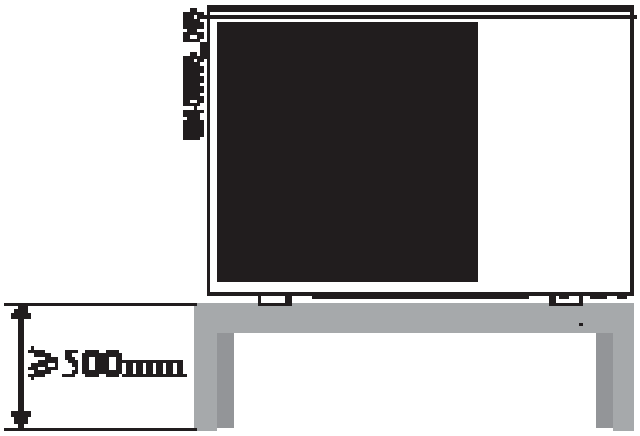


Figure 6-7 - Installation on a raised floor

6.8.2 - STM outdoor unit condensate drain installation

The machine is designed for conveying and discharging the condensate that forms on the battery. To do this, insert the condensate drain fitting in the desired hole (Figure 6-8).

☞ Mount the drainage fitting in “A” position and seal it with silicone, as shown in Figure 6-8.

☞ Incline the machine by 1 cm / m in the direction of the drainage fitting (A) to facilitate the evacuation of the collected water.

☞ During installation, tilt the condensate collection pipe by 1 cm / m to facilitate the drainage of rainwater.

☞ Convey the condensate drain connection to a suitable drain with siphon (see Figure 6-9).

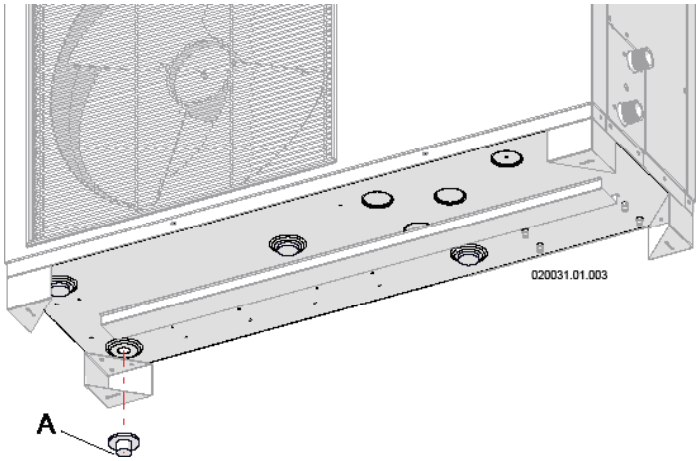
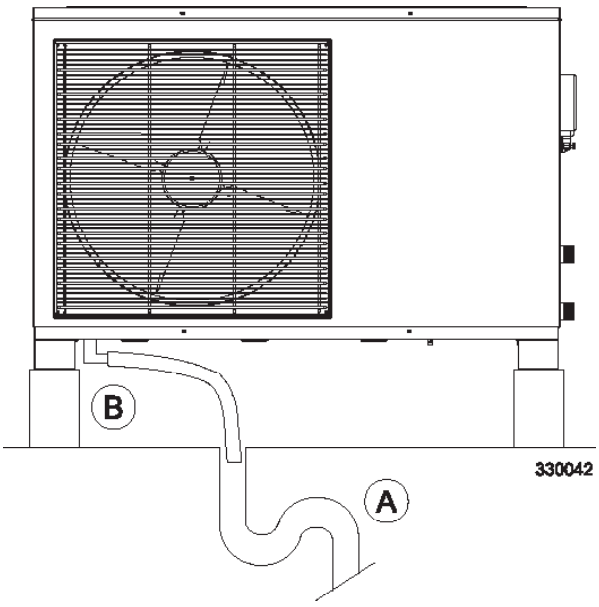


Figure 6-8 - Mounting the drainage fitting



A - Drain with siphon
B - Condensate drain connection

Figure 6-9 - Condensate drain connection

6.8.3 - Installation in cold and snowy areas

Wind and snow can greatly affect the performance of the heat pump. For a correct installation of the outdoor unit it is essential to follow the information below:

- ☞The width of the base must not exceed the width of the outdoor unit. Ice formation can cause it to rupture, resulting in a coolant leakage.
- ☞The height of the base cover must be greater than the height of the maximum snowfall. This measure helps to protect the exchanger from snow and to prevent ice formation during defrost function.
- ☞ In areas characterized by heavy snowfall, raise the protection by at least 200 mm above the average thickness of the snowpack.

WARNING!!!

- **If the outdoor temperatures drop below 0°C, take the necessary measures to avoid the risk of freezing in the condensate drain pipes.**
- **Avoid any risk of condensate freezing inside the passages.**
- **Always install the outdoor unit as far as possible from trafficable roads, as the discharged condensate can freeze and cause a potential danger (ice sheet).**
- **Place the outdoor units side by side and not on top of each other to prevent condensation from freezing on the bottom unit (Figure 6-4).**

6.9 - Heating/Cooling supply and return

The indoor unit has 3 hydraulic connections in the lower part (all diameter 1 “, see Figure 3-1):
- a “Water Inlet” connection which is the hydraulic return;
- a “Heating-cooling water outlet” connection which is supply of heating and cooling service;
- a “Water outlet to DHW buffer tank” connection which is the supply to the buffer tank set up for the production of domestic hot water.

The unit can operate without an inertial buffer tank if the amount of water circulating in the circuit is at least equal to 10 l / kW of unit power. For example, in the case of the Ecotwin 09 unit (heat output 10 kW) the amount of water circulating in the system should be at least 10 l/kW = 100 liters.
If the machine is to perform only the heating and / or cooling service without DHW production, the “Water outlet to DHW buffer tank” connection must be closed with a blind plug diam. 1 “.

In the upper part of the machine there are the refrigerant connections to the outdoor unit, the diameter of which is shown in Figure 3-1.

WARNING!!! The appliance is equipped with a safety pressure relief valve set at 3 bar. It must therefore not be installed with a sash greater than 30 m.

The safety drain valve must be conveyed to an anti-odor siphon. This drain must be designed to avoid overpressure, in the event of opening the valves, and allow the user to check for any intervention.

WARNING !!! If the safety pressure relief valve is not connected to the drain, it could cause damage to people, animals or things.

WARNING!!! COSMOGAS is not liable for any damage caused by the incorrect use of additives in the heating / cooling system.

WARNING!!! The system downstream of the appliance must be made with materials that withstand temperatures up to 95 ° C and a pressure of 3 bar. Otherwise (e.g. pipes in plastic materials), the system must be equipped with the appropriate protection and safety devices.
Before connecting the heating pipes, carefully wash the system to remove any waste (hemp, radiator melt earth, etc.) that could damage the appliance. This washing must also be carried out when replacing an appliance.
Figure 3-1 shows the positioning of the supply and return pipes.

☞ Install a metal mesh filter on the return pipe to protect the appliance from any residues coming from the system.

☞ Do not use the appliance for introducing any type of additive into the system.

☞ A continuous supply of water to the heating circuit increases the oxygen and limescale content with the risk of corrosion of the hydraulic circuit and consequent reduction of the life of the appliance itself. Any leaks from the hydraulic circuit must be repaired to prevent the problem.

6.10 - Radiant panel systems (or low temperature)

WARNING!!! The system downstream of the appliance must be made with materials that withstand temperatures up to 95 ° C and a pressure of 3 bar. Otherwise (e.g. pipes in plastic materials), the system must be equipped with the appropriate protection and safety devices.

WARNING !!! If the heat pump is installed in a radiant panel system made with plastic pipes, all precautions must be taken against corrosion due to oxygenation of the water: make sure that the system is carried out with plastic pipes having oxygen permeability not exceeding 0.1 g / m3 at 40 ° C. If the pipe does not satisfy these characteristics, it is essential to isolate the radiant panel circuit from the heat pump by means of a plate heat exchanger.

6.11 - Domestic hot and cold water

Figure 3-1 shows the positioning of the domestic hot and cold water pipes.
Provide a shut-off valve upstream of the cold water inlet, useful for maintenance work.

WARNING!!! The domestic hot water circuit must be made of materials resistant to a temperature of at least 95 ° C and a pressure of 7 bar. Otherwise (e.g. pipes made of plastic materials) the system must be equipped with the appropriate protective devices.

WARNING!!! If the appliance is connected to a DHW recirculation circuit, a safety pressure relief valve and an expansion tank, suitably sized, must be installed to manage the natural increase in water volume during the heating.

6.12 - Antilegionella

To minimize energy consumption, it is advisable to use hot water preparation devices that avoid the storage of large quantities of water. It is therefore recommended to use tank with semi-rapid production or tanks with external heat exchanger plate (“freshwater”). In this way the thermal shock against legionellosis can be avoided. Refer to the hydraulic diagrams of Figures from 5-6 to 5-12.

6.13 - Distances between indoor and outdoor unit

WARNING !!! To ensure proper operation of the heat pump, respect the minimum and maximum connection lengths between the hydraulic module and the outdoor unit (Figure 6-10).

WARNING !!! If the refrigerant connection between the outdoor unit and the indoor module is less than 2 m, the following problems may occur:
• functional disturbances due to fluid overload;
• acoustic disturbances due to the circulation of the refrigerant.
Therefore, provide for a refrigerant connection of at least 2 m, making one or two horizontal rings to limit these disturbances.

A	Indoor unit	
B	Outdoor unit	
C	Curves	max number of curves: 15
		radius of the curves: between 100mm and 150mm
D	Siphon on the refrigerant gas line	the curves of each siphon affect the maximum number of curves that can be created on the system. One siphon = 2 curves.
E	Refrigerant gas connection length (Check section 6.16.4 for additional charge)	min: 2m
		max:15m
F	Maximum height difference between indoor and outdoor unit	12m
G	Distance between one siphon and the other	mount a siphon every 3 meters in height.
H	Siphon height	100 - 150 mm

Table “addition” of refrigerant and lubricating oil

	Addition refrigerant		Addition FV68S lubricating oil		
	0-5 m	6-15 m	0-5 m	5-10 m	10-15 m
6	NO	30 gr al m	NO	60 ml	100 ml
9	NO	30 gr al m	NO	60 ml	100 ml
12	NO	30 gr al m	NO	80 ml	120 ml

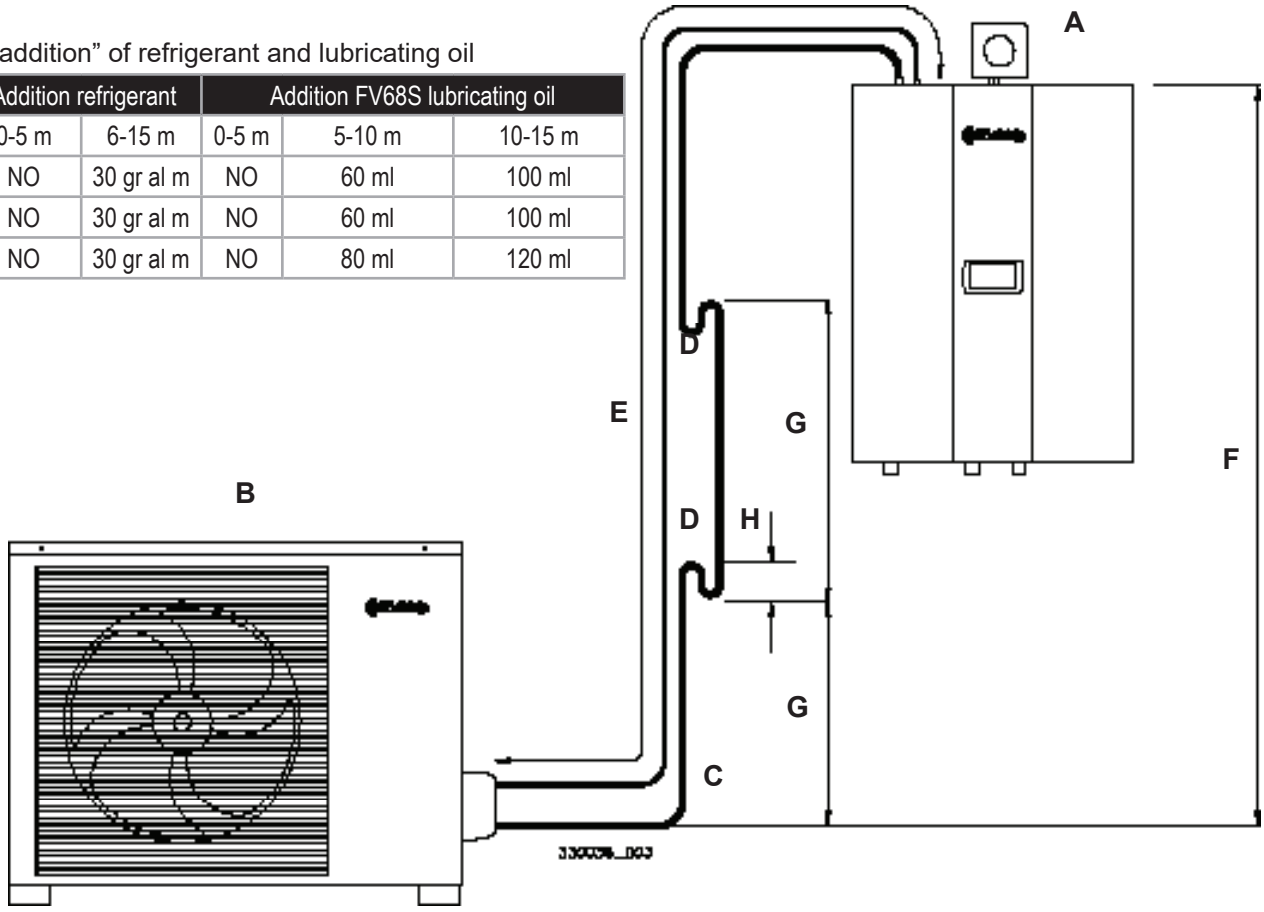


Figure 6-10 - Distances between outdoor and indoor unit

6.14 - Wall mounting of the GS indoor unit

☞The indoor unit must be installed inside and mounted on a wall with the water connections facing down.

☞The indoor unit must be installed in a dry and ventilated compartment.

☞The indoor unit cannot be installed in a place with the presence of volatile, corrosive or flammable liquids or gases.

☞It is recommended to install the indoor unit close to the net water system.

☞Sufficient space must be left around the indoor unit for maintenance operations and to ensure good ventilation (Figure 6-2).

The indoor unit must be mounted on a wall according to the following instructions:

1.- Take the expansion plugs and mounting bracket from the accessories. Place the mounting bracket on the wall in the desired position making sure it is horizontal. Mark the position of the screws on the wall through the holes on the bracket;
2.- Drill the wall with holes of the correct diameter;
3.- Unscrew the screws from the expansion plug;
4.- Attach the mounting bracket to the expansion anchors without overtightening;
5.- With a hammer insert the wall anchors. Use a wrench to tighten the nuts to secure the mounting plate to the wall;
6.- Hang the indoor unit on the mounting plate. Make sure it hangs well before leaving the unit. The wall installation is completed.

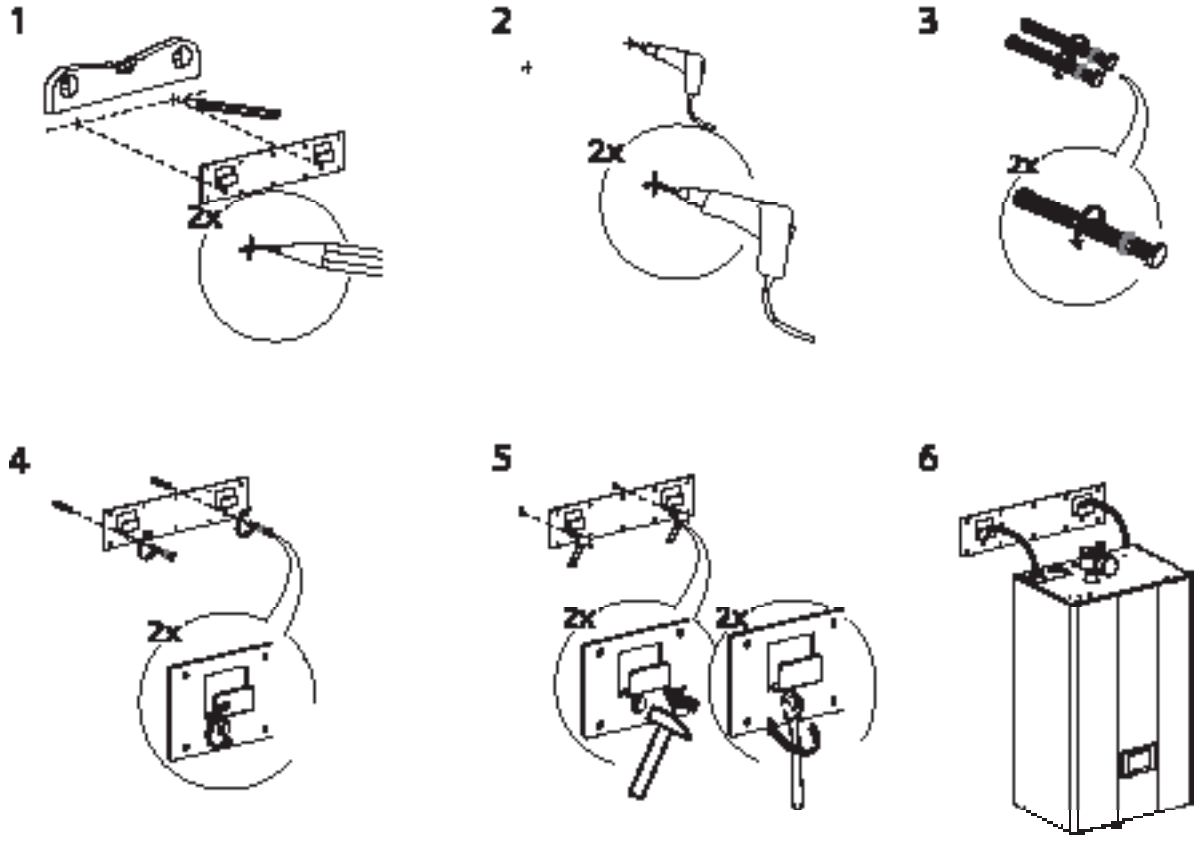


Figure 6-11 - Support blocks

6.15 - Installation of the safety kit in the GS indoor unit

The safety kit is supplied from the factory in the accessories bag (section 2.2). Mount the safety kit as follows:

1.- Install the safety kit on the fitting located on the upper side of the indoor unit (Figure 6-12);
2.- Insert the copper pipe supplied with the drain (from the non-flared side) into the hole provided behind the safety unit and insert it until the flagged bend aligns with the safety valve drain.
3.- Taking care to use the right gaskets, connect the drain pipe, by means of a supplied nipple, to the safety pressure relief valve outlet (Figure 6-13).

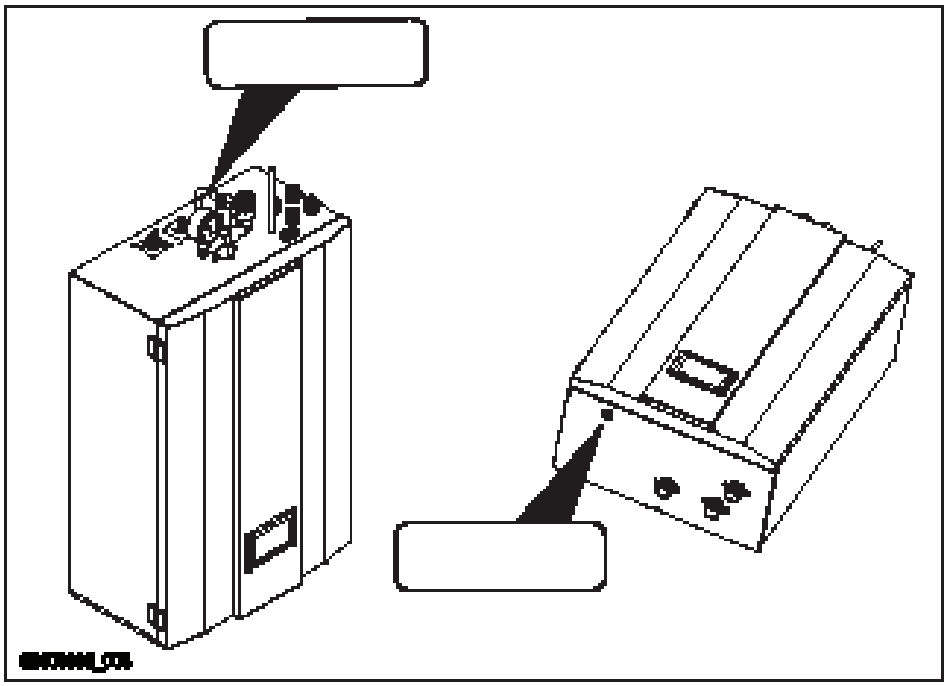


Figure 6-12 - Safety kit installation

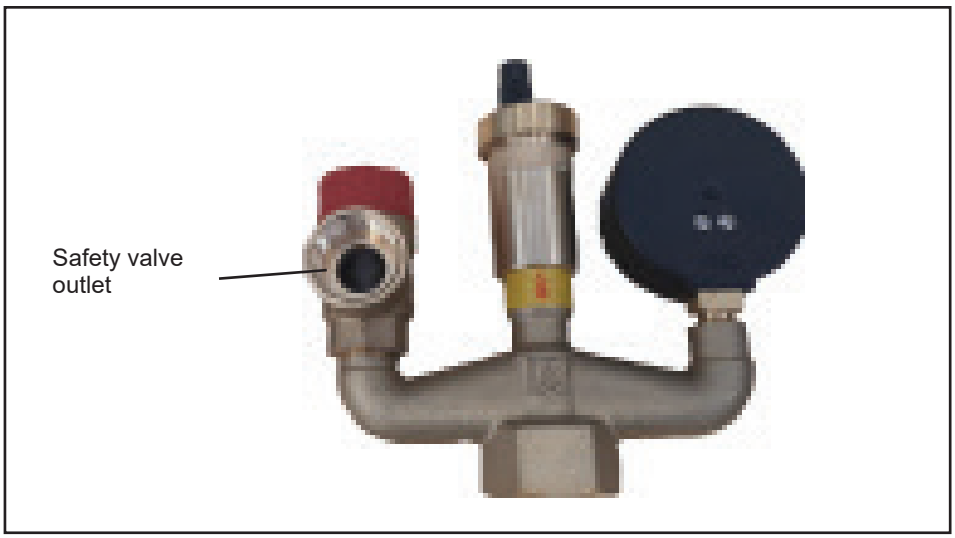


Figure 6-13 - Connection of the drain pipe to the safety pressure relief valve (a cura dell'installatore)

6.16 - Refrigerant connections

To connect the refrigerant gas between the indoor and outdoor units, proceed as follows:

1.-Install the refrigerant connection pipes between the hydraulic module and the outdoor unit (section 6.16.1);
2.- Make sure that the dimensions of the pipes are respected, following section 6.13.

The refrigerant pipes carry the heat throughout the system. An incomplete vacuum or refrigerant gas leak will lead to a loss of performance, so pay close attention to the following points:

a.- Use a quality refrigerant pipe compliant with the gas in use.
b.- Perfectly insulate the pipe before connection.
c.- Check the joints to avoid leaks.
d.- Avoid excessive bending of the pipe to ensure smooth circulation of the refrigerant (Figure 6-14).
e.- Dry the refrigerant pipe to avoid humidity inside the refrigerant pipe.
f.- In the case of walls between the indoor and outdoor unit, drill a hole in the wall and install a sleeve. Route the refrigerant piping through a sleeve.
g.- The insulation of the pipes must be single for each pipe. Do not insulate the pipes together (Figure 6-15).

The radius of the curve pipes must not be less than 10-15 cm. Use a template to check it. Create the curves gradually and carefully, do not use edges to bend the tube.

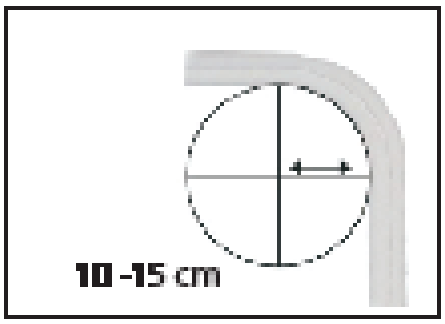


Figure 6-14 - Curve of the pipe

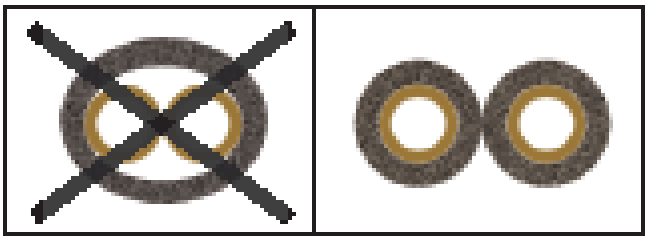


Figure 6-15 - Pipe insulation

6.16.1 - Connections for the refrigerant gas circuit

Refer to Figure 6-16:

1.- Unscrew both nuts of the **indoor unit** taps, removing the copper caps and keeping the nuts. Both taps are supplied with the internal valve **open**;
2.- Insert the pipes inside the connection nuts;
3.- Expanding the pipes;
4.- Connect the pipes and tighten the nuts with a torque wrench, referring to the tightening torques indicated in Figure 6-17.

WARNING!!! Apply refrigerant oil on the expanded parts to facilitate tightening and improve sealing.

WARNING!!! The outdoor unit is supplied pre-charged with refrigerant gas. Do not open the taps before having made the connection refrigeration lines and tested the tightness.

Refer to Figure 6-16:

1.- Unscrew both nuts from the taps of the **outdoor unit**, removing the copper caps and keeping the nuts. Both taps are supplied with the internal valve **closed**;
2.- Insert the pipes inside the connection nuts;
3.- Expanding the pipes;
4.- Connect the pipes and tighten the nuts with a torque wrench, referring to the tightening torques indicated in Figure 6-17.

WARNING!!! Apply refrigerant oil on the expanded parts to facilitate tightening and improve sealing.

5.- The indoor and outdoor units are now connected as in Figure 6-18.
6.- Proceed to check the tightness of the refrigerant circuit as per section 6.16.2.

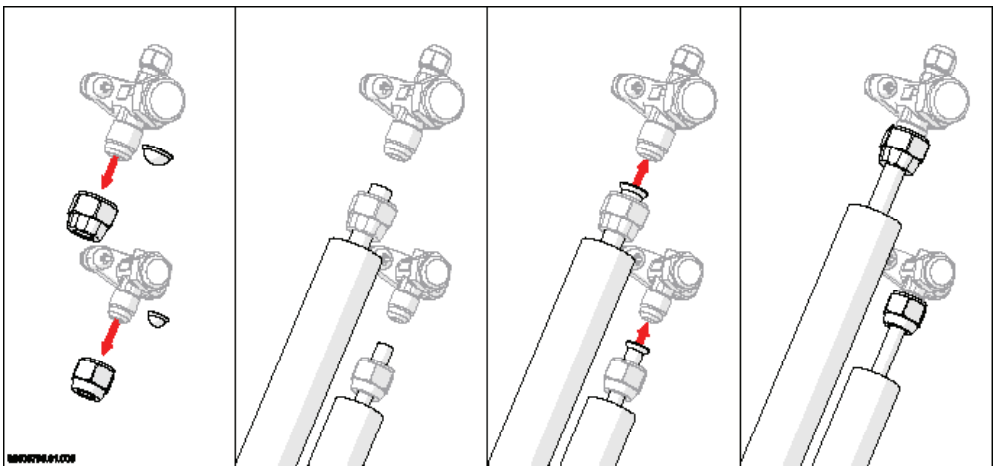


Figure 6-16 - Refrigerant circuit connections

TIGHTENING TORQUE		
Pipe outer diameter (mm / inch)	**Outside diameter of the conical fitting (mm)**	**Tightening torque (Nm)**
6,35 - 1/4”	17	14 - 18
9,52 - 3/8”	22	34 - 42
12,7 - 1/2”	26	49 - 61
15,88 - 5/8”	29	69 - 82

Figure 6-17 - Tightening torque of refrigerant connections

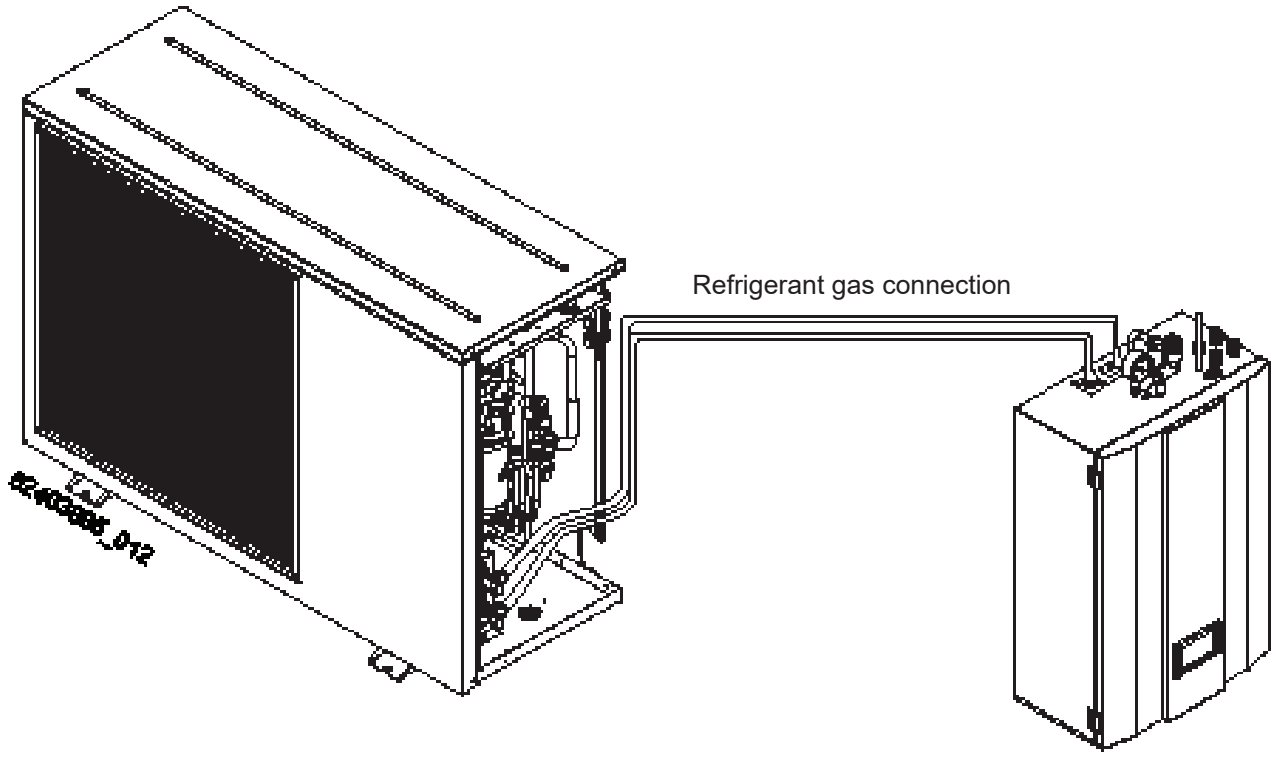
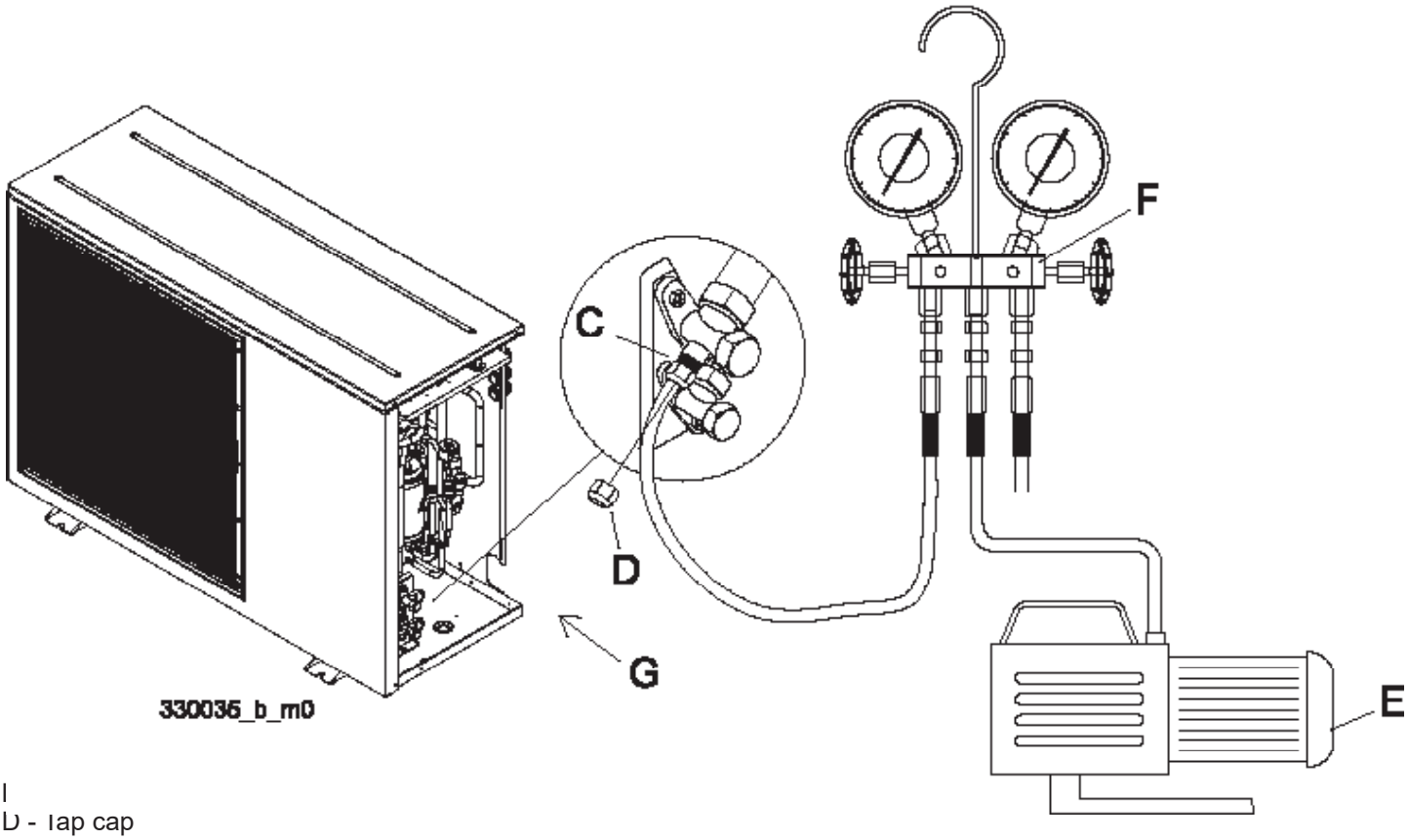


Figure 6-18 - Refrigerant connection between indoor and outdoor unit



I
D - Tap cap
C - Outdoor unit charging port
E - Vacuum pump
F - Vacuum gauge
G - Right panel (remove for access)

Figure 6-19 - Outdoor unit and vacuum pump connection

6.16.2 - Checking the tightness of the refrigerant circuit

Refer to Figure 6-19:

1.- Remove the cap “D” and connect a nitrogen bottle equipped with a pressure regulator to the charge connection of the outdoor unit “C”;
2.- Progressively fill the circuit with nitrogen, in 5 bar increments, by acting on the pressure regulator until reaching 40 bar;
3.- Check the tightness of the fittings with a leak detector spray. If there are leaks, repeat the operations of points 2, 3 and 4 of section 6.16.1 and check the tightness again;
4.- Release the pressure and nitrogen;
5.- Proceed with the evacuation of the air from the refrigerat circuit and release of the refrigerant as per section 6.16.3.

6.16.3 - Evacuation of the air from the refrigerant circuit and release the refrigerant

1. - Connect a vacuum pump “E” (Figure 6-19) with a minimum flow rate of 4 m3 / h to the fitting on the outdoor unit (item “C” of Figures 6-19 and 6-20). Furthermore, connect in parallel a vacuum gauge “F” (Figure 6-19) to check the residual pressure reached;
2.- Turn on the vacuum pump and let it act for about an hour. Check that the vacuum degree reached is less than 0.5 mbar;
3.- Close the vacuum pump valve and check that the residual pressure on the vacuum gauge does not increase;
4.- Close the vacuum gauge tap to avoid damage to the instrument;
5.- After stopping the vacuum pump, remove the cap “A” (Figure 6-20) and immediately open the internal valve “B” (Figure 6-20) using an allen key;

WARNING!!! Once the valves have been unscrewed and reached the limit switch (fully open), screw them back about 3/4 of a turn to ensure the tightness of the internal O-rings.

6.- Reposition the cap “A” on the fitting “B” (Figure 6-20);
7.- Disconnect the vacuum gauge and the vacuum pump;
8.- Reposition the cap “D” on the fitting “C” (Figure 6-20);
9.- Tighten the caps “A” and “D” (Figure 6-20) with the aid of a torque wrench (tightening torque from 20 to 25 Nm);
10.- Check the tightness of the fittings using a leak detector;
11.- Add refrigerant according to the length of the refrigerant circuit, as reported in section 6.16.4.

LEGEND of Figure 6-20:
A - Cap
B - Internal valve
C - Connection for the vacuum pump
D - Vacuum pump connection cap

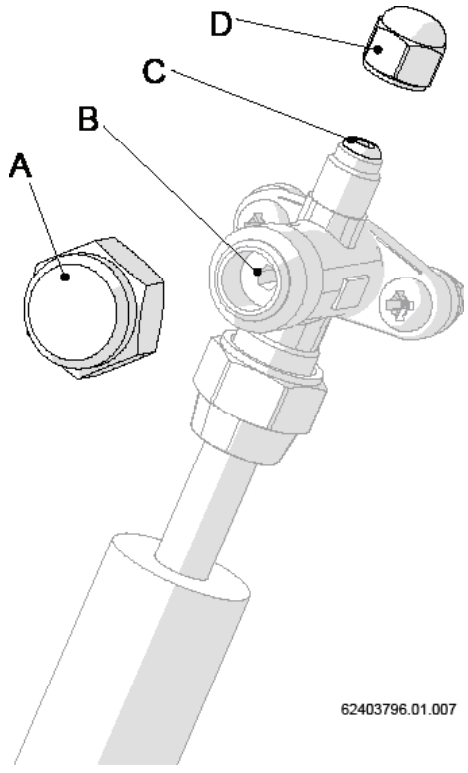


Figure 6-20 - Outdoor unit connection

6.16.4 - Refrigerant addition according to the length of the refrigerant circuit

The outdoor unit is equipped with an initial pre-charge that guarantees operation up to a distance of 5 m. If the length of the refrigerant connection pipes exceeds this value, it is necessary to add more fluid in the quantity of 40g for each meter exceeding 5m (see table in Figure 6-21).

WARNING!!! The maximum recommended length of the refrigerant line between the indoor and outdoor module is 15m.

Length pipe line (m)	Refrigerant quantity
1	Standard pre-charge
2	Standard pre-charge
3	Standard pre-charge
4	Standard pre-charge
5	Standard pre-charge
6	Add 30 grams
7	Add 60 grams
8	Add 90 grams
9	Add 120 grams
10	Add 150 grams

Figure 6-21 - Addition of refrigerant fluid in relation to the length of the refrigerant circuit pipes

6.17 - Electrical connections: general information

WARNING !!! The electrical safety of the appliance is achieved only when it is properly connected to an effective grounding system, performed as required by current safety standards.

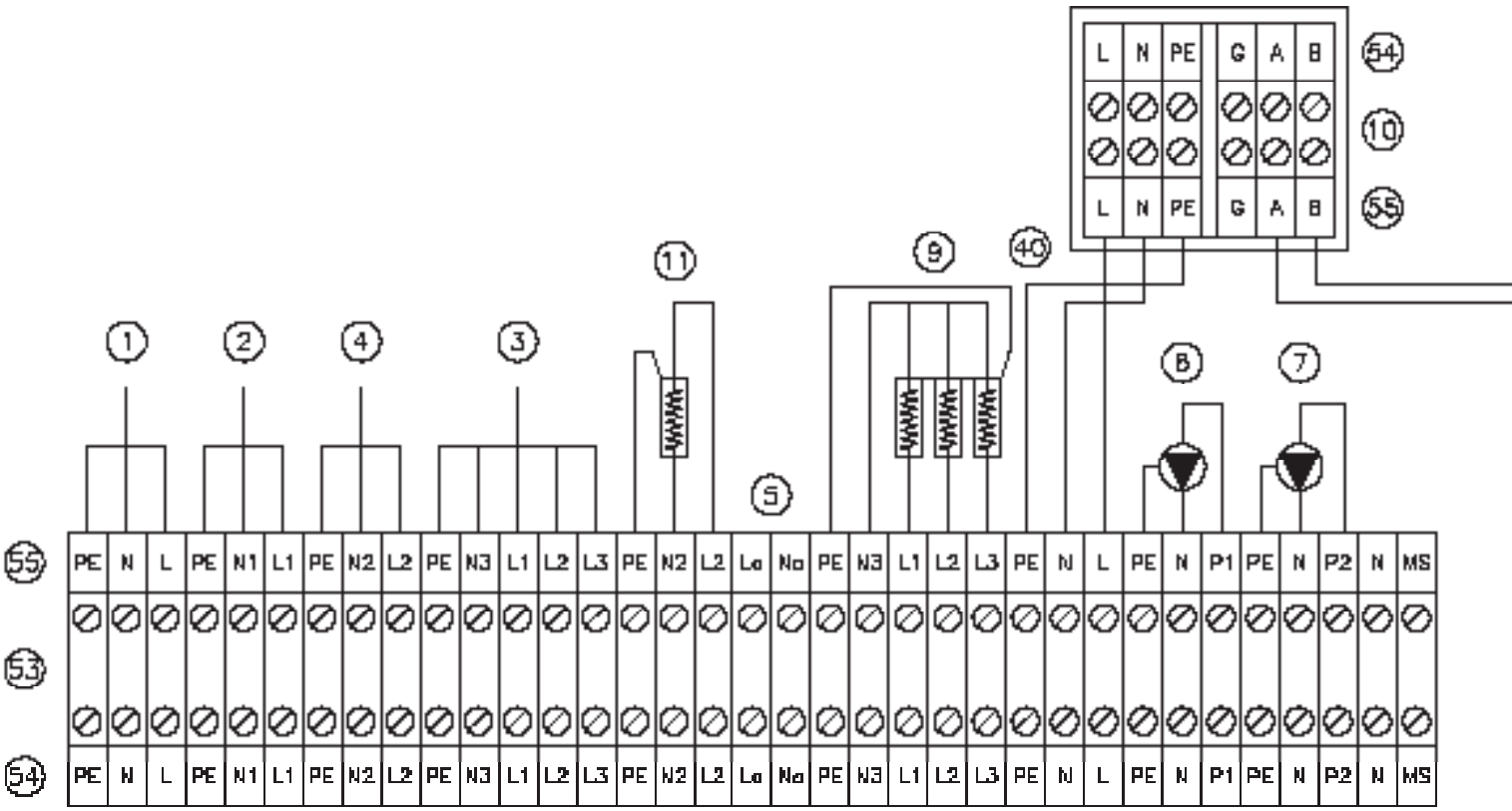
It is necessary to verify this fundamental safety requirement. If in doubt, request an accurate check of the electrical system by a professionally qualified technician.

- ☞ Have a professionally qualified technician check that the electrical system is adequate for the electrical power, indicated on the plate, required by the appliance.
- ☞ The connection of the appliance to the main electrical supply must be carried out with a connection with a mobile plug. The use of adapters, multiple sockets, extensions, etc. is not allowed.
- ☞ The connection of the appliance to the main electrical supply must be carried out with a three-pole, double-insulated electric cable with a section suitable for the electrical absorption of the machine (section 11).
- ☞ For connection to the electrical network, a bipolar switch with a contact opening distance of at least 3mm as required by current regulations must be provided in the vicinity of the appliance.
- ☞ Respect the polarity between phase and neutral when connecting the appliance.
- ☞ Make sure that the pipes of the water and heating systems are not used as earth sockets for the electrical or telephone system. These pipes are absolutely not suitable for this purpose, furthermore serious corrosion damage to the appliance, pipes and radiators could occur in a short time.

WARNING !!! This appliance has no protection against the effects caused by lightning.

WARNING !!! The product is equipped with devices controlled via low voltage communication BUS (for example heat pump BUS, outdoor sensor, remote control BUS etc.), whose connections must be protected from electromagnetic disturbances. To avoid faults or malfunctions and to obtain correct operation of all devices, the high voltage cables (power cables) and low voltage cables must have separate paths and not close together. In case of proximity, the low voltage cables must be shielded or screened / twisted and suitable for the type of installation, remembering to connect ONLY the shielding of one end of the cable to earth.

The electrical connections are positioned inside the indoor unit as in Figures 3-1, 6-22 and 6-24 and positioned inside the outdoor unit as in Figures 3-2, 3-3 and 6-24.



LEGEND of Figure 6-22:

1 - Main electrical supply (model 6 = 2,5 kW, 9 = 3,9 kW, 13 = 4,3 kW).

2 - Internal electrical heater (3 kW). To enable it go to the “BACK-UP” menu (section 8.2.10) and select if it is for heating , DHW or both.

3 - Electrical supply (Max 10A). To enable it go to the “BACK-UP” menu (section 8.2.10) and select the parameter “Backup heating sources for sanitary hot water”. Then write the “Backup source start accumulating value (HBH)” and “Water temperature rise reading interval (HWTBH)” parameter according to the use of the electrical heater.

4 - Electrical supply (Max 10A). To enable it go to the “BACK-UP” menu (section 8.2.10) and select the parameter “Backup heating sources for heating”. Then write the “Backup source start accumulating value (HBH)” and “Water temperature rise reading interval (HWTBH)” parameter according to the use of the electrical heater.

5 - Not applicable.

6 - Pump. P1. To enable circulator P1 access the menu “WATER PUMPS” (section 8.2.11) and act on the parameters relating to “P1”.

7 - Pump. P2. To enable circulator P2 access the menu “WATER PUMPS” (section 8.2.11) and act on the parameters relating to “P2”.

8 - DHW pump P3. The pump is always enabled and is activated when there is a DHW demand.

9 - DHW electrical heater. It must be enabled in the “BACK-UP” menu (section 8.2.10) at the parameter “Backup heating sources for sanitary hot water”.

10 - Outdoor unit.

11 - Heating electrical heater. It must be enabled in the “BACK-UP” menu (section 8.2.10) at the parameter “Backup heating sources for heating”.

If detail “11” is not present, in its place there is the connection to the boiler TA detail “26” in Figure 5-11 and instead of detail “4” there is an electric jumper “25” in Figure 5-11

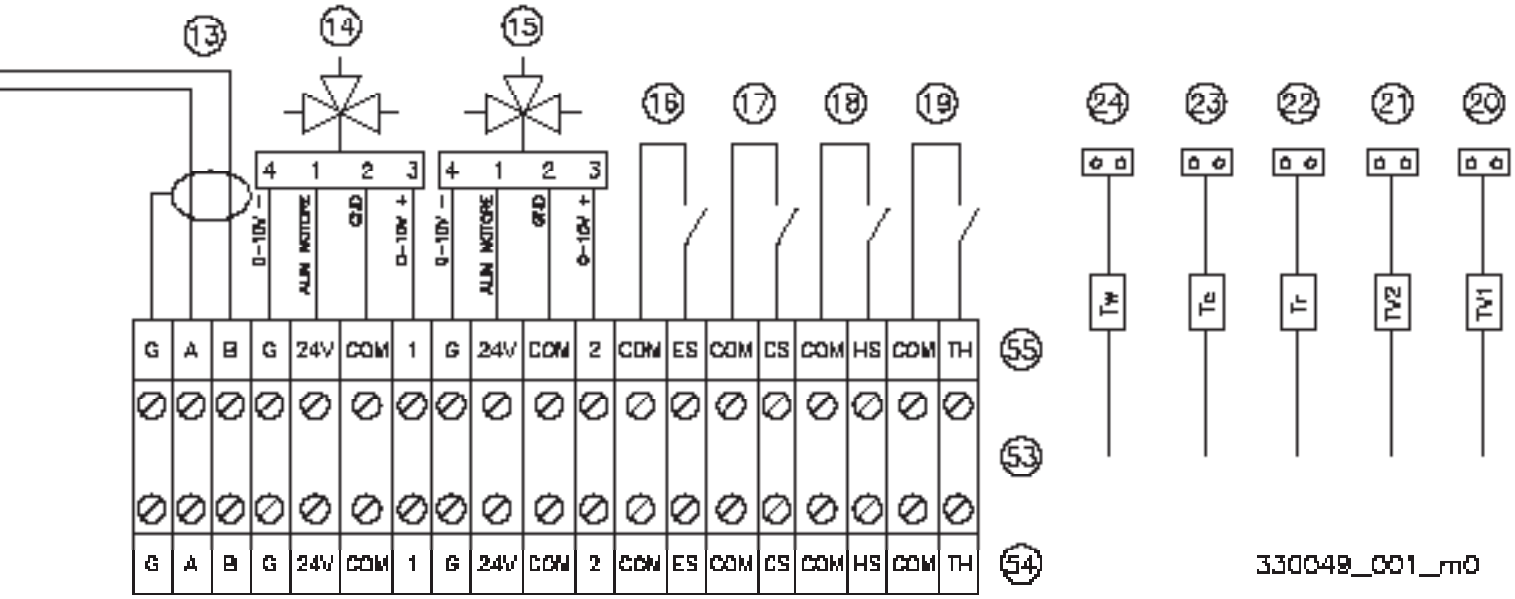
12 - Not applicable.

13 - Modbus communication.

14 - Enable mixing valve (M51) circuit 1, via the parameter “Mixing valve” in “ZONE 1” menù (section 8.2.1). When the mixing valve is active, also connect the relative TV1 sensor (item “20”).

⚠ **WARNING !!! Use only mixing valves with 0-10V control.**

Figure 6-22 - Electrical connections of the indoor unit



15 - Enable mixing valve (M51) circuit 2, via the parameter "Mixing valve" in "ZONE 2" menù (section 8.2.1). When the mixing valve is active, also connect the relative TV2 sensor (item "21"). ⚠ **WARNING !!! Use only mixing valves with 0-10V control.**

16 - ON/OFF remote control (Stop everything, including DHW). It must be enabled by selecting "Electrical utility lock" in the "ELECTRIC LOCK" menu (section 8.2.12).

17 - Cooling demand. It is enabled by going to the "WORKING MODE" menu (section 8.2.9) in the "Heating / cooling switch" parameter and selecting "External signal control" or "External signal control + outdoor temp.". If you choose the second option, you must complete the limits of "Outdoor temp.", as they have priority over external contact.

18 - Heating demand. It is enabled by going to the "WORKING MODE" menu (section 8.2.9) in the "Heating / cooling switch" parameter and selecting "External signal control" or "External signal control + outdoor temp.". If you choose the second option, you must complete the limits of "Outdoor temp.", as they have priority over external contact.

⚠ **WARNING !!! If both external signals ("17" and "18") are closed the appliance has no priority and stops.**

19 - Double setpoint demand (see section 8.2.11 "WATER PUMPS").

20 - Circuit 1 temperature sensor (TV1)

21 - Circuit 2 temperature sensor (TV2)

22 - Room temperature sensor (Tr). It must always be connected and must be left under the appliance.

23 - Heating/Cooling thermoregulation sensor (Tc)

24 - DHW temperature sensor (Tw)

35 - Integrative electrical heater inside the heat pump

40 - Outdoor unit electrical supply

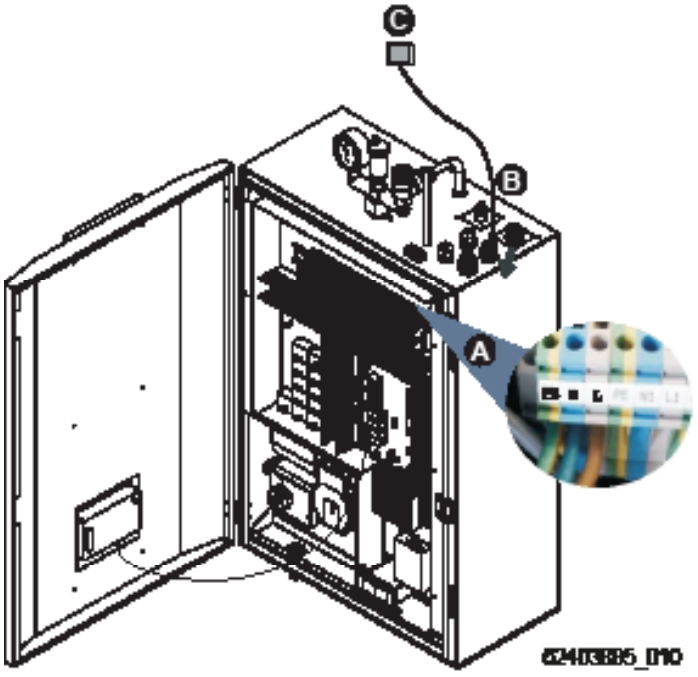
53 - Indoor unit (terminals)

54 - Terminal block side already connected (internal device)

55 - Terminal block side for installer connections

6.17.1 - Electrical supply connection of GS indoor unit

The electrical supply to the indoor unit is also supplied to the outdoor unit (section 6.17.2).
To connect the electrical supply cable to the indoor unit, proceed as follows:
1.- Use a double-insulated three-core cable, with a minimum section of 2.5 mm2;
2.- Remove the casing of the indoor unit (section 10.24);
3.- Access the terminals block (Figure 3-1);
4.- Lay the electrical supply cable;
5.- Strip the cable taking care to keep the earth cable (yellow-green) 20 mm longer than the other two;
6.- Connect the yellow-green cable to the ground terminal “PE” (item “1” in Figure 6-22);
7.- Connect the brown cable to terminal “L” (item “1” in Figure 6-22);
8.- Connect the blue cable to terminal “N” (item “1” in Figure 6-22).



Access to the terminal block of the STM outdoor unit

6.17.2 - Electrical supply connection of STM outdoor unit

The electrical supply to the STM outdoor unit must be given by passing through the GS indoor unit. To do this, proceed as follows:
1.- Remove the casing of the indoor unit (section 10.24);
2.- Remove the electrical connection cover of the outdoor unit (Figure 6-23);
3.- Lay a three-core cable with a section of at least 2.5 mm2, between the indoor and outdoor unit (Figure 6-24) for lengths up to 10 meters. For longer lengths, the cable must be dimensioned for the current absorbed by the appliance;
4.- Run the cable through a cable gland of the indoor unit (Figure 6-24);
5.- Secure the cable with the special cable gland in the outdoor unit (Figure 6-24);
6.- Strip the cable at both ends, taking care to keep the ground wire (Yellow-Green), 20 mm longer than the other two wires;
7.- Connect the yellow-green ground wire to the “PE” terminal of the indoor unit and the outdoor unit (Figure 6-24);
8.- Connect the blue wire (Neutral) to the “N” terminal of the indoor unit and to the “N” terminal of the outdoor unit (Figure 6-24);
9.- Connect the brown wire (Phase) to the “L” terminal of the indoor unit and to the “L” terminal of the outdoor unit (Figure 6-24).

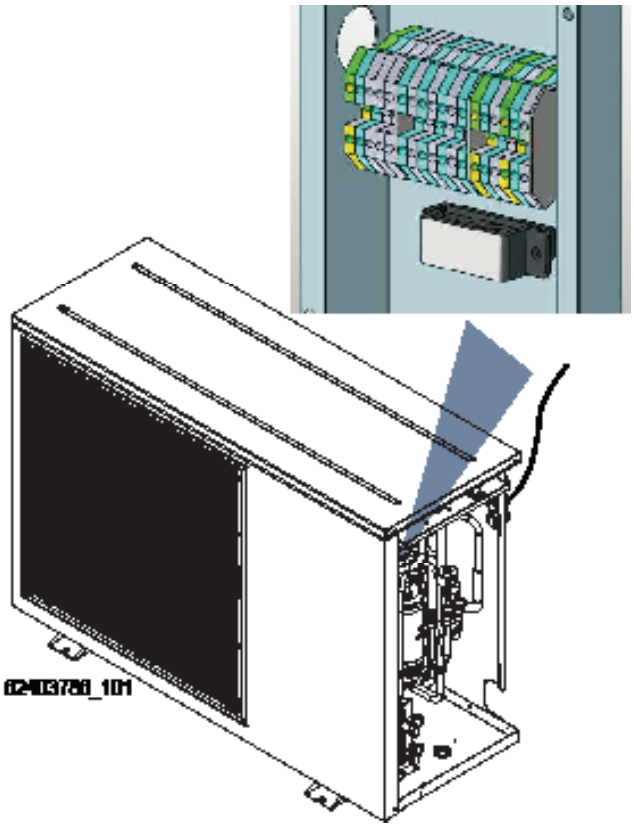


Figure 6-23 - Access to the terminal block of the STM outdoor unit

6.17.3 - Connection of the communication cable between GS indoor unit and STM outdoor unit

To connect the modbus communication cable between the indoor and outdoor units, proceed as follows (refer to Figure 6-24):

1.- Use a shielded bipolar cable, with a minimum section of 0.5 mm2;
2.- Remove the casing of the indoor unit (section 10.24);
3.- Access the two terminal blocks as shown in Figure 6-24;
4.- Lay the bipolar cable;
5.- Strip the cable;
6.- Connect the cable to terminals “A” and “B” of the indoor unit (item “E”);
7.- Access the terminal block of the outdoor unit (Figure 6-23);
8.- Strip the cable;
9. - Connect the cable to terminals “A” and “B” of the indoor unit, respecting the polarity performed on the indoor unit;
10. - Connect the cable shield to the ground terminal of the outdoor unit only.

WARNING !!! Since the cables are subjected to very low safety voltage (24Vdc), they must run in conduits other than the 230Vac power supplies.

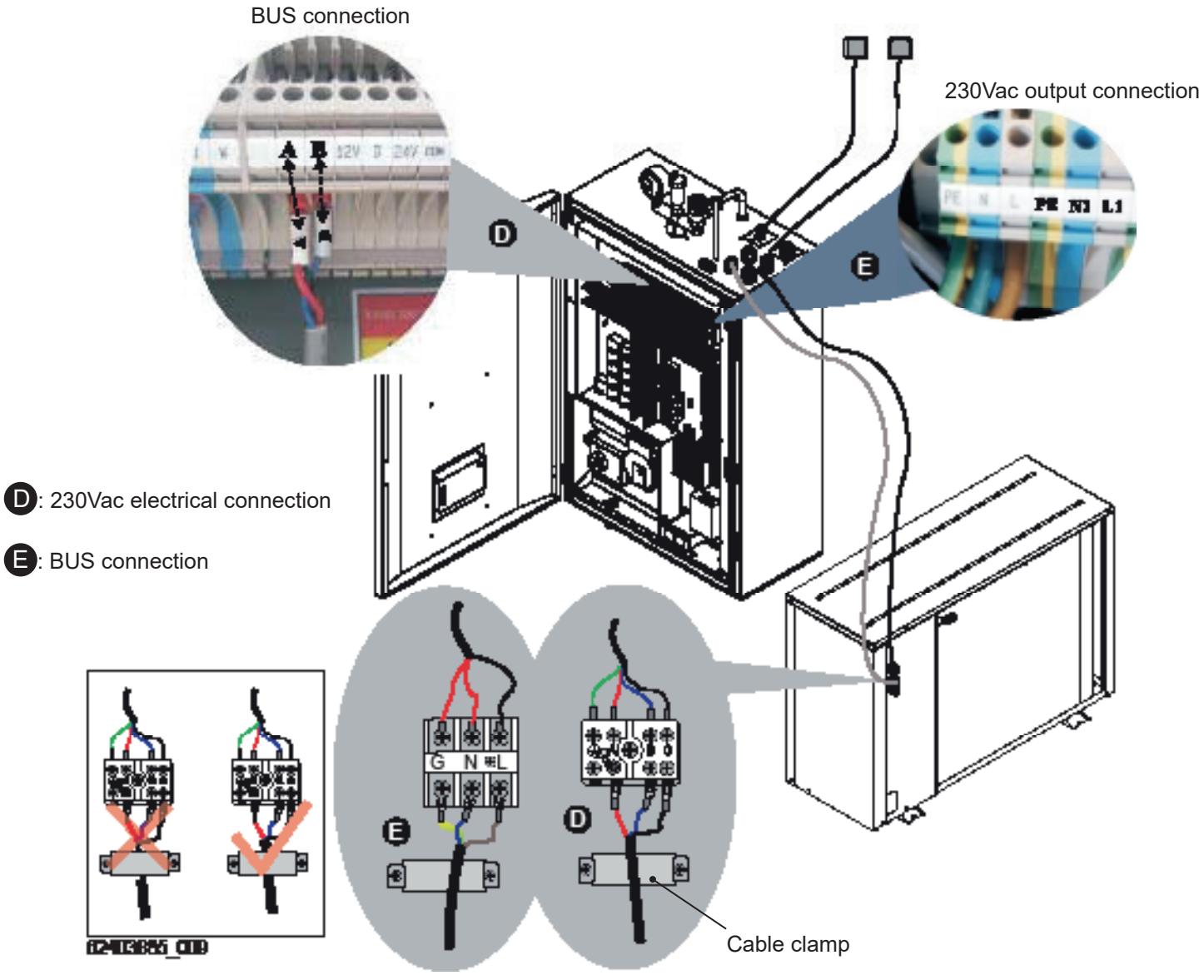


Figure 6-24 - Outdoor and Indoor unit connection

6.17.4 - Connection of the RT / chronothermostat to the relevant heating / cooling circuit

If the appliance has more than one heating circuit (see Figure 5-12), the room thermostats of each circuit check the activation of the relevant circuit.

Install the room thermostat in a point of the house where the temperature is as characteristic of the house as possible and in any case in an area not subject to sudden changes in temperature, away from windows or doors that give directly to the outside (see Figure 6 -24).

To connect the room thermostat cable, proceed as follows:

1.- The first thermostat must be connected to the heating (COM-HS) or cooling (COM-CS) (Figure 6-22);

2.- The second thermostat must be connected to the “COM-HT” contact (Figure 6-22) and works in slave mode with respect to the first.

WARNING!!! Therefore, if thermostat 1 is not closing the contacts (COM-CS or COM-HT) the second circuit will not work either.

WARNING !!! As the cables of the room thermostat / chronothermostat are subjected to very low safety voltage (24Vdc), they must run in ducts other than the 230Vac power supplies.

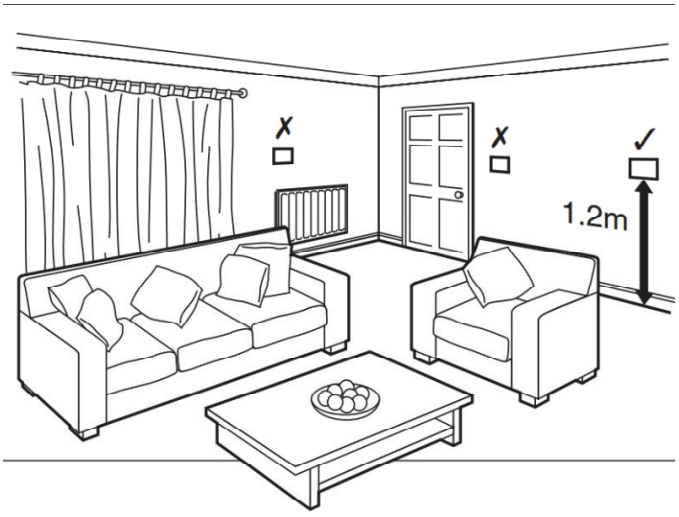


Figure 6-25 - Correct position of the room thermostat / chronothermostat

7.1 - Before starting

Before starting the appliance, it is necessary to perform the operations indicated in the following chapters.

7.1.1 - User instructions

Instruct the user on the correct use of the appliance and of the entire system in general. In particular:

☞ Deliver the installation and use manual and all the documentation contained in the packaging.

☞ Inform the user about the correct adjustment of temperatures, control units / room thermostats to save energy.

7.1.2 - Filling the heating / cooling circuit

To fill the heating system, make exclusive use of clean water from the net water system.

WARNING!!! The addition of chemicals such as antifreeze must be carried out in compliance with the product instructions. In any case, these substances must not be inserted directly into the device.

1.- Check that there are no water leaks from the fittings;
2.- Check that the air vent valve is open;
3.- Vent the heating elements.

7.2 - Emergency operation

WARNING!!! Emergency operation only guarantees the domestic hot water function, in the event that the plumbing system is made according to the diagrams in Figure from 5-6 to 5-12.

WARNING!!! Do not set the temperature of the digital thermostat to a value higher than 75 ° C.

If the control panel (Figure 8-1) stops working, it is possible to guarantee a minimum level of domestic hot water, by operating manually on the “digital thermostat” of Figure 3-1. To manually activate the digital thermostat, proceed as follows:

1.- Press the button for 3 seconds to start the digital thermostat. When the thermostat is off, “- - -“ appears;
2.- After starting the thermostat, press for 3 seconds to see the set temperature value. The current value will flash;
3.- To increase or decrease the set temperature, press or while the value is flashing;
4.- After 6 seconds from the last pressure of the keys, the value will stop flashing and the new value will be saved.

Figure 7-1 - Digital thermostat

7.3 - Start up

To start the appliance proceed as follows:
1.- Power the appliance electrically;
2.- Wait until the display turns on and select the “Configurations” icon (section 8.2);
3.- Access the “USER” menu (section 8.2.8);

WARNING!!! Changing these parameters could cause malfunctions to the appliance and therefore to the system. For this reason, only a technician who has the sensitivity and in-depth knowledge can modify them.

4.- Select “Permission level” and enter the password: 8 7 6 5 4 3 2 1.
5.- Go to the “WORKING MODE” menù (section 8.2.9) and activate the parameters according to the characteristics of the appliance and the system.

7.4 - Choosing the heating / cooling mode

The appliance is supplied with manual switching heating and cooling mode.
The appliance can be configured for:
- summer / winter remote switching;
- automatic switching according to the outdoor temperature;
- summer / winter remote switching with outdoor temperature threshold.

To choose one of these switching modes, refer to the “Heating / cooling switch” parameter in section 8.2.9.

8 - USE

8.1 - Display

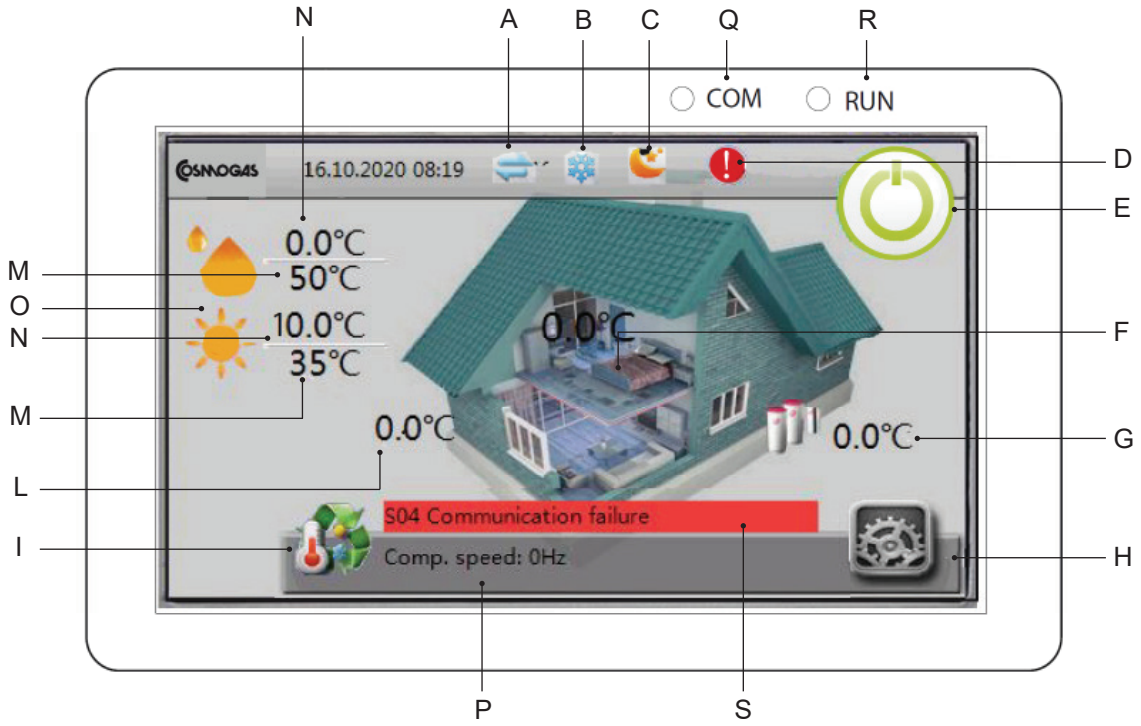


Figure 8-1 - Display

A - Communication: when the symbol is blue the communication works correctly; when the symbol is gray the communication is interrupted.

B - Operation mode: when the relative operating mode is active the symbol will be active, if we have several active modes the symbol will show the operating mode at that moment:

Symbol	Mode	Symbol	Mode	Symbol	Mode
	Heating		Heating with integrative electrical heater (item “35” Figure 6-22)		Heating with alternative source (item “11” Figure 6-22)
	Cooling				
	DHW		DHW with integrative electrical heater (item “35” Figure 6-22)		DHW with alternative source (item “9” Figure 6-22)

C - Functions: is the symbol of the current functioning mode:

Symbol	Mode	Description
	Economy mode	Appears when the “Reduced setpoint” is active (section 8.2.5).
	Pre-heating mode	N/A.
	Interruption mode	Appears when the “ELECTRIC LOCK” is enable (section 8.2.12).
	Disinfection mode	N/A.
	DHW buffer tank mode	If this icon appears, the “Reheating function “(section 8.2.4).
	Defrost mode	Appears when the machine is in defrosting.

D - Warning: when the unit is in protection or blocked, the relative symbol will appear. By entering the “Info” menu (section 8.2.15) you will be able to see the relative protection or lock code:

Symbol	Warning
Yellow	Appliance is in alarm
Red	Appliance is in alarm

Some information, protections and errors (section 9) that can happen more easily will appear directly on the first page to facilitate reading.

E - Power on/ off: Press this icon to start or stop the heat pump. When the unit is powered, the icon appears on the screen. If the power is removed and then restored, the unit will return to its previous state.

F - Room temperature: Room temperature sensor (Tr) positioned under the indoor unit.

G - Buffer tank temperature: DHW temperature sensor (Tw).

H - Settings: Press this icon to access the menu described in section 8.2.

I - Automatic operating mode: By automatic operating mode we mean that the domestic hot water always has priority over heating or cooling and the latter follow the logics according to the relative parameters in section 8.2.9. By clicking on the “I” icon, the display switches as shown in Figure 8-2. By pressing on the relative icon, the machine can be forced into the relative parameter. Press this icon to change the operating mode to heating, cooling, domestic hot water or automatic. In automatic mode the system changes the operating mode according to the parameters set.

Figure 8-2 - Operation mode

L - Outdoor temperature: Temperature read by sensor “29” or “11” respectively in Figure 4-2 and 4-3.

M - Supply setpoint temperature

N - Measured supply temperature: Tc sensor (see section 8.2.14)

O - Active operating mode

P - Compressor speed

Q - LED COM

R - LED RUN

S - Alarm code: If there is an error / alarm, this red band will appear with the name relating to the same alarm. For the list of alarms, refer to section 9.

8.2 - Settings

To access the “Settings” menu, press the “H” icon in Figure 8-1.The menu will consist of two pages that can be scrolled using the two arrows at the bottom right and left (see Figure 8-3). On each page there are different icons, pressing above each icon will access a group of parameters related to the selected icon.

To return to the home page, press the key .

Figure 8-3 - Settings Menù

8.2.1 - ZONE 1

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to circuit 1:

Figure 8-4 - ZONE 1 icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Heating / cooling stops - water ΔT (Compressor shut off positive hysteresis on heating setpoint or compressor shut off negative hysteresis on cooling setpoint).	End user	°C	1...3	2	
Heating / cooling restarts - water ΔT (Compressor light on negative hysteresis on heating setpoint or compressor light on positive hysteresis on cooling setpoint).	End user	°C	1...10	2	
ΔT compressor speed-reduction (Compressor modulating band on heating/cooling setpoint. It is recommended to keep it equal to the values of the two previous parameters).	End user	°C	1...10	2	
Set temp. for cooling (fix flow water temperature) (Cooling setpoint when “Cooling curve 1 (CC1)” is not enable. This value is limited by the “Low temperature limit”).	End user	°C	18...25	24	
Heating curve (HC1) (Enabling or disabling the heating outdoor reset)	End user	/	Selected - Not selected	Not selected	
Outdoor temp. 1 - HC (Winter) (*)	End user	°C	-25...25	-5	
Outdoor temp. 2 - HC (Spring) (*)	End user	°C	-25...25	20	
Outdoor temp. 3 - HC (Don’t change) (*)	End user	°C	-25...25	43	
Outdoor temp. 4 - HC (Don’t change) (*)	End user	°C	-25...25	44	
Outdoor temp. 5 - HC (Don’t change) (*)	End user	°C	-25...25	45	
Water / Outdoor temp. 1 - HC1 (Winter supply temperature) (*)	End user	°C	20...40	40	
Water / Outdoor temp. 2 - HC1 (Spring supply temperature) (*)	End user	°C	20...40	37	
Water / Outdoor temp. 3 - HC1 (Don’t change)	End user	°C	20...40	22	
Water / Outdoor temp. 4 - HC1 (Don’t change)	End user	°C	20...40	21	
Water / Outdoor temp. 5 - HC1 (Don’t change)	End user	°C	20...40	20	
Room temp. effect on heating curve (N/A)	End user	/	Selected - Not selected	Not selected	
Ideal room temp. in heating (N/A)	End user	°C	15...35	21	
Ideal room temp. in cooling (N/A)	End user	°C	15...35	24	
Set temp. for heating (fix flow water temperature) (Heating setpoint when “Heating curve 1 (HC1)” is not enable. This value is limited by the “High temperature limit”)	End user	°C	20...40	30	
Low temperature limit (see the parameter “Set temp. for cooling (fix flow water temperature)”)	Installer	°C	7...40	18	
High temperature limit (see the parameter “Set temp. for heating (fix flow water temperature)”) ⚠ **WARNING!!! A temperature higher than 55 ° C can cause malfunctions.**	Installer	°C	18...60	40	

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Mixing valve (Enabling or disabling a mixing valve on heating circuit 1)	Installer	/	Selected - Not selected	Not selected	
Outdoor temp. 1 - CC (Don't change) (**)	End user	°C	16...31	25	
Outdoor temp. 2 - CC (Spring) (**)	End user	°C	26...37	32	
Outdoor temp. 3 - CC (Summer) (**)	End user	°C	33...40	38	
Water / outdoor temp. 1 - CC1 (Don't change) (**)	End user	°C	18...40	23	
Water / outdoor temp. 2 - CC1 (Spring) (**)	End user	°C	18...40	21	
Water / outdoor temp. 3 - CC1 (Summer) (**)	End user	°C	18...40	18	
Cooling curve 1 (CC1) (Enabling or disabling the cooling outdoor reset)	End user	/	Selected - Not selected	Not selected	

(*)Setting parameters of the heating outdoor reset, refer to Figure 8-6.
(**)Setting parameters of the cooling outdoor reset, refer to Figure 8-7.

8.2.2 - ZONE 2

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to circuit 2:

Figure 8-5 - Zone 2 icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Zone 2 (Enabling or disabling the second heating / cooling circuit)	End user	/	Selected - Not selected	Not selected	
Set temp. for cooling (fix flow water temperature) (Cooling setpoint when “Cooling curve 2 (CC2)” is not enable. This value is limited by the “Low temperature limit”)	End user	°C	18...25	24	
Set temp. for heating (fix flow water temperature) (Heating setpoint when “Heating curve 2 (HC2)” is not enable. This value is limited by the “High temperature limit”)	End user	°C	20...55	35	
Mixing valve (Enabling or disabling a mixing valve on the heating circuit 2)	Installer	/	Selected - Not selected	Not selected	
Heating curve 2 (HC2) (Enabling or disabling the heating outdoor reset)	End user	/	Selected - Not selected	Selected	
Water / Outdoor temp. 1 - HC2 (Winter) (*)	End user	°C	20...55	40	
Water / Outdoor temp. 2 - HC2 (Spring) (*)	End user	°C	20...55	37	
Water / Outdoor temp. 3 - HC2 (Don’t change) (*)	End user	°C	20...55	22	
Water / Outdoor temp. 4 - HC2 (Don’t change) (*)	End user	°C	20...55	21	
Water / Outdoor temp. 5 - HC2 (Don’t change) (*)	End user	°C	20...55	20	
High temperature limit (see the parameter “Set temp. for heating (fix flow water temperature)”) ⚠ **WARNING!!! A temperature higher than 55 ° C can cause malfunctions.**	Installer	°C	18...60	55	
Low temperature limit (see parameter “Set temp. for cooling (fix flow water temperature)”)	Installer	°C	7...55	18	
Water / Outdoor temp. 1 - CC2 (Don’t change) (**)	End user	°C	18...55	23	
Water / Outdoor temp. 2 - CC2 (Spring) (**)	End user	°C	18...55	21	
Water / Outdoor temp. 3 - CC2 (Summer) (**)	End user	°C	18...55	18	
Cooling curve 2 (CC2) (Enabling or disabling the cooling outdoor reset)	End user	/	Selected - Not selected	Not selected	

(*)Setting parameters of the heating outdoor reset, refer to Figure 8-6.
(**)Setting parameters of the cooling outdoor reset, refer to Figure 8-7.

8.2.2.1 - Heating/Cooling outdoor reset

To proceed with a correct automatic setting of the calculated supply temperature, it is advisable to set the values graphed on the diagram of Figure 8-6 for heating or Figure 8-7 for cooling. If these values do not give a satisfactory result, proceed with the appropriate modifications taking into account that:

- Each parameter must be adjusted in small degrees;
- After each variation wait at least 24 hours to see the result;
- The more the adjustment parameter approaches the real needs of the building, the more comfortable the heating / cooling of the building will be with high energy savings.

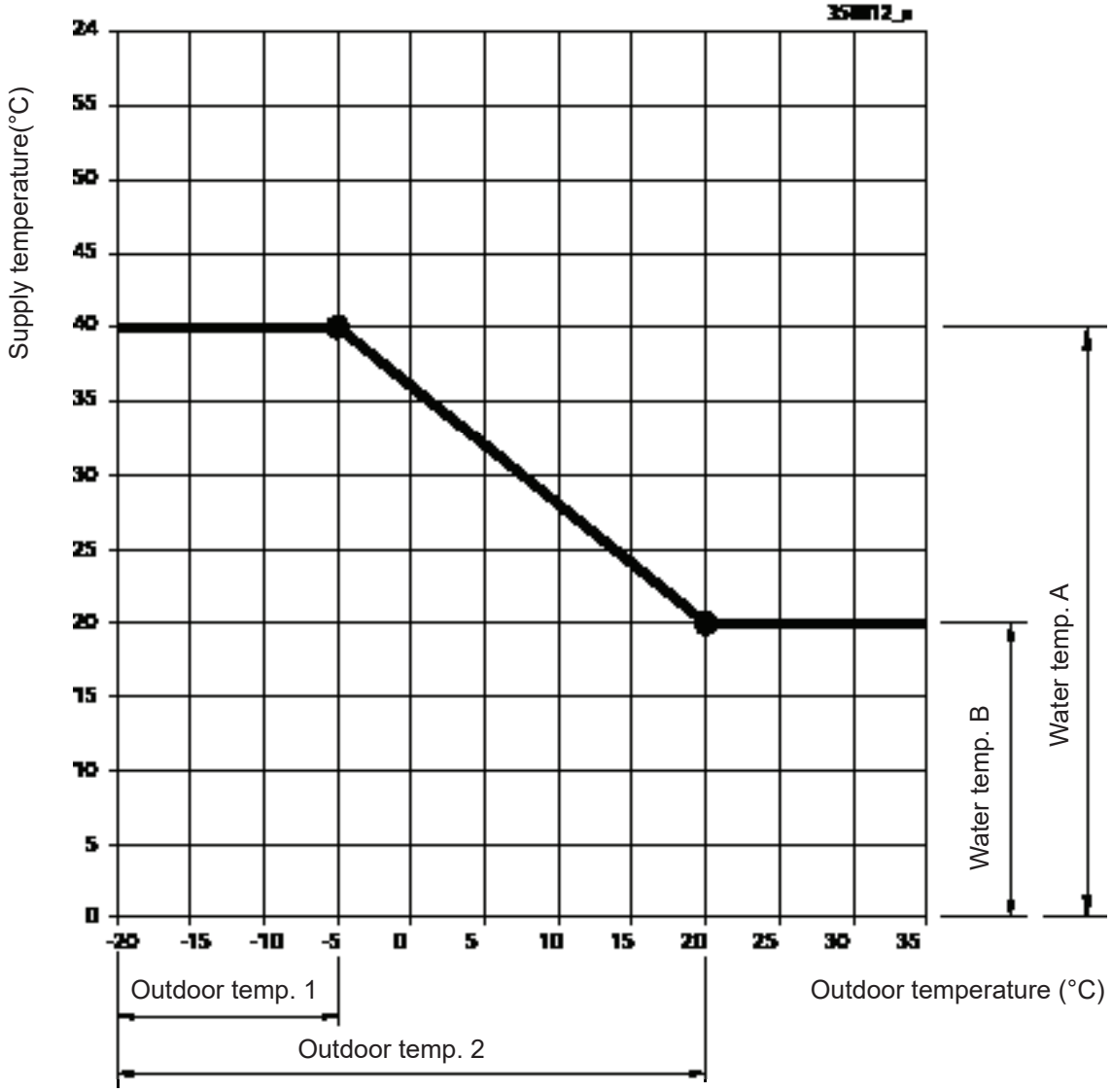


Figure 8-6 - Heating Outdoor reset

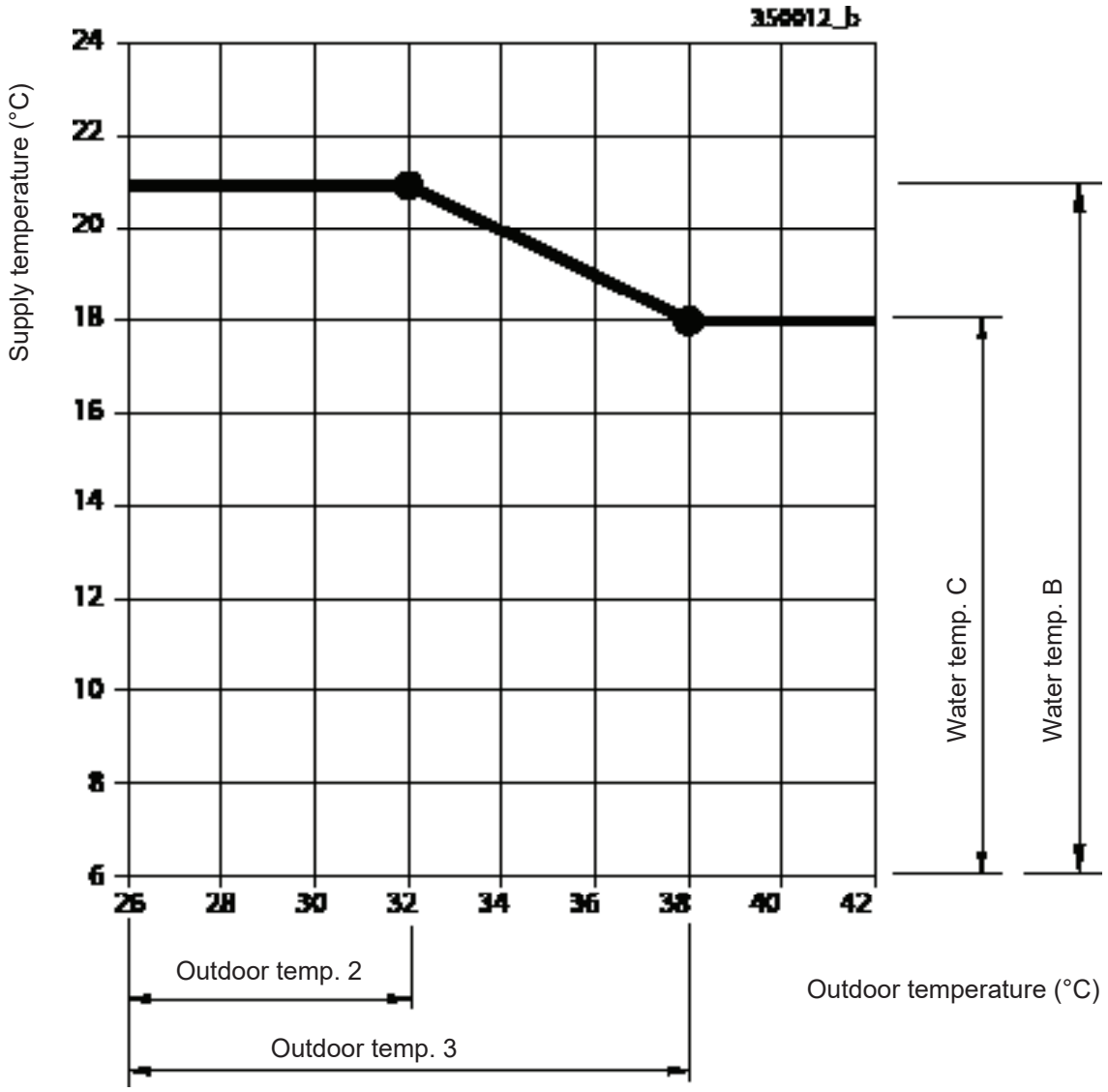


Figure 8-7 - Cooling outdoor reset

8.2.3 - DHW

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to DHW circuit:

Figure 8-8 - DHW icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Setpoint DHW ⚠ **WARNING!!! A temperature higher than 55 ° C can cause malfunctions.**	End user	°C	25...75	50	
DHW restart ΔT setting (Compressor light on negative hysteresis on “Setpoint DHW”)	End user	°C	2...15	5	
Shifting priority (If this parameter is not selected the priority is totally to the DHW, if is selected the priority is conditioned by the following parameters)	End user	/	Selected - Not selected	Not selected	
Start shifting priority below outdoor temp. (Outdoor temperature for the start-up of the DHW conditioned priority. Over this outdoor temperature value, the DHW priority is total respect to the heating function)	End user	°C	-15...20	15	
Sanitary water min. working time (minutes) (Minimum DHW working time in DHW conditioned priority)	End user	Min	10...60	30	
Heating max. working time (minutes) (Maximum time in heating after which switches to domestic hot water)	End user	Min	30...180	90	
Allowable temp drift in heating (Maximum cooling allowed on the heating temperature after which the unit is switched from DHW to heating to recover heat to the rooms)	End user	°C	3...10	6	
DHW backup heater for shifting priority (Enabling the DHW heating electric heater, item “9” of Figure 6-22, during the conditioned DHW phase)	End user	/	Selected - Not selected	Not selected	
DHW Eco operation (Don’t change)	Installer	/	Selected - Not selected	Not selected	
Outdoor temp. to start DHW ECO operation (Don’t change)	Installer	°C	-20...43	-20	

8.2.4 - DHW storage

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to DHW storage:

Figure 8-9 - DHW storage icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Sanitary hot water storage function (Don't change)	End user	/	Selected - Not selected	Not selected	
Sanitary hot water storage timer (Don't change)	End user	/			
Reheating function (Don't change)	End user	/	Selected - Not selected	Not selected	
Reheating function timer (Don't change)	End user	/			
Reheating set temp. (Don't change)	End user	°C	30...55	35	
Reheating restart ΔT setting (Don't change)	End user	°C	2...20	10	

WARNING!!! When setting the "Sanitary hot water storage timer" and "Reheating function timer" make sure that:
-the time bands chosen in these two functions do not overlap;
- there are no time bands in which neither of the two functions is inactive; at least one of the two functions must be active for each time band.

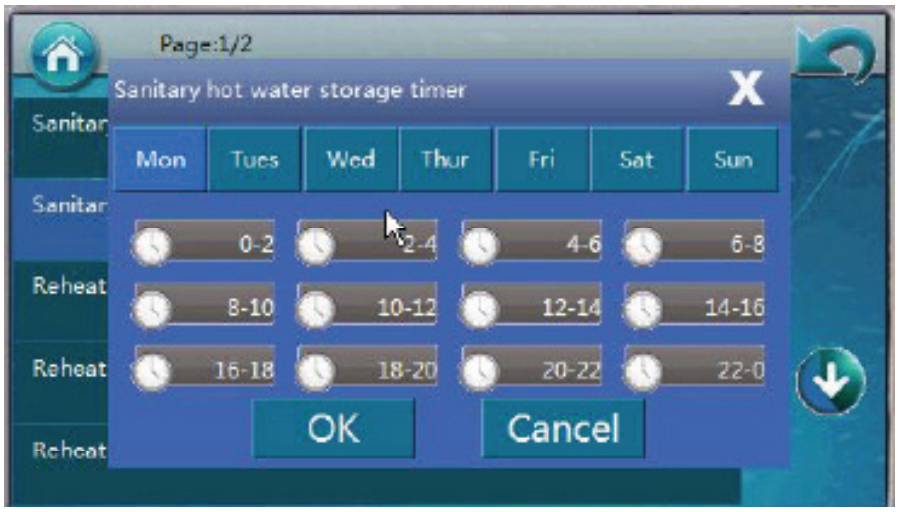


Figure 8-10 - Sanitary hot water storage timer

8.2.5 - NIGHT

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to heating setpoint:

Figure 8-11 - Night icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Reduced setpoint (Enabling or disabling of a reduced heating setpoint according to the time bands to be set in the parameter “Reduced setpoint timer”)	End user	/	Selected - Not selected	Not selected	
Temp. drop / rise (reduction value of the heating setpoint respect to the current setpoint as set manually or from the outdoor reset)	End user	°C	2...10	5	
Reduced setpoint timer (time band during which the heating setpoint is reduced by the value set in the parameter “Temp. drop / rise”)	End user	/			
Quiet operation (Enabling or disabling of the quiet operation. In this mode, fans and compressor run at a reduced speed to limit noise, at the expense of the overall efficiency of the system)	End user	/	Selected - Not selected	Not selected	
Max allowable temp. drifting (Maximum acceptable supply temperature reduction in “quiet” mode)	End user	°C	2...10	8	
Quiet operation timer (“Quiet operation” activation time bands)	End user	/			

8.2.6 - LEGIONELLA

The result of the anti-legionella sanitization cannot be guaranteed by this unit and in any case it generates an enormous waste of electricity. To avoid this cycle, the use of buffer tanks is recommended, see Figures 5-8 to 5-12:

Figure 8-12 - Legionella icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Anti-legionella program (Don’t change)	End user	/	Selected - Not selected	Not selected	
Day and time (Don’t change)	End user	/			
Setpoint (Don’t change)	End user	°C	60...75	70	
Duration (Don’t change)	End user	Min	5...60	20	
Finish time (Don’t change)	End user	Min	10...180	120	

8.2.7 - VACATION

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to vacation mode:

Figure 8-13 - Vacation icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Vacation mode (Enabling or disabling of the “Vacation” function, which reduces the domestic hot water, heating and cooling set point for a long time)	End user	/	Selected - Not selected	Not selected	
Sanitary hot water temp. drop during vacation (Reduction of the domestic hot water temperature in the period set in the parameters “Vacation start date” and “Vacation finish date” of this menù)	End user	°C	10...50	20	
Heating water temp. drop during vacation (Reduction of the heating temperature in the period set in the parameters “Vacation start date” and “Vacation finish date”)	End user	°C	10...50	20	
Vacation start date (Start date of temperature reduction according to the two previous parameters)	End user	day.m.year		1.1.2015	
Vacation finish date (End date of temperature reduction according to the two previous parameters)	End user	day.m.year		1.2.2015	

8.2.8 - USER

Figure 8-14 - User icon

WARNING !!! Changing these parameters could cause malfunctions to the heat pump and therefore to the system. For this reason, only a technician who has the sensitivity and in-depth knowledge can modify them.

☞To access the “Permission level” it is necessary to follow the procedure in section 7.3

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to user menagement:

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Permission level (The “Installer” level enables the modification of some parameters that cannot otherwise be modified with the “End user” level)	End user	/	Installer - End user	End user	
Heating / cooling ON/OFF timer (Enabling or disabling the timer for switching on and off the heating / cooling. This function has priority over the digital inputs “17” and “18” in Figure 6-22)	End user	/	Selected - Not selected	Not selected	
Heating / cooling ON/OFF timer (Setting the time bands for switching on heating / cooling. See Figure 8-15)	End user	/			
Language	End user	/	Italiano, Русский, Українська, Francais, English, Slovenščina, Deutsch, Polski	Italiano	
Date and time setting	End user	d.m.year			
Distribution system setting (Setting the diverter valve of the indoor unit for the distribution of water to the heating circuit or to the DHW)	Installer	/	- W/HC = In one position I have “domestic hot water” and in the other position I have “heating or cooling”. - WH = In one position I have “domestic water and heating” and in the other position “cooling”.	W/HC	
Save settings	Installer	/			
Load saved settings	End user	/			
Reset to factory settings	Installer	/			

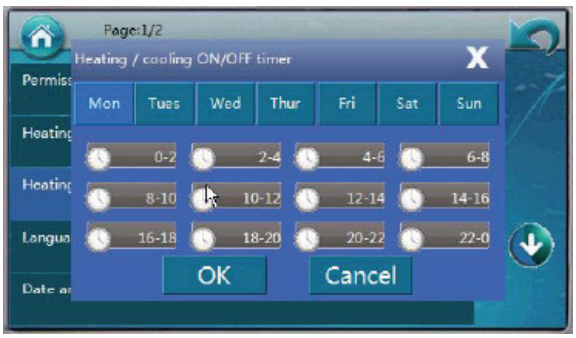


Figure 8-15 - Heating/Cooling ON/OFF timer

8.2.9 - WORKING MODE

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to the settings:

Figura 8-16 - Working mode icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Sanitary hot water (Enabling or disabling of the DHW function)	Installer	/	Selected - Not selected	Selected	
Heating (Enabling or disabling of the heating function)	Installer	/	Selected - Not selected	Selected	
Cooling (Enabling or disabling of the cooling function)	Installer	/	Selected - Not selected	Not selected	
Basic operation mode (Don't change)	Installer	/	Selected - Not selected	Not selected	
Max duration for min compressor speed	Installer	Min	5...60	5	
Heating / cooling switch	Installer	/	- OFF, - Outdoor temp. (parameter intervention threshold "Outdoor temp. to start heating" and "Outdoor temp. to start cooling"), - External signal control (items "17" and "18" of Figure 6-22), - External signal control + outdoor temp. (combination of the previous two options).	OFF	
Outdoor temp. to start heating (Upon reaching this value, the machine waits an hour before restarting).	End user	°C	-10...25	18	
Outdoor temp. to start cooling (Upon reaching this value, the machine waits an hour before restarting).	End user	°C	20...-53	25	

8.2.10 - BACK-UP

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to additional heat sources:

Figure 8-17 - Back-up icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Backup heating sources for heating (Enabling internal electrical heaters and external heat sources, items “11” and “35” of Figure 6-22)	End user	/	Selected - Not selected	Not selected	
Priority for backup heating sources (HBH) (Selecting the first line, priority is given to the internal electrical heater of the heat pump, item “35” in Figure 6-22, after which the electrical heater “11” in Figure 6-22 is called. Selecting the second line the priority is inverse compared to the first line)	End user	/	a.- Lower than AH b - Higher than AH	Higher than AH	
Backup heating sources for sanitary hot water (Enabling or disabling the electrical heater “9” of Figure 6-22)	End user	/	Selected - Not selected	Not selected	
Priority for backup heating sources (HWTBH) (Selecting the first line, priority is given to the internal electrical heater of the heat pump, item “35” in Figure 6-22, after which the electrical heater “9” in Figure 6-22 is called. Selecting the second line the priority is inverse compared to the first line)	End user	/	a.- Lower than AH b - Higher than AH	Higher than AH	
Backup source start accumulating value (HBH) (Electrical heater demand algorithm “9” or “11” in Figure 6-22. The lower the value the external electrical heater is called sooner)	End user	/	0...600	240	
Water temperature rise reading interval (HWTBH) (Check interval of the domestic hot water temperature increase to call the integrative electrical heater “9” of Figure 6-22. The lower this value is, the sooner the electrical heater is called)	End user	Min	5...60	10	
Emergency operation (Enabling or disabling the demand function of the external electrical heater, “9” and “11” of Figure 6-22, in the event that the heat pump does not work correctly or is in alarm. Be careful if you activate this function)	Installer	/	Selected - Not selected	Not selected	
Block the working of auxiliary heater (AH) (Enabling or disabling the blocking function of the external electrical heater “11” in Figure 6-22. The electrical heater “35” in Figure 6-22 continues to work with its logics)	Installer	/	Selected - Not selected	Not selected	
Block the working of auxiliary heater (AH) according to outdoor temp. (Enabling or disabling of the block function of the external electrical heater “11” of Figure 6-22 according to the threshold “External auxiliary heater block temperature”. The electrical heater “35” in Figure 6-22 continues to work with its logics)	Installer	/	Selected - Not selected	Not selected	
Set outdoor temp. to block the working of auxiliary heater (Enable threshold of the function recalled in the parameter “Block the working of auxiliary heater (AH) according to outdoor temp.”).	Installer	°C	-20...30	0	

8.2.11 - WATER PUMPS

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to the settings pump:

Figure 8-18 - Water pumps icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Circulation pump P0 type (Setting the pump inside the unit. Leave at "PWM pump", DO NOT CHANGE!!!)	Installer	/	- PWM pump, - AC pump.	PWM pump	
Working mode of circulation pump P0 (Type of operation of the pump inside the heat pump)	Installer	/	- Interval working mode: in this mode the pump switches on together with the compressor and when the compressor switches off the pump cycles for the timers set in "Pump ON time for P0" and "Pump OFF interval for P0". - ON Costantly: the internal pump is always on. It turns off only when the heat request is removed (Opening of contacts "16", "17", "18" or "19" in Figure 6-22). - OFF with compr.: the pump remains on only at the same time as the compressor is running.	OFF with compr.	
Pump OFF interval for P0 (see "Interval working mode" of the parameter "Working mode of circulation pump P0")	Installer	Min	5...60	15	
Pump ON time for P0 (see "Interval working mode" of the parameter "Working mode of circulation pump P0")	Installer	Min	1...10	2	
Buffer tank (Enabling or not the buffer tank "36" of Figures 5-8 to 5-12)	Installer	/	Selected - Not selected	Not selected	
P1 for heating operation (Selection or not of pump "6" in Figure 6-22 as pump for the heating circuit only)	Installer	/	Selected - Not selected	Selected	
P1 for cooling operation (Selection or not of pump "6" in Figure 6-22 as pump for the cooling circuit only)	Installer	/	Selected - Not selected	Not selected	
P1 with high temp. demand (Selection or not of pump "6" in Figure 6-22 as pump for the high temperature circuit only)	Installer	/	Selected - Not selected	Not selected	
P2 for heating operation (Selection or not of pump "7" in Figure 6-22 as pump for the heating circuit only)	Installer	/	Selected - Not selected	Selected	
P2 for cooling operation (Selection or not of pump "7" in Figure 6-22 as pump for the cooling circuit only)	Installer	/	Selected - Not selected	Not selected	
P2 with high temp. demand (Selection or not of pump "7" in Figure 6-22 as pump for the high temperature circuit only)	Installer	/	Selected - Not selected	Not selected	

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
P0 speed setting in heating operation (Don't change)	Installer	/	- High speed, - Medium speed, - Low speed.	High speed	
P0 speed setting in cooling operation (Don't change)	Installer	/	- High speed, - Medium speed, - Low speed.	High speed	
P0 speed setting in DHW operation (Don't change)	Installer	/	- High speed, - Medium speed, - Low speed.	High speed	
Air purge - heating / cooling circuit (N/A)		/	Selected - Not selected	Not selected	
Air purge - DHW circuit (N/A)		/	Selected - Not selected	Not selected	

8.2.12 - ELECTRIC LOCK

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to the lock function:

Figure 8-19 - Electric lock icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Electrical utility lock (N/A)	End user	/	Selected - Not selected	Not selected	
Electrical utility lock signal (N/A)	Installer	/	- Normally open, - Normally close	Normally open	
HBH during electrical utility lock (N/A)	End user	/	Selected - Not selected	Selected	
P0 during electrical utility lock (N/A)	End user	/	Selected - Not selected	Not selected	
Heating ECO operation	Installer	/	Selected - Not selected	Not selected	
Outdoor temp. to start heating ECO operation	Installer	°C	-20...43	-20	
Tw sensor dropped from its position (N/A)	End user	/	Selected - Not selected	Not selected	
Signal for cutting outdoor unit power supply (N/A)	End user	/	Selected - Not selected	Not selected	
Constant power supply for outdoor unit below (°C) (N/A)	Installer	°C	-5...25	-2	

8.2.13 - OTHER OPTIONS

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult and modify all the parameters relating to the other system options:

Figure 8-20 - Other options icon

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Motorized diverting valve switching time (Don't change! Leave at factory setting)	Installer	Min	0...16	6	
Diverting valve - power on time (Don't change! Leave at factory setting)	Installer	Min	0...16	0 = always with power	
Refrigerant recycle function (This function allows the accumulation of refrigerant gas in the outdoor unit and consequently the complete emptying of the indoor unit. Use this function only when moving or disconnecting the two units is required. See section 10.22)	Installer	S (Sec)	- Start refrigerant recycle - Stop refrigerant recycle	0	
Control panel backlight light (Control panel shutdown delay time)	End user		- Always ON, - 3 min, - 5 min, - 10 min	Always ON	
Exit system (Do not use! Button to exit the machine application. If you use it inadvertently, to re-enter the application double click on the "Shortcut to HeatStar" icon)	Installer				
Outdoor temp. to activate first class anti-freezing (Outdoor temperature threshold for activating the anti-freeze cycle which is carried out by switching on the pump only) ⚠ **WARNING !!! Should there be this risk, we recommend not cutting off the power supply and protecting the heating circuit by adding antifreeze additive. Otherwise, we recommend emptying the hydraulic circuit (section 10.23)**	Installer	°C	5...10	6	
Outdoor temp. to activate second class anti-freezing (Outdoor temperature threshold for activating the antifreeze cycle, the pump and the compressor switch on)	Installer	°C	0...4	4	
Outdoor temp. to stop second class anti-freezing (Outdoor temperature for stopping the antifreeze cycle)	Installer	°C	0...10	6	
Water temp. to activate second class anti-freezing (Supply temperature threshold for activating the antifreeze cycle which takes place when the pump and compressor are turned on)	Installer	°C	5...30	5	
Water temp. to stop second class anti-freezing (Supply temperature threshold for disactivating the antifreeze cycle which takes place when the pump and compressor are turned off)	Installer	°C	5...30	12	
Mode switch during defrosting (Enabling or disabling the frost protection on the second heating circuit)	Installer		Selected - Not selected	Selected	
Mode signal output (N/A)	Installer		- OFF, - Heating, - Cooling	Cooling	
Mode signal type (N/A)	Installer		- Normally open, - Normally close.	Normally open	

Parameter	Permission level	U.M.	Range	Factory setting	Costum value
Fan speed limit (Fan speed limitation to reduce noise) ⚠ **WARNING !!! Limit the fan speed causes a reduction of performance unit.**	Installer	%	90...100	100	
Defrosting Logic Selection (Don't change)	Installer		0...2	0	
Activate Wifi module or not? (N/A)	Installer		Selected - Not selected	Not Selected	
Accept setting from Wifi module? (N/A)	Installer		Selected - Not selected	Not Selected	
Connection to the server (N/A)				Disconnected	
Connessione to the router (N/A)				Disconnected	
MAC (N/A)				00-00-00-00-00-00	
Wifi module IP address (N/A)					
SSID (N/A)					
Access code (N/A)				******	
Server address (N/A)					
Service port (N/A)				0	

8.2.14 - REAL TIME DATA

The menu consists of several pages and, by scrolling with the arrows, it is possible to consult all the parameters relating to the real time data system:

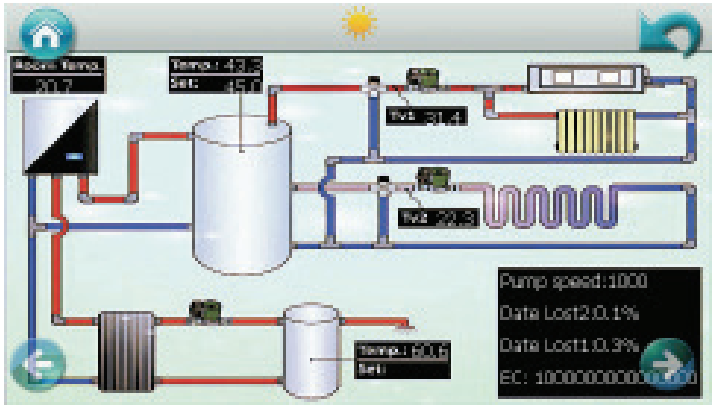
Figure 8-21 - Real time data icon

Parameter	Permission level	U.M.
Software version No.	Installer	/
Database version	Installer	/
Heat exchanger water outlet temperature - indoor - Tuo	Installer	°C
Heat exchanger water return temperature - indoor - Tui	Installer	°C
Indoor coil temp. - Tup	Installer	°C
Sanitary hot water temp. - TW	Installer	°C
Cooling/Heating water temp. - TC	Installer	°C
Water flow rate (N/A)	/	/
Compressor working speed	Installer	Hz
EEV opening (number of opening steps of the expansion valve)	Installer	P
Average outdoor temp. in 1 hour	Installer	°C
Actual outdoor temp.	Installer	°C
Average outdoor temp. in 24 hours	Installer	°C
High pressure - Pd	Installer	Bar
Low pressure - Ps	Installer	Bar
Discharge temp. - Td	Installer	°C
Suction temp. - Ts	Installer	°C
Outdoor coil temp. - Tp	Installer	°C
Heat pump accumullated operation time.	Installer	h
preserved	Installer	/
Fan speed 1	Installer	RPM
Fan speed 2	Installer	RPM
Outdoor unit working current	Installer	A
Voltage	Installer	V
Eeprom version No.	Installer	/

8.2.15 - Info

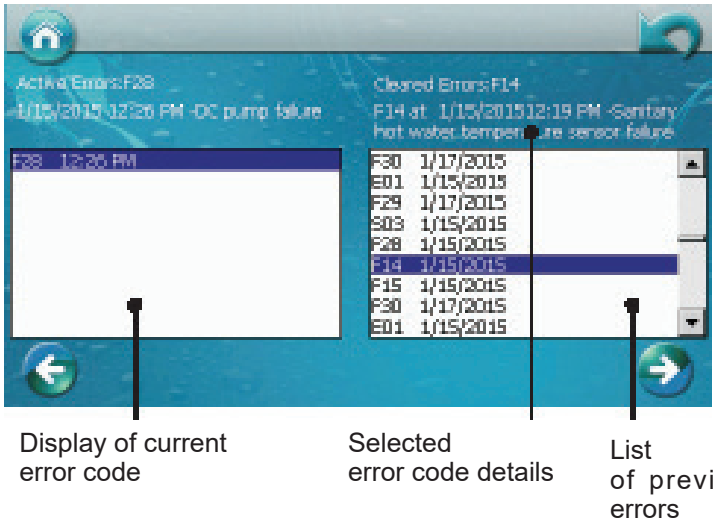
Press “Info” to see the status of the hydraulic system.

Figure 8-22 - Info icon



Pump speed: Internal pump (P0) to the machine, in this diagram it is not shown.

Figure 8-23 - Page 1

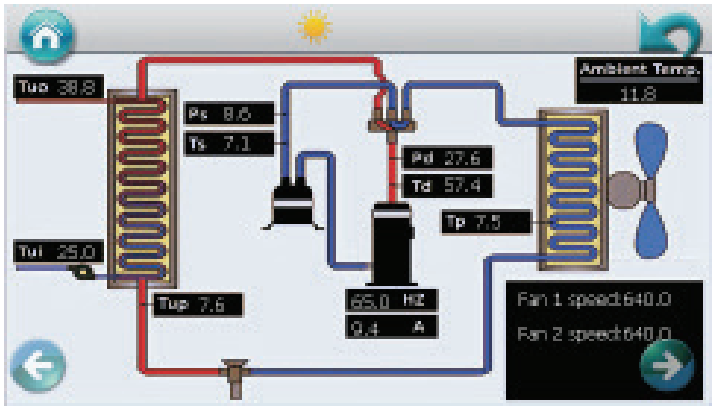


Display of current error code

Selected error code details

List of previous errors

Figure 8-24 - Page 2



Tuo: Supply water temperature
Tui: Return water temperature
Tup: Liquid line temperature
Ps: Refrigerant suction pressure
Ts: Refrigerant suction temperature
Pd: Compressor supply pressure
Td: Compressor supply temperature
Tp: Evapo-condensing battery temperature
Ambient Temp: Outdoor temperature

Figure 8-25 - Page 3

TW: DHW buffer tank temperature
TC: Heating/Cooling storage tank temperature
TR: Room temperature
TA: Outdoor temperature

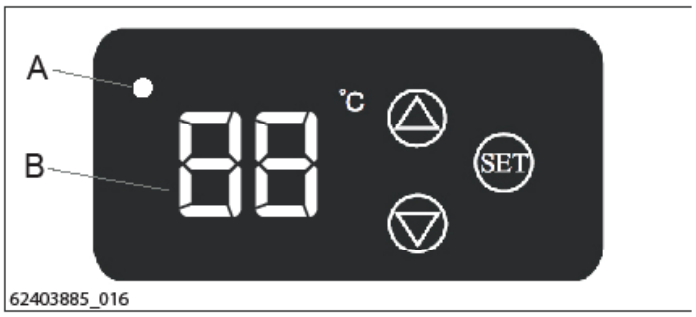
Figure 8-26 - Page 4

8.2.16 - Home page

Press this icon to return to the home page.

Figure 8-27 - Home page icon

8.3 - Digital thermostat



Press **SET** for set temperature “B”;
Press ▲ to increase value
il tasto ▼ to decrease value
Once the desired temperature has been reached press **SET** to confirm the new value.

Led “A” on = electric heater turned on;
Led “A” off = electric heater turned off;

8.3.1 - Temperature setting

To set the desired temperature press **SET**, the set temperature flashes, to modify its value, press the keys ▲ and ▼, once the desired temperature has been reached press **SET** to confirm the new value.

By default the thermostat is set to 30°C.

The adjustment range is from 10°C to 75°C.

8.3.2 - Control logic

When the thermostat is powered on, the display shows the actual water temperature. When the actual water temperature is lower than the set temperature (-3°C), the electric haeter is turned on. When the actual water temperature equals or higher than the set temperature, the electric haeter stops.

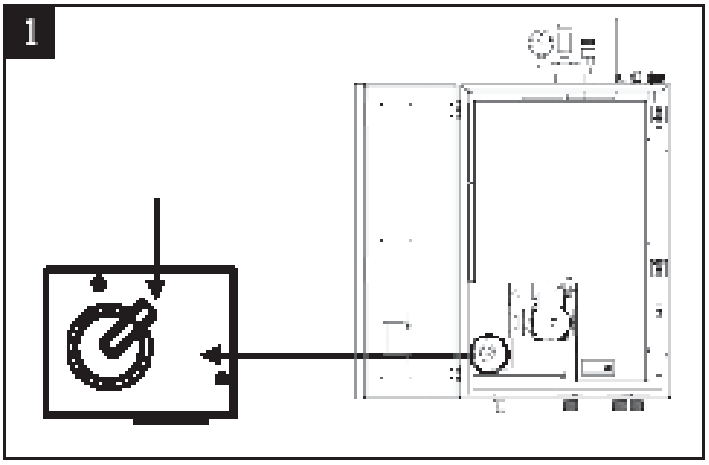
8.3.3 - Failure code

If the temperature sensor detects a value higher than 120 ° C it means that it is short-circuited, the display shows the code “HH” and the electric heater switches off.
If the temperature sensor detects a value below -40°C it means that the sensor contact is open, the display shows the code “LL” and the electric heater switches off.
In both cases the problem is solved by replacing the sensor.

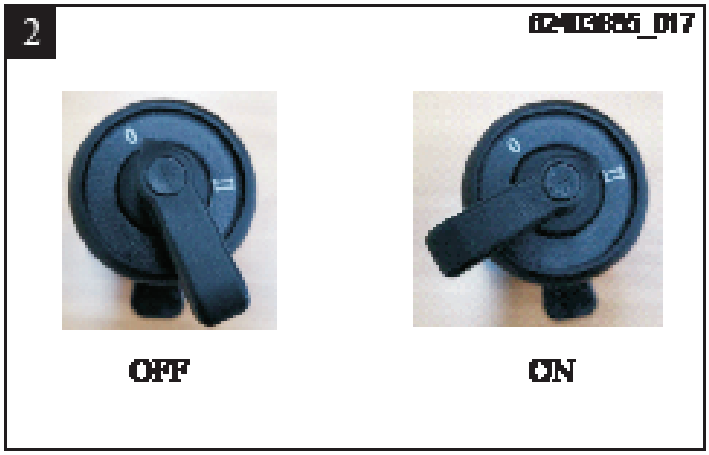
8.4 - Emergency electric heater

When the heat pump has the touch screen control out of order and cannot be used, the electric heater must be forced to switch on as indicated below:

1



2



Move the switch to ON to activate the electric heater.

3

Solved the heat pump problem, return the switch to the OFF position to deactivate the electric heater and return to normal operation of the heat pump.

9 - DIAGNOSTICS

The alarm history is displayed in the “Info” icon (section 8.2.15) of the display.

Code	Description	Status	Solution
E01	No communication between control panel and control card or gas side board	Compressor stopped	Communication between control panel and control card or gas side card, check the electrical wiring. Check that the microswitches on the control board and the microswitches on the gas side board are in the position shown in the wiring diagram. The system restarts as soon as communication is restored.
E02	No communication between control panel and control card	Compressor stopped	Check the electrical wiring.
E03	Error in the compressor electrical supply phase (short circuit or open)	Compressor stopped	Check the compressor electrical supply wiring, make sure there are no short circuits.
E04	Current on the compressor phase over the limit	Compressor stopped	Check the compressor electrical supply wiring, make sure there are no short circuits.
E05	Compressor driver error	Compressor stopped	Supply voltage too high or low.
E06	Electrical supply voltage of the compressor inverter board out of limits.	Compressor stopped	Check that the electrical supply between the “ACL” and “ACN” heads of the compressor inverter board is between 197 and 253 VAC.
E07	Electrical supply error	Compressor stopped	Check the electrical absorption of the outdoor unit and compare these values with those shown on the control panel. If the difference is low, check that the refrigerant quantity is sufficient. If the difference is great, replace the compressor inverter board.
E08	Eeprom error	Compressor stopped	Replace the gas side control board.
F01	Failure of the outdoor temperature sensor	Compressor stopped	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F02	Failure of the evapo-condensing battery sensor	Compressor stopped	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F03	Failure of the compressor discharge temperature sensor	Compressor stopped	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F04	Failure of the compressor suction temperature sensor	Compressor stopped	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F05	Failure of the low pressure sensor	Compressor stopped	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F06	Failure of the high pressure sensor	Compressor stopped	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F07	Failure of the high pressure switch	Compressor stopped	This message appears if the pressure switch is in the open position while the unit is on standby or 2 minutes after the compressor is stopped. Check that the pressure switch is not broken or badly connected.
F09	Fan speed control failure	Low speed compressor	The speed of a fan or its return signal does not reach the desired value. Check if the gas side control board or the fan motor are not broken.
F10	Fault in fan speed control	Compressor stopped	The speed of a fan or its return signal does not reach the desired value. Check if the gas side control board or the fan motor are not broken.
F11	Evaporating pressure too low	Compressor stopped	If the pressure switch on the evaporator detects too low pressure 3 times in a certain period of time, this message appears. The system restores by removing and re-energizing the power supply. Check that the refrigerant in the system is sufficient. Check that the fan or pump motors are running smoothly. Check that the capacitor works properly. Check that the EEV works regularly. Check that the water temperature is not too low and that the difference between supply and return in cooling is quite low (within approximately 8 ° C)
F12	Condensing pressure too high	Compressor stopped	If the pressure switch on the evaporator detects too high pressure 3 times in a certain period of time, this message appears. The system restores by removing and re-energizing the power supply. Check that the water flow in the system is sufficient. Check that the fan or pump motors are running smoothly. Check that the external battery works properly. Check that the EEV works regularly. Check that the water temperature is not too high and that the difference between supply and return in cooling is quite low (within approximately 6 ° C)

Code	Description	Status	Solution
F13	Failure of the temperature sensor (Tr)	Unit locked	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F14	Failure of the DHW temperature sensor (TW)	Unit locked	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F15	Failure of the heating/cooling temperature sensor (Tc)	Unit locked	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F16	Failure of the supply water temperature sensor (TUO)	Unit locked	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F17	Failure of the return water temperature sensor (TUI)	Unit locked	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F18	Failure of the liquid line temperature sensor (TUP)	Unit locked	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F21	Failure of the circuit 1 water temperature sensor (TV1)	Unit active, mixing valve 1 blocked at 0.	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F22	Failure of the circuit 2 water temperature sensor (TV2)	Unit active, mixing valve 2 blocked at 0.	Check that the sensor is not shorted, open and that it is not giving wrong values. If necessary, replace the sensor.
F25	Communication error	Unit locked	Communication between control panel and control card or gas side control card, check the electrical wiring. Check that the microswitches on the boards are positioned as shown in the wiring diagrams. The system restarts as soon as communication is restored.
F27	Eeprom internal error	Unit remains active	Replace the control board.
F28	Error on the PWM signal of the circulator	Unit remains active	Check the electrical supply to the circulator, check the circulator wiring check that the circulator is not broken.
F29	Error on mixing valve 1	Active unit, mixing valve 1 blocked at 0.	Check the wiring of mixing valve 1, check the output signal voltage from the PCB board, check that the valve is not broken.
F30	Error on mixing valve 2	Active unit, mixing valve 2 blocked at 0.	Check the wiring of mixing valve 2, check the output signal voltage from the PCB board, check that the valve is not broken.
P01	Protection in the main electrical supply line	Compressor stopped	The electrical supply current is too high or too low. The system automatically resets after 5 minutes. If the same error occurs 3 times consecutively in a certain period of time, the system is permanently blocked. Check that the electrical supply is correct. Check that the fan or pump motors are running smoothly. Check that the compressor is working properly. Check that the water temperature is not too high and that the difference between supply and return is less than 8 ° C.
P02	Compressor phase protection	Compressor stopped	The compressor supply current is too high or too low. Check that the fan or pump motors are running smoothly. Check that the compressor is not blocked. Check that the water temperature is not too high and that the difference between supply and return is less than 8 ° C.
P03	Compressor inverter in protection	Compressor stopped	Compressor driving failed. Check that the compressor connection cable is not broken or loose. Check that the compressor or the compressor inverter board are not broken.
P04	Oil return protection in the compressor	Compressor remains on	If the unit works at low speed for a long time, this protection will automatically activate to allow the oil to return to the compressor. This is a normal functioning protection, which does not need any action.
P05	The compressor turns off due to the intervention of the high pressure switch	Compressor stopped	The refrigerant circuit pressure is too high. The system resets itself after 5 minutes. If the same error occurs 3 times consecutively in a certain period of time, the system is permanently blocked. Check that the fan or pump motors are running smoothly. Check that the compressor is working properly. Check that the water temperature is not too high and that the difference between supply and return is less than 8 ° C.

Code	Description	Status	Solution
P06	The compressor reduces its speed due to the high pressure detection	Compressor stopped	If the pressure is too high, this protection is activated. The system resets itself after 5 minutes. If the same error occurs 3 times consecutively in a certain amount of time, the system is permanently blocked. Check that the fan or pump motors are running smoothly. Check that the compressor is working properly. Check that the water temperature is not too high and that the difference between supply and return is less than 8 ° C.
P07	Compressor preheating	Standard operation	This is normal protection and needs no action. When the compressor is inactive for a long time and the outdoor temperature is low, the compressor heater is activated before the compressor is started to bring it to the correct temperature.
P08	Compressor discharge temperature too high	Compressor stopped	Check that the water supply temperature is not too high, especially if the outdoor temperature is low; check that the water flow rate of the system is sufficient. Check that there is sufficient refrigerant in the system.
P09	Evapo-condensing battery temperature protection	Compressor stopped	Check that air circulates freely in the outdoor unit.
P10	Voltage beyond the limits	Compressor stopped	The electrical supply voltage is too low or too high. Check the supply voltage
P11	Compressor off due to too high or too low outdoor temperature	Compressor stopped	The outdoor temperature is too high or too low to guarantee operation.
P12	Compressor limit speed reached due to too high or too low speed	Compressor speed slow down	This is normal protection which does not need any action.
P14	Compressor stopped due to too low pressure detected by the high pressure sensor	Compressor stopped	If the system pressure is too low this protection is activated. The system automatically resets after 5 minutes. If the same error occurs 3 times consecutively in a certain period of time, the system is permanently blocked. Check that the system has the right amount of refrigerant or internal leaks (probably the amount of refrigerant is not enough and this results in too low a pressure). Check that the fan and pump motor work correctly; Check that the evapo-condensing battery or the plate heat exchanger are not blocked; Check that the electronic expansion valve works properly; Check that the water temperature is not too low.
S01	Frost protection in cooling	Compressor speed reduced or off	The compressor speed is reduced if the liquid line temperature sensor (TUP) falls below 2 ° C. It stops if it drops below -1 ° C. The compressor restarts when the temperature exceeds 6 ° C. 1. Check that the temperature set for cooling is not too low, that the water flow rate is not insufficient and check the filter; Check the pressure read by the low pressure sensor.
S02	Water flow rate too low	Compressor stopped	The system water flow is too low. Check the hydraulic system, especially the filter. Check the proper functioning of the pump.
S03	Water flow switch error	Compressor stopped	Check that the water flow switch is not badly connected or broken. Check that there is no external pump that is pushing water inside the machine.
S04	Communication error	Unit stopped	Too much data lost in communication. Check that the BUS communication cable between the indoor and outdoor units is less than 30 meters long. Check that there are no sources of disturbance nearby. The message disappears when communication is restored.
S05	Connection error on the serial port	Unit stopped	Communication between control panel and control board or gas side board failed. Check the electrical wiring. Check that the microswitches on the control and gas side boards are positioned as shown in the wiring diagram. The system restarts as soon as communication is restored.
S06	Water temperature too low in cooling mode	Compressor stopped	The compressor stops if the supply water has a temperature below 5 ° C in cooling. Check that the “Tc” sensor is connected well and that it works correctly. Check that the set temperature is not too low and that the water flow rate is sufficient.
S07	Water temperature too high in heating mode	Compressor stopped	The compressor stops if the supply water has a temperature above 57 ° C in heating or DHW production. Check that the “Tc” sensor is connected well and that it works correctly. Check that the set temperature is not too high and that the water flow is sufficient.

Code	Description	Status	Solution
S08	Defrost error	Compressor stopped	If the system fails to finish the defrost process 3 consecutive times, it stops and the error message S08 appears. Remove and restore electricity to reset the error. Check that the water temperature is not too cold, in case the plate heat exchanger could break.
S09	Supply water temperature error, too cold in heating or DHW production	Compressor stopped and electric heater in operation.	The error appears if the unit is stopped but the electric heater is running and the supply water temperature is below 15 ° C during heating or DHW production mode. The compressor restarts when the supply temperature exceeds 17 ° C. This function is to avoid damage to the compressor.
S10	Water flow too low error	Compressor stopped	If the unit stops due to error S2 (water flow too low) 3 times in a certain period of time it will re-lock and S10 will appear. Remove and restore the electrical supply to reset the error. Check the hydraulic circuit, especially the filter. Check the proper functioning of the pump.
S11	Defrost antifreeze protection error	Compressor stopped	If the unit stops due to error S1 (antifreeze protection in cooling) 3 times in a certain period of time it will re-lock and S11 will appear. Remove and restore the electrical supply to reset the error.
S12	“Floor curing” function not achieved (N/A)	(N/A)	(N/A)
S13	4 way valve blocked		Turn the unit off and on again. If the error is repeated immediately, the 4-way valve is blocked and must be replaced.
S14	3 way valve position error		Check that the 3-way valve works correctly. Check that the Tw and Tc sensors are not reversed. When the compressor has been running for more than 5 minutes, if Tw-TUI> 12 (for more than 2 min) in DHW or if Tc-TUI> 12 (for more than 2 min) in heating, the unit will go into error S14 .

10.1 - General warnings

It is advisable to carry out a regular annual maintenance of the heating systems for the following reasons:

- ☞ To maintain a high efficiency and manage the heating system in an economical way (with low energy consumption);
- ☞ To achieve high operational safety;
- ☞ To keep the level of environmental compatibility of the appliance high;

WARNING!!! Maintenance of the appliance must only be performed by a professionally qualified technician.

WARNING !!! During maintenance operations, to ensure the proper functioning of the appliance, it is necessary to check its good condition, correct operation and the possible presence of water leaks from all the air vent valves present in the appliance.

WARNING!!! Before any maintenance operation, disconnect the appliance from the electrical supply, using the appropriate switch located nearby.

10.2 - Maintenance protocol

INDOOR UNIT	- Check the water pressure in the system and there are no leaks (Follow section 10.3); - Check the good condition of the safety pressure relief valve (Follow section 10.4); - Check and clean the safety exhaust valve system (Follow section 10.5); - Check the good condition of the safety and control devices (Follow section 10.6); - Check the good condition of the electrical system (Follow section 10.7); - Check the operation of the main switch (Follow section 10.8); - Check the correct temperature adjustment in heating and DHW (Follow section 10.9); - Check the good condition and operation of the vent valves present (Follow section 10.10); - Check the good condition of the heating / solar expansion tanks; (Follow section 10.11);
OUTDOOR UNIT	- Check that the evapocondensing battery is clean (Follow section 10.12); - Check for there are no leaks in the refrigerant circuit (Follow section 10.13); - Check the good condition of the electrical connections (Follow section 10.14); - Check the status of the fan (Follow section 10.15); - Check the control devices (Follow section 10.16); - Check the operating pressures of the refrigerant circuit (Follow section 10.17);

10.3 - Check the water pressure in the system and there are no leaks

1.- Check that the system is full of water and under pressure as reported in section 11. The check must be performed with the system cold and after each filling of the same;
2.- Check there are no leaks.

WARNING!!! Eliminate any leaks to the system or to the appliance. The continuous supply of new water involves an increase in minerals which reduce the passage section, decreasing the heat exchange and causing overheating of the heat exchangers. All this will lead to breakdowns and a reduction in the life of the device itself.

10.4 - Check the good condition of the safety pressure relief valve

1.- Visually check the safety pressure relief valves for obstructions in the exhaust duct, signs of corrosion, physical damage, water stains or signs of rust.
2.- In case of obstructions in the exhaust duct, proceed with cleaning it, if on the other hand you find other types of damage indicated above, replace the valve.

10.5 - Check and clean the safety exhaust valve system

1.- Visually check that the exhaust safety pressure relief valve do not show obstructions in the ducts and in the drain conveyor;
2.- In case of obstructions in the exhaust duct, proceed with cleaning it, if on the other hand you find other types of damage indicated above, proceed with the replacement.

10.6 - Check the good condition of the safety and control devicees

1.- Check, by querying the device diagnostics (section 9), any interventions of the safety and control devices;
2.- Visually check that the safety and control devices show no signs of corrosion or physical damage;
3.- In case of damage indicated above, replace them.

10.7 - Check the good conditions of the electrical system

1.- Access the internal components of the appliance as per section 10.24;
2.- Visually check that the cables are in the relative cable glands, that the plug-in connections are correctly secured and that they do not show any signs of blackening or burning,
3.- In case of damage indicated above, replace the damaged cables.

10.8 - Check the operation of the main switch

1.- Verify, by installing an external magnetothermic switch, the switching off of the device when the main switch is positioned on OFF and vice versa when it is switched on when it is positioned on ON;
2.- In case of malfunction, proceed with replacing the switch.

10.9 - Check the temperature adjustment in heating and DHW

1.- Check the relationship between the regulated temperature and the actual one obtained in heating and DHW mode;
2.- If the temperatures do not match, replace the sensor concerned and if the problem persists, replace the thermoregulator.

10.10 - Check the good conditions and operation of the vent valves present

1.- Visually check that the vent valves do not show obstructions, signs of corrosion, physical damage, water stains or signs of rust;
2.- In case of one or more of the signs listed above, replace the valve.

10.11 - Check the expansion tanks

The appliance is not equipped with expansion tanks. They must be provided (by a qualified technician) according to the type of use (domestic hot water / heating) and the calculated necessary volume. Therefore, their maintenance must in any case be performed according to section 10.2.

10.12 - Check that the evapocondensing battery is clean

Check the cleanliness of the battery fins: if they are partially blocked by leaves, dust or debris, proceed with cleaning using a soft brush.
In case of particularly stubborn dirt, proceed with a jet of pressurized water, paying particular attention not to damage or deform the fins.

10.13 - Check there are no leaks in the refrigerant circuit

Check that the operating pressures and temperatures of the refrigerant circuit are regular.
This is possible by accessing the “Info” menu (section 8.2.15).
If it is understood that the refrigerant circuit no longer has the correct refrigerant charge, before restoring it, carefully check, with an electronic leak detector, all the connections and pipes of the refrigerant circuit in order to search for any leaks and eliminate them.

10.14 - Check the good conditions of the electrical connections

1.- Visually check that the cables are in the relative cable glands, that the plug connections are correctly fixed and that they do not show signs of blackening or burning;
2.- In case of damage indicated above, replace the damaged wiring.

10.15 - Check the status of the fan

Check that the fan does not make abnormal noises during operation due to misalignments and / or bearing problems. In case of malfunctions, proceed with the replacement of the fan and / or the motor.

10.16 - Check the control devices

1.- Check by the device diagnostics (section 9) any interventions of the safety and control devices;
2.- Visually check that the control devices do not show signs of corrosion or physical damage;
3.- In case of damage indicated above, replace them.

10.17 - Check the operating pressures of the refrigerant circuit

To check the refrigerant circuit pressures, proceed as follows:
1.- Make sure that the heat pump is on;
2.- Access the control panel and check the following parameters in the “Info” menu (section 8.2.15):
   a.- compressor suction and discharge pressures and temperatures;
   b.- check the outdoor temperature;
3.- Check the supply and return temperature of the heat pump sensors the menu on the synoptic;
4.- Check that the overheating (in evaporation) is contained within 7K and check that the subcooling (in condensation) is greater than or equal to 2K.

WARNING!!! Never touch the compressor discharge pipe: it can reach temperatures above 100 ° C and cause burns in case of contact.

10.18 - Refrigerant circuit repairs

Always drain the system before carrying out repairs on the refrigeration circuit. The refrigerant gas must not be dispersed in the environment for any reason. Use the appropriate portable stations for gas recovery and recycling.
To identify any leaks, proceed as follows:
1.- Fill the circuit with nitrogen at a pressure of **40 bar**;

WARNING!!! Do not use air or oxygen, they can cause explosions.
2.- Check the leak with the proper equipment;
3.- Once you have identified the leak, completely discharge the nitrogen circuit;
4.- Eliminate the loss by brazing with a high silver content alloy (Ag 34%, Cu 25%, Zn 22%, Cd 19%), and deoxidizing paste;
5.- Recharge the refrigeration circuit.
If, at the time of the check, the circuit is completely empty, also replace the filter drier before refilling.

10.19 - Filling the refrigerant circuit

Act as follows:
1.- Connect the special vacuum pump inside the refrigeration circuit to the suction pressure socket of the outdoor unit (section 6.16.4);
2.- Start the pump to remove all the air present and obtain a vacuum of at least **0.5 mbar absolute, keeping the vacuum pump on for at least 30 min**;
3.- Now add the refrigerant gas, **in liquid form**, in the quantities indicated in section 11 under the heading “Refrigerant”;
4.- Add any additional refrigerant gas supply to the nominal charge in relation to the length of the pipes, as indicated in section 6.16.4;
5.- Check the charge of the refrigerant circuit.

10.20 - Replace the pump

If it is necessary to replace the circulation pump, proceed as follows (refer to Figure 3-1):
1.- Drain the water from the heating circuit;
2.- Access the internal components of the device, following section 10.24;
3.- Extract the pump towards the outside;
4.- Disconnect the electrical wires from the pump body.

10.21 - Cleaning the filter

To clean the filter in the heat pump circuit, proceed as follows:
1.- Disconnect the electrical supply to the system;
2.- Close the filter interception valves;
3.- Empty the water contained in the circuit;
4.- Remove the filter cap while keeping the body locked;
5.- Eliminate any impurities and deposits from the filter;
6.- Close the filter with the special cap previously removed;
7.- Reopen the shut-off valve and fill the system, paying attention to the deaeration of the same.

10.22 - Refrigerant accumulation in outdoor unit

In the event that it is necessary to disconnect the indoor unit from the outdoor unit, it is necessary to accumulate the refrigerant gas in the outdoor unit.
To do this, act as follows:
1.- Access the refrigerant connections of the outdoor unit by removing the valve cover (Figures 3-2 and 3-3);
2.- Remove the caps (“A” in Figure 6-20) of the refrigerant fittings of the outdoor unit;
3.- Using the control panel, access the “OTHER OPTIONS” menu (section 8.2.13) and start the “Refrigerant recycle function” ;
4.- The unit starts cooling automatically;
5.- Go to the “Info” menu (8.2.15) and check the working pressures (Figure 8-25);
6.- With an Allen key, close the liquid line valve on the outdoor unit side (1/4 ”or 3/8” refrigerant line valve) (Figure 3-2 and 3-3);
7.- Check in the “Info” menu (section 8.2.15) that the suction pressure (Ps) reaches the **value 0.0 bar and immediately close the gas line tap** on the outdoor condensing unit side (tap on the 1/2 “or 5” refrigeration line / 8 “depending on the power) (Figures 3-2 and 3-3);
8.- Go back to the “OTHER OPTIONS” menu (section 8.2.13) and stop the “Refrigerant recycle function”;
9.- The function will be turned off in 60 seconds. Now the refrigerant gas is all inside the outdoor unit.

10.23 - Draining the heating circuit

The appliance is not equipped with a drain valve. The installer must provide the system drain valves as shown in Figures 5-6, 5-8, 5-10 and 5-12 item “43”. To empty the circuit, proceed as follows:
1. - Open the drain valves and the vent valves of the heating elements, starting from those installed higher up;
2. - Once all the water has been evacuated, close all the vents of the heating elements and the drain valves;

WARNING!!! It is absolutely forbidden to recover and / or reuse the water evacuated from the heating circuit for any purpose, as this could be polluted.

10.24 - Remove the casing and access to the internal components of the GS unit

To remove the casing proceed as follows, referring to Figure 10-1:

1.- Open the door of the indoor unit;

2.- Unscrew the screws that fix the cover of the electrical connections, so as to be able to access the terminal board and the internal components of the appliance.

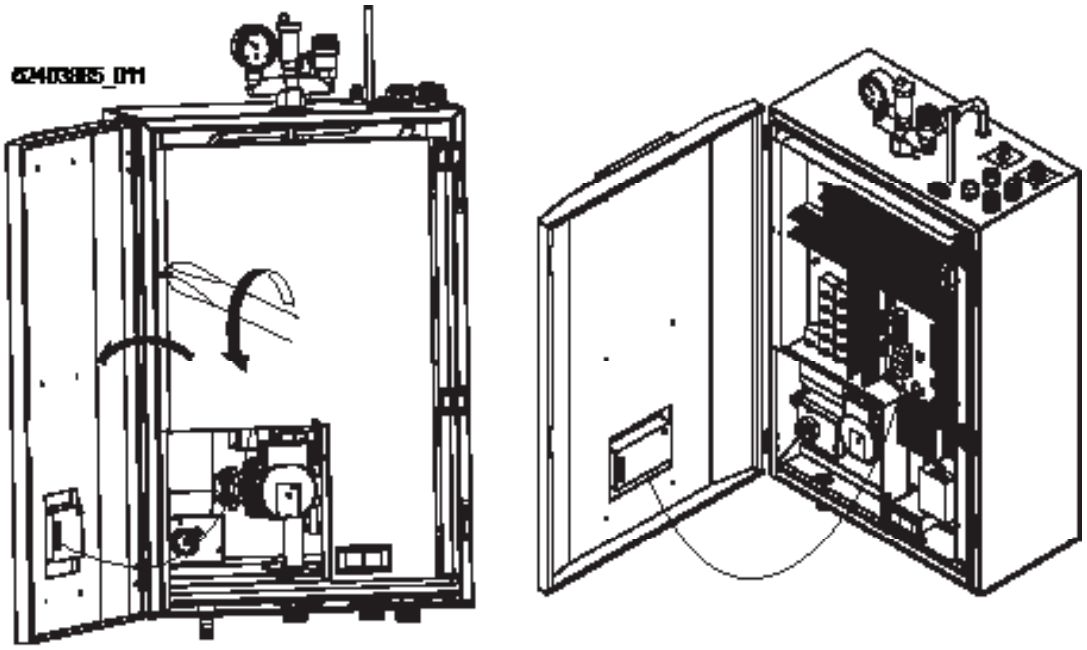


Figure 10-1 - Dismantling the casing and access to the internal components

10.25 - Remove the casing and access to the internal components of the STM

To remove the casing proceed as follows, referring to Figure 10-2:

1.- Unscrew the screws that fix the upper panel (A) and remove it, so as to be able to access the internal components and subsequently also remove the front panel;

2.- Unscrew the screws that secure the front panel (B) and remove it, so as to be able to access all internal components.

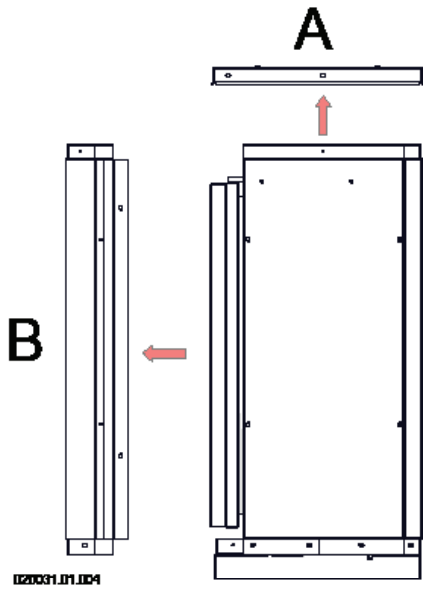
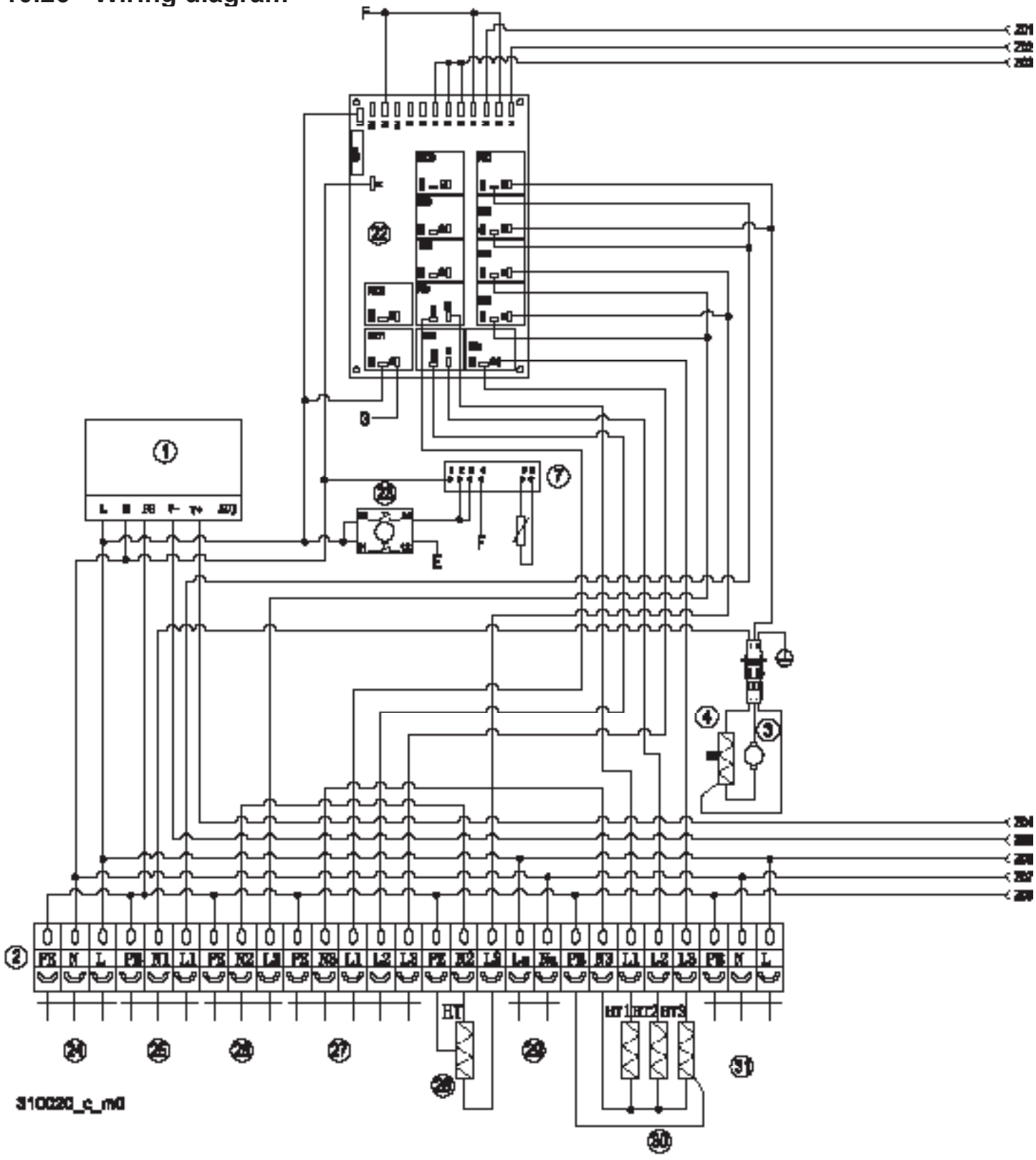


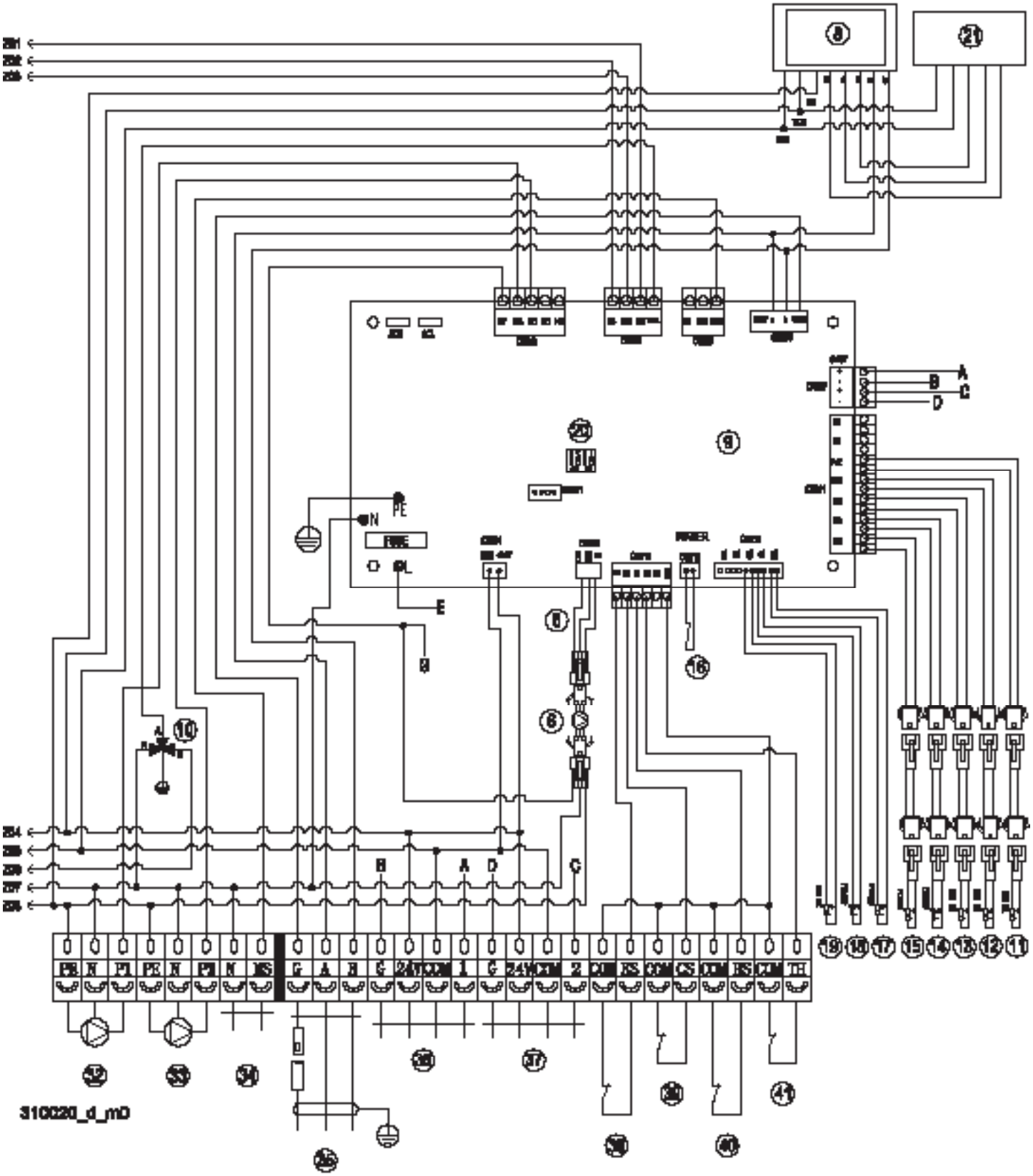
Figure 10-2 - Remove the front, the right side and upper cover panel

10.26 - Wiring diagram



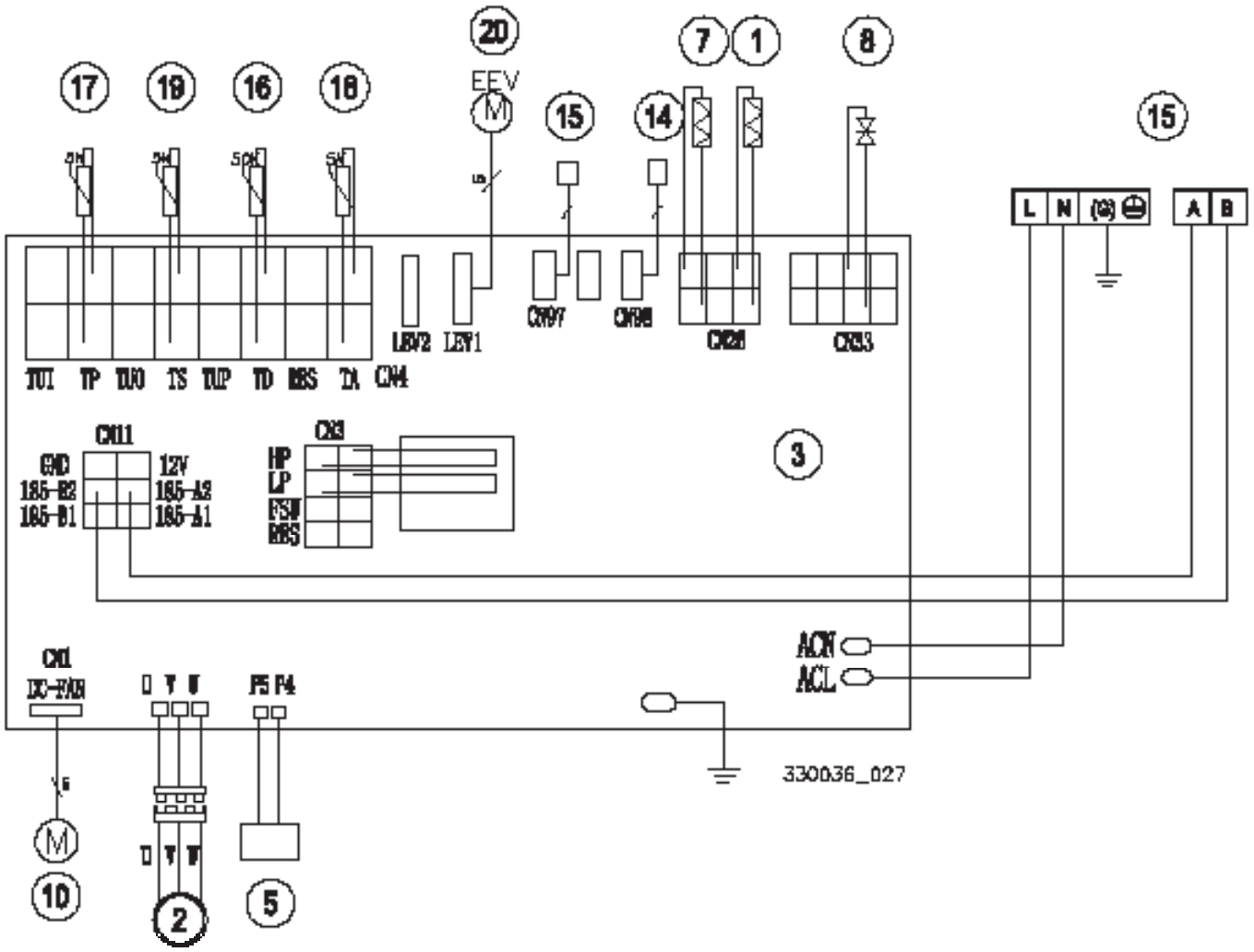
1 - Main electrical supply 230Vac - 24Vdc
2 - Terminals block
3 - Overheating safety thermostat
4 - Electric heater
5 - PWM Pump
6 - Pump
7 - Digital thermostat max 75°C
8 - Control panel
9 - Control board
10 - 3-way valve
11 - Circuit 2 temperature sensor (TV2)
12 - Circuit 1 temperature sensor (TV1)
13 - Room temperature sensor (Tr)
14 - Heating/Cooling temperature sensor (Tc)
15 - DHW temperature sensor (Tw)
16 - Water flow switch
17 - Supply temperature sensor (TUO)
18 - Return temperature sensor (TUI)
19 - Liquid line temperature sensor (TUP)
20 - Microswitches
21 - WI-FI modul
22 - Relay board
23 - Switch emergency electric heater

Figure 10-3 - GS wiring diagram



24 - Main electrical supply 230Vac - 50Hz
25 - Electric heater power supply
26 - Power supply for heating integration resistance
27 - Domestic hot water tank resistance power supply
28 - Heating integration resistance
29 - Auxiliary power supply (Terminals not used)
30 - DHW boiler resistance
31 - Outdoor unit STM power supply
32 - Circuit 1 pump
33 - Circuit 2 pump
34 - Terminals not used
35 - BUS External condensing unit
36 - Circuit 1 mix valve
37 - Circuit 2 mix valve
38 - ES General shutdown contact
39 - CS cooling switch
40 - HS heating switch
41 - TH high temperature contact

Figure 10-3 - GS wiring diagram



1 - Wire floor heater
2 - Compressor
3 - Compressor inverter board
5 - Reactance
7 - Compressor wire heater
8 - 4 way valve
10 - Fan
14 - Low pressure sensor
15 - High pressure sensor
16 - Compressor discharge temperature sensor
17 - Evapo-condensing battery temperature sensor
18 - Outdoor temperature sensor
19 - Suction temperature sensor
20 - Electronic expansion valve
21 - Terminal block (Figure 6-24)

Figure 10-4 - STM 06, 09 and 12 wiring diagram

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11 - TECHNICAL DATA

ECOTWIN		UM	Inverter air to water heat pump		
Model			GS 06/STM 06	GS 09/STM 09	GS 12/STM 12
Main electrical supply		V/Hz/Ph	220-240 / 50 / 1	220-240 / 50 / 1	220-240 / 50 / 1
Refrigerant		kg	R32 / 1,0	R32 / 1,6	R32 / 1,8
Heat output (1)		kW	6,50	9,20	11,65
Electric absorption in heating (1)		W	1410	2060	2683
C.O.P 100% Capacity ratio (1)		W/W	4,61	4,47	4,35
Heating heat output(2)		kW	6,24	8,68	11,25
Electric absorption in heating (2)		W	1977	2509	3261
C.O.P 100% Capacity ratio (2)		W/W	3,44	3,46	3,45
Cooling heat output (3)		kW	7,41	9,48	9,80
Electric absorption in cooling (3)		W	1807	2199	2510
E.E.R 100% Capacity ratio (3)		W/W	4,10	4,31	3,90
Cooling heat output (4)		kW	4,25	6,95	6,56
Electric absorption in cooling (4)		W	1687	2324	2448
E.E.R 100% Capacity ratio (4)		W/W	2,52	2,99	2,68
Circuit maximum pressure		bar	42	42	42
Compressor	Type		Twin Rotary	Twin Rotary	Twin Rotary
	Quantity/System		1	1	1
	Oil		FV68S	FV68S	FV68S
	V.max Heating	Hz	90	90	90
	V.max Cooling	Hz	90	90	78
Fan	Quantity		1	1	1
	Air flow	m³/h	2500	3150	3150
	Nominal power	W	34	45	45
Noise level	Internal/ external	dB (A)	35/52	35/53	35/52
Refrigerant connection	Liquid / Gas	“	1/4” / 1/2”	3/8” / 5/8”	3/8” / 5/8”
Net size (L×D×H)	Outdoor unit	mm	1010×370×700	1165×370×850	1165×370×850
	Indoor unit	mm	790×288×505	790×288×505	790×288×505
Net weight	Outdoor unit	kg	62	63	80
	Indoor unit	kg	45,0	45,0	45,0
Weight with packaging	Outdoor unit	kg	72	73	90
	Indoor unit	kg	50	50	50
Outdoor operating temperature	Heating	°C	from -25 to 46		
	Cooling	°C	from 0 to 55		
Limits of supply temperature		°C	from 7 to 75		
Water volume		Kg	4,5		
Maximum heating water pressure		MPa	0,3	0,3	0,3
Built-in electric heating heater		kW	3	3	3
Seasonal space heating energy efficiency (ηs)		%	182	185	187

(1) Heating condition: Return/supply water temperature : 30 °C/35 °C, outdoor temperature: BS/BU 7/6°C
(2) Heating condition: Return/supply water temperature : 40 °C/45 °C, outdoor temperature: BS/BU 7/6°C
(3) Cooling condition: Return/supply water temperature : 23 °C/18 °C, outdoor temperature: 35°C
(4) Cooling condition: Return/supply water temperature : 12 °C/7 °C, outdoor temperature: 35°C
Performance tests according to the legislation EN 14511.
Specifications are subject to change without notice. For current specifications refer to the adhesive labels on the equipment.

ECOTWIN - Heating efficiency						
Water inlet/outlet 30/35°C						
	6		9		12	
Te	Heating heat output	COP	Heating heat output	COP	Heating heat output	COP
-7	4,74	3,04	5,71	2,97	7,64	3,10
2	6,13	3,80	7,87	3,87	10,17	3,89
7	6,50	4,61	9,20	4,47	11,65	4,35
12	7,27	5,23	8,85	5,16	11,09	4,94
Water inlet/outlet 40/45°C						
	6		9		12	
Te	Heating heat output	COP	Heating heat output	COP	Heating heat output	COP
-7	4,44	2,38	5,29	2,28	7,12	2,39
2	5,87	3,07	7,40	2,98	9,80	3,07
7	6,24	3,44	8,68	3,46	11,25	3,45
12	6,76	3,91	8,63	4,00	10,69	3,82
Water inlet/outlet 50/55°C						
	6		9		12	
Te	Heating heat output	COP	Heating heat output	COP	Heating heat output	COP
-7	3,69	1,77	4,88	1,73	6,51	1,74
2	4,72	2,22	6,85	2,28	8,62	2,28
7	5,69	2,60	7,91	2,56	9,86	2,63
12	6,32	2,98	7,96	3,03	9,67	2,80

ECOTWIN - Cooling efficiency						
Water inlet/outlet 23/18°C						
	6		9		12	
Te	Cooling heat output	EER	Cooling heat output	EER	Cooling heat output	EER
35	7,41	4,10	9,48	4,31	9,80	3,90
30	8,50	5,50	10,80	5,70	11,00	5,00
25	9,40	6,70	11,90	6,60	12,10	5,80
20	10,10	7,80	13,10	7,70	13,20	6,90
Water inlet/outlet 12/7°C						
	6		9		12	
Te	Cooling heat output	EER	Cooling heat output	EER	Cooling heat output	EER
35	4,25	2,52	6,95	2,99	6,56	2,68
30	5,40	3,30	7,10	3,30	7,30	3,20
25	6,20	4,30	8,00	4,20	8,20	3,90
20	7,10	5,10	9,20	5,10	9,40	5,20

12 - PRODUCT FICHE

Low temperature table (30/35) medium zones	
Name or brand of the supplier	COSMOGAS
Model	**ECOTWIN 6 R32**
Air/Water heat pump	YES
Water/Water heat pump	NO
Brine/Water heat pump	NO
Low temperature heat pump	YES
With additional heater	NO
Combined heating appliance with heat pump	NO

The parameters are declared for medium temperature application, except for low temperature heat pumps.
For low temperature heat pumps, the parameters are declared for low temperature application.

The parameters are suitable for medium climatic applications

Element	**Symbol**	**Value**	**Unit**
Nominal heat output	Pnominal	4,193	kW
Heating capacity at partial load, with room temperature equal to 20 ° C and outdoor temperature Tj			
Tj = -7°C	Pdh	3,709	kW
Tj = +2°C	Pdh	2,258	kW
Tj = +7°C	Pdh	1,451	kW
Tj = +12°C	Pdh	0,645	kW
Tj = bivalent temperature	Pdh	3,709	kW
Tj = operating limit temperature	Pdh	4,314	kW
for air/water heat pump: Tj = -15 °C (se TOL < -20 °C)	Pdh		kW
Bivalent temperature	Tbiv	-7	°C
Cyclicality of capacity intervals for heating	Pcych		kW
Degradation coefficient	Cdh	0,9	--
Energy consumption in ways other than the active way			
Off mode	Poff	0,013	kW
Thermostat off mode	Pto	0,013	kW
Stand-by mode	Psb	0,013	kW
Crankcase heating mode	Pck	0,044	kW
Other elements			
Capacity control	Variable		
Sound power level, inside / outside	Lwa	52	dB
Annual energy consumption	Qhe	1827	kWh or GJ

Element	**Symbol**	**Value**	**Unit**
Seasonal space heating energy efficiency	ηs	186,7	%
Declared coefficient of performance, with room temperature equal to 20 ° C and outdoor temperature Tj			
Tj = -7°C	COPd	3,12	--
Tj = +2°C	COPd	4,48	--
Tj = +7°C	COPd	6,18	--
Tj = +12°C	COPd	8,49	--
Tj = bivalent temperature	COPd	3,12	--
Tj = operating limit temperature	COPd	2,84	--
for air/water heat pump: Tj = -15 °C(se TOL < -20 °C)	COPd		--
for air/water heat pump: operating limit temperature	TOL	-10	°C
Cyclicality of the intervals efficiency	COPcyc or PERcyc		--
Operating limit temperature for water heating	WTOL	60	°C
Additional heater			
Nominal heat output	Psup		kW
Type of energy supply			
For air / water heat pumps: nominal air flow, outside	--	3000	m3/h
For water / water and brine / water heat pumps: brine or nominal water flow, external heat exchanger	--		m3/h

For mixed heat pump heaters:							
Load profile declared				Energy efficiency of water heating	ηwh		%
Daily consumption of electricity	Qelec		kWh	Daily fuel consumption	Qfuel		kWh
Annual energy consumption	AEC		kWh	Annual fuel consumption	AFC		GJ
Contact details	COSMOGAS S.r.l. via Leonardo da Vinci, 16 - 47014 Meldola (FC)						

12 - PRODUCT FICHE

Low temperature table (30/35) medium zones							
Name or brand of the supplier			COSMOGAS				
Model			**ECOTWIN 9 R32**				
Air/Water heat pump			YES				
Water/Water heat pump			NO				
Brine/Water heat pump			NO				
Low temperature heat pump			YES				
With additional heater			NO				
Combined heating appliance with heat pump			NO				
The parameters are declared for medium temperature application, except for low temperature heat pumps. For low temperature heat pumps, the parameters are declared for low temperature application.							
The parameters are suitable for medium climatic applications							
Element	**Symbol**	**Value**	**Unit**		**Element**	**Symbol**	**Value**	**Unit**
Nominal heat output	Pnominal	6,464	kW		Seasonal space heating energy efficiency	ηs	186	%
Heating capacity at partial load, with room temperature equal to 20 ° C and outdoor temperature Tj					Declared coefficient of performance, with room temperature equal to 20 ° C and outdoor temperature Tj			
Tj = -7°C	Pdh	5,718	kW		Tj = -7°C	COPd	3,16	--
Tj = +2°C	Pdh	3,481	kW		Tj = +2°C	COPd	4,44	--
Tj = +7°C	Pdh	2,238	kW		Tj = +7°C	COPd	6,19	--
Tj = +12°C	Pdh	0,994	kW		Tj = +12°C	COPd	8,62	--
Tj = bivalent temperature	Pdh	5,718	kW		Tj = bivalent temperature	COPd	3,16	--
Tj = operating limit temperature	Pdh	5,391	kW		Tj = operating limit temperature	COPd	2,80	--
for air/water heat pump: Tj = -15 °C (se TOL < -20 °C)	Pdh		kW		for air/water heat pump: Tj = -15 °C(se TOL < -20 °C)	COPd		--
Bivalent temperature	Tbiv	-7	°C		for air/water heat pump: operating limit temperature	TOL	-10	°C
Cyclicality of capacity intervals for heating	Pcych		kW					
Degradation coefficient	Cdh	0,9	--		Cyclicality of the intervals efficiency	COPcyc or PERcyc		--
Energy consumption in ways other than the active way								
Off mode	Poff	0,01	kW		Operating limit temperature for water heating	WTOL	60	°C
Thermostat off mode	Pto	0,01	kW		**Additional heater**			
Stand-by mode	Psb	0,01	kW		Nominal heat output	Psup		kW
Crankcase heating mode	Pck	0,027	kW		Type of energy supply			
Other elements								
Capacity control	Variable				For air / water heat pumps: nominal air flow, outside	--	3500	m3/h
Sound power level, inside / outside	Lwa	53	dB		For water / water and brine / water heat pumps: brine or nominal water flow, external heat exchanger	--		m3/h
Annual energy consumption	Qhe	2826	kWh or GJ					
For mixed heat pump heaters:								
Load profile declared					Energy efficiency of water heating	ηwh		%
Daily consumption of electricity	Qelec		kWh		Daily fuel consumption	Qfuel		kWh
Annual energy consumption	AEC		kWh		Annual fuel consumption	AFC		GJ
Contact details	COSMOGAS S.r.l. via Leonardo da Vinci, 16 - 47014 Meldola (FC)							

12 - PRODUCT FICHE

Low temperature table (30/35) medium zones							
Name or brand of the supplier			COSMOGAS				
Model			**ECOTWIN 12 R32**				
Air/Water heat pump			YES				
Water/Water heat pump			NO				
Brine/Water heat pump			NO				
Low temperature heat pump			YES				
With additional heater			NO				
Combined heating appliance with heat pump			NO				
The parameters are declared for medium temperature application, except for low temperature heat pumps. For low temperature heat pumps, the parameters are declared for low temperature application.							
The parameters are suitable for medium climatic applications							
Element	**Symbol**	**Value**	**Unit**		**Element**	**Symbol**	**Value**	**Unit**
Nominal heat output	Pnominal	8,849	kW		Seasonal space heating energy efficiency	ηs	185,5	%
Heating capacity at partial load, with room temperature equal to 20 ° C and outdoor temperature Tj					Declared coefficient of performance, with room temperature equal to 20 ° C and outdoor temperature Tj			
Tj = -7°C	Pdh	7,828	kW		Tj = -7°C	COPd	3,25	--
Tj = +2°C	Pdh	4,765	kW		Tj = +2°C	COPd	4,51	--
Tj = +7°C	Pdh	3,063	kW		Tj = +7°C	COPd	5,79	--
Tj = +12°C	Pdh	1,361	kW		Tj = +12°C	COPd	9,26	--
Tj = bivalent temperature	Pdh	7,828	kW		Tj = bivalent temperature	COPd	3,25	--
Tj = operating limit temperature	Pdh	6,380	kW		Tj = operating limit temperature	COPd	2,78	--
for air/water heat pump: Tj = -15 °C (se TOL < -20 °C)	Pdh		kW		for air/water heat pump: Tj = -15 °C(se TOL < -20 °C)	COPd		--
Bivalent temperature	Tbiv	-7	°C		for air/water heat pump: operating limit temperature	TOL	-20	°C
Cyclicality of capacity intervals for heating	Pcych		kW					
Degradation coefficient	Cdh	0,9	--		Cyclicality of the intervals efficiency	COPcyc or PERcyc		--
Energy consumption in ways other than the active way								
Off mode	Poff	0,017	kW		Operating limit temperature for water heating	WTOL	60	°C
Thermostat off mode	Pto	0,017	kW		**Additional heater**			
Stand-by mode	Psb	0,017	kW		Nominal heat output	Psup		kW
Crankcase heating mode	Pck	0,033	kW		Type of energy supply			
Other elements								
Capacity control	Variable				For air / water heat pumps: nominal air flow, outside	--	3500	m3/h
Sound power level, inside / outside	Lwa	52	dB		For water / water and brine / water heat pumps: brine or nominal water flow, external heat exchanger	--		m3/h
Annual energy consumption	Qhe	3879	kWh or GJ					
For mixed heat pump heaters:								
Load profile declared					Energy efficiency of water heating	ηwh		%
Daily consumption of electricity	Qelec		kWh		Daily fuel consumption	Qfuel		kWh
Annual energy consumption	AEC		kWh		Annual fuel consumption	AFC		GJ
Contact details	COSMOGAS S.r.l. via Leonardo da Vinci, 16 - 47014 Meldola (FC)							

The undersigned CEO of the company COSMOGAS S.r.l., with registered office in Via L. Da Vinci no. 16 - 47014 Meldola (FC) Italy,

DECLARES

under its own responsibility that the appliance:

SERIAL N°	
MODEL	
PRODUCTION DATA	

subject of this declaration is in compliance with:

- Energy Related Products directive **2009/125/CE**
- Electromagnetic compatibility directive **2014/30/UE**
- Low Voltage Directive **2014/35/UE**
- Regulation **(UE) N. 2017/1369**
- Ecodesign requirements regulation **(UE) N. 813/2013**
- Energy labeling regulation **(UE) N. 811/2013**

This declaration is issued as stipulated by the aforementioned directives.

Meldola (FC) ITALY, (Production data).

Alessandrini Arturo
Sole Director

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