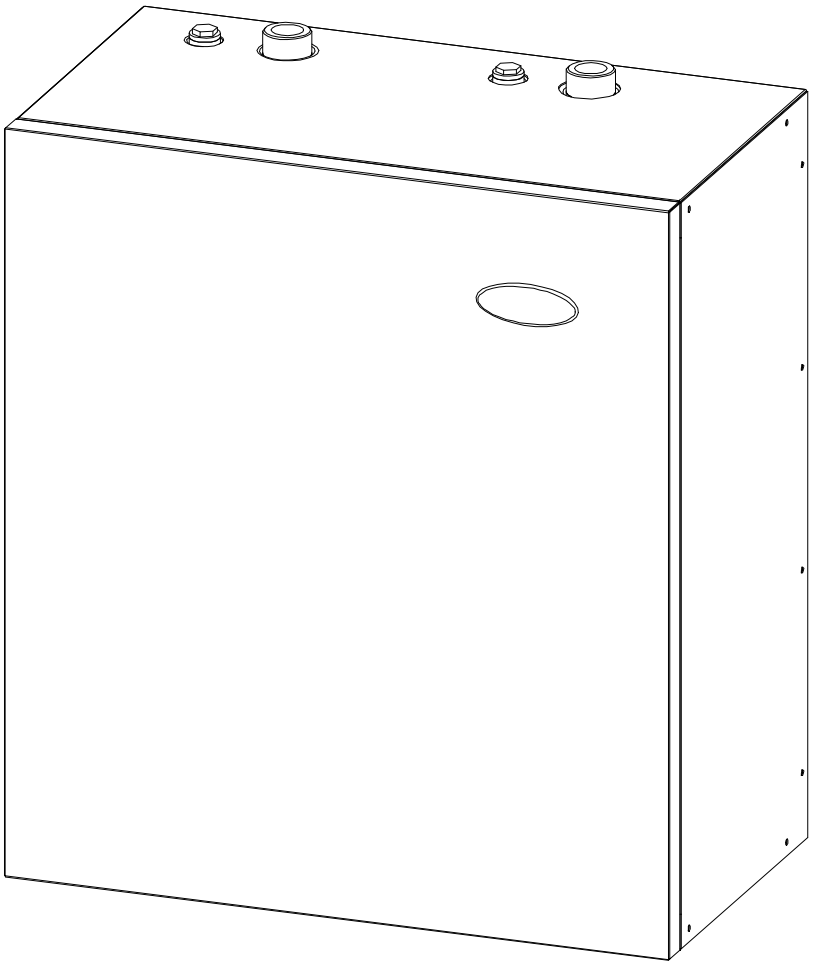
INSTALLATION AND OPERATING INSTRUCTIONS

➥ BIO 2M KIT



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Thank you for choosing a DOMUSA TEKNIK product. From the range of **DOMUSA TEKNIK** products, you have chosen the **Bio 2M Underfloor Heating Kit**. With a suitable hydraulic installation, installed and connected to a **BioClass NG** pellet boiler, this accessory will provide the ideal level of comfort for your home.

This manual forms an essential part of the product and it must be given to the user. Read the warnings and recommendations in the manual carefully, as they contain important information on the safety, use and maintenance of the installation.

This accessory must be installed by qualified personnel only, in accordance with the legislation in force and following the manufacturer's instructions.

The commissioning of these products and any maintenance operations must only be carried out by an Official **DOMUSA TEKNIK** Technical Assistance Service.

Incorrect installation of this appliance could result in damage to people, animals or property, and the manufacturer will not accept liability in such cases.

DOMUSA TEKNIK informs all parties concerned that, in compliance with section 1 of the first additional provision of Law 11/1997, the responsibility for delivering packaging waste or used packaging for its proper environmental management will be that of the final owner of the product (Article 18.1 Royal Decree 782/1998). At the end of its useful life, the product must be taken to a selected collection point for electrical and electronic equipment or must be returned to the distributor at the time of purchasing a new equivalent appliance. For more detailed information on the collection schemes available, contact either the collection facilities of the local authority or the distributor where the purchase was made.

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CONTENTS **Page**

1 LIST OF COMPONENTS 2

2 INSTALLATION INSTRUCTIONS 3

2.1 WALL-MOUNTING THE BIO 2M UNDERFLOOR HEATING KIT 3
2.2 HYDRAULIC INSTALLATION 5
2.3 ELECTRICAL CONNECTION 7

3 OPERATION 8

3.1 FUNCTIONING WITHOUT AN OUTDOOR SENSOR 8
3.2 FUNCTIONING WITH AN OUTDOOR SENSOR 10

4 LAGO FB OT+ REMOTE CONTROL (OPTIONAL) 12

4.1 FUNCTIONING WITHOUT AN OUTDOOR SENSOR 12
4.2 FUNCTIONING WITH AN OUTDOOR SENSOR 13
4.3 DHW SERVICE FUNCTION 14

5 CIRCULATION PUMPS 15

5.1 CHARACTERISTIC CURVES OF THE PUMPS. 15

6 DIAGRAMS AND MEASUREMENTS 17

7 ELECTRICAL DIAGRAM 18

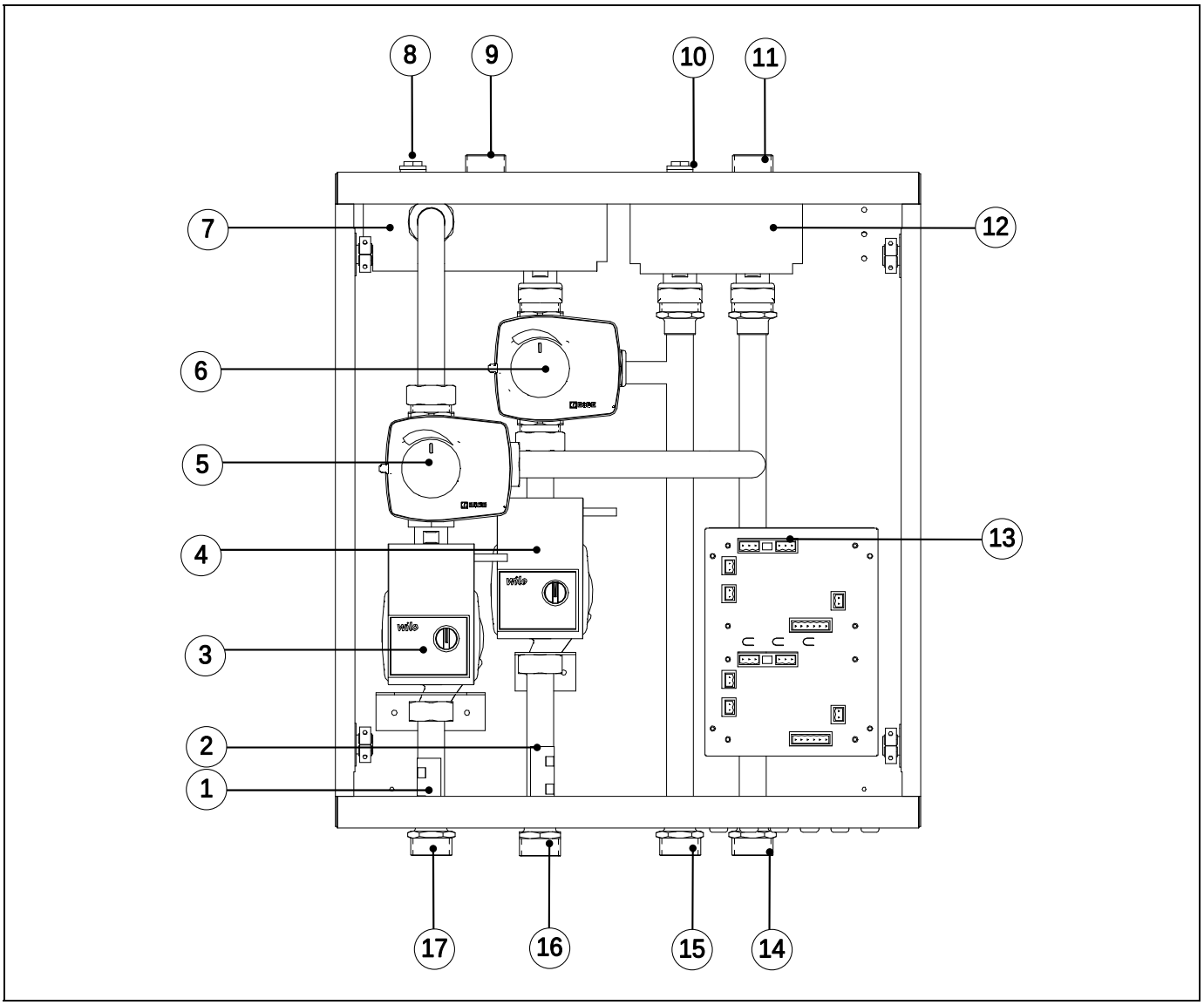
8 CONNECTIONS DIAGRAM 19

9 ALARM CODES 20

9.1 ALARMS DISPLAYED ON THE BOILER CONTROL PANEL 20
9.2 CIRCULATION PUMP ALARMS 21

10 SPARE PARTS LIST 22

1 LIST OF COMPONENTS



1. Mixed circuit temperature sensor no1.
2. Mixed circuit temperature sensor no2.
3. Mixed circuit pump no1.
4. Mixed circuit pump no2.
5. 3-way motorised mixing valve no1.
6. 3-way motorised mixing valve no2.
7. Flow manifold.
8. Drain valve socket.
9. Inlet from boiler.
10. Drain valve socket.
11. Outlet to boiler.
12. Return manifold.
13. Electronic control
14. Mixed circuit return no1.
15. Mixed circuit return no2.
16. Mixed circuit flow no2.
17. Mixed circuit flow no1.

2 INSTALLATION INSTRUCTIONS

The **Bio 2M Underfloor Heating Kit** must be installed by personnel authorised by the Department of Industry in accordance with the applicable regulations and standards in force. However, the following recommendations must be complied with when installing the kit:

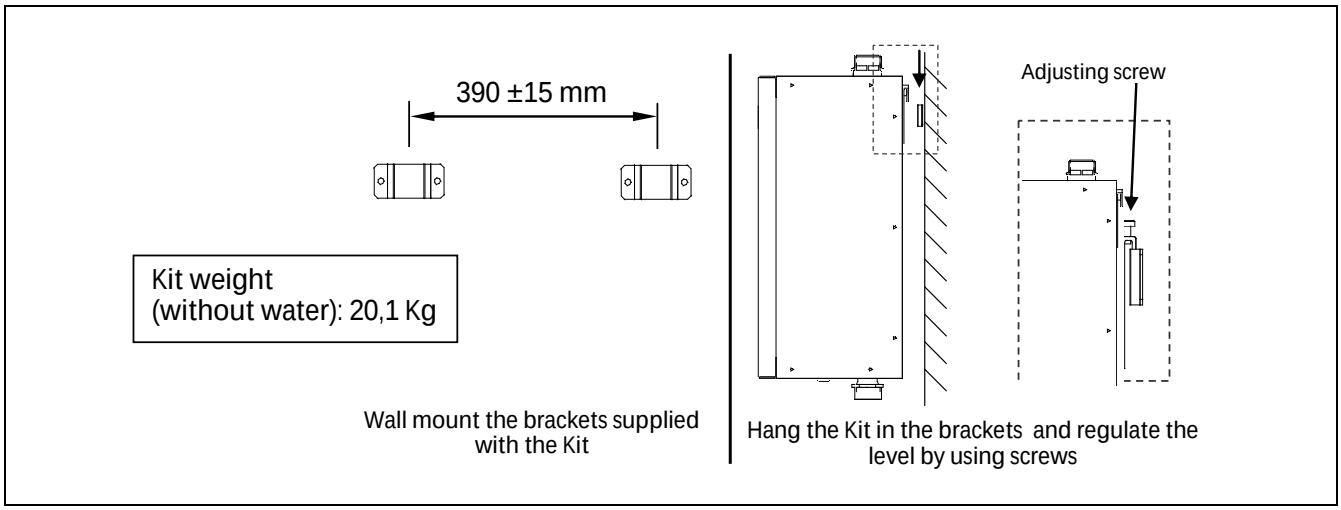
2.1 Wall-mounting the Bio 2M Underfloor Heating Kit

The Kit must be installed in a sufficiently ventilated place and preferably near the boiler.

If the kit is installed on a higher level than the lower part of the boiler, it is recommendable to install a drain valve in the socket provided for this purpose on the kit manifold, to prevent the creation of any siphons in the installation.

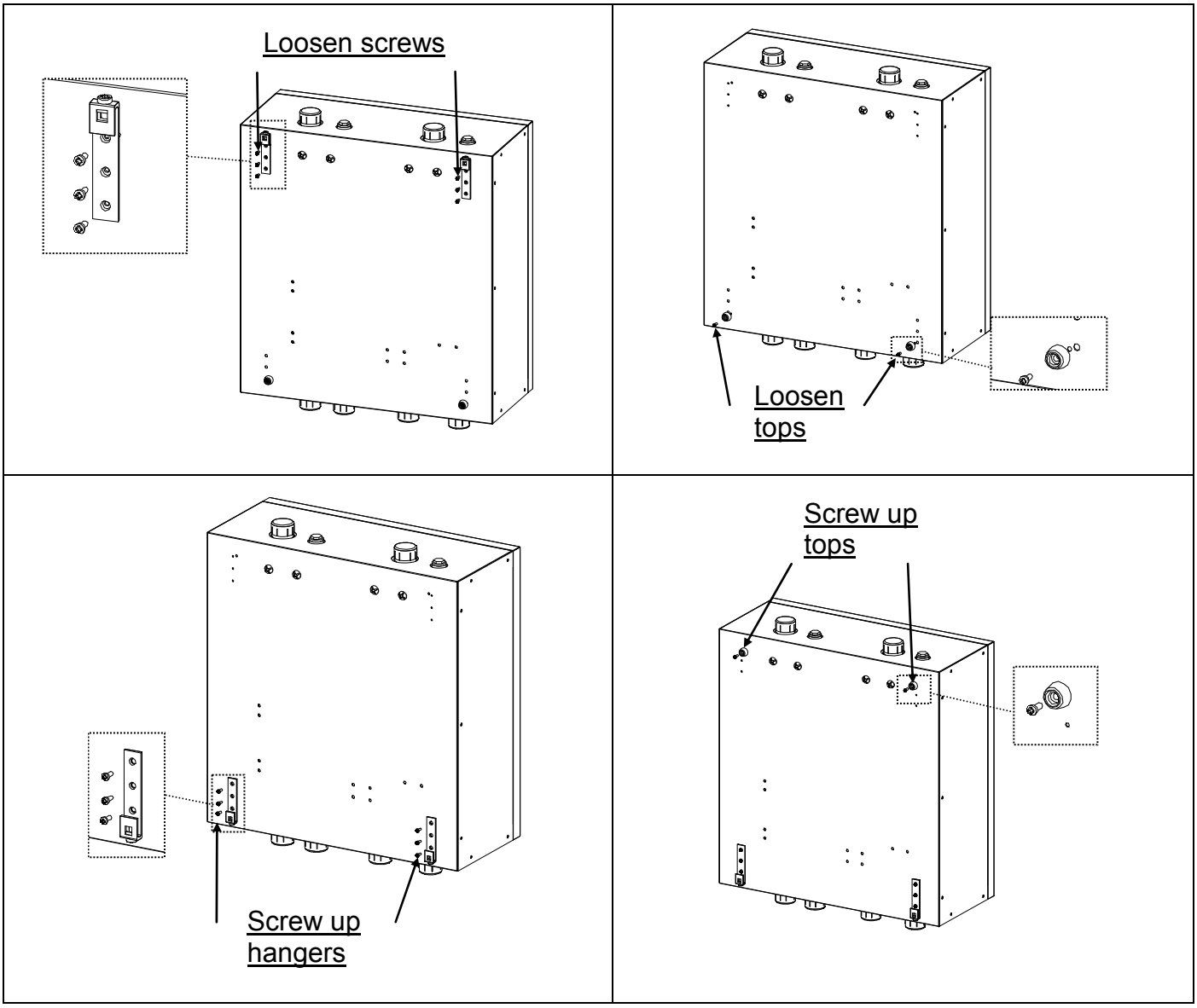
A space must be left at the front for access, and the kit must therefore not be installed opposite any obstacles that would prevent this access.

Wall-fixing system:



BIO 2M Kit

To assemble the Kit, with the flow and return boiler outlets on the bottom part, follow these steps:



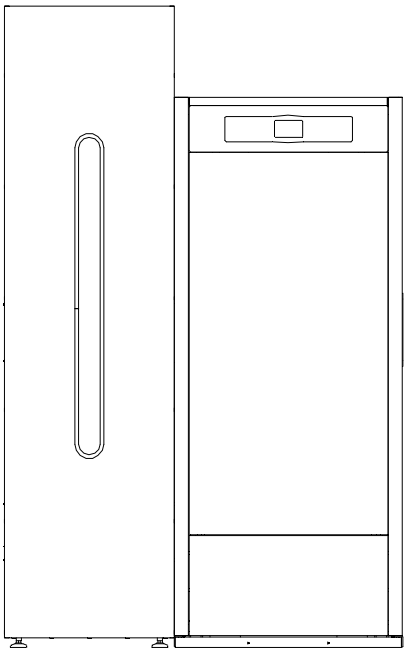
Nota In this case, the drain valve outlets are not used.

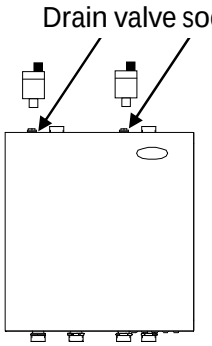
2.2 Hydraulic Installation

The hydraulic installation must be made by personnel authorised by the Department of Industry, in accordance with the applicable legislation. However, we would recommend the following:

- Before making the hydraulic connection, the inside of the heating installation pipes should be thoroughly cleaned.
- It is recommended to fit shut-off valves to the heating installation flow and return pipes, to avoid having to drain the installation when maintenance work is carried out.
- Bleed the air from the kit and the heating installation. Ensure there is no air in the heating circuit.

If the kit is installed on a higher level than the lower part of the boiler, it is recommendable to install a drain valve in the socket provided for this purpose on the kit manifold, to prevent the creation of any siphons in the installation.

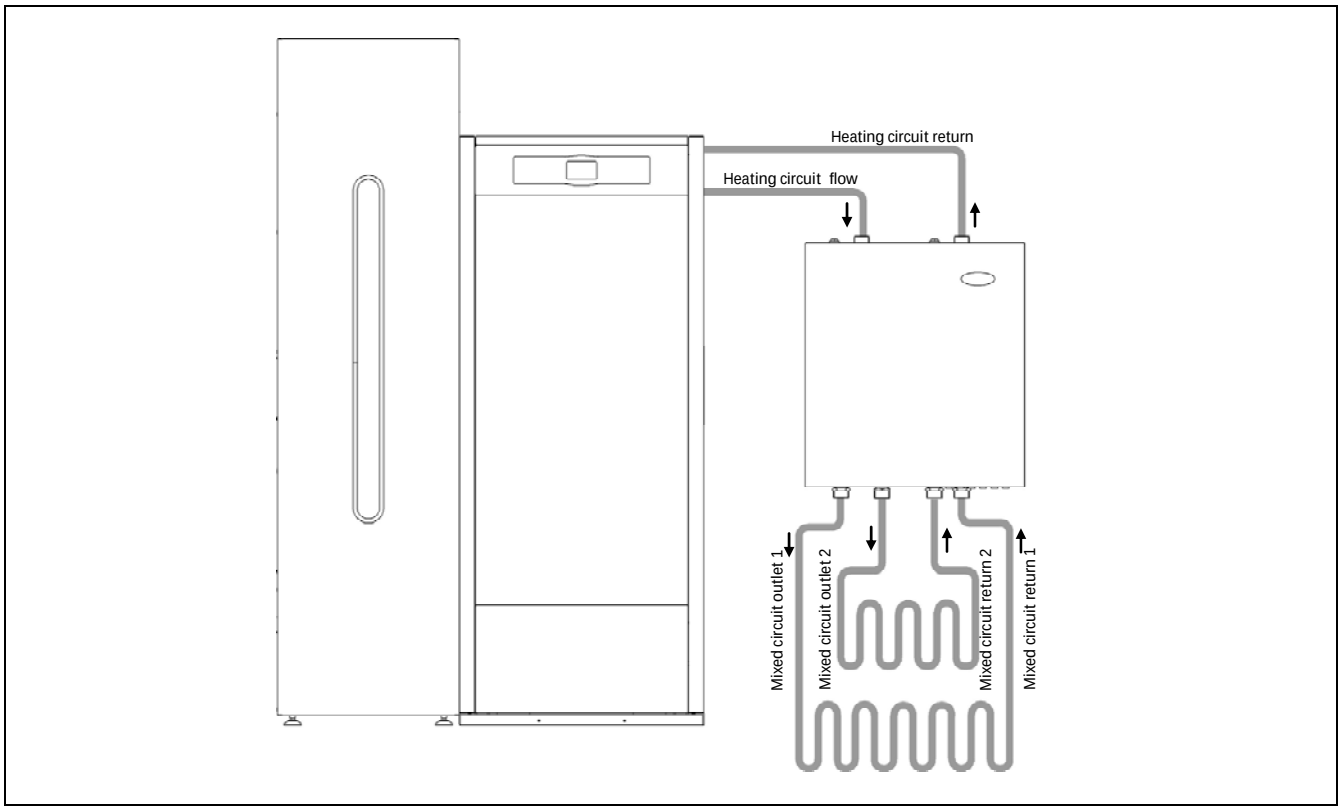




It is recommended to set to drain valves with the Kit

BIO 2M Kit

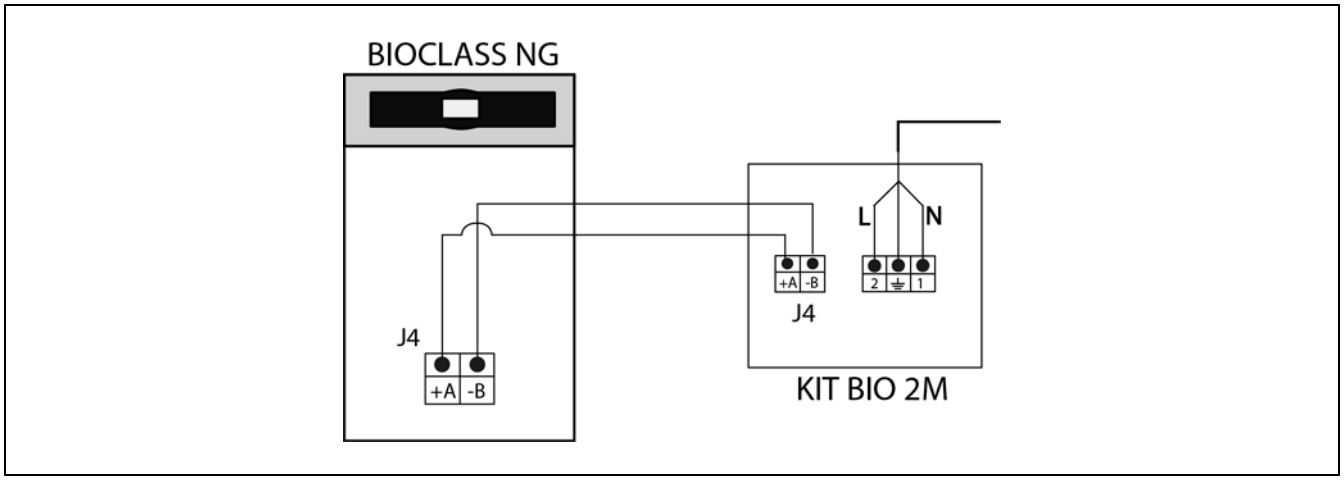
To correctly connect the **Bio Underfloor Heating 2M Kit** proceed as shown in the diagram below:



2.3 Electrical Connection

The **2M Underfloor Heating Kit** is designed for electrical connection to terminals **1** and **2** on the terminal strip, at a voltage of 230 V~ / 50Hz. **An earth connection is essential.** The maximum electrical consumption of the kit is 100 W.

For the **Bio 2M Underfloor Heating Kit** to function correctly in combination with a BioClass NG boiler, carefully follow the connection diagram provided in the "*Connections Diagram*" section of this manual. Specifically, the BioClass NG boiler connection input terminals (J4 connector) must be connected to connection terminals **+A** and **-B** (J4 connector) of the **Bio 2M Underfloor Heating Kit**. The Underfloor Heating Kit will then be inter-connected to the BioClass NG boiler.



Furthermore, the **Bio 2M Underfloor Heating Kit** includes the **J14 connector** prepared for connection to a room chronothermostat or thermostat (T_{aM1}) to manage the heating demand of mixed circuit no 1, the **J18 connector** prepared for connection to another room chronothermostat or thermostat (T_{aM2}) to manage the heating demand of mixed circuit no2 and, in turn, includes terminal no. **11** and **12** (**connector J15**) prepared for connection to an exterior sensor, provided in the Kit (see "*Connections Diagram*").

If any metal hydraulic pipes are installed (copper, iron, etc.) they must be connected to an earth connection.

The electrical installation must comply with all national and local laws and regulations concerning electrical installations applicable at the time and place of installation.

For the proper interconnection of the hydraulic kit and the boiler, the kit should be electrically connected first.

Nota **The power supply must be connected so that the kit can be totally isolated and disconnected for safely carrying out any maintenance operations.**

3 OPERATION

The **Bio 2M Underfloor Heating Kit** is equipped with two Heating Modules (two electronic cards) in charge of managing and controlling the 2 circuits built in to the Kit.

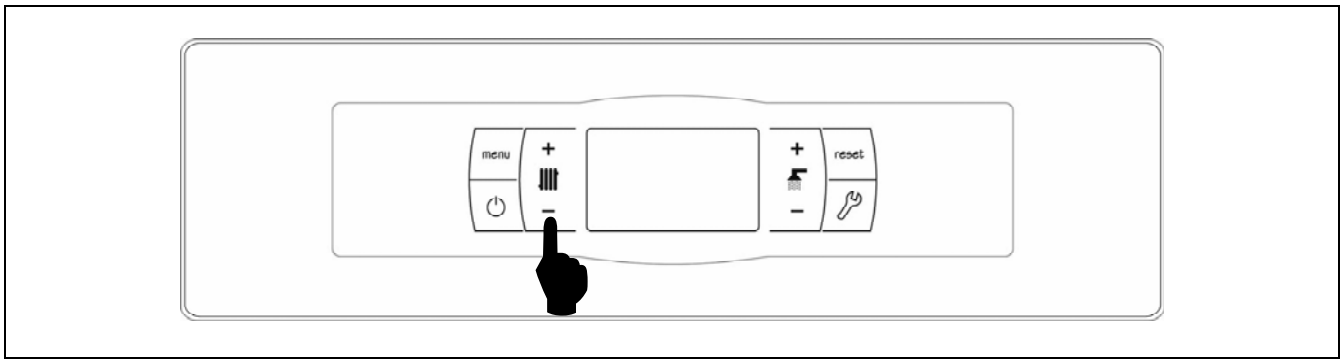
These modules through orders received from the central unit are capable of, through the sensors integrated in the kit, independently regulating 2 heating zones; circuit no. 1, with mixing valve (e.g. underfloor heating); and circuit no. 2 also with a mixing valve (e.g. underfloor heating), regulating the installation according to the needs of the house, measuring outside temperature optionally via the AFS outdoor temperature sensor supplied with the kit.

3.1 Functioning without an outdoor sensor

Operation of mixed circuit no1

The mixed heating circuit no. 1 is a circuit made up of a heating pump (B_{CM1}), a mixing valve (V_{M1}) and a mixed flow temperature sensor (S_{r1}).

The mixed circuit no. 1 will work with the selected setpoint temperature on the boiler control panel and the temperature of the room thermostat, T_{aM1}, connected on the Bio 2M Hydraulic Kit.



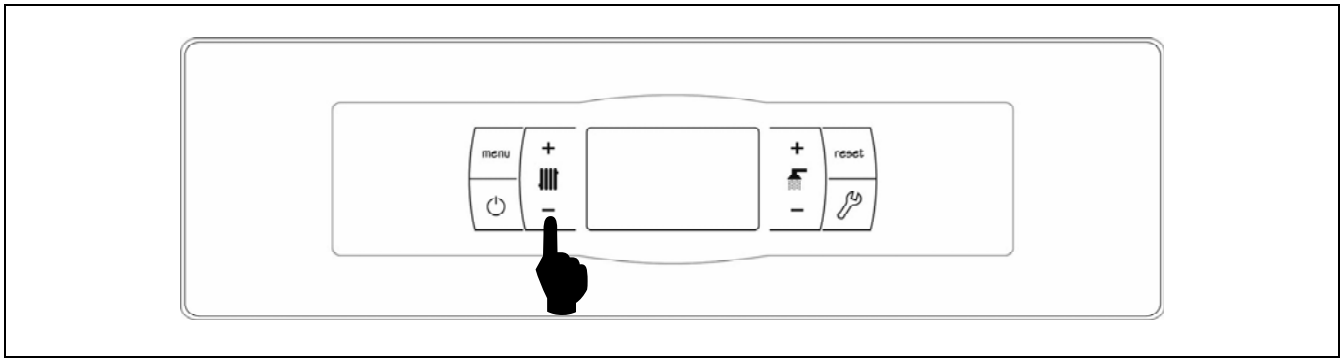
To select the circuit flow temperature, press ***MENU*** to browse until the $_1$ icon appears on the display with the **SET** symbol flashing. The temperature can be changed by pressing the "**+**" and "**—**" Heating symbols.

The permitted flow temperature range for mixed circuit 1 is 10 - 45 ºC.

The value of the boiler setpoint temperature is calculated by adding 20 ºC to the mixed circuit flow setpoint temperature, with a maximum limit of 80 ºC and if the calculated setpoint is lower than 65 ºC, it will be set at 65 ºC.

Operation of mixed circuit no2

The mixed heating circuit no. 2 is a circuit made up of a heating pump (B_{CM2}), a mixing valve (V_{M2}) and a mixed flow temperature sensor (S_{r2}).



To select the circuit flow temperature, press ***MENU*** to browse until the T_2 icon appears on the display with the **SET** symbol flashing. The temperature can be changed by pressing the "**+**" and "**—**" Heating symbols.

The permitted flow temperature range for mixed circuit 2 is 10 - 45 ºC.

The value of the boiler setpoint temperature is calculated by adding 20 ºC to the mixed circuit flow setpoint temperature, with a maximum limit of 80 ºC and if the calculated setpoint is lower than 65 ºC, it will be set at 65 ºC.

Operation of the Bio 2M Kit plus a direct heating circuit

When a pump, external to the Kit, is connected (in output B_C of the boiler) to a heating circuit (circuit no. 3), the direct heating circuit will work with the selected boiler setpoint temperature and the temperature of the room thermostat T_{a1} (that of the boiler).

By pressing "**+**" and "**—**" Heating symbols, you can select the desired boiler operating temperature.

The boiler setpoint temperature can also be selected by pressing ***MENU*** until the icon appears on the display, with the word **SET** flashing. The value of the setting can be changed by pressing the "**+**" and "**—**" Heating symbols.

The permitted boiler setpoint temperature range is 65 - 80 ºC.

Operating with a DHW tank

If the boiler and the **Bio 2M Underfloor Heating Kit** are installed together with a DHW tank, refer to the "*DHW Circuit Settings*" section of the Installation and operating Manual of the BioClass NG boiler.

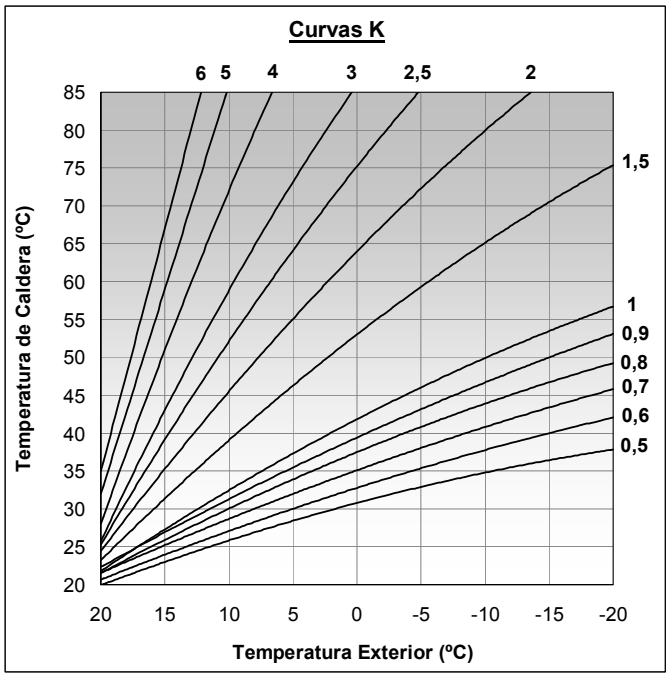
3.2 Functioning with an outdoor sensor

If the Kit is fitted with an outdoor temperature sensor ("Outdoor AFS sensor"), the **Bio 2M underfloor heating Kit** can calculate the heating temperature of heating circuit according to the outside weather conditions at each particular time, with optimum adjustment of the heating installation conditions for improved comfort in the home and energy savings.

To activate its operation according to the outdoor temperature conditions, an outdoor AFS sensor (supplied with the Kit) must be connected and the setting **P.10** from the "*Technical Menu*" of the **BioClass NG** Boiler must be set to ON.

Operation of mixed circuit no1

When this operating mode is activated, the heating flow temperature of circuit no. 1 is determined in accordance with the slope of the K curve (in setting **P.11** of the "*Technical Menu*"). If the installation is correctly dimensioned, the boiler temperature and/or flow temperature calculated will ensure the room temperature is in accordance with the set point programmed.



The K curve relates the external temperature reading on the sensor installed outside the home to the boiler temperature setpoint. The graph shows the temperature ratio for each point on the K curve.

For underfloor heating, we recommend selecting a value for K lower than 0.8 in order to protect the installation from overheating.

If setting **P.11** is set to "OFF", the operation will be deactivated depending on the outdoor sensor for this circuit and a fixed flow temperature can be selected for the circuit.

Operation of mixed circuit no2

When this operating mode is activated, the heating flow temperature of circuit no. 2 is determined in accordance with the slope of the K curve (in setting **P.12** of the "*Technical Menu*"). The graph attached in the description of mixed circuit no 1 shows the temperature ratio for each point on the K curve.

If setting **P.12** is set to "OFF", the operation will be deactivated depending on the outdoor sensor for this circuit and a fixed flow temperature can be selected for the circuit.

When both circuits of the boiler are operating with an outdoor sensor the "+" and "—" Heating symbols will only serve to activate or deactivate the heating service.

Operation of the Bio 2M Kit plus a direct heating circuit

When a pump, external to the Kit, is connected (in output B_C of the boiler) to a heating circuit (circuit no. 3), the direct heating circuit will work with the selected boiler setpoint temperature and

the temperature of the room thermostat T_{a1} (that of the boiler). Regulation according to external conditions is not allowed, unless a LAGO remote control is connected, in which case this will be in charge of managing said regulation (see *Lago FB OT+ Remote Control*).

Operating with a DHW tank

If the boiler and the **Bio 2M Underfloor Heating Kit** are installed together with a DHW tank, refer to the "*DHW Circuit Settings*" section of the Installation and operating Manual of the BioClass NG boiler.

IMPORTANT: **To connect the outdoor sensor carefully follow the connection instructions provided in the *"Connections Diagram"* section.**

4 LAGO FB OT+ REMOTE CONTROL (OPTIONAL)

One or two remote controls (LAGO FB OT+) can optionally be supplied together with the **Bio 2M Underfloor Heating Hydraulic Kit**. These remote controls can be used to fully operate the boiler and the kit from any room in the home in which it is installed. Each LAGO FB OT+ remote control governs the settings of a heating circuit and the installation's domestic hot water production (where applicable).

This remote control allows the hours of home comfort to be programmed for heating circuit, adjusting the installation to the particular requirements of the home by measuring the room temperature and consequently adapting the installation temperature. The remote control can also be used to adjust the DHW and heating setpoint temperatures at any time, and for viewing the different boiler operation settings. It also warns of any functioning anomalies affecting the boiler.

When the outdoor AFS sensor is connected in the boiler, the remote control can adjust the home comfort level according to the weather conditions at each particular time, optimising fuel consumption and heating comfort in the home.

When a LAGO FB OT+ is connected to the **Bio 2M Underfloor Heating Hydraulic Kit**, the different temperatures and settings which can be selected via the remote control cannot be modified through the boiler control. It is easy to install, only requiring 2 wires for communication between the Kit and the LAGO FB OT+ control. Connection to the Kit is performed by connecting the two wires to terminal strip **J13** to control Circuit no 1, to terminal strip **J17** to control Circuit no 2, or to both to control both circuits (see *Connections Diagram*). For correct installation and functioning, carefully read the instructions enclosed with the remote control.

The following sections contain a general explanation of the LAGO FB OT+ remote control's different operating modes and options.

NOTE: Only the supplied "outdoor AFS sensor" can be connected to the Hydraulic Kit. NO other sensor is compatible for reading outdoor temperature.

4.1 Functioning without an outdoor sensor

Installing heating circuit no 1

The maximum temperature for the controlled heating circuit no 1, the scheduled heating times and the desired room temperatures can be selected on the remote control. The LAGO FB OT+ remote control will calculate the boiler temperature required at each particular time, depending on the room temperature, and it will enable or disable the heating mode of the circuits, depending on the scheduled heating times and room temperatures.

Installing heating circuit no 2

The maximum temperature for the controlled heating circuit no 2, the scheduled heating times and the desired room temperatures can be selected on the remote control. The LAGO FB OT+ remote control will calculate the boiler temperature required at each particular time, depending on the room temperature, and it will enable or disable the heating mode of the circuits, depending on the scheduled heating times and room temperatures.

4.2 Functioning with an outdoor sensor

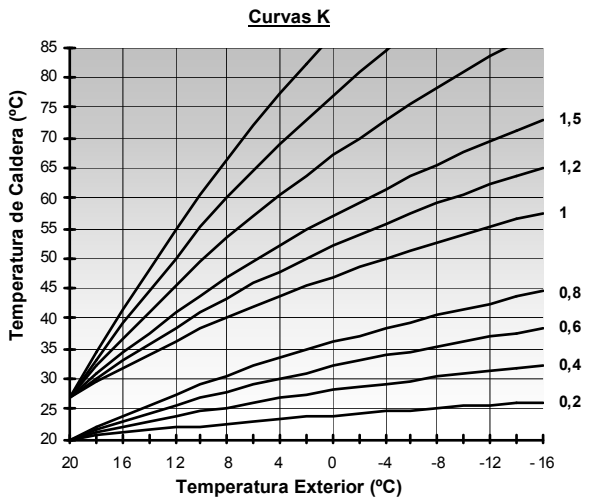
If the Kit is fitted with the outdoor temperature sensor ("Outdoor AFS sensor"), the LAGO FB OT+ control can calculate the heating temperature of heating circuit according to the outside weather conditions at each particular time, with optimum adjustment of the heating installation conditions for improved comfort in the home and energy savings.

The maximum temperature, an operating curve for heating circuit (see instructions enclosed with the LAGO FB OT+ remote control) and the desired heating times and room temperatures can all be selected on the remote control. The LAGO FB OT+ remote control calculates the required boiler temperature at each particular time, depending on the temperature inside the home and the outside weather conditions, in accordance with the operating curve selected (setting 01 of the "User Menu" on the LAGO FB OT+), switching the heating on and off in accordance with the programmed heating times and the room temperatures.

Depending on the type of heating circuit, the following adjustments should be made:

Installing low temperature heating (mixed circuit)

In setting 01 of the LAGO FB OT+ "User Menu", select a curve of less than 0.8. We also recommend selecting a maximum flow temperature NO HIGHER THAN 85ºC, to protect the underfloor heating installation from overheating. To do this, select the maximum flow temperature of heating circuit 1 in setting 07 of the LAGO FB OT+ "Service Menu".



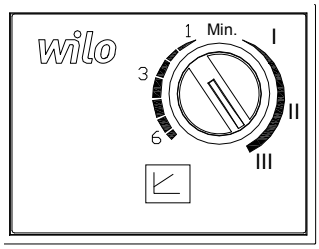
4.3 DHW service function

When the remote control is connected to the **Bio 2M Underfloor Heating Kit**, the desired DHW temperature and the desired hours for DHW use can be selected on the LAGO FB OT+ remote control (if there is a DHW circuit). The LAGO FB OT+ remote control regulates the DHW tank temperature at each particular time, and enables or disables the DHW function according to the times scheduled.

5 CIRCULATION PUMPS

The **2M Underfloor Heating Hydraulic Kit** pumps are high efficiency circulation pumps which allow savings of up to 70 % in energetic consumption in comparison to conventional pumps.

5.1 Characteristic curves of the pumps.



The pump (Yonos For 15/6 RKC) can be adjusted in two ways:

1-Constant speed I, II, III (traditional mode):

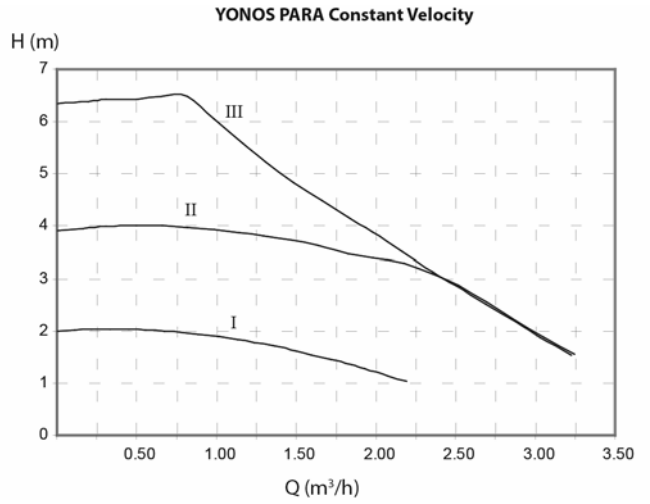
The pump operates at a constant, pre-set speed.

2-Variable differential pressure (Δp-v):

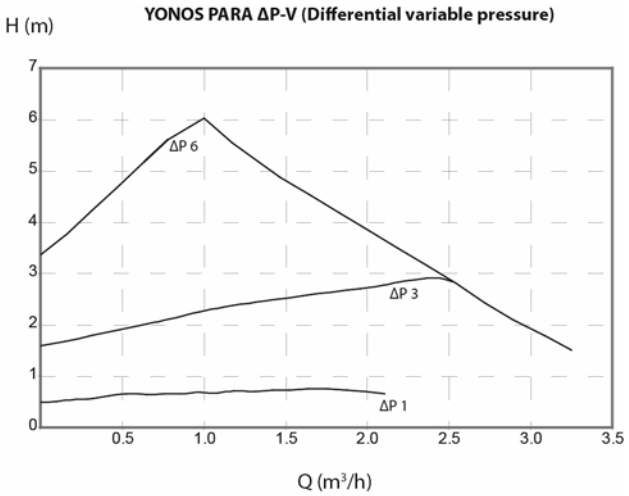
The setpoint value of the differential pressure H increases in a straight line between ½H and H within the permitted flow margin. The differential pressure generated by the pump is adjusted to the appropriate setpoint value of differential pressure.

The graphs below show the operating curves for the pump integrated in the kit. These graphs show the curves, corresponding to the different options of the circulating pump.

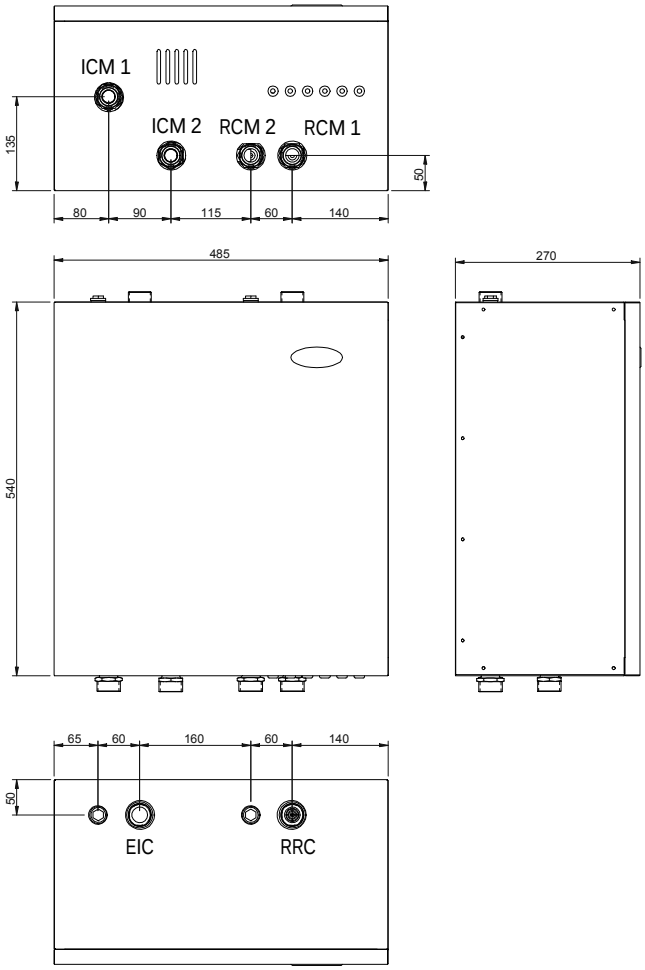
Characteristic curve of the circulation pump for the constant speed mode I, II, III:



Characteristic curve of the circulation pump for the variable differential pressure mode:

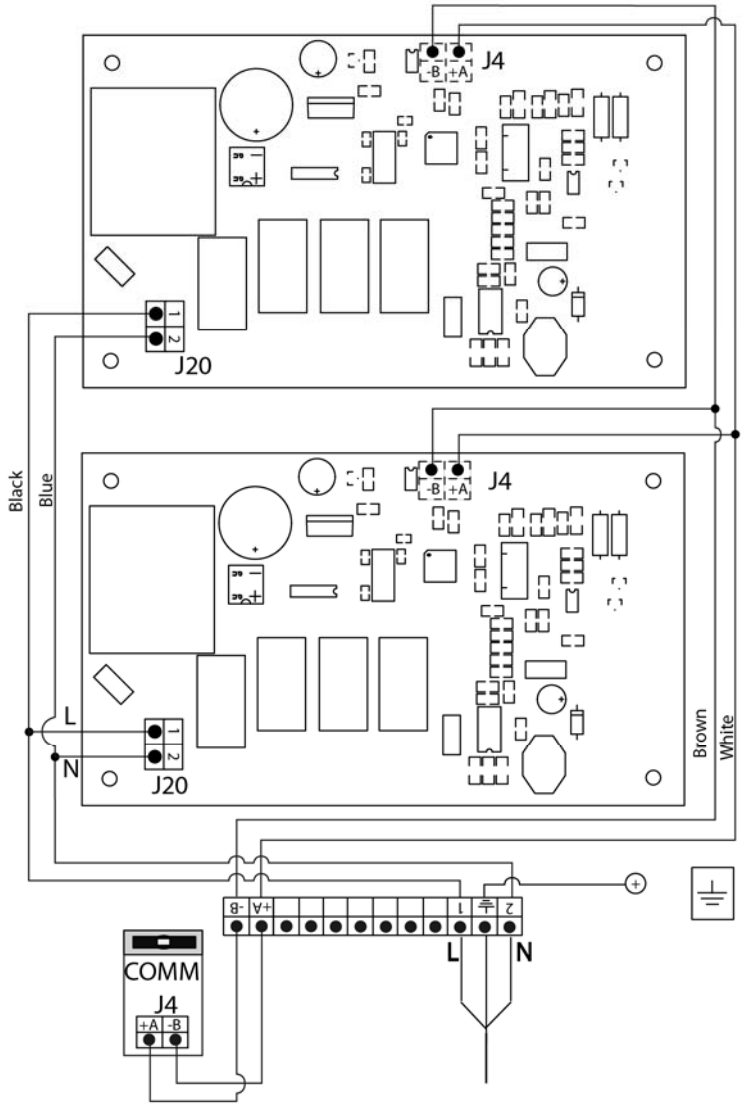


6 DIAGRAMS AND MEASUREMENTS



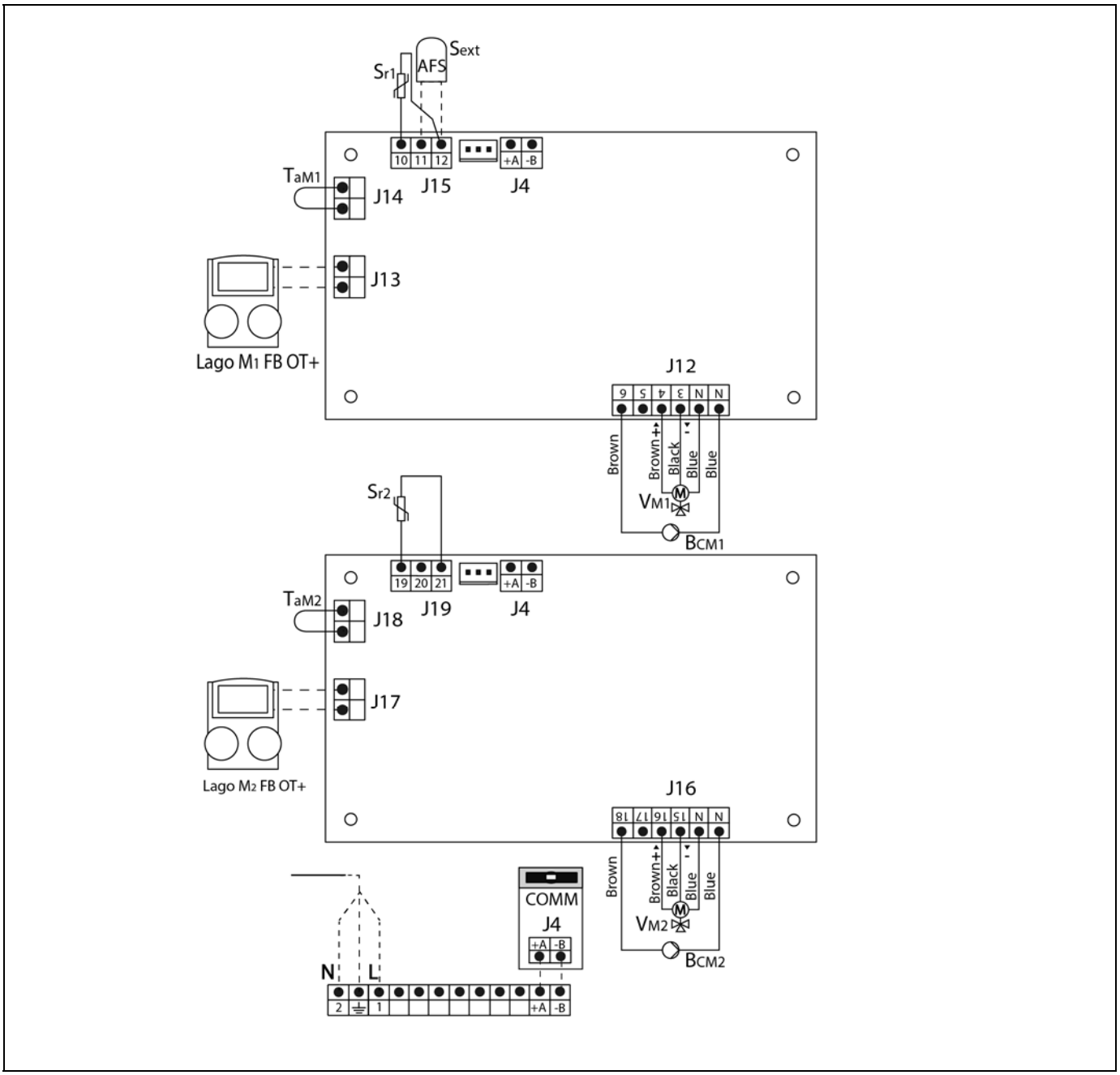
ICM 1: Mixed circuit no 1 Heating flow (1" M).
ICM 2: Mixed circuit no 2 Heating flow (1" M).
RCM 1: Mixed circuit 1 Heating return (1" M).
RCM 2: Mixed circuit 2 Heating return (1" M).
EIC: Inlet from Boiler Flow (1" M).
RRC: Return from Boiler Return (1" M).

7 ELECTRICAL DIAGRAM



L:	Line.
N:	Neutral.
COMM:	Communication to boiler connection.
J4:	Communication connector.
J20:	Supply connector.

8 CONNECTIONS DIAGRAM



L: Line.
N: Neutral.
V_{M1}: Mixing valve no 1.
V_{M2}: Mixing valve no 2.
B_{CM1}: Mixed circuit pump no1.
B_{CM2}: Mixed circuit pump no2.
T_{aM1} : Room thermostat no 1.
T_{aM2} : Room thermostat no 2.
S_{r1}: Mixed circuit no 1 sensor.
S_{r2}: Mixed circuit no2 sensor.
S_{ext}: AFS sensor.

COMM: Communication to boiler connection.
J4: Communication connector.
J11: Supply connector.
J12: Component connector.
J13: Remote control connector.
J14: Room thermostat no 1 connector.
J15: Sensor connector.
J16: Component connector.
J17: Remote control connector.
J18: Room thermostat no 2 connector.
J19: Sensor connector.

9 ALARM CODES

9.1 Alarms displayed on the boiler control panel

The **BioClass NG** boiler has an electronic control able to detect any malfunctioning in the Hydraulic Kit. When the electronic control detects an operating error, this is indicated by an alarm code on the display. The table below shows a list of the alarm codes that may appear:

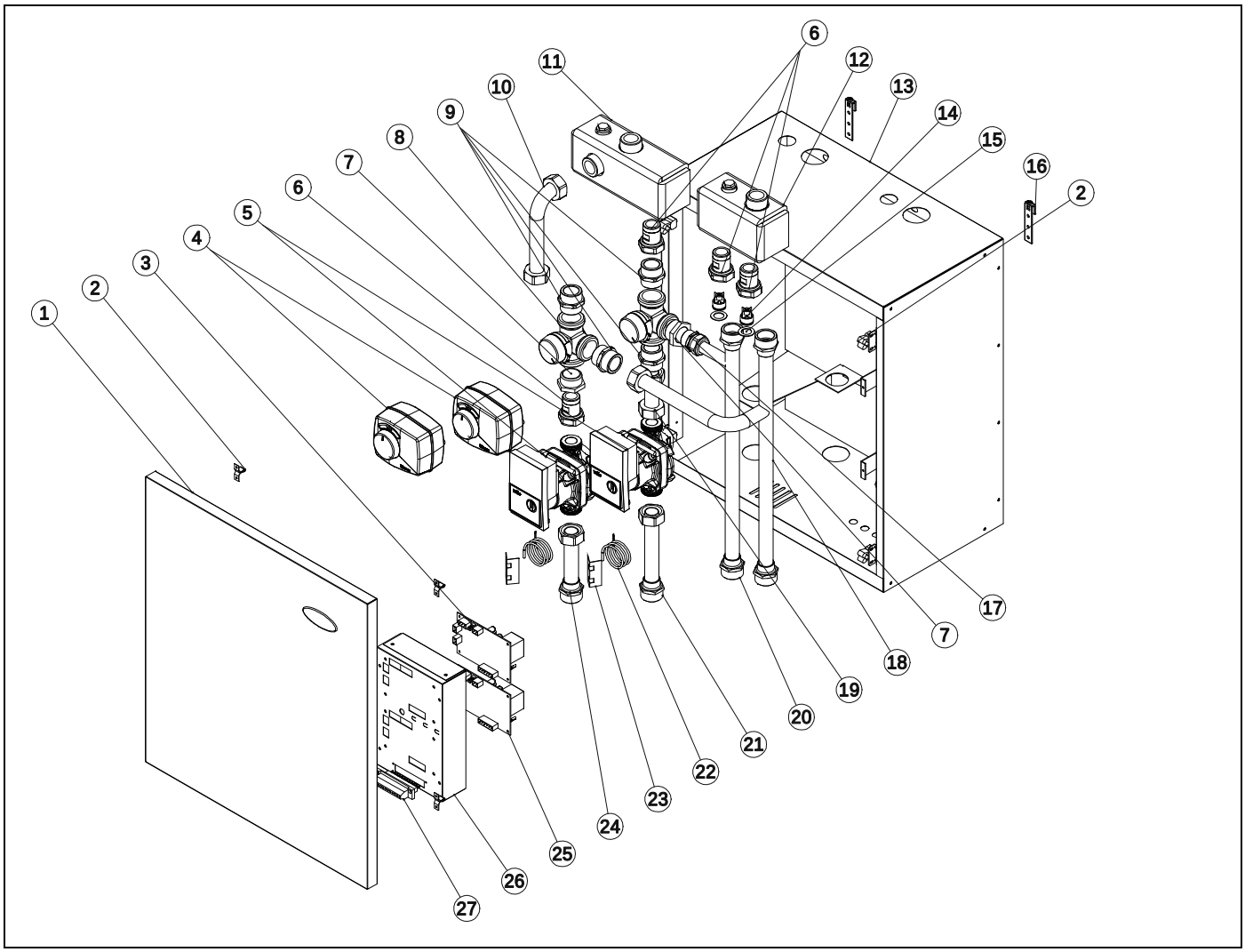
CODE	CAUSE	DESCRIPTION
E-30	Flow sensor S_{r1} open circuit.	The flow tank S_{r1} is broken or disconnected. Contact your nearest official technical assistance service to have it replaced.
E-31	Flow sensor S_{r1} short circuited.	
E-32	Flow sensor S_{r2} open circuit.	The flow tank S_{r2} is broken or disconnected. Contact your nearest official technical assistance service to have it replaced.
E-33	Flow sensor S_{r3} short circuited.	
E-34	Outdoor sensor S_{ext} open circuit.	The outdoor sensor S_{ext} is broken or disconnected. Contact your nearest official technical assistance service to have it replaced.
E-35	Outdoor sensor S_{ext} short circuited.	
E-37	Communication failure with heating module.	Communication failure between the Hydraulic Kit card and the pump supply card. If this alarm occurs repeatedly, you should contact the nearest official technical assistance service

9.2 Circulation pump alarms

The high efficiency pumps of the **Bio 2M Underfloor Heating Kit** include a Led (light) which displays their status.

PUMP LIGHT	DESCRIPTION	STATUS	CAUSE	SOLUTION
It is lit green	The pump is functioning	The pump operates according to its setting	Standard functioning	
It flashes red/green	The pump is ready for service but is not functioning	The pump will start up again automatically once the error has been solved	1. Low voltage U<160 V or Excess voltage U>253 V	1. Check the power supply 195 V<U<253 V
			2. Excess temperature of the module: the temperature of the motor is too high	2. Check the room temperature and that of the fluid
Flashes red	The pump is out of order	The pump is stopped (blocked)	The pump does not start up automatically.	Change the pump. Please contact your nearest official technical assistance service to have it replaced.
Light off	There is no power supply	The electrical system is not receiving power supply	1. The pump is not connected to the power supply	1. Check the connection of the cable
			2. The LED is faulty	2. Check if the pump works
			3. The electrical system is faulty	3. Change the Pump. Change the pump. Please contact your nearest official technical assistance service to have it replaced.

10 SPARE PARTS LIST



Nº	Code	Descriptiom
1	SEPO001754	Door
2	CFER000045	Closure
3	REBI137XXX	Electronic card
4	CFOV000023	Motor
5	CFOV000143	Pump
6	122-P	Brass fittings pump
7	CFOL000016	Reducing hex. Bush 3/4x1
8	CVAL000015	Three way valve 1”
9	CFOL000007	Hexagonal nipple 1”
10	SCOB012629	Mixed outlet
11	RKITBIO012	Manifold outlet
12	RKITBIO011	Manifold return
13	RKITBIO005	Case
14	CVAL000006	Non return valve ¾”

Nº	Code	Descriptiom
15	CTOR000053	Nylon washer
16	CFER000041	Hanger
17	CFOV000047	Telescopic stud union ¾
18	SCOB012633	Mixed return
19	SCOB012631	Mixed return
20	SCOB012632	Mixed return
21	SCOB012628	Direct outlet
22	CELC000234	Sensor
23	SCHA006943	Fastening bulb
24	SCOB012630	Mixed outlet
25	REBI237XXX	Electronic card
26	SCHA009580	Rear electrical board cover
27	CELC000042	Weidmuller strip 12 poles

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