



LYRA B/R



**INSTALLATION,
USE AND MAINTENANCE**



IST 04 C 180 - 01

Dear Customer,
thank you for choosing our boilers. Please read these installation, use and maintenance instructions with care.

General information for installers, service engineers and users

This INSTRUCTION MANUAL, which is an integral and indispensable part of the product, must be handed over to the user by the installer and must be kept in a safe place for future reference. The manual must accompany the boiler should it be sold or moved.

This boiler must be used for the purpose for which it has been designed. Any other use is considered incorrect and therefore dangerous.

The boiler must be installed in compliance with applicable laws and standards and according to the manufacturer's instructions given in this manual. Incorrect installation may cause injury or damage to people, animal, or properties, for which the manufacturer shall not be held liable.

Damage or injury caused by incorrect installation or use or failure to observe the enclosed instructions shall relieve the manufacturer of all liabilities whether under a contract or not.

Before installing the boiler, check that its specifications meet the requirements of the system in which it is to be installed.

Check that the boiler is intact and that it has not been damaged during transport and handling. Do not install equipment which is clearly damaged or faulty.

Do not obstruct the air intake and / or flue gas exhausting grates.

Only original accessories must be used for all boilers supplied with options or kits (including electrical ones).

All the packaging materials can be recycled and should be sent to specific waste management sites.

Keep the packaging out of the reach of children as it constitutes a serious hazard.

In the event of a malfunction, switch off the boiler immediately. Do not attempt to make any repairs and contact a qualified technician.

Original parts must be used for all repairs to the boiler.

Failure to do this may jeopardize the safety of the boiler and create a serious hazard to people, animal, or properties.

It is necessary to service the boiler periodically, according to the schedule indicated in the applicable section of this manual.

Correct maintenance allows for efficient and correct functioning of the equipment, granting the better working conditions, optimizing performance and safety for people, animals, things and environment.

When the boiler is not used for a prolonged period, switch off the electricity and fuel supply (Warning! The electronic anti-freeze function will not operate). Place some calcium carbonate inside the heat exchanger to absorb moisture.

Should there be a risk of freezing, add anti-freeze. It is not advisable to empty the system as this may result in damaging the system. Use a specific anti-freeze for multi-metal heating systems.

WARNING

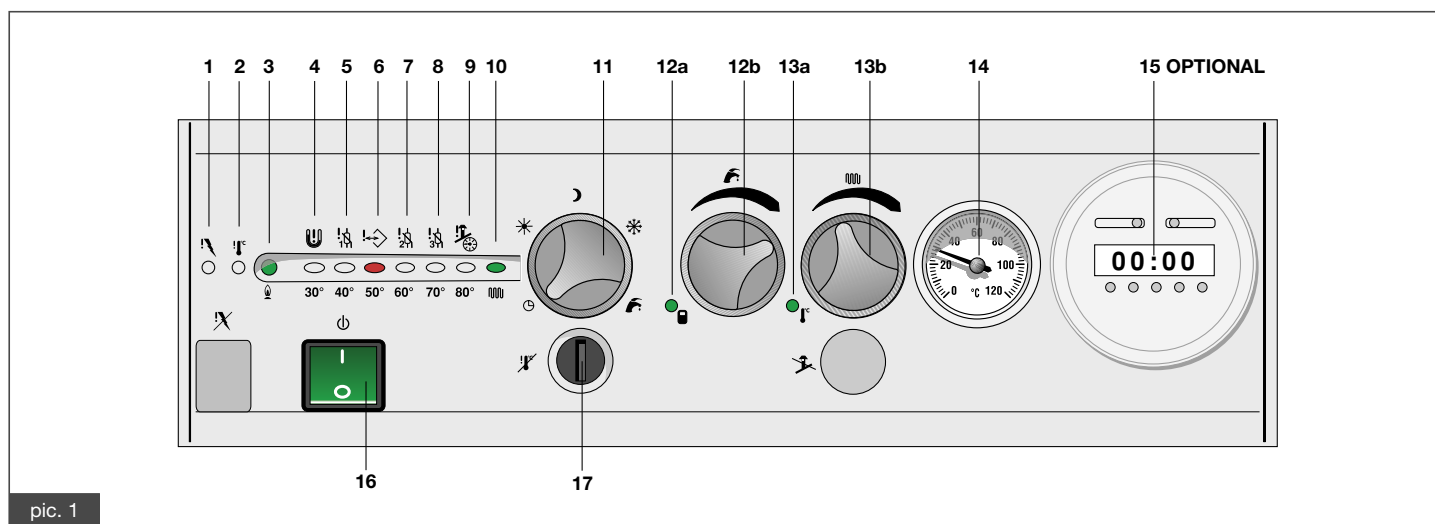
The boiler has been designed for installation only in the country indicated on the rating plate: installation in any other country may cause injury or damage to people, animals and/or properties.

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1. INSTRUCTIONS FOR THE USER

1.1. Control panel



pic. 1

1. Signal light (red): when the light is ON the burner was shutdown due to lack of flame.

Resume heating unit operation by pressing the burner reset button (pic.4).

2. Signal light (red): the red led shows activation of the safety thermostat. The burner is turned OFF. The heating unit will resume operation once the safety thermostat reset button 17 is pressed (remove the protective cap to access the button).

3. Signal light (green): the green led is ON and fixed when power is supplied to the burner (regardless of flame presence).

4. Signal light (red): the led is ON and fixed when the temperature of the heating water is between 25° and 35°C. When the led is flashing the pressure switch has detected low water pressure in the system. The heating unit and the pumps are turned OFF. As soon as correct water pressure is restored, the pressure switch will give the ok for operation, the led will turn OFF and the heating unit will switch ON again.

5. Signal light (red): the led is ON and fixed when the temperature of the heating water is between 36° and 45°C. When the led is flashing the temperature probe 1 (flow) is faulty (interrupted or out of range). The burner is turned OFF while the pumps keep running. As soon as the faulty probe is replaced, the led will turn OFF and the heating unit will resume normal operation. When signal lights 4 and 5 flash simultaneously, the external probe (standard in BV and RV models) is faulty or disconnected. As soon as the probe malfunction is solved the lights will turn OFF.

6. Signal light (red): the led is ON and fixed when the temperature of the heating water is between 46° and 55°C. When the led is flashing it indicates the connection between the "OPEN THERM" remote control (option) and heating unit is interrupted or malfunctioning. As soon as correct connection is restored, the led will turn OFF and the heating unit will resume normal operation.

7. Signal light (red): the led is ON and fixed when the temperature of the heating water is between 56° and 65°C. When the led is flashing (B and BV models only) the temperature probe 2 (cylinder) is faulty (interrupted or out of range). The heating unit keeps operating in CH mode (DHW supply is halted). As soon as the faulty probe is replaced the heating unit will resume normal operation.

8. Signal light (red): the led is ON and fixed when the temperature of the heating water is between 66° and 75°C.

9. Signal light (red): the led is ON and fixed when the temperature of the heating water is between 76° and 85°C. When the led is flashing the temperature has exceeded 85°C.

10. Signal light (green): the green led is ON and fixed when the heating unit is operating in central heating mode.

11. Heating unit mode knob: the knob allows for choosing the desired heating unit operating mode (refer to paragraphs from 1.2.2 to 1.2.2.3).

12a. Cylinder operation light: when the led is ON the cylinder is operating, vice-versa when the led is OFF.

12b. DHW supply adjusting knob: The knob manages DHW mode of the heating unit (R and RV models, only when connected to an optional external cylinder). Refer to paragraphs from 1.2.2 to 1.2.2.3.

13a. EXCHANGER TEMPERATURE HOLDING light: the led is ON when the function is activated and vice-versa.

13b. CH temperature adjusting knob: the knob allows for management of CH water temperature (refer to paragraphs from 1.2.2 to 1.2.2.3).

14. Water pressure gauge: the gauge shows water pressure in the CH system.

15. Digital programmable timer (standard on BV and RV models, optional for R and B models): the timer allows for management of operation periods of the heating unit in CH and DHW modes (refer to paragraphs from 1.2.2 to 1.2.4).

16. ON/OFF button: when the button is positioned to I, power is supplied to the heating unit and the button light is ON; when the button is positioned to O, power is not supplied to the heating unit and the button light is OFF.

17. Reset button: press the button to resume heating unit operation when the safety thermostat has shut it down (remove the plastic cap to access the button). Prior to resume operation, allow the heating unit to cool down below 70°C.

1.2. How the heating unit operates

1.2.1. Start-up

- Turn on the fuel tap;
- turn the power switch external to the heating unit to ON;
- turn the heating unit main switch 16 (pic.1) to ON (the switch lights up);
- select the heating unit operating mode through knobs 11, 12 and 13, and the programmable timer when installed (refer to 1.2.2 paragraphs from 1.2.2 to 1.2.3);
- set desired room temperature through the room thermostat (when available);
- when the system requires heat, CH request led 10 (pic.1) comes on;
- when the burner is ON, led 3 is on (the light turns on when electric power is supplied to the burner, and it does not necessarily indicates that a flame is present).

N.B.

On models 23 and 33 the burner is equipped with an oil pre-heating device (always active). Therefore a waiting time of up to three minute might be necessary prior to actual flame presence, depending on the temperature of the oil.

In B and BV models and R and RV models equipped with external cylinder (optional equipment), the DHW supply and temperature maintenance function has always priority over CH function

1.2.2. Operation

Heating units are divided into two main families:


- a) heating unit serving an high temperature CH zone + DHW supply (B and R* models);
- b) heating unit serving a mixed water CH zone, an high temperature CH zone + DHW supply (BV and RV* models)

1.2.2.1. Management of a heating unit serving an high temperature CH zone + DHW supply (B and R models)

(*) In R and RV models, DHW supply and related functions are operated only when an external cylinder is connected (optional equipment), for which the ANTI-LEGIONELLA function is not active.

Set button 16 to position I: power is supplied to the heating unit and the button light is ON.

Knob 11 is to select the heating unit operation mode. In detail:

 **"timer"** position (to be used when programmable timer 15 is installed).

All functions are active: (CH, DHW (*), ANTI-FROST, PUMP ANTI-LOCKING, ANTI-LEGIONELLA).

In this position the heating unit operates following the programs of the two channel programmable timer 15. The user manages CH through channel 1 (see CENTRAL HEATING); The user manages DHW supply through channel 2 (see DOMESTIC HOT WATER);

- CHANNEL 1 without external probe

When the contact is OFF, CH is OFF. When the contact is ON, CH is managed through the room thermostat.

- CHANNEL 1 with external probe

See 1.2.2.3 "SLIDING TEMPERATURE" paragraph operation.

- CHANNEL 2

When the contact is OFF, DHW production is not active, DHW is supplied at domestic cold water network temperature. When the contact is ON, the cylinder is kept to the temperature set by knob 12b (B and BV models), or through the adjustable thermo-

stat on the cylinder. Temperature range is 35°C – 65° C in B and BV models, in R and RV models it is depending on the type of cylinder (optional equipment).

The programmable timer 15 allows for setting of up to 8 ON daily programs and 8 OFF daily programs.

Detailed programmable timer setting procedure is available in 1.2.3 paragraph.

N.B.

When neither the programmable timer nor the external probe are installed, the position manages the "Summer" function (see below).

When the programmable timer is not available, and the external probe is installed, the position manages the "night" function (see below).




"Comfort" position.

All functions are active: (CH, DHW (*), ANTI-FROST, PUMP ANTI-LOCKING, ANTI-LEGIONELLA).

Channel 1 of the programmable timer (when available) is considered always ON regardless of the set program, therefore CH function is managed by the room thermostat or thermoregulation control unit (when they are available).

Detailed information about **"Comfort"** position with external probe are available in 1.2.2.2 paragraph "Management of a heating unit serving an high temperature CH zone + DHW supply (B and R models)" and 1.2.2.3 paragraph "SLIDING TEMPERATURE" operation.

DHW (*) function is managed through knob 12b, by the adjustable thermostat on the cylinder (R and RV models), and by channel 2 of the programmable timer (see above described "timer" position ).




"Night" position.

When the external probe is not installed, the position manages the "Summer" function (see below).

The "Night" position is active when an external probe is installed (see 1.2.2.2 paragraph "Management of a heating unit serving an high temperature CH zone + DHW supply (B and R models) and 1.2.2.3 paragraph "SLIDING TEMPERATURE" operation.

CH function is not active. DHW (*), ANTI-FROST, PUMP ANTI-LOCKING, ANTI-LEGIONELLA functions are active.

Channel 1 of the programmable timer (when available) is considered always OFF regardless of the set program, therefore CH mode is always off in spite of a CH request from the room thermostat or thermoregulation control unit (when they are available).

DHW(*) is set by knob **12b** (B and BV models), or via the adjustable thermostat on the cylinder, and by channel 2 of the programmable timer (see above information about "programmable timer" ).



"Anti-frost" position.

Active functions are: ANTI-FROST, PUMP ANTI-LOCKING, ANTI-LEGIONELLA. The thermal unit is in stand-by mode.

CH flow anti-frost: when the probe detects a temperature below 5°C, the heating unit is turned on until CH flow temperature reaches 50°C or 15 minutes have elapsed.

DHW flow anti-frost (active in B and BV models only): when the cylinder probe detects a temperature below 5°C, the heating unit is turned on until the cylinder water temperature reaches 10°C or 15 minutes have elapsed.

 **“Summer”** position.

CH function is not active. DHW (*), ANTI-FROST, PUMP ANTI-BLOCKING, ANTI-LEGIONELLA functions are active.

CH requests are not satisfied.

Knob **12b**, and the adjustable thermostat on the cylinder, when available (R and RV models) manage DHW production (*) (see DOMESTIC HOT WATER (*)).

CENTRAL HEATING


CH management board adjusts CH water temperature between 50°C and 90°C depending on the user setting of knob **13b** (pic.1). CH mode is activated when it is requested by channel 1 (ON) of the programmable timer (when available) and at the same time the contacts of the room thermostat (when available) are closed; such request terminates when one of the two contacts opens or DHW supply is needed.


Furthermore, when a room thermostat is available, the user can set a fictitious room temperature by acting on knob 13b (see 1.2.2.3 paragraph “SLIDING TEMPERATURE” operation).

EXCHANGER TEMPERATURE HOLDING


The function is active in R and RV models, only when connected to an external cylinder (optional equipment).

Knob **13b**, in addition to setting flow temperature, allows for EXCHANGER TEMPERATURE HOLDING activation.

When the EXCHANGER TEMPERATURE HOLDING function is ON (led **13a**  is off), the heat exchanger, when CH or DHW are not requested, is kept at 50°C in order to expedite DHW production.

When the EXCHANGER TEMPERATURE HOLDING function is OFF (led **13a**  is off), the heat exchanger, when CH or DHW are not requested, is left to cool down.

Follow the instructions below in order to activate/deactivate the EXCHANGER TEMPERATURE HOLDING function:

- fully turn **13b** knob counter-clockwise;
- wait 2 seconds for led **13a**  to change from ON to OFF or vice-versa, indicating the chosen function (see above);
- now fully turn **13b** knob clockwise in order to set flow water temperature.

N.B.

The EXCHANGER TEMPERATURE HOLDING function is activated regardless of selector 11 position.

The EXCHANGER TEMPERATURE HOLDING function, even when activated, is not turned on when the cylinder is deactivated (via the adjusting knob 12b or the programmable timer, when available).



Should DHW be frequently requested, the manufacturer recommends the EXCHANGER TEMPERATURE HOLDING function to be deactivated, and the cylinder always ON.

DOMESTIC HOT WATER

The function is active in R and RV models, only when connected to an external cylinder (optional equipment).

DHW supply has priority over every other function. The user can adjust DHW parameters through knob **12b**, the adjustable thermostat on the cylinder (R and RV models), and channel 2 of the programmable timer **15** when available. DHW temperature adjusting range is from 35°C to 65°C for B and BV models, in R and RV models it is depending on the connected cylinder /optional equipment).

Specifically, by acting on knob **12b**, it is possible to activate/deactivate the cylinder:



- led **12a**  indicates the boiler is active. The unit heats the cylinder up to the temperature set via knob 12b (B and BV models) or via the adjustable thermostat on the cylinder when a cylinder was installed (R and RV models) and allows for available DHW from the cylinder upon request.
- When led **12a**  is OFF, it indicates the cylinder is not active.

The function allows not to heat up the cylinder during period it is not necessary, and save fuel. Should DHW be requested, it will be supplied at domestic cold water network temperature.

In order to activate or deactivate the cylinder, proceed as follows:

- fully turn **12b** knob counter-clockwise;
- wait 2 seconds for led 12a to change from ON to OFF or vice-versa, indicating the desired function
- now fully turn **12b** knob clockwise (B and BV models) or the adjustable thermostat on the cylinder (R and RV model) in order to set DHW temperature.

N.B.

When a programmable timer is installed on the heating unit, the cylinder is heated only in the periods which are programmed ON via channel 2 (see 1.2.3 paragraph for programmable timer setting) and the “cylinder active” function is ON (led 12a  is ON). When the boiler is deactivated (led 12a  is OFF), the cylinder is not heated up, regardless of the programmable timer setting.

ANTI-FROST

Anti-frost function is active in any position of the selecting knob 11:

- when the flow temperature goes below 5°C, the control board ignites the burner and CH pump until flow reaches 50°C, or, when 50°C are not reached, for 15 minutes;
- in B and BV models, when cylinder water temperature goes below 5°C, the control board ignites the burner and DHW pump until water temperature reaches 10°C, or, when 10°C are not reached, for 15 minutes. CH flow in this instance is brought to 50°C.

PUMP ANTI-BLOCKING

In case CH or DHW are not required, every 24 hours, CH and DHW pumps are activated for 180 seconds in order to avoid blockage.

ANTI-LEGIONELLA

The function is available in B and BV models only.

Every 15 days the anti-Legionella function is activated; it consists in heating the cylinder water up to 65°C for 30 minutes, in order to prevent or eliminate possible bacteria in the cylinder

EXCESSIVE HEAT MANAGEMENT

When flow temperature exceeds 91°C, the pumps are turned on to avoid exchanger overheating. In detail:

- In R and RV models excessive heat management acts on CH circuit, and its pump stays on until water temperature goes below 90°C. Then the pump runs for three additional minutes and turns off;
- In R and RV models equipped with cylinder, and in B and BV models:
 - a) should the heating unit be in post-circulation mode, CH circuit excessive heat is managed by operating the CH pump until water temperature goes below 90°C. After that the pump runs for three additional minutes and turns off;
 - b) should the heating unit not be in post-circulation mode, excessive heat is managed through the cylinder by operating the DHW pump until water temperature goes below 90°C. After that the pump runs for three additional minutes and turns off;

POST-CIRCULATION

Once CH, DHW or anti-frost operation is over, the burner, when ON, is turned OFF, while the pump (CH or DHW pump depending on the previously operated function) keeps running for a period equal to the post-circulation function.

Any subsequent CH, DHW, or anti-frost request has priority over post-circulation and therefore halts it.

Post-circulation when exchanger heat holding function is not active:

| | |
|---|-------|
| CH post-circulation, anti-frost (active pump: CH) | 180 s |
| DHW post-circulation, anti-frost (active pump: DHW) | 30 s |

Post-circulation when exchanger heat holding function is active:

| | |
|---|-------|
| CH post-circulation, anti-frost, DHW (active pump: DHW) | 180 s |
|---|-------|

1.2.2.2. Management of a heating unit serving a mixed water CH zone + DHW supply (BV and RV models)

(*) In R and RV models, DHW supply and related functions are operated only when an external cylinder is connected (optional equipment).

The indication of operation, malfunction diagnostic, DHW (*), EXCHANGER HEAT HOLDING, ANTI-FROST, PUMP ANTI-BLOCKING, ANTI-LEGIONELLA, and OVER HEAT MANAGEMENT modes are the same as in B and R models (see 1.2.2.1 paragraph above); operation of CH functions is different.

Below are described the variations from units without mixed water zone management (B and R models); refer to 1.2.2.1 paragraph for other functions.

Set button **16** to position I: power is supplied to the heating unit and the button light is ON.

Knob **11** is to select the heating unit operation mode. In detail:

⌚ **“timer”** position (to be used when programmable timer **15** is installed).

All functions are active: (CH, DHW (*), ANTI-FROST, PUMP ANTI-LOCKING, ANTI-LEGIONELLA).

In this position the heating unit operates following the programs of the two channel programmable timer **15**. The user manages CH through channel 1 (see CENTRAL HEATING); The user manages DHW (*) supply through channel 2 (see DOMESTIC HOT WATER);

- CHANNEL 1 with external probe

Channel 1 ON: flow temperature (high and low temperature) is adjusted in order to achieve COMFORT room temperature set by knob **13b**.

Channel 1 OFF: flow temperature (high and low temperature) is adjusted in order to achieve NIGHT room temperature.

(NIGHT room temperature = COMFORT room temperature – 4°C; when CM4 jumper is positioned to OFF – see electric diagram;

NIGHT room temperature = COMFORT room temperature – 2°C; when CM4 jumper is positioned to ON).

Room thermostats turn ON or OFF the relevant zone pumps and when all room thermostats are OFF, CH requests are terminated.

- CHANNEL 2

As described in 1.2.2.1 paragraph.

The programmable timer **15** allows for setting of up to 8 ON daily programs and 8 OFF daily programs.

Detailed programmable timer setting procedure is available in 1.2.3 paragraph.

☼ **“Comfort”** position.

All functions are active: (CH, DHW (*), ANTI-FROST, PUMP ANTI-LOCKING, ANTI-LEGIONELLA).

Channel 1 of the programmable timer is considered always ON regardless of the set program, therefore CH function is managed by the room thermostat or thermoregulation control unit (when they are available), ignoring timer programmed settings.

Flow temperature is not managed by the user through knob **13b**, it manages the fictitious temperature to COMFORT (see 1.2.2.3 paragraph “SLIDING TEMPERATURE” operation).

Room thermostats turn ON or OFF the relevant zone pumps, and when all thermostats are OFF, CH requests are terminated.

DHW (*) function is managed through knob **12b** (B and BV models), by the adjustable thermostat on the cylinder (R and RV models), and by channel 2 of the programmable timer (see above information about **“programmable timer”**).

☾ **“Night”** position.

CH, DHW (*), ANTI-FROST, PUMP ANTI-LOCKING, ANTI-LEGIONELLA functions are active.

Channel 1 of the programmable timer is considered always OFF regardless of the set program.

Flow temperature is not managed by the user through knob **13b**, it manages the fictitious room temperature to NIGHT (see 1.2.2.3 paragraph).

-NIGHT room temperature = COMFORT room temperature – 4°C; when CM4 jumper is positioned to OFF – see electric diagram; NIGHT room temperature = COMFORT room temperature – 2°C; when CM4 jumper is positioned to ON).

See 1.2.2.3 paragraph “SLIDING TEMPERATURE” operation.

Room thermostats turn ON or OFF the relevant zone pumps, and when all thermostats are OFF, CH requests are terminated.

DHW(*) is set by knob **12b** (B and BV models), or via the adjustable thermostat on the cylinder (R and RV models), and by channel 2 of the programmable timer (see above information about **“programmable timer”** ⌚).

1.2.2.3. “SLIDING TEMPERATURE” operation

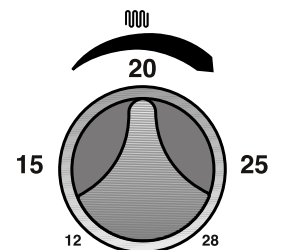
When an external probe is connected (standard equipment in BV and RV models), the heating unit manages the high temperature zone flow (e.g. temperature of the radiators), and the low temperature flow (e.g. floor heating), in relation to:

- outdoor temperature (as observed by the external probe)

- desired room temperature, which can be set via knob 13b (fictitious room temperature). Temperature range goes from 12°C to 28°C:

When knob 13b is fully rotated counter-clockwise, the fictitious room temperature is 12°C, when knob 13b is set to 9:00 it is 15°C, when knob 13b is set to 12:00 it is 20°C, when knob 13b is set to 3:00 it is 25°C, and when knob 13b is fully rotated clockwise it is 28°C.

For best setting of the curves, it is advisable the position “20”.



NOTE TO THE FITTER

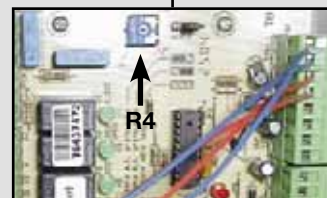
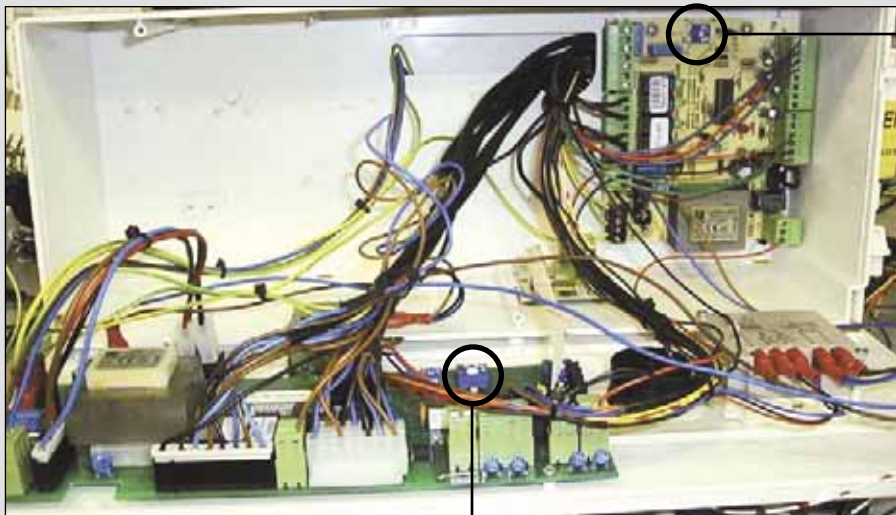
The fictitious room temperature, set by the user through knob **13b**, is more precise when the SLIDING TEMPERATURE curves are set correctly.

Such curves are to be set by the fitter by programming:

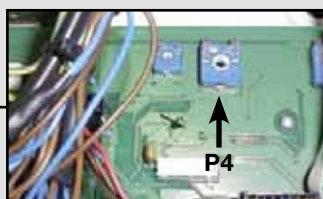
- the curve coefficient for high temperature, set through **P4** potentiometer on the thermal unit electronic board (code **0CIRCSTA05** in the electric diagram). It is advisable to set the potentiometer between 1 and 1,5.

- the curve coefficient for low temperature, set through **R4** potentiometer on the zone electronic board (code **0CIRCSTA06** in the electric diagram). It is advisable to set the potentiometer between 3 and 4.

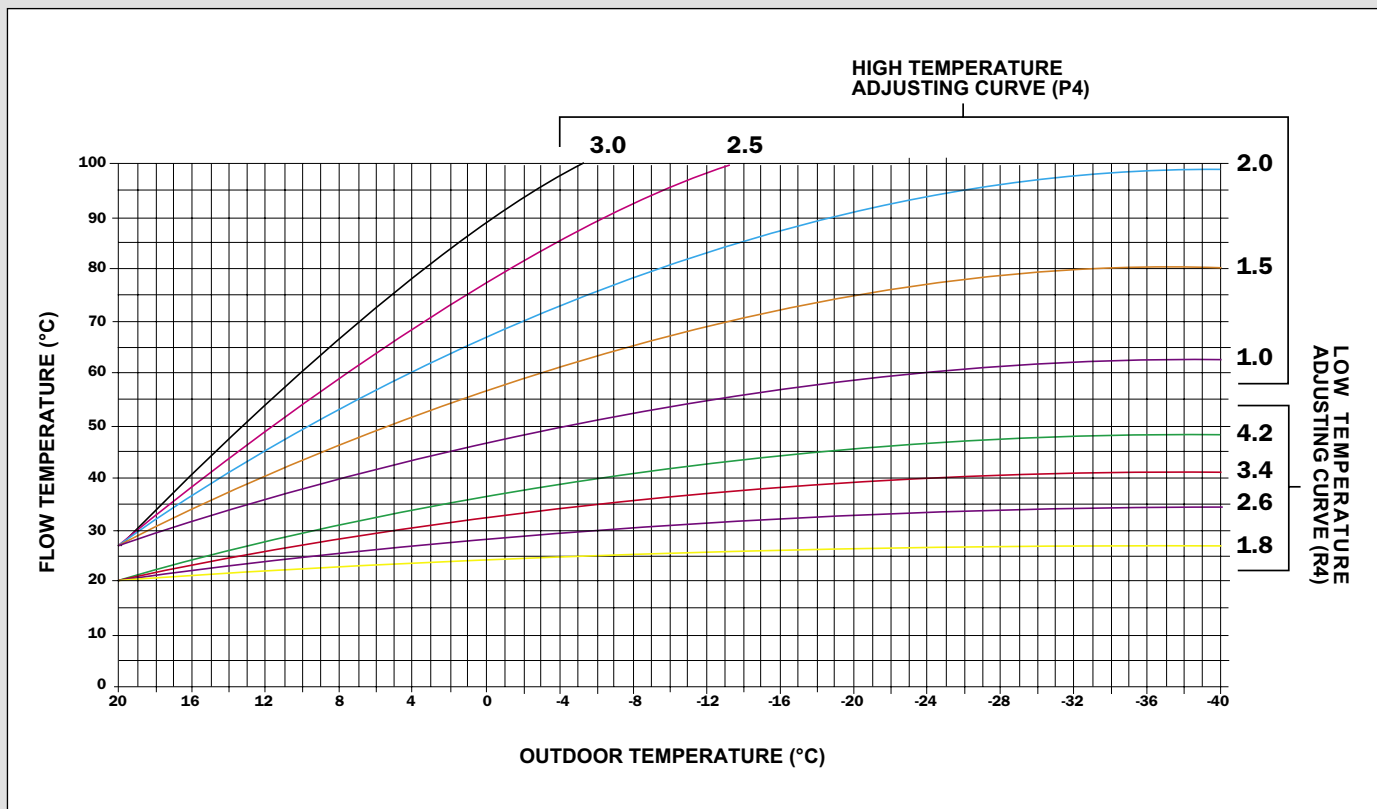
In order to access to **P4** and **R4** potentiometers, it is necessary to open the control panel (see pic.2).



0CIRCSTA06
R4 = setting of low temperature curve



0CIRCSTA05
P4 = setting of high temperature curve

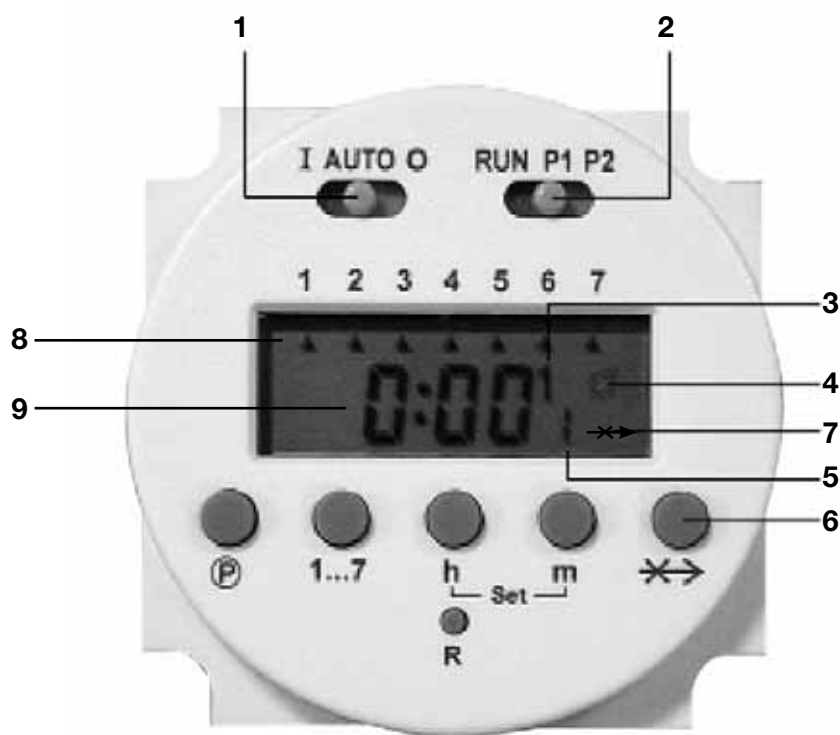


pic. 2

The curves displayed in the above chart are referred to a desired room temperature of 20°C.

Should desired room temperature be different from 20°C, higher or lower, all curves slide consequently, toward the top or the bottom of the chart.

1.2.3. Electronic timer programming



- | | |
|--------------------------------|---------------------------|
| 1 Mode selector | 6 Skip function button |
| 2 Program selector | 7 Skip function indicator |
| 3 Channel indicator | 8 Week days indicator |
| 4 Channel activation indicator | 9 Actual time |
| 5 Programmed period indicator | |

pic. 3

A) Initialization

When programming the timer for the first time, or re-programming it, it is advisable to perform a full reset of the timer by positioning selector 2 to RUN and pressing the reset micro-button R: The time and start and stop programs will be reset (time display flashes 0:00).

In order to set the week day, actual time and start and stop programs, see paragraph B and C.

B) Setting the day of the week and actual time

Position selector 2 to **RUN** and at the same time press buttons h and m until the two dots, dividing hours and minutes stop flashing (If previously the reset micro-button R was pressed, the actual time display stops flashing also); press button 1...7 in order to set the current week day (shown by indicator 8), press button h to set actual hour, press button m to set actual minutes (by keeping button h or m pressed the digits run faster).

Wait approximately ten seconds, until the two dots, dividing hours and minutes start flashing. The programming procedure of the day of the week and time is now completed.

C) Start and stop programs

Position selector 2 to **P1** in order to program channel 1, and to **P2** in order to program channel 2 (indicator 3 shows the chosen channel, indicator 4 shows the symbol, indicating we are programming a start time, and indicator 5 shows digit 1 to indicate the first program is set; Up to 8 start periods and 8 stop periods can be set, a total of 16).

In order to set a start program, follow the instructions below:

- press button 1...7 in order to set the desired week day (or days (1));
- press button h and button m to set hour and minutes of the start program;
- press button P to memorize the programmed time and go to the stop program (indicator 4 is off showing we are programming a stop time, and indicator 5 shows digit 2 indicating we are in the second time of the program).

Perform again the above procedure in order to set the stop time, and at the end press button P.

Now we have set a heating unit operation period, by setting a start and stop time, indicator 5 shows digit 3; Follow the above instruction to program an additional heating unit operation period, otherwise position selector 2 to **RUN** to terminate the programming procedure.

(1) The following periods are available in order to automatically repeat the programmed heating unit operation periods during the week:

Period no.1: single week day

Period no.2: day 1-2-3-4-5 of the week (Mon-Tue-Wed-Thu-Fri)

Period no.3: day 6-7 of the week (Sat-Sun)

Period no.4: day 1-2-3-4-5-6 of the week (Mon-Tue-Wed-Thu-Fri-Sat)

Period no.5: day 1-2-3-4-5-6-7 of the week (Mon-Tue-Wed-Thu-Fri-Sat-Sun)

When programming a start time by using a multiple day period (e.g. period no.2), the stop time is to be programmed in the same multiple day period for it to be effective every day of the period.

D) Timer operating modes

The programmable timer has 3 operating modes, they are available through selector 1.

- I** permanently ON mode (the channel, or the channels selected are always active)
- AUTO** operation follows the programs (the channels, 1 and 2, are activated and de-activated following the programs (see C paragraph for programming procedure)
- 0** permanently OFF mode (the channel, or the channels selected are always inactive)

Permanently ON mode (I)

Proceed as follows in order to set one channel always active:

Position selector **1** to **I**, press button **6** once to activate channel **1**, twice to activate channel **2**; the selected channel will flash for three seconds (indicator **3**), after that it will be displayed fixed and symbol ☀ will be displayed (indicator **4**), now the channel is permanently active. Selector **1** is to remain set to **I**.

When both channels are to be set always active, repeat the above procedure and select the channel which was not previously set. Indicator **3** will confirm permanent activation of both channels by displaying digits **1** and **2**.

When only one channel is set to be permanently active, the other channel follows the set programs (see C paragraph for programming procedure).

In order to stop permanent activation of the channels, position selector **1** to **AUTO**.

Program operation mode (AUTO)

The channels activate and deactivate following the programs (see C paragraph for programming procedure).

When a programmed start time is active, the symbol ☀ (indicator **4**) and the active channel (indicator **5**) are displayed.

Permanently OFF mode (0)

Proceed as follows in order to set one channel always inactive:

Position selector **1** to **0**, press button **6** once to select channel **1**, twice for channel **2**; the selected channel will flash (indicator **3**), do not press any other button for three seconds, now the selected channel will remain permanently inactive (indicator **3** will keep flashing the selected channel). Selector **1** is to remain set to position **0**.

Should it be needed to set both channels always inactive, repeat the above procedure for the channel not previously involved. Indicator **3** will keep flashing digits **1** and **2**, confirming both channels are inactive.

When only one channel is set to be permanently inactive, the other channel follows the set programs (see C paragraph for programming procedure).

In order to stop permanent de-activation of the channels, position selector **1** to **AUTO**.

It is possible to permanently activate one channel and permanently de-activate the other.

Proceed as follows:

position selector **1** to **I**, press button **6** once to select channel **1**, twice for channel **2**; the selected channel will flash for three seconds (indicator **3**), afterward it will be displayed fixed and symbol ☀ will appear (indicator **4**), now the channel is permanently active

Quickly move selector **1** to **0**, without stopping in **AUTO**, press button **6** once or twice to select the channel to be permanently de-activated; the chosen channel will flash (indicator **3**), while the previously activated channel will keep being displayed fixed and symbol ☀ will keep being shown (indicator **4**), do not press any other button for three seconds, now the channel will remain permanently inactive (indicator **3** will keep flashing the selected channel).

E) SKIP function setting

The SKIP function (program by-pass) allows to change the operational mode of the timer from ON to OFF and vice-versa, after pressing button **6**. Such function is displayed by the symbol ⇄.

In order to activate or de-activate the SKIP function, press button **6** again.

The SKIP function is active only when the programmable timer is set to **AUTO**.

The operational status is shown on the display by the ☀ symbol (indicator **4**).

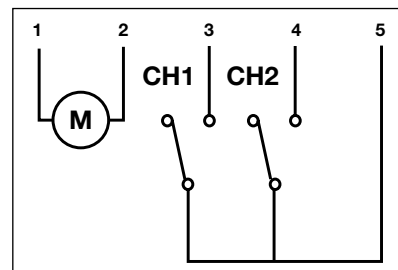
F) Technical characteristics

Electric connection: 220-240Vca 50/60 Hz

Relay exit: 2 x 5A; 250Vca single-pole contact

Lithium battery for program memory in excess of 5 years

Minimum commutation time: 1 minute



Relays

CH1: ON/OFF switch (3-5)

CH2: ON/OFF switch (4-5)

1.2.4. "OPEN THERM" remote control programming (optional equipment)

The heating units can be connected to an "Open Therm" remote control (option) supplied by the manufacturer.

In this instance the electronic timer (when available) has to have both channels, 1 and 2, programmed as permanently ON (see 1.2.3 paragraph);

The remote control allows for full management of the heating unit (CH, DHW, CH and DHW flow temperatures, operation programs, etc.) with the exception of the EXCHANGER TEMPERATURE MAINTENANCE and CYLINDER ACTIVATION/DE-ACTIVATION, are to be managed via the relevant adjusters/selectors: 12b (pic.1) for CYLINDER function and 13b for EXCHANGER TEMPERATURE MAINTENANCE function.

WARNING

When a Remote Control is connected, selector 11 is to be set to COMFORT ☀ and the programmable timer (when available) has to have both channels, 1 and 2, programmed as permanently ON (see 1.2.3 paragraph);

See 3.2.11 paragraph for "Open Therm" remote control installation procedure.

See the "Open Therm" remote control own manual for programming procedure

1.2.5. Heating unit shutdown

When there is a malfunction, the heating unit automatically shuts down. In order to detect the cause of the shutdown, see 4.10 paragraph "Burner troubleshooting" and 7 paragraph "Heating unit troubleshooting".

1.2.5.1. Burner shutdown

When there is a burner malfunction, it automatically shuts down and shutdown light 1 turns on, on the control panel (pic.1), and the red reset button on the burner (pic.2).

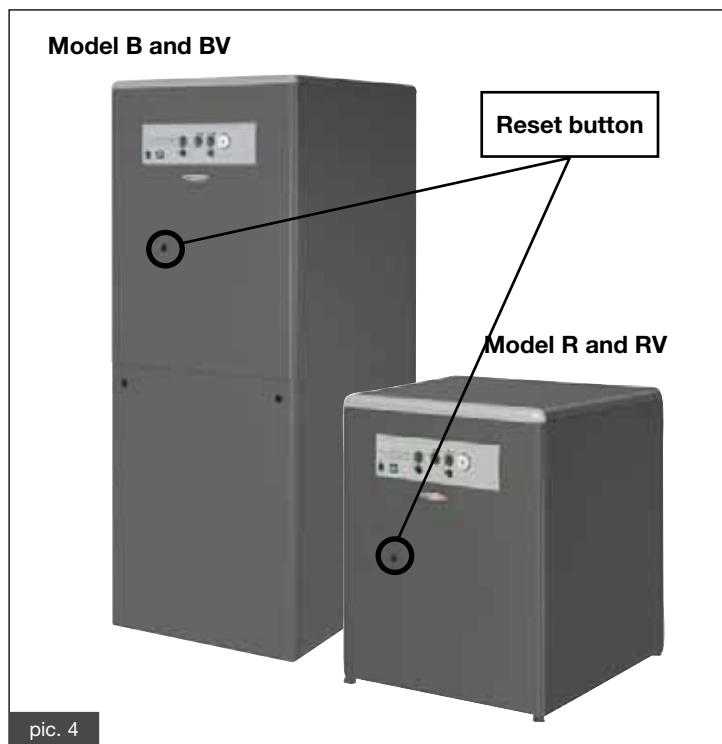
In this instance, proceed as below described:

- check fuel to be available, its valve to be open and that fuel is actually supplied from the network;

- Once fuel availability is verified, reset the burner by pressing the red lit reset button (pic. 4): should the appliance not start and resume shutdown, after three attempts, contact an Authorized Service Center or qualified technician for service.

WARNING

Should the burner shut down frequently, indicating a recurrent malfunction, contact an Authorized Service Center or qualified technician for service.



1.2.5.2. Shutdown due to overheating

Should the red overheating light 2 (pic.1) come on, it means the safety thermostat with manual reset has cut in due to a malfunction. Please contact an authorized Service Centre or a qualified service technician for service.

1.2.5.3. Shutdown due to low water pressure

Should the pressure switch shut down the boiler, no.4 red light starts flashing (pic.1), indicating low water pressure in the CH system. Restore pressure by acting upon the loading tap (pic.5), located inside the heating unit.

In order to restore proper water pressure proceed as follows:

- turn the main switch 16 (pic.1) to O (the green light turns off);
- remove the heating unit front panel (R model), or the heating unit

lower front panel (B model), by pulling it toward the outside,

- Rotate the loading tap (pic.5) counter-clockwise in order to allow water into the heating unit, and keep it open until the water pressure gauge (14 in pic.1) indicates 1/1,3 bar; now shut the tap by fully rotating it clockwise, and install the front panel.

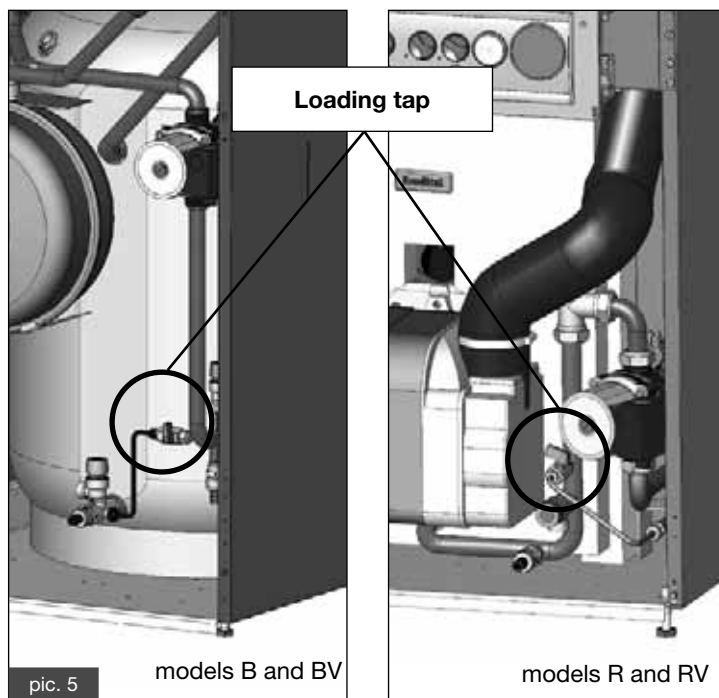
WARNING

Open the loading tap only.

Do not touch any other component of the heating unit as they could be hot, such as the heat exchanger and water pipes.

Once the loading procedure is completed, carefully close the tap. Should the tap not be fully closed, the water pressure may raise, the safety valve intervene and let water out of the heating unit.

Should the shutdown occur frequently, contact an authorized Service Centre or a qualified service technician for service.



1.2.5.4. Shutdown due to malfunction of the temperature probes

When the burner shuts down due to a malfunction of the temperature probes, the following lights start flashing:

- red light no.5 (pic.1) for probe 1 (CH); the burner turns off and the pump starts running;
- red light no.7 (B and BV models) for probe 2 (DHW); DHW supply is terminated, CH function is still available.

In the above instance, contact an authorized Service Centre or a qualified service technician for service.

1.3. Maintenance

The heating unit is to be serviced in accordance to current laws and regulations.

Proper maintenance allows the heating unit to operate efficiently, environmentally friendly, and safely with regards to people, animals and property.

The heating unit maintenance procedure is to be performed by qualified personnel.

The user may only clean the outer casing of the heating unit, by means of furniture cleaning products.

Do not use water!

1.4. Information for the user

The user can only access heating unit parts which are accessible without the use of tools and/or utensils.

No-one, including qualified personnel, is authorized to implement modifications to the heating unit.

The manufacturer shall not be held liable for injury to people and animals, and damage to property resulting from tampering with or improper intervention to the heating unit.

Should the heating unit be left inactive for a long period, and power disconnected, it may be necessary to unlock the pumps.

This operation must be performed by a qualified service technician.

In order to prevent the pumps from locking, add special filming products to the water, suitable for multi-metal systems.

Frost protection can be ensured by adding a specific anti-freeze product suitable for multi-metal systems.

Do not use automotive anti-freeze and check it regularly to verify product efficacy.

The heating unit is equipped with a led thermometer on the control panel (pic.1), for water temperature verification.

2. TECHNICAL FEATURES AND DIMENSIONS

2.1. Technical features

The heating unit has a cast iron heat exchanger with three flue gas passes, and operates with an oil-fired blown-air burner; the following models are available:

B combination heating unit, serving one high temperature CH zone, and equipped with a 130 liter DHW cylinder;

BV combination heating unit, serving one high temperature CH zone and one low temperature CH zone (via mixing valve), equipped with a 130 liter DHW cylinder;

R CH only heating unit, serving one high temperature CH zone;

RV CH only heating unit, serving one high temperature CH zone and one low temperature CH zone (via mixing valve);

All the above models are available in the following versions:

TF 23: open chamber heating unit with 24 kW thermal output;

TF 33: open chamber heating unit with 33 kW thermal output;

TF 43: open chamber heating unit with 43 kW thermal output;

TFD 23: sealed chamber heating unit with split air/flue gas system and 24 kW thermal output;

TFD 33: sealed chamber heating unit with split air/flue gas system and 33 kW thermal output;

TFD 43: sealed chamber heating unit with split air/flue gas system and 43 kW thermal output.

Each heating unit meets the legal requirements in the country of destination which is indicated on the rating plate.

Installation in a different country from the one indicated may be source of injury and/or damage for people, animals and properties.

The heating unit main technical features are listed below.

Manufacturing features

- High-efficiency cast-iron heat exchanger with three flue gas passes.
- Extra thick fiberglass insulation with aluminum Kraft (50 mm).
- Oil-fired blown air burner, sealed version, with built-in fuel oil pre-heater.
- 130 liter DHW ceramic-glass lined cylinder, easy to inspect, with high efficiency, oval shaped, coil exchanger, polyurethane insulated, and magnesium sacrificial anode;
- Electro-zinc plated steel sheet casing, painted with epoxy-polyester powder.
- Electronic control board managing the heating unit.
- 12 liter CH expansion vessel.
- 5 liter DHW expansion vessel (B and BV models).
- 3 bar CH safety valve.

- 7 bar DHW safety valve (B and BV models).
- Three-speed CH pump with integrated air purging device.
- DHW pump with integrated air purging device (B and BV models).
- Additional air purging device on the exchanger.
- Digital programmable timer (optional equipment for B and R models).
- In-line oil filter.
- Cylinder temperature probes.
- CH system loading tap.
- CH system unloading tap.
- Low water pressure switch.
- Safety thermostat (110°C).
- Designed to host an additional electronic board for different CH zone management (standard on BV and RV models).
- Designed for connection to an Open Therm remote control (optional kit).
- Designed for connection to an external temperature probe (optional kit for B and R models, standard on BV and RV models).

User interface

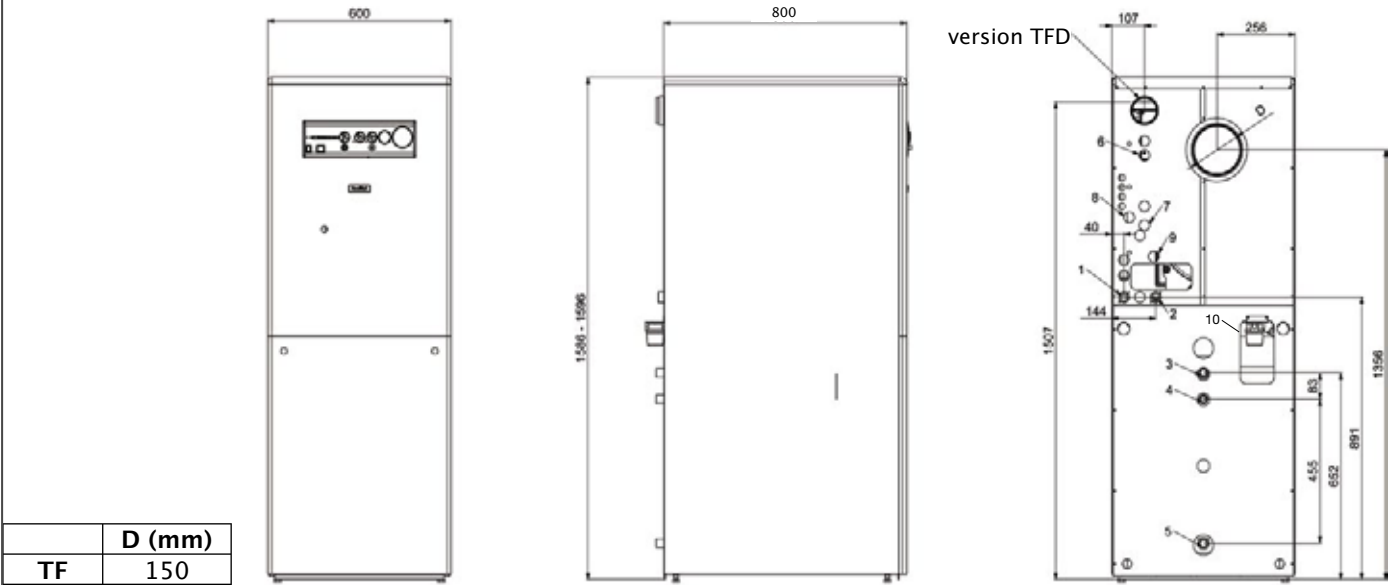
- Master switch with light;
- selector managing: TIMER, COMFORT TEMPERATURE, NIGHT TEMPERATURE, ANTI-FROST, SUMMER;
- CH water temperature adjusting knob (also allowing activation of EXCHANGER TEMPERATURE MAINTENANCE function);
- DHW temperature adjusting knob in B and BV models (also allowing activation/de-activation of cylinder);
- cylinder activation selector (R and RV models);
- thermometer with leds;
- pressure gauge;
- lights indicating:
 - . power ON;
 - . burner ON;
 - . CH function active;
 - . burner shutdown;
 - . overheating shutdown;
 - . low water pressure shutdown;
 - . shutdown due to malfunction of temperature probes;
 - . remote control connection fault;

Operational functions

- Anti-frost function;
- anti-legionella function;
- pump anti-locking function;
- pump post-circulation function;
- excessive heat management function.

2.2. Dimensions

Models B and BV

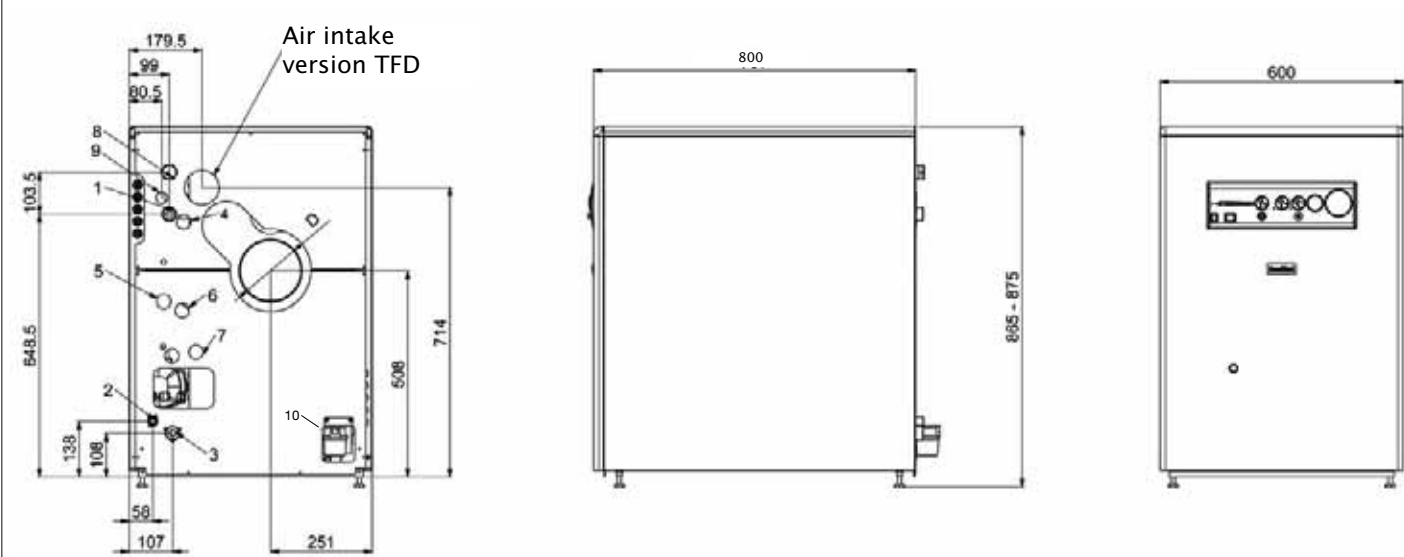


| | D (mm) |
|-----|--------|
| TF | 150 |
| TFD | 120 |

| | | | | | |
|---|---------------------|--------|----|--------------------------------|------|
| 1 | FLOW | G1 M | 6 | HIGH TEMP. FLOW (BV version) | G1 M |
| 2 | RETURN | G1 M | 7 | HIGH TEMP. RETURN (BV version) | G1 M |
| 3 | DHW | G3/4 M | 8 | LOW TEMP. FLOW (BV version) | G1 M |
| 4 | RE-CIRCULATION | G1/2 M | 9 | LOW TEMP. RETURN (BV version) | G1 M |
| 5 | DOMESTIC COLD WATER | G3/4 M | 10 | FUEL INLET | |

pic. 6

Models R and RV



| | D (mm) |
|-----|--------|
| TF | 150 |
| TFD | 120 |

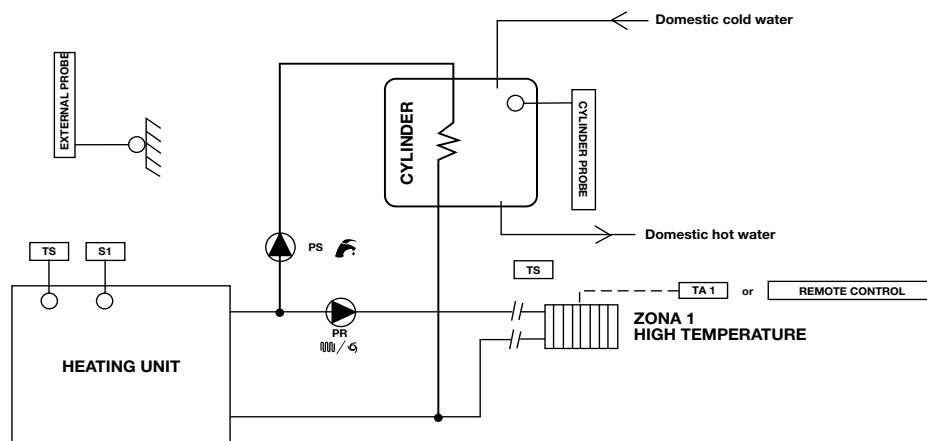
| | | | | | |
|---|------------------------------|--------|----|---|------|
| 1 | FLOW | G1 M | 6 | HIGH TEMP. RETURN (VA version) | G1 M |
| 2 | DOMESTIC COLD WATER INLET | G1/2 M | 7 | LOW TEMP. RETURN (VA version) | G1 M |
| 3 | RETURN | G1 M | 8 | ADDITIONAL FLOW | G1 M |
| 4 | HIGH TEMP. FLOW (VA version) | G1 M | 9 | RETURN OUTLET FOR 0KITSANI01 (VA version) | |
| 5 | LOW TEMP. FLOW (VA version) | G1 M | 10 | FUEL INLET | |

pic. 7

2.3. Heating unit layout

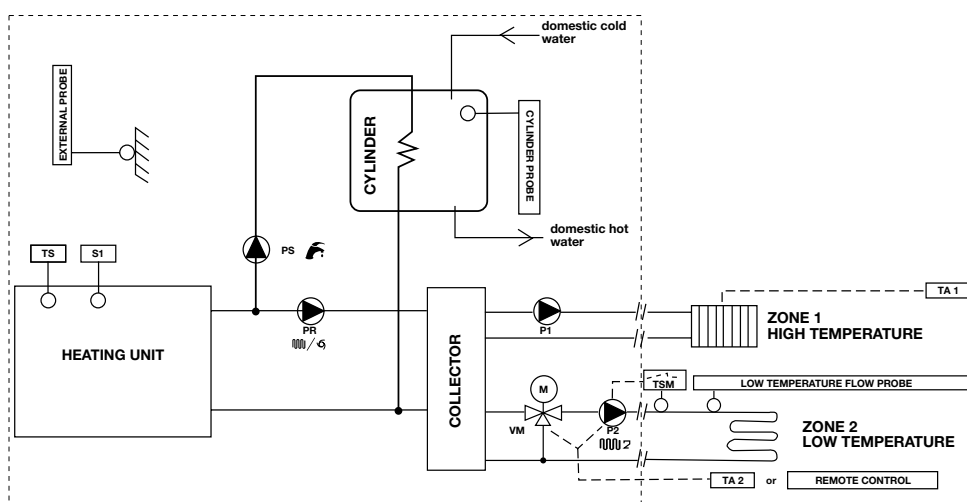
MODEL B

PR CH PUMP
PS DHW PUMP
TS LIMIT THERMOSTAT
TA1 ROOM THERMOSTAT (OPTIONAL)



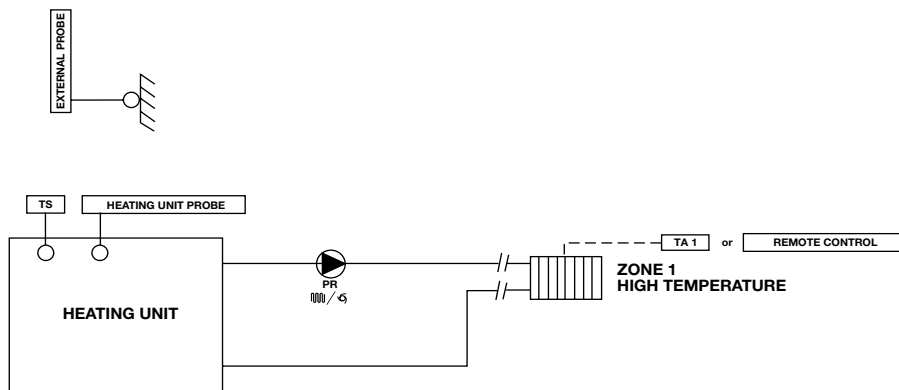
MODEL BV

PR: CH PUMP
PS: DHW PUMP
P1: HIGH TEMPERATURE PUMP
P2: LOW TEMPERATURE PUMP
TS: LIMIT THERMOSTAT
TSM: LOW TEMPERATURE LIMIT THERMOSTAT
VM: MIXING VALVE
TA1: ZONE 1 ROOM THERMOSTAT (OPTIONAL)
TA2: ZONE 2 ROOM THERMOSTAT (OPTIONAL)



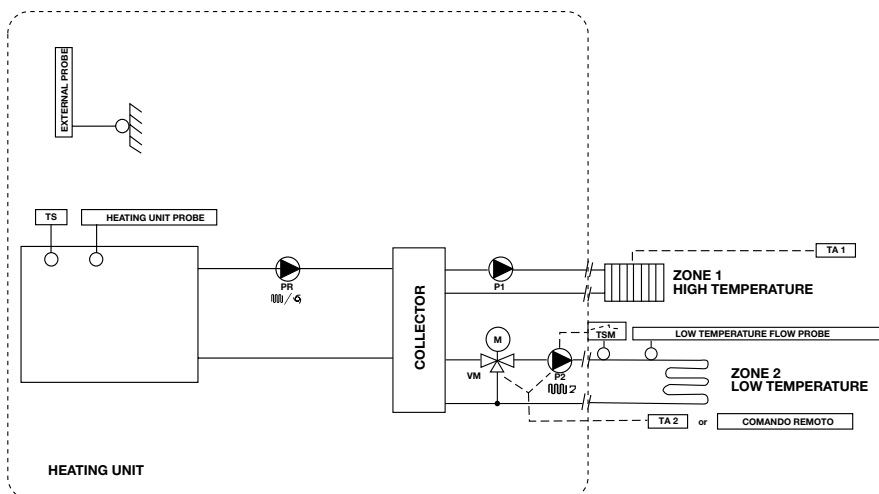
MODEL R

PR CH PUMP
TS LIMIT THERMOSTAT
TA1 ROOM THERMOSTAT (OPTIONAL)



MODEL RV

PR: CH PUMP
PS: DHW PUMP
P1: HIGH TEMPERATURE PUMP
P2: LOW TEMPERATURE PUMP
TS: LIMIT THERMOSTAT
TSM: LOW TEMPERATURE LIMIT THERMOSTAT
VM: MIXING VALVE
TA1: ZONE 1 ROOM THERMOSTAT (OPTIONAL)
TA2: ZONE 2 ROOM THERMOSTAT (OPTIONAL)



2.4. Technical data of the heating units

| MODEL | | | 23 | 33 | 43 |
|---|-----------|----|-------------|---------|---------|
| Efficiency rating | | | ★★ | ★★ | ★★ |
| Thermal input Q _n | kW | | 26.6 | 36.3 | 47.2 |
| Thermal output P _n | kW | | 24.0 | 33.0 | 43.0 |
| Efficiency at nominal load | % | | 90 | 91 | 91 |
| Efficiency at reduced load | % | | 89.7 | 90.7 | 90.7 |
| No. of elements of cast iron heat exchanger | | | 3 | 4 | 5 |
| CO ₂ value | % | | 12.5 ÷ 13.0 | | |
| Flue gas temperature | °C | | 215 | 190 | 188 |
| Bacharach number | | | <1 | <1 | <1 |
| Flue gas flow rate | kg/h | | 40.0 | 53.2 | 69.3 |
| Flue gas load loss | Pa | | 13 | 25 | 40 |
| Water capacity | l | | 20 | 24 | 28 |
| Minimum flow rate of heating system | l/h | | 680 | 950 | 1230 |
| Load loss of water side (Δt =10 K) | Pa | | 4800 | 5600 | 6000 |
| Temperature holding loss (Δt =50 K) | % | | 0.5 | 0.5 | 0.5 |
| CH temperature range | °C | | 50 ÷ 82 | 50 ÷ 82 | 50 ÷ 82 |
| Max. CH operating pressure | bar | | 3 | 3 | 3 |
| CH expansion vessel capacity | l | | 12 | 12 | 12 |
| DHW expansion vessel capacity (*) | l | | 5 | 5 | 5 |
| DHW temperature range (*) | °C | | 35 ÷ 57 | 35 ÷ 57 | 35 ÷ 57 |
| Max. DHW working pressure (*) | bar | | 7 | 7 | 7 |
| DHW supply (Δt 30 K) | l/10 min | | 215 | 250 | 265 |
| Power supply | V/Hz | | 230/50 | | |
| Power supply fuse | A | | 2 | 2 | 2 |
| Height | Mod. B/BV | mm | 1600 | 1600 | 1600 |
| | Mod. R/RV | mm | 875 | 875 | 875 |
| Length | | mm | 600 | 600 | 600 |
| Depth | | mm | 800 | 800 | 800 |

(*) B and BV models only

2.5. Technical data of the burner

| MODEL | | | 23 | 33 | 43 |
|-----------------------------|---------|--|------------------------------------|-----------|-----------|
| Fuel | | | Oil 1.4°E. Hi = 10210 kcal/kg 20°C | | |
| Nozzle manufacturer | | | Delavan W. Steinen Q. Danfoss S | | |
| Type of nozzle | Usgal/h | | 0.60 | 0.85 | 1.00 |
| Nozzle inclination | - | | 80°B | 80°W | 60°B |
| Oil pressure calibration | bar | | 12.0 | 12.0 | 12.0 |
| Oil consumption | kg/h | | 2.24 ± 4% | 3.06 ± 4% | 3.98 ± 4% |
| Pump negative pressure | bar | | >-0.4 | >-0.4 | >-0.4 |
| Pre-heater | W | | 55 | 55 | - |
| Combustion head calibration | index | | fixed | fixed | 4 |

3. INSTRUCTIONS FOR THE INSTALLER

3.1. Installation regulations

The heating unit is to be installed in accordance to applicable standards and laws, which are to be considered as incorporated in full to this manual.

3.2. Installation

3.2.1. Packaging

The heating unit is packed in a sturdy wooden cage on a wooden pallet. Once the wooden cage has been removed, check the heating unit to be intact. The packaging material is recyclable: and it is to be disposed of in a specific waste management center.

Keep the packaging out of the reach of children as by its nature may be hazardous.

The manufacturer shall not be held liable for injury to persons and animals or damage to property resulting from non-observance of the above instruction.

The packaging contains:

- installation, use and maintenance handbook,
- four screw-adjustable legs,
- oil filter, hose pipes and fittings for burner fuel supply.

3.2.2. Choosing where to install the heating unit

When choosing the position of the heating unit please take into account the following:

- it is advisable to provide a 50 cm clearance from each side of the heating unit, in order to simplify service operations;
- avoid installing the heating unit in humid or dusty areas;
- the boiler room is to be un-accessible to non authorized personnel, children and animals.

3.2.3. Installing the heating unit

Before connecting the boiler to the DHW and CH system pipes, carefully clean the pipes to remove all traces of metal resulting from processing and welding operations as well as any oil and grease which could damage the heating unit or alter its operation.

WARNING

Do not use solvents which could damage the components.

The manufacturer shall not be held liable for injury to persons and animals or damage to property resulting from non-observance of the above instruction.

After placing the heating unit in the boiler room, and in order to install it, proceed as follows:

B and BV MODELS

- remove the two front panels by pulling them toward the outside;
- remove the two screws securing the base to the wooden pallet;
- in order to remove the wooden pallet from the heating unit, it is necessary to raise it; proceed carefully: insert two 1" iron bars through the openings underneath the chassis which supports the heat exchanger, raise it without damaging the hydraulic components and lower it to the floor;
- screw the four adjustable supporting legs in: adjust as necessary in order to stabilize the unit;
- connect the heating unit to the DHW and CH flow and return pipes;
- connect the unit to the chimney (and to the air intake pipe in TFD versions);
- connect the heating unit to the power mains and, when available, to the room thermostat (option).
- connect the burner to the fuel oil supply pipes (see paragraph 3.2.4);

R and RV MODELS

- remove the front panel by pulling it toward the outside;
- remove the two screws securing the base to the wooden pallet;
- in order to remove the wooden pallet from the heating unit, it is necessary to raise it; proceed carefully: insert two ropes or cables under the base front-rear wise, raise it and lower it to the floor;

- screw the four adjustable supporting legs in: adjust as necessary in order to stabilize the unit;
- connect the heating unit to the CH flow and return pipes;
- connect the unit to the chimney (and to the air intake pipe in TFD versions);
- connect the heating unit to the power mains and, when available, to the room thermostat (option).

3.2.4. Connection to the fuel oil mains supply

Refer to paragraph 4.3 for instructions on connecting to the fuel oil supply.

When heating units are installed in particularly cold areas, use fuel oil with a low content of paraffin.

It may be necessary to install an additional fuel oil pre-heater.

It is mandatory to install the provided fuel oil filter.

3.2.5. Room ventilation

Heating units are designed for connection to a chimney.

The combustion air can be taken:

- directly from the room in which the unit is installed;
- from outdoor using 80 mm diameter pipes (D version).

N.B.

When the combustion air is taken from the room where it is installed, the system must comply with applicable standards and laws which are to be considered as fully incorporated to this manual.

3.2.6. Air intake and flue gas discharge system

As far as the emission of flue gas into the atmosphere, it is mandatory to comply with all applicable standards and laws; they are to be considered as fully incorporated in this manual.

The flue gas discharge pipes in the heating system have the following diameter:

- connection to 150 mm diameter flue gas discharge ducts (TF versions; type B23);
- connection to 120 mm diameter flue gas discharge ducts (TFD versions; types B23, C53 and C83).

TF version (type B23)

Flue gas discharge ducts must be connected to a chimney system designed in compliance with all applicable standards and laws, which are to be considered as fully incorporated to this manual. When the combustion air is taken from the room where the unit is installed, the system must comply with applicable standards and laws.

The chimney system and flue gas pipes must comply with the following requirements:

- the diameter is not to be smaller than the heat-exchanger flue gas discharge opening. In case of square or rectangular cross section flue gas pipes, the diameter must be 10% larger than the opening diameter of the heat exchanger.
- the pipes must be made with waterproof material, resistant to flue gas temperature and acid condensate;
- they are to have low thermal conductivity, proper mechanical resistance, perfect seal and appropriately calculated height and cross section;
- vertical path (chimney system) and constant cross section without any narrowing;
- the terminal is to ensure constant, efficient discharge of flue gas in any atmospheric condition;
- the terminal must project at least 50 cm from any adjacent structure within a 5 meter radius.

TFD version (types B23, C53 and C83)

The heating unit, TFD version (types B23, C53 and C83) has a female fitting at its back, with an 80 mm lip seal for connection to a combustion air intake pipe. The pipe is already connected to the burner via a flexible paper-aluminum duct.

Combustion air can be taken from outside the room in which the heating unit is installed by means of a suitable pipe.

Maximum length of the combustion air pipe is specified in the following technical data charts.

Flue gas discharge system is to be implemented by means of 120 mm diameter pipes, vertical and horizontal, and wall terminal when laws and regulations allow it; maximum length of the flue gas pipe is specified in the following technical data charts.

When bends are necessary in the combustion air system, bear in mind that a wide radius 90° bend, in term of load losses, is equivalent to a 1 meter long straight section of pipe, and a narrow radius 90° bend is equivalent to a 1.5 meter long straight pipe.

N.B.

Only enameled steel or stainless steel pipes with gaskets from the manufacturer or available on the market, are to be used as flue gas discharge system.

In presence of vertical flue gas discharge pipes, provide a specific section for condensate discharge.

All the installations (both TF and TFD versions), require a specific section linked to the flue gas discharge pipe, allowing for measurement of flue gas temperature and CO2 concentration, so that the burner can be correctly adjusted and the combustion efficiency verified.

N.B.

When routing through flammable walls, provide the flue gas discharge pipes with suitable thermal insulation (50 mm minimum thickness).

N.B.

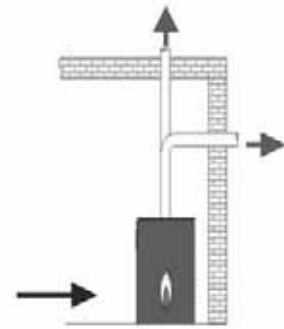
When flue gas is discharged through 120 mm diameter pipes, it is mandatory to install on the air intake pipe the provided 80 mm diameter terminal.

Types and classification of air intake and flue gas discharge systems

Type B23

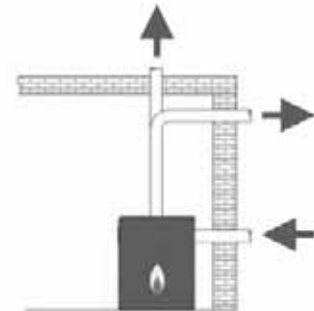
Discharge through the wall (when allowed by applicable installation standards) or through the roof or via chimney system dedicated to the boiler only.

| Model 23 |
|--|
| Max equivalent length of discharge pipe Ø 120 mm: 7 meters |
| Each added wide radius 90° equals 1 meter discharge |
| Each added narrow radius 90° equals 1.5 meter discharge |
| Model 33 |
| Max equivalent length of discharge pipe Ø 120 mm: 9 meters |
| Each added wide radius 90° equals 1 meter discharge |
| Each added narrow radius 90° equals 1.5 meter discharge |
| Model 43 |
| Max equivalent length of discharge pipe Ø 120 mm: 5 meters |
| Each added wide radius 90° equals 1 meter discharge |
| Each added narrow radius 90° equals 1.5 meter discharge |



Type C53

The air intake terminal and flue gas discharge terminal are never to be positioned on opposite walls.



| Model TFD 23 | |
|---|---|
| Air intake equivalent length of Ø 80 mm pipe | Flue gas discharge equivalent length of Ø 120 mm pipe |
| From 0 to 4 meters | Up to 7 meters |
| From 4 to 6 meters | Up to 9 meters |
| From 6 to 8 meters | Up to 11 meters |
| Each added wide radius 90° equals 1 meter both in air intake and flue gas discharge | |
| Each added narrow radius 90° equals 1.5 meter both in air intake and flue gas discharge | |

| Model TFD 33 | |
|---|---|
| Air intake equivalent length of Ø 80 mm pipe | Flue gas discharge equivalent length of Ø 120 mm pipe |
| From 0 to 6 meters | Up to 9 meters |
| From 6 to 7 meters | Up to 11 meters |
| Each added wide radius 90° equals 1 meter both in air intake and flue gas discharge | |
| Each added narrow radius 90° equals 1.5 meter both in air intake and flue gas discharge | |

| Model TFD 43 | |
|---|---|
| Air intake equivalent length of Ø 80 mm pipe | Flue gas discharge equivalent length of Ø 120 mm pipe |
| From 0 to 5 meters | Up to 5 meters |
| From 5 to 6 meters | Up to 8 meters |
| From 6 to 7 meters | Up to 10 meters |
| Each added wide radius 90° equals 1 meter both in air intake and flue gas discharge | |
| Each added narrow radius 90° equals 1.5 meter both in air intake and flue gas discharge | |

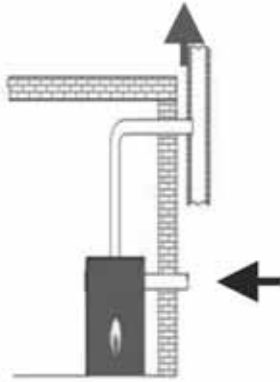
Type C83

Type C device, equipped with fan after the combustion chamber, and designed for connection, via its own duct, to single chimney or chimney system serving more than one appliance (collective system).

The single or collective chimney system is designed to operate via natural draught.

The device is connected, via an additional duct, to an air intake terminal retrieving air from outside the boiler room.

For suitable pipe lengths refer to type C53 charts.



3.2.7. Measuring combustion efficiency

Perform the following measurements in order to determine combustion efficiency:

- combustion air temperature;
- temperature of flue gas and the CO₂ concentration from provided opening on the flue gas duct.

Perform the measurements after the boiler has reached working temperature, and after verifying the Bacharach index to be less than 1.

3.2.8. Connecting to the power mains

The heating unit must be connected to a 230V – 50 Hz power supply.

The power cable must be made of rubber.

Do not use PVC cables, which have low temperature resistance and tend to deteriorate over time.

Make sure polarity instructions are followed and phase and neutral are correctly wired.

Installation procedure is to comply with applicable standards and laws, which are to be considered as fully incorporated to this manual.

A two-pole switch must be fitted before the heating unit to ensure safe maintenance procedures.

The power cabling must be protected by a differential magnetothermal switch with a suitable breaking capacity.

The mains supply must be properly earthed.

Carefully verify the above safety precaution. When in doubt, have the electric system carefully checked by a qualified technician.

The manufacturer shall not be held liable for damage or injury caused by failure to properly earth the system. The DHW, CH and fuel pipes are not suitable for grounding purposes.

3.2.9. Hydraulic connections

CENTRAL HEATING

Before installing the heating unit we recommend you clean the system to remove any impurities from the various components which might damage the circulating pumps or the heat exchanger.

Central heating flow and return pipes must be connected to their relevant G 1 fittings.

When determining the size of central heating circuit pipes, it is necessary to take into account the load losses induced by the radiators, thermostatic valves, radiator cut-off valves and configuration of the system.

DOMESTIC HOT WATER (B and BV models)

Flow and return pipes must be connected to the relevant G ¾" fittings on the heating unit.

Water mains pressure must not exceed 7 bar (in presence of higher pressures a reducer is to be installed).

The pressure in the DHW circuit is limited to 3 - 4 bars.

The hardness of water from mains determines how often the coil heat exchanger needs to be cleaned.

WARNING

- Should water be particularly hard it may be necessary to install a domestic water softener, administering a specific product for treating drinking water in compliance with applicable laws.

It is always advisable to treat water harder than 20°F.

- Due to its pH value, water supplied from normal water softeners may not be compatible with some components of the heating system.

- The safety valve should be connected to the sewer, otherwise the boiler room may get flooded.

The manufacturer shall not be held liable for damages caused by failure to follow the above safety precautions.

3.2.10. Room thermostat connection

The heating unit can be connected to a room thermostat (option).

The wires of the room thermostat

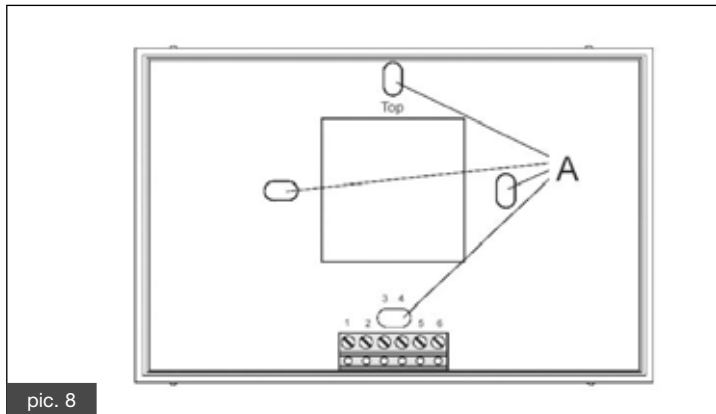
are to be fixed to the relevant connection on the heating unit electronic board (see electric layout charts).

The room thermostat contact is to be potential free.

The room thermostat wires are not to be routed together with the power main cables.

3.2.11. "OPEN THERM" remote control installation (option)

The heating unit can be connected to an *Open Therm* remote control (delivered as optional equipment). Position the remote control on an inside wall of the premises, far from heat sources or draughts. Detach the rear part of the plastic casing (grey) from the front one (white), by means of a screwdriver, and fix the rear part to the wall using the holes A (pic.8).



WARNING

The remote control is not to be connected to the 230V power main.

The remote control wires are not to be routed together with the power main cables.

In order to connect the remote control, employ two-wire cables with the following characteristics:

- max length: 40 m;
- max. impedance: $2 \times 4 \Omega/\text{m}$
- in order to avoid interferences it is possible to implement interlaced wires or with a sheath.

An electronic board, code 0SCHEREM00 is provided with the remote control kit, and it to be used to connect the remote control to the boiler.

Refer to the instruction delivered with the electronic board, code 0SCHEREM00, for its installation.

The connection of the remote control to the heating units to be implemented by connecting position 1 and 2 of the remote control to the OT-BUS 06 terminal board of the 0SCHEREM00 board (see electric layout charts). The OT-BUS 06 terminal board is protected against false polarity, that is the connections can be switched.

Now close the remote control.

WARNING

When connecting the remote control, selector 11 is to be set to the COMFORT \boxtimes position, and the programmable timer, when available, has to have both channels, 1 and 2, programmed as permanently ON (see 1.2.3 paragraph).

3.2.12. External probe installation

The heating unit can be connected to an external probe for outdoor temperature measurement (standard for BV and RV models, as option for B and R models), and "sliding temperature" function operation (see 1.2.2.3 paragraph)

Refer to the heating unit layout charts when choosing the type of external probe.

The external probe wires are NOT to be routed together with the power main cables.

Position the external probe on an outside wall facing North – North / East.

Do not install the probe in the windows areas, near ventilation openings or heat sources.

In order to assure correct heating unit operation, employ only manufacturer supplied probes.

3.3. Filling up the heating system

When all system connections are performed, the CH circuit can be filled.

The procedure is to be carefully performed, following the steps below indicated:

- open all radiator air purging valves and the automatic relief valves on the heating unit;
- remove the front panel (for model R), or its lower part (for models B), of the heating unit by pulling it toward the outside;
- turn the loading tap counter-clockwise in order to allow water into the system;
- close the radiator air purging valves as soon as water comes out;
- check the gauge to show a pressure of 1-1,3 bars;
- close the loading tap and open all radiator air purging valves again;
- switch on the heating unit and allow the system to reach working temperature, then switch it off and repeat the air bleeding procedure;
- allow the system to cool down and check the water pressure to be 1-1,3 bars.

3.4. Starting up the heating unit

3.4.1. Preliminary checks

Prior to starting up the heating unit perform the following checks:

- the flue gas discharge pipe and the air intake pipe are installed correctly: while the heating unit is working, no leakage of combustion products from any of the seals is to be detected;
- the power supply voltage is 230 V - 50 Hz;
- the system is correctly filled with water (water pressure gauge reading 1-1,3 bar);
- any cut-off valves in the CH and DHW systems are open;
- the fuel supply tap is open;
- the master switch is ON;
- the safety valve is not blocked;
- no water leaks are detected;

3.4.2. Switching on and off

For instructions on how to switch the heating unit on and off, refer to the "Instructions for the user".

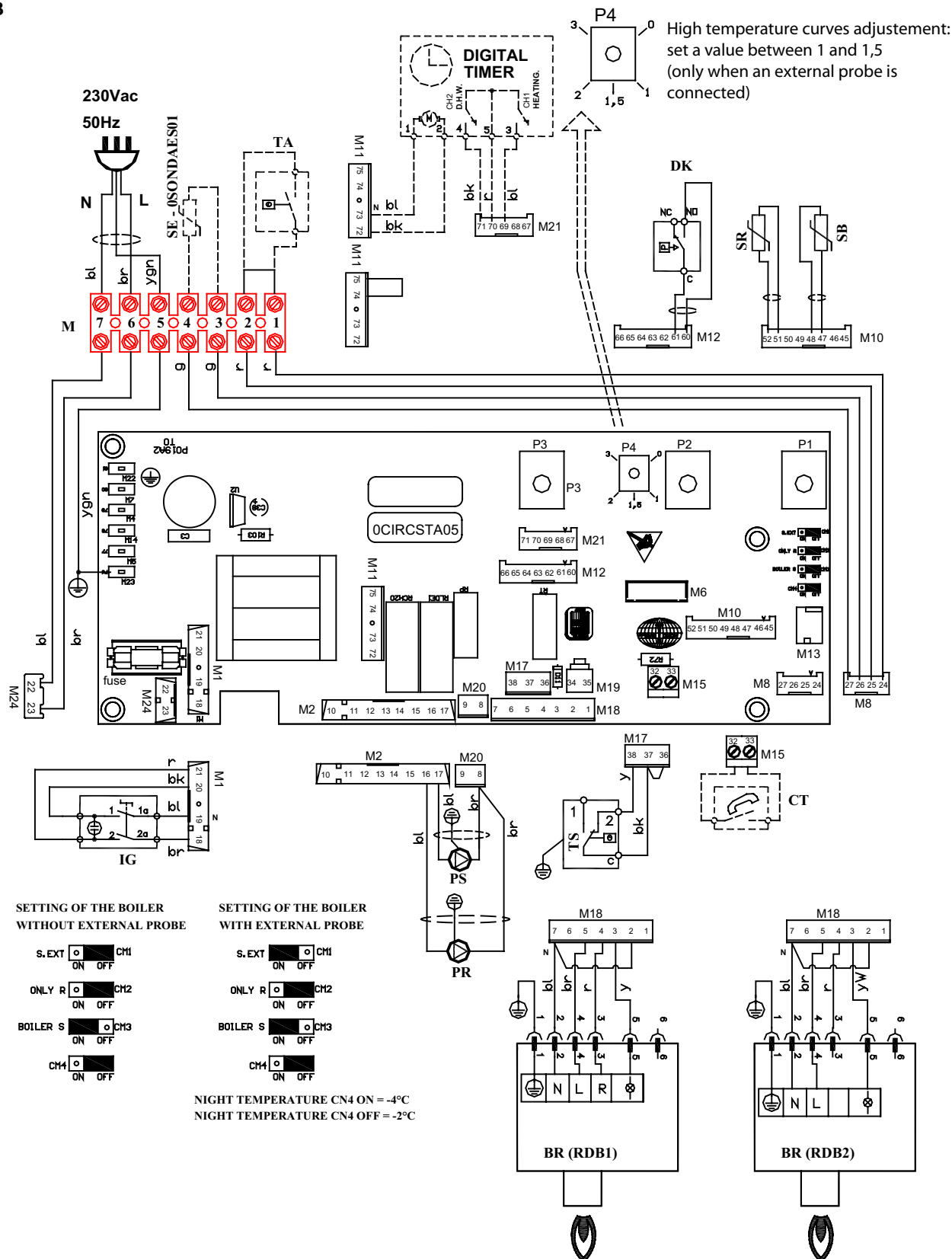
3.4.3. Burner adjustment

After starting up the heating unit it is necessary to adjust the burner (see paragraph 4.4), checking that:

- fuel oil pressure;
 - CO_2 concentration;
 - Bacharach index;
 - flue gas temperature;
- are in compliance with the values indicated in the technical data chart (see 4.4 paragraph).

3.5. Electric diagrams

MODEL B



0CIRCSTA05: MAIN ELECTRONIC BOARD

M: TERMINAL BOARD FOR CONNECTION TO POWER MAINS, EXTERNAL PROBE, ROOM THERMOSTATS

M6: CONNECTOR FOR TELE-METERING

M1-M24: AVAILABLE CONNECTIONS

TA1-TA2: ZONE 1 ROOM THERMOSTAT AND ZONE 2 ROOM THERMOSTAT (BOTH OPTIONAL EQUIPMENT)

TSM: LOW TEMPERATURE ZONE THERMOSTAT

SE: EXTERNAL PROBE, CODE 0SA0DAES01

CT: PHONE PROGRAMMER (OPTION)

FUSE: 2AF 250Vac FUSE

P4: POTENTIOMETER FOR HIGH TEMPERATURE CURVE ADJUSTMENT

P3: BOILER FUNCTION SELECTOR

P2: DHW TEMPERATURE POTENTIOMETER

P1: CH TEMPERATURE POTENTIOMETER

IG: BI-POLAR MAIN SWITCH

BR (RDB1): BURNER WITH PRE-HEATING RESISTANCE WITHOUT THERMOSTAT

BR (RDB2): BURNER WITH PRE-HEATING RESISTANCE WITH THERMOSTAT

TS: SAFETY THERMOSTAT

DK: SAFETY PRESSURE SWITCH

PR: RE-CIRCULATION PUMP OF THE SEPARATOR

PR1: HIGH TEMPERATURE ZONE PUMP

PR2: LOW TEMPERATURE ZONE PUMP

VM: MOTORIZED MIXING VALVE

PS: DHW PUMP

DIGITAL TIMER: TWIN CHANNEL ELECTRONIC DIGITAL TIMER

SB: 10K B=3435 CYLINDER PROBE

SR: 10K B=3435 CH PROBE

SM: 10K B=3435 LOW TEMPERATURE FLOW PROBE

CM1-CM2-CM3-CM4: BOILER TYPE SELECTING JUMPERS

0CREMOTO03: REMOTE CONTROL (OPTION)

0SCHEREM00: INTERFACE BOARD FOR REMOTE CONTROL

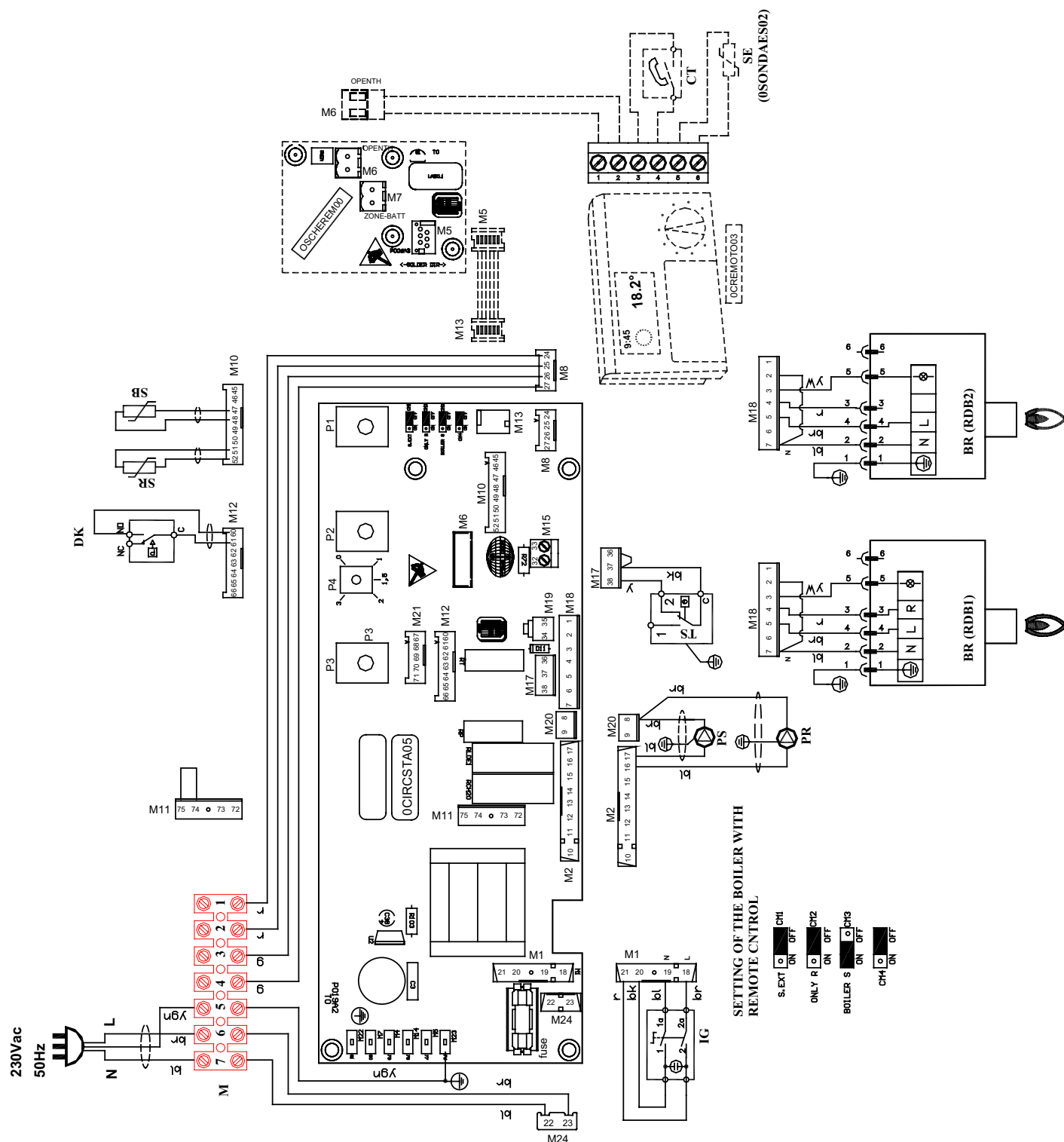
R4: POTENTIOMETER FOR LOW TEMPERATURE CURVE ADJUSTMENT

S1: MAIN CH ZONE SELECTION JUMPERS

S2: SETTING OF ZONE ELECTRONIC BOARDS

X1-X8: AVAILABLE CONNECTORS FOR ZONE ELECTRONIC BOARDS

MODEL B with REMOTE CONTROL



0CIRCSTA05: MAIN ELECTRONIC BOARD

M: TERMINAL BOARD FOR CONNECTION TO POWER MAINS, EXTERNAL PROBE, ROOM THERMOSTATS

M6: CONNECTOR FOR TELE-METERING

M1-M24: AVAILABLE CONNECTIONS

TA1-TA2: ZONE 1 ROOM THERMOSTAT AND ZONE 2 ROOM THERMOSTAT (BOTH OPTIONAL EQUIPMENT)

TSM: LOW TEMPERATURE ZONE THERMOSTAT

SE: EXTERNAL PROBE, CODE 0SA0DAES01

CT: PHONE PROGRAMMER (OPTION)

FUSE: 2AF 250Vac FUSE

P4: POTENTIOMETER FOR HIGH TEMPERATURE CURVE ADJUSTMENT

P3: BOILER FUNCTION SELECTOR

P2: DHW TEMPERATURE POTENTIOMETER

P1: CH TEMPERATURE POTENTIOMETER

IG: BI-POLAR MAIN SWITCH

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BR (RDB2): BURNER WITH PRE-HEATING RESISTANCE WITH THERMOSTAT

TS: SAFETY THERMOSTAT

DK: SAFETY PRESSURE SWITCH

PR: RE-CIRCULATION PUMP OF THE SEPARATOR

PR1: HIGH TEMPERATURE ZONE PUMP

PR2: LOW TEMPERATURE ZONE PUMP

VM: MOTORIZED MIXING VALVE

PS: DHW PUMP

DIGITAL TIMER: TWIN CHANNEL ELECTRONIC DIGITAL TIMER

SB: 10K B=3435 CYLINDER PROBE

SR: 10K B=3435 CH PROBE

SM: 10K B=3435 LOW TEMPERATURE FLOW PROBE

CM1-CM2-CM3-CM4: BOILER TYPE SELECTING JUMPERS

0CREMOTO03: REMOTE CONTROL (OPTION)

0SCHEREM00: INTERFACE BOARD FOR REMOTE CONTROL

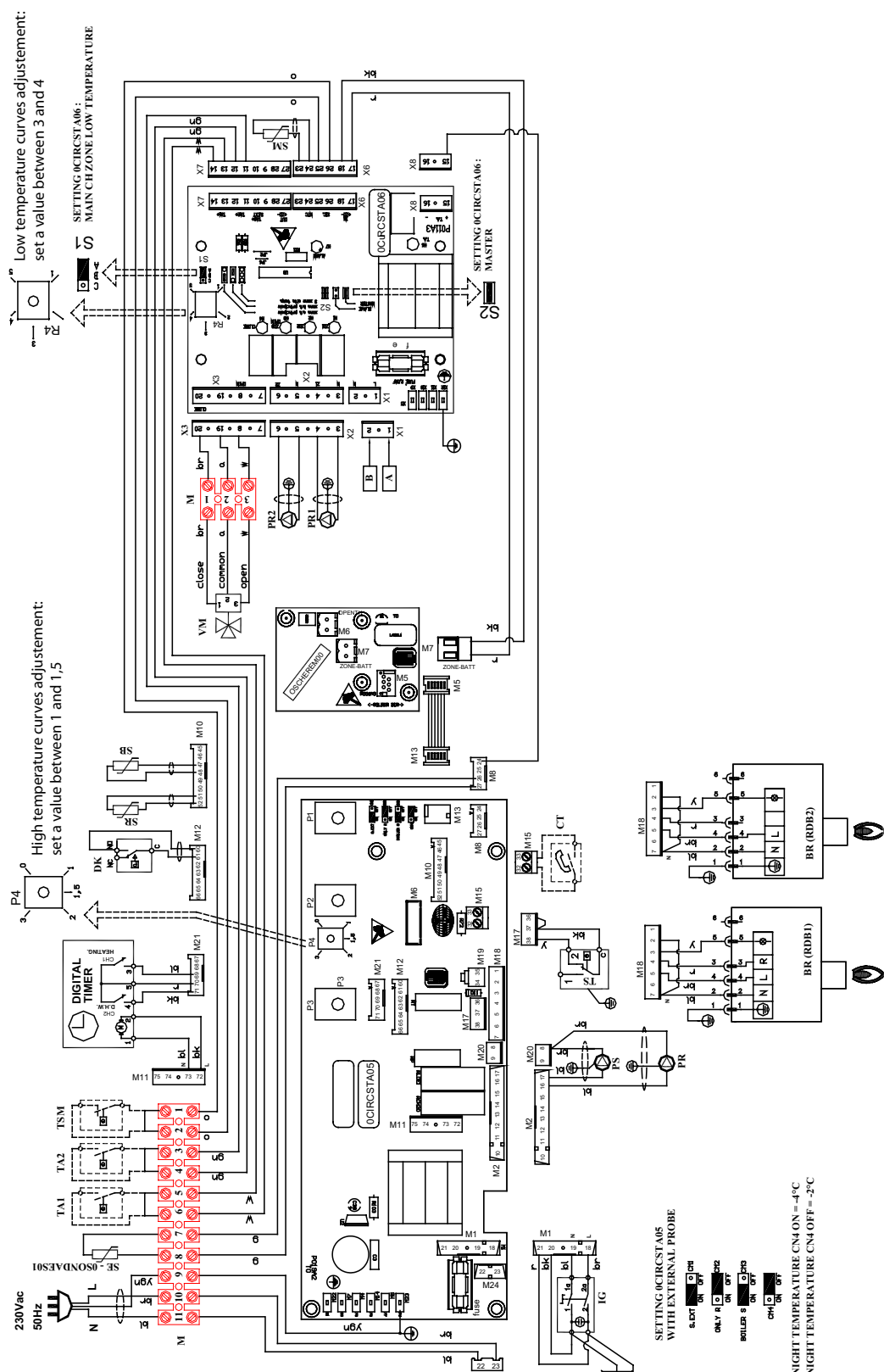
R4: POTENTIOMETER FOR LOW TEMPERATURE CURVE

ADJUSTMENT

S1: MAIN CH ZONE SELECTION JUMPERS

S2: SETTING OF ZONE ELECTRONIC BOARDS

X1-X8: AVAILABLE CONNECTORS FOR ZONE ELECTRONIC BOARDS



0CIRCSTA05: MAIN ELECTRONIC BOARD

M: TERMINAL BOARD FOR CONNECTION TO POWER MAINS,

EXTERNAL PROBE, ROOM THERMOSTATS

M6: CONNECTOR FOR TELE-METERING

M1-M24: AVAILABLE CONNECTIONS

TA1-TA2: ZONE 1 ROOM THERMOSTAT AND ZONE 2 ROOM THERMOSTAT (BOTH OPTIONAL EQUIPMENT)

TSM: LOW TEMPERATURE ZONE THERMOSTAT

SE: EXTERNAL PROBE, CODE 0SAOD

CT: PHONE PROGRAMM

FUSE: 2AF 250Vac FUSE
P4: POTENTIOMETER FOR HIGH TEMPERATURE CURVE ADJUSTMENT

P3: BOILER FUNCTION SELECTOR

P2: DHW TEMPERATURE POTENTIOMETER

P1: CH TEMPERATURE POTENTIOMETER

IG: BI-POLAR MAIN SWITCH

BR (RDB1): BURNER WITH PRE-HEATING RESISTANCE WITHOUT THERMOSTAT

BR (RDB2): BURNER WITH PRE-HEATING RESISTANCE WITH THERMOSTAT
TS: SAFETY THERMOSTAT

DK: SAFETY PRESSURE SWITCH

PR: RE-CIRCULATION PUMP OF THE SEPARATOR

PR1: HIGH TEMPERATURE ZONE PUMP

PR2: LOW TEMPERATURE ZONE

VM. MOTORIZED MIXING VALVE

PS: DHW PUMP

DIGITAL TIMER: TWIN CHANNEL ELECTRONIC DIGITAL TIMER

SB: 10K B=3435 CYLINDER PROBE

SR: 10K B=3435 CH PROBE

SM: 10K B=3435 LOW TEMPERATURE FLOW PROBE

CM1-CM2-CM3-CM4: BOILER TYPE SELECTING JUMPERS

0CREMOTO03: REMOTE CONTROL (OPTION)

00SCHEREM00: INTERFACE BOARD FOR REMOTE CONTROL

R4: POTENTIOMETER FOR LOW TEMPERATURE CURVE ADJUSTMENT

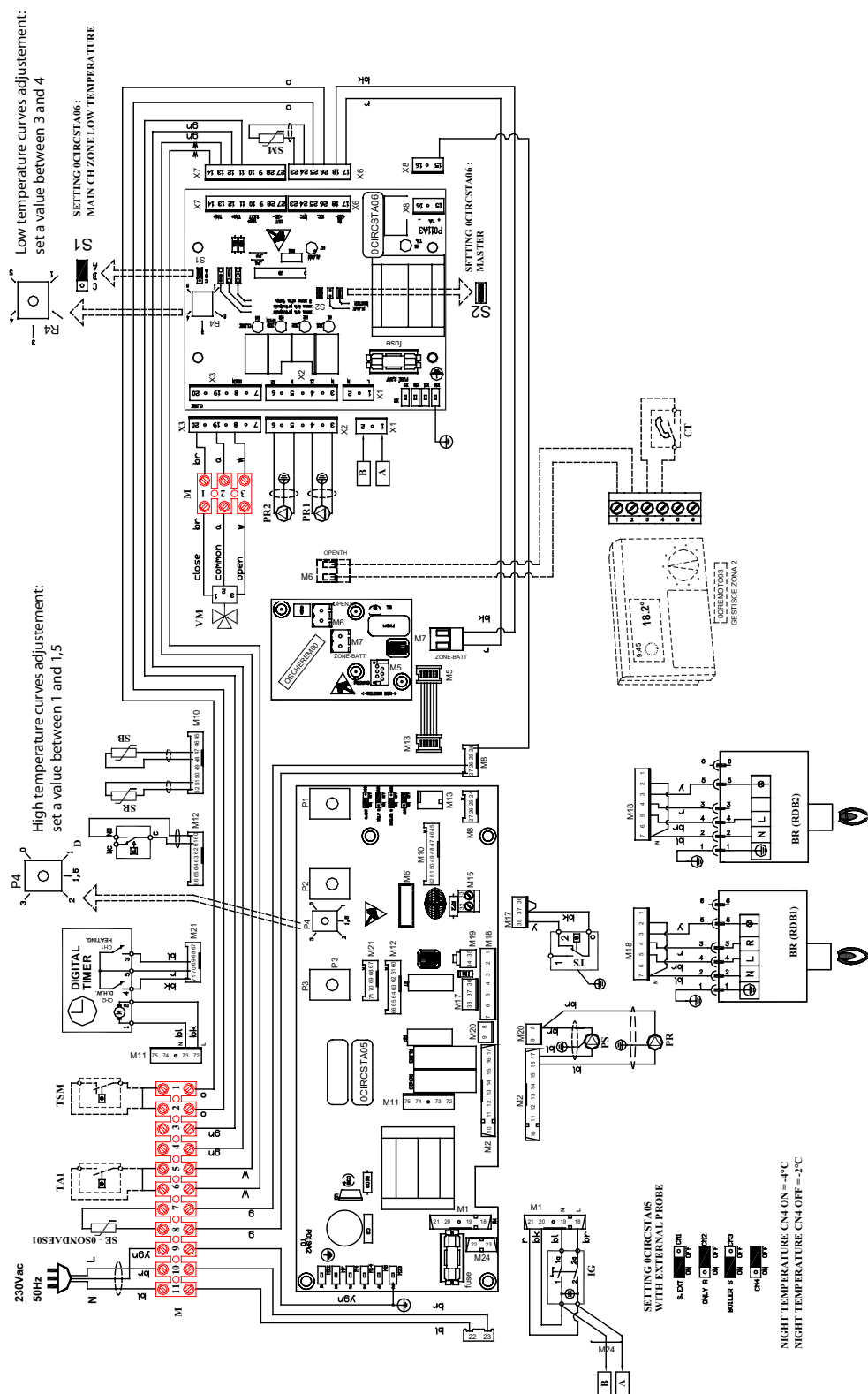
S1: MAIN CH ZONE SELECTION JUMPERS

S2: SETTING OF ZONE ELECTRONIC BOARDS

X1-X8: AVAILABLE CONNECTORS FOR ZONE ELECTRONIC

BOARDS

MODEL BV with REMOTE CONTROL

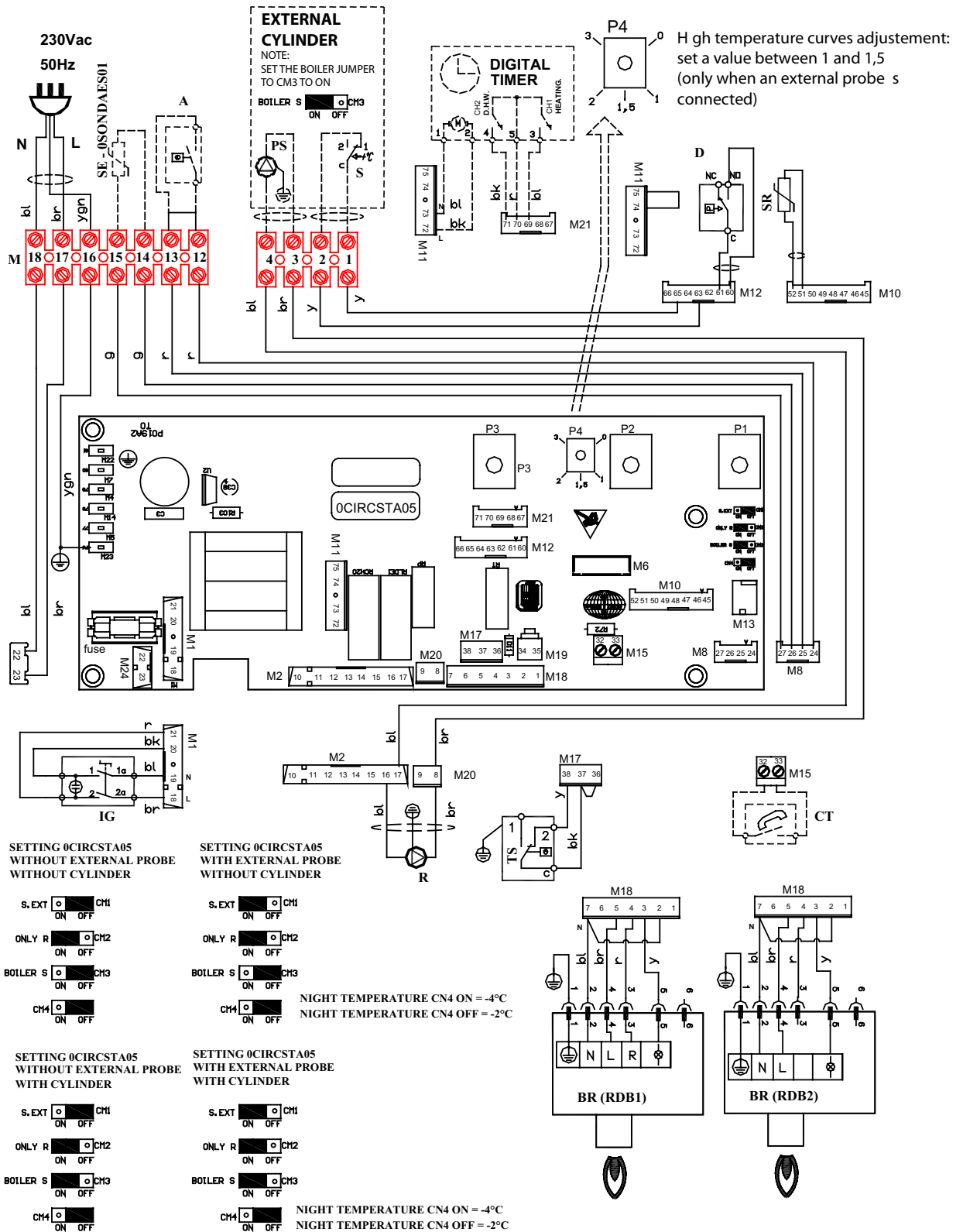


OCIRCSTA05: MAIN ELECTRONIC BOARD
M: TERMINAL BOARD FOR CONNECTION TO POWER MAINS, EXTERNAL PROBE, ROOM THERMOSTATS
M6: CONNECTOR FOR TELE-METERING
M1-M24: AVAILABLE CONNECTIONS
TA1-TA2: ZONE 1 ROOM THERMOSTAT AND ZONE 2 ROOM THERMOSTAT (BOTH OPTIONAL EQUIPMENT)
TSM: LOW TEMPERATURE ZONE THERMOSTAT
SE: EXTERNAL PROBE, CODE 0SAODAES01
CT: PHONE PROGRAMMER (OPTION)
FUSE: 2AF 250Vac FUSE
P4: POTENTIOMETER FOR HIGH TEMPERATURE CURVE ADJUSTMENT
P3: BOILER FUNCTION SELECTOR
P2: DHW TEMPERATURE POTENTIOMETER

P1: CH TEMPERATURE POTENTIOMETER
IG: BI-POLAR MAIN SWITCH
BR (RDB1): BURNER WITH PRE-HEATING RESISTANCE WITHOUT THERMOSTAT
BR (RDB2): BURNER WITH PRE-HEATING RESISTANCE WITH THERMOSTAT
TS: SAFETY THERMOSTAT
DK: SAFETY PRESSURE SWITCH
PR: RE-CIRCULATION PUMP OF THE SEPARATOR
PR1: HIGH TEMPERATURE ZONE PUMP
PR2: LOW TEMPERATURE ZONE PUMP
VM: MOTORIZED MIXING VALVE
PS: DHW PUMP
DIGITAL TIMER: TWIN CHANNEL ELECTRONIC DIGITAL TIMER

SB: 10K B=3435 CYLINDER PROBE
SR: 10K B=3435 CH PROBE
SM: 10K B=3435 LOW TEMPERATURE FLOW PROBE
CM1-CM2-CM3-CM4: BOILER TYPE SELECTING JUMPERS
0CREMOTO03: REMOTE CONTROL (OPTION)
0SCHEREM00: INTERFACE BOARD FOR REMOTE CONTROL
R4: POTENTIOMETER FOR LOW TEMPERATURE CURVE ADJUSTMENT
S1: MAIN CH ZONE SELECTION JUMPERS
S2: SETTING OF ZONE ELECTRONIC BOARDS
X1-X8: AVAILABLE CONNECTORS FOR ZONE ELECTRONIC BOARDS

MODEL R



0CIRCSTA05: MAIN ELECTRONIC BOARD

M: TERMINAL BOARD FOR CONNECTION TO POWER MAINS, EXTERNAL PROBE, ROOM THERMOSTATS

M6: CONNECTOR FOR TELE-METERING

M1-M24: AVAILABLE CONNECTIONS

TA1-TA2: ZONE 1 ROOM THERMOSTAT AND ZONE 2 ROOM THERMOSTAT (BOTH OPTIONAL EQUIPMENT)

TSM: LOW TEMPERATURE ZONE THERMOSTAT

SE: EXTERNAL PROBE, CODE 0SA0DAES01

CT: PHONE PROGRAMMER (OPTION)

FUSE: 2AF 250Vac FUSE

P4: POTENTIOMETER FOR HIGH TEMPERATURE CURVE ADJUSTMENT

P3: BOILER FUNCTION SELECTOR

P2: DHW TEMPERATURE POTENTIOMETER

P1: CH TEMPERATURE POTENTIOMETER

IG: BI-POLAR MAIN SWITCH

BR (RDB1): BURNER WITH PRE-HEATING RESISTANCE WITHOUT THERMOSTAT

BR (RDB2): BURNER WITH PRE-HEATING RESISTANCE WITH THERMOSTAT

TS: SAFETY THERMOSTAT

DK: SAFETY PRESSURE SWITCH

PR: RE-CIRCULATION PUMP OF THE SEPARATOR

PR1: HIGH TEMPERATURE ZONE PUMP

PR2: LOW TEMPERATURE ZONE PUMP

VM: MOTORIZED MIXING VALVE

PS: DHW PUMP

DIGITAL TIMER: TWIN CHANNEL ELECTRONIC DIGITAL TIMER

SB: 10K B=3435 CYLINDER PROBE

SR: 10K B=3435 CH PROBE

SM: 10K B=3435 LOW TEMPERATURE FLOW PROBE

CM1-CM2-CM3-CM4: BOILER TYPE SELECTING JUMPERS

0CREMOTO03: REMOTE CONTROL (OPTION)

0SCHEREM00: INTERFACE BOARD FOR REMOTE CONTROL

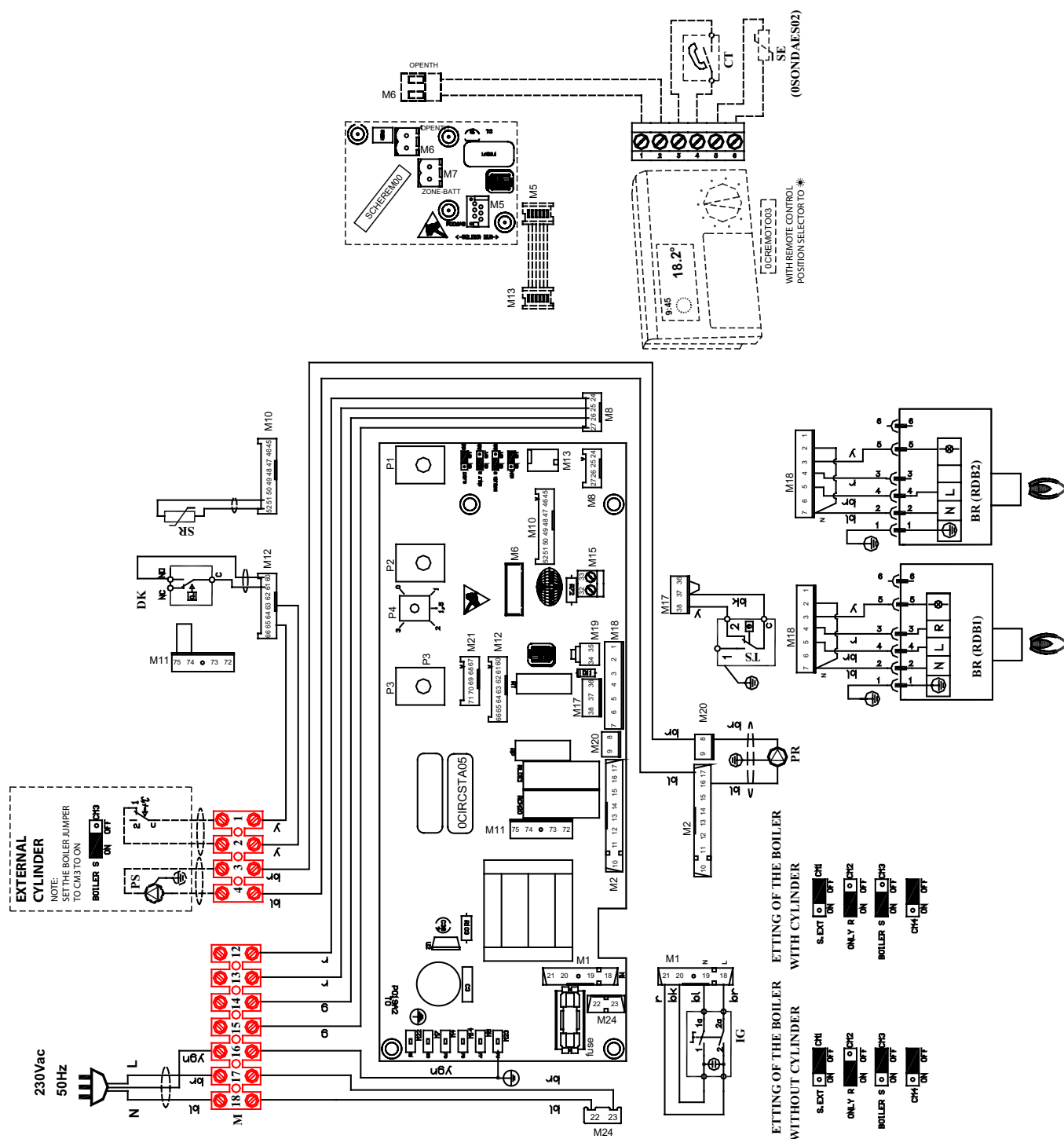
R4: POTENTIOMETER FOR LOW TEMPERATURE CURVE ADJUSTMENT

S1: MAIN CH ZONE SELECTION JUMPERS

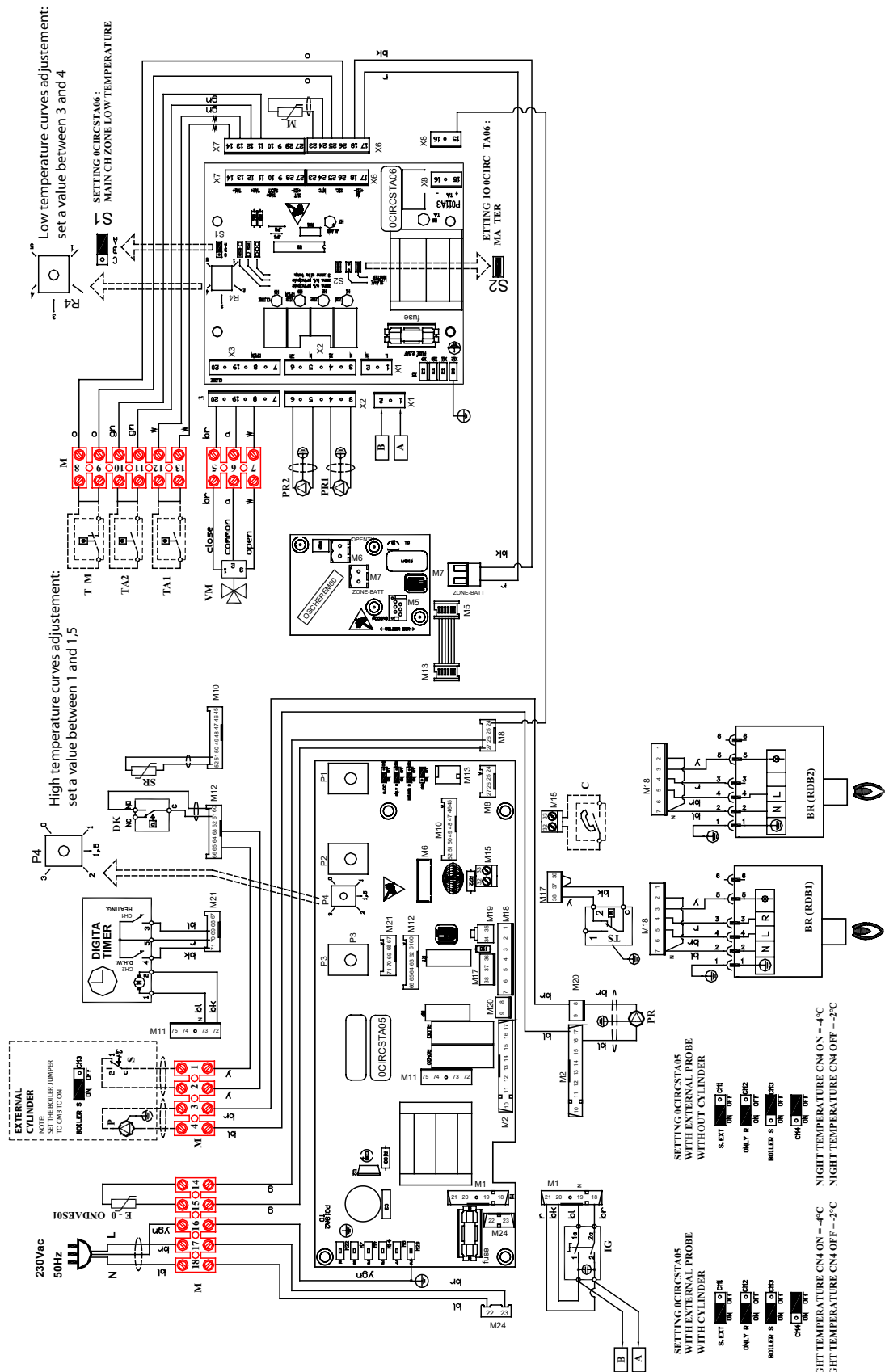
S2: SETTING OF ZONE ELECTRONIC BOARDS

X1-X8: AVAILABLE CONNECTORS FOR ZONE ELECTRONIC BOARDS

MODEL R with REMOTE CONTROL



MODEL RV

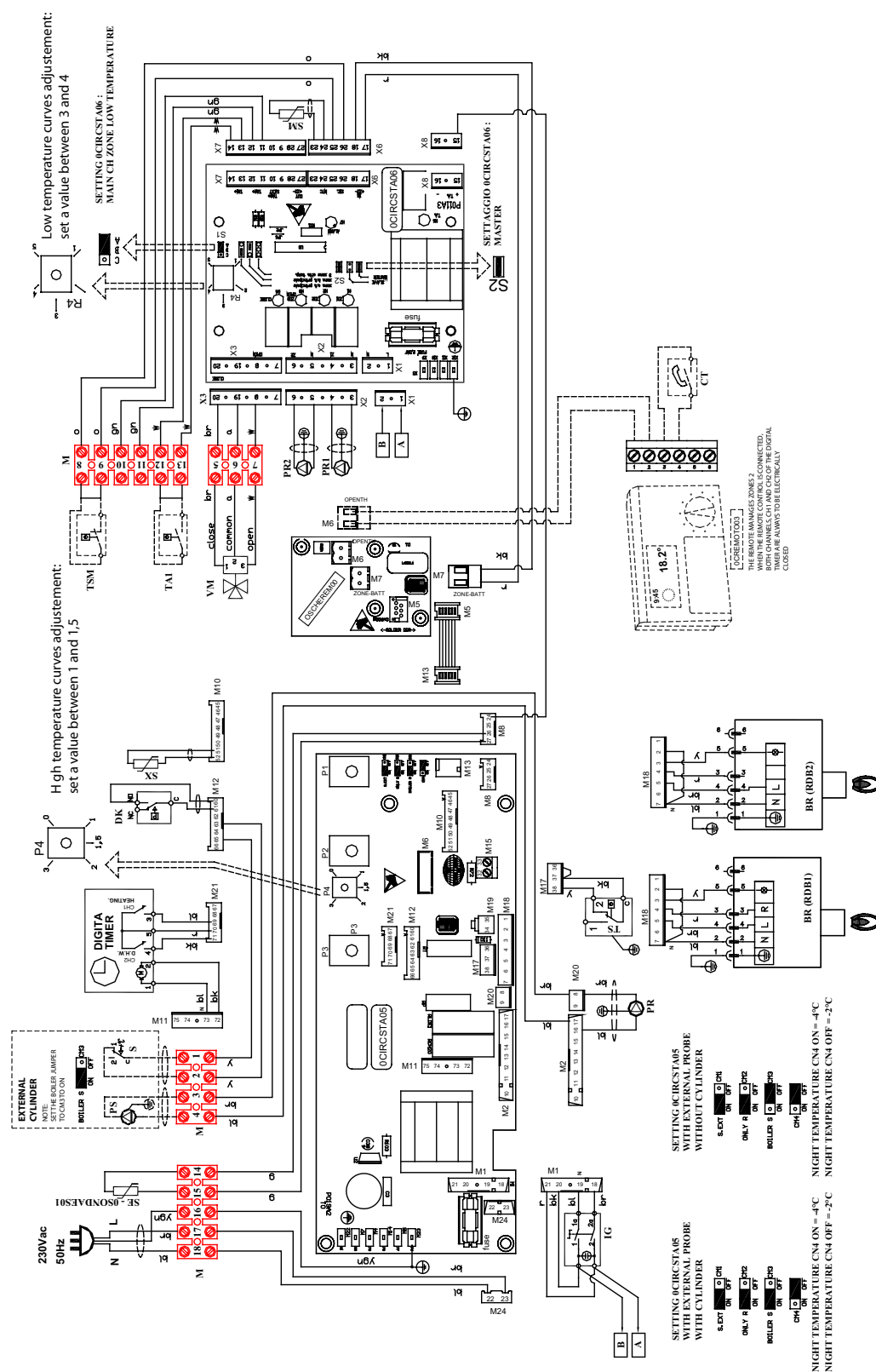


OCIRCSTA05: MAIN ELECTRONIC BOARD
M: TERMINAL BOARD FOR CONNECTION TO POWER MAINS, EXTERNAL PROBE, ROOM THERMOSTATS
M6: CONNECTOR FOR TELE-METERING
M1-M24: AVAILABLE CONNECTIONS
TA1-TA2: ZONE 1 ROOM THERMOSTAT AND ZONE 2 ROOM THERMOSTAT (BOTH OPTIONAL EQUIPMENT)
TSM: LOW TEMPERATURE ZONE SAODAES01
SE: EXTERNAL PROBE, CODE 0SAODAES01
CT: PHONE PROGRAMMER (OPTION)
FUSE: 2AF 250Vac FUSE
P4: POTENTIOMETER FOR HIGH TEMPERATURE CURVE ADJUSTMENT
P3: BOILER FUNCTION SELECTOR
P2: DHW TEMPERATURE POTENTIOMETER

P1: CH TEMPERATURE POTENTIOMETER
IG: BI-POLAR MAIN SWITCH
BR (RDB1): BURNER WITH PRE-HEATING RESISTANCE WITHOUT THERMOSTAT
BR (RDB2): BURNER WITH PRE-HEATING RESISTANCE WITH THERMOSTAT
TS: SAFETY THERMOSTAT
DK: SAFETY PRESSURE SWITCH
PR: RE-CIRCULATION PUMP OF THE SEPARATOR
PR1: HIGH TEMPERATURE ZONE PUMP
PR2: LOW TEMPERATURE ZONE PUMP
VM: MOTORIZED MIXING VALVE
PS: DHW PUMP
DIGITAL TIMER: TWIN CHANNEL ELECTRONIC DIGITAL TIMER
SB: 10K B=3435 CYLINDER PROBE

SR: 10K B=3435 CH PROBE
SM: 10K B=3435 LOW TEMPERATURE FLOW PROBE
CM1-CM2-CM3-CM4: BOILER TYPE SELECTING JUMPERS
OCREMOTO03: REMOTE CONTROL (OPTION)
OSCHEREM00: INTERFACE BOARD FOR REMOTE CONTROL
R4: POTENTIOMETER FOR LOW TEMPERATURE CURVE ADJUSTMENT
S1: MAIN CH ZONE SELECTION JUMPERS
S2: SETTING OF ZONE ELECTRONIC BOARDS
X1-X8: AVAILABLE CONNECTORS FOR ZONE ELECTRONIC BOARDS

MODEL RV with REMOTE CONTROL



0CIRCSTA05: MAIN ELECTRONIC BOARD

M: TERMINAL BOARD FOR CONNECTION TO POWER MAINS.

EXTERNAL PROBE, ROOM THERMOSTATS

M6: CONNECTOR FOR THERMISTOR

M1-M24: AVAILABLE CONNECTIONS

TA1-TA2: ZONE 1 ROOM THERMOSTAT AND ZONE 2 ROOM

THERMOSTAT (BOTH OPTIONAL EQUIPMENT)

TSM: LOW TEMPERATURE ZONE THERMOSTAT

TSM: LOW TEMPERATURE ZONE THE
SE: EXTERNAL PROBE CODE 06A0D

SE: EXTERNAL PROBE, CODE 0SAOD
SE: PHONE PROGRAMMER (OPTION)

CT: PHONE PROGRAMM
FLUSE: 2AE 250V/20 FLUSE

FUSE: 2AF 250Vac FUSE

P4: POTENTIO

ADJUSTMENT

P3: BOILER FUNCTION SELECTOR

P1: CH TEMPERATURE POTENTIOMETER

IG: BI-POLAR MAIN SWITCH

BR (RDB1): BURNER WITH PRE-HEATING RESISTANCE

WITHOUT THERMOSTAT

BB (BDB2): BURNER WITH I

THERMOSTAT

TS: SAFETY THERMOSTAT

TS: SAFETY THERMOSTAT
DK: SAFETY PRESSURE SWITCH

DK: SAFETY PRESSURE SWITCH
RB: RE CIRCULATION PUMP OF THE SE

PR: RE-CIRCULATION PUMP OF THE SE
 004 HIGH TEMPERATURE ZONE PUMP

PR1: HIGH TEMPERATURE ZONE

VM. MOTORIZED MIXING VALVE

PS: DHW PUMP

DIGITAL TIMER: TWIN CHANNEL EL

SR: 10K B=3435 CH PROBE

SM: 10K B=3435 LOW TEMPERATURE FLOW PROBE

CM1-CM2-CM3-CM4: BOILER TYPE SELECTING JUMPEBS

QCBEMOTO03: REMOTE CONTROL (OPTION)

OSCHBEM00: INTERFACE BOARD FOR REMOTE CONTROL

B4: POTENTIOMETER FOR LOW TEMPERATURE CURVE

R4: POTENTIOMETER FOR LOW TEMPERA ADJUSTMENT

ADJUSTMENT

S1: MAIN CH ZONE SELECTION JUMBERS

S1: MAIN CH ZONE SELECTION JUMPERS
S2: SETTING OF ZONE ELECTRONIC BOARDS

S2: SETTING OF ZONE ELECTRONIC BOARDS

X1-X8: AVAILABLE CONNECTORS FOR ZONE ELECTRONIC BOARDS

BOARDS

4. OIL BURNER

4.1. Description

The heating unit is equipped with a single-stage oil burner, bearing the CE mark, and complying with EC product Directives.

4.2. Installing the burner on the heating unit

The burner is mounted on the heating unit by means of its own aluminum flange, and held in position by a projecting screw and nut. In order to remove the burner, unscrew the nut A and remove the burner (see pic. 10).

4.3. Hydraulic system

The burner pump can generate a maximum depression of 0.4 bar. Vapors are produced when this value is exceeded. The oil pipes must be perfectly airtight, in order to prevent air intake.

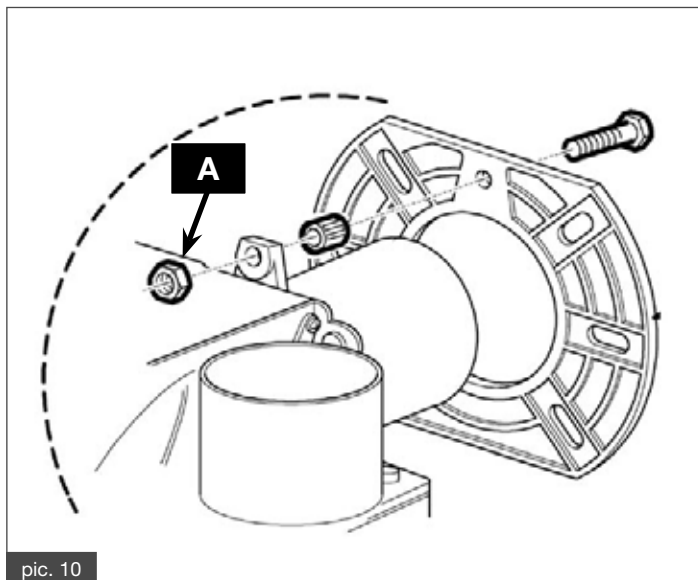
It is mandatory to install a filter on the fuel oil supply pipe.

The burner pump is designed to operate in a twin-pipe system. In order to supply via a single pipe, unscrew cap 2 and remove the grub screw 3. Afterwards, re-install cap 2 (pic. 11).

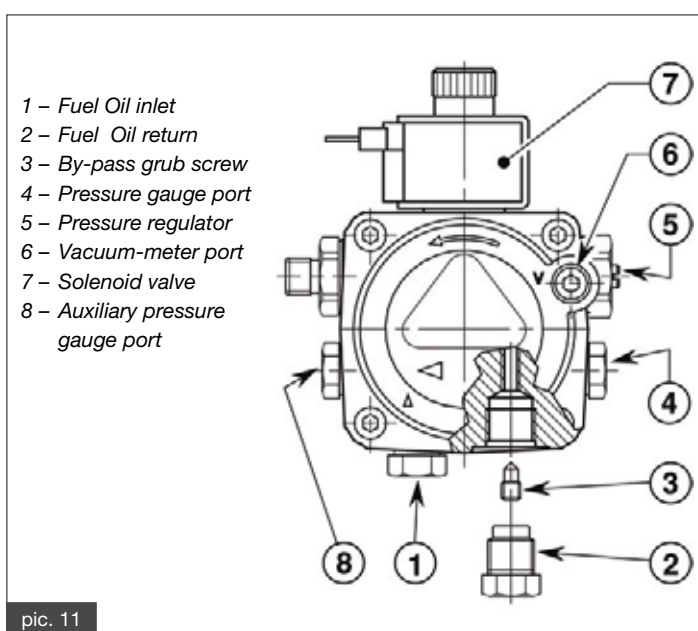
WARNING

In twin-pipe systems, before starting up the burner, make sure the return pipe is not clogged: an excessive back pressure might damage the pump.

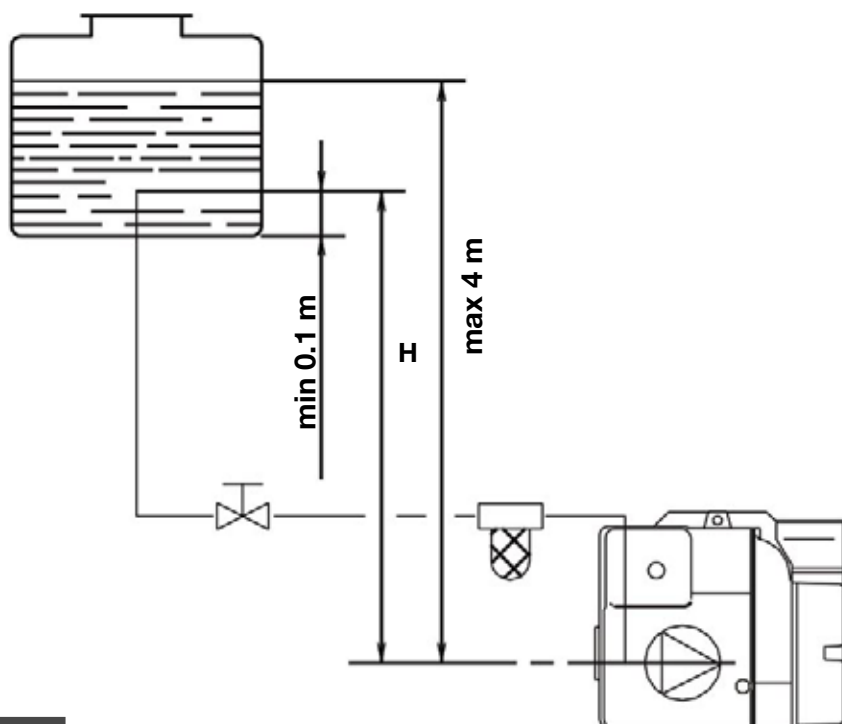
Pic.12 shows gravity, single pipe, fuel oil supply system



pic. 10



pic. 11



pic. 12

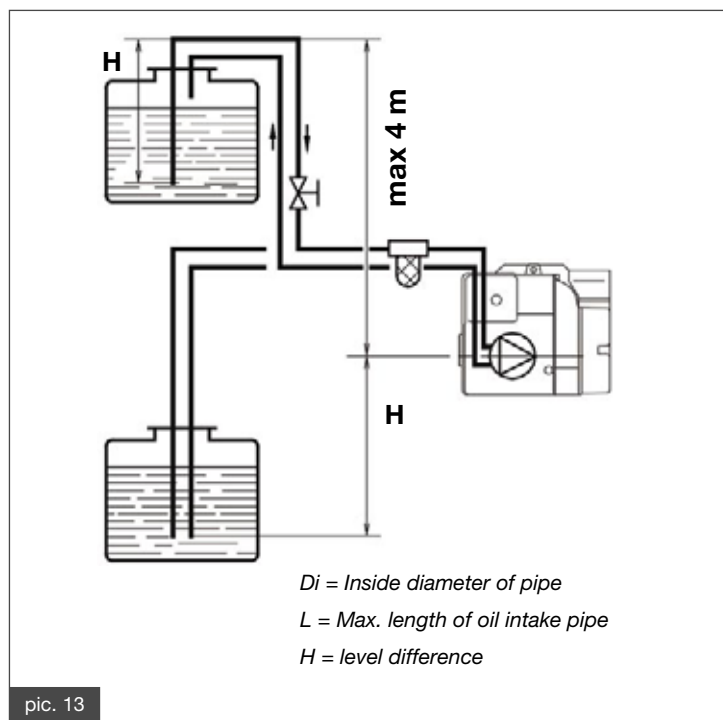
D_i = Inside diameter of pipe

L = Max. length of oil intake pipe

H = level difference

| H (m) | Pipe L (m) | |
|----------|---------------|---------------|
| | Pipe 8 mm | Pipe 10 mm |
| 0,5 | 10 | 20 |
| 1 | 20 | 40 |
| 1,5 | 40 | 80 |
| 2 | 60 | 100 |

Picture 13 shows a twin-pipe fuel oil supply system. When oil is fed from a tank, the return pipe must end at the same height as the feeding pipe. Should the return pipe be positioned above the oil level, a non return valve is to be installed on the feeding pipe to prevent it from emptying.



WARNING

A cut-off valve (manual or solenoid) must be fitted on the oil supply pipe.

The burner hose pipes must be inspected regularly.

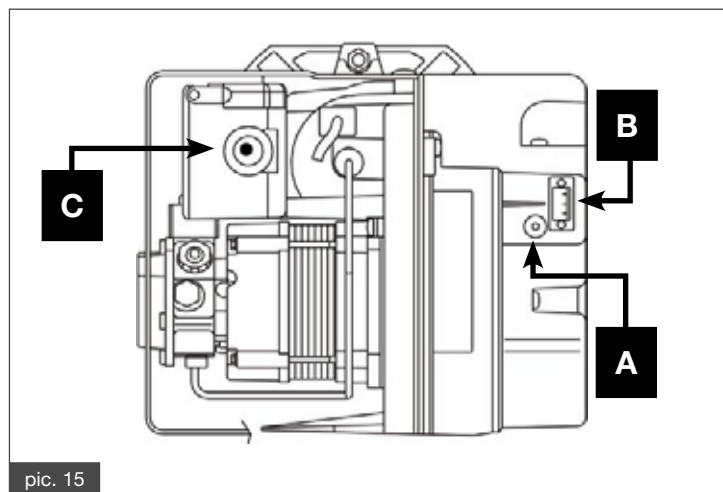
4.4. Combustion adjustment

When regulating combustion, adhere to the CO₂, flue gas temperature, Bacharach index and oil pressure values shown on the technical data charts.

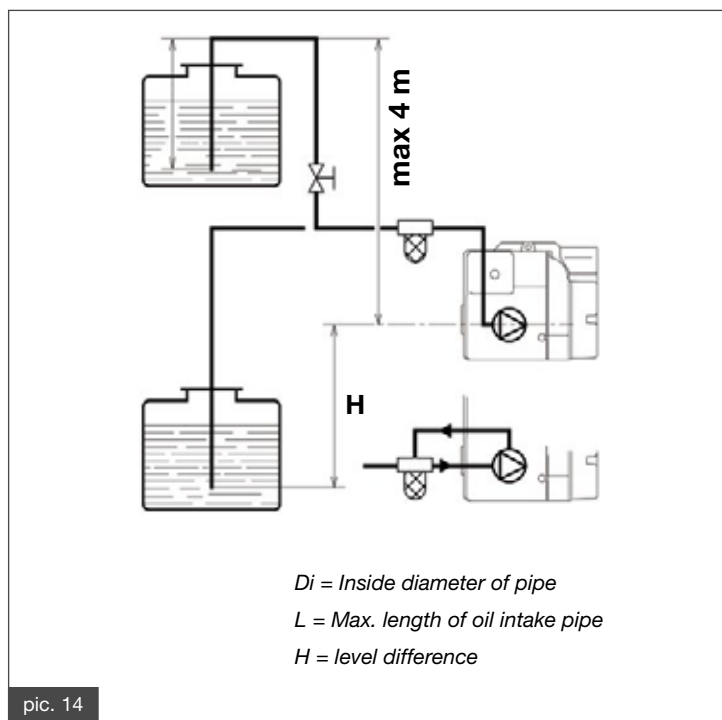
The burner combustion head is a fixed type and does not require adjustment.

Combustion air can be adjusted by turning the socket screw A shown in pic. 15. The setting is shown on the relevant, graduated scale B.

The oil pressure can be adjusted by turning screw 5 in pic. 11. Refer to the technical data charts for the required value.



The burner performs best when the return pipe is immersed in the oil. Picture 14 refers to a single-pipe system.



WARNING

Each installation has its own setting, it cannot be predicted in advance: that is the combustion needs to be adjusted once the system is installed.

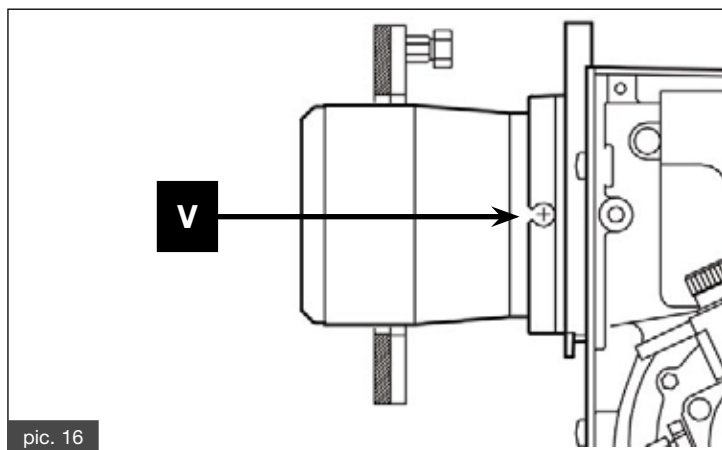
4.5. Removing the nozzle

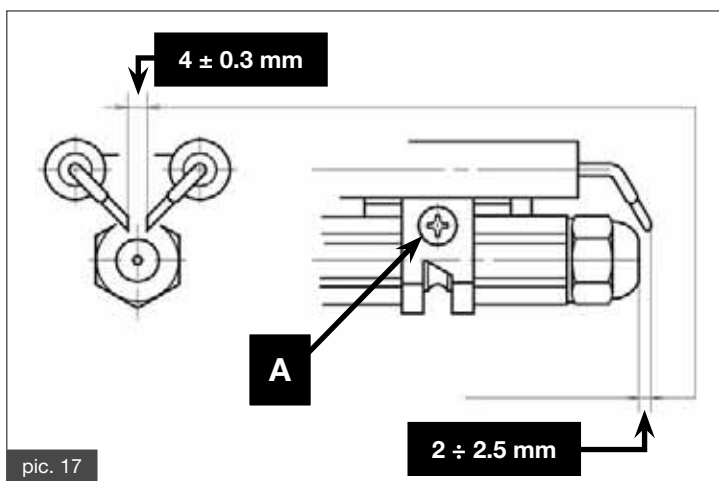
Proceed as follows to remove the nozzle:

- remove the two screws V in pic. 12, and the burner head;
- remove the electrodes by taking off screw A in pic. 13;
- remove the nozzle using one 17 mm and one 16 mm spanner.

4.6. Adjusting the electrodes

It is essential to keep to the correct distance between the electrodes, and between the nozzle and the electrodes, for best burner operation (pic. 13).

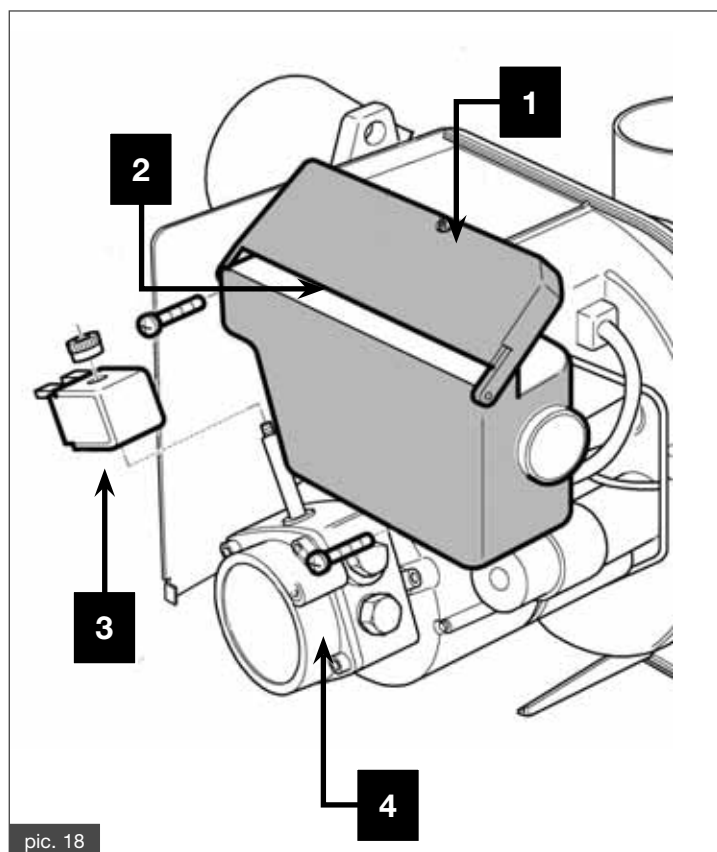




4.7. Replacing the control unit

Proceed as follows in order to replace the burner control unit (see pic. 18).

- Remove screw 1, open lid 2 and disconnect the wires.
- Remove coil 3.
- Remove the two screws 4.



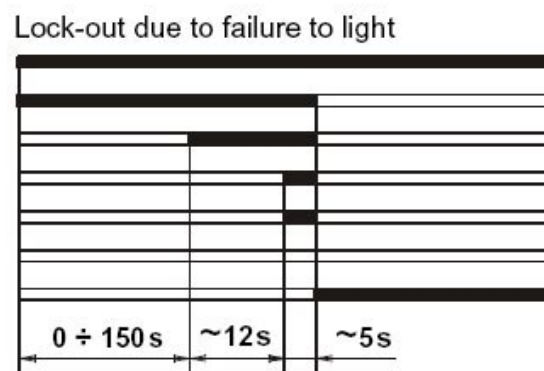
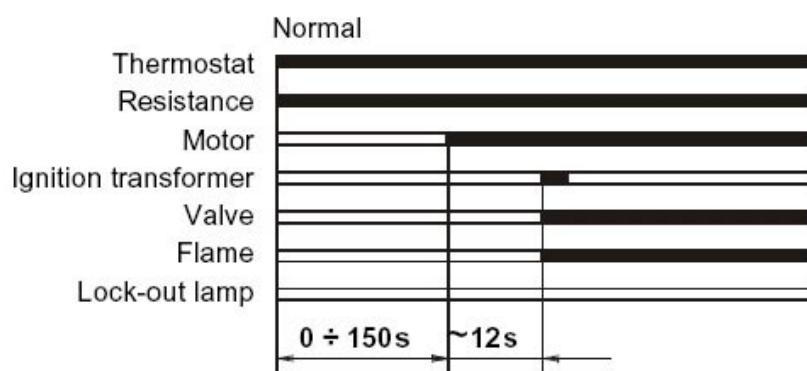
4.8. Burner ignition cycle

The burner ignition cycle is shown in pic.19 chart.

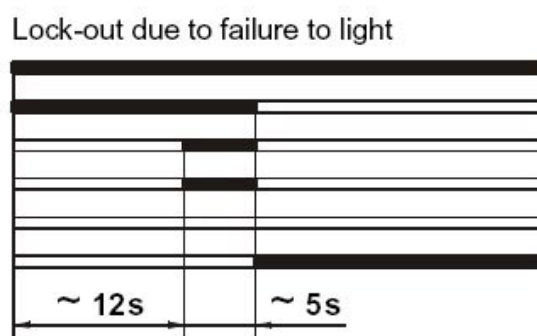
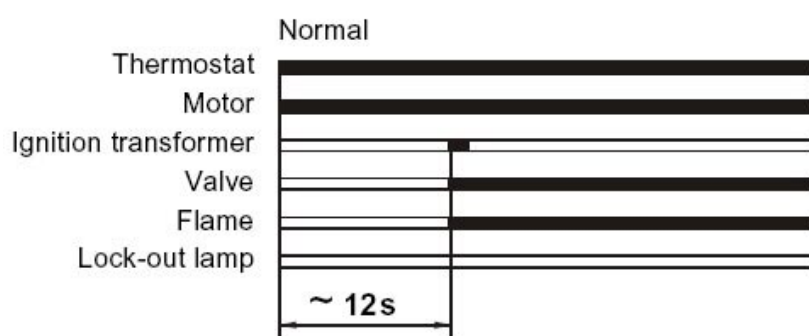
In the event of shutdown, the red light 7 on the control panel (pic. 1) comes on and the reset button C on the burner (pic. 15) lights up, press the button in order to reset.

Shake lightly the box and remove high tension connections.

Ignition cycle models 23 and 33



Ignition cycle model 43



pic. 19

Picture 20 shows the wiring diagrams of the burners.



4.10. Burner trouble-shooting

| Malfunction | Probable cause | Probable cause |
|--|--|---|
| The burner does not switch on when it receives a start signal from the room thermostat | Power mains not connected | Check tension at the terminals |
| | | Check the fuse |
| | | Check the room thermostat |
| | The optical resistance reads a false light | Eliminate the false light |
| | The control unit is not connected properly | Check the terminal connections |
| The burner performs pre-purge correctly and then shuts down | The optical resistance is dirty | Clean it |
| | The optical resistance is faulty | Replace it |
| | The flame goes out or does not light | Check the fuel oil pressure |
| | | Check that fuel oil flows from the nozzle |
| | | Check the air |
| | | Check the solenoid valve |
| The burner starts up after one failed attempt | | Change the nozzle |
| | The distance of ignition electrodes is wrong | Position the electrodes as instructed |
| | The air flow is too high | Adjust the air flow |
| | The nozzle is dirty or damaged | Replace it |
| | The resistance is faulty | Replace it |

5. TESTING THE HEATING UNIT

5.1. Preliminary checks

Before testing the heating unit (or perform a first ignition), carry out the following checks:

- verify the heating unit was installed in compliance with legal requirements;
- make sure the flue gas discharge pipe is installed correctly.

When the heating unit is operating, there is not to be any leakage of combustion products from the seals;

- check that the supply voltage is 230 V - 50 Hz;
- make sure the system is filled (water pressure gauge reading is to be 1-1,3 bar);
- verify any cut-off valves in the system are open;
- check for oil leaks;

- master switch is to be set to ON;
- check the safety valve not to be jammed;
- check for water leaks.

If the heating unit is not installed in compliance with the relevant laws and standards, do not switch it on and inform the system supervisor.

5.2. Switching on and off

For instructions on how to switch the heating unit on and off, refer to the "Instructions for the user" section in this manual.

6. MAINTENANCE

In order to ensure correct and efficient heating unit operation, have it serviced according to the following schedule and complying to the legal requirements.

Appropriate maintenance ensures correct, environmentally friendly, and safe operation of the heating unit for people, animals and property. All maintenance (and repair) procedures must be carried out by qualified service technicians.

T

accurately trained personnel.

6.1. Maintenance schedule

Routine maintenance is to include the following:

- general check and inspection of the heating unit;
- check for leaks of the oil supply system;
- check that the heating unit switches on correctly;
- check combustion parameters through flue gas analysis;
- check condition, state and tightness of flue gas discharge pipes;
- check all safety devices of the heating unit to be working;
- check the fittings for water leaks and oxidation;
- check efficiency of the safety valve;
- check the safety thermostat;
- check the safety valve;
- check pressure of the expansion vessel;
- check efficiency of the water pressure switch.

and the following cleaning operations:

- internal cleaning of the heating unit;
- clean the burner and adjustment as necessary (see "combustion adjustment" section);
- clean the ventilation grille of the boiler room;
- clean the flue gas side of the heat exchanger.

When servicing the unit for the first time, perform the following checks:

- verify the suitability of the room of installation;
- burner cleaning and adjustment when necessary (see "combustion adjustment");
- cleaning of the ventilation openings of the boiler room;
- cleaning of the flue gas side of the heat exchanger.

When first service is performed on the heating unit , also check the following:

- boiler room suitability
- vent openings
- flue gas discharge ducts, diameters and length
- installation of the heating unit in accordance to the instructions in this manual.

If the hea

the system supervisor both verbally and by filling out a written declaration.

7. HEATING UNIT TROUBLE-SHOOTING

| HEATING UNIT CONDITION | MALFUNCTION | PROBABLE CAUSE | REMEDY |
|---|---|---|--|
| The heating unit has shut down, the red shutdown light no.1 is ON. | See 4.10 paragraph "Burner troubleshooting". | See 4.10 paragraph "Burner troubleshooting". | See 4.10 paragraph "Burner troubleshooting". |
| The heating unit has shut down, the red shutdown light no.2 is ON. Press no.17 button in order to reset the unit. | The safety thermostat has shutdown the heating unit | Water is not flowing in the CH system: the pipes are clogged, the thermostatic valves are closed, the system cut-off valves are closed. | Check the system. |
| | | The pump is jammed or faulty. | Check the pump. |
| The heating unit has shut down, the red shutdown light no.4 is flashing. Restore correct water pressure in order to resume unit operation. | Insufficient water pressure in the CH system | CH system is leaking. | Check the system. |
| | | Pressure switch is disconnected. | Reconnect it. |
| | | Pressure switch is not working: it is faulty. | Replace it. |
| The heating unit has shut down, the red shutdown light no.5 is flashing. The unit will automatically resume operation once the problem is solved. | Flow probe is faulty. | Flow probe is disconnected. | Reconnect it. |
| | | Flow probe is faulty. | Replace it. |
| The heating unit has shut down, the red shutdown light no.6 is flashing. The unit will automatically resume operation once the problem is solved. | Communication with the remote control is faulty or there are connection problems. | The remote control wire is disconnected from the remote contacts or from the heating unit contacts or it is interrupted. | Check the remote control connecting wire. |
| The heating unit has shut down, the red shutdown light no.7 is flashing (B and BV models). The unit will automatically resume operation once the problem is solved. | Water tank probe is faulty. | Water tank probe is disconnected. | Reconnect it. |
| | | Water tank probe is faulty. | Replace it. |
| The red light no.9 is flashing and the heating unit has not shut down. The unit will automatically resume operation once the problem is solved. | Temperature of water in the boiler has exceeded 80°C. | Water is not flowing in the CH system: the pipes are clogged, the thermostatic valves are closed, the system cut-off valves are closed. | Check the system. |
| | | The pump is jammed or faulty. | Check the pump. |
| The heating unit is not operating in DHW mode. (B and BV models). | Water flow to tank is not adequate. | The system pressure or flow rate is not adequate. | Check the DHW system. |
| | Water tank probe is not working. | Water tank probe is faulty. | Replace it. |



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