

Steel Pro Power

EN INSTALLATION, TECHNICAL ASSISTANCE SERVICE AND SYSTEM MANAGEMENT MANUAL

RIELLO

RANGE

| MODEL | CODE |
|-------------------------|----------|
| STEEL PRO POWER 114-2 P | 20138572 |
| STEEL PRO POWER 140-2 P | 20138573 |
| STEEL PRO POWER 180-2 P | 20138574 |
| STEEL PRO POWER 230-2 P | 20138575 |
| STEEL PRO POWER 270-2 P | 20138576 |
| STEEL PRO POWER 300-3 P | 20138577 |
| STEEL PRO POWER 345-3 P | 20138578 |
| STEEL PRO POWER 405-3 P | 20138579 |
| STEEL PRO POWER 460-4 P | 20138580 |
| STEEL PRO POWER 540-4 P | 20138581 |

ACCESSORIES

For a complete list of accessories and details of their compatibility, refer to the Catalogue.

Dear heating engineer,
we congratulate you for proposing a modular system **RIELLO** which is able to ensure maximum and long lasting well-being with high reliability, efficiency, quality and safety.
This manual provides information that is essential to the installation of the appliance. Used in conjunction with your own knowledge and expertise it will enable you to install the appliance quickly, easily, and correctly.

Please accept our thanks and our congratulations on your choice of product.
Riello S.p.A.

CONFORMITY

thermal modules **Steel Pro Power** comply with:

- Regulation (EU) 2016/426
- Directive 92/42/EEC on efficiency requirements and Annex E and Pres. Republic Decree n. 412, 26 August 1993 (****)
- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Ecodesign Directive 2009/125/CE for energy-related products
- Regulation (EU) 2017/1369 Energy labelling
- Delegated Regulation (EU) N. 813/2013
- Standard for gas-fired heating boilers - General requirements and tests - EN 15502-1
- Specific standard for type C appliances and type B2, B3 and B5 appliances of nominal heat input not exceeding 1000 kW - EN 15502-2/1



At the end of its life, the product should be not be disposed of as solid urban waste, but rather it should be handed over to a differentiated waste collection centre.

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The following symbols are used in this manual:














CAUTION! = Identifies actions that require caution and adequate preparation.




STOP! = Identifies actions that you MUST NOT do.

1 GENERAL INFORMATION















1.1 General Safety Information

-  After removing the packaging, check the condition and completeness of the supply. If there are any problems, contact the company **RIELLO** that sold the equipment.
-  This product must be installed by a legally qualified heating engineer. On completion of the installation, the installer must issue the owner with a declaration of conformity confirming that the installation has been completed to the highest standards in compliance with the instructions provided by **RIELLO** in this instruction manual, and that it conforms to all applicable laws and standards.
-  This product must only be used for the purpose for which it is designed and made, as specified by **RIELLO**. **RIELLO** declines all responsibility, contractual or other, for damage to property or injury to persons or animals caused by improper installation, adjustment, maintenance or use.
-  In the event of a water leak, disconnect the thermal module from the main power supply, shut off the water supply and promptly notify the Technical Assistance Service **RIELLO** or professionally qualified personnel.
-  Regularly check that the condensate drain is free from obstruction.
-  Periodically check that operating pressure in the water circuit is over 1 bar but below the maximum limit specified for the boiler. If this is not the case, contact Technical Assistance Service **RIELLO** or a professionally qualified heating engineer.
-  The following operations shall be necessary if the thermal module is not used for a long period of time:
 - Switch the boiler OFF at the control panel
 - Turn the main system switch "off"
 - Close the fuel cock and heating circuit water cock
 - Drain the central heating circuit if there is any risk of freezing.
-  Maintenance must be performed on the thermal module at least once a year.
-  This manual is an integral part of the appliance and must therefore be kept with care and must ALWAYS accompany the thermal module, even when it is passed on to another owner or user or transferred to another installation. If it is lost or damaged, please contact your local Technical Assistance Service **RIELLO** for a new copy.
-  This manual must be read carefully so as to ensure the correct and safe installation, operation and maintenance of the appliance. The Owner must be adequately informed and trained on how to operate the appliance. Make sure that he/she is familiar with all the information required for safe system operation.
-  The thermal module, before being connected to the hydraulic system, the gas network, and the electrical system, may be exposed to temperatures ranging from 4°C to 40°C. After it can activate the Frost Protection function, it can be exposed to temperatures ranging from -20°C to 40° C.

-  We recommend cleaning inside the exchanger once a year, extracting jet and burner and removing any installation debris by suction. This operation should be done by personnel from the Technical Assistance Service only.

1.2 Precautions

The operation of any appliance that uses fuel, electrical power and water demands that a number of fundamental safety precautions be respected:

-  Do not allow children or infirm persons to operate the system unsupervised.
-  It is forbidden to use electrical devices or equipment, such as switches, appliances, etc. if there is a smell of gas or unburnt products. If so:
 - Ventilate the room, opening doors and windows
 - Close the fuel shut-off cock
 - Report the fault immediately to the **RIELLO's** Technical Assistance Service or a professionally qualified heating engineer.
-  Do not touch the boiler while barefoot or wet.
-  Any technical or cleaning activity is forbidden before disconnecting the appliance from the main power supply by switching the system's master switch and the appliance's main switch to the "OFF" position.
-  Do not tamper with or adjust the safety or control devices without prior authorisation and instructions from the manufacturer.
-  Do not plug or block the condensate drain outlet.
-  Never pull, disconnect, or twist the electrical cables coming from the appliance even if it is disconnected from the mains electricity supply.
-  Do not obstruct or restrict the vents in the room where the boiler is installed. Adequate ventilation is essential for correct combustion.
-  Do not expose the appliance to weather elements (without using the dedicated accessory). It has been designed for indoor use.
-  Do not switch off the appliance if the outdoor temperature may drop to below ZERO (frost hazard).
-  Do not leave flammable containers and substances in the room where the device is installed.
-  Do not dispose of packaging material into the environment, or leave it within the reach of children, since it can become a potential hazard. Dispose of packaging material in compliance with applicable legislation.
-  Do not activate the thermal module without water.
-  Individuals without specific qualifications and skills are not allowed not remove the thermal module's casing.

1.3 Description of the appliance

Steel Pro Power is a modular, premixed condensing system, consisting of a cascade of modulating thermal elements installed inside a frame assembled in anodised aluminum and painted panels.

The standard product is suitable for indoor installation, with open chamber combustion; it can be transformed either into sealed combustion or into indoor version by means of some specific accessory kits that increase its electrical protection up to IPX5D.

The cabinets are equipped with 2, 3 or 4 heating elements from 57 kW to 131 kW, with overall power of 114 kW to 524 kW.

The models with heat-exchanger from 131 kW (270-2 P - 405-3 P - 540-4 P) are suitable for cascade installation, with side by side coupling, up to a maximum of 10 total thermal elements and a power of 1310 kW.

The optimal management of combustion allows both high efficiency levels (exceeding also the 109%, value calculated on the PCI, under condensation) and low pollutant emissions (Class 5 according to UNI EN 297).

The main technical features of the appliance are:

- pre-mix burner with constant air-gas ratio;
- helicoidal heat exchanger with double coil with smooth stainless steel pipe, to guarantee good corrosion resistance and the option of operating with high Δt s (up to 40°C), reducing system set-up times;
- power from 114 to 524 kW;
- maximum flue gas output temperature 100°C;
- microprocessor management and control with self-diagnostics, shown by means of a display, and logging of main errors;
- Anti-Frost function;
- external probe that enables the climate control function;
- provision for room thermostat / heat request on high or low temperature zones;
- option to manage a CH circuit and a DHW circuit with storage tank;
- high efficiency pump with high residual head mounted on all "P" versions

1.4 Safety devices

All the functions of each thermal element are electronically controlled by a board approved to perform safety functions with dual processor technology.


Any malfunction results in the appliance being shut down and the automatic closure of the gas valve.


On the water circuit of each thermal element are installed:


- **Safety thermostat.**
- **Flow sensor** capable of monitoring the main circuit's flow on an ongoing basis and of stopping the appliance in the event of insufficient flow.
- **Temperature probes** on the flow and return that continuously measure the difference in temperature (Δt) between inlet and outlet fluid and allow the control to intervene.

On the combustion circuit of each thermal element are installed:

- **Gas solenoid** in class B+C, with pneumatic gas flow compensation depending on the suction line's air flow rate.
- **Ionisation electrode for detection.**
- **Flue gases temperature probe.**
- The **Minimum pressure switch** is installed on the manifold of the thermal module

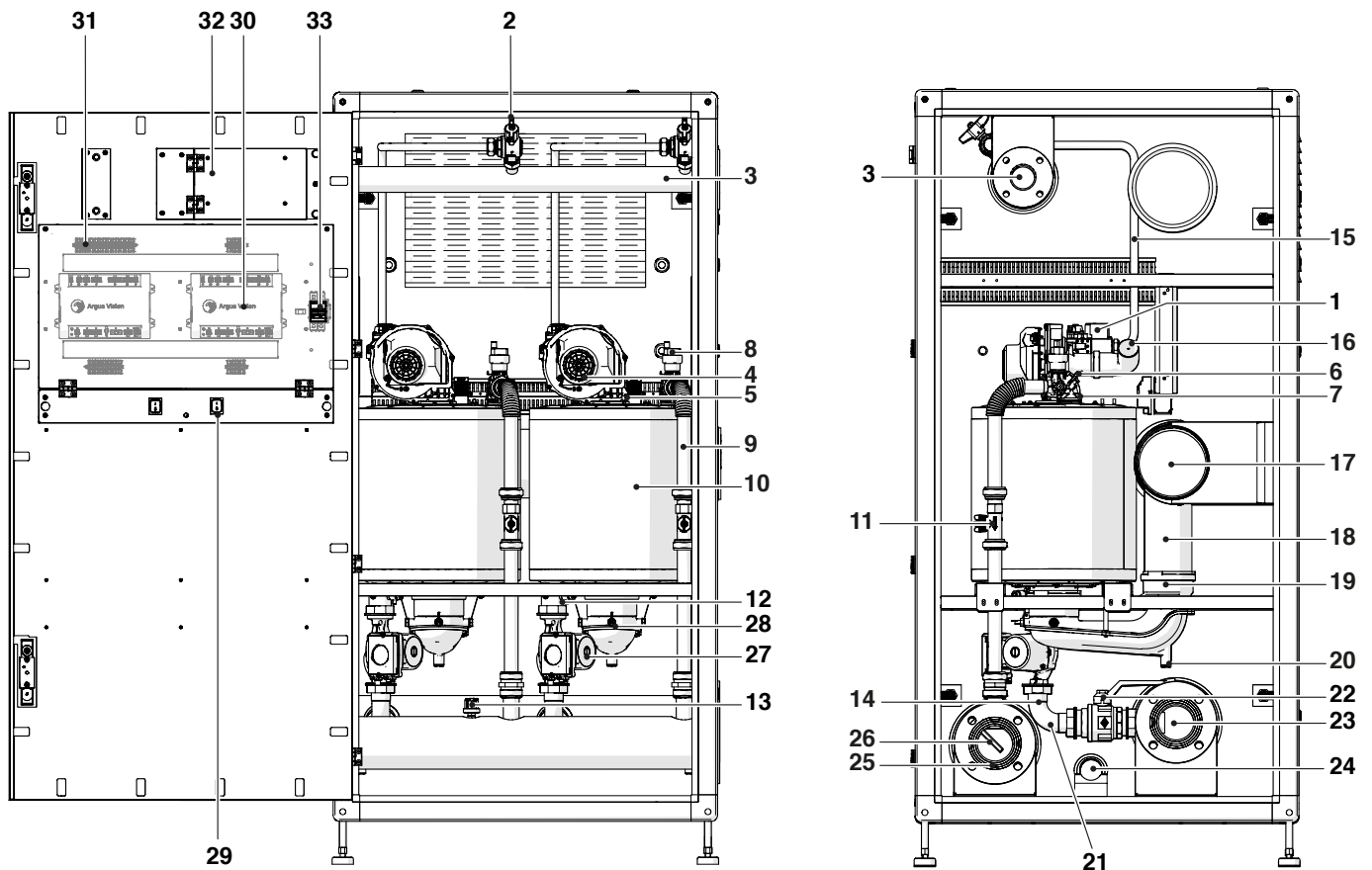
 The triggering of safety devices indicates the malfunction of a potentially hazardous thermal module. Therefore, contact Technical Assistance Service immediately. After a brief pause, it is possible to try and restart the appliance (see Paragraph "Initial startup").

 Safety devices must be replaced by Technical Assistance Service, using only original parts. Refer to the spare parts catalogue supplied with the appliance. After making the repair, check that the appliance is working properly.

 The appliance must not be put in service, even temporarily, when tampered safety devices are not in operation or have been tampered with.

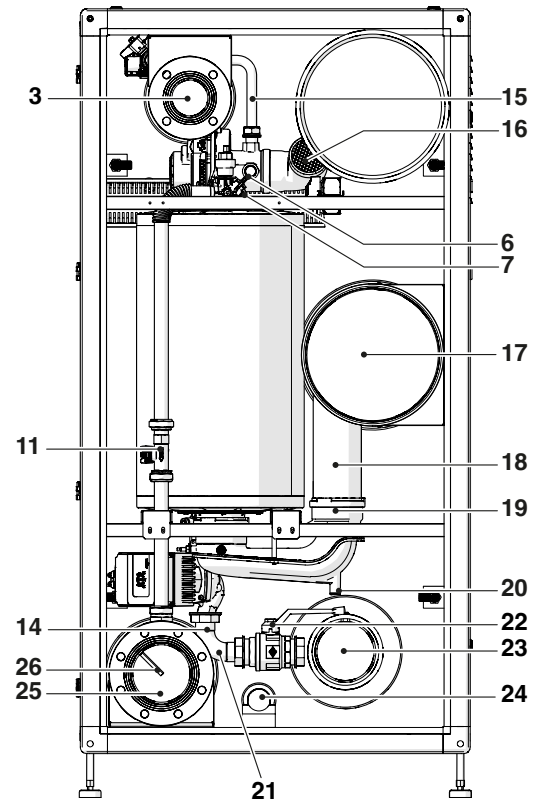
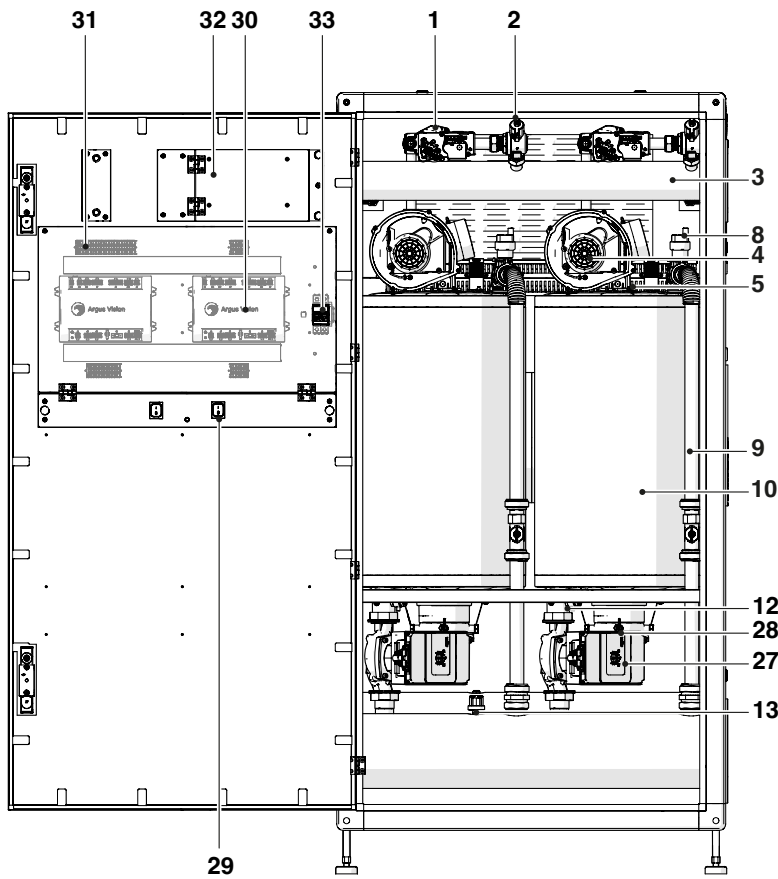
1.6 System layout

Steel Pro Power 114-2 P ÷ 140-2 P



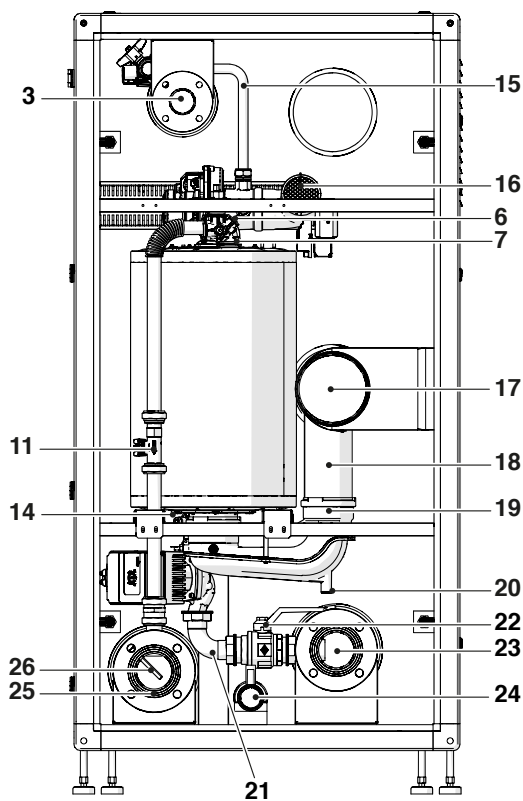
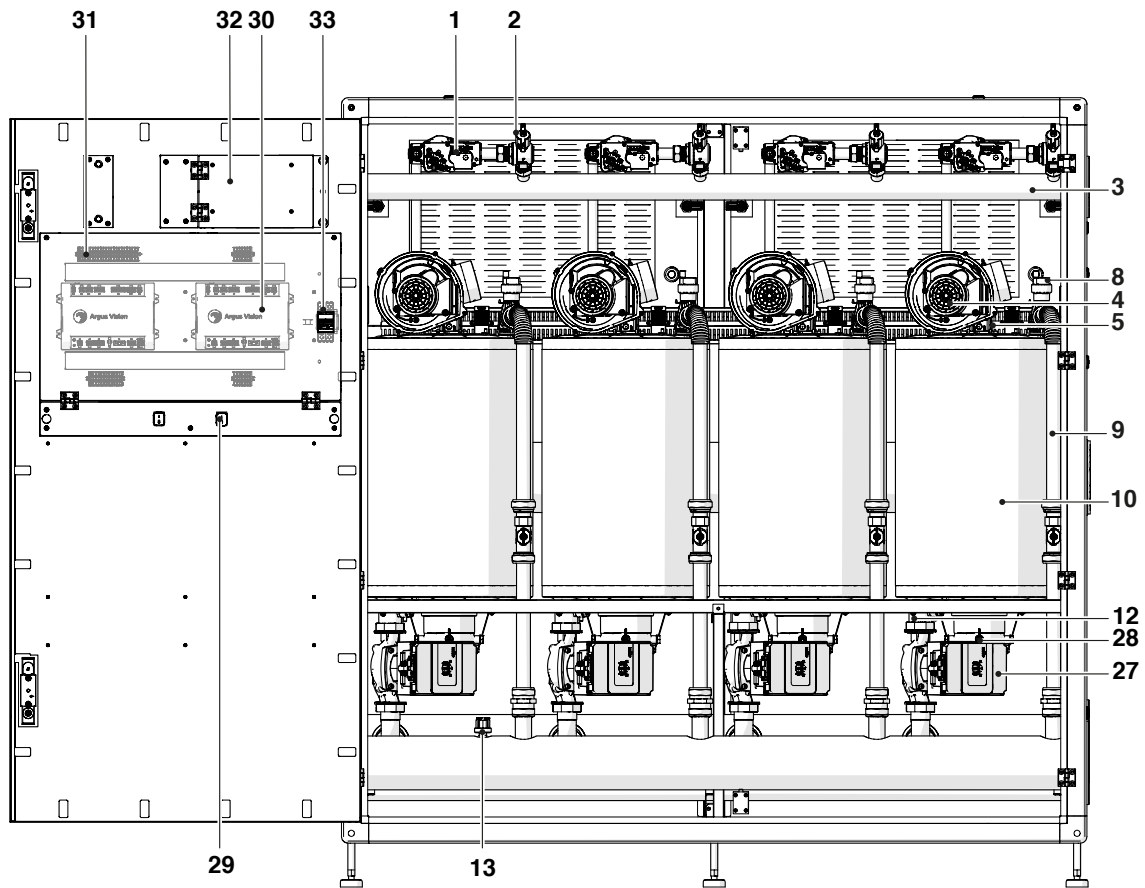
- 1 Gas valve
- 2 Gas cock
- 3 Gas manifold
- 4 Fan
- 5 Electrode
- 6 Flow probe
- 7 Safety thermostat with reset by the board
- 8 Automatic bleed valve
- 9 Delivery pipe unit
- 10 Combustion chamber
- 11 Flow-meter
- 12 Unit return probe
- 13 Minimum pressure switch
- 14 Unit drain valve
- 15 Gas pipe unit
- 16 Unit inlet pipe
- 17 Flue Manifold
- 18 Flue exhaust pipe unit
- 19 Clapet unit
- 20 Condensate drain unit
- 21 Return pipe unit
- 22 Two-way valve return unit
- 23 Water return manifold
- 24 Condensate collector
- 25 Water flow manifold
- 26 Delivery probe socket
- 27 Unit pump
- 28 Exhaust flue probe
- 29 Unit switch
- 30 Control board
- 31 Terminal strip
- 32 Display
- 33 Mains power switch

Steel Pro Power 180-2 P ÷ 270-2 P



- 1 Gas valve
- 2 Gas cock
- 3 Gas manifold
- 4 Fan
- 5 Electrode
- 6 Flow probe
- 7 Safety thermostat with reset by the board
- 8 Automatic bleed valve
- 9 Delivery pipe unit
- 10 Combustion chamber
- 11 Flow-meter
- 12 Unit return probe
- 13 Minimum pressure switch
- 14 Unit drain valve
- 15 Gas pipe unit
- 16 Unit inlet pipe
- 17 Flue Manifold
- 18 Flue exhaust pipe unit
- 19 Clapet unit
- 20 Condensate drain unit
- 21 Return pipe unit
- 22 Two-way valve return unit
- 23 Water return manifold
- 24 Condensate collector
- 25 Water flow manifold
- 26 Delivery probe socket
- 27 Unit pump
- 28 Exhaust flue probe
- 29 Unit switch
- 30 Control board
- 31 Terminal strip
- 32 Display
- 33 Mains power switch

Steel Pro Power 300-3 P ÷ 540-4 P



- 1 Gas valve
- 2 Gas cock
- 3 Gas manifold
- 4 Fan
- 5 Electrode
- 6 Flow probe
- 7 Safety thermostat with reset by the board
- 8 Automatic bleed valve
- 9 Delivery pipe unit
- 10 Combustion chamber
- 11 Flow-meter
- 12 Unit return probe
- 13 Minimum pressure switch
- 14 Unit drain valve
- 15 Gas pipe unit
- 16 Unit inlet pipe
- 17 Flue Manifold
- 18 Flue exhaust pipe unit
- 19 Clapet unit
- 20 Condensate drain unit
- 21 Return pipe unit
- 22 Two-way valve return unit
- 23 Water return manifold
- 24 Condensate collector
- 25 Water flow manifold
- 26 Delivery probe socket
- 27 Unit pump
- 28 Exhaust flue probe
- 29 unit switch
- 30 Control board
- 31 Terminal strip
- 32 Display
- 33 Mains power switch

1.7 Technical specifications

| Description | Steel Pro Power | | | | | | | | | |
|--|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 114-2 P | 140-2 P | 180-2 P | 230-2 P | 270-2 P | 300-3 P | 345-3 P | 405-3 P | 460-4 P | 540-4 P |
| TYPE OF APPLIANCE | | | | | | | | | | |
| Appliance type | Condensing boiler heating system B23, B53; B53P | | | | | | | | | |
| Fuel – Device category | G20=20mbar G20.2=20mbar G30/G31=28-30/37mbar; II2HY203+ | | | | | | | | | |
| Combustion chamber | vertical | | | | | | | | | |
| Flue exhaust homologations | B23, B53, B53P, C13(*), C33(*), C53(*), C63(*) | | | | | | | | | |
| Device category according to UNI 10642 | II2H3P | | | | | | | | | |

(*) Configurations possible only with the installation of the dedicated accessories (available separately).

| Description | Steel Pro Power | | | | | U.M. | |
|--|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----|
| | 114-2 P | 140-2 P | 180-2 P | 230-2 P | 270-2 P | | |
| POWERS AND EFFICIENCY | | | | | | | |
| Nominal rated heat input (PCI) | 114 | 136 | 180 | 223,2 | 262 | kW | |
| Nominal rated heat input (PCS) | 126 | 152 | 200 | 248 | 292 | kW | |
| Maximum rated heat output (80°-60°C) | G20 | 111,4 | 134 | 176,6 | 219,6 | 258 | kW |
| Maximum rated heat output (60-40°C) | G20 | 119,2 | 142,8 | 187,6 | 232,4 | 274,6 | kW |
| Maximum rated heat output (50-30°C) | G20 | 123,8 | 147,8 | 194,8 | 242,2 | 284,2 | kW |
| Minimum rated heat input (PCI) | G20 | 13,7 | 13,7 | 19,4 | 22,4 | 26,3 | kW |
| Minimum rated heat input (PCS) | G20 | 15 | 15 | 21,6 | 24,9 | 29 | kW |
| Minimum thermal output 80/60°C | G20 | 13,5 | 13,5 | 19,2 | 22,1 | 26 | kW |
| Minimum thermal output 50/30°C | G20 | 14,9 | 14,9 | 21,1 | 24,5 | 28,9 | kW |
| Useful efficiency at nominal heat output 80-60°C (PCI) | | 97,72 | 98,53 | 98,11 | 98,40 | 98,47 | % |
| Useful efficiency at minimum heat output 80-60°C (PCI) | | 98,9 | 98,9 | 98,8 | 99,2 | 99,1 | % |
| Useful efficiency at nominal heat output 50/30°C (PCI) | | 108,6 | 108,1 | 108,3 | 108,6 | 108,3 | % |
| Useful efficiency at minimum heat output 50/30°C (PCI) | | 109,3 | 109,3 | 109,2 | 110 | 110 | % |
| Useful efficiency 30% - 50/30°C PCS (PCI) | | 98,94 (109,36) | 97,81 (109,31) | 98,00 (108,89) | 98,39 (108,93) | 98,17 (109,41) | % |
| Combustion efficiency | | 99,0 | 99,0 | 99,0 | 99,3 | 99,3 | % |
| Chimney losses with burner off | | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | % |
| Chimney losses with burner on P. max. 80-60°C | | 2,3 | 2,3 | 2,5 | 2,5 | 2,6 | % |
| Chimney losses with burner on at 30% Pn 50-30°C | | 0,5 | 0,5 | 0,6 | 0,5 | 0,6 | % |
| Chimney losses with burner on P. min. 80-60°C | | 0,12 | 0,11 | 0,22 | 0,1 | 0,1 | % |
| Losses through the casing with average T 70°C and burner on | | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | % |
| Losses through the casing with average T 70°C and burner off | | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | % |
| Flue gas temperature at max power and min power 80-60°C | | 71 - 61 | 72 - 61 | 76 - 62 | 75 - 61 | 77 - 61 | °C |
| Flue gas temperature at max power and min power 50-30°C | | 45 - 33 | 46 - 33 | 47 - 35 | 45 - 33 | 48 - 35 | °C |
| Air index λ at max power | G20 | 1,27 | 1,27 | 1,27 | 1,27 | 1,27 | no. |
| | G31 | 1,29 | 1,29 | 1,29 | 1,29 | 1,29 | no. |
| Air index λ at min power | G20 | 1,27 | 1,27 | 1,27 | 1,27 | 1,27 | no. |
| | G31 | 1,29 | 1,29 | 1,29 | 1,29 | 1,29 | no. |
| Max Flue flow at max-min power | G20 | 53 - 6 | 64 - 6 | 84 - 9 | 104 - 10 | 122 - 12 | g/s |
| | G31 | 51 - 6 | 62 - 6 | 82 - 9 | 101 - 10 | 119 - 12 | g/s |
| Flue Residual prevalence at min power | | 35 | 35 | 32 | 30 | 28 | Pa |
| Flue gas residual head with max power | | 510 | 630 | 560 | 500 | 353 | Pa |
| Maximum rated heat input (LCV) | G25 | 106 | 130 | 170 | 214 | 254 | kW |
| Minimum rated heat input (LCV) | G25 | 13 | 13 | 18,1 | 21,4 | 24,5 | kW |

| Description | Steel Pro Power | | | | | U.M. | |
|---|-----------------|-------------|-------------|-------------|--------------|-------|------|
| | 114-2 P | 140-2 P | 180-2 P | 230-2 P | 270-2 P | | |
| ELECTRICAL DATA | | | | | | | |
| Power supply voltage | 230-50 | | | | | V-Hz | |
| Electric degree of protection | IPX4D | | | | | IP | |
| Electric power consumption of the boiler at max power | 198 | 264 | 460 | 706 | 964 | W | |
| Electric power consumption of the boiler at min power | 92 | 96 | 126 | 198 | 220 | W | |
| Electric power consumption of the pumps at max power | 100 | 110 | 160 | 296 | 360 | W | |
| Electric power consumption of the pumps with min power | 40 | 44 | 64 | 118 | 144 | W | |
| HEATING EXERCISE | | | | | | | |
| Water temperature selection range (with plate heat exchanger) | 20-80/(85)* | | | | | °C | |
| Lockout thermostat activation temperature | 95 | | | | | °C | |
| Maximum operating temperature | 100 | | | | | °C | |
| Maximum working pressure | 6 | | | | | bar | |
| Minimum operating pressure | 0,7 | | | | | bar | |
| Water content | 45 | 45 | 50 | 60 | 75 | l | |
| Water side pressure drops with ΔT 20°C "versions V" | 102 | 135 | 168 | 356 | 526 | mbar | |
| Residual head on water side with ΔT 20°C "versions P" | 400 | 280 | 450 | 300 | 500 | mbar | |
| Maximum condensation production at maximum power 50-30°C | 17,8 | 20,2 | 27,2 | 35 | 39,6 | l/h | |
| Noise (sound power) | 56 | 58 | 58 | 60 | 61 | dB(A) | |
| GAS SUPPLY DATA | | | | | | | |
| Maximum supply gas pressure | G20 | 60 | 60 | 60 | 60 | 60 | mbar |
| | G31 | 60 | 60 | 60 | 60 | 60 | mbar |
| Nominal supply gas pressure | G20 | 20 | 20 | 20 | 20 | 20 | mbar |
| | G31 | 37 | 37 | 37 | 37 | 37 | mbar |
| Minimum gas supply pressure | G20 | 17 | 17 | 17 | 17 | 17 | mbar |
| | G31 | 25 | 25 | 25 | 25 | 25 | mbar |
| DIMENSIONAL DATA | | | | | | | |
| Heating delivery diameter | 3" DN80 PN6 | 3" DN80 PN6 | 3" DN80 PN6 | 3" DN80 PN6 | 5" DN125 PN6 | Ø DN | |
| Heating return diameter | 3" DN80 PN6 | 3" DN80 PN6 | 3" DN80 PN6 | 3" DN80 PN6 | 5" DN125 PN6 | Ø DN | |
| Gas inlet diameter | 2 "DN50 PN6 | 2 "DN50 PN6 | 2 "DN50 PN6 | 2 "DN50 PN6 | 3" DN80 PN6 | Ø DN | |
| Condensate discharge diameter | 50 | 50 | 50 | 50 | 50 | Ø mm | |
| Coat height | 1800 | 1800 | 1800 | 1800 | 1800 | mm | |
| Width of the mantle | 900 | 900 | 900 | 900 | 900 | mm | |
| Depth of the coat | 890 | 890 | 890 | 890 | 890 | mm | |
| Flue exhaust diameter | DN160 | DN160 | DN160 | DN160 | DN300 | Ø mm | |
| Air intake diameter (optional) | DN160 | DN160 | DN160 | DN160 | DN300 | Ø mm | |

| Description | Steel Pro Power | | | | | U.M. | |
|--|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----|
| | 300-3 P | 345-3 P | 405-3 P | 460-4 P | 540-4 P | | |
| POWERS AND EFFICIENCY | | | | | | | |
| Nominal rated heat input (PCI) | | 291 | 334,8 | 393 | 446,4 | 524 | kW |
| Nominal rated heat input (PCS) | | 324 | 372 | 438 | 496 | 584 | kW |
| Maximum rated heat output (80°-60°C) | G20 | 285,9 | 329,4 | 387 | 439,2 | 516 | kW |
| Maximum rated heat output (60-40°C) | G20 | 303,3 | 348,6 | 411,9 | 464,8 | 549,2 | kW |
| Maximum rated heat output (50-30°C) | G20 | 315,3 | 363,6 | 426,3 | 484,4 | 568,4 | kW |
| Minimum rated heat input (PCI) | G20 | 19,4 | 22,4 | 26,3 | 22,4 | 26,3 | kW |
| Minimum rated heat input (PCS) | G20 | 21,6 | 24,9 | 29 | 24,9 | 29 | kW |
| Minimum thermal output 80/60°C | G20 | 19,2 | 22,1 | 26 | 22,1 | 26 | kW |
| Minimum thermal output 50/30°C | G20 | 21,1 | 24,5 | 28,9 | 24,5 | 28,9 | kW |
| Useful efficiency at nominal heat output 80-60°C (PCI) | | 98,25 | 98,40 | 98,47 | 98,40 | 98,47 | % |
| Useful efficiency at minimum heat output 80-60°C (PCI) | | 98,8 | 99,2 | 99,1 | 99,2 | 99,1 | % |
| Useful efficiency at nominal heat output 50/30°C (PCI) | | 108,2 | 108,6 | 108,3 | 108,6 | 108,3 | % |
| Useful efficiency at minimum heat output 50/30°C (PCI) | | 109,2 | 110 | 110 | 110 | 110 | % |
| Useful efficiency 30% - 50/30°C PCS (PCI) | | 97,84 (108,93) | 98,39 (108,93) | 98,17 (109,41) | 98,39 (108,93) | 98,17 (109,41) | % |
| Combustion efficiency | | 99,0 | 99,3 | 99,3 | 99,3 | 99,3 | % |
| Chimney losses with burner off | | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | % |
| Chimney losses with burner on P. max. 80-60°C | | 2,6 | 2,5 | 2,6 | 2,5 | 2,6 | % |
| Chimney losses with burner on at 30% Pn 50-30°C | | 0,6 | 0,5 | 0,6 | 0,5 | 0,6 | % |
| Chimney losses with burner on P. min. 80-60°C | | 0,2 | 0,1 | 0,1 | 0,1 | 0,1 | % |
| Losses through the casing with average T 70°C and burner on | | 0,33 | 0,33 | 0,33 | 0,25 | 0,25 | % |
| Losses through the casing with average T 70°C and burner off | | 0,33 | 0,33 | 0,33 | 0,25 | 0,25 | % |
| Flue gas temperature at max power and min power 80-60°C | | 78 - 62 | 75 - 61 | 77 - 61 | 75 - 61 | 77 - 61 | °C |
| Flue gas temperature at max power and min power 50-30°C | | 49 - 35 | 45 - 33 | 48 - 35 | 45 - 33 | 48 - 35 | °C |
| Air index λ at max power | G20 | 1,27 | 1,27 | 1,27 | 1,27 | 1,27 | no. |
| | G31 | 1,29 | 1,29 | 1,29 | 1,29 | 1,29 | no. |
| Air index λ at min power | G20 | 1,27 | 1,27 | 1,27 | 1,27 | 1,27 | no. |
| | G31 | 1,29 | 1,29 | 1,29 | 1,29 | 1,29 | no. |
| Max Flue flow at max-min power | G20 | 136 - 9 | 156 - 10 | 183-12 | 208-10 | 245-12 | g/s |
| | G31 | 132 - 9 | 152-10 | 179-12 | 203-10 | 238-12 | g/s |
| Flue Residual prevalence at min power | | 32 | 30 | 28 | 30 | 28 | Pa |
| Flue gas residual head with max power | | 610 | 500 | 353 | 500 | 353 | Pa |
| Maximum rated heat input (LCV) | G25 | 279 | 321 | 381 | 428 | 508 | kW |
| Minimum rated heat input (LCV) | G25 | 18,5 | 21,4 | 24,5 | 21,4 | 24,5 | kW |

| Description | Steel Pro Power | | | | | U.M. | |
|---|-----------------|-------------|--------------|-------------|--------------|-------|------|
| | 300-3 P | 345-3 P | 405-3 P | 460-4 P | 540-4 P | | |
| ELECTRICAL DATA | | | | | | | |
| Power supply voltage | 230-50 | | | | | V-Hz | |
| Electric degree of protection | IPX4D | | | | | IP | |
| Electric power consumption of the boiler at max power | 951 | 1059 | 1446 | 1412 | 1928 | W | |
| Electric power consumption of the boiler at min power | 228 | 297 | 330 | 396 | 440 | W | |
| Electric power consumption of the pumps at max power | 342 | 444 | 540 | 592 | 720 | W | |
| Electric power consumption of the pumps with min power | 135 | 177 | 216 | 236 | 288 | W | |
| HEATING EXERCISE | | | | | | | |
| Water temperature selection range (with plate heat exchanger) | 20-80/(85)* | | | | | °C | |
| Lockout thermostat activation temperature | 95 | | | | | °C | |
| Maximum operating temperature | 100 | | | | | °C | |
| Maximum working pressure | 6 | | | | | bar | |
| Minimum operating pressure | 0,7 | | | | | bar | |
| Water content | 80 | 100 | 120 | 120 | 150 | l | |
| Residual head on water side with ΔT 20°C | 300 | 300 | 500 | 300 | 500 | mbar | |
| Maximum condensation production at maximum power 50-30°C | 45 | 52,5 | 59,4 | 70 | 79,2 | l/h | |
| Noise (sound power) | 60 | 61 | 62 | 63 | 64 | dB(A) | |
| GAS SUPPLY DATA | | | | | | | |
| Maximum supply gas pressure | G20 | 60 | 60 | 60 | 60 | 60 | mbar |
| | G31 | 60 | 60 | 60 | 60 | 60 | mbar |
| Nominal supply gas pressure | G20 | 20 | 20 | 20 | 20 | 20 | mbar |
| | G31 | 37 | 37 | 37 | 37 | 37 | mbar |
| Minimum gas supply pressure | G20 | 17 | 17 | 17 | 17 | 17 | mbar |
| | G31 | 25 | 25 | 25 | 25 | 25 | mbar |
| DIMENSIONAL DATA | | | | | | | |
| Heating delivery diameter | 3" DN80 PN6 | 3" DN80 PN6 | 5" DN125 PN6 | 3" DN80 PN6 | 5" DN125 PN6 | ∅ DN | |
| Heating return diameter | 3" DN80 PN6 | 3" DN80 PN6 | 5" DN125 PN6 | 3" DN80 PN6 | 5" DN125 PN6 | ∅ DN | |
| Gas inlet diameter | 2 "DN50 PN6 | 2 "DN50 PN6 | 3" DN80 PN6 | 2 "DN50 PN6 | 3" DN80 PN6 | ∅ DN | |
| Condensate discharge diameter | 50 | 50 | 50 | 50 | 50 | ∅ mm | |
| Coat height | 1800 | 1800 | 1800 | 1800 | 1800 | mm | |
| Width of the mantle | 1700 | 1700 | 1700 | 1700 | 1700 | mm | |
| Depth of the coat | 890 | 890 | 890 | 890 | 890 | mm | |
| Flue exhaust diameter | DN160 | DN160 | DN300 | DN160 | DN300 | ∅ mm | |
| Air intake diameter (optional) | DN160 | DN160 | DN300 | DN160 | DN300 | ∅ mm | |

1.8 ERP data

| Description | Steel Pro Power | | | | | U.M. | | |
|--|--------------------|------------|------------|------------|------------|------------|---------|--------|
| | 114-2 P | 140-2 P | 180-2 P | 230-2 P | 270-2 P | | | |
| Rated input | 114 | 136 | 180 | 223,2 | 262 | kW | | |
| Seasonal energy efficiency of space heating η_s | 94 / 94 | 93 / 93 | 93 / 93 | 93 / 93 | 93 / 93 | % | | |
| USEFUL HEAT OUTPUT | | | | | | | | |
| At rated heat output and at a high temperature regime P4 | G20 | 114 | 134 | 176,6 | 219,6 | 258 | kW | |
| At 30% of the nominal heat output and at a low temperature regime P1 | G20 | 37,4 | 44,6 | 58,8 | 73,2 | 86,6 | kW | |
| EFFICIENCY | | | | | | | | |
| At rated heat output and at a high temperature regime η_4 (PCS) | | 88,41 | 88,16 | 88,3 | 88,55 | 88,36 | % | |
| At 30% of nominal heat output and at a low temperature regime η_1 (PCS) | | 98,94 | 97,81 | 98 | 98,39 | 98,17 | % | |
| ADDITIONAL ENERGY CONSUMPTION | | | | | | | | |
| At full load Elmax | | 198 / 98 | 264 / 154 | 460 / 300 | 706 / 410 | 964 / 604 | W | |
| At Partial load Elmin | | 92 / 52 | 96 / 52 | 126 / 62 | 198 / 80 | 220 / 76 | W | |
| In PSB Standby mode | | 26 / 15 | 26 / 15 | 12 / 12 | 12 / 12 | 16 / 16 | W | |
| OTHER PARAMETERS | | | | | | | | |
| Thermal losses in Pstby standby mode | | 159,16 | 194,47 | 255,56 | 316,64 | 374,47 | W | |
| QHE Annual energy consumption | | 236 | 282 | 364 | 384 | 532 | GJ | |
| Sound power level within LWA | | 56 | 58 | 58 | 60 | 61 | dB(A) | |
| Nox oxides emissions Nox (*) | | 34,2 | 36,4 | 38,1 | 39,3 | 46,1 | mg/kWh | |
| Nox Class | | 6 | 6 | 6 | 6 | 6 | n° | |
| Emissions values with maximum flow (*) | CO less than | G20 | 79 | 90 | 81 | 89 | 91,5 | p.p.m. |
| | | G31 | 142 | 147 | 153 | 177 | 185 | |
| | CO2 (**) | G20 | 9 | 9 | 9 | 9 | 9 | % |
| | | G31 | 10,4 | 10,4 | 10,4 | 10,4 | 10,4 | |
| | NOx s.a lower than | G20 | 30 | 30 | 30 | 30 | 30 | p.p.m. |
| | | G31 | 40 | 40 | 40 | 40 | 40 | |
| Flue gas T | | | 71 | 72 | 76 | 75 | 77 | °C |
| Emissions values with minimum flow (*) | CO less than | G20 | 6,5 | 6,5 | 7,5 | 4,6 | 5,6 | p.p.m. |
| | | G31 | 11 | 11 | 12 | 14 | 16 | |
| | CO2 (**) | G20 | 9 | 9 | 9 | 9 | 9 (***) | % |
| | | G31 | 10,4 | 10,4 | 10,4 | 10,4 | 10,4 | |
| | NOx s.a lower than | G20 | 30 | 30 | 30 | 30 | 30 | p.p.m. |
| | | G31 | 40 | 40 | 40 | 40 | 40 | |
| Flue gas T | | | 61 | 61 | 62 | 61 | 61 | °C |
| Gas consumption (min-max) | G20 | 2,86÷12,00 | 2,86÷14,48 | 4,12÷19,06 | 4,74÷23,64 | 5,00÷27,82 | mc/h | |
| | G30 | 2,18÷9,16 | 2,18÷11,06 | 3,14÷14,56 | 3,62÷18,04 | 3,82÷21,24 | kg/h | |
| | G31 | 2,14÷9,00 | 2,14÷10,86 | 3,08÷14,30 | 3,56÷17,72 | 3,74÷20,86 | kg/h | |

(*) Weights calculated according to EN 15502.

(**) Values referred to atmospheric pressure at sea level.

(***) To adjust the STEEL PRO POWER 270-2 P models in **Belgium and Switzerland**, please refer to the chapter "Adjustments".

| Description | Steel Pro Power | | | | | U.M. | | |
|--|--------------------|------------|------------|------------|------------|-------------|---------|--------|
| | 300-3 P | 345-3 P | 405-3 P | 460-4 P | 540-4 P | | | |
| Rated input | 291 | 334,8 | 393 | 446,4 | 524 | kW | | |
| Seasonal energy efficiency of space heating η_s | 93 / 93 | 93 / 93 | 93 / 93 | 93 / 93 | 93 / 93 | % | | |
| USEFUL HEAT OUTPUT | | | | | | | | |
| At rated heat output and at a high temperature regime P4 | G20 | 285,9 | 329,4 | 387 | 439,2 | 516 | kW | |
| At 30% of the nominal heat output and at a low temperature regime P1 | G20 | 95,1 | 109,8 | 129 | 146,4 | 172 | kW | |
| EFFICIENCY | | | | | | | | |
| At rated heat output and at a high temperature regime η_4 (PCS) | | 88,24 | 88,55 | 88,36 | 88,55 | 88,36 | % | |
| At 30% of nominal heat output and at a low temperature regime η_1 (PCS) | | 97,84 | 98,39 | 98,17 | 98,39 | 98,17 | % | |
| ADDITIONAL ENERGY CONSUMPTION | | | | | | | | |
| At full load Elmax | | 951 / 609 | 1059 / 615 | 1446 / 906 | 1412 / 820 | 1928 / 1208 | W | |
| At Partial load Elmin | | 228 / 93 | 297 / 120 | 330 / 114 | 396 / 160 | 440 / 152 | W | |
| In PSB Standby mode | | 18 / 18 | 18 / 18 | 24 / 24 | 24 / 24 | 32 / 32 | W | |
| OTHER PARAMETERS | | | | | | | | |
| Thermal losses in Pstby standby mode | | 414,19 | 474,96 | 561,71 | 636,09 | 748,95 | W | |
| QHE Annual energy consumption | | 588 | 678 | 798 | 904 | 1064 | GJ | |
| Sound power level within LWA | | 60 | 61 | 62 | 63 | 64 | dB(A) | |
| Nox oxides emissions Nox (*) | | 38,7 | 39,3 | 46,1 | 39,3 | 46,1 | mg/kWh | |
| Nox Class | | 6 | 6 | 6 | 6 | 6 | n° | |
| Emissions values with minimum flow (*) | CO less than | G20 | 91,5 | 89 | 91,5 | 89 | 91,5 | p.p.m. |
| | | G31 | 163 | 177 | 185 | 177 | 185 | |
| | CO2 (**) | G20 | 9 | 9 | 9 | 9 | 9 | % |
| | | G31 | 10,4 | 10,4 | 10,4 | 10,4 | 10,4 | |
| | NOx s.a lower than | G20 | 30 | 30 | 30 | 30 | 30 | p.p.m. |
| | | G31 | 40 | 40 | 40 | 40 | 40 | |
| Flue gas T | | | 78 | 75 | 77 | 75 | 77 | °C |
| Emissions values with minimum flow (*) | CO less than | G20 | 7,5 | 4,6 | 5,6 | 4,6 | 5,6 | p.p.m. |
| | | G31 | 12 | 14 | 16 | 14 | 16 | |
| | CO2 (**) | G20 | 9 (***) | 9 | 9 (***) | 9 | 9 (***) | % |
| | | G31 | 10,4 | 10,4 | 10,4 | 10,4 | 10,4 | |
| | NOx s.a lower than | G20 | 30 | 30 | 30 | 30 | 30 | p.p.m. |
| | | G31 | 40 | 40 | 40 | 40 | 40 | |
| Flue gas T | | | 62 | 61 | 61 | 61 | °C | |
| Gas consumption (min-max) | G20 | 6,18÷30,87 | 7,11÷35,46 | 7,50÷41,73 | 9,48÷47,28 | 10,00÷55,64 | mc/h | |
| | G30 | 4,71÷23,58 | 5,43÷27,06 | 5,73÷31,86 | 7,24÷36,08 | 7,64÷42,48 | kg/h | |
| | G31 | 4,62÷23,16 | 5,34÷26,58 | 5,61÷31,29 | 7,12÷35,44 | 7,48÷41,72 | kg/h | |

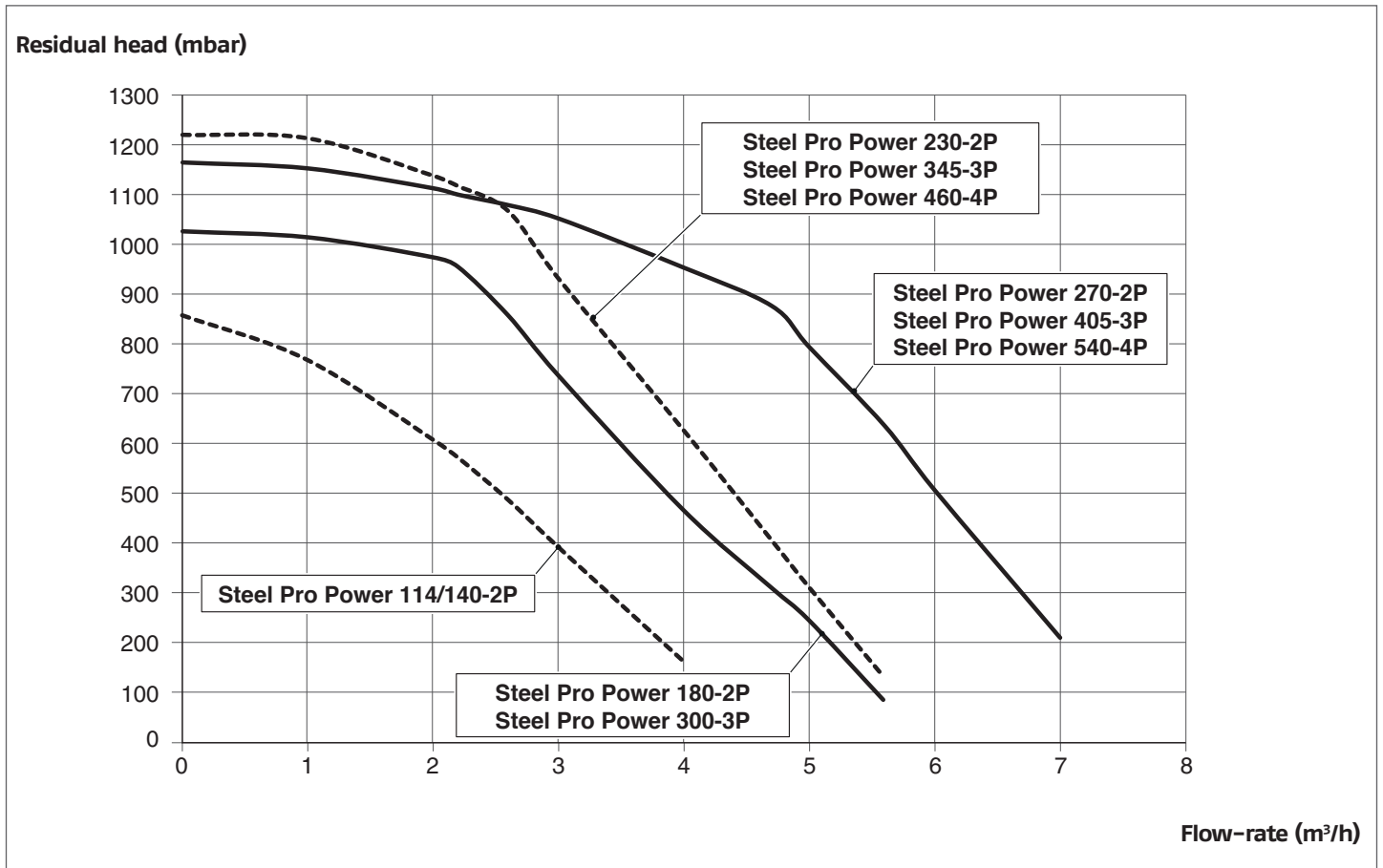
(*) Weights calculated according to EN 15502.




(**) Values referred to atmospheric pressure at sea level.

(***) To adjust the STEEL PRO POWER 300-3 P, STEEL PRO POWER 405-3 P and STEEL PRO POWER 540-4 P models in **Belgium and Switzerland**, please refer to the chapter "Adjustments".

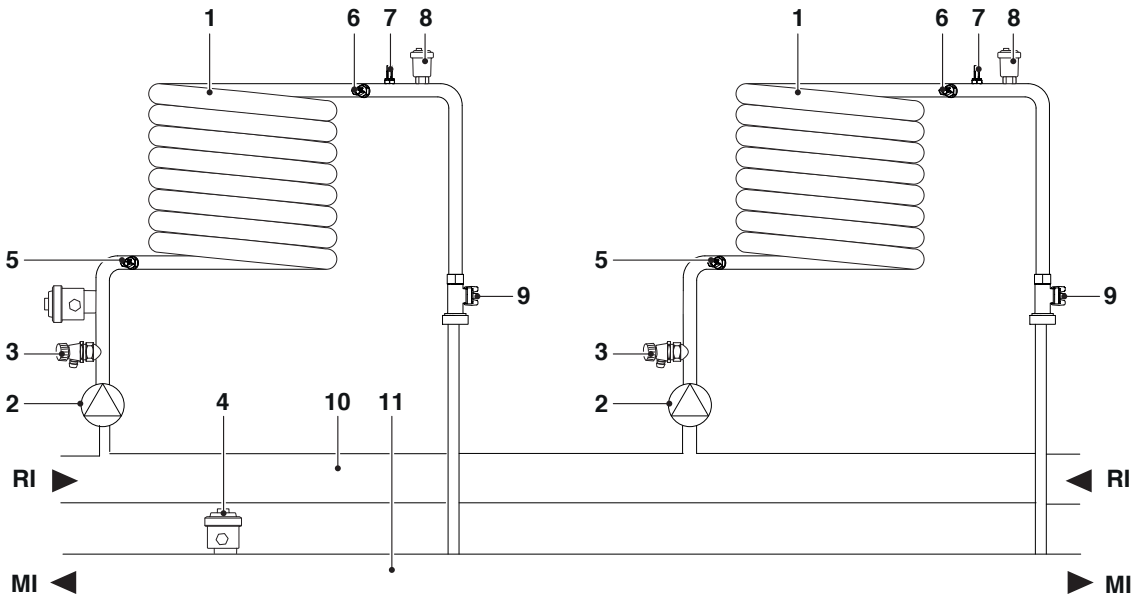
1.9 Pumps

Steel Pro Power appliances have the following headform curves for each single module:



-  At the first start-up, and at least once a year, the rotation of the circulator shaft should be checked as, especially after long periods of not being operated, deposits and/or residuals could impede its free rotation.
-  Before loosening or removing the circulator cap, protect the electric devices located underneath from any water that exits.
-  It is prohibited to operate the circulators without water.

1.10 Water circuit



- 1 Heat exchanger
 - 2 Pump
 - 3 Drain cock
 - 4 Minimum pressure switch
 - 5 NTC return probe
 - 6 NTC delivery probe
 - 7 Safety thermostat temperature sensor
 - 8 Automatic bleed valve
 - 9 Flow-meter
 - 10 Water return manifold
 - 11 Water flow manifold
- MI Central heating flow
 - RI Central heating return

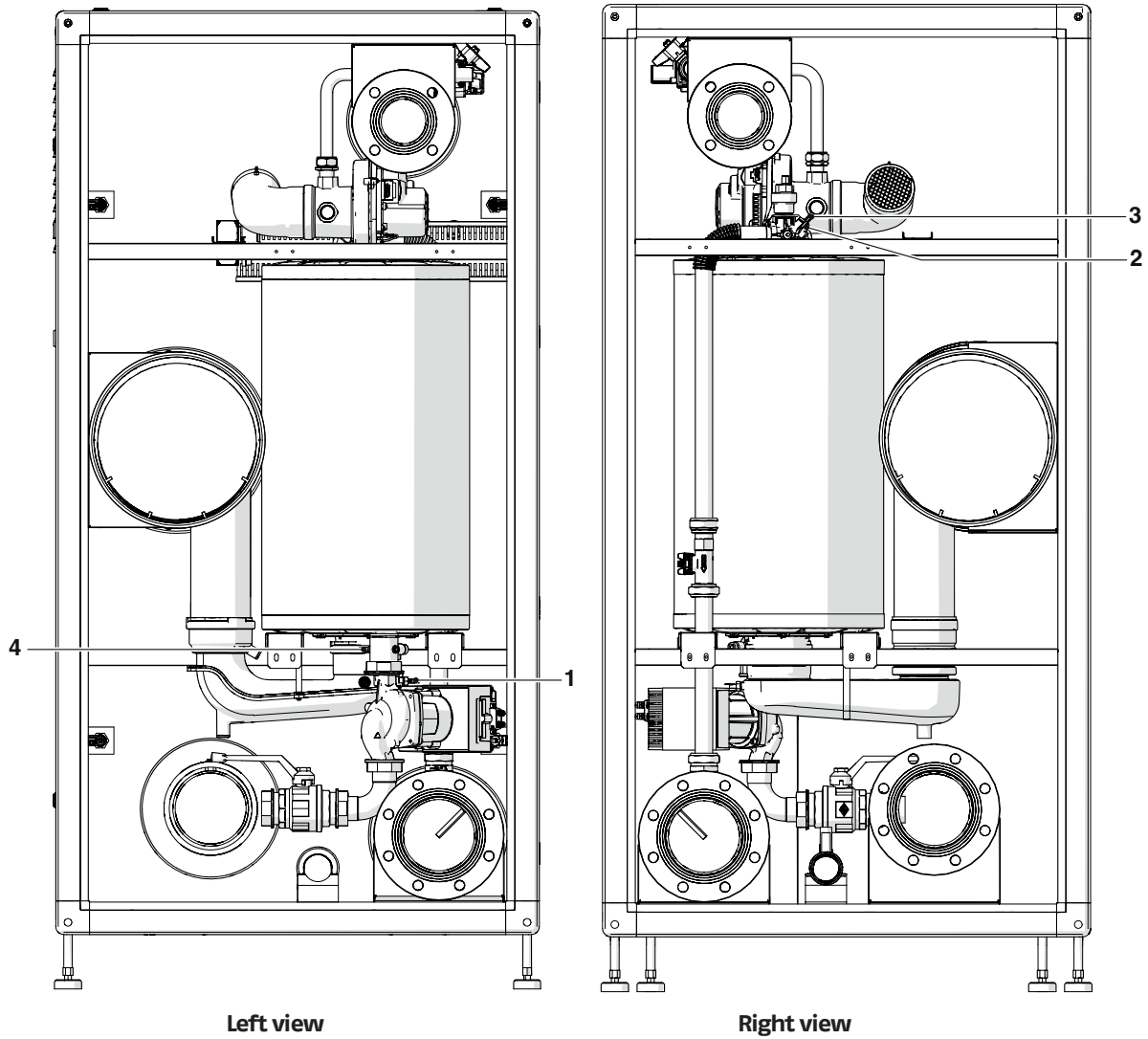
Values of NTC probes' resistors with changing temperatures.

| Temperature °C Tolerance test ±10% | Resistor Ω | Temperature °C Tolerance test ±10% | Resistor Ω |
|---------------------------------------|------------|---------------------------------------|------------|
| -40 | 191908 | 45 | 4904 |
| -35 | 146593 | 50 | 4151 |
| -30 | 112877 | 55 | 3529 |
| -25 | 87588 | 60 | 3012 |
| -20 | 68471 | 65 | 2582 |
| -15 | 53910 | 70 | 2221 |
| -10 | 42739 | 75 | 1918 |
| -5 | 34109 | 80 | 1663 |
| 0 | 27396 | 85 | 1446 |
| 5 | 22140 | 90 | 1262 |
| 10 | 17999 | 95 | 1105 |
| 15 | 14716 | 100 | 970 |
| 20 | 12099 | 105 | 855 |
| 25 | 10000 | 110 | 755 |
| 30 | 8308 | 115 | 669 |
| 35 | 6936 | 120 | 594 |
| 40 | 5819 | 125 | 529 |

1.11 Positioning the temperature sensors

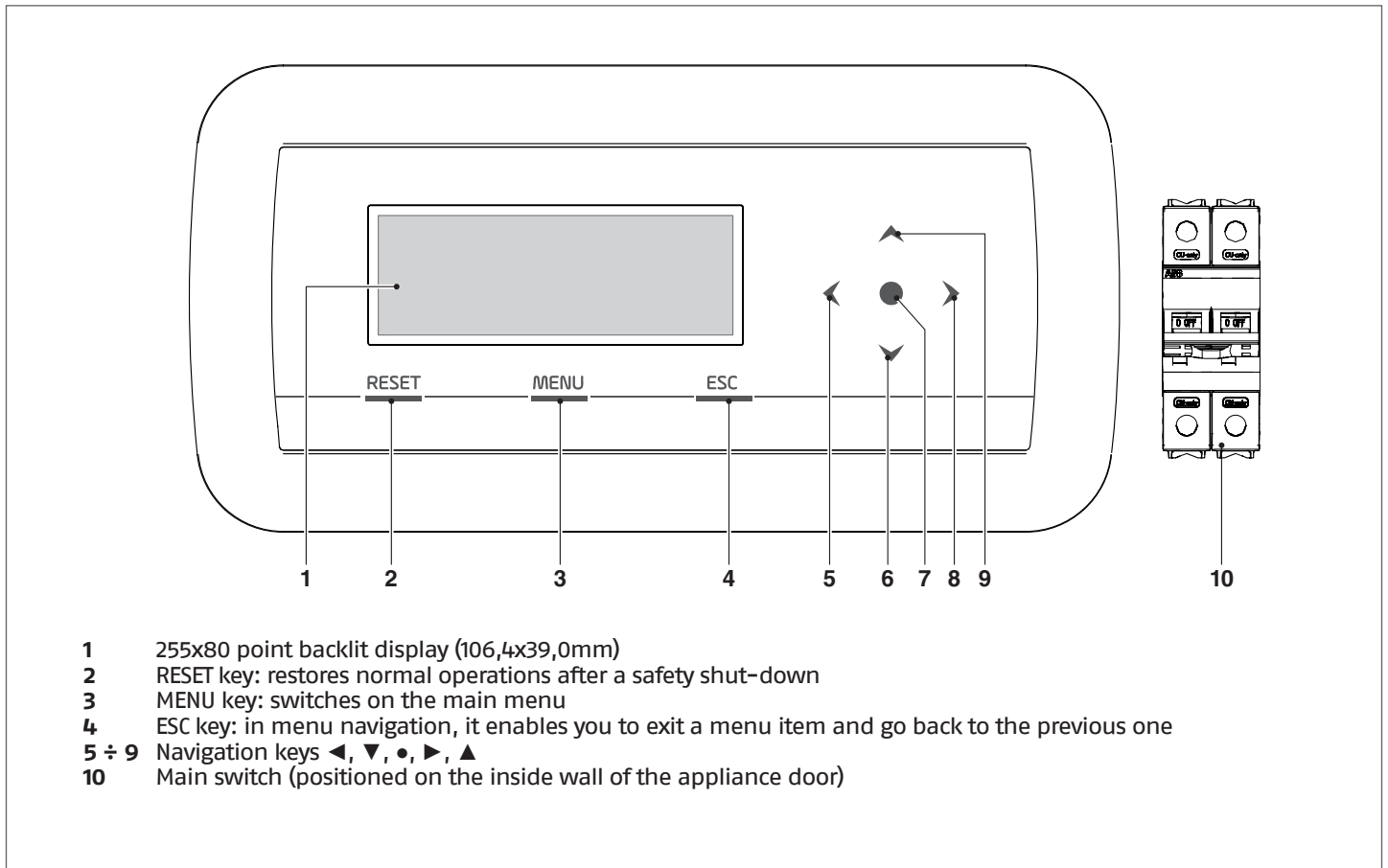
Probes placed on the related sockets of the thermal module:

- 1 Exhaust flue probe
- 2 Safety thermostat
- 3 CH flow temperature sensor
- 4 Return probe

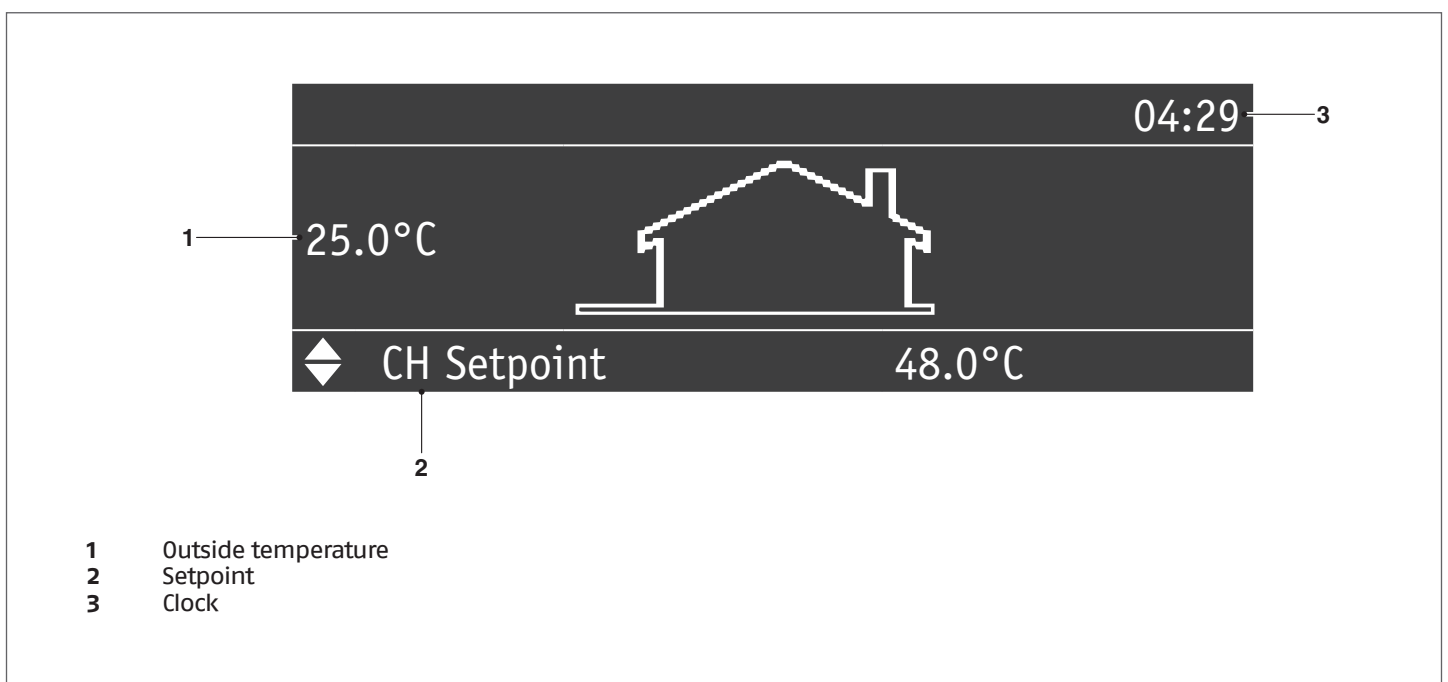


1.12 Control panel

CONTROL PANEL AND SYMBOLS



SECONDARY INFORMATION/DISPLAY VISUALISATION



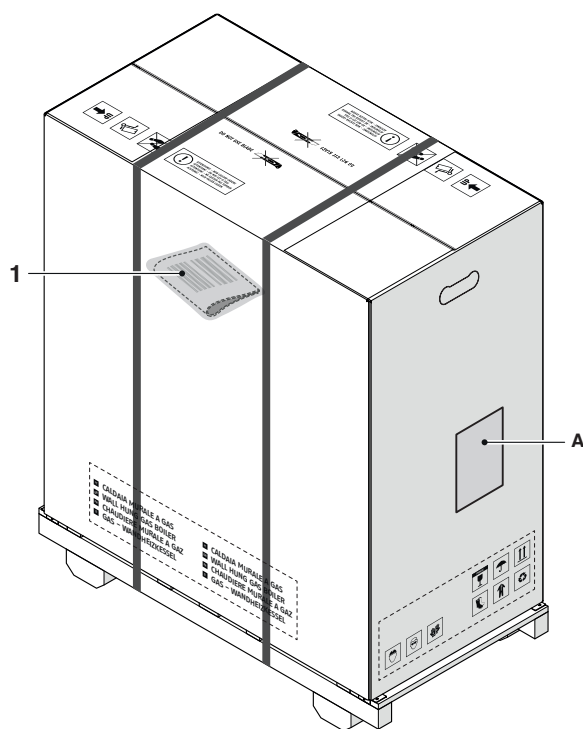
2 INSTALLATION

2.1 Unpacking the product

The thermal module **Steel Pro Power** is shipped palletised, packaged and with cardboard protections. The following material is supplied in a plastic envelope inside the package (1):


- Instruction manual
- Warranty information leaflet **RIELLO**
- LPG conversion kit
- Hydraulic test certificate

2.1.1 Positioning of labels

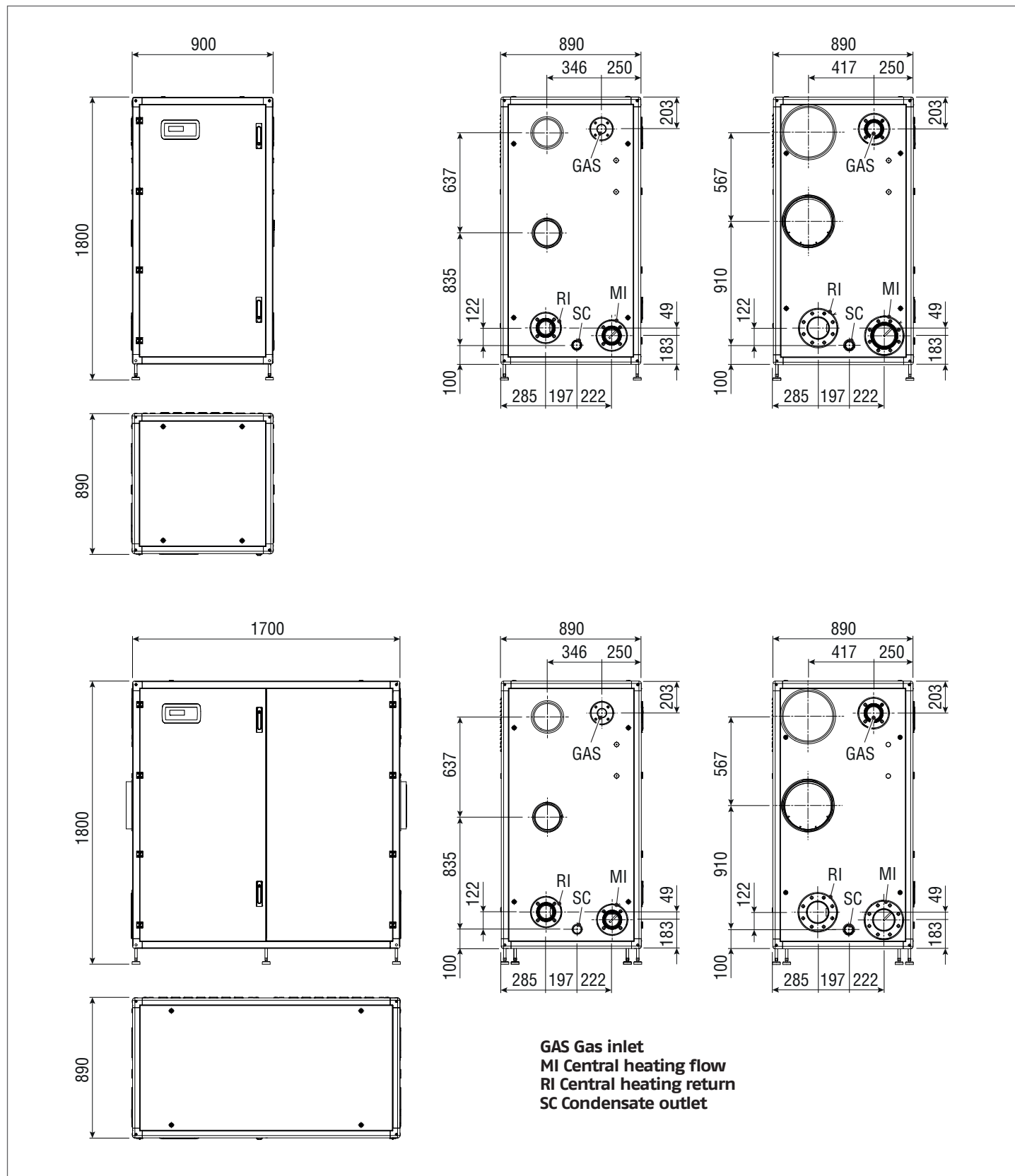


A Packing label

 The instruction manual is an integral part of the appliance; therefore, it should be read and stored carefully.

 Keep the documentation envelope in a safe place. Any replacement documents must be ordered from Riello S.p.A. who reserve the right to charge for the cost of the replacement.

2.2 Overall dimensions and weights









| Description | Steel Pro Power | | | | | U.M. |
|--------------|-----------------|---------|---------|---------|---------|------|
| | 114-2 P | 140-2 P | 180-2 P | 230-2 P | 270-2 P | |
| Empty weight | 270 | 270 | 280 | 300 | 350 | kg |

| Description | Steel Pro Power | | | | | U.M. |
|--------------|-----------------|---------|---------|---------|---------|------|
| | 300-3 P | 345-3 P | 405-3 P | 460-4 P | 540-4 P | |
| Empty weight | 450 | 490 | 540 | 560 | 600 | kg |

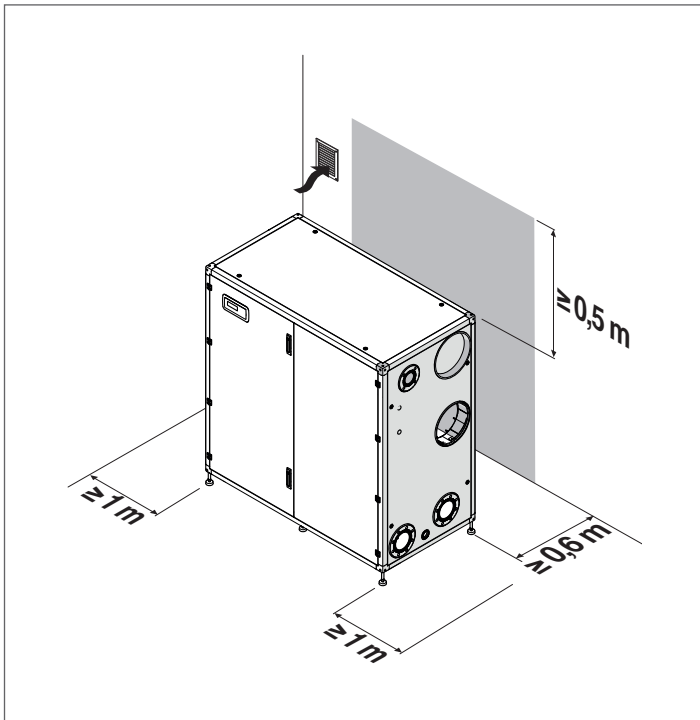
2.3 Installation premises

The thermal module **Steel Pro Power** can be installed in rooms that are permanently ventilated and equipped with suitably sized ventilation openings in line with Technical Standards and Regulations applicable to the installation site.

-  When installing the boiler, allow sufficient space around it to access all safety and control devices and to permit easy maintenance.
-  Check that the electric protection level of the appliance is suitable for features of the room where it is installed.
-  Make sure that comburent air is not contaminated by substances containing chlorine or fluorine (elements found in sprays, paints, detergents etc.).
-  Thermal modules may be installed outdoors only if the special accessory is fitted.
-  Do not obstruct or restrict the air vents in the room where the boiler is installed. A free air supply is essential for correct combustion.
-  It is forbidden to leave flammable containers and substances in the room where the thermal module is installed.

2.3.1 Recommended minimum distances


Clearances for the assembly and the maintenance of the appliance are shown in the figure.



2.4 Installation in older systems and systems requiring modernisation

When installing these boilers in older systems or systems requiring modernisation, always perform the following checks:


- Make sure that the flue is able to withstand the temperature of the combustion gases and that it has been designed and made in compliance with applicable standards. The flue must also be as straight as possible, sealed, insulated and not blocked or choked. See Paragraph "Discharge of combustion products" for any additional information.
- Make sure that the electrical supply system has been installed by a qualified electrician in compliance with applicable standards
- Make sure that the fuel feed line and any storage tank are made and installed in compliance with applicable standards
- Make sure that expansion vessels are big enough to contain the additional volume generated by thermal expansion
- Make sure that the flow rate, head and direction of flow of the pumps are suitable and correct
- The system has been washed, cleaned of mud and grime and water seals have been checked
- A treatment system is fitted when the supply/refill water has values other than those indicated in Paragraph "Water quality requirements"


-  The manufacturer declines all responsibility for damage caused by incorrectly constructed flue systems.

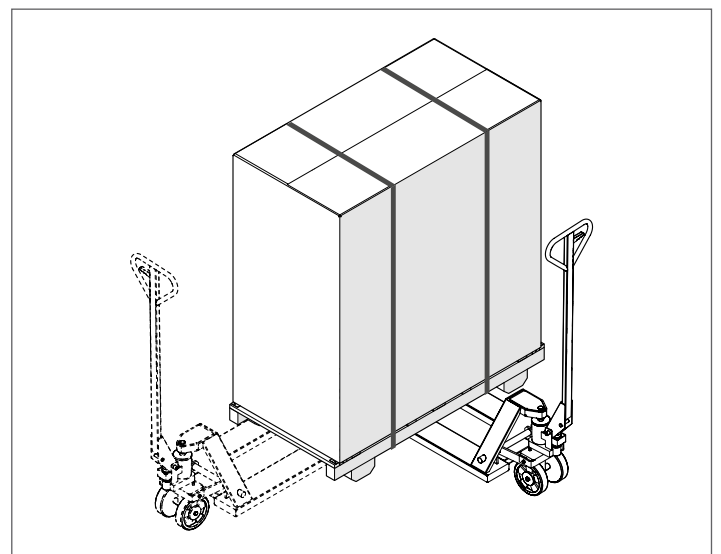
2.5 Moving and removing the packing

To move the module before removing the packaging, place yourself on the front of the packaging, making sure that the forks stretch out from the opposite side before lifting the load from the ground.

- If it is necessary to fork the appliance from the side, make sure that for the 2 unit modules the fork is stretched beyond the opposite side while for the 3/4 unit modules the forks need to exceed the center line.

-  To move the appliance, use suitable equipment according to the weight of the appliance itself.

-  Avoid slamming against rigid surfaces (such as floors and walls) during operations of movement.



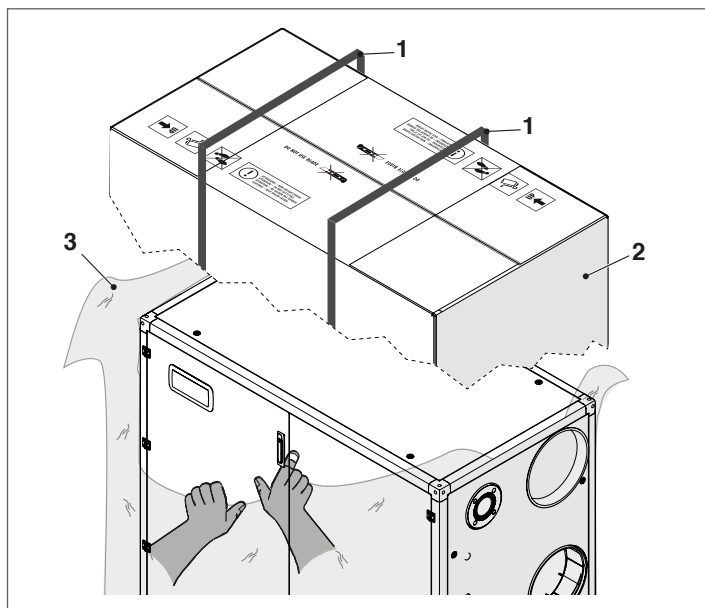
⚠ Do not remove the cardboard packaging until you reach the installation location.

⚠ Before handling the appliance and removing the packaging, wear PPE and use tools suitable for the appliance's size and weight.

⚠ This step must be carried out by several individuals equipped with suitable means with respect to the appliance's size. Make sure that the load is not unbalanced during handling.

Proceed as follows to remove the packing:

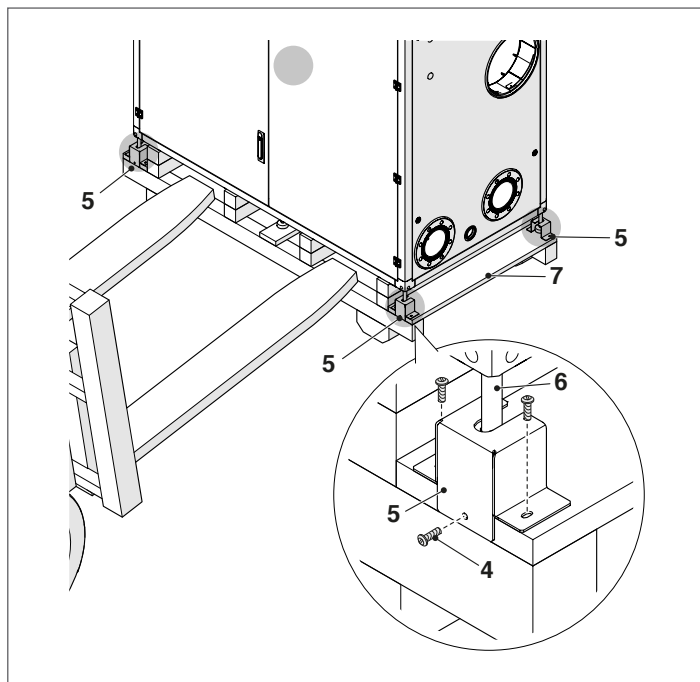
- Remove the straps (1) that fix the packaging to the pallet
- Remove the box (2)
- Remove the protective bag (3)



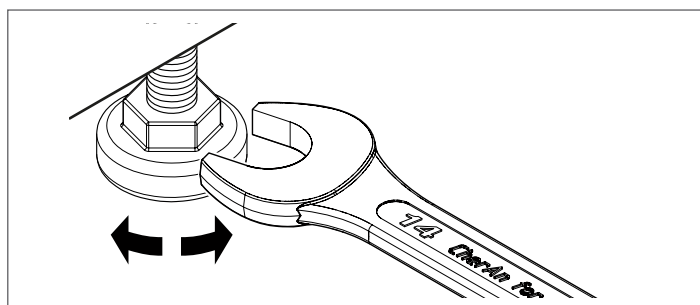
⊘ Do not dispose of packaging material into the environment, or leave it within the reach of children, since it can become a potential hazard. Dispose of packaging material in compliance with applicable legislation.

To remove the module from the pallet proceed as follows:

- Unscrew the screws (4) of the four stops (5) that fix the feet (6)
- To separate the pallet (7) from the module insert it as shown in the figure (always pushing from the front).

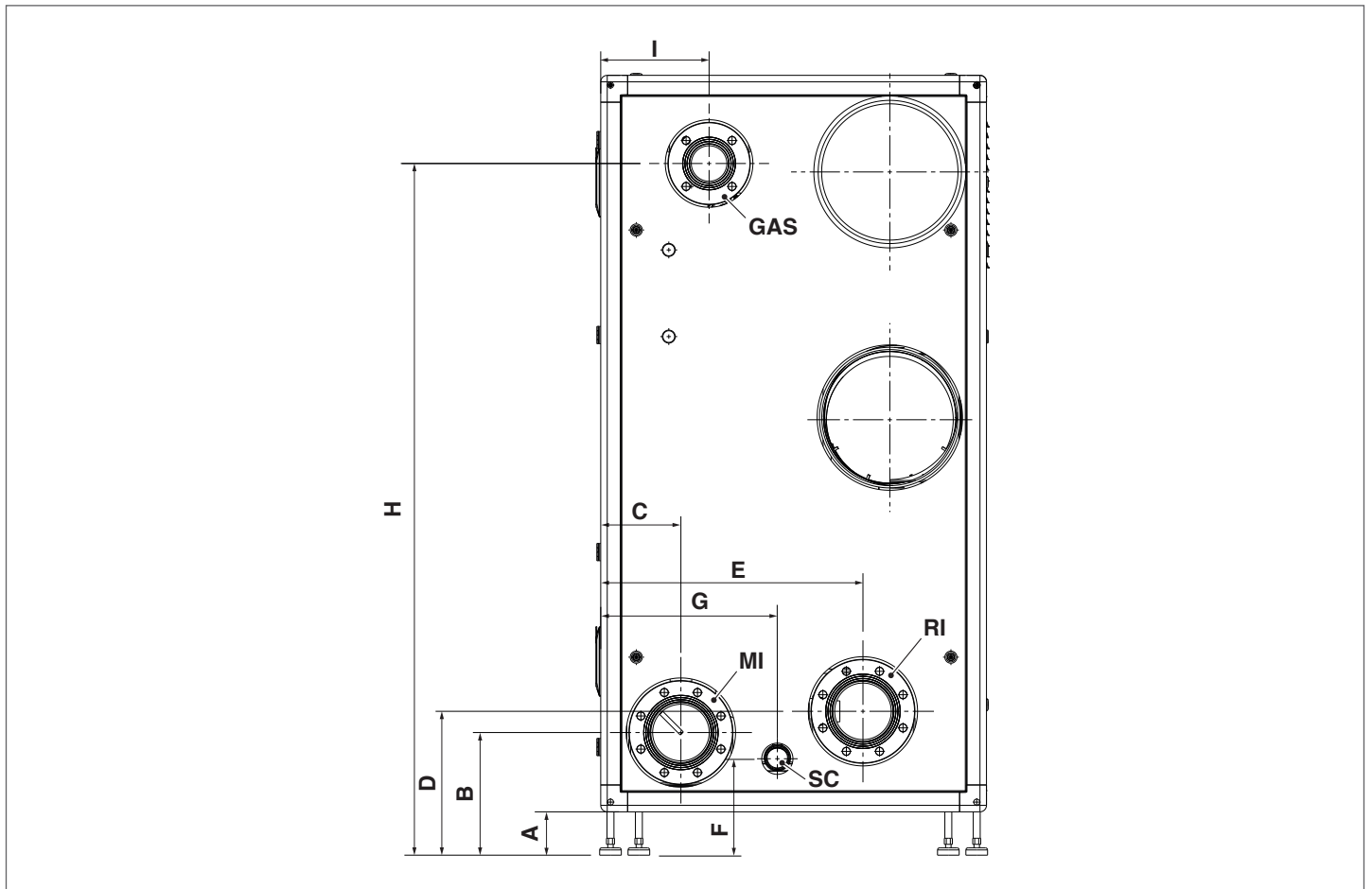


Once the module is positioned, level it by using the appropriate adjustments of the feet with a 14-key, as shown in the figure.



2.6 Water connections

The dimensions and position of thermal module's hydraulic connections are shown in the table below.



| DESCRIPTION | Steel Pro Power | | | | | | | | | | |
|-----------------------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----|
| | 114-2 P | 140-2 P | 180-2 P | 230-2 P | 270-2 P | 300-3 P | 345-3 P | 405-3 P | 460-4 P | 540-4 P | |
| A | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | mm |
| B | 283 | 283 | 283 | 283 | 283 | 283 | 283 | 283 | 283 | 283 | mm |
| C | 185 | 185 | 185 | 185 | 185 | 185 | 185 | 185 | 185 | 185 | mm |
| D | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | mm |
| E | 605 | 605 | 605 | 605 | 605 | 605 | 605 | 605 | 605 | 605 | mm |
| F | 222 | 222 | 222 | 222 | 222 | 222 | 222 | 222 | 222 | 222 | mm |
| G | 408 | 408 | 408 | 408 | 408 | 408 | 408 | 408 | 408 | 408 | mm |
| H | 1596 | 1596 | 1596 | 1596 | 1596 | 1596 | 1596 | 1596 | 1596 | 1596 | mm |
| I | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | mm |
| GAS (gas inlet) | DN 50 | DN 50 | DN 50 | DN 50 | DN 80 | DN 50 | DN 50 | DN 80 | DN 50 | DN 80 | ∅ |
| MI (system flow) | DN 80 | DN 80 | DN 80 | DN 80 | DN 125 | DN 80 | DN 80 | DN 125 | DN 80 | DN 125 | ∅ |
| RI (system return) | DN 80 | DN 80 | DN 80 | DN 80 | DN 125 | DN 80 | DN 80 | DN 125 | DN 80 | DN 125 | ∅ |
| SC (condensate drain) | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | ∅ |

- ⚠** Before connecting the thermal module the protection plugs must be removed from the delivery, return and condensate drain pipes.
- ⚠** Before connecting the thermal module, it is necessary to clean the system. This step is absolutely required when the appliance replaces another one on pre-existing systems.
- ⚠** Before connecting up the external pipework to the boiler, first connect the pipes to a suitable equipotential and earthing system via a specific conductor, different from the earthing terminal board on the boiler. The technician responsible for installing the hydraulic system is responsible for earthing the external pipework.

In order to carry out this cleaning activity, if the old generator is still installed on the system, it is advisable to:

- add a de-scaling additive.
- Operate the system with the generator on for around 7 days.
- Discharge dirty system water and flush the system one or more times with clean water.

If the system is very dirty, repeat the last procedure one more time.

If the old generator is not present or available, use a pump to circulate the water + additive through the system for about 10 days and perform a final washing as described in the previous paragraph.

Once the cleaning has been completed, it is recommended to add a suitable protective fluid to the system's water before installing the thermal module.

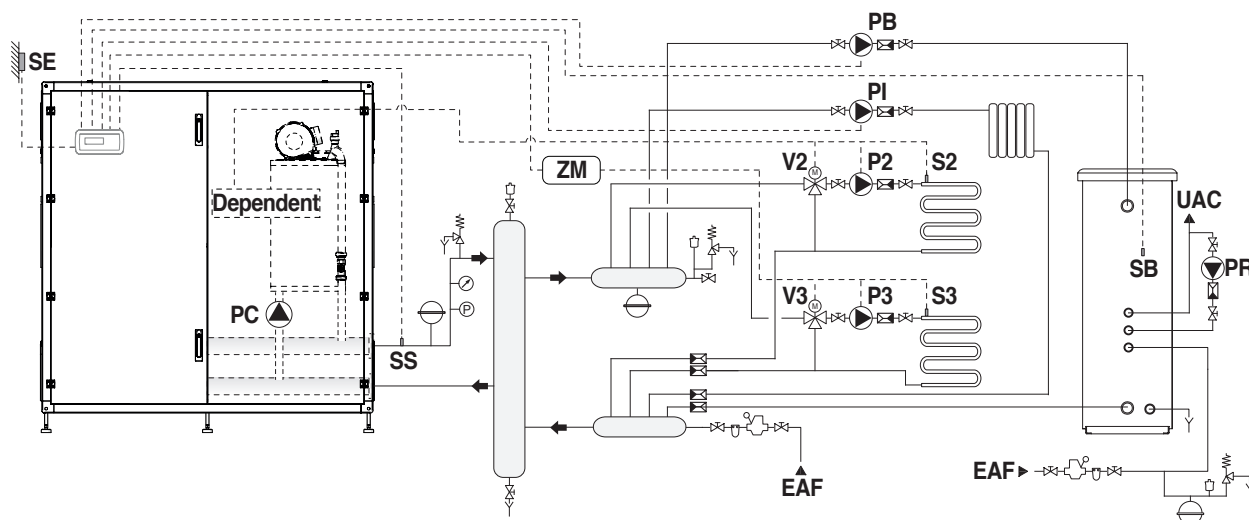
In order to clean the heat exchanger's built-in water system, please contact Technical Assistance Service **RIELLO**.

⊖ Do not use incompatible liquid detergents, including acids (for instance, chloridric acid and similar) in any concentration.

⊖ Do not subject the heat exchanger to cyclical pressure changes because fatigue stress is very dangerous for the integrity of system components.

2.7 Typical water system schematics

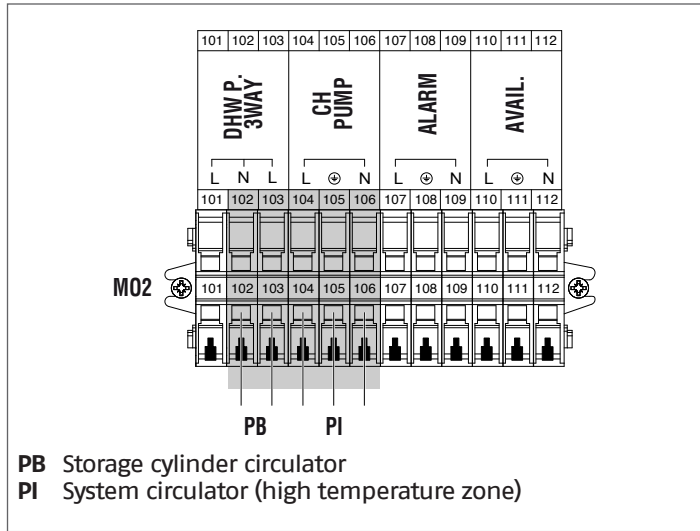
Block diagram 1: Circuit with thermal modules with their own circulator, connected in cascade.



- | | | | |
|-----------|---|------------|---|
| PC | Thermal module circulator | V2 | Mixer valve zone 2 |
| PB | Storage cylinder circulator | V3 | Mixer valve zone 3 |
| PR | DHW circulation pump | ZM | Electronic device for zone management (accessory) |
| P1 | System circulator (high temperature zone) | EAF | Domestic cold water inlet |
| P2 | Zone 2 circulator (low temperature) | UAC | Domestic hot water outlet |
| P3 | Zone 3 circulator (low temperature) | | |
| S2 | Zone 2 sensor | | |
| S3 | Zone 3 sensor | | |
| SB | Boiler sensor | | |
| SE | Outdoor sensor | | |
| SS | Primary sensor | | |

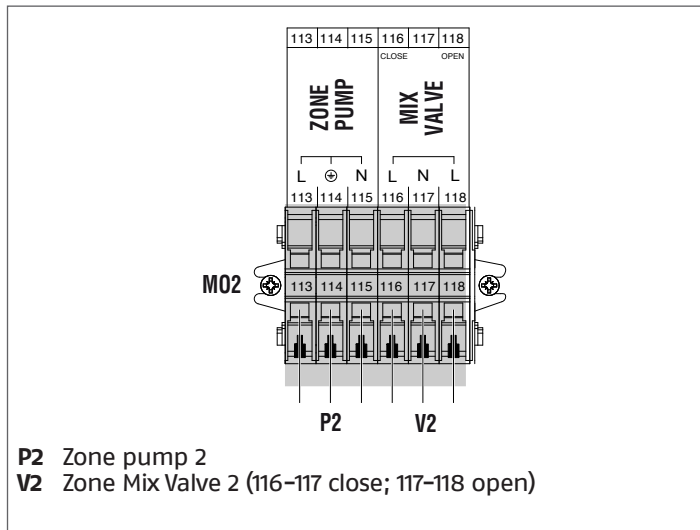
2.7.1 Electrical power connections Block diagram 1

MANAGING CONNECTIONS

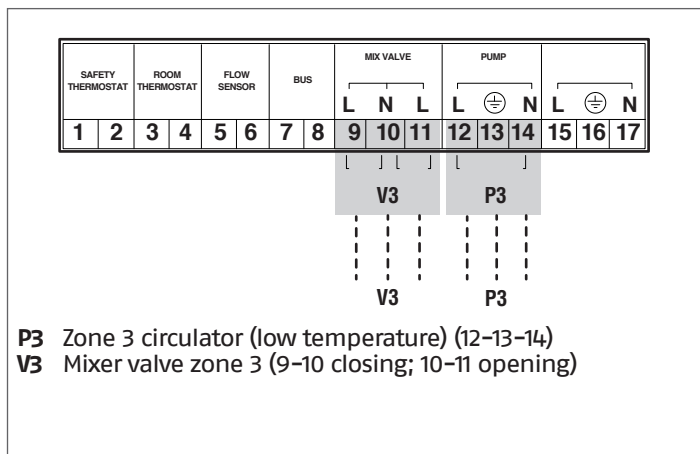


DEPENDENT CONNECTIONS

(only if the dependent zone is connected)

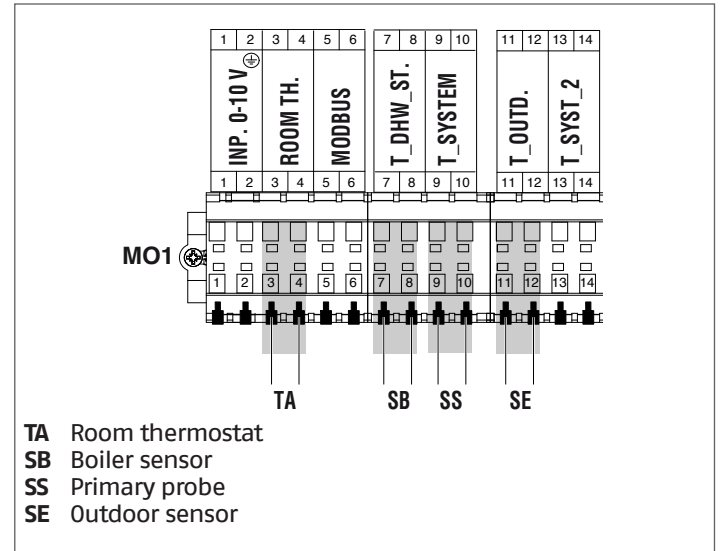


ACCESSORY CONNECTIONS FOR ADDITIONAL ZONE



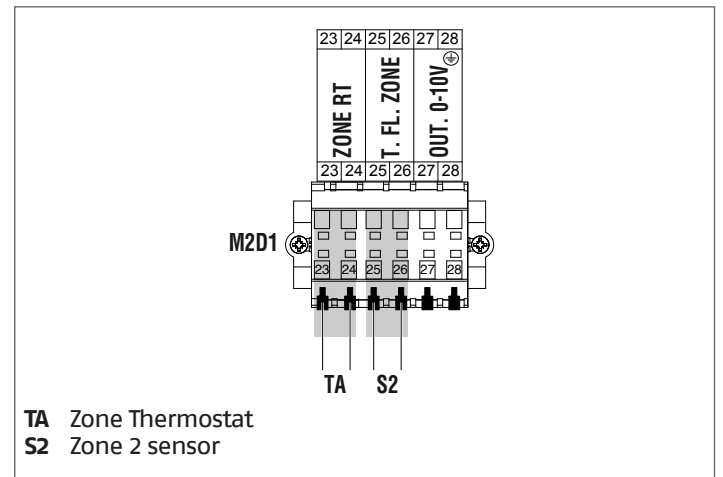
2.7.2 Connecting sensors/room thermostats Diagram 1

MANAGING CONNECTIONS

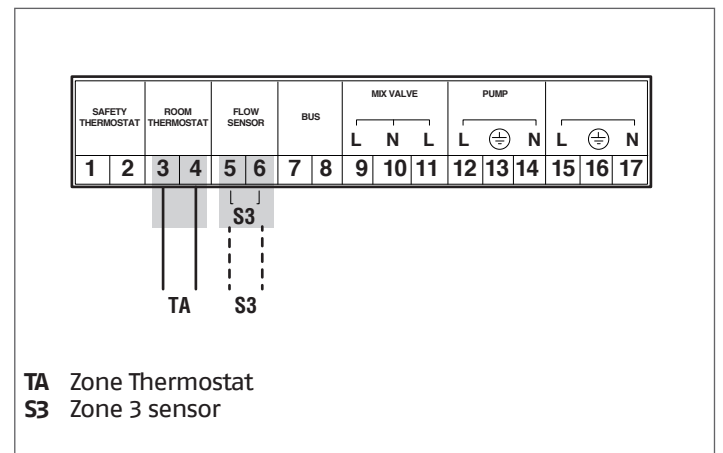


DEPENDENT CONNECTIONS

(only if the dependent zone is connected)

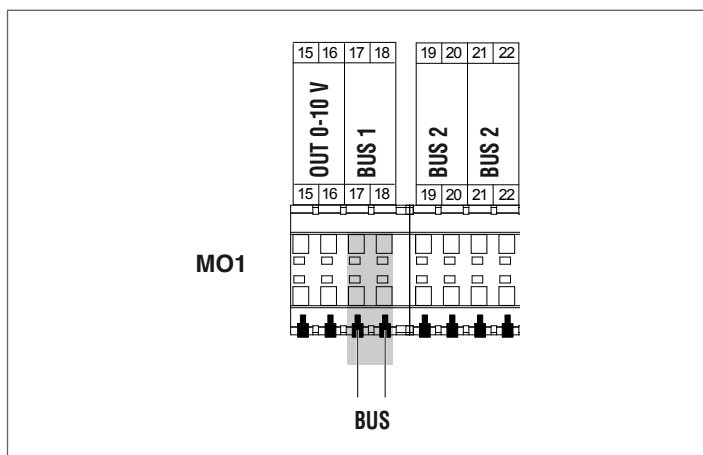


ACCESSORY CONNECTIONS FOR ADDITIONAL ZONE

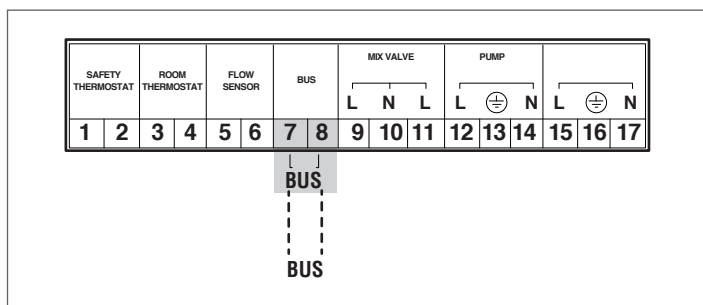


2.7.3 Bus connections Block diagram 1

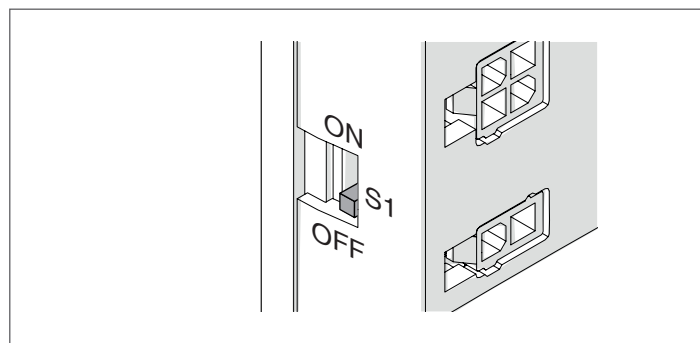
MANAGING CONNECTIONS



ACCESSORY CONNECTIONS FOR ADDITIONAL ZONE

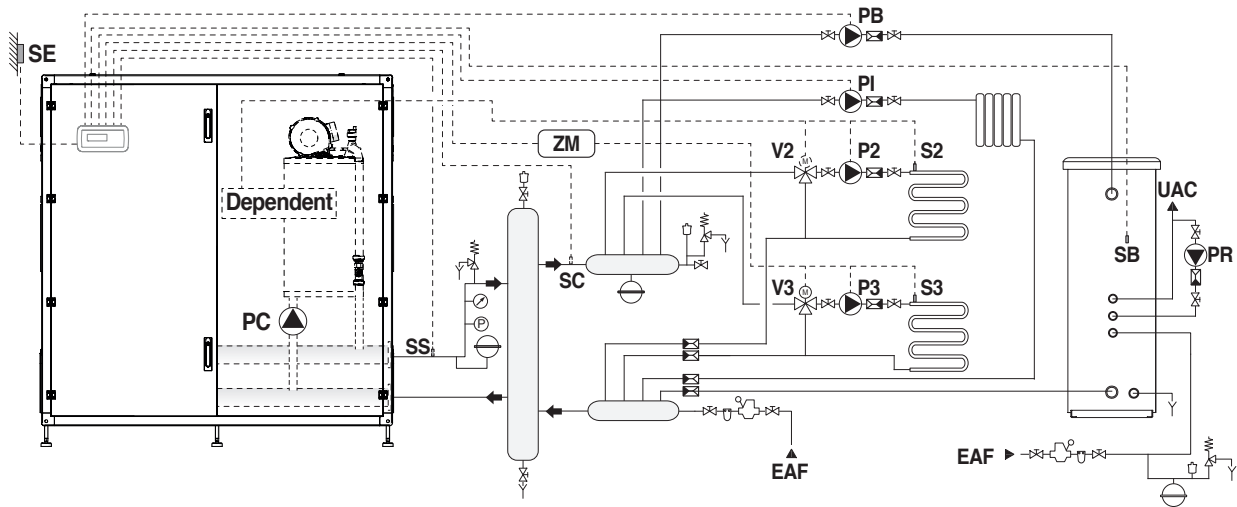


2.7.4 Setting switch S1 Block diagram 1



Setting switch S1=OFF

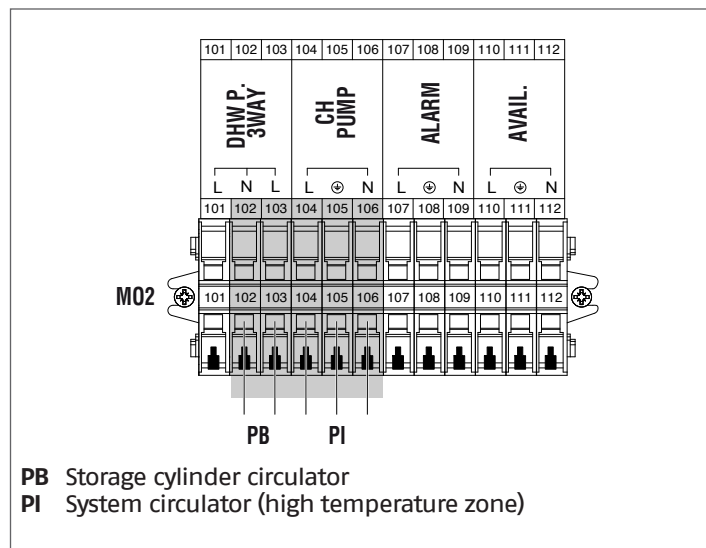
Block diagram 2: Circuit with thermal modules with their own circulator, connected in cascade. Using the secondary sensor.



- | | | | |
|-----------|---|------------|---|
| PC | Thermal module circulator | SC | Secondary sensor |
| PB | Storage cylinder circulator | V2 | Mixer valve zone 2 |
| PR | DHW circulation pump | V3 | Mixer valve zone 3 |
| PI | System circulator (high temperature zone) | ZM | Electronic device for zone management (accessory) |
| P2 | Zone 2 circulator (low temperature) | EAF | Domestic cold water inlet |
| P3 | Zone 3 circulator (low temperature) | UAC | Domestic hot water outlet |
| S2 | Zone 2 sensor | | |
| S3 | Zone 3 sensor | | |
| SB | Boiler sensor | | |
| SE | Outdoor sensor | | |
| SS | Primary sensor | | |

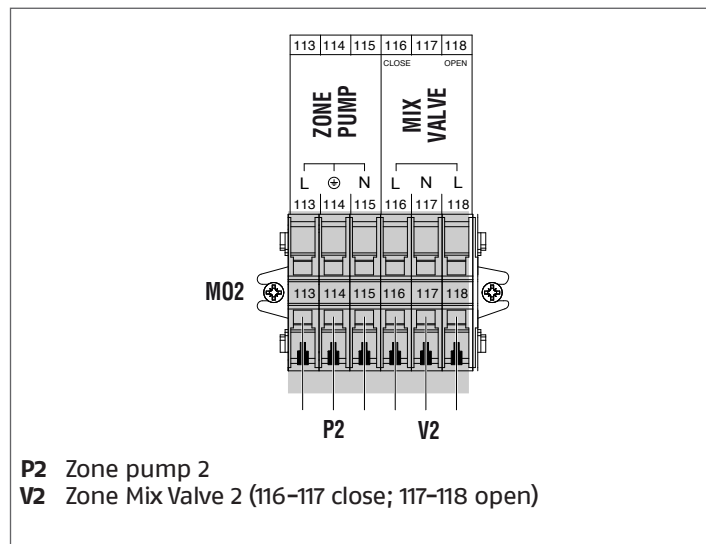
2.7.5 Electrical power connections Block diagram 2

MANAGING CONNECTIONS

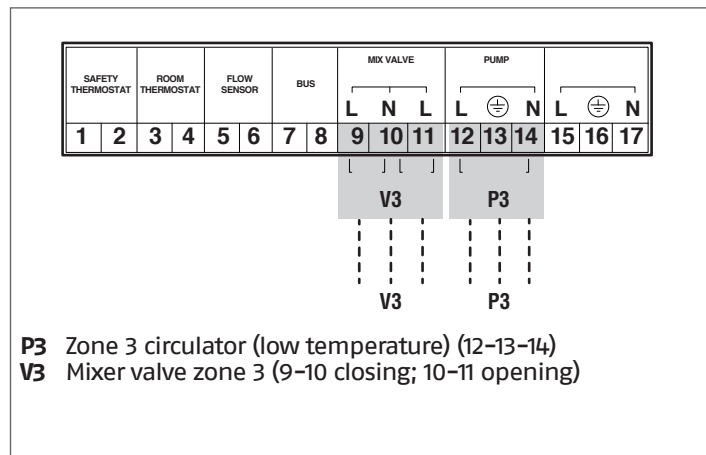


DEPENDENT CONNECTIONS

(only if the dependent zone is connected)

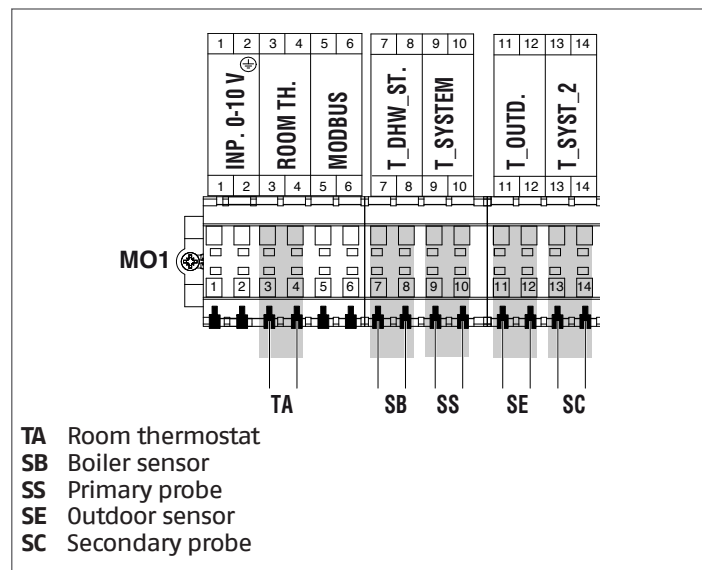


ACCESSORY CONNECTIONS FOR ADDITIONAL ZONE



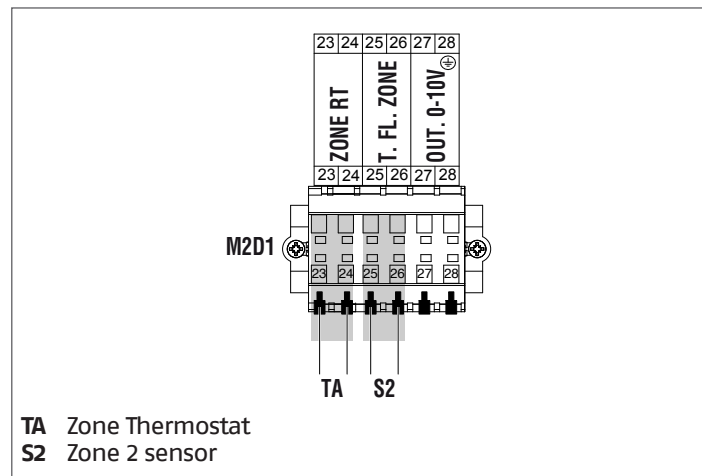
2.7.6 Connecting sensors/room thermostats Diagram 2

MANAGING CONNECTIONS

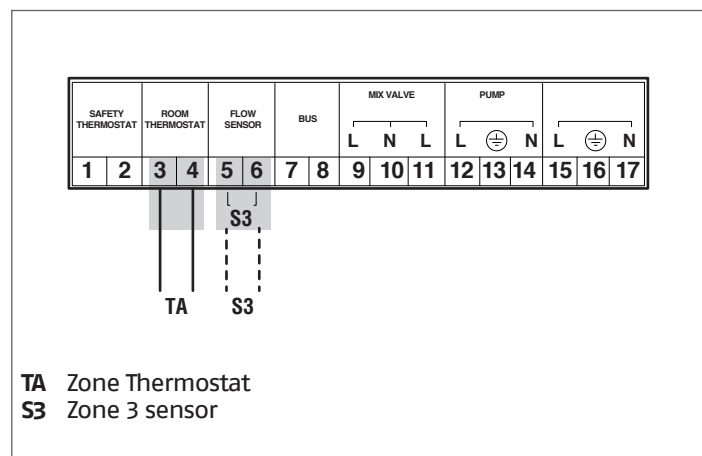


DEPENDENT CONNECTIONS

(only if the dependent zone is connected)

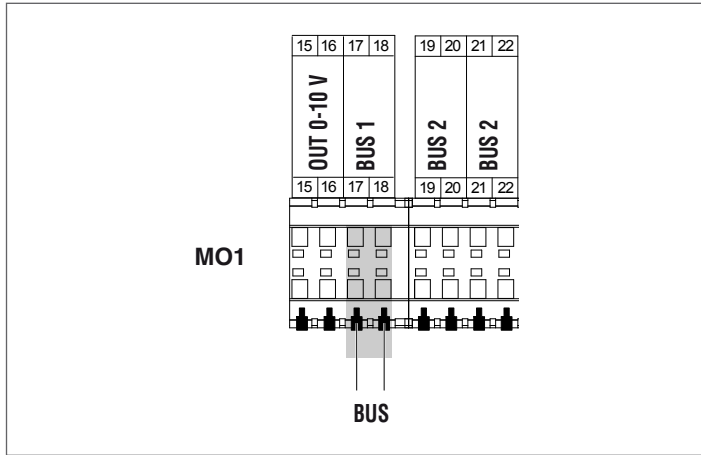


ACCESSORY CONNECTIONS FOR ADDITIONAL ZONE

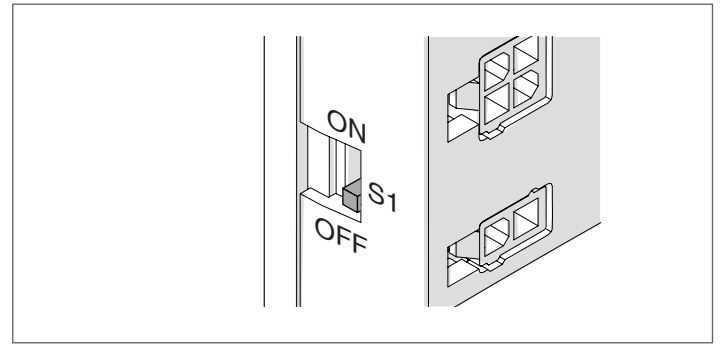


2.7.7 Bus connections Block diagram 2

MANAGING CONNECTIONS

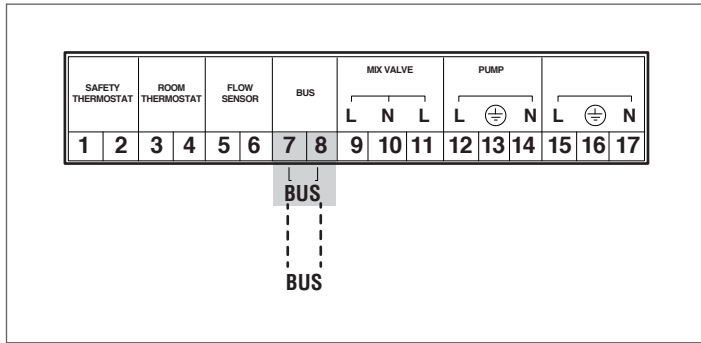


2.7.8 Setting switch S1 Block diagram 2



Setting switch S1=OFF







ACCESSORY CONNECTIONS FOR ADDITIONAL ZONE




2.8 Gas connections

The gas connection must be made respecting the installation regulations in force, and sized to ensure the correct gas delivery to the burner.

Before making the connection, check that:

-  The gas type is suitable for the appliance
-  If the appliance needs to be adapted for use with another gas fuel, contact your local Technical Assistance Service to have the necessary modifications made. These operations may not be performed by the installer under any circumstances.
-  The piping is thoroughly clean
-  The gas meter's flow rate is capable of ensuring the simultaneous use of all the appliances connected to it. The appliance's connection to the gas supply line must be carried out in accordance with the current regulations.
-  Intake pressure with the appliance in the off position has the following reference values:
 - powered by methane gas: optimal pressure 20 mbar
 - powered by L.P.G.: optimal pressure 37 mbar
-  Do not use any fuels other than those provided under any circumstances.

While it is normal for the intake pressure to decrease while the appliance is in operation, it is advisable to verify that no excessive pressure fluctuations take place. In order to limit the extent of these types of variations, the diameter of the gas supply line to be used must be assessed based on the length and the pressure drops of the line itself, from the meter to the thermal module.

-  If fluctuations in the gas distribution pressure are encountered, it is recommended to install an appropriate pressure stabiliser upstream of the appliance's gas intake. For G30 and G31 gas supply, all the necessary precautions must be taken in order to prevent the gas from freezing in the case of extremely low outdoor temperatures.





If the gas distribution network contains solid particles, install a filter on the fuel supply line. When selecting it, consider that pressure drops due to the filter should be as low as possible.

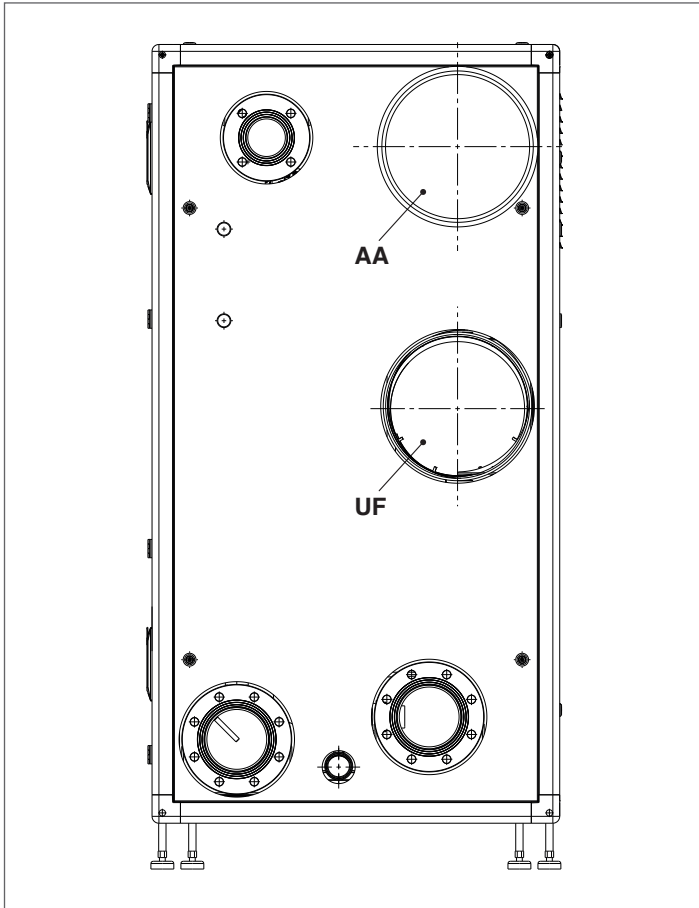
-  On completion of the installation, check that all joints are sealed.

2.9 Discharge of combustion products

The appliance is supplied as standard in B-type configuration (B23-B23P-B53P), i.e. pre-fitted to suction air directly into the installation room and may be converted into a C-type appliance with the use of specific accessories. In this configuration, the appliance will suction the air directly from outdoors, with the possibility of coaxial or dual piping.

For flue gas extraction and the intake of combustion air, it is essential to use only specific pipes for condensing boilers and ensure that they are correctly connected, as shown in the instructions supplied with the flue gas accessories.

-  Do not connect this appliance's flue gas extraction pipes with those of other appliances, unless this is specifically authorised by the manufacturer. Non-compliance with this precaution may cause a build-up of carbon monoxide in the room where the appliance is installed. This could jeopardise people's health and safety.
-  For further information on flue gas extraction pipes for thermal modules connected in a cascaded system, see Catalogue and the instructions provided for the relevant accessories.
-  Ensure that combustion air (suction line air) is not contaminated by:
 - waxes/chlorinated detergents
 - chemical products based on swimming pool chlorine
 - calcium chloride
 - sodium chloride use to soften tap water
 - refrigerant leaks
 - paint or varnish removers
 - chloridric acid/muriatic acid
 - cements and glues
 - anti-static softeners used in dryers
 - chloride used for domestic or industrial applications as detergent, whitener or solvent
 - adhesives used to glue construction and other similar products.
-  To prevent contamination of the thermal module, do not install suction line air intakes and gas flue extraction pipes near:
 - dry-cleaners/laundry rooms and factories
 - swimming pools
 - metal processing plants
 - beauty parlours
 - fridge repair shops
 - photo-processing facilities
 - body-shops
 - plastics manufacturing plants
 - furniture workshops and manufacturing plants.



The AA outlet is supplied capped in B23 configuration.

| Steel Pro Power | DESCRIPTION | | |
|-----------------|----------------------|------------------|---|
| | UF (flue gas outlet) | AA (air suction) | |
| 114-2 P | DN160 | DN160 | ∅ |
| 140-2 P | DN160 | DN160 | ∅ |
| 180-2 P | DN160 | DN160 | ∅ |
| 230-2 P | DN160 | DN160 | ∅ |
| 300-3 P | DN160 | DN160 | ∅ |
| 345-3 P | DN160 | DN160 | ∅ |
| 460-4 P | DN160 | DN160 | ∅ |

| Steel Pro Power | DESCRIPTION | | |
|-----------------|----------------------|------------------|---|
| | UF (flue gas outlet) | AA (air suction) | |
| 270-2 P | DN300 | DN300 | ∅ |
| 405-3 P | DN300 | DN300 | ∅ |
| 540-4 P | DN300 | DN300 | ∅ |

⚠ For stand-alone installations, a ∅300/160 adapter is required for models **Steel Pro Power** 270-2 P and 405-3 P to connect both models to a ∅160 mm duct.

⚠ For B-type installation, combustion air is taken from the environment and goes through the openings (shutters) on the rear panel of the device that must be located in a suitable and ventilated technical room.

⚠ Read the requirements, instructions and prohibitions detailed below carefully, since non-compliance with them may result in a safety hazard or the appliance's malfunction.

⚠ Condensation appliances described in this handbook must be installed with flue gas pipes compliant with applicable legislation and expressly manufactured for this specific use.

⚠ Check that pipes and joints are not damaged.

⚠ Joint seals must be executed with materials that withstand the condensate's acidity and the temperatures of the appliance's flue gases.

⚠ When installing flue pipes, always bear in mind the direction of the flue gases and of possible condensate flows.

⚠ Inadequate or incorrectly sized flue gas pipes may increase combustion noise, create condensate extraction issues and negatively impact on combustion parameters.

⚠ Check that pipes are suitably far (min. 500 mm) from flammable or heat-sensitive construction elements.

⚠ Make sure that condensation is not built up along the duct. For this purpose, provide a sloping duct of at least 3 degrees towards the appliance in case there is an a horizontal section. If the horizontal or vertical section is longer than 4 meters, a condensate siphon drainage must be provided at the base of the pipe. The useful height of the siphon must be at least equal to the value "H" (see figure below). The siphon discharge must then be connected to the sewerage system (see paragraph "Preparation for the condensate drain" on page 33).

⊖ It is prohibited to block or section the flue gas extraction pipe or the combustion air suction pipe, if any.

⊖ It is prohibited to use pipes that not designed for this application, because the condensate's action would damage them quickly.

Maximum equivalent lengths are provided below.

B TYPE INSTALLATION

Exhaust ∅ 160 mm

| Model | Maximum length ∅ 160 mm | Pressure drop | |
|---------|-------------------------|---------------|----------|
| | | 45° bend | 90° bend |
| 114-2 P | 30 m | 1,5 m | 2 m |
| 140-2 P | 30 m | 1,5 m | 2 m |
| 180-2 P | 30 m | 1,5 m | 2 m |
| 230-2 P | 30 m | 1,5 m | 2 m |
| 300-3 P | 30 m | 1,5 m | 2 m |
| 345-3 P | 30 m | 1,5 m | 2 m |
| 460-4 P | 30 m | 1,5 m | 2 m |

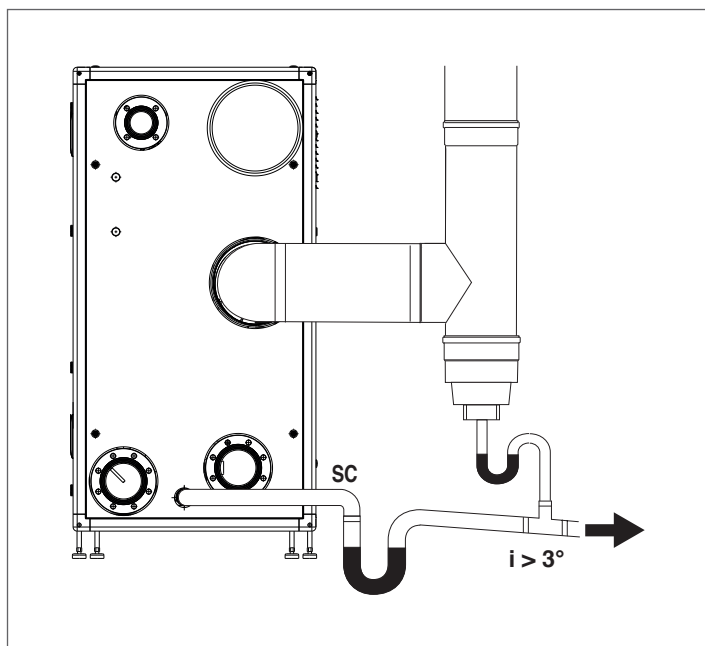
Exhaust \varnothing 300 mm

| Model | Maximum length \varnothing 300 mm | Pressure drop | |
|---------|-------------------------------------|---------------|----------|
| | | 45° bend | 90° bend |
| 270-2 P | 30 m | 2 m | 4 m |
| 405-3 P | 30 m | 2 m | 4 m |
| 540-4 P | 30 m | 2 m | 4 m |

The table with available residual discharge heads is shown below.

| Description | Discharge head | |
|-------------|----------------|-----|
| | Max | Min |
| 114-2 P | 510 | 35 |
| 140-2 P | 630 | 35 |
| 180-2 P | 560 | 32 |
| 230-2 P | 500 | 30 |
| 270-2 P | 353 | 28 |
| 300-3 P | 610 | 32 |
| 345-3 P | 500 | 30 |
| 405-3 P | 353 | 28 |
| 460-4 P | 500 | 30 |
| 540-4 P | 353 | 28 |

The residual discharge head values are shown in Pascal.



To change direction, use a T section with an inspection cap to permit easy access for cleaning inside the pipe. After cleaning, always make sure that inspection caps are replaced tightly and that their seals are undamaged and efficient.

2.9.1 Preparation for the condensate drain

The condensate coming out of the drainer must be collected for dripping into a taped vessel connected to the sewer system, if necessary by interposing a neutralizer (for more information see paragraph "Neutralization of the condensate"), according to the following procedure:

- Fit a drip tray near the condensate discharge outlet, adding a condensate neutraliser if necessary
- Connect the drip collection receptacle to the local drain or sewer system using a siphon.

The drip tray can be created by fitting a cup or simply a polypropylene bend, suitable for collecting the condensate that comes out of the appliance and any liquid leaking from the safety valve. The maximum distance between the condensate drainage of the appliance and the socket (or socket pipe) must not be less than 10 mm.

The connection to the local drain or sewer system must be executed using a siphon in order to prevent unpleasant odours from being released back into the room from the sewer.

We advise using plastic (PP) piping for building the condensate drainage.

⊖ Never use copper pipes under any circumstances, as the condensate itself will cause them to rapidly deteriorate.

⚠ Execute the condensate drain outlet so as to prevent combustion gases leaking into the environment or the drain or sewage system by sizing the siphon (height H) as described in Paragraph "Discharge of combustion products".

⚠ Always maintain a slope angle "s" of over 3° and ensure that the diameter of any condensate drain pipe is greater than that of the connection fitted at the drain outlet.

⚠ Connect the condensate drain hose to a domestic water drain in accordance with national and local legislation and standards.

⚠ Fill the siphons with water before switching on the module, avoiding the release of combustion products into the environment during the first few minutes of switching on the module.

⚠ Both the products from the condensate outlet of the module and the condensate from the flue-gas stack should flow into the same outlet duct.

⚠ The connection pipes used must be as short and as straight as possible. Any curves or sharp bends can lead to hoses becoming clogged and, therefore, can prevent proper condensate discharge.

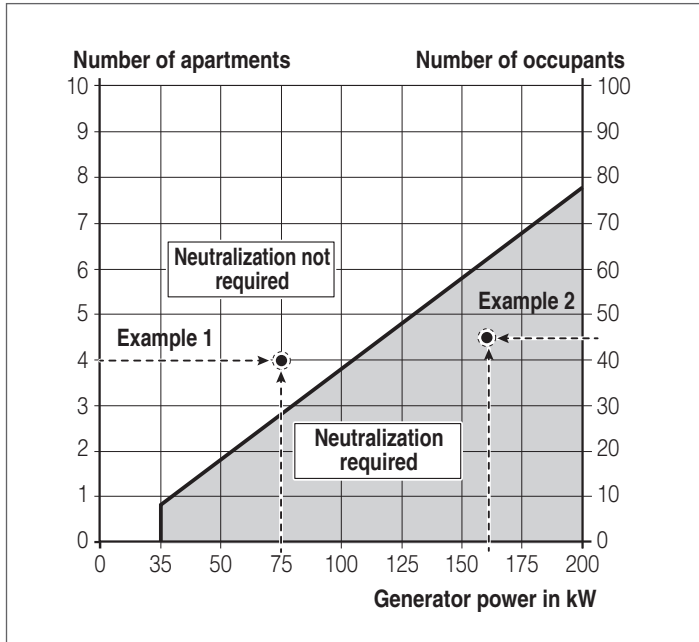
⚠ Size the condensate drain outlet so as to ensure the proper drainage of waste liquids without leaks.

⚠ The condensate drain must be connected to the drain and sewage network in such a way so that the condensate may not freeze under any circumstances.

2.10 Neutralization of the condensate

To correctly eliminate the combustion condensate, check if the condensate needs to be neutralized using a designated accessory.

- For systems with a nominal heat input greater than 200 kW, the condensate always needs to be neutralized
- For systems with a nominal heat input greater than 35 kW but less than 200 kW, the selection and evaluation criteria is provided in the figure below



Example 1

For a residential building with 4 apartments, a 75 kW condensing boiler needs to be installed. The 4 apartments / 75 kW intersection point is within the range "neutralization not required", therefore the condensate does not need to be neutralized.

Example 2

For an office block with 45 users, a 160 kW condensing boiler needs to be installed. The 45 users / 160 kW intersection point is within the range "neutralization required", therefore the condensate needs to be neutralized.

In the case of residential applications, reference must be made to the number of apartments served by the system, while in the case of non-residential applications, reference must be made to the number of users.

In the case of mixed applications, the number of apartments must be converted into equivalent users, or conversely, according to the alignment of the two vertical axes, therefore refer only to one axis (for example, 2 apartments equate to 20 users).

⚠ The condensate drainage system must be sized and installed to ensure correct elimination of the effluents produced by the appliance and/or by the evacuation system of the combustion products in any and all operating conditions.

2.10.1 Water quality requirements

It is ABSOLUTELY NECESSARY to treat the water system in order for the heat generator to work properly and to guarantee its service life, as well as that of all its components. This not only applies to jobs carried out on existing installations but also on new installations.

Sludge, lime-scale and pollutants contained in the water can cause permanent damage to the heat generator, also within a short time and notwithstanding the quality standards of the materials used.

Contact the Technical Assistance Service for any further information on type and use of additives.

The heat transfer fluid (water) for the central heating circuit must conform to the quality parameters given in the following table:

| Parameters | Value | Unit |
|-------------------------|----------------------------------|-------|
| General characteristic | Colourless, without sediment | |
| PH value | Min. 6.5; Max. 8 | PH |
| Dissolved oxygen | < 0,05 | mg/l |
| Total iron (Fe) | < 0,3 | mg/l |
| Total copper (Cu) | < 0,1 | mg/l |
| Na2SO3 | < 10 | mg/l |
| N2H4 | < 3 | mg/l |
| P04 | < 15 | mg/l |
| CaCO3 | Min. 50 ; Max.150 | ppm |
| Trisodium phosphate | None | ppm |
| Chlorine | < 100 | ppm |
| Electrical conductivity | <200 | µS/cm |
| Pressure | Min. 0.6; Max. 6 | bar |
| Glycol | Max. 40% (only propylene glycol) | % |

⚠ All data in the table refer to water contained in the system after 8 weeks' operation.

⚠ Do not use excessively softened water. Excessive water softening (total hardness < 5° f) results in corrosion due to contact with metal elements (pipes or thermal module components)

⚠ Immediately repair any leaks or drips that could result in air entering the system

⚠ Excessive pressure fluctuations can cause stress and fatigue to the heat exchanger. Keep the operating pressure constant.

⚠ Water used to fill a system for the first time and water used to top it up must always be filtered (using synthetic or metal mesh filters with a filtration rating of no less than 50 microns) to prevent sludge from forming and triggering deposit corrosion.

⚠ If oxygen enters a circuit continuously or even intermittently (e.g. in under-floor heating systems whose pipes are not protected by impermeable synthetic sheaths, in circuits with open expansion vessels, or in circuits that require frequent top-ups) always separate the boiler's water circuit from the central heating circuit.

To sum up, in order to eliminate contact between air and water (and to prevent the latter from becoming oxidized), it is necessary:

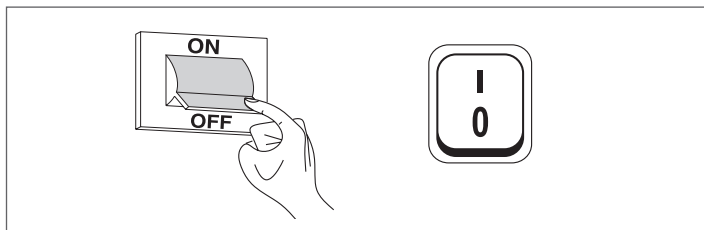
- that the expansion system be a closed vessel, correctly sized and with the correct pre-loading pressure (to be regularly checked);

- that the system be always at a pressure higher than the atmospheric one at any point (including the pump suction side) and under any operating conditions (all seals and hydraulic couplings in a system are designed to withstand pressure towards the outside, but not under-pressure);
- the installation be not made with gas-permeable materials (e.g. plastic pipes without oxygen barrier for under-floor heating systems)

⚠ Damages suffered by the thermal module, caused by encrustations and corrosion, are not covered by warranty. In addition, the non compliance of the water requirements listed in this chapter will void the appliance warranty itself.

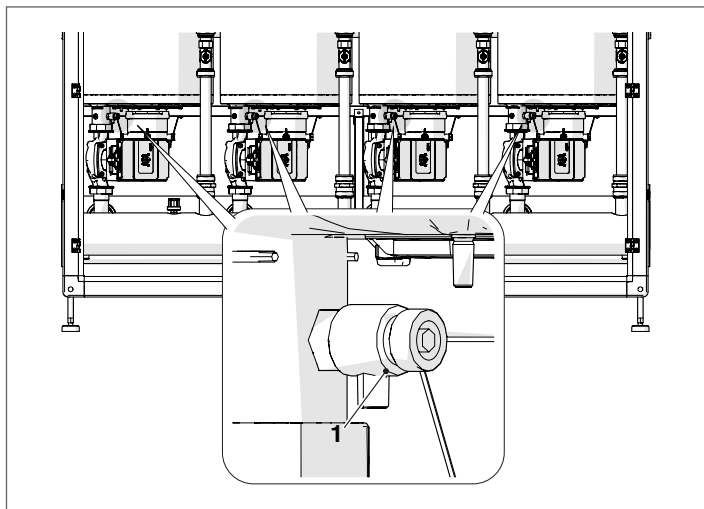
2.11 System filling and emptying

The thermal module **Steel Pro Power** must be provided with a charging system to be connected to the appliance's return line. Before filling or emptying the system, switch the system's master switch to the OFF position and the thermal module's master switch to (0).



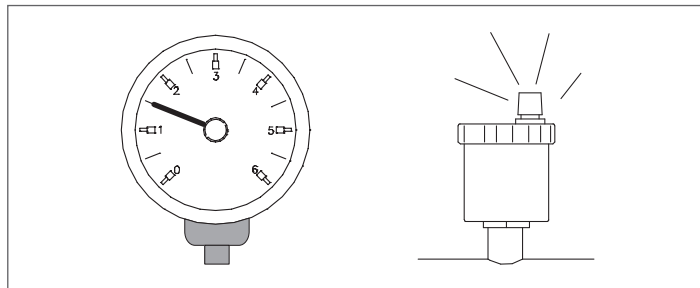
2.11.1 Filling

- Make sure that drain cocks (1) are closed before you start loading the system



- Unscrew the vent valve's release cap
- Open the shut-off cocks in order to slowly fill the system
- Use the pressure gauge to check that the pressure is rising and the water is exiting through the vent valves
- Close the shut-off cocks after the pressure reaches 1.5 bar

- Start the system pumps and the thermal module's pump as shown in Paragraph "Commissioning and maintenance"
- During this stage, check that the air is correctly eliminated
- Restore the pressure if necessary
- Switch the pumps off and on again
- Repeat the last three steps until the pressure is stabilised



⚠ The system must be filled up slowly the first time; once it is filled and the air expelled it should never need to be topped up again.

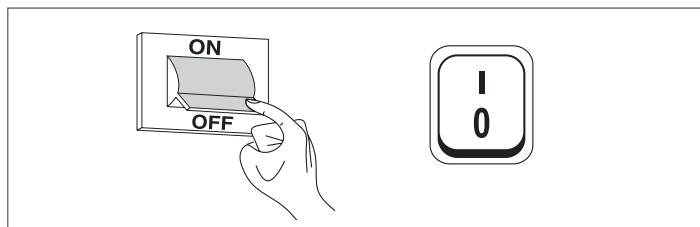
⚠ Systems should also be operated at maximum working temperature the first time they are started up, in order to facilitate de-aeration. (Gas is not released from the water at low temperatures).

⚠ An automatic spurge can be performed during the first ignition. The parameter that set the cycle is Par. 139. See parameter table for more information.

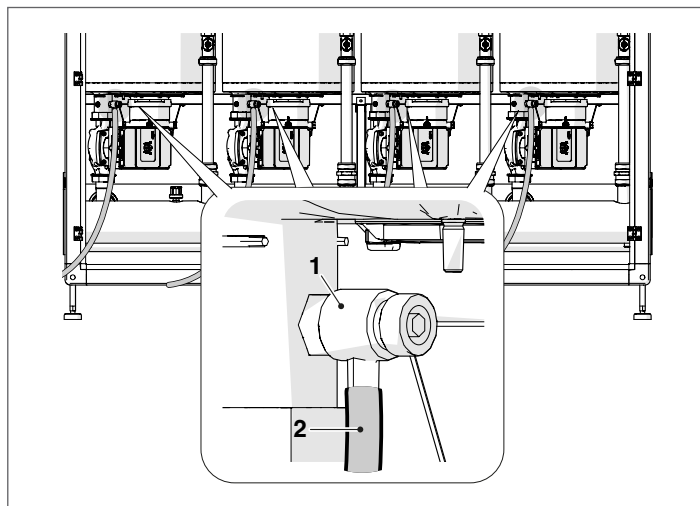
2.11.2 Emptying

Before starting to empty the appliance and the storage cylinder:

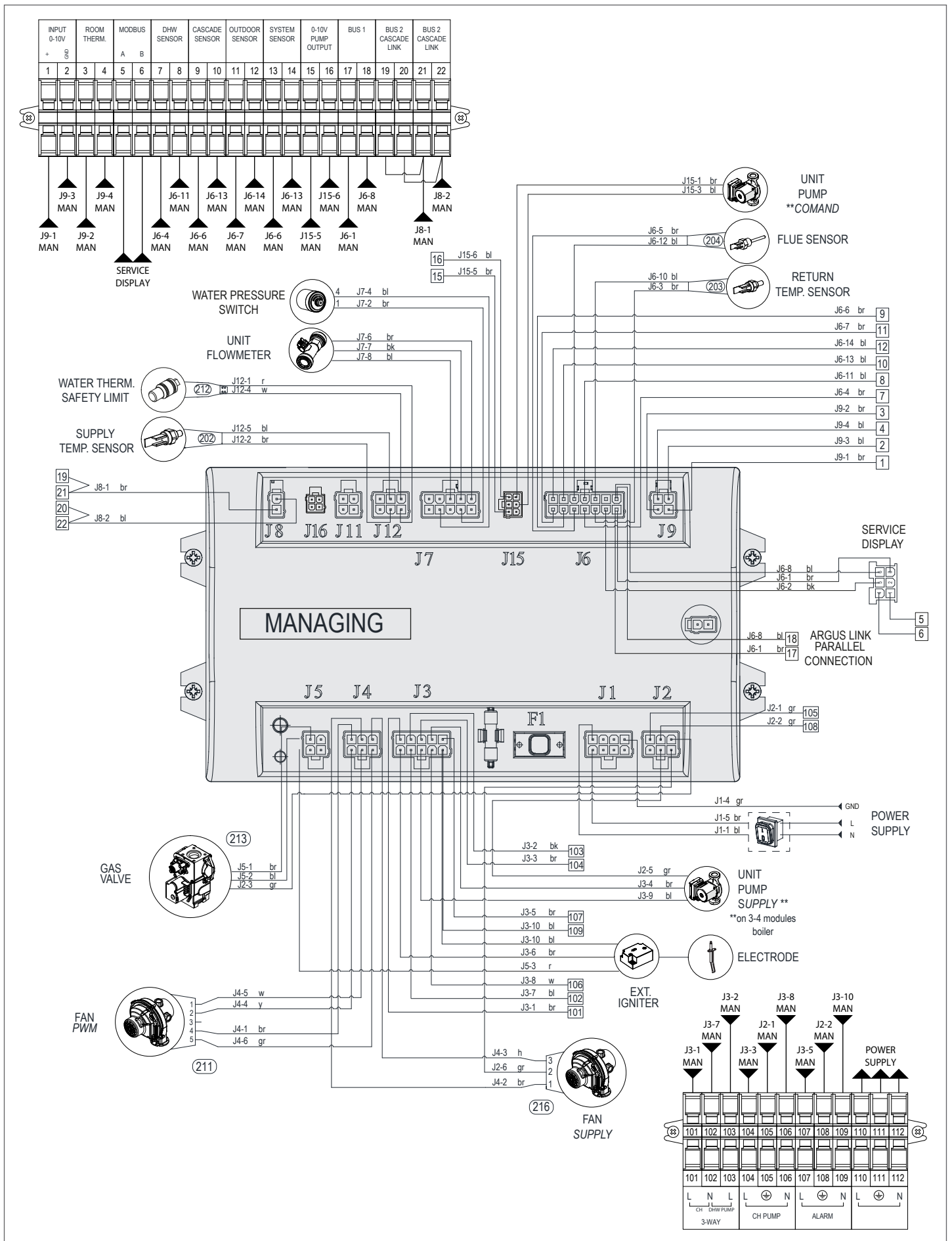
- Switch the system's master switch to the OFF position and the thermal module's master switch to (0).

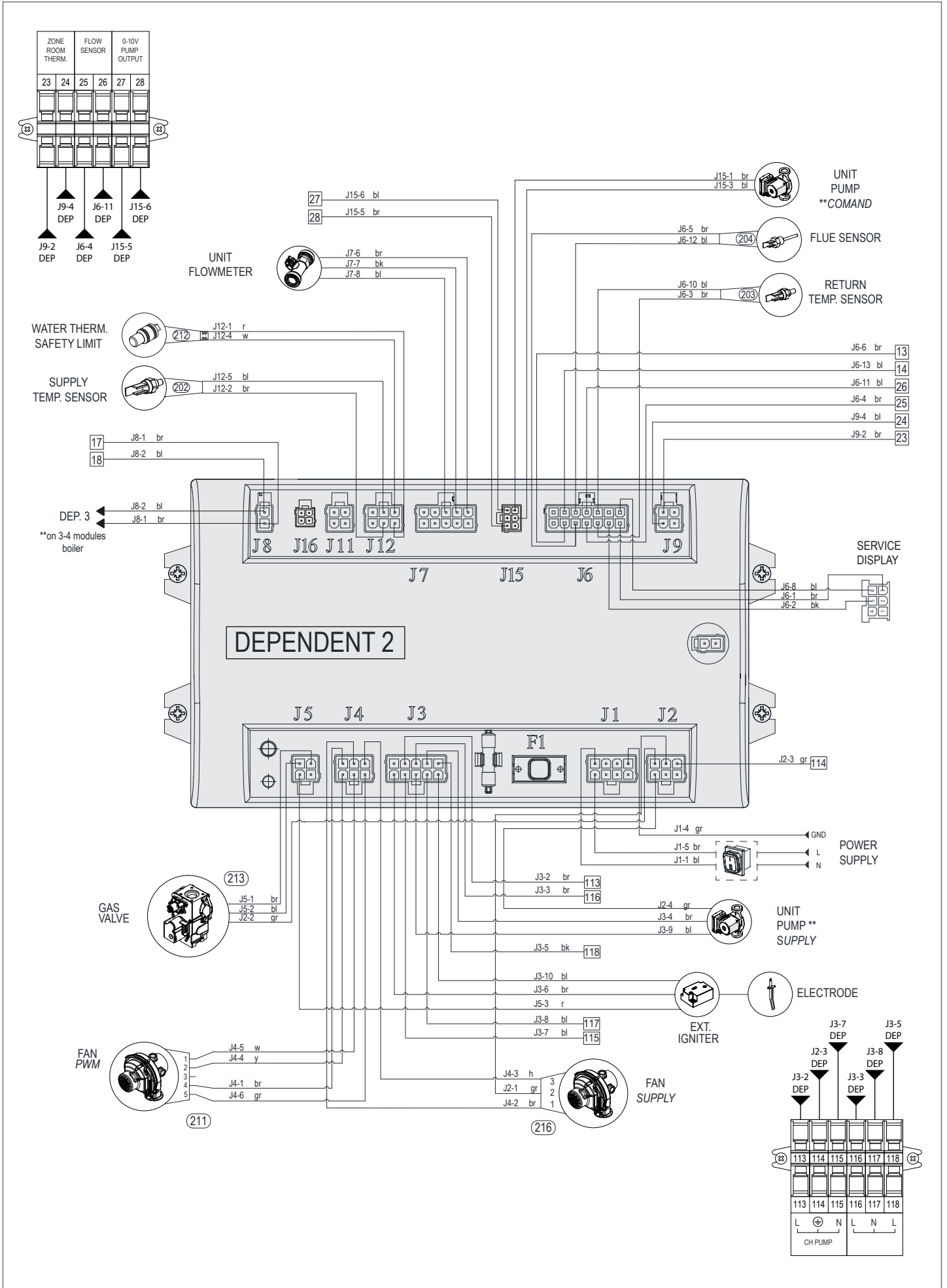


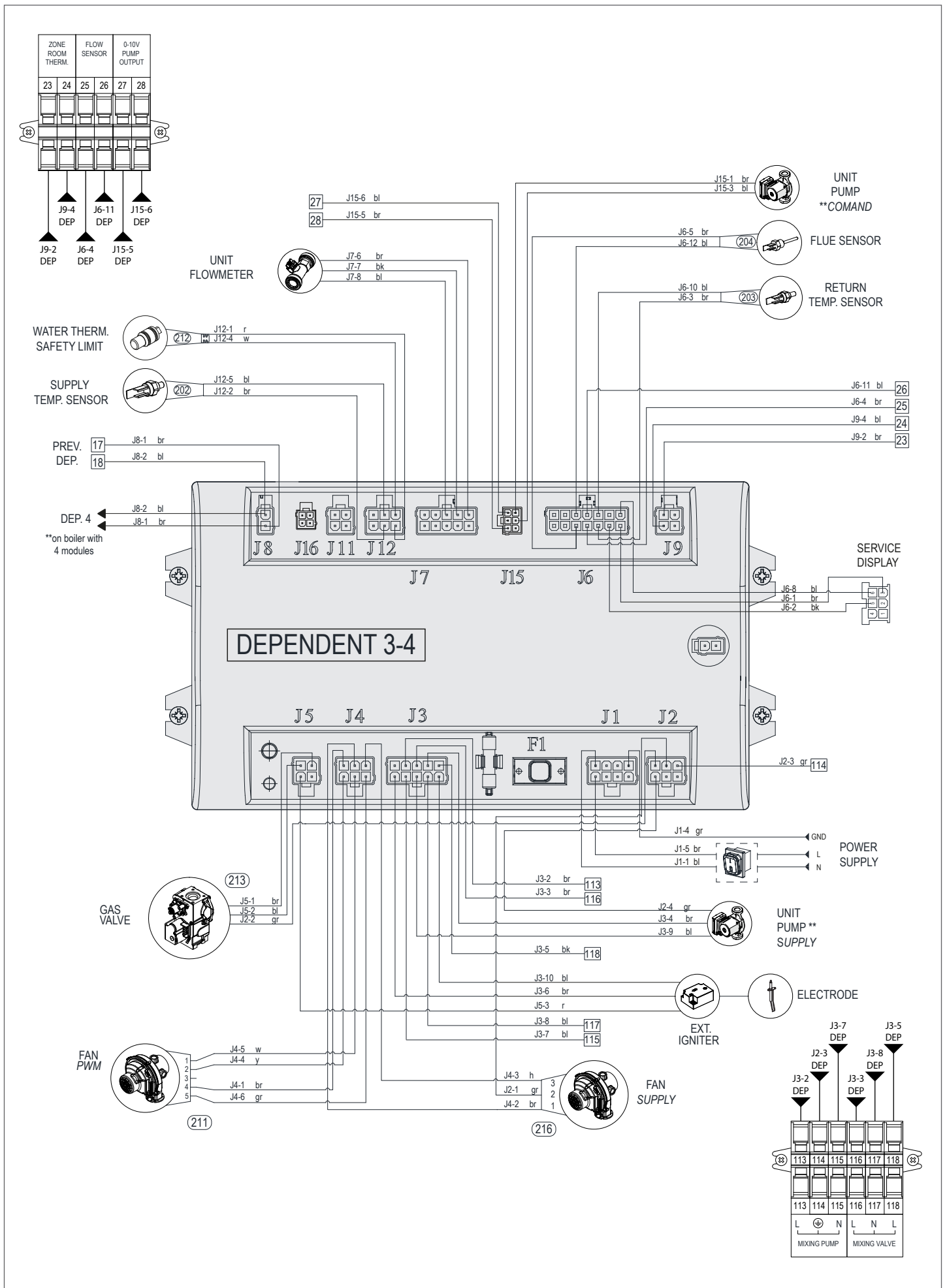
- Close the water supply shut-off cocks;
- To empty the appliance, connect a rubber hose (2) (Øint internal diameter = 12mm) to the drainage hose connector of each unit (1).



2.12 Wiring diagram







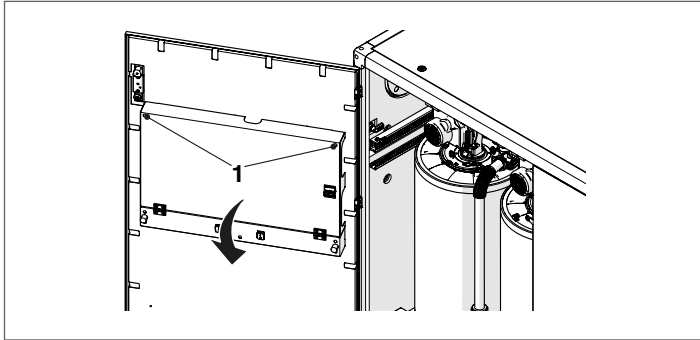
2.13 Electrical connections

The thermal module **Steel Pro Power** is manufactured fully wired and only needs to be connected to the mains, the room/heat demand thermostat and any other system components.

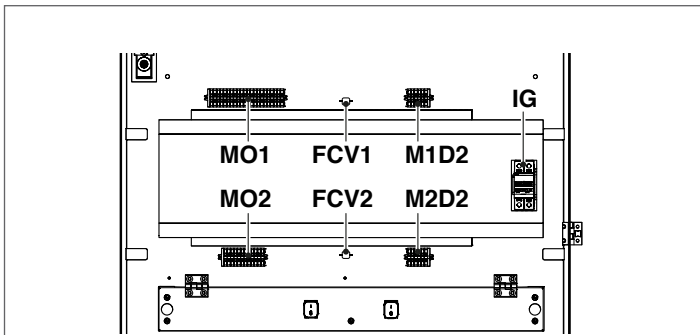
- ⚠ The following is mandatory:
 - The use of an all-pole magnetothermal switch and residual current circuit breaker, line disconnecting switch in compliance with CEI-EN standards (contact opening of at least 3 mm)
 - Respect the connection L (line) - N (neutral). Keep the earth conductor 2 cm longer than the power supply conductors
 - Use cables with a section greater than or equal to 1.5 mm², complete with cable terminal caps
 - Refer to the wiring diagrams in this manual for all electric operations.
- ⚠ The use of adaptors, multiple sockets and extensions to power the appliance is not allowed.
- ⚠ to connect external electric components, it is necessary to use auxiliary relays and/or contactors to be fitted in a dedicated external electrical panel.
- ⚠ Any work on the electrical system must be carried out only by qualified personnel in compliance with all legal provision and safety regulations in particular.
- ⚠ Secure the cables into the dedicated cable ties in order to always guarantee their correct positioning within the appliance.
- ⚠ Electrical supply cables and control cables (room/heat demand thermostat, external temperature probes, etc.) must be strictly separate the one from the other and fitting inside independent ribbed PVC sheaths up to the electrical panel.
- ⚠ The connection to the electrical power supply must be performed using type 1 sheathed cables (3 x 1,5) N1WK or equivalent, while simple N07VK type or equivalent conductors can be used for the thermoregulation and low voltage circuits.
- ⚠ If the electrical power provided by the electrical company is of "PHASE-PHASE" connection type, preventively contact the nearest Technical Assistance Service.
- ⚠ Never shut the appliance off during normal operation (with the burner on) by shutting off the electrical power supply using the On-Off key or an external switch. This could cause the primary heat exchanger to overheat.
- ⚠ To switch it off (during the heating stage) use a room/heat demand thermostat. The On-Off key can only be actioned whilst the appliance is in stand-by or emergency mode.
- ⚠ Before connecting any external electrical components to the appliance (regulators, electric valves, climate control probes, etc.), check to make sure that their electrical characteristics are compatible with the available inputs and outputs (voltage, absorption, acceleration current).
- ⚠ Temperature probes must be NTC like. For resistance value, refer to table pag 17.
- ⚠ Always check the proper operation of the "grounding conductor" for the electrical system to which the appliance will be connected.
- ⚠ **RIELLO** shall bear no responsibility for any personal injuries or property damage caused by non-compliance with wiring diagrams or the electrical system's incorrect/lacking connection to the grounding system, or by non-compliance with applicable CEI Standards.
- ⚠ Please note that the unit's electrical system is not protected against lightning. Therefore, transient overvoltage protection devices must be installed in the system and within the power supply unit.
- ⚠ The technician responsible for installing the hydraulic system is responsible for earthing the external pipework. Before connecting up the pipes to the boiler, first connect them to a suitable equipotential and earthing system via a specific conductor, different from the earthing terminal board on the boiler. Improper use of the earthing terminal on the appliance may compromise the protective devices and generate dangerous potential differences.
- ⊖ It is strictly forbidden to use pipes of any kind to ground the appliance.
- ⊖ It is prohibited to lay power supply and room/heat demand thermostat cables near hot surfaces (delivery pipes). If they may come into contact with parts that have a temperature of over 50°C, use a suitable type of cable.
- ⊖ It is prohibited to touch electric appliances with damp/wet body parts or when your feet are wet.
- ⊖ It is prohibited to leave the appliance exposed to weather elements (rain, sun, wind, etc.) unless it is equipped with the relevant weatherproof kit.
- ⊖ It is prohibited to pull, detach, or twist any electric cables coming from the thermal module even when the latter is disconnected from the mains power supply.

To access the terminal jigs operate in this way:

- open the module door (or the left door if two doors are present).
- Unscrew the two screws (1) placed on the panel.

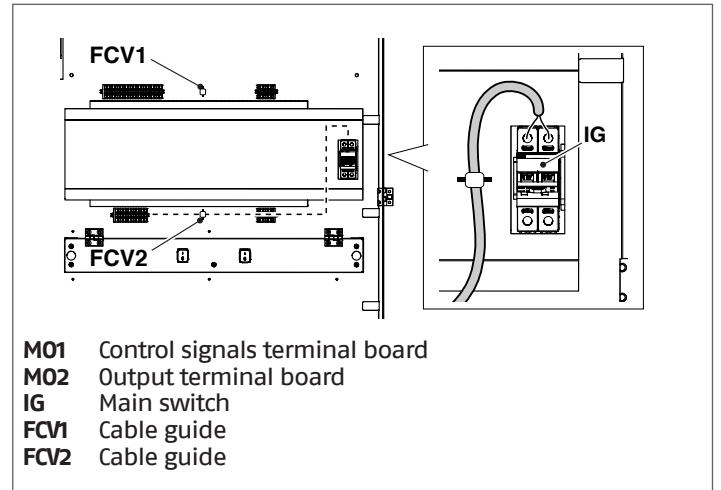


- Fold the panel forward by placing it on the two rubber pads. At this stage, you have full access to the terminal jigs.



- M01** Low voltage managing terminal jig M01
- M02** High-voltage managing terminal jig M02
- M1D2** Low voltage terminal jig of the first dependent
- M2D2** High voltage terminal block of the first dependent
- IG** Main switch
- FCV1** Cable guide
- FCV2** Cable guide

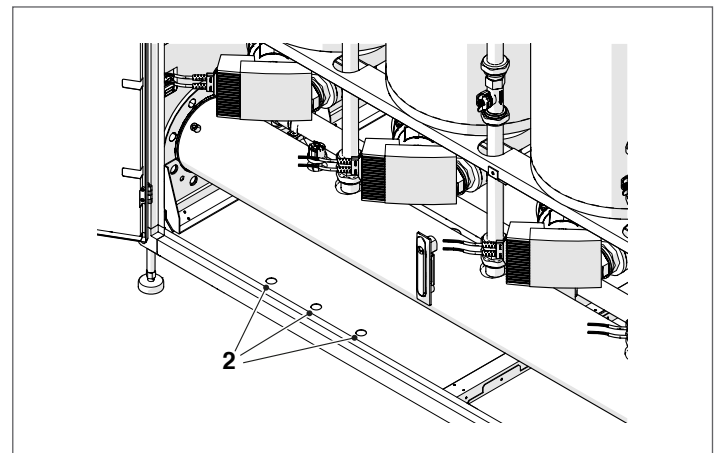
Connect the power cables to the main switch (IG).



- M01** Control signals terminal board
- M02** Output terminal board
- IG** Main switch
- FCV1** Cable guide
- FCV2** Cable guide

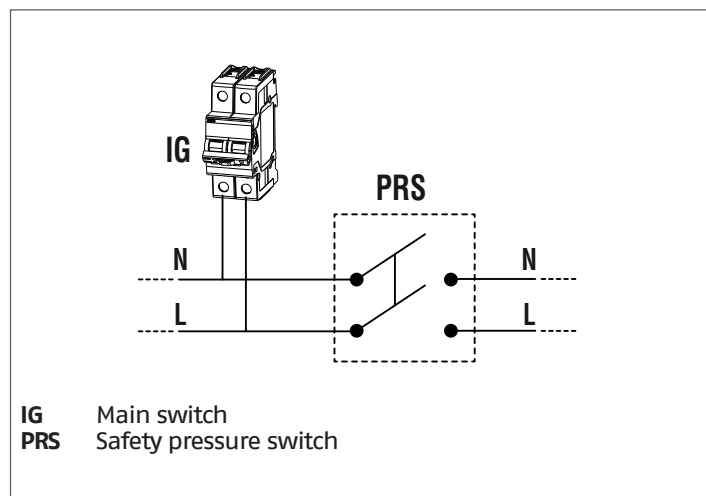
! Always keep the power cables and signal cables separate. Route the signal cables to the top of the control panel and secure them to the cable clamp FCV1. Pass the power cables through the lower part of the panel and secure them with the cable clamp FCV2.

The cables must exit the machine through the appropriate cable glands 2 placed on the side panels and at the bottom.

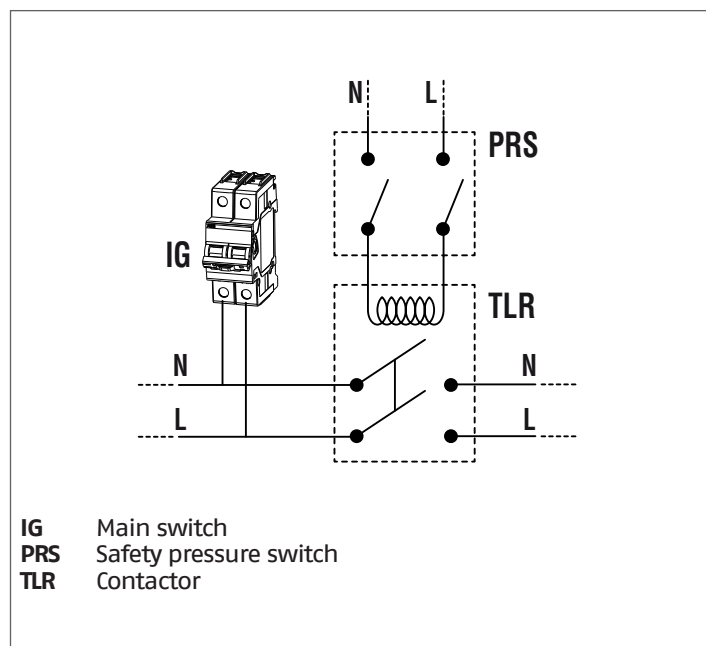


2.13.1 INAIL security connection

Before being connected to the general circuit-breaker IG (see wiring diagram), the power supply cables must be connected to the contacts of the safety pressure switch as provided by the INAIL collection R.

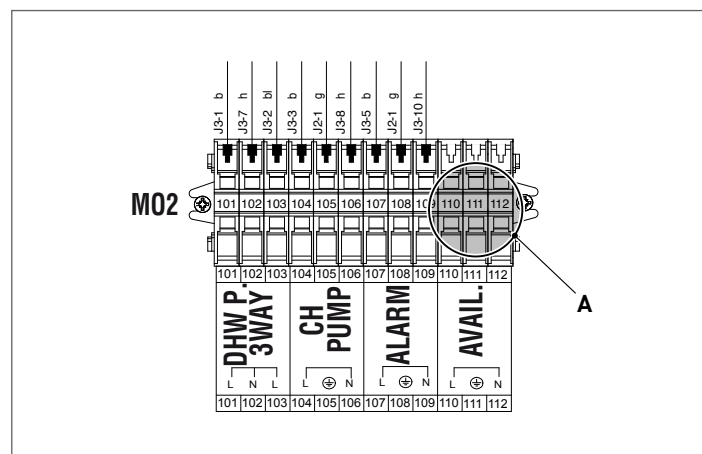


⚠ If several appliances are installed in a battery, if the total absorption of the connected equipments exceeds 4000 VA, a certified contactor with adequate capacity must be interposed as shown in the diagram below.



2.13.2 Connection available on terminal board

On the high voltage terminal board managing M02 there are 3 terminals (A) that can be used to connect specific accessories.

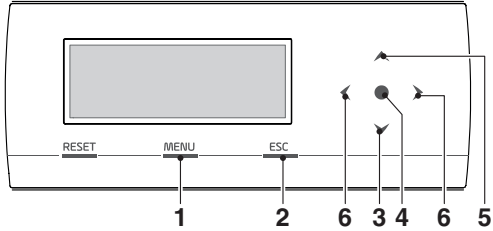


2.14 Electronic control

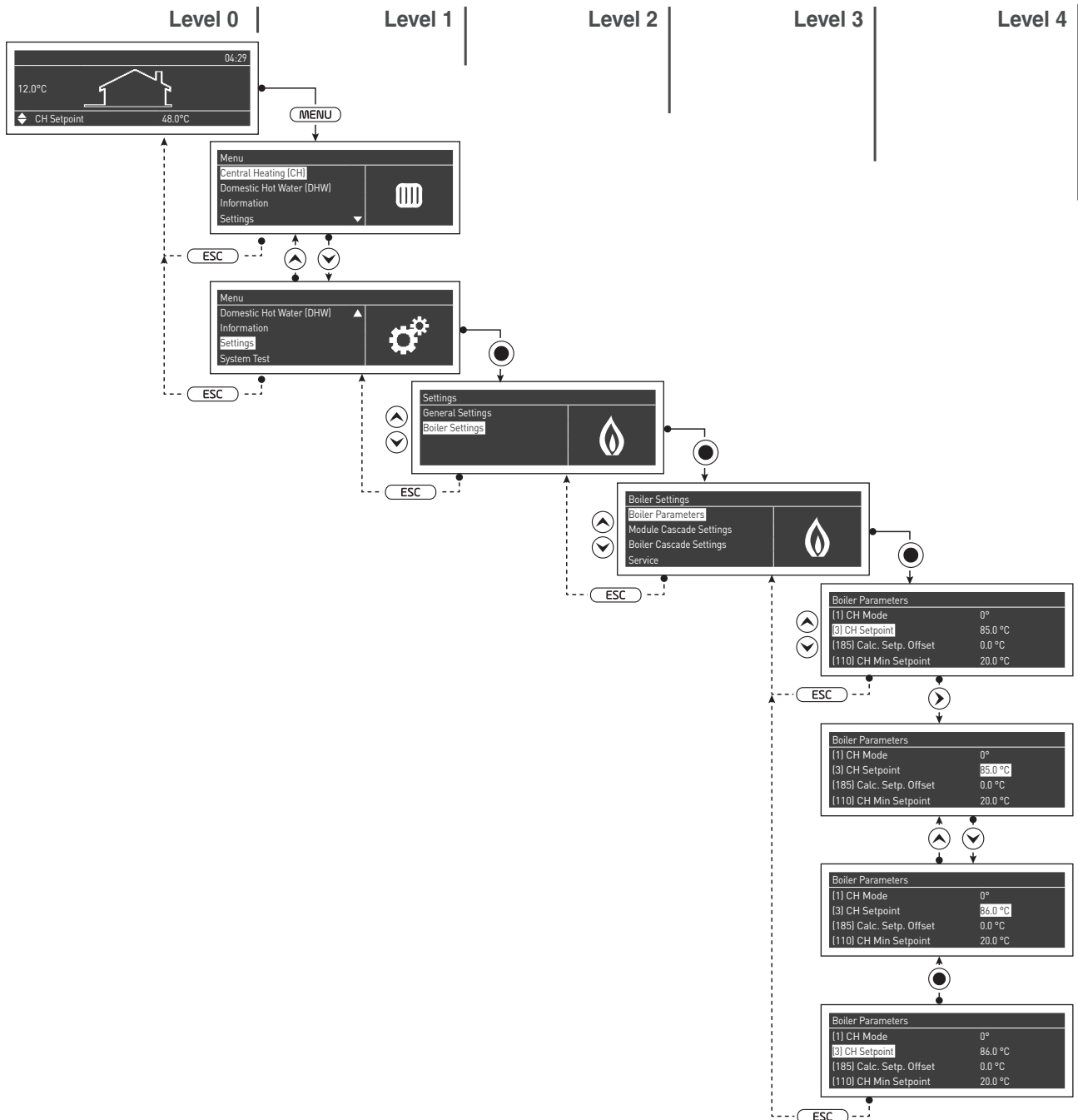
The electronic control operator interface menu is a multi-level one. Navigation between the various levels is shown in the figures below.

Level 0 displays the Home Screen (Home). Level 1 displays the Main Menu screen. The subsequent levels are activated depending on available sub-menus. For the full layout, see Paragraph "Control panel". For how to access and change the parameters, see the picture on the next page. The parameters for the installer are accessible only after entering the security password (see paragraph "Control panel").

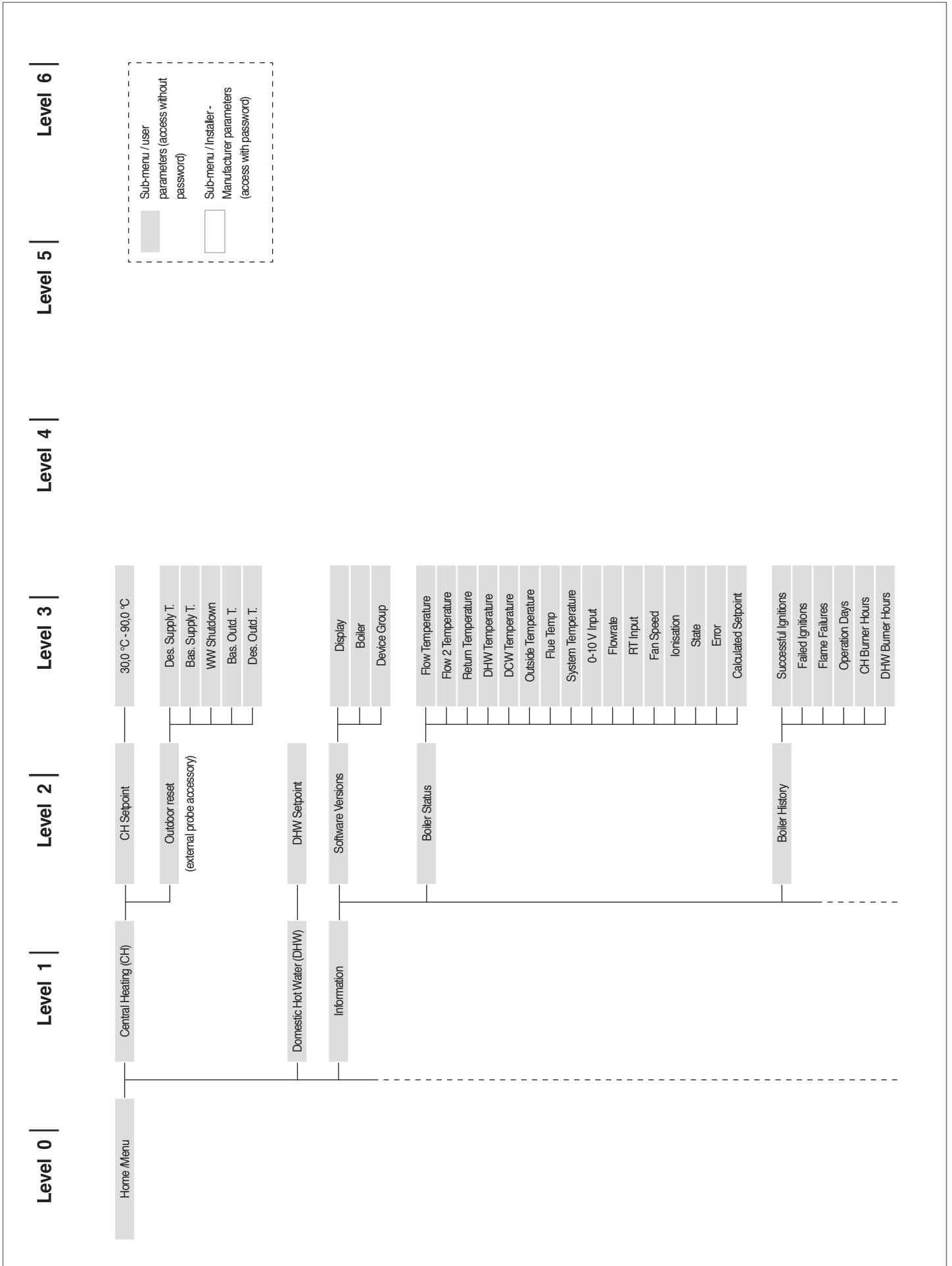
Please note that the thermal module's operating parameters are identified with a number, whilst other additional functions are simply descriptive.

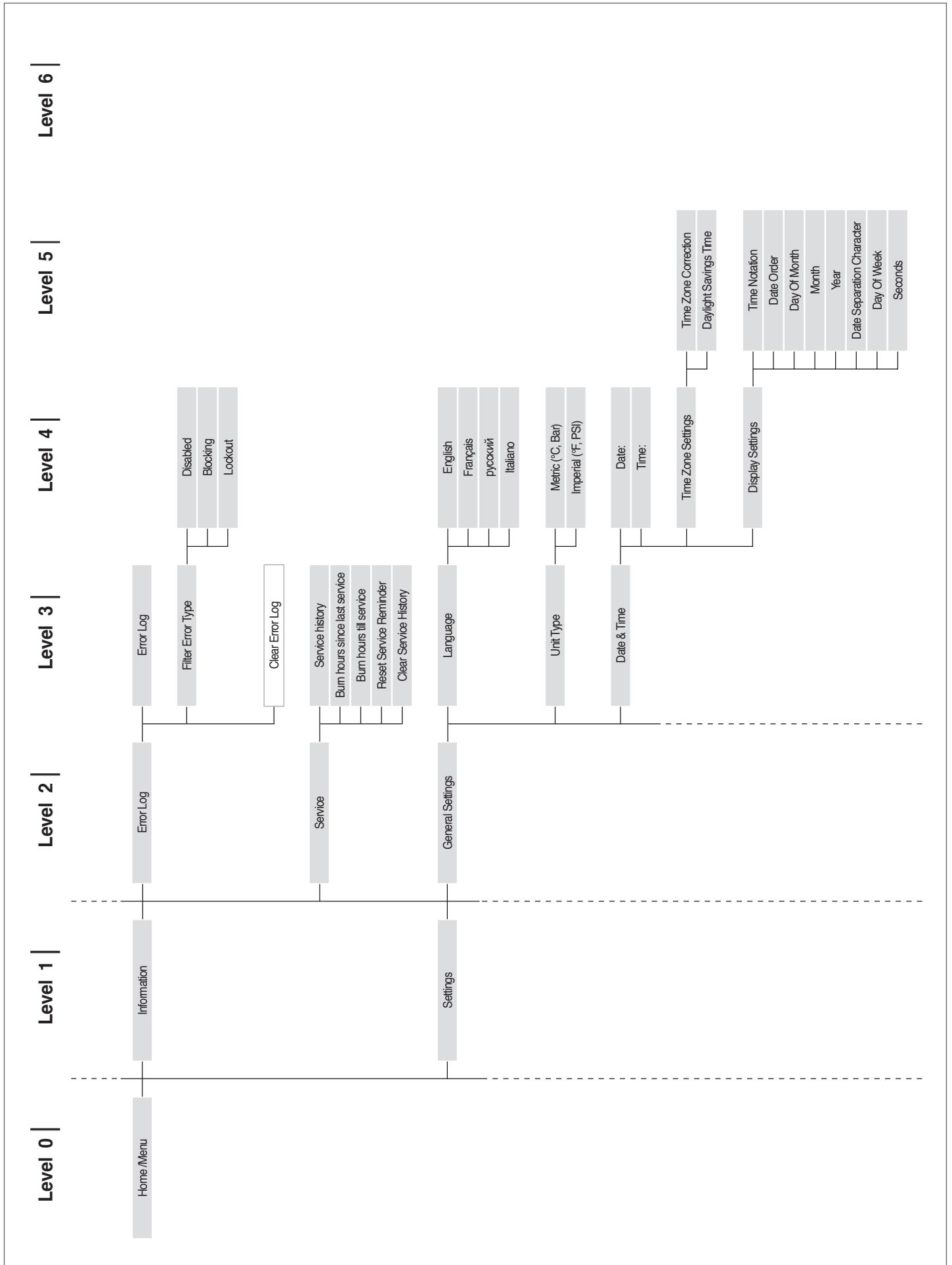


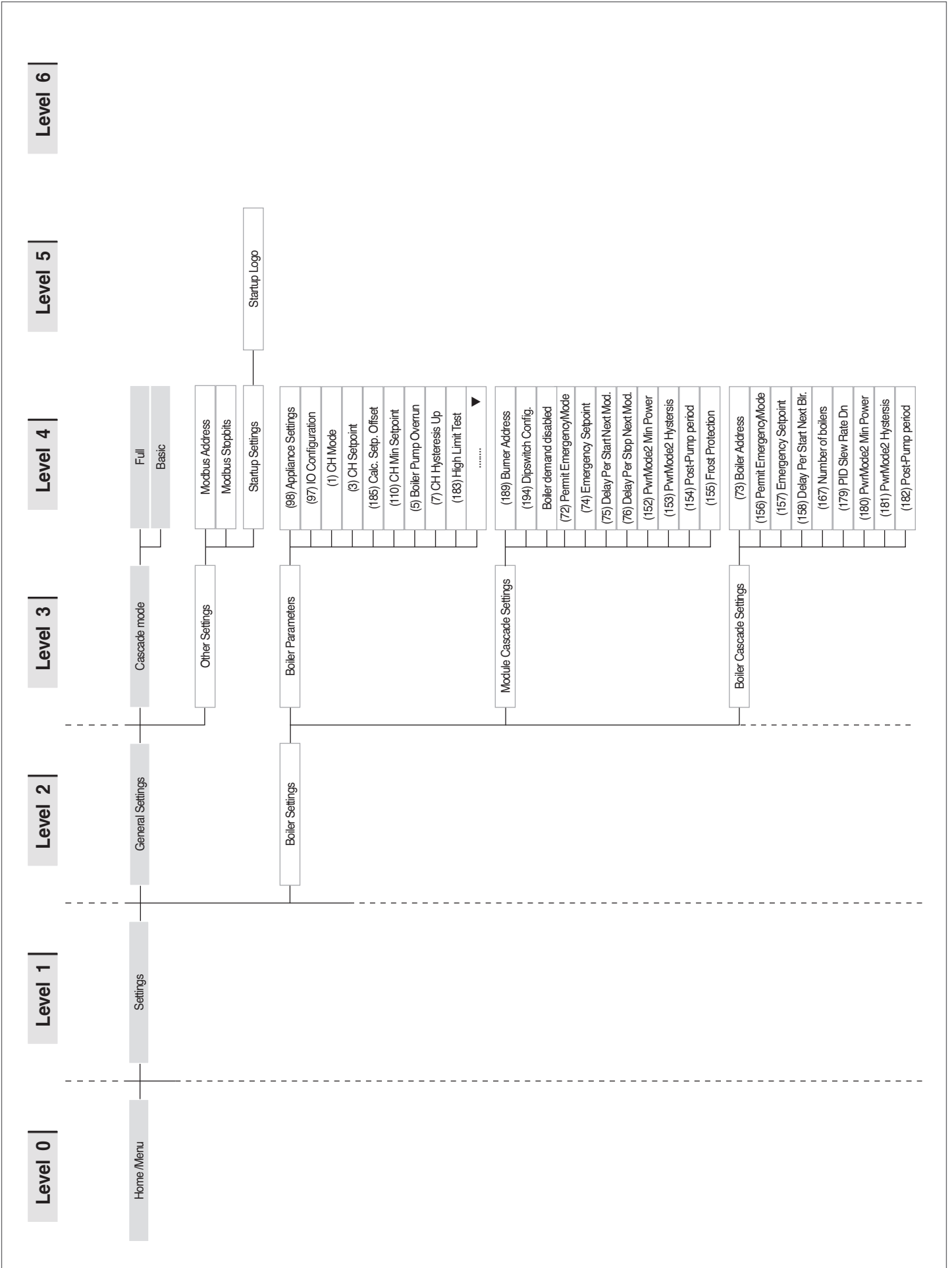
- 1 switches on the main menu
- 2 in menu navigation, it enables you to exit a menu item and go back to the previous one
- 3 supports selecting menus or parameters or decreasing numeric values
- 4 enter
- 5 supports selecting menus or parameters or increasing numeric values
- 6 supports moving to the RH/LH area of the display

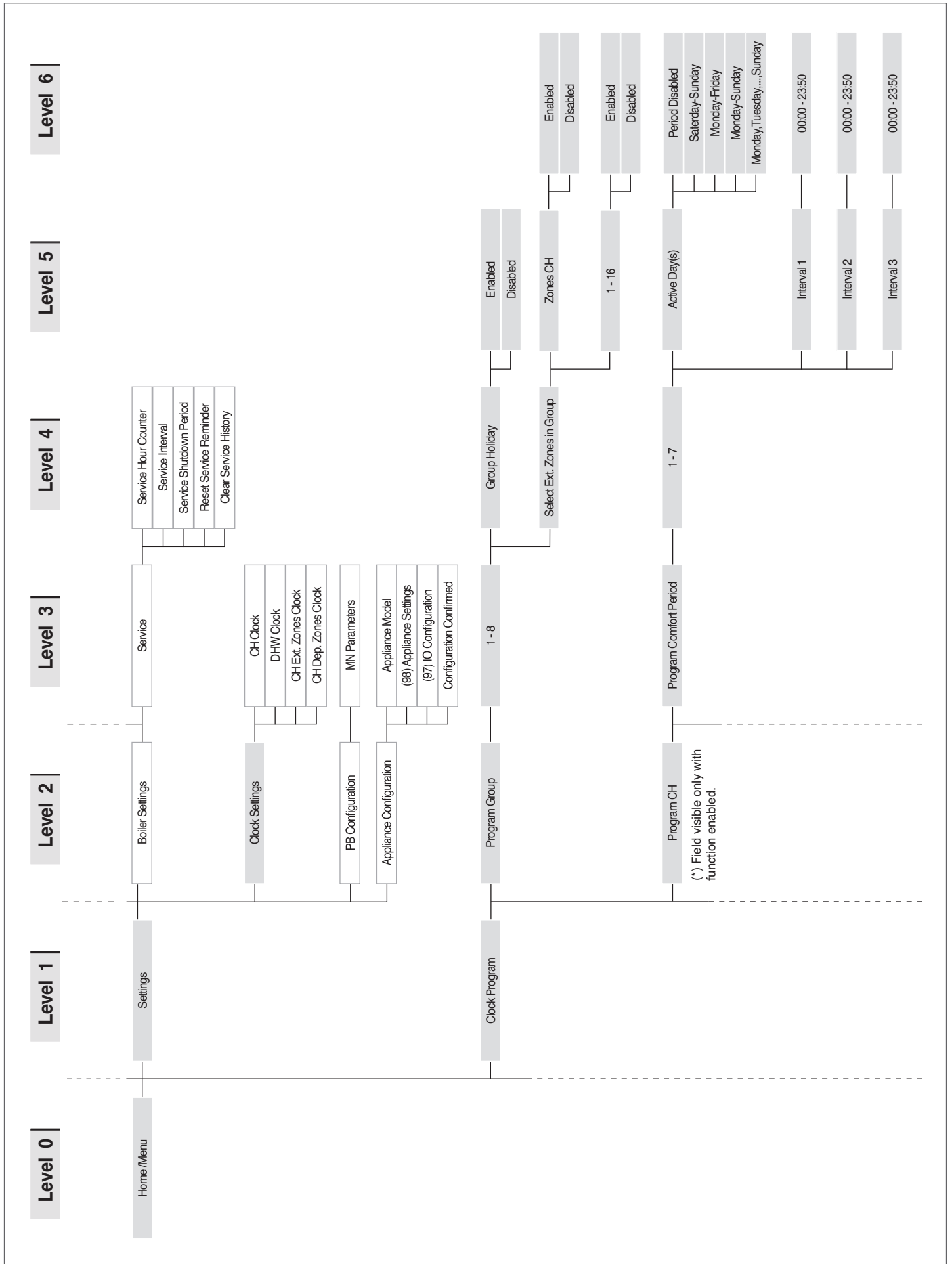


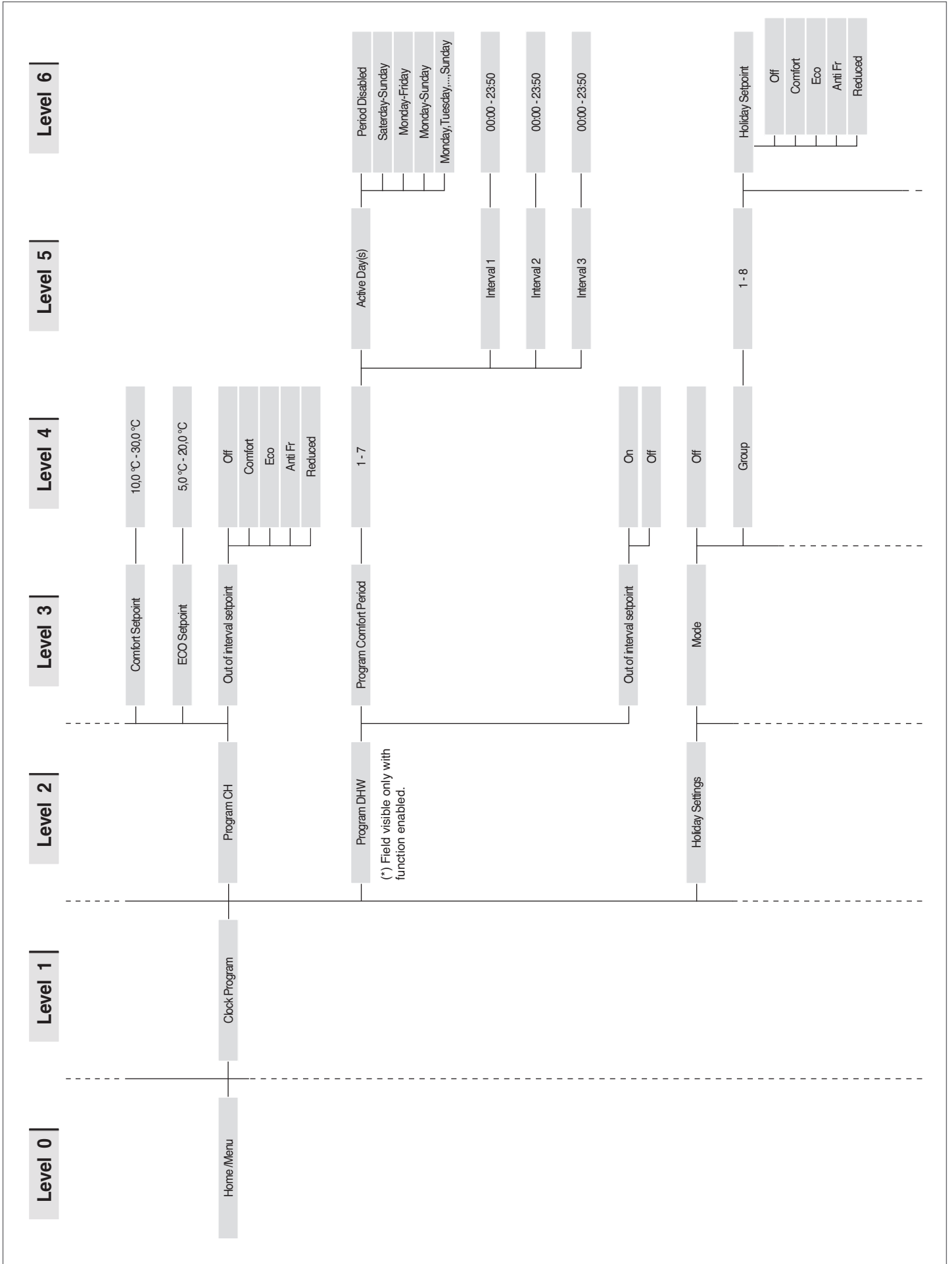
2.14.1 Menu structure

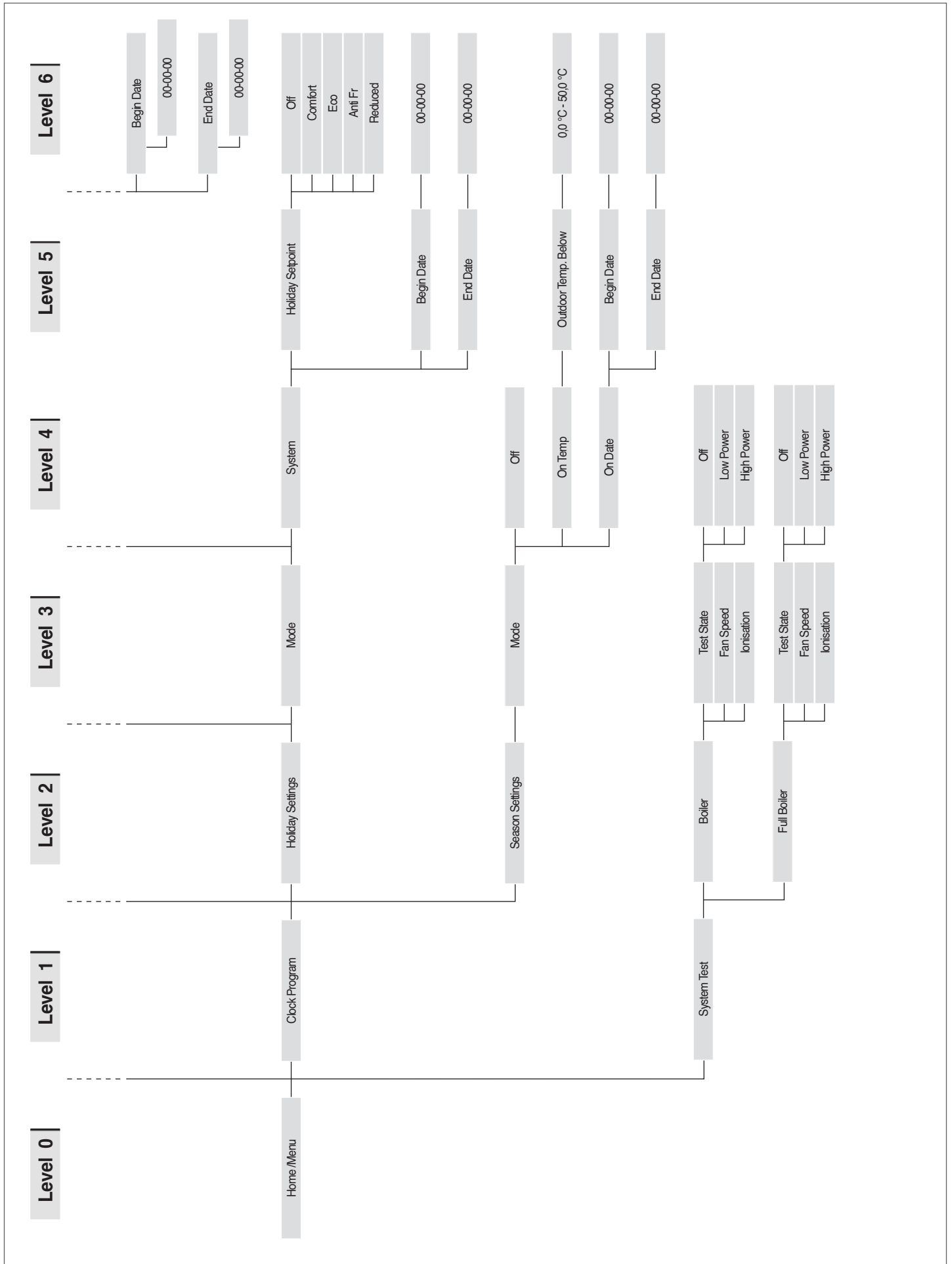












2.14.2 Parameters' list

Parameters are listed base on the reference menu.

Reference Menu

- M1** Parameters Menu
- M2** Cascaded module configuration menu
- M3** Cascaded boiler configuration menu
- M4** Appliance configuration menu

Access type

- U** End user
- I** Installer
- O** Manufacturer

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|-------------------------|--|------------------|-----------------|------|-------------|----------|
| M1 | 201 | CH Control | Enable or disable the heating circuit. | Enabled/Disabled | Enabled | | I | Heating |
| M1 | 1 | CH mode | Defines the thermal module's various heating operation modes. | 0...5 | 0 | | I | Heating |
| M1 | 3 | CH set-point | Defines the desired delivery temperature in heating mode (Par. 1) = 0. | 30...90 | 70 | °C | U | Heating |
| M1 | 185 | Calc. set-point off-set | It is possible to shift the climatic curve up and down. The calculated setpoint can be increased or decreased with a maximum of 10°C. | -10...10 | 0 | °C | I | Heating |
| M1 | 109 | Comp. T. @Bas. Outd | Establishes the set-point offset value calculated in climatic mode (Par. 1= 1). Offsets the climatic curve in presence of mild outdoor temperatures. | Off, -10...10 | 0 | | I | Heating |
| M1 | 110 | CH Min. Set-point | Defines the minimum delivery temperature at which the system operates in both heating and DHW mode. | 20...50 | 30 | °C | I | Heating |
| M1 | 111 | CH Max. Set-point | Defines the maximum delivery temperature at which the system operates in both heating and DHW mode. | 50...90 | 80 | °C | I | Heating |
| M1 | 190 | Outd. Comp. Fact. | | 0...100 | 0 | % | I | Heating |
| M1 | 5 | Boiler Pump Overrun | Sets the overrun time in seconds of the boiler's circulator during stand-alone operation; cascaded operation determines the module's overrun after switch-off due to temperature control. | 0...900 | 60 | Sec. | I | Heating |
| M1 | 6 | Flue Temp. Limit | Sets the activation temperature when the maximum flue gas temperature is exceeded. When the flue gas temperature is higher than a set value, the module switches off and an error message is generated. When the flue gas temperature is in the interval between (Par. 6) -5°C and Par. 6, the module reduces its power in a linear way until it reaches minimum power when the temperature measured is equal to Par. 6. | 10...120 | 100 | °C | O | General |
| M1 | 7 | CH Hysteresis Up | Sets the value in degrees beyond the set-point at which the burner switches off for thermoregulation. | 0...20 | 5 | °C | I | Heating |
| M1 | 112 | CH Hysteresis Down | Sets the value in degrees below the set-point at which the burner switches on again for thermoregulation. | 0...20 | 5 | °C | I | Heating |
| M1 | 9 | An-ti-cycle Period | Sets the stand-by time before the appliance is switched on again after it switches off due to thermoregulation, independently from the delivery temperature dropping below the value indicated in Par. 10. Parameter valid only in stand-alone mode. | 10...900 | 120 | Sec. | I | Heating |
| M1 | 10 | An-ti-cycle Temp. Diff. | Sets the value in degrees below which the burner switches on again notwithstanding from the time spent at Par. 9. | 0...20 | 16 | °C | I | Heating |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|--------------------------|---|------------------|-----------------|------|-------------|----------|
| M1 | 12 | Hx diff. Minimum | Sets the value of the temperature difference (Delta T) between the module's delivery and return temperature. For a Delta T value ranging between Par. 12 and (Par. 12) +8°C, the module reduces its power in a linear fashion until it reaches the minimum power. The minimum power is maintained until reaching (Par. 12) +8°C+5°C, after which the module switches off for a period of time equal to the value attributed to Par. 13; at the end of this time interval, the module switches on again. | 10...60 | 40 | °C | 0 | General |
| M1 | 13 | Hx Diff. Max. Wait Time | Defines the restart time after reaching the Delta T limit between delivery and return. | 10...250 | 30 | Sec. | 0 | General |
| M1 | 14 | Max. Power CH | Sets the heating's % max. power. | 50...100 | 100 | % | I | Heating |
| M1 | 15 | Min. Power CH | Sets the heating's % min. power. | 1...30 | 1 | % | I | Heating |
| M1 | 16 | CH PID P | Defines the proportional parameter for modulation during heating operation. | 0...1275 | 100 | | 0 | Heating |
| M1 | 17 | CH PID I | Defines the modulation integral term during heating operation. | 0...1275 | 250 | | 0 | Heating |
| M1 | 18 | CH PID D | Defines the modulation derivative term during heating operation. | 0...1275 | 0 | | 0 | Heating |
| M1 | 19 | Design Supply Temp. | Defines the max. set-point at the minimum outdoor temperature for climatic regulation. | 30...90 | 80 | °C | U | Heating |
| M1 | 20 | Design Outdoor Temp. | Defines the minimum outdoor temperature to which the maximum set-point can be associated for climatic regulation. | -25...25 | 0 | °C | U | Heating |
| M1 | 21 | Baseline Supply Temp. | Defines the minimum set-point at the maximum outdoor temperature for climatic regulation. | 30...90 | 40 | °C | I | Heating |
| M1 | 22 | Baseline Outdoor Temp. | Defines the maximum minimum outdoor temperature to which the minimum set-point can be associated for climatic regulation. | 0...30 | 20 | °C | I | Heating |
| M1 | 23 | Design Supply Min. Limit | Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). | 4...82 | 30 | °C | I | Heating |
| M1 | 24 | Design Supply Max. Limit | Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). | 27...90 | 80 | °C | I | Heating |
| M1 | 25 | Warm Weather Shutdn | Defines the temperature at which climatic regulation is switched off. | 0...35 | 22 | °C | I | Heating |
| M1 | 26 | Boost Temp Increment | Establishes the set-point temperature increase delta T, if the heat demand in heating mode is not satisfied after the time interval specified in Par. 27 (applies only to stand-alone mode). | 0...30 | 0 | °C | I | Heating |
| M1 | 27 | Boost Time Delay | Defines the time interval after which the set-point is increased as defined in Par. 26 (applies only to stand-alone mode). | 1...120 | 20 | Min. | I | Heating |
| M1 | 28 | Night Setback Temp. | Used in heating mode Par. 1= 2 or 3. Establishes by how many degrees the delivery set-point is reduced when the RT (room thermostat/heat demand) contact is closed. | 0...30 | 10 | °C | I | Heating |
| M1 | 195 | WWSD Enable | It is possible to enable/disable the shutdown of the entire system due to high external temperatures, both CH and ZH. | Enabled/Disabled | Enabled | | I | Heating |
| | 202 | DHW check | Enable or disable the DHW circuit. | Enabled/Disabled | Enabled | | I | Heating |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|------------------------|--|----------|-----------------|------|-------------|----------|
| M1 | 35 | DHW mode | Establishes the domestic hot water circuit's operation mode. 0 = Disabled 1 = Tank + sensor 2 = Tank + thermostat | 0,1,2 | 0 | | I | DHW |
| M1 | 113 | Max. Power DHW | Defines the domestic hot water circuit's % max. power. | 50...100 | 100 | % | I | DHW |
| M1 | 114 | Min. Power DHW | Defines the domestic hot water circuit's % minimum power. | 1...30 | 1 | % | I | DHW |
| M1 | 36 | DHW Tank Hyst. Down | Defines the hysteresis to initiate the domestic hot water demand. | 0...20 | 5 | °C | I | DHW |
| M1 | 37 | DHW Tank Hyst. Up | Defines the hysteresis to stop the domestic hot water demand. | 0...20 | 5 | °C | I | DHW |
| M1 | 38 | DHW Tank Supply Extra | Defines the primary circuit's set-point increase in degrees compared to the temperature set for the domestic hot water tank. | 0...30 | 15 | °C | I | DHW |
| M1 | 39 | DHW Tank Supp Hyst Dn | Defines the primary circuit's restart hysteresis in modes 1 and 2 of domestic hot water (valid both for cascade and stand-alone applications). | 0...20 | 5 | °C | 0 | DHW |
| M1 | 40 | DHW Tank Supp Hyst Up | Defines the primary circuit's shut-off hysteresis in modes 1 and 2 of domestic hot water (valid both for cascade and stand-alone applications). | 0...20 | 5 | °C | 0 | DHW |
| M1 | 41 | DHW Tank Hold Warm | Defines the value referred to the Delta T of the tank for maintenance purposes. E.g.: if it is set on 3, when the tank has a set point lowered of 3 degrees, the module turns on at the minimum to allow maintenance till the set point plus hysteresis. If this parameter is equal to 36, this function is inactivated and the module starts at the maximum sanitary power. | 0...10 | 5 | °C | 0 | DHW |
| M1 | 42 | DHW Priority | Defines the priority type: 0 = Time: time priority between the two circuits defined by Par. 43; 1 = Off: priority for CH; 2 = On: priority for DHW; 3 = Parallel: parallel priority managed on the basis of the primary circuit's temperature compared to the heating circuit's set-point. | 0...3 | 2 = On | | I | DHW |
| M1 | 43 | DHW Max. Priority Time | Establishes the time in minutes during which priority is alternatively allocated to the DHW and CH circuits when Par. 43 is set to "time" mode. | 1...255 | 30 | Min. | I | DHW |
| M1 | 44 | DHW Pump Overrun | Establishes the overrun time in seconds for the domestic hot water mode with the boiler in stand-alone operation; cascaded operation defines the module's overrun after switch-off due to thermoregulation. | 0...900 | 60 | Sec. | I | DHW |
| M1 | 45 | DHW Tank PID P | Defines the proportional term for modulation during operation of the DHW storage tank. | 0...1255 | 100 | | 0 | DHW |
| M1 | 46 | DHW Tank PID I | Defines the integral term for modulation during operation of the DHW storage tank. | 0...1255 | 500 | | 0 | DHW |
| M1 | 47 | DHW Tank PID D | Defines the derivative term for modulation during operation of the DHW storage tank. | 0...1255 | 0 | | 0 | DHW |
| M1 | 48 | DHW tank set-point | Establishes the DHW storage tank set-point. | 40...71 | 50 | °C | U | DHW |
| M1 | 115 | DHW setpoint setting | "reserved" | 40...71 | 57 | °C | U | DHW |
| M1 | 49 | DHW Hysteresis Down | "reserved" | 0...20 | 4 | °C | 0 | DHW |
| M1 | 50 | DHW Hysteresis Up | "reserved" | 0...20 | 4 | °C | 0 | DHW |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|--------------------------|---|----------------------------|--------------------|-------|-------------|----------|
| M1 | 51 | DHW Instant PID P | "reserved" | 0...1255 | 100 | °C | 0 | DHW |
| M1 | 52 | DHW Instant PID I | "reserved" | 0...1255 | 160 | °C | 0 | DHW |
| M1 | 53 | DHW Instant PID D | "reserved" | 0...1255 | 0 | °C | 0 | DHW |
| M1 | 60 | Flow Rate Start | "reserved" | 0.1...20 | 1.4 | l/min | 0 | DHW |
| M1 | 61 | Flow Rate Lo Temp Pwr | "reserved" | 0.1...20 | 1.4 | l/min | 0 | DHW |
| M1 | 62 | Flow Rate Hi Temp Pwr | "reserved" | 0.1...20 | 1.4 | l/min | 0 | DHW |
| M1 | 63 | DHW On Off Period | "reserved" | 10...60 | 30 | Sec. | 0 | DHW |
| M1 | 64 | PreHeat Mode | "reserved" | Off, Comfort, Eco, Anti-Fr | Off | | U | DHW |
| M1 | 65 | PreHeat Eco Set-point | "reserved" | 20...60 | 30 | °C | 0 | DHW |
| M1 | 67 | PreHeat After Tap Hld T. | "reserved" | 0...255 | 30 | Sec. | 0 | DHW |
| M1 | 68 | After Tap Hold Time | "reserved" | 0...255 | 120 | Sec. | 0 | DHW |
| M1 | 69 | PreHeat Hyst. Down | "reserved" | 0...30 | 5 | °C | 0 | DHW |
| M1 | 70 | PreHeat Hyst. Up | "reserved" | 0...30 | 0 | °C | 0 | DHW |
| M1 | 71 | PreHeat Delay Time | "reserved" | 0...15 | 10 | Sec. | 0 | DHW |
| M1 | 92 | Fan Speed Maximum | Defines the number of fan rpm at max. power (it depends on the model). | 0...12750 | Defined by Par. 98 | RPM | I | General |
| M1 | 93 | Fan Speed Minimum | Defines the number of fan rpm at minimum power (it depends on the model). | 0...12750 | Defined by Par. 98 | RPM | I | General |
| M1 | 94 | Fan Speed Ignition | Defines the number of fan rpm when the boiler is switched on (it depends on the model). | 0...12750 | Defined by Par. 98 | RPM | I | General |
| M1 | 116 | Prog. Input 1. | 0 = Disabled 1 = Water pressure sensor 2 = CH flow switch 3 = Flue pressure switch | 0,1,2,3 | Defined by Par. 97 | | I | General |
| M1 | 117 | Prog Input 2. | 0 = Disabled 1 = DHW flow sensor 2 = DHW flow switch 3 = CH flow sensor | 0,1,2,3 | Defined by Par. 97 | | I | General |
| M1 | 118 | Prog Input 3. | 0 = Disabled 1 = Drain switch 2 = Gas pressure switch | 0,1,2 | Defined by Par. 97 | | I | General |
| M1 | 119 | Progr.ble Inp. 4. | 0 = Supply 2 sensor 1 = Disabled 2 = Air Damper Switch | 0,1,2 | Defined by Par. 97 | | I | General |
| M1 | 120 | Prog Input 5. | 0 = Disabled 1 = T_Return sensor 2 = Extern switch | 0,1,2 | Defined by Par. 97 | | I | General |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|-----------------------|---|---|--------------------|----|-------------|----------|
| M1 | 121 | Prog Input 6. | 0 = Disabled 1 = T_Flue sensor 2 = Flue switch 3 = APS switch | 0,1,2,3 | Defined by Par. 97 | | I | General |
| M1 | 122 | Prog Input 7. | 0 = Disabled 1 = T_Flue_2 sensor 2 = T_Flue_2 + Bl. Flue 3 T_System sensor 4 = Blocked Flue switch 5 Cascade Sensor | 0,1,2,3,4,5 | Defined by Par. 97 | | I | General |
| M1 | 123 | Prog Input 8. | 0 = Disabled 1 = T_DCW sensor 2 = Water pressure switch | 0,1,2 | Defined by Par. 97 | | I | General |
| M1 | 188 | Prog. Input 9. | 0 = Disabled 1 = DHW sensor 2 = Zone sensor | 0,1,2 | Defined by Par. 97 | | I | General |
| M1 | 124 | Prog. Input RT. | 0 = Disabled 1 = Enabled | 0,1 | 1 | | I | General |
| M1 | 125 | Prog. Output 1. | 0 = Disabled 1 = General Pump 2 = CH Pump 3 = DHW Pump 4 = System Pump 5 = Cascade Pump 6 = Alarm Relay 7 = Filling Valve 8 = LPG Tank 9 = External Igniter 10 = Air Damper 14 = Alarm Burner CC 15 = Status Burner CC 16 = Zone pump 17 = Mixing valve open 18 = Mixing valve closed 19 = Anti-Legionella 20 = LPG Tank Cascade | 0,1,2,3,4,5,6,7,8,9,10,14,15,16,17,18,19,20 | Defined by Par. 97 | | I | General |
| M1 | 126 | Prog. Output 2. | 0 = Disabled 1 = General Pump 2 = CH Pump 3 = DHW Pump 4 = System Pump 5 = Cascade Pump 6 = Alarm Relay 7 = Filling Valve 8 = LPG Tank 9 = External Igniter 10 = Air Damper 14 = Alarm Burner CC 15 = Status Burner CC 16 = Zone pump 17 = Mixing valve open 18 = Mixing valve closed 19 = Anti-Legionella 20 = LPG Tank Cascade | 0,1,2,3,4,5,6,7,8,9,10,14,15,16,17,18,19,20 | Defined by Par. 97 | | I | General |
| M1 | 127 | Prog. Output 3. | 0 = Disabled 6 = Alarm relay 10 = Air Damper 11 = External Igniter | 0,1,2,3,4,5,6,7,8,9,10,11,12 | Defined by Par. 97 | | I | General |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|-----------------------|---|---|--------------------|-------|-------------|----------|
| M1 | 128 | Prog. Output 4. | 0 = Disabled 1 = General Pump 2 = CH Pump 3 = DHW Pump 4 = System Pump 5 = Cascade Pump 6 = Alarm Relay 7 = Filling Valve 8 = LPG Tank 9 = External Igniter 10 = Air Damper 14 = Alarm Burner CC 15 = Status Burner CC 16 = Zone pump 17 = Mixing valve open 18 = Mixing valve closed 19 = Anti-Legionella 20 = LPG Tank Cascade | 0,1,2,3,4,5,6,7,8,9,10,14,15,16,17,18,19,20 | Defined by Par. 97 | | I | General |
| M1 | 187 | Prog. Output 5. | 0 = Disabled 1 = General Pump 2 = CH Pump 3 = DHW Pump 4 = System Pump 5 = Cascade Pump 6 = Alarm Relay 7 = Filling Valve 8 = LPG Tank 9 = External Igniter 10 = Air Damper 14 = Alarm Burner CC 15 = Status Burner CC 16 = Zone pump 17 = Mixing valve open 18 = Mixing valve closed 19 = Anti-Legionella 20 = LPG Tank Cascade | 0,1,2,3,4,5,6,7,8,9,10,14,15,16,17,18,19,20 | Defined by Par. 97 | | I | General |
| M1 | 129 | Flow sensor | Defines the type of flow sensor used. | Custom, Huba: DN8, DN10, DN15, DN20, DN25, DN32 | Huba DN25 | | I | General |
| M1 | 130 | Flow Scaling Factor | "reserved" | 0...25.5 | 3.2 | rpm/l | I | DHW |
| M1 | 131 | Min. Pressure | "reserved" | Off, 0.3...5.0 | 0.1 | bar | I | DHW |
| M1 | 132 | Pressure Fill Hyst. | "reserved" | Off, 0.2...5.0 | 0.5 | bar | I | DHW |
| M1 | 133 | Mod. Pump dT | Defines the delta T set for the operation of the modulating circulator. | 5...40 | 15 | °C | I | General |
| M1 | 134 | Mod. Pump Start Time | Defines the time in seconds from the moment the burner is switched on to start the modulation of the circulator and obtain the delta T specified in Par. 133. | 0...255 | 120 | Sec. | I | General |
| M1 | 135 | Mod. Pump Type | Defines the PWM circulator model installed. 0 = Wilo 1 = Salmson 2 = Grundfos | 0,1,2 | 2 = Grundfos | | I | General |
| M1 | 136 | Mod. Pump Mode | Defines whether the boiler's circulator operates in modulating mode or at a set speed (as a percentage of maximum speed). | On/Off Modulating Fixed 20... 100% | Modulating | | I | General |
| M1 | 137 | Mod. Pump Min Pwr | Defines the percentage of speed that sets the minimum speed that the circulator can reach during modulation. | 0...100 | 30 | % | I | General |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|-----------------------------|---|---|-------------------------|-------|-------------|----------|
| M1 | 139 | Dair active | Activates bleeding the system's air. To activate air bleeding, it is necessary to switch on the boiler and change the parameter from "No" to "Yes". Wait for one minute. Switch off and restart. At this stage, when it is restarted the boiler will initiate the automatic bleeding procedure (lasting around 20 minutes). With the parameter set to "Yes", the procedure is carried out each time the boiler is switched off and restarted using its master switch. The value must be set to "No" if you do not wish to initiate the bleeding procedure when the module is switched on. | Yes, No | No | | I | General |
| M1 | 140 | Minimum Flow | Defines the flow rate below which the boiler is switched off. The value varies depending on the model. | 0.0...100 | Depends on boiler model | l/min | I | General |
| M1 | 196 | HX flow timeout | If the minimum flow rate is not reached within the timeout, error 163 (LOWEXFLOW_PROTECTION) will be generated which will also cause the end of prepurge. | 4...100 | 18 | Sec. | I | General |
| M1 | 107 | Anti-Le-gionella day | Sets the weekday on which the anti-Le-gionella procedure is carried out. | Sun...Sat. | Sun | Day | I | DHW |
| M1 | 108 | Anti-Le-gionella Hour | Sets the time of the day during which the anti-Le-gionella procedure is carried out. | 0...23 | 0 | Hour | I | DHW |
| M1 | 183 | High Limit Test | Enable limit thermostat physical test. | Simulated/Physical | Simulated | | 0 | General |
| M1 | 205 | Enabling of dependent zones | Enabling of dependent zones. | Enabled/Disabled | Disabled | | U | General |
| M1 | 155 | Frost Protection | This defines the temperature (detected by the primary sensor) below which the module pump and the system pump (with cascade configuration) activate. If the temperature of the primary sensor falls another 5 degrees below the value set by Par. 155, then a request to activate the cascade is generated. When the temperature of the primary sensor reaches the value defined by Par. 155 increased by 5 degrees, then the request ceases and the cascade returns to stand-by mode. | 10...30 | 15 | °C | I | General |
| M1 | 186 | Frost protection Outd | It defines the intervention temperature of the anti-freeze function related to the external probe. | -30...15 | 3 | °C | I | General |
| M1 | 191 | Fan Type | Defines the type of fan installed in the boiler. | 0...17 | Defined by Par. 97 | | I | General |
| M1 | 193 | DHW for all | Enabling DHW for all. | No...Yes | No | | I | DHW |
| M2 | 189 | Burner Address | It is used to address the module. | Stand-alone (0) Managing (1) Dependent (2...16) | Managing (1) | | I | DHW |
| M2 | 194 | Dipswitch Config. | Enable or disable the dipswitch function. | Enabled/Disabled | Disabled | | I | Cascade |
| M2 | | Boiler demand disabled | All requests for this boiler are disabled. | Yes/No | No | | I | Cascade |
| M2 | 72 | Permit Emergency Mode | Activates the emergency mode. This mode comes on when communication between Managing and the primary circuit's probe is lost. In this event, if Par. 72 is set to "Yes", the cascade is initiated, working to the fixed set-point determined by Par. 74. | Yes/No | Yes | | U | Cascade |
| M2 | 74 | Emergency Set-point | Set-point active in emergency mode. | 20...90 | 70 | °C | I | Cascade |
| M2 | 75 | Delay Per Start Next Mod. | Defines the stand-by time in seconds to restart the subsequent cascade module in normal start mode. | 5...255 | 120 | Sec. | I | Cascade |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|--------------------------|--|----------|-----------------|------|-------------|----------|
| M2 | 76 | Delay Per Stop Next Mod. | Defines the stand-by time in seconds to switch off the last cascade module on in normal Off mode. | 5...255 | 30 | Sec. | I | Cascade |
| M2 | 142 | Delay Quick Start Next | Defines the stand-by time in seconds to restart the next cascade module in quick start mode. | 5...255 | 60 | Sec. | I | Cascade |
| M2 | 143 | Delay Quick Stop Next | Defines the stand-by time in seconds to switch off the last cascade module on in Quick Stop mode. | 5...255 | 15 | Sec. | I | Cascade |
| M2 | 77 | Hyst. Down Start Module | Defines by how many degrees the temperature measured by the primary circuit's probe must fall below the set-point in order for the subsequent module to be started after the time interval set by Par. 75. | 0...40 | 5 | °C | I | Cascade |
| M2 | 78 | Hyst. Up Stop Module | Defines by how many degrees the temperature measured by the primary circuit's probe must go above the set-point in order for the subsequent module to be switched off after the time interval set by Par. 76. | 0...40 | 4 | °C | I | Cascade |
| M2 | 147 | Number of Units | Defines the number of modules of which the cascade consists. | 1...16 | 8 | | I | Cascade |
| M2 | 144 | Hyst. Down Quick Start | Defines by how many degrees the temperature measured by the primary circuit's probe must go below the set-point in order for the subsequent module to be started after the time interval set by Par. 142 (quick-start mode). | 0...40 | 20 | °C | I | Cascade |
| M2 | 145 | Hyst. Up Quick Stop | Defines by how many degrees the temperature measured by the primary circuit's probe must go above the set-point in order for the subsequent module to be switched off after the time interval set by Par. 143 (quick stop mode). | 0...40 | 6 | °C | I | Cascade |
| M2 | 146 | Hyst. Up Stop All | Defines by how many degrees the temperature measured by the primary circuit's probe must go above the set-point in order for all "On" modules to be switched off at the same time. | 0...40 | 8 | °C | I | Cascade |
| M2 | 148 | Power Mode | Defines the cascade operation mode. 0 = Disabled 1 = Min burners 2 = Max burners 3 = Balanced burners | 0,1,2,3 | 2 | | I | Cascade |
| M2 | 79 | Max. Setp. Offset Down | Defines the maximum decrease in the primary circuit's cascade set-point. Is based on the primary circuit's probe reading. | 0...40 | 2 | °C | I | Cascade |
| M2 | 80 | Max. Setp. Offset Up | Defines the maximum increase in the primary circuit's cascade set-point. Is based on the primary circuit's probe reading. | 0...40 | 5 | °C | I | Cascade |
| M2 | 81 | Start Mod. Delay Fact. | Defines the time in minutes from the moment the demand is triggered until the activation of the set-point increases or decreases provided for by Par. 79 e 80. | 0...60 | 60 | Min. | I | Cascade |
| M2 | 82 | Next Module Start Rate | It defines the minimum power for at least one of the modules in the cascade in order for the next module to be switched on (if the other conditions linked to Par. 75 and 77 are met). | 10...100 | 80 | % | I | Cascade |
| M2 | 83 | Next Module Stop Rate | It defines the maximum power for all the modules in the cascade in order for the last module on to be switched off (if the other conditions linked to Par. 76 and 78 are met). | 10...100 | 25 | % | I | Cascade |
| M2 | 84 | Module Rotation Interval | It defines the time interval (in days) after which modules are rotated. | 0...30 | 1 | Days | I | Cascade |
| M2 | 149 | First Module to Start | Establishes the number of the next module to be rotated (this value is automatically updated at each rotation). | 1..16 | 1 | | I | Cascade |
| M2 | 86 | PID P | Defines the proportional term to change the setpoint of the cascade module. | 0...1275 | 50 | | 0 | Cascade |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|---------------------------|--|--|-----------------|------|-------------|----------|
| M2 | 87 | PID I | Defines the integral term to change the setpoint of the cascade module. | 0...1275 | 500 | | 0 | Cascade |
| M2 | 150 | PID Slew Rate Up | Defines the speed (in °C/100 ms) with which the setpoint of individual modules is increased in the event the primary circuit's set-point is not achieved (if the value is set to zero, the change is controlled by the PI of Par. 86 and 87 without restrictions). | 0...25.5 | 1 | | 0 | Cascade |
| M2 | 151 | PID Slew Rate Dn | Defines the speed (in °C/100 ms) with which the setpoint of individual modules is decreased in the event the primary circuit's set-point is exceeded (if the value is set to zero, the change is controlled by the PI of Par. 86 and 87 without restrictions). | 0...25.5 | 1 | | 0 | Cascade |
| M2 | 152 | Pwr-Mode2 Min Power | Defines the power value (in percentage terms) against which the average power of all on modules in cascade operation mode must be compared (Par. 148 = 2). | 0...100 | 20 | % | I | Cascade |
| M2 | 153 | Pwr-Mode2 Hysteresis | Defines the extra power value (in percentage terms) compared to the average power of all on modules in cascade operation mode (Par. 148 = 2). | 0...100 | 40 | % | I | Cascade |
| M2 | 154 | Post-Pump Period | Defines overrun time in seconds at the end of the cascade heat demand. | 0...255 | 60 | Sec. | I | Cascade |
| M2 | 184 | N. active burner in DHW | With this setting it is possible to set the number of burners that are used for cascade DHW. | 0...16 | 16 | | I | Cascade |
| M3 | 73 | Boiler Address | Defines the way in which the boiler is managed. | Managing, Stand-alone, Dependent | Stand-alone | | I | Cascade |
| M3 | 156 | Permit Emergency Mode | Enable/disable emergency mode. | Yes/No | Yes | | U | Cascade |
| M3 | 157 | Emergency Set-point | Defines the emergency mode setpoint. | 20...90 | 70 | °C | I | Cascade |
| M3 | 158 | Delay Per Start Next Blr. | This defines the waiting time in seconds for the next cascade to start up in normal start mode. | 0...1275 | 1275 | Sec. | I | Cascade |
| M3 | 159 | Delay Per Stop Next Blr. | This defines the waiting time in seconds for the last switched-on cascade to switch off in normal off mode. | 0...1275 | 1275 | Sec. | I | Cascade |
| M3 | 160 | Delay Quick Start Next | This defines the waiting time in seconds for the next cascade to start up in quick start mode. | 0...1275 | 400 | Sec. | I | Cascade |
| M3 | 161 | Delay Quick Stop Next | This defines the waiting time in seconds for the last switched-on cascade to switch off in quick off mode. | 0...1275 | 240 | Sec. | I | Cascade |
| M3 | 162 | Hyst. Down Start Boiler | "reserved" | 0...40 | 5 | °C | I | Cascade |
| M3 | 163 | Hyst. Up Stop Boiler | "reserved" | 0...40 | 2 | °C | I | Cascade |
| M3 | 164 | Hyst. Down Quick Start | "reserved" | 0...40 | 10 | °C | I | Cascade |
| M3 | 165 | Hyst. Up Quick Stop | "reserved" | 0...40 | 4 | °C | I | Cascade |
| M3 | 166 | Hyst. Up Stop All | "reserved" | 0...60 | 8 | °C | I | Cascade |
| M3 | 167 | Number of boilers | This defines the number of boilers connected (cascade of cascades). | 1...16 (basic cascade) 1...8 (full cascade) | 1 | | I | Cascade |

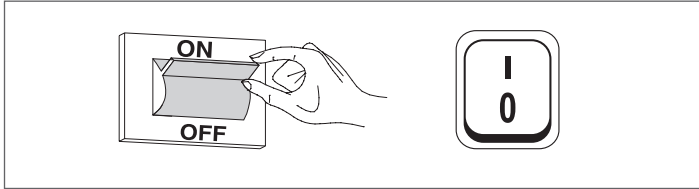
| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|--------------------------|---|---|-----------------|------|-------------|----------|
| M3 | 168 | Power Mode | "reserved" | 0 = Disabled 2 = Max burners 3 = Balanced burners | 2 | | I | Cascade |
| M3 | 169 | Max. Setp. Offset Down | Defines the maximum decrease in the primary circuit's cascade set-point. Is based on the secondary circuit's probe reading. | 0...40 | 2 | °C | I | Cascade |
| M3 | 170 | Max. Setp. Offset Up | Defines the maximum increase in the primary circuit's cascade set-point. Is based on the secondary circuit's probe reading. | 0...40 | 5 | °C | I | Cascade |
| M3 | 171 | Start Mod. Delay Fact. | Defines the time in minutes from the moment the request is triggered until the activation of the set-point increases or decreases provided for by Par.169 e 170. | 0...60 | 40 | Min. | I | Cascade |
| M3 | 172 | Next Boiler Start Rate | "reserved" | 10...100 | 80 | % | I | Cascade |
| M3 | 173 | Next Boiler Stop Rate | "reserved" | 10...100 | 25 | % | I | Cascade |
| M3 | 174 | Module Rotation Interval | "reserved" | 0...30 | 5 | Days | I | Cascade |
| M3 | 175 | First Boiler to Start | "reserved" | 1...8 | - | | I | Cascade |
| M3 | 176 | PID P | Defines the proportional term to change the set-point of the cascade module based on the secondary circuit's temperature. | 0...1275 | 25 | | 0 | Cascade |
| M3 | 177 | PID I | Defines the integral term to change the set-point of the cascade module based on the secondary circuit's temperature. | 0...1275 | 1000 | | 0 | Cascade |
| M3 | 178 | PID Slew Rate Up | Defines the speed (in °C/100 ms) with which the set-point of individual modules is increased in the event the secondary circuit's set-point not reached (if the value is set to zero, the change is controlled by the PI of Par. 176 and 177 without restrictions). | 0...25.5 | 1 | | 0 | Cascade |
| M3 | 179 | PID Slew Rate Dn | Defines the speed (in °C/100 ms) with which the set-point of individual modules is decreased in the event the primary circuit's set-point is exceeded (if the value is set to zero, the change is controlled by the PI of Par. 176 and 177 without restrictions). | 0...25.5 | 1 | | 0 | Cascade |
| M3 | 180 | Pwr-Mode2 Min Power | "reserved" | 0...100 | 20 | % | I | Cascade |
| M3 | 181 | Pwr-Mode2 Hysteresis | "reserved" | 0...100 | 40 | % | I | Cascade |
| M3 | 182 | Post-Pump period | "reserved" | 0...255 | 30 | Sec. | I | Cascade |
| M4 | | Appliance Model | Defines the boiler model. | 1...4 | | | 0 | General |
| M4 | 98 | Appliance Settings | Supports uploading the values of Par. 92, 93 and 94 from a set of pre-defined rpm values that identifies the boiler type. | 1...85 | | | 0 | General |
| M4 | 97 | IO Configuration | Supports uploading the values of Par. from 116 to 128 from a set of pre-defined rpm values that defines the configuration of the boiler's inputs and outputs. | 1..53 | | | 0 | General |

NOTE:
Please see sections "Replacing the display and control boards" and "Replacing the Dependent board" for detailed information on how to use and configure parameters 97 and 98.

3 COMMISSIONING AND MAINTENANCE

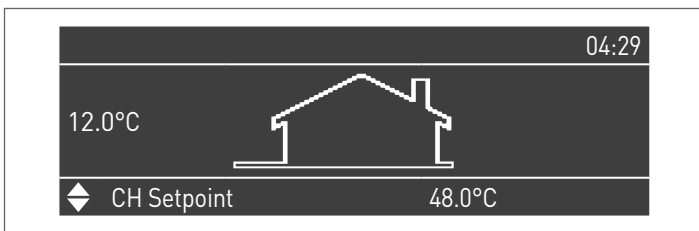
3.1 Initial startup

- Switch the system's master switch to the ON position and the thermal module's master switch to (I).



3.1.1 Switching the appliance on and off

After switching the appliance on, the display shall look as shown in the figure below:



External temperature is shown on the display on the left. This value is displayed only if the outdoor temperature sensor (accessory) is installed.

Main setpoint values are shown in the lower side of the display while the time is shown on the top right side.

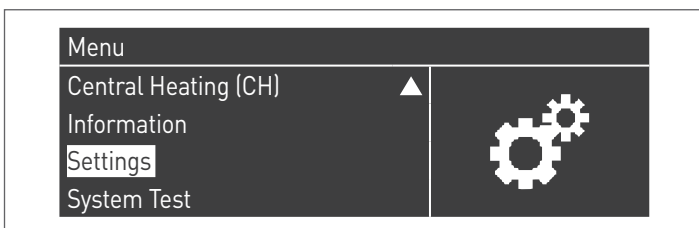
To turn the equipment off set the main switch "0/I" that is placed on the back side to "0".

⚠ Never power off the appliance before switching the master switch to the "0" position.

⚠ Never switch off the appliance with the master switch if a request is active. Always make sure that the appliance is in stand-by before switching the main switch.

3.1.2 Date and time setting

Press the MENU key and select "Settings" with the ▲ / ▼ keys



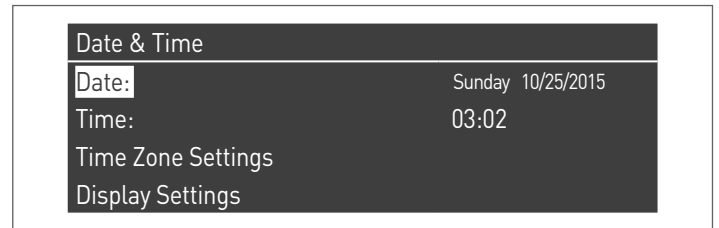
Confirm with the ● key and select "General settings" with the ▲ / ▼ keys



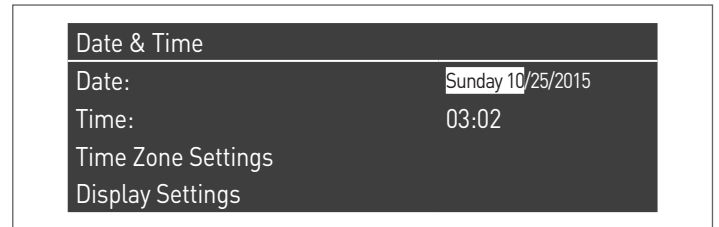
Confirm with the ● key and select "Date and Time " with the ▲ / ▼ keys



Press the ● key, the display will be shown as follows:

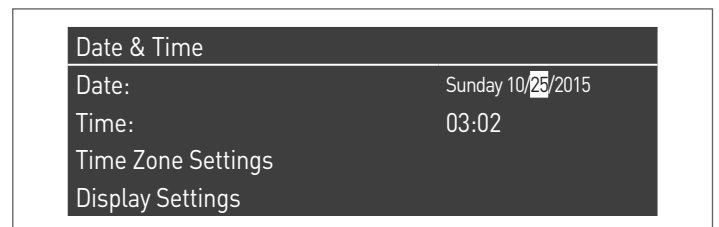


Press the ● key to highlight the values.



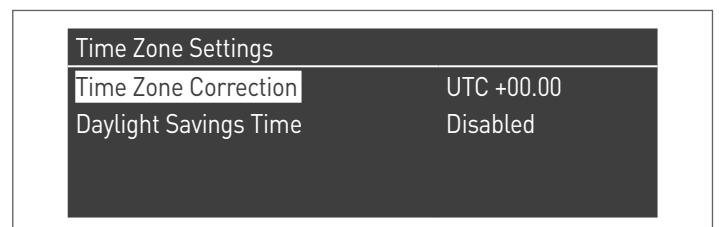
Values can be changed with the ▲ / ▼ keys.

Confirm the value entered pressing the ● key and move to the next value.

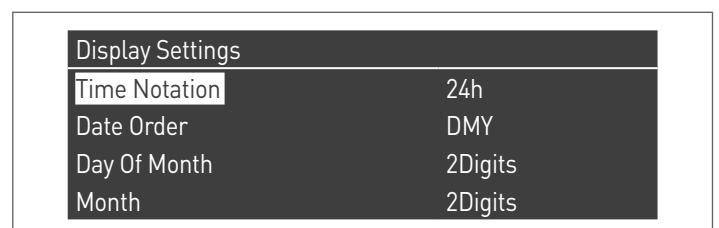


To set the time, follow the same procedure.

By accessing the "Time Zone Settings" menu, it is possible to set the time zone parameter as shown in the figure below:




To change the way in which date and time are displayed, it is possible to change the following characteristics by accessing the "Display Settings" menu:




| Display Settings | |
|---------------------------|------------|
| Year | 4Digits |
| Date Separation Character | - |
| Day Of Week | Short Text |
| Seconds | No |

3.1.3 Password access

To access the parameters, press the MENU key and select "Settings" with the ▲ / ▼ keys.

| Menu | |
|----------------------------|---|
| Domestic Hot Water (DHW) ▲ |  |
| Information | |
| Settings | |
| System Test | |

Confirm with the ● key and select "Boiler settings" with the ▲ / ▼ keys

| Settings | |
|------------------|--|
| General Settings |  |
| Boiler Settings | |

Press the ● key to confirm.

- The system will now ask you to enter a password (the password is required for thermal module settings only):

| Password |
|----------|
| 0 * * * |

Enter one digit at a time using the ▲ / ▼ keys to increase/decrease the numeric value. When you have set the right value, confirm by pressing the ● key.

The system provides for three types of access:
 USER (password not required, e.g. password No. 0000)
 INSTALLER (password No. 0300)
 MANUFACTURER

⚠ After it is entered, the password is active during display and/or parametrisation. If the display is inactive for a few minutes, it needs to be re-entered.

3.1.4 Setting the heating parameters

The parameter 1establishes the thermal module's various heating operation modes.


Mode 0

(Operation with room thermostat/heat demand and fixed heating setpoint)

In this mode, the thermal module operates with a fixed setpoint (controlled by the parameter3) based on whether the room/heat demand thermostat's contact is closed or not.

The set-point value can be entered directly, without entering in the parameter list, by accessing the "CH" menu in the following way:

Press MENU and select "Central heating" using the ▲ / ▼ keys. Press the ● key to confirm.

| Menu | |
|--------------------------|---|
| Central Heating (CH) |  |
| Domestic Hot Water (DHW) | |
| Information | |
| Settings ▼ | |

After the selection, use the ► key to highlight the value and use the ▲ / ▼ keys to change the selected value. Press the ● key to confirm/save the new settings.

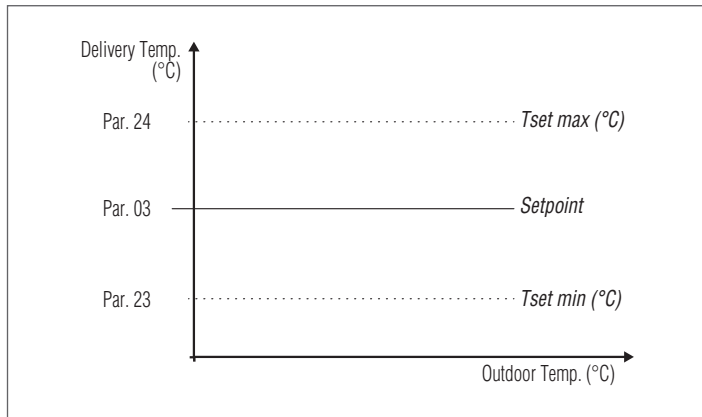
| Central Heating (CH) | |
|----------------------|---------|
| CH Setpoint | 61.5 °C |

the set point can be set within a minimum and maximum value as indicated respectively on Par. 23 and 24 as shown in the figure.

The outdoor temperature sensor (accessory) is not required and if connected the outdoor temperature that is measured does not influence the setpoint that has been set.

The parameters regulating such temperature are:

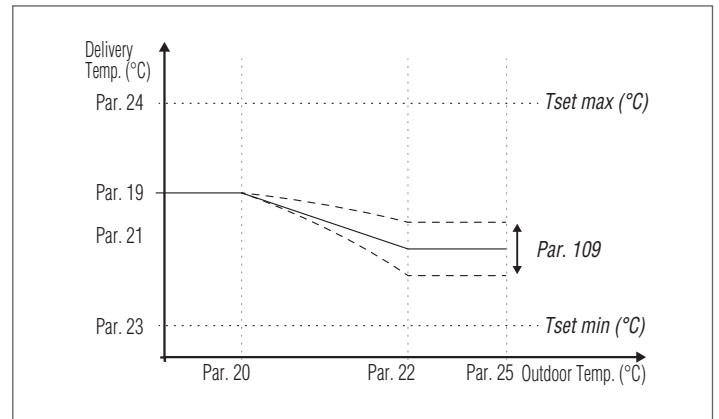
| Par. No. | Description |
|----------|--|
| 3 | Sets the desired flow temperature with heating mode. Active for the heating mode Par. 1 = 0 o 3 |
| 23 | Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). |
| 24 | Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). |



Mode 1
(Climatic functioning with room/heat demand thermostat, variable set point according to the outdoor temperature)

In this case the thermal module operates with a variable set-point depending on outdoor temperature based on a climatic curve defined by the following parameters:

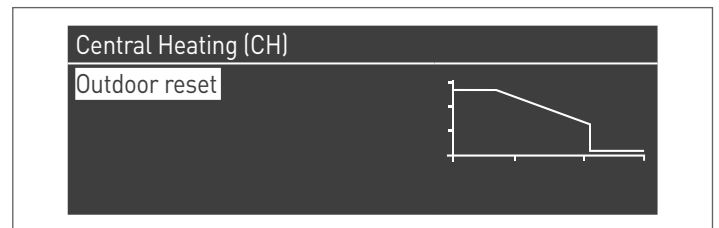
| Par. No. | Description |
|----------|--|
| 109 | Defines the value of the set point calculated on climatic mode (Par. 1 = 1). |
| 19 | Establishes the max. set-point at the minimum outdoor temperature for climatic regulation |
| 20 | Establishes the minimum outdoor temperature to which the maximum set-point can be associated for climatic regulation |
| 21 | Establishes the minimum set-point at the maximum outdoor temperature for climatic regulation |
| 22 | Establishes the maximum minimum outdoor temperature to which the minimum set-point can be associated for climatic regulation |
| 23 | Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). |
| 24 | Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). |
| 25 | Defines the temperature at which climatic regulation is switched off |



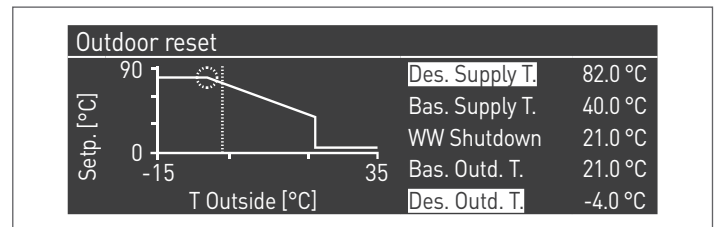
The demand is activated when the room/heat demand thermostat's contact is closed provided that outdoor temperature does not exceed the value set by the parameter 25.

if the outdoor temperature is higher than the one set on parameter 25, the burner is stopped even if there is a heat demand. The climatic curve can also be adjusted in a simpler, more user-friendly way.

Enter the "CH" menu. The following display will appear:



Press the ● key to confirm and enter the climatic curve screen.



"Design Supply Temp." and "Design Outdoor Temp." will be displayed. To change their value, press the ● key.

- 1 Use the ▲ / ▼ keys to modify Design Supply Temp and the ◀ / ▶ keys to change Design Outdoor Temp.
 - 2 Press ● to save changes
 - 3 Use the ◀ / ▶ keys to select other values.
- Repeat steps 1 from 3 to make other changes.
After setting the parameters, press the ESC key to exit the menu.

! If the outdoor temperature sensor (accessory) is not detected (not installed or damaged) the system provides a warning: no. 202
The presence of the warning does not stop the thermal module allowing a heat request to be carried out at the maximum setpoint set on the climatic regulation.

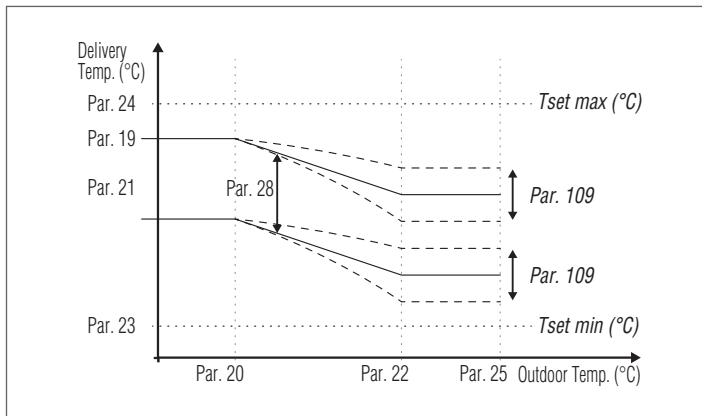
Mode 2

(Working on climatic mode with attenuation controlled by a room/heat demand thermostat, variable set point according to the outdoor temperature)

In this case the thermal module operates with a set-point defined by the climatic curve (which can be set in the same way as described in Mode 1) depending on outdoor temperature. Heat demand is actioned independently from whether the room/heat demand thermostat's contact is closed and stops only when the outdoor temperature is greater than the one defined by the parameter 25.

In this mode the parameter 28 defines by how many degrees the set-point is decreased (attenuation) when the room/heat demand thermostat's contact is opened.

| Par. No. | Description |
|----------|--|
| 109 | Defines the value of the set point calculated on climatic mode (Par. 1 = 1). |
| 19 | Establishes the max. set-point at the minimum outdoor temperature for climatic regulation |
| 20 | Establishes the minimum outdoor temperature to which the maximum set-point can be associated for climatic regulation |
| 21 | Establishes the minimum set-point at the maximum outdoor temperature for climatic regulation |
| 22 | Establishes the maximum minimum outdoor temperature to which the minimum set-point can be associated for climatic regulation |
| 23 | Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). |
| 24 | Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). |
| 25 | Defines the temperature at which climatic regulation is switched off |
| 28 | Use the heating mode Par. 1= 2 or 3. Defines how many degrees the flow set point is lowered. |

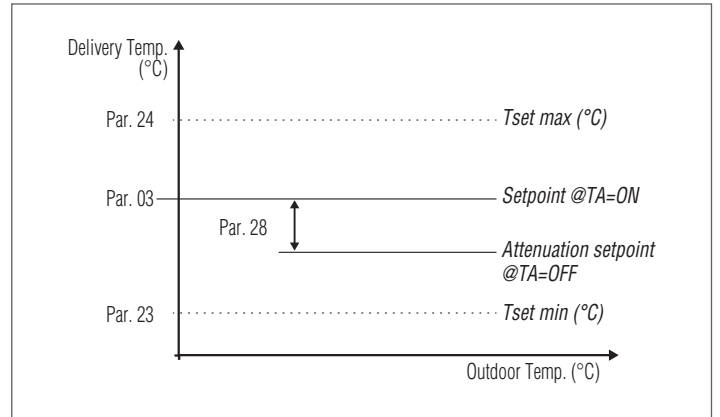


Mode 3

(Continuous fixed set-point operation with attenuation controlled by room/heat demand thermostat)

In this mode the fixed set-point is adjusted in the same way as described for Mode 0. The difference consists in the fact that the demand is always active and the set-point is decreased (attenuation) by the value defined by the parameter 28 when the room/heat demand thermostat's contact is opened.

| Par. No. | Description |
|----------|--|
| 3 | Sets the desired flow temperature with heating mode. Active for the heating mode Par. 1 = 0 o 3 |
| 23 | Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). |
| 24 | Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4). |
| 28 | Use the heating mode Par. 1= 2 or 3. Defines how many degrees the flow set point is lowered. |



! The outdoor temperature sensor (accessory) is not required and if connected the outdoor temperature that is measured does not influence the setpoint that has been set.

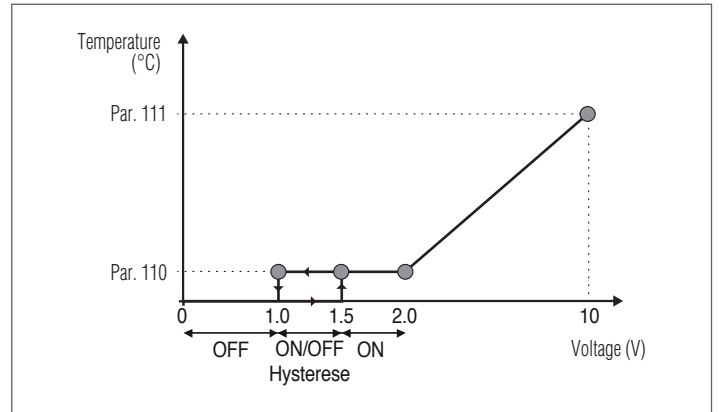
Mode 4

(Set-point adjustment based on a 0-10V analogical input)

The parameters that control this mode are the following:

| Par. No. | Description |
|----------|---|
| 110 | Sets the minimum delivery temperature value in heating mode (Par. 1) = 4. |
| 111 | Sets the maximum delivery temperature value in heating mode (Par. 1) = 4. |

The operation set-point is adjusted on the basis of the following curve:



3.1.5 Setting the domestic hot water parameters

The parameter 35 defines the various operation modes of the thermal module for DHW production

Mode 0
(No production of domestic hot water)

In this mode the thermal module will work only for the heating circuit (see paragraph "Setting the heating parameters")

Mode 1
(DHW production with storage tank and storage cylinder probe)

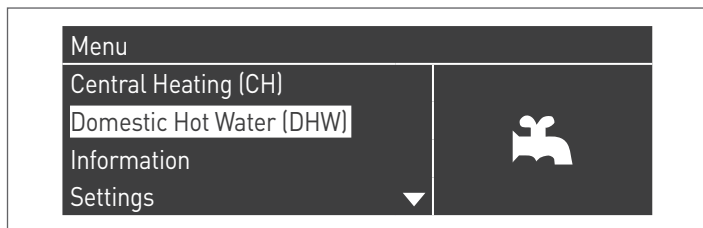
In this mode, the thermal module is activated when the temperature recorded by the storage cylinder probe falls below the DHW setpoint by an amount equal to the hysteresis value and is deactivated when the temperature rises above the DHW setpoint by the value of the hysteresis.

The parameters that control DHW production are the following:

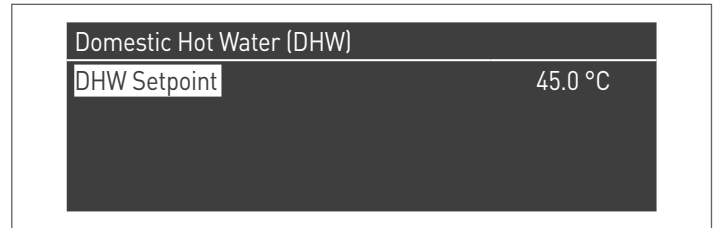
| Par. No. | Description |
|----------|--|
| 36 | Defines the hysteresis to initiate the domestic hot water demand. |
| 37 | Defines the hysteresis to stop the domestic hot water demand. |
| 38 | Defines the primary circuit's set-point increase in degrees compared to the temperature set for the domestic hot water tank. |
| 39 | Defines the primary circuit's restart hysteresis in modes 1 and 2 of DHW (valid both for cascade and stand-alone applications). |
| 40 | Defines the primary circuit's shut-off hysteresis in modes 1 and 2 of DHW (valid both for cascade and stand-alone applications). |
| 41 | Defines the value referred to the Delta T of the tank for maintenance purposes. E.g.: if it is set on 3, when the tank has a set point lowered of 3 degrees, the module turns on at the minimum to allow maintenance till the set point plus hysteresis. If this parameter is equal to 36, this function is inactivated and the module starts at the maximum sanitary power. |
| 48 | Establishes the DHW storage tank set-point. |

The setpoint value can be set directly, without entering the list of the parameters:

- Press MENU and select "Domestic Hot Water" using the ▲ / ▼ keys.



- Press the ● key to confirm.



- Use the ► key to highlight the value, and use the ▲ / ▼ keys to change the selected value. Press the ● key to confirm/save the new settings.

the DHW value can be changed only when the "domestic hot water" function is enabled. See paragraph "Password access" for instructions about outdoor recovery.

Mode 2
(DHW production with storage tank controlled by a thermostat)

In this case the thermal module is activated when the contact in boiler's thermostat is closed and is deactivated when the latter is opened.

The parameters that control DHW production are the following:

| Par. No. | Description |
|----------|--|
| 38* | Defines the primary circuit's set-point increase in degrees compared to the temperature set for the domestic hot water tank. |
| 39 | Defines the primary circuit's restart hysteresis in modes 1 and 2 of DHW (valid both for cascade and stand-alone applications). |
| 40 | Defines the primary circuit's shut-off hysteresis in modes 1 and 2 of DHW (valid both for cascade and stand-alone applications). |
| 48 | Establishes the DHW storage tank set-point. |

- (*) Parameter 38 is active on such mode even if the tank probe is not installed and it influences the flow temperature of the module.

It can be used to limit the difference between the flow and set temperature on the tank thermostat so that the system efficiency is maximized.

Also in this case, the setpoint value can be set directly, without entering the parameters list, by accessing the "Domestic Hot Water" menu, as already earlier for mode 1.

Priority setting

The parameter 42 sets the priorities between the DHW and CH circuit.

Four modes are envisaged:

- 0 **Time:** timed priority between the two circuits. In the event of a simultaneous demand, initially the domestic hot water circuit is made to operate for a number of minutes equal to the value assigned to the parameter 43. At the end of this time period, the CH circuit is operated (also for the same amount of time) and so on until demand for one or the other circuit stops
- 1 **Off:** priority given to the heating circuit
- 2 **On:** priority allocated to the DHW circuit
- 3 **Parallel:** simultaneous operation of both circuits provided that the delivery temperature requested by the DHW circuit is lower than or equal to the setpoint requested by the heating circuit. When the temperature requested by the DHW circuit exceeds the heating setpoint, the circulation pump of the heating is turned off and priority is switched to the DHW.

Anti-Legionella function

When the production of domestic hot water is activated (Par. 35= 1), using the parameters 107 and 108 it is possible to carry out a weekly scheduling of the "Anti-legionella" function.

Parameter 107 sets the day of the week on which the activity is performed, whilst parameter 108 sets the time.

At the planned time, the thermal module generates a heat demand for DHW storage tank with a pre-set set-point of 60°C (not adjustable). After reaching 60°C, the temperature is maintained for 30 minutes, during which the system checks that the probe's temperature does not fall below 57°C. At the end of this time interval, the Anti-Legionella function stops and standard operation of the thermal module is resumed.

Operation in "Anti-Legionella" mode has priority over other demands independently from the setting of the parameter 42.

| Par. No. | Description |
|----------|---|
| 107 | Sets the weekday on which the anti-Legionella procedure is carried out. |
| 108 | Sets the time of the day during which the anti-Legionella procedure is carried out. |

3.1.6 Scheduled programme

The Scheduled Programme is designed to program the operation of the various circuits managed by the thermal module, (CH, DHW and additional mixed zones).

Seasonal Programme

The Seasonal Programme is use to exclude additional mixed zones during the summer season.

It does not control any DHW parameter.

Holiday Programme

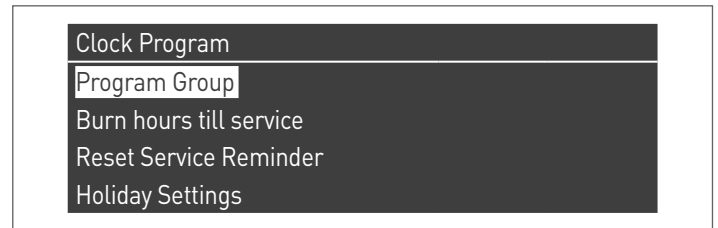
The Holiday Programme is used to exclude part of or all the circuits at a certain time of the year.

A holiday can be set both on the full system and on various groups of circuits.

The group system enables the user to add various circuits to the group to set a holiday period for several circuits at the same time. (For instance, to manage a semi-detached house with a centralised heating system when one of the two families is on holiday and the other is not).

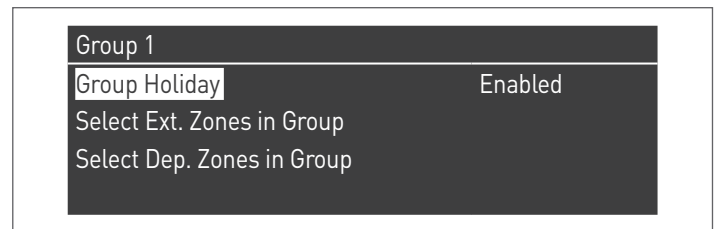
The set-point type can be adjusted so as to correspond to the desired setting.

The system can control up to a total of 16 "Mixed" zones. The programming of mixed areas is only allowed with an accessory. At the same time as these 16 areas, it is also possible to enable the CH zone (direct zone for central heating only).



The time programme includes the following parameters:

Group Programming

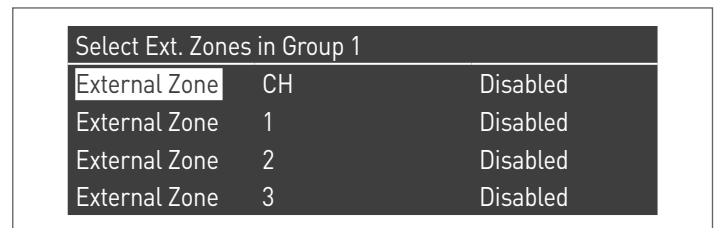


It enables the user to select a group to add zones to the selected group. It also enables the user to enable/disable the group in question.

Group settings are used to add zones to the groups.

The "Group programming" menu enables the use to chose among 8 groups. Each of them can be enabled or disabled.

Within it, it is possible to select zones to be added to the group (direct zone (CH) - mixed zones from 1 to 16)



N.B. The programming of mixed areas is only allowed with an accessory.

Heating programming

| | |
|--------------------------|---------|
| Group 1 | |
| Program Comfort Period | 1 |
| Comfort Setpoint | 28.0 °C |
| ECO Setpoint | 20.0 °C |
| Out of interval setpoint | Reduced |

It supports adjusting the time programme for the CH zones with the following parameters:

Period setting

Enables the user to select a period from 1 to 7. Period settings enable the user to adjust the active periods for this zone.

- **Active days:** Selection of the day (s) on which the period is active. Enables the user to disable the period set for one or more days. When this parameter is set as inactive, the other items on this menu are no longer used and hidden from the view. The choice of active days is between the following macro-groups: Sat-Sun, Mon-Fri, Mon-Sun, or individual days: Mon, Tue, Wed,...
- **Interval 1 (hidden if Active Days is disabled):** This parameter allows the user to regulate the starting and end time of the period. The starting time must always be before the finishing time.
- **Interval 2 (hidden if Active Days is disabled):** Same as interval 1. Interval added for the activated period.
- **Interval 3 (hidden if Active Days is disabled):** Same as interval 1. Interval added for the activated period.

| | | |
|-----------------------------|--------|-------|
| External Zone CH - Period 1 | | |
| Active Day(s) | Sunday | |
| Interval 1 | 00:00 | 00:00 |
| Interval 2 | 00:00 | 00:00 |
| Interval 3 | 00:00 | 00:00 |

Comfort Set-point

Comfort temperature to be used when the zone is in a certain period. (10 -30 °C).

ECO set-point

ECO temperature. Adjustable temperature that can be used outside set periods (5 - 20 °C).

Set-points outside the interval

Selection of the type of set-point to be used when a zone is not on a set period by selecting between:

- Off
- Comfort
- Eco
- Anti-Freeze (is activated below 5°C NON-ADJUSTABLE)
- Reduced (Calculated as -10°C Comfort Set-point value)

DHW setting

| | |
|--------------------------|----|
| Group 1 | |
| Program Comfort Period | 1 |
| Out of interval setpoint | On |

It supports adjusting the time programme for the DHW zone.

Period setting

Enables the user to select a period from 1 to 7. Period settings enable the user to adjust the active periods for this zone.

- **Active days:** Selection of the day (s) on which the period is active. Enables the user to disable the period set for one or more days. When this parameter is set as inactive, the other items on this menu are no longer used and hidden from the view. The choice of active days is between the following macro-groups: Sat-Sun, Mon-Fri, Mon-Sun, or individual days: Mon, Tue, Wed,...
- **Interval 1 (hidden if Active Days is disabled):** This parameter allows the user to regulate the starting and end time of the period. The starting time must always be before the finishing time.
- **Interval 2 (hidden if Active Days is disabled):** Same as interval 1. Interval added for the activated period.
- **Interval 3 (hidden if Active Days is disabled):** Same as interval 1. Interval added for the activated period.

| | | |
|------------------------------|--------|-------|
| External Zone DHW - Period 1 | | |
| Active Day(s) | Sunday | |
| Interval 1 | 00:00 | 00:00 |
| Interval 2 | 00:00 | 00:00 |
| Interval 3 | 00:00 | 00:00 |

Set-points outside the interval

Selection of the type of set-point to be used when a zone is not on a set period by selecting between:

- Off
- On

Holiday setting

| Holiday Settings | |
|------------------|-------|
| Mode | Group |
| Group | 1 |

Enables the user to change parameters for the Holiday Programme.

Mode

Select the Holiday programme mode. It can be set to Off, System or group.

Off

Disabled programme

Group

it enables the selection of the group (1 – 8).

As part of group selection, the Holiday Group is displayed with the following parameters:

- **Holiday set-point:** Set-point type to be used for the selected group. All zones in this group shall use this set-point if the current date is between the start and end date of the holiday period, but only if the group is enabled in the group settings menu, and can be selected from: Off, Comfort, Eco, Anti-freeze and Reduced.
- **Start date / End date (Day DD-MM-YEAR):**

| External Zone DHW - Period 1 | | |
|------------------------------|--------|-------|
| Active Day(s) | Sunday | |
| Interval 1 | 00:00 | 00:00 |
| Interval 2 | 00:00 | 00:00 |
| Interval 3 | 00:00 | 00:00 |

- **System:** It enables the user to select the holiday programme for the entire system. In this mode, the set-point is common to all system groups.

| External Zone DHW - Period 1 | | |
|------------------------------|--------|-------|
| Active Day(s) | Sunday | |
| Interval 1 | 00:00 | 00:00 |
| Interval 2 | 00:00 | 00:00 |
| Interval 3 | 00:00 | 00:00 |

- **Holiday set-point (hidden if the Mode is set to "Off"):** Type of reference to be used when system mode is selected. This set-point is used for all areas. Only used for the holiday system.

Seasonal setting

Enables the user to change parameters for the Seasonal Programme.

The seasonal programme is used to define a period of inactivity for the heating system. This menu includes the following elements:

Activates heating basis

Selects how the seasonal programme must verify whether heating can be allowed or not. It can be set on:

- **Always:** it means that the seasonal programme is ignored and (CH) heat demand is always allowed throughout the year.

| Season Settings | |
|-----------------|-----|
| Mode | Off |

- **At date:** excludes heating (CH+zone) when the current date is included between the start and the end dates.

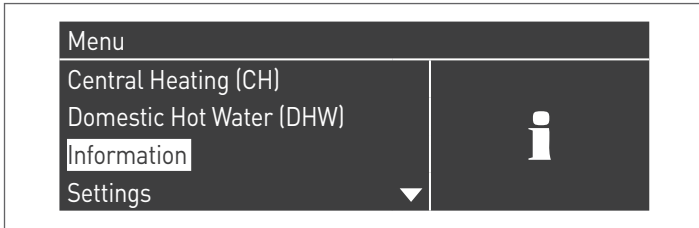
| Season Settings | |
|-----------------|---------|
| Mode | On Date |
| Begin Date | 15-04 |
| End Date | 15-09 |

- **At Temp:** excludes heating (CH+zone) when the outdoor temperature is higher than the selected temperature. (Ext. deactivation T: 0.0 °C/50 °C)

| Season Settings | |
|---------------------|---------|
| Mode | On Temp |
| Outdoor Temp. Below | 25.0 °C |

3.1.7 Thermal module information

In order to display key information on the screen, press the menu key and select "Information" with the ▲ / ▼ keys.



Press the ● key to confirm.

The following screen will be displayed:



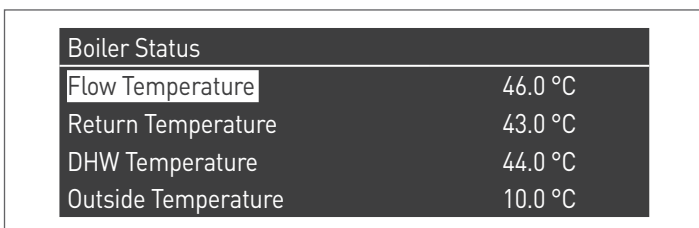
By selecting "Boiler status" and pressing the ● button you have the following screen:



At this point by selecting "Master" or "Dep1 ... N" the following values are displayed:

- Delivery temperature
- Return temperature
- DHW temperature (the sensor must be connected in order to display a value; if it is not present, the default value is displayed)
- Outside temperature
- Flue gas temperature
- System temperature (the sensor must be connected in order to display a value; if it is not present, the default value is displayed)
- Fan speed
- Ionization
- State
- Error

A The display shows four lines at a time. You can scroll the list by using the ▲ / ▼ keys.



By selecting "Boiler Register" and pressing the ● button you have the following screen:



At this point by selecting "Master" or "Dep1 ... N" the following values are displayed:

- Firing OK
- No firing
- No flame det.
- Oper. days
- Heat. burner hours
- DHW burner hours



You can scroll the list by using the ▲ / ▼ keys.

By selecting "Error log" and pressing the ● key, the following values are displayed:

- Error log (the errors listed in paragraph "Manual error list" are displayed)
- Error filter (in the "Error filter" item, it is possible to select: Disabled - Vol. Err. - Block)
- Boiler ID filter (in the boiler ID filter item you can choose between: Disabled - Master - Dep1 ... N)
- Erase Error Log (allowed only with Installer password)



You can scroll the list by using the ▲ / ▼ keys.

By selecting "Maintenance" and pressing the ● key, the following values are displayed:

- Maintenance log (each time a "Maintenance reminder reset" is performed, the event is logged)
- Oper. hours since last Maint.
- Oper. hours until next Maint
- Maintenance reminder reset (accessible only with installer password)
- Delete Maint. history (accessible only with OEM password)

| Service | |
|-------------------------------|----------|
| Service history | |
| Burn hours since last service | 0 hrs |
| Burn hours till service | 2000 hrs |
| Reset Service Reminder | No |


| Service | |
|-------------------------------|----------|
| Burn hours since last service | 0 hrs |
| Burn hours till service | 2000 hrs |
| Reset Service Reminder | No |
| Clear Service History | No |

You can scroll the list by using the ▲ / ▼ keys.

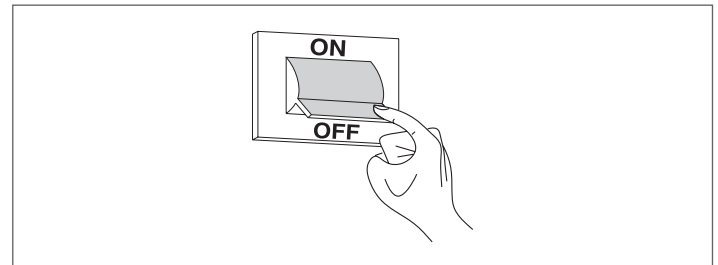
3.2 Checks during and after initial start-up

When the appliance it started, it must be checked by stopping and then restarting the thermal module in the following way:

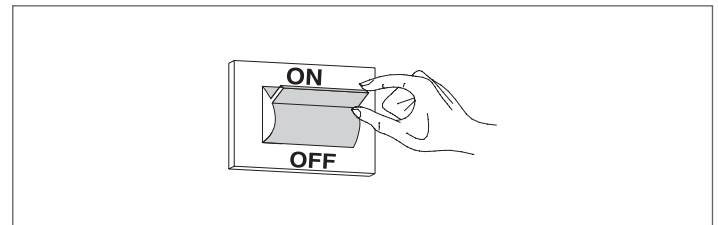
- Set the operating mode of the thermal module in heating to 0 (Par. 1) e and close the RT input to generate a heat request
- If inecessary, increase the setpoint value (Centralized Heating → Heating Set) till all units start

| Menu | |
|--------------------------|---|
| Central Heating [CH] |  |
| Domestic Hot Water (DHW) | |
| Information | |
| Settings | |

- Check the full stop of the thermal module and the heat demand by opening the "RT" contact (OFF).
- Check that the thermal module has come to a complete stop by setting the main switch of the equipment and the main switch of the system to "off".

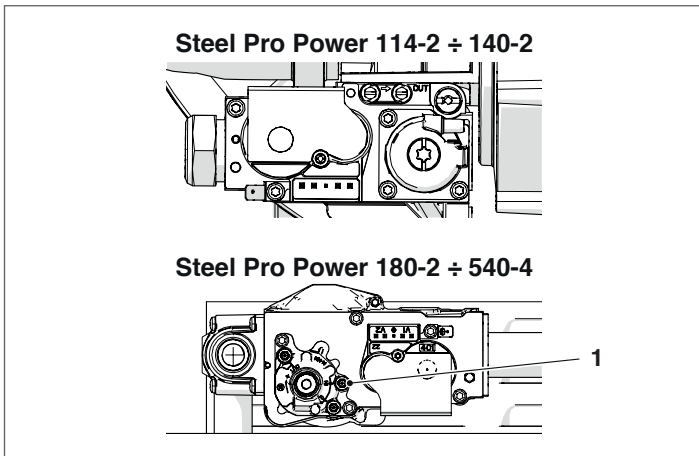


If all conditions are met, power the thermal module by setting the system's and the appliance's master switches to "On" and test combustion products (see Paragraph "Adjustments").

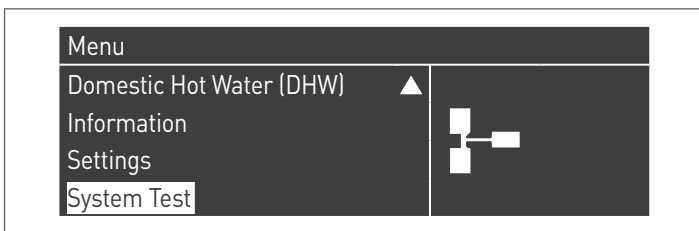


SUPPLY GAS PRESSURE CHECK

- Turn the main system switch "off"
- Access the module and identify the unit you want to check (it is not necessary to do it for all the units)
- Loosen by about two turns the pressure inlet screw (1) upstream of the gas valve and connect the pressure gauge



- Power the thermal module by setting the system's and the appliance's master switches to "On".
- Press the MENU key, select "System test" and press ● to confirm.



- select the unit between "Master" and "Dep1 ... N"



- select "Max. power" with the ▲ / ▼ keys and press ● to confirm. The fan starts turning at its maximum speed (which can vary based on the model).



| DESCRIPTION | G20 | G30 | G31 | |
|-------------------------|------|-------|------|-------------------|
| Wobbe index | 45,7 | 80,6 | 70,7 | MJ/m ³ |
| Nominal supply pressure | 20 | 28-30 | 37 | mbar |

After the checks:

- select "OFF" with the ▲ / ▼ keys and press ● to confirm.
- Disconnect the pressure gauge and tighten again the pressure test point screw (1) upstream from the gas valve.



- After completing the operations, close the module doors.

3.3 Error List

When a display has a technical fault, a numeric error code appears that will enable the maintenance operator to identify the possible cause.

There are 3 categories of errors:

- 1 Permanent: errors that require a manual reset
- 2 Temporary: errors that are automatically reset once the cause that generated them is removed or stopped
- 3 Notices: simple warnings that do not block the appliance's operation

3.3.1 Permanent Errors

| Nr. | Error | Description | Checks | Solutions |
|-----|-----------------------|---|--|---|
| 0 | E2PROM_READ_ERROR | Internal software error | | Control board replacement |
| 1 | IGNIT_ERROR | Three unsuccessful ignition attempts in a row | Check gas supply pressure Check ignition spark Correct amount of air Check for voltage at the gas valve | If the gas supply pressure is incorrect, it must be adjusted to the correct pressure If spark is not present check for correct ignition electrode position If the combustion air pressure is incorrect, inspect the vent system and eliminate any obstructions If the voltage at the gas valve is not the same as the boiler power supply, replace the control board |
| 2 | GV_RELAY_ERROR | Failure detected in the GV (Gas Valve) relay | Check the integrity of the wire connections between gas valve and control board | If wires are damaged, replace them If the wiring is intact, replace the gas valve or the control board |
| 3 | SAFETY_RELAY_ERROR | Internal control board error | | a) If the error appears during operation, replace the control board b) If the error appears when the boiler is starting up (using main switch), check that the limit thermostat (and wiring) is integral |
| 4 | BLOCKING_TOO_LONG | Control had a blocking error for more than 20 hours | Press RESET button to display the Blocking error description | Remove the cause of the Blocking error |
| 5 | FAN_ERROR_NOT_RUNNING | Fan is not running for more than 60 seconds | Check that the fan is connected to the power supply Check PWM connection of the fan | If there is no voltage, replace the control board If no PWM signal is present, replace control board Replace the fan |
| 6 | FAN_ERROR_TOO_SLOW | Fan runs too slow for more than 60 seconds | | |
| 7 | FAN_ERROR_TOO_FAST | Fan runs too fast for more than 60 seconds | | |
| 8 | RAM_ERROR | Internal software error | | Control board replacement |

| Nr. | Error | Description | Checks | Solutions |
|-----|------------------------|---|---|--|
| 9 | WRONG_EEPROM_SIGNATURE | Contents of Eeprom is not up to date | | Control board replacement |
| 10 | E2PROM_ERROR | Wrong safety parameters in Eeprom | | Control board replacement |
| 11 | STATE_ERROR | Internal software error | | Control board replacement |
| 12 | ROM_ERROR | Internal software error | | Control board replacement |
| 15 | MAX_TEMP_ERROR | The external overheat protection is enabled or the T_Supply sensor measures a temperature of over 100°C (212°F) | Check the pump to verify the flow circulation Check if the valves on hydraulic circuit are open Check the safety thermostat | Change the pump or restart it Open the valves on hydraulic circuit Replace the safety thermostat |
| 16 | FLUE_GAS_ERROR | Flue temperature exceeded the maximum flue temperature | | |
| 17 | STACK_ERROR | Internal software error | | Control board replacement |
| 18 | INSTRUCTION_ERROR | Internal software error | | Control board replacement |
| 19 | ION_CHECK_FAILED | Internal software error | | Control board replacement |
| 20 | FLAME_OUT_TOO_LATE | Flame still present 10 seconds after closing the gas valve | | Replace the gas valve |
| 21 | FLAME_BEFORE_IGNIT | Flame is detected before ignition | | Replace the gas valve |
| 22 | Loss of flame | Flame lost three times during a request | | |
| 23 | CORRUPTED_ERROR_NR | Error code RAM byte was corrupted to an unknown error code | | |
| 29 | PSM_ERROR | Internal software error | | |
| 30 | REGISTER_ERROR | Internal software error | | Control board replacement |

3.3.2 Temporary Errors

| Nr. | Error | Description | 54,912 | Solutions |
|-----|--------------------------------|---|--|--|
| 100 | WD_ERROR_RAM | Internal software error | | Control board replacement |
| 101 | WD_ERROR_ROM | Internal software error | | Control board replacement |
| 102 | WD_ERROR_STACK | Internal software error | | Control board replacement |
| 103 | WD_ERROR_REGISTER | Internal software error | | Control board replacement |
| 106 | REFHI_TOO_HIGH / REFHI_TOO_LOW | Internal software error | | Control board replacement |
| 107 | REFHI_TOO_HIGH / REFHI_TOO_LOW | Internal software error | | Control board replacement |
| 108 | REFHI_TOO_HIGH / REFHI_TOO_LOW | Internal software error | | Control board replacement |
| 109 | REFHI_TOO_HIGH / REFHI_TOO_LOW | Internal software error | | Control board replacement |
| 110 | REFHI_TOO_HIGH / REFHI_TOO_LOW | Internal software error | | Control board replacement |
| 111 | REFHI_TOO_HIGH / REFHI_TOO_LOW | Internal software error | | Control board replacement |
| 112 | REFHI_TOO_HIGH / REFHI_TOO_LOW | Internal software error | | Control board replacement |
| 113 | REFHI_TOO_HIGH / REFHI_TOO_LOW | Internal software error | | Control board replacement |
| 114 | FALSE_FLAME | Flame is detected in a state in which no flame is allowed to be seen. | | Control board replacement |
| 115 | LOW_WATER_PRESSURE_ERROR | Low water pressure error | | |
| 118 | WD_COMM_ERROR | Watchdog communication error | | Control board replacement |
| 119 | RETURN_OPEN | Return sensor open | Check the integrity of the wire connections Check the return temperature sensor | If the wiring is damaged, replace it Verify that the temperature sensor has the correct resistance values. If values are incorrect sensor must be replaced. |
| 120 | SUPPLY_OPEN | Supply sensor open | Check the integrity of the wire connections Check the return temperature sensor | If the wiring is damaged, replace it Verify that the temperature sensor has the correct resistance values. If values are incorrect sensor must be replaced. |
| 122 | DHW_OPEN | DHW sensor open | Check the integrity of the wire connections Check the DHW temperature sensor | If the wiring is damaged, replace it Verify that the temperature sensor has the correct resistance values. If values are incorrect sensor must be replaced. |
| 123 | FLUE_OPEN | Flue sensor open | | |
| 126 | RETURN_SHORTED | Return sensor shorted | Check the integrity of the wire connections Check the return temperature sensor | If the wiring is damaged, replace it Verify that the temperature sensor has the correct resistance values. If values are incorrect sensor must be replaced. |

| Nr. | Error | Description | Checks | Solutions |
|-----|---------------------------|---|---|--|
| 127 | SUPPLY_SHORTED | Supply sensor shorted | Check the integrity of the wire connections Check the return temperature sensor | If the wiring is damaged, replace it Verify that the temperature sensor has the correct resistance values. If values are incorrect sensor must be replaced. |
| 129 | DHW_SHORTED | DHW sensor shorted | Check the integrity of the wire connections Check the DHW temperature sensor | If the wiring is damaged, replace it Verify that the temperature sensor has the correct resistance values. If values are incorrect sensor must be replaced. |
| 130 | FLUE_SHORTED | Flue sensor shorted | Check the integrity of the wire connections Check the Outdoor temperature sensor | If the wiring is damaged, replace it Verify that the temperature sensor has the correct resistance values. If values are incorrect sensor must be replaced. |
| 133 | Net Freq Error | Net. freq. error detected by the watchdog | | |
| 134 | RESET_BUTTON_ERROR | Too many resets in a short time period | | |
| 163 | T_SELECTION1_OPEN | Heat exchanger's flow rate too low | | |
| 164 | Boiler model not detected | Boiler model not set | | |

3.3.3 Warnings

| Nr. | Error | Description |
|-----|-------------------------|---|
| 200 | CC_LOSS_COMMUNICATION | Cascade system: the burner of the managing module has lost the signal of one of the dependent thermal module burner |
| 201 | CC_LOSS_COMMUNICATION | Cascade system: the managing module has lost the signal of one of the dependent thermal module |
| 202 | OUTDOOR_WRONG | Outdoor sensor is open of shorted |
| 203 | T_SYSTEM_WRONG | T_System sensor is open of shorted |
| 204 | T_CASCADE_WRONG | T_Cascade sensor is open of shorted |
| 207 | DHW sensor error | DHW sensor error |
| 208 | Zone sensor error | Zone sensor error |
| 209 | Boiler request disabled | Boiler request disabled |

3.4 Transformation from one gas type to another

3.4.1 Gas conversion for G30/G31

The thermal module **Steel Pro Power** is supplied for operation with G20 (natural gas). However, it can be converted to operation with G30-G31 (LPG) using the dedicated accessory supplied as standard.

⊘ Forbidden in Belgium and Switzerland.

⚠ Conversion can only be executed by Technical Assistance Service or staff authorised by **RIELLO**.

⚠ In order to execute the conversion, only follow the instructions in this manual and the provisions of safety standards.

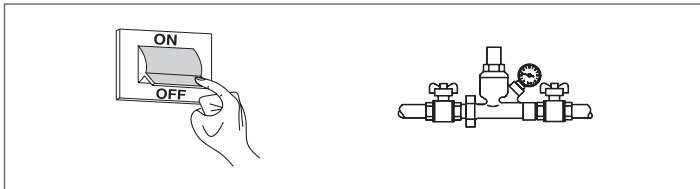
⚠ If the information contained in these instructions is not properly performed or performed by personnel not properly trained, there is a potential risk of fuel leakage and/or carbon monoxide production resulting in personal injury and/or injury.

⚠ Conversion is not complete until all the control steps described in these instructions have been carried out.

⚠ After conversion, calibrate the CO₂ as shown in the "Adjustment" Paragraph.

Before making the transformation:

- make sure that both the main switch, the switch on the module, and the switch on the unit you are working on are in the "off" position.
- check that the main shut-off valve and the gas tap on the single unit on which you are working are closed.



To install the accessory:

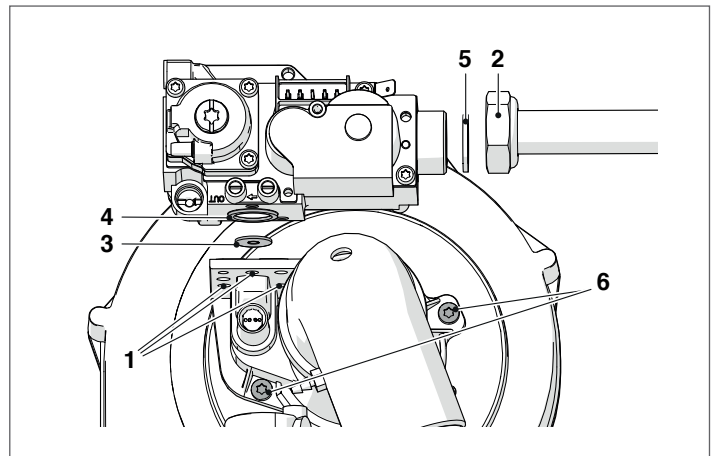
- Access the module and start operating on one of the units.

Versions 114-2 P and 140-2 P

- unscrew the three screws (1) and the swivel nut (2) of the gas pipe in order to remove the valve from the fan
- insert the related diaphragm (3) onto the gasket (4) without removing the gasket itself

| Model | int. Ø (mm) |
|-------------------------|-------------|
| STEEL PRO POWER 114-2 P | 6.5 (*) |
| STEEL PRO POWER 140-2 P | 6.5 (*) |

- check the integrity of the gasket (5); replace it if necessary
- retighten the mixer screws (6)
- refit the three screws (1)
- refit the swivel nut (2)
- reconnect the fan and gas valve electrical connections



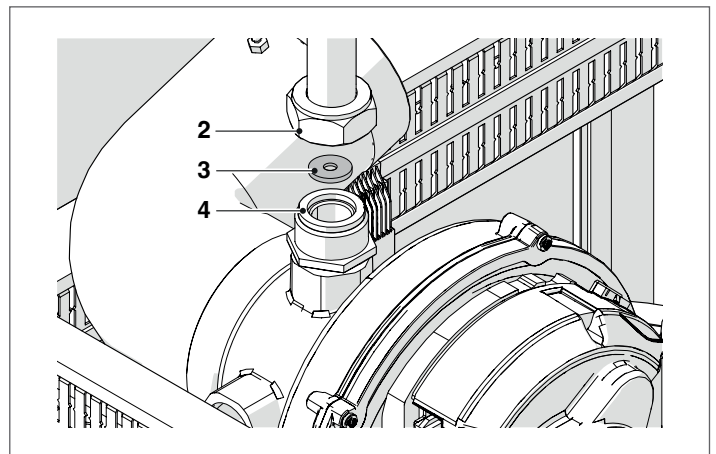
Check the tightening torques described in the "Torque value" section.

All other versions: 180-2 P ÷ 540-4 P

- disconnect the electrical connections of the fan and the gas valve
- unscrew the swivel nut (2) on the gas pipe
- insert the related diaphragm (3) onto the gasket (4) without removing the gasket itself

| Model | int. Ø (mm) |
|-------------------------|-------------|
| STEEL PRO POWER 180-2 P | 9 |
| STEEL PRO POWER 230-2 P | 9.25 |
| STEEL PRO POWER 270-2 P | 9.25 |
| STEEL PRO POWER 300-3 P | 9 |
| STEEL PRO POWER 345-3 P | 9.25 |
| STEEL PRO POWER 405-3 P | 9.25 |
| STEEL PRO POWER 460-4 P | 9.25 |
| STEEL PRO POWER 540-4 P | 9.25 |

- retighten the valve
- retighten the fan screws
- screw the swivel nut (2) on the gas pipe
- reconnect the electrical connections of the fan and the gas valve



Check the tightening torques described in the "Torque value" section.

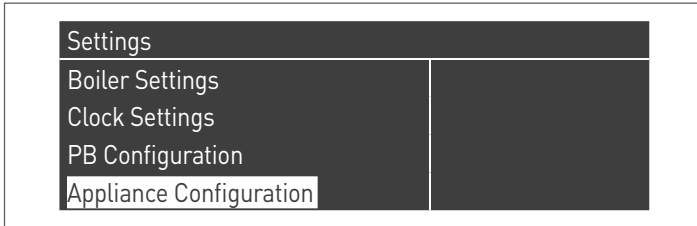
For all models

- Open the general fuel shut-off valve.
- Open the tap of the unit you are working on.
- Place the main system switch, the main switch of the module and the one of the unit on which you are working on "ON".
- Make sure that there is no heat or DHW demand.

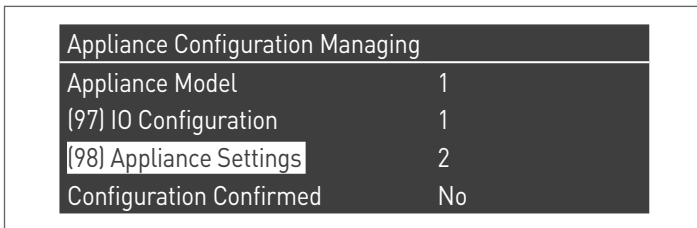
It is now necessary to change the setting of the parameter 98.

Proceed as follows:

- On the home screen of the control panel, press the ● key
- Select "Settings" with the ▲ / ▼ keys and press the ● key
- Select "Device configuration" with the ▲ / ▼ keys and press the ● key



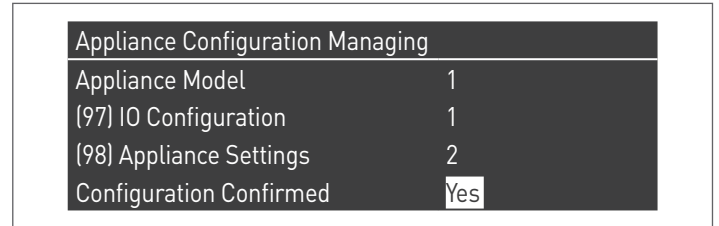
- Enter the password as described in paragraph "Password access"
- Select the unit between "Master" and "Dep1 ... N"
- Press the ▼ key, select "(98) Appliance Settings" and press the ● key



- With the ▲ / ▼ keys change the value following what is in the following table and press the ● key:

| Model | Parameter 98 |
|-------------------------|--------------|
| Steel Pro Power 114-2 P | 12 |
| Steel Pro Power 140-2 P | 10 |
| Steel Pro Power 180-2 P | 8 |
| Steel Pro Power 230-2 P | 4 |
| Steel Pro Power 270-2 P | 2 |
| Steel Pro Power 300-3 P | 6 |
| Steel Pro Power 345-3 P | 4 |
| Steel Pro Power 405-3 P | 2 |
| Steel Pro Power 460-4 P | 4 |
| Steel Pro Power 540-4 P | 2 |

- Press the ▼ key, select "Config. Confirmed" and press the ● key
- With the ▲ / ▼ keys change the value to "Yes" and press the ● key



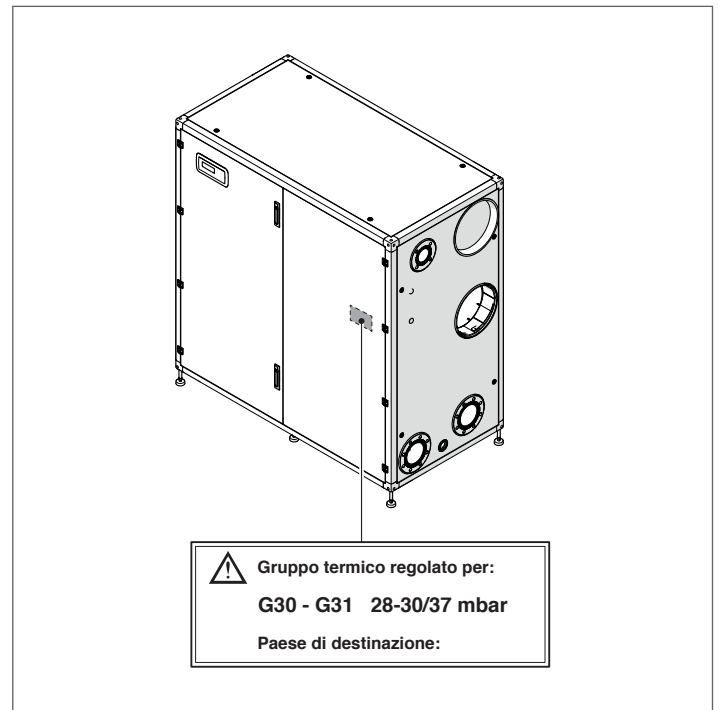
At this point the systems starts an application update process. Once this is finished, the menu "Settings" appears on the menu.

Repeat this operation for all the modules.

- Press ◀ until you return to the home screen

An error message is displayed for a few seconds and then the display returns to its normal state.

Apply the new gas label supplied in the kit on completion of the conversion.



After installing the accessory, check all gaskets tightness. Carry out all calibration activities described in Paragraph "Adjustments".

Restore the desired set points.

3.5 Adjustments

The thermal module **Steel Pro Power** is supplied for operation with G20 (methane gas), as indicated by the type plate, and has already been factory-calibrated by the manufacturer.

If further adjustments need to be made, for example after non-scheduled maintenance, replacing a gas valve or switching the gas supply, follow the instructions below.

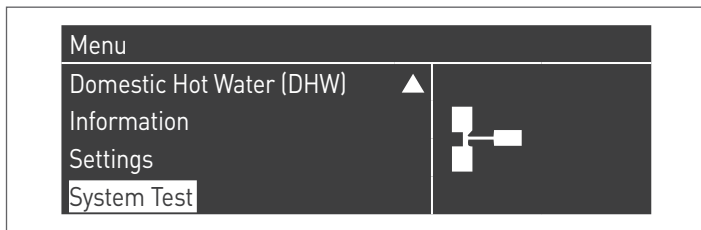
⚠ Adjustments to maximum and minimum power must be performed in the indicated sequence and only by Technical Assistance Service.

Before making the regulation:

- access inside the module
- identify the unit on which you want to operate.

CO2 ADJUSTMENT AT MAXIMUM POWER

- Press the MENU key, select "System test" and press ● to confirm.



- Selecting "System Test" you will have the following screen:



- Choose between "Master" or "Dep1 ... N"
- select "Max. power" with the ▲ / ▼ keys and press ● to confirm. The fan starts turning at its maximum speed (which can vary based on the model).



- the appliance will operate at maximum power.
- unscrew the cap from the smoke duct (1) and insert the combustion analyser probe
- set the CO2 with a screwdriver on the regulation screw (2) placed on the gas valve, thus reaching the value reported on the table.

| CO2% maximum power | Gas type | | | |
|-------------------------|---|---------------------------------------|--|--|
| | G20 | G25 | G30 | G31 |
| Steel Pro Power 114-2 P | 9 ^(+0.2) _(-0.2) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 140-2 P | 9 ^(+0.2) _(-0.2) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 180-2 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 230-2 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 270-2 P | 9 ^(+0.2) _(-0.4) (*) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 300-3 P | 9 ^(+0.2) _(-0.4) (*) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 345-3 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 405-3 P | 9 ^(+0.2) _(-0.4) (*) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 460-4 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 540-4 P | 9 ^(+0.2) _(-0.4) (*) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |

⚠ (*) In Belgium and Switzerland the value must be adjusted to 8.6^(+0.6).

CO2 ADJUSTMENT AT MINIMUM POWER

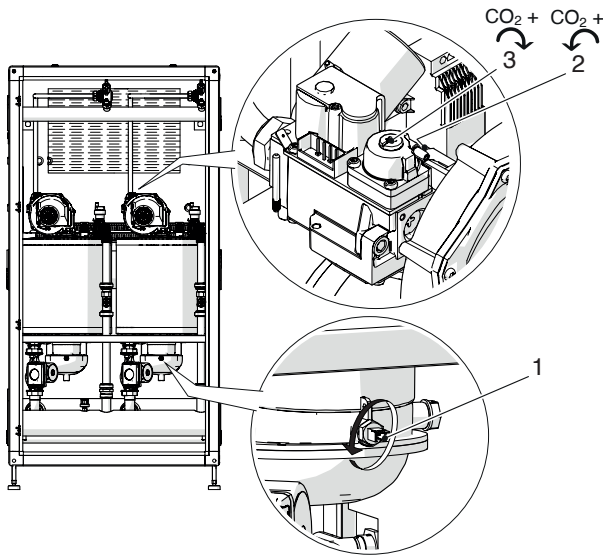
- Select "Min. power" with the ▲ / ▼ keys and press ● to confirm.



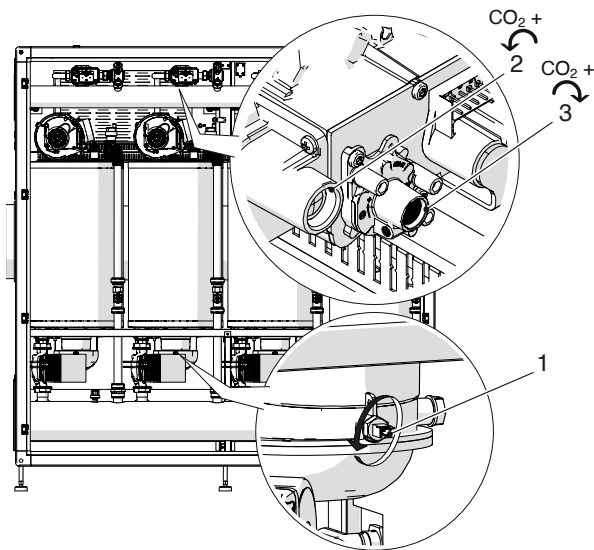
- the appliance will operate at minimum power.
- Adjust the CO2 using a screwdriver on the adjustment screw (3) on the fan unit, so as to obtain a value listed in the table.

| CO2% minimum power | Gas type | | | |
|-------------------------|---------------------------------------|---------------------------------------|--|--|
| | G20 | G25 | G30 | G31 |
| Steel Pro Power 114-2 P | 9 ^(+0.2) _(-0.2) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 140-2 P | 9 ^(+0.2) _(-0.2) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 180-2 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 230-2 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 270-2 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 300-3 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 345-3 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 405-3 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 460-4 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |
| Steel Pro Power 540-4 P | 9 ^(+0.2) _(-0.4) | 9 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) | 10,4 ^(+0.2) _(-0.2) |

Versions 114-2 P ÷ 140-2 P



Versions 180-2 P ÷ 540-4 P



CHECKING THE CALIBRATION

Select the "Max. power" value, wait until speed stabilises and check that CO₂ correspond to required ones.

After the checks:

- select "OFF" with the ▲ / ▼ keys and press ● to confirm.
- remove the analyzer probe and carefully screw the flue probe back (1)
- place back the front panel and lock the locking screw.

| | |
|-------------|--------|
| System Test | |
| Test State | Off |
| Fan Speed | 0 rpm |
| Ionisation | 0.0 µA |

3.6 System antifreeze protection

The anti-freeze protection function protects the system against freezing.

The flow and return sensors of each individual thermal element are monitored to generate an antifreeze protection request in the following ways:

- When one of the sensors falls below 10°C, the CH pump and the module pump start up.
- When one of the sensors falls below 5°C, the burner is started.
- When all sensors measure a value above 15°C, the anti-freeze protection request is deactivated.
- When the primary probe detects a temperature lower than parameter 155 (by default set to 15°C), the CH pumps and the general cascade pump are activated. When the temperature of the primary probe reaches the value defined by the parameter 155 plus 5 degrees, the request ceases and the cascade returns to stand-by mode.
- When the antifreeze protection is switched off, the pumps continue to operate for the post-circulation period.

If the external probe is present, an additional antifreeze protection is activated. If the external probe detects a temperature lower than that set in parameter 186 (default value=3 °C), then the pump of the first element and the pump of the CH circuit are started.

In case of indoor installation and if no antifreeze protection (linked to the external probe) is requested, it is sufficient to set the parameter 186 at the lowest possible value -30 °C).

3.7 Temporary or short-term shut-down

In the event of temporary or short-term shut-down (e.g. due to holidays), proceed as follows:

- Press the MENU key and select with keys ▲ / ▼ "Time schedule", confirm with key ●.
- Select with keys ▲ / ▼ "Holiday Schedule" and confirm with key ●.
- Select with keys ▲ / ▼ "Mode" and confirm with key ●. Select "System" mode and confirm.

| |
|-------------------------|
| Clock Program |
| Program Group |
| Burn hours till service |
| Reset Service Reminder |
| Holiday Settings |

| | |
|------------------|---------------------|
| Holiday Settings | |
| Mode | System |
| Holiday Setpoint | Comfort |
| Begin Date | Saturday 01-08-2015 |
| End Date | Saturday 01-08-2015 |

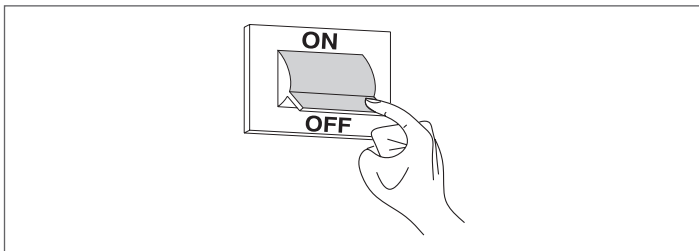
- Select with keys ▲ / ▼ "Holiday Setpoint" and confirm with key ●.
- Select "Antifreeze" holiday setpoint and confirm.

| Holiday Settings | |
|------------------|---------------------|
| Mode | System |
| Holiday Setpoint | Anti Fr |
| Begin Date | Saturday 01-08-2015 |
| End Date | Saturday 01-08-2015 |

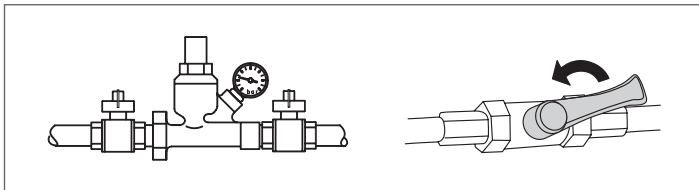
3.8 Preparing for extended periods of disuse

The following operations shall be necessary if the thermal module is not used for a long period of time:

- set the modules' main switch and the system's main switch to "off"



- Close the fuel and water valves for the heating and domestic hot water system.



⚠ Empty the thermal and sanitary system if there is a danger of frost.

3.9 Replacing the display and control boards

⚠ System configurations must be performed only by the Technical Assistance Service or by personnel authorized by **RIELLO**.

After the control panel has been replaced, the next time the device is restarted, the initial screen is shown.

The system performs a consistency check between the configuration data saved on the motherboard and those saved in the user interface; therefore, when replacing the control interface, the system can detect an inconsistency between the saved data. Set the Par. 97 and the Par. 98.

Proceed as follows:

- On the home screen of the control panel, press the ● key
- Select "Settings" with the ▲ / ▼ keys and press the ● key
- Select "Device configuration" with the ▲ / ▼ keys and press the ● key

| Settings | |
|-------------------------|--|
| General Settings | |
| Boiler Settings | |
| Appliance Configuration | |

- Enter the password as described in paragraph "Password access"
- Select the unit between "Master" and "Dep1 ... N"
- Select "(97) IO Configuration" and press the ● button
- With the ▲ / ▼ keys change the value following what is in the following table and press the ● key:

| Version | Par. 97 |
|--------------------------|---------|
| Master, pump version | 14 |
| Master, valve version | 15 |
| Dependent, pump version | 16 |
| Dependent, valve version | 17 |

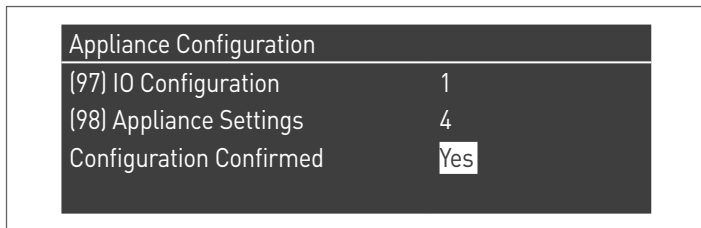
- Press the ▼ key, select "(98) Appliance Settings" and press the ● key

| Appliance Configuration Managing | |
|----------------------------------|-----|
| Appliance Model | 1 |
| (97) IO Configuration | 1 |
| (98) Appliance Settings | 2 |
| Configuration Confirmed | Yes |

- With the ▲ / ▼ keys change the value following what is in the following table and press the ● key:

| Model | Gas | Par. 98 |
|-------------------------|---------|---------|
| STEEL PRO POWER 114-2 P | methane | 11 |
| | LPG | 12 |
| STEEL PRO POWER 140-2 P | methane | 9 |
| | LPG | 10 |
| STEEL PRO POWER 180-2 P | methane | 7 |
| | LPG | 8 |
| STEEL PRO POWER 230-2 P | methane | 3 |
| | LPG | 4 |
| STEEL PRO POWER 270-2 P | methane | 1 |
| | LPG | 2 |
| STEEL PRO POWER 300-3 P | methane | 5 |
| | LPG | 6 |
| STEEL PRO POWER 345-3 P | methane | 3 |
| | LPG | 4 |
| STEEL PRO POWER 405-3 P | methane | 1 |
| | LPG | 2 |
| STEEL PRO POWER 460-4 P | methane | 3 |
| | LPG | 4 |
| STEEL PRO POWER 540-4 P | methane | 1 |
| | LPG | 2 |

- Press the ▼ key, select "Config. Confirmed" and press the ● key
- With the ▲ / ▼ keys change the value to "Yes" and press the ● key



At this point the systems starts an application update process. Once this is finished, the menu "Settings" appears on the menu.

- Press ◀ until you return to the home screen

An error message is displayed for a few seconds and then the display returns to its normal state.

3.10 Replacing the Dependent board

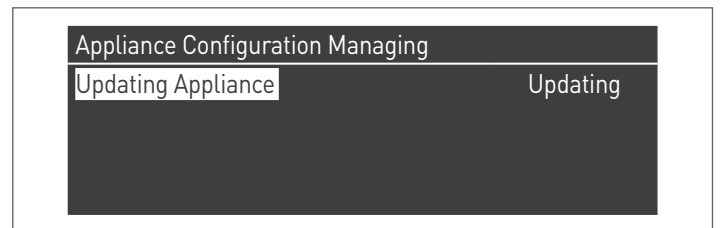
⚠ System configurations must be performed only by the Technical Assistance Service or by personnel authorized by **RIELLO**. When replacing the front control panel, an initial screen with the logo is displayed on the next reboot **RIELLO**.

Before configuring:

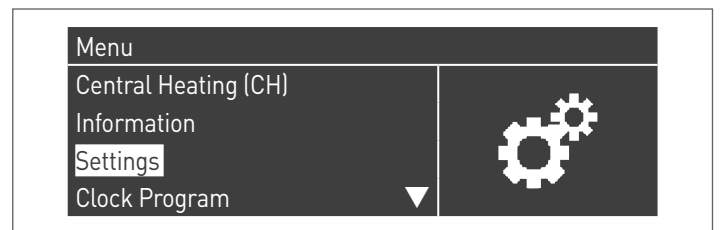
- Disconnect the power supply to all modules
- Remove the failed board and replace it with the new one with the selected dipswitch
- Disconnect the display from the Managing board and connect it to the Dependent board
- Power the replaced board

The display updates the board automatically with the Managing configuration.

After the configuration is complete, the board must be reconfigured into a Dependent board:



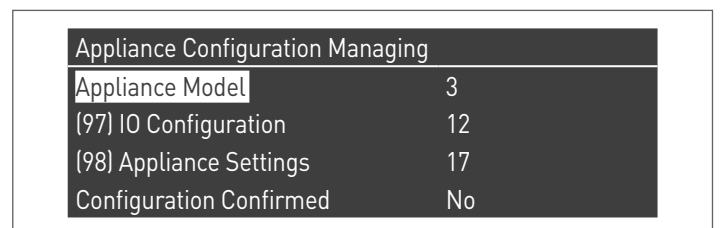
- Press the Menu key on the display
- Select "Settings" with the ▲ / ▼ keys and press the ● key



- Select "Appliance Configuration" using keys ▲ / ▼ and press ●



- Enter the password as described in paragraph "Password access". The configuration menu appears on the display



- Select "(97) IO Configuration" and press the ● button
- Use keys ▲ / ▼ to change the value from 12 to 13 and press ● to confirm

| | |
|----------------------------------|-----|
| Appliance Configuration Managing | |
| Appliance Model | 3 |
| (97) IO Configuration | 13 |
| (98) Appliance Settings | 17 |
| Configuration Confirmed | Yes |

Act on the parameters by configuring them in accordance with the Dependent Table shown at the end of this paragraph.


At this point, the system starts updating the application.

| | |
|----------------------------------|----------|
| Appliance Configuration Managing | |
| Updating Appliance | Updating |

- After the configuration is complete, select "Boiler Settings" using keys ▲ / ▼ and press ●

| | |
|------------------|---|
| Settings | |
| General Settings |  |
| Boiler Settings | |
| Clock Settings | |
| PB Configuration | |

- Select "Module Cascade Settings" using keys ▲ / ▼ and press ●

| | |
|-------------------------|---|
| Boiler Settings | |
| Boiler Parameters |  |
| Module Cascade Settings | |
| Boiler Cascade Settings | |
| Boiler error settings | |

- Select "Dipswitch Config" using keys ▲ / ▼ and press ●
- Use keys ▲ / ▼ to set in "Disabled" and press ● to confirm

| | |
|---------------------------|----------|
| Module Cascade Settings | |
| (189) Burner Address | Managing |
| (194) Dipswitch Config. | Disabled |
| Boiler demand disabled | No |
| (72) Permit EmergencyMode | Yes |

- After making the modifications, press ESC to return to the HOME page

| | |
|---------------------|--------|
| 12:11 | |
| Dependent | |
| Calculated Setpoint | 20.0°C |

- Disconnect the power supply to the Dependent board; disconnect the Display from the Dependent board and connect it to the Managing board. Power the Managing board and, after the initialisation phase when the logo is displayed RIELLO, the Display automatically switches to the "Master Device Configuration" page; use keys ▲ / ▼ to configure the parameters (according to the Dependent Table) and press ● to confirm

| | |
|----------------------------------|----|
| Appliance Configuration Managing | |
| Appliance Model | 0 |
| (97) IO Configuration | 0 |
| (98) Appliance Settings | 0 |
| Configuration Confirmed | No |

| | |
|----------------------------------|-----|
| Appliance Configuration Managing | |
| Appliance Model | 3 |
| (97) IO Configuration | 13 |
| (98) Appliance Settings | 17 |
| Configuration Confirmed | Yes |

After the configuration is complete, the Display shows a configuration error for a short time. Disconnect the power supply to the Managing board and power all modules simultaneously.

Dependent Table

| Model | Par. 97 | Par. 98 |
|-------------------------|---------------|---------|
| STEEL PRO POWER 114-2 P | Managing: 14 | 11 |
| | Dependent: 16 | |
| STEEL PRO POWER 140-2 P | Managing: 14 | 9 |
| | Dependent: 16 | |
| STEEL PRO POWER 180-2 P | Managing: 14 | 7 |
| | Dependent: 16 | |
| STEEL PRO POWER 230-2 P | Managing: 14 | 3 |
| | Dependent: 16 | |
| STEEL PRO POWER 270-2 P | Managing: 14 | 1 |
| | Dependent: 16 | |
| STEEL PRO POWER 300-3 P | Managing: 14 | 5 |
| | Dependent: 16 | |
| STEEL PRO POWER 345-3 P | Managing: 14 | 3 |
| | Dependent: 16 | |
| STEEL PRO POWER 405-3 P | Managing: 14 | 1 |
| | Dependent: 16 | |
| STEEL PRO POWER 460-4 P | Managing: 14 | 3 |
| | Dependent: 16 | |
| STEEL PRO POWER 540-4 P | Managing: 14 | 1 |
| | Dependent: 16 | |

3.11 Maintenance

It is mandatory to perform maintenance and cleaning of the device at least once a year.

⚠ The non-performance of the annual maintenance will invalidate the warranty.

This operation, carried out by Technical Assistance Service or by professionally qualified personnel, is necessary to monitor and ensure that the flue pipes inside and outside of the device, the fan, the safety valves, the condensate removal devices, the water drainage tubes and all the measurement and control devices are in perfect working order.

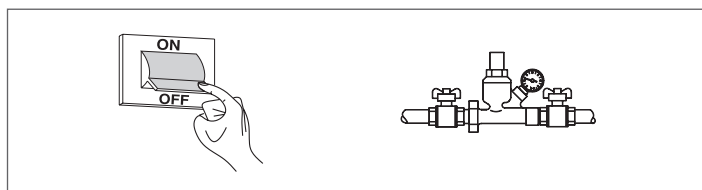
| Table of the compulsory maintenance activities (to be performed every 2000 working hours or at least once a year) |
|---|
| Make the combustion test |
| Check the conditions of the inlet pipes (if present) and the flue pipes by making sure that no leakage is present |
| Check the ignition electrode |
| Clean the combustion chamber and check the conditions of the gaskets you have dismantled during such operation |
| Clean the condensate discharge pipe |
| Check the parameters settings |
| Check if there is any gas leakage |
| Check if there is any leakage on the hydraulic connections |
| Check the integrity of the cabling system and its related connections |
| Make sure the ignition takes place regularly |
| Make sure that there is the flame after ignition |
| Check the safety devices down the equipment |
| Check the system pressure |

⚠ Before carrying out any maintenance or cleaning, disconnect the power from the device by turning off the bipolar main switch and closing the main gas valve. In addition, for all maintenance (to be carried out at least once a year, as noted above) always replace all the flue and gas seals, in particular the burner seals.

⚠ After performing maintenance work, check the tightening torques of the nuts/screws/gas connectors on the burner and gas valve; for the torque values, please see the "Torque value" section.

Before performing any operation:

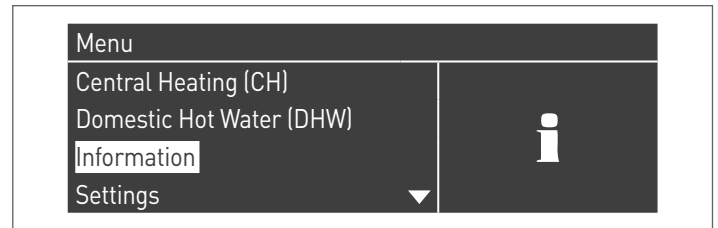
- disconnect the electric power supply by turning the main system switch to "off"
- close the gas shut-off valve.



3.11.1 "Service reminder" function

The thermal module is fitted with a function that reminds the user of the need to carry out planned maintenance on the appliance after a number of hours defined in the maintenance plan.

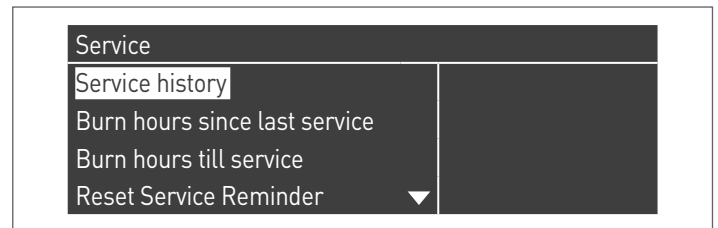
When this maintenance activity is required, the following text appears on the normal display: **"Maintenance required!"** This text will remain active until the technical support service resets the internal meter after maintaining the appliance. The user can check at any time how many hours miss from the next planned maintenance activity by accessing the "Information" menu



and selecting "Maintenance" using the ▲ / ▼ arrows



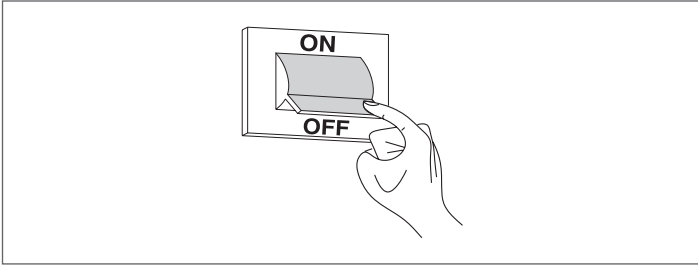
The menu also shows the hours from the last maintenance activity performed and access to a log that lists the dates of the last 15 maintenance activities.



The "Settings" → "Boiler set." → "Maintenance" menu contains the advanced controls for this function, which, in any case, are only available if you access it with the manufacturer password. If it is necessary to use this access level, contact the Technical Assistance Service.

3.12 Cleaning and removing internal components

Before any cleaning operation, disconnect the electric power supply by switching the main system switch to "off".



OUTSIDE

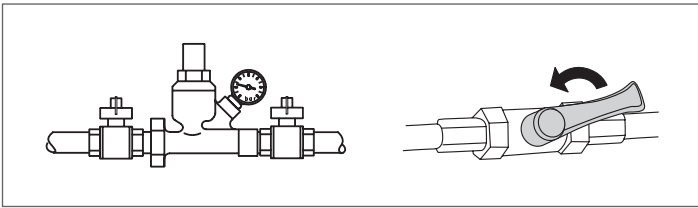
Clean the casing, the control panel, the painted parts and plastic parts with cloths moistened with soap and water. In the case of stubborn stains, moisten the cloth with a 50% water and alcohol mixture or specific products.

⊘ Do not use fuels, sponges impregnated with abrasive solutions or powder detergents.

INSIDE

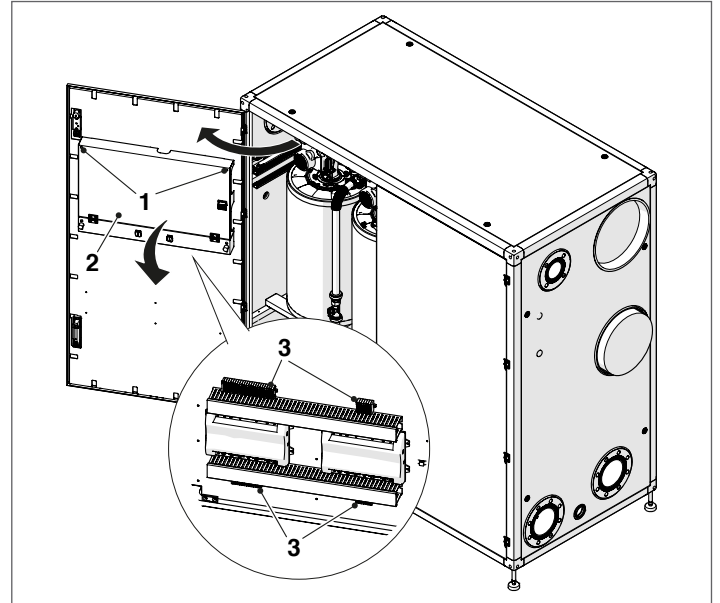
Before starting internal cleaning operations:

- close the gas shut-off valves
- close the system taps.



Access to the control panel and the internal modular system parts

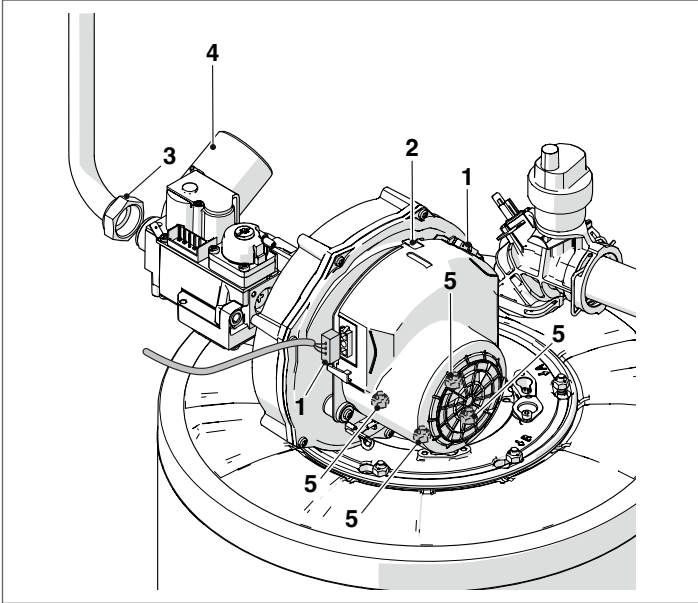
- open the module door (or the left door if two doors are present).
- Unscrew the two screws (1) placed on the panel.
- Fold the panel forward (2) making it rest on the two rubber pads. At this point you have full access to the terminal blocks (3).



Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

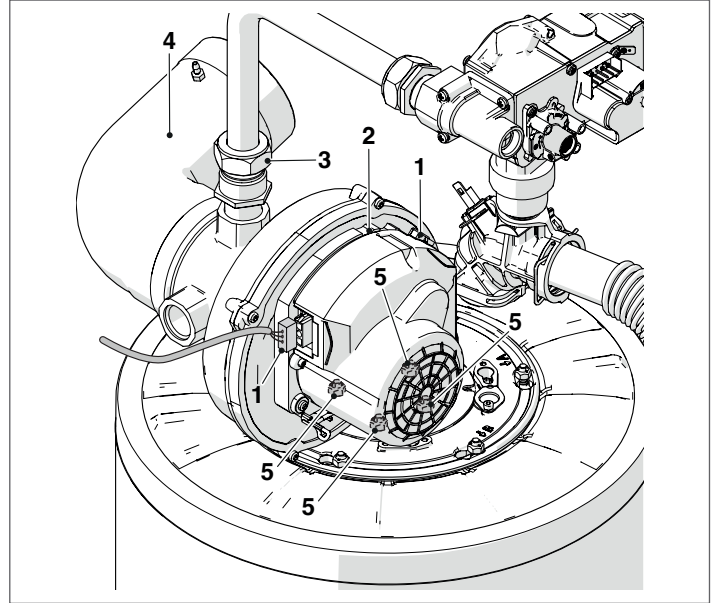
Disassemble of the fan and burner models Steel Pro Power 114-2 P ÷ 140-2 P

- Open the module's doors (or the door in case there is only one door).
- Disconnect the wirings (1) of the fan (2).
- Unscrew the turntable (3) and disconnect the gas pipe.
- Remove the air conveyor (4).
- Unscrew the four nuts (5) that fix the fan (2) to the flange.

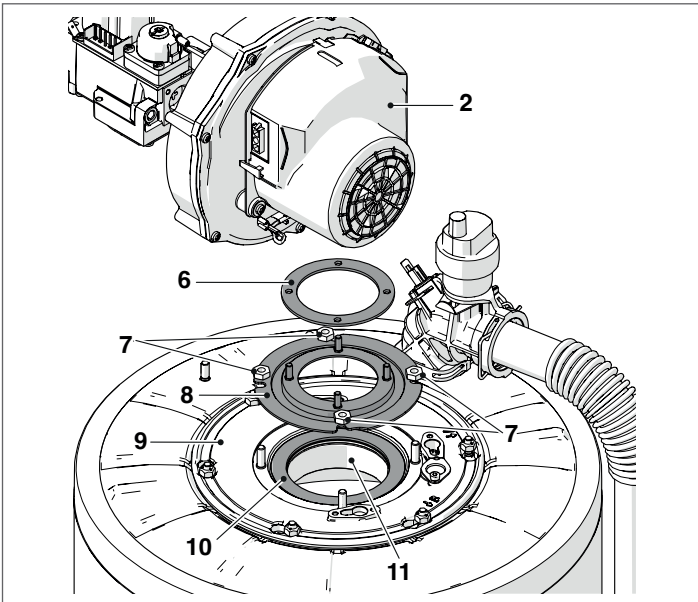


Disassemble of the fan and burner models Steel Pro Power 180-2 P ÷ 540-4 P

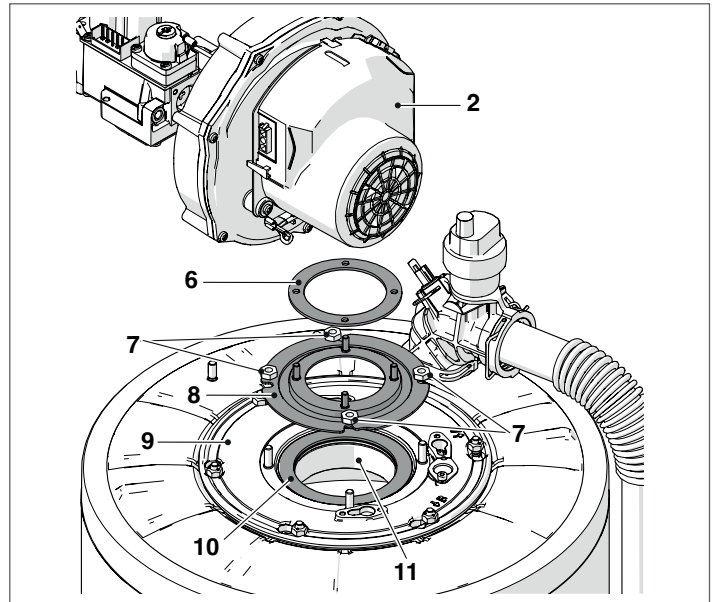
- Open the module's doors (or the door in case there is only one door).
- Disconnect the wirings (1) of the fan (2).
- Unscrew the turntable (3) and disconnect the gas pipe.
- Remove the air conveyor (4).
- Unscrew the four nuts (5) that fix the fan (2) to the flange.



- Take the fan (2) and the gasket (6) out.
- Unscrew the four screws (7) fixing the flange (8) to the flange below (9).
- Remove the seal (10) and extract the burner (11).



- Take the fan (2) and the gasket (6) out.
- Unscrew the four screws (7) fixing the flange (8) to the flange below (9).
- Remove the seal (10) and extract the burner (11).



Once the maintenance operations are complete, refit the components working in the opposite direction of what was described; for information on the tightening torques, please see the "Torque value" section.

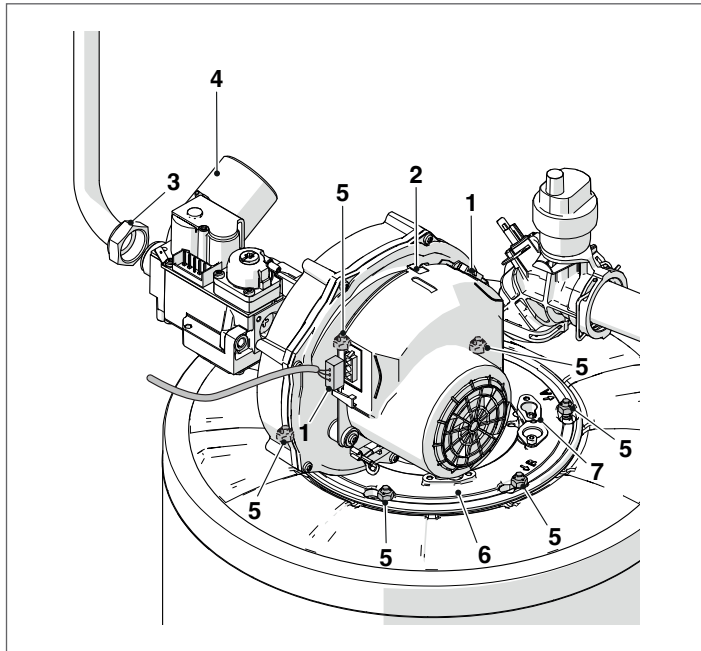
⚠ Check that the gas connection is leak proof.

Once the maintenance operations are complete, refit the components working in the opposite direction of what was described; for information on the tightening torques, please see the "Torque value" section.

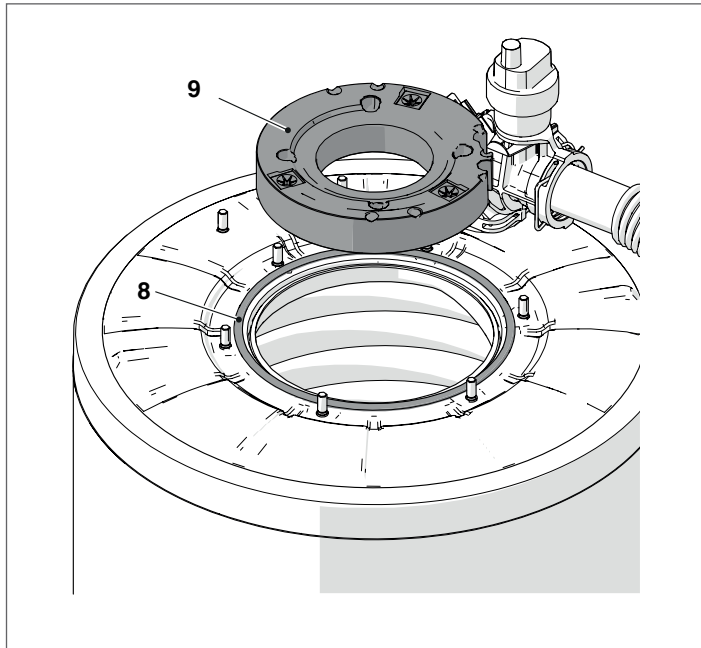
⚠ Check that the gas connection is leak proof.

Disassembly of the flange for cleaning the exchanger models Steel Pro Power 114-2 P ÷ 140-2 P

- Open the module's doors (or the door in case there is only one door).
- Disconnect the wirings (1) of the fan (2).
- Unscrew the turntable (3) and disconnect the gas pipe.
- Remove the air conveyor (4).
- Unscrew the six screws (5) that secure the burner unit (6) to the heat exchanger with a socket wrench.
- Remove the fan and the entire burner body (6).
- Remove the electrode plate (7), check the electrode's condition and replace it if necessary.



- Remove the gasket (8) and the protective padding (9).

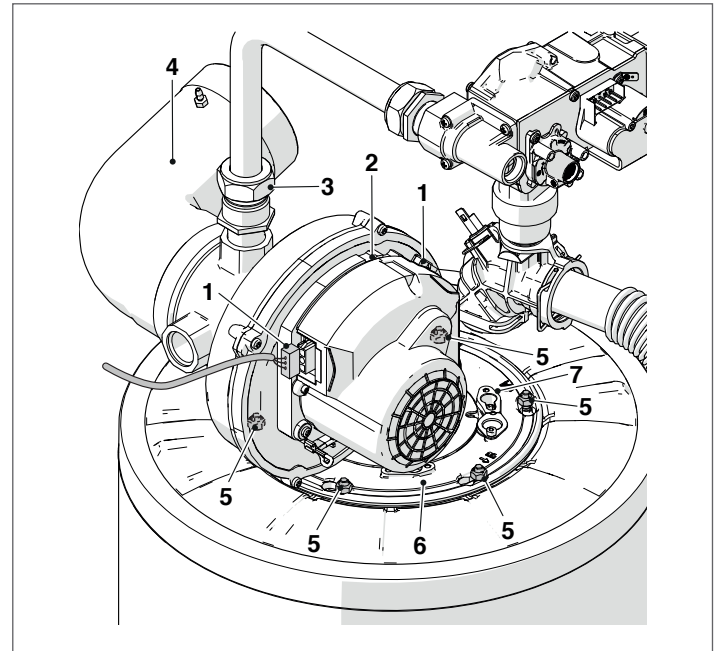


Once the maintenance operations are complete, refit the components working in the opposite direction of what was described; for information on the tightening torques, please see the "Torque value" section.

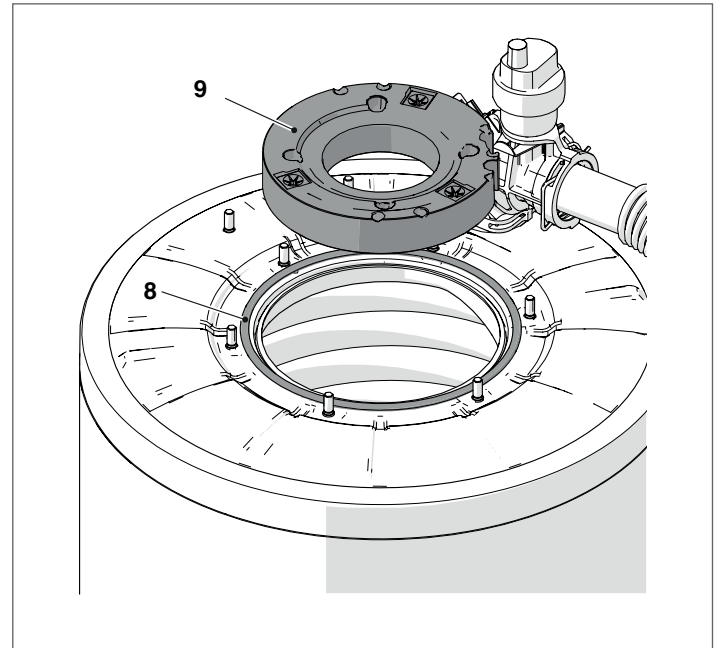
⚠ Check that the gas connection is leak proof.

Disassembly of the flange for cleaning the exchanger models Steel Pro Power 180-2 P ÷ 540-4 P

- Open the module's doors (or the door in case there is only one door).
- Disconnect the wirings (1) of the fan (2).
- Unscrew the turntable (3) and disconnect the gas pipe.
- Remove the air conveyor (4).
- Unscrew the six screws (5) that secure the burner unit (6) to the heat exchanger with a socket wrench.
- Remove the fan and the entire burner body (6).
- Remove the electrode plate (7), check the electrode's condition and replace it if necessary.



- Remove the gasket (8) and the protective padding (9).

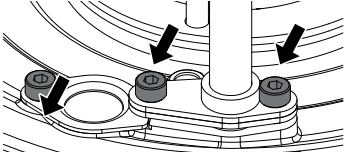
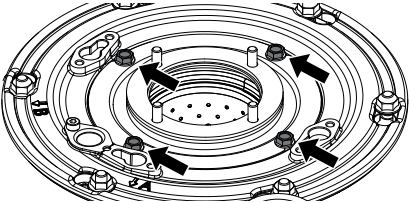
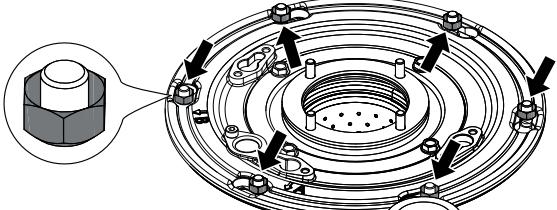
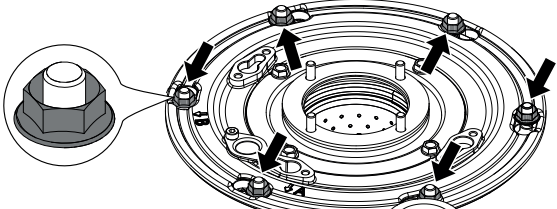
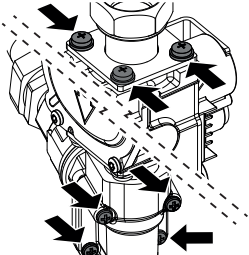
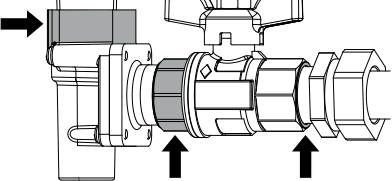
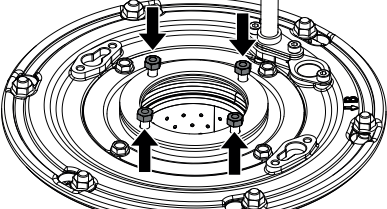
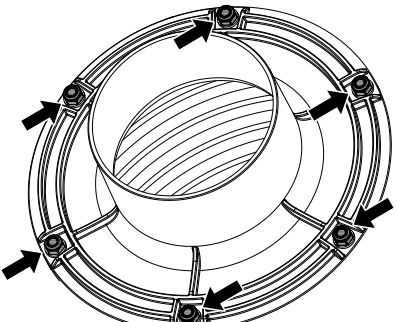


Once the maintenance operations are complete, refit the components working in the opposite direction of what was described; for information on the tightening torques, please see the "Torque value" section.

⚠ Check that the gas connection is leak proof.

3.13 Torque value

The tightening torques and torque values expressed in Nm are shown below.

| Torque value | Nm | Figure |
|---|--|---|
| Ignition electrode and inspection glass | 2,5 |  |
| Fan flange | 5 |  |
| Burner flange (nut) | 5 |  |
| Burner flange (flanged nut) | 6 |  |
| Gas valve flange screw and shutter screws | 3 |  |
| Threaded gas connections | Connections are secured with sealant and tightened to obtain the appropriate geometry using a standard wrench. |  |
| Fan flange - fan installation | 5 |  |
| Flue flange nut | 5 |  |

3.14 Troubleshooting

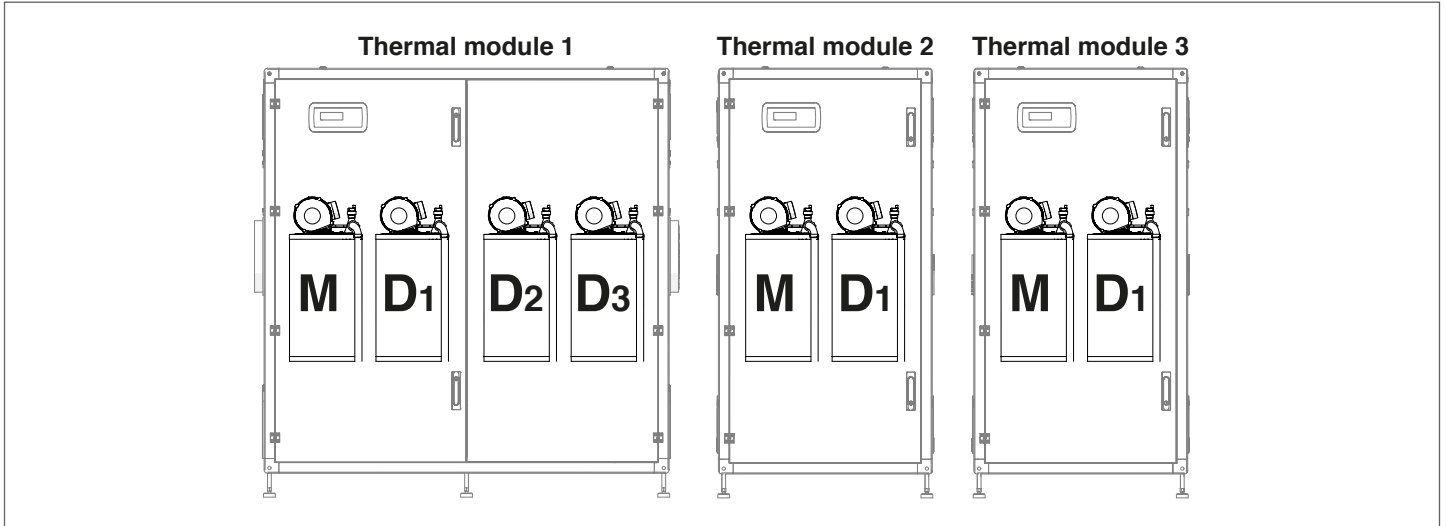
| FAULT | CAUSE | SOLUTION |
|--|--|---|
| There is a smell of gas | Gas supply circuit | - Check the seal of the gaskets and the closure of the pressure tapping points |
| Odour of unburnt gas | Flue gas circuit | - Check the gasket seals - Make sure there are no obstructions - Check the combustion quality |
| Irregular combustion | Burner gas pressure | - Check the setting |
| | Diaphragm installed | - Check the diameter |
| | Clean the burner and exchanger | - Check the conditions |
| | Exchanger passages obstructed | - Check passage cleaning |
| | Faulty fan | - Check operation |
| Ignition delays with pulsations to the burner | Burner gas pressure | - Check the setting |
| | Ignition electrode | - Check the positioning and conditions |
| The modular system becomes dirty very quickly | Combustion | - Check the combustion controls |
| The burner does not start upon consent of the modular system control | Gas valve | - Check for the presence of 230Vac voltage on the gas valve terminals, check wiring and connections |
| The modular system does not start | No electric power supply (no message on the display) | - Check the electric connections - Check the condition of the fuse |
| The modular system does not arrive at temperature | Boiler dirty | - Clean the combustion chamber |
| | Burner capacity insufficient | - Check and adjust the burner |
| | Modular system adjustment | - Check correct functioning - Check the temperature setting |
| The generator triggers a thermal safety block | No water | - Check correct functioning - Check the temperature setting - Check the electrical wiring - Check the position of the sensor bulbs |
| | Modular system adjustment | - Check the bleed valve - Check the heating circuit pressure |
| The generator is at temperature but the heating system is cold | Presence of air in the system | - Bleed the system |
| | Pump malfunctioning | - Check/unseize the pump - Replace the circulator - Check the electrical connection of the circulator |
| The circulator does not start | Pump malfunctioning | - Check/unseize the pump - Replace the circulator - Check the electrical connection of the circulator |
| Frequent tripping of the system safety valve | System safety valve | - Check calibration or efficiency |
| | Incorrect circuit pressure | - Check the circuit pressure - Check pressure reducer functioning |
| | CH expansion vessel | - Check the efficiency of the expansion vessel |

4 CASCADE CONNECTION

The models **Steel Pro Power** 270-2 P, 405-3 P and 540-4 P can be connected together to build a modular and modulating cascading system with a maximum of 10 heating elements, with maximum installed power of 1310 kW. There are two ways of connecting up a cascading system, illustrated in the following chapters.

4.1 Connection in a direct cascade

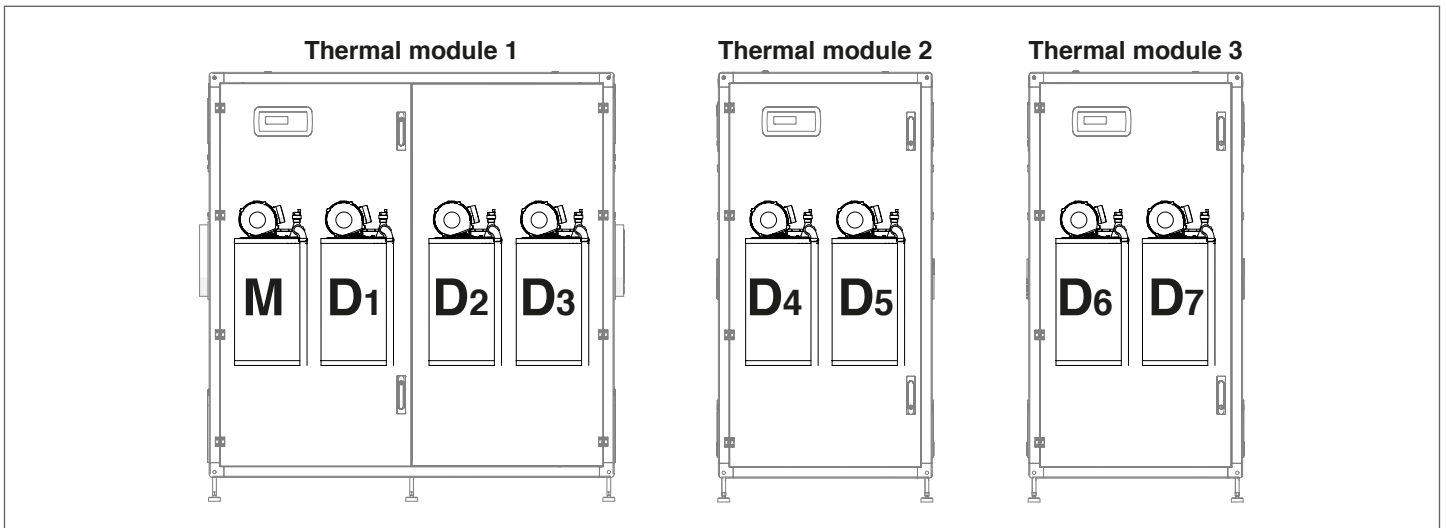
This configuration is feasible for up to 8 modules. This means that the whole cascade can be managed from the interface on one of the two thermal modules (chosen as the managing unit for the system).



The thermal modules are standard set with a MANAGING element (M) and a DEPENDENT (D) element. To be able to connect the modules in cascade it is necessary to carry out the operations described in the following paragraph.

Before proceeding to connect the cascade bus, the following preliminary operations must be carried out:

- 1 Configure the I/Os of the MANAGING element as DEPENDENT (see table below);
- 2 Reconfigure the MANAGING element address of thermal modules 2 and 3 in D4 and D6 respectively;
- 3 Reconfigure the DEPENDENT element address of thermal modules 2 and 3 in D5 and D7 respectively.



4.1.1 IO Configuration

⚠ Perform this operation only on the cascade-connected thermal modules such as "DEPENDENT".

This operation is intended to modify the I/O management on the "MANAGING" tab of each of the thermal modules connected as "DEPENDENT".

Modify the par. 97 in this way:

- give power to the only thermal module on which the I/O assignment needs to be carried out;
- go to "Settings", "Device Configuration", "MANAGING" and assign the correct value to parameter 97 as shown in the table below;
- remove the power supply to the module;
- repeat this operation for all the "DEPENDENT" thermal modules of the cascade.

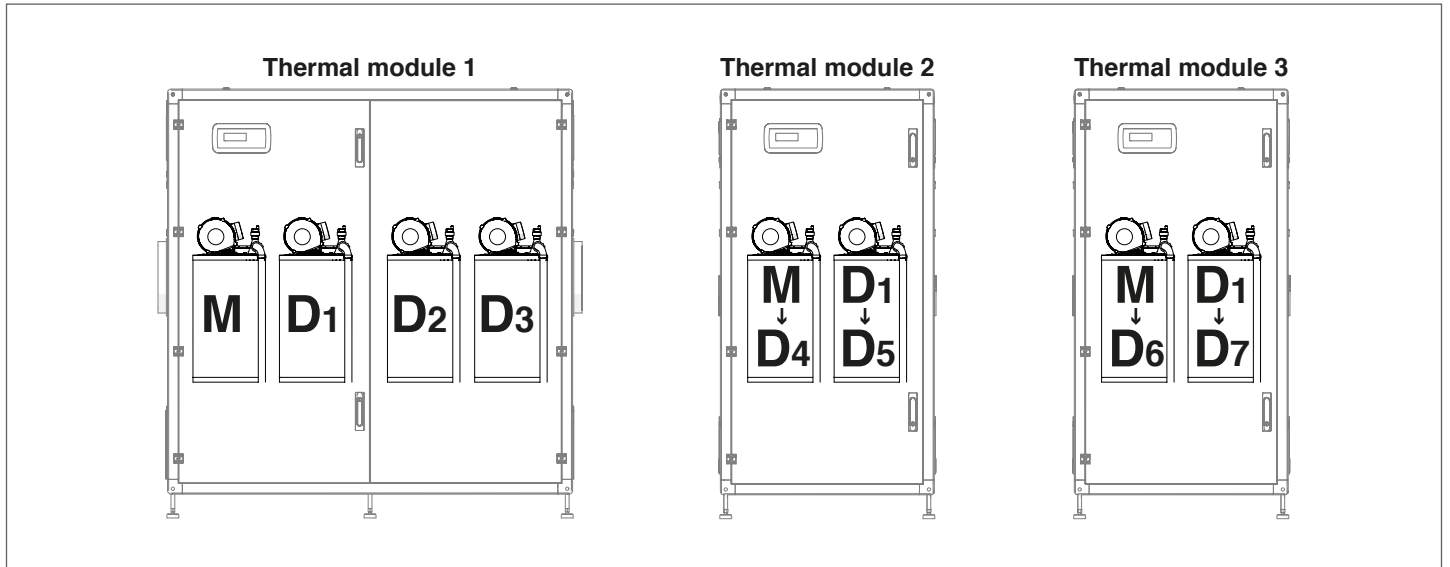
4.1.2 Setting the Address parameter

The addresses of all the thermal modules in the system must be set, and each must be set with an unequivocal sequence. To access the dip-switches, open the hatch using a flat-bladed screwdriver.

⚠ The addresses must be configured in sequence. The thermal module 1 will always be correct because the configuration has not been changed. From the thermal module 2 onwards, we recommend maintaining the elements in sequence after changing the configuration (from MANAGING to DEPENDENT).

- only power the thermal module that needs to be modified;
- go to "Settings", "Boiler sett.", "Cascade Module Conf." and assign the desired value to parameter 189;

Note! Make sure that parameter 194 (Dipswitch Config) is disabled.



4.1.3 Bus connection

The bus connections are made on the MANAGING "M01" low voltage terminal blocks of the connected thermal modules in cascade. Locate the thermal module that will be deputed to be MANAGING of the system.

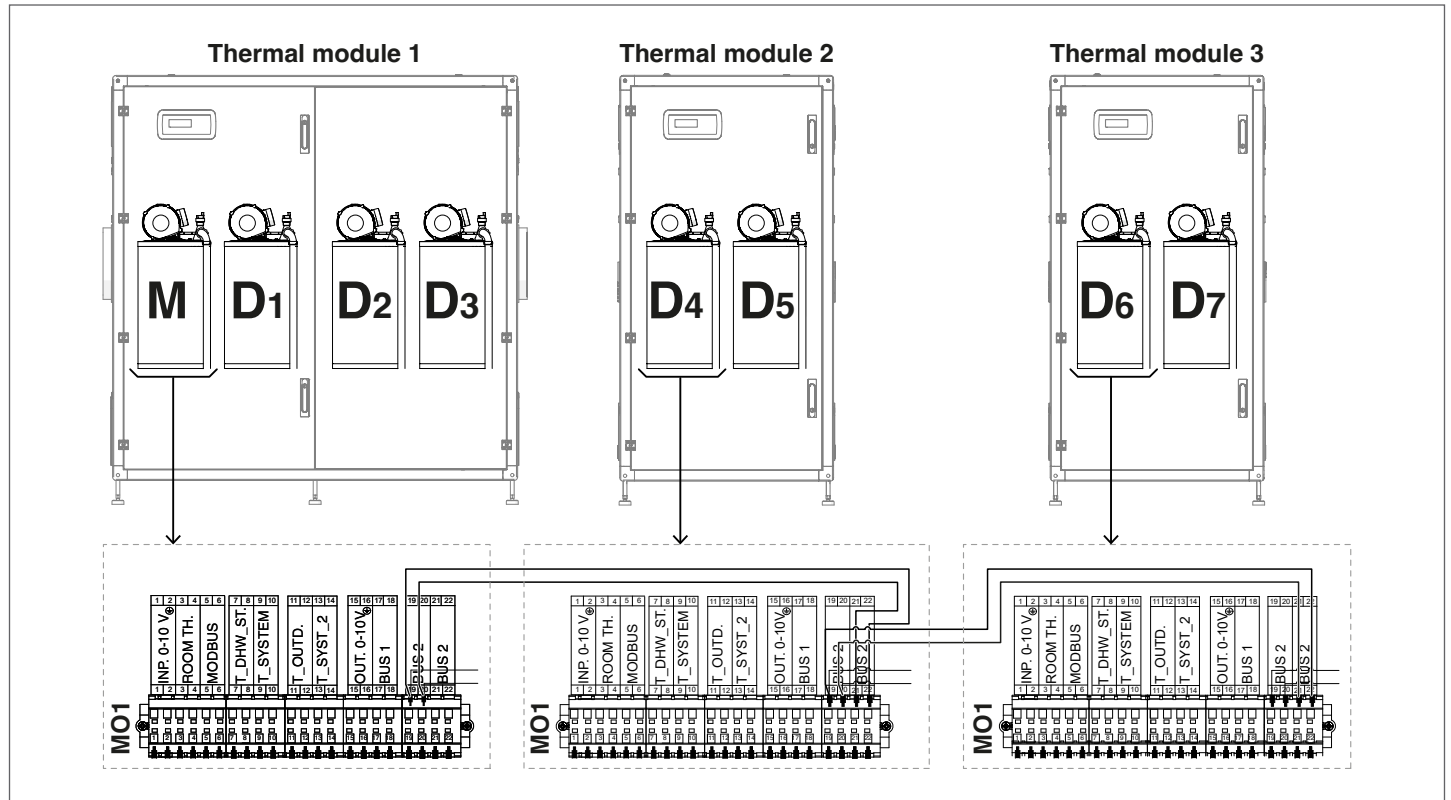
Connect a bipolar cable to the contacts 17 and 18 (BUS 1) of the "M01" of the thermal element M (the bipolar cable already present in the contacts 17 and 18 must not be removed).

Connect the outgoing bipolar cable from the "M01" (thermal element M) of the "MANAGING" thermal module into the contacts 21 and 22 (Bus 2) present on the "M01" of the thermal element D4.

Move the cable in the contacts 17 and 18 (Bus 1) on contacts 19 and 20 (Bus 2).


If you need to connect an additional thermal module, you have to start from contacts 19 and 20 of the "M01" (element D4) of the first DEPENDENT module, a bipolar cable which will be connected to the terminals 21 and 22 of the "M01" of the thermal element D8.

Example: cascade connection diagram of three thermal modules:



4.1.4 Setting the main parameters

Some parameters are essential in order for the system to operate in cascade and setting these parameters is a determining factor for correct system operation.

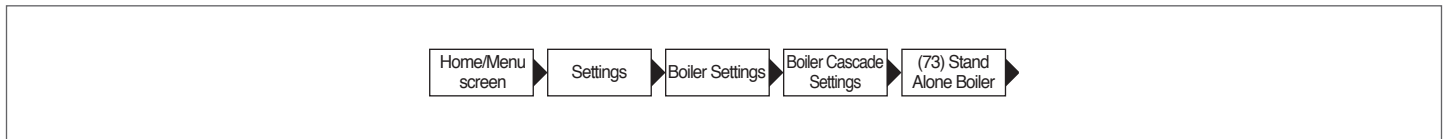
 The parameters below must be set only on the Managing thermal module.

Par. 73 – Managing, Stand-alone mode

Parameter 73 defines how the thermal module is addressed and serves to ensure that the signal from the secondary sensor is recognised.

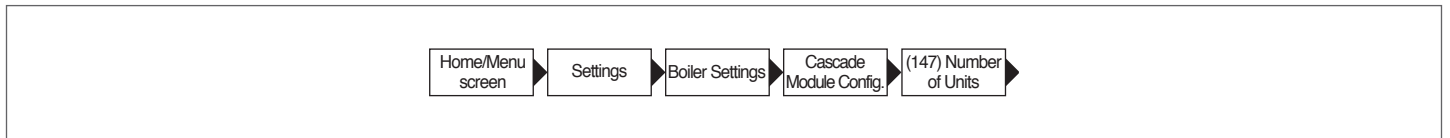
You can set two values:

- **Managing:** to be set on the Managing module so that secondary sensor operation is activated.
NOTE: The secondary SC probe must be connected to the 13 terminals and 14 of the M01 terminal block of the managing module;
- **Stand Alone:** to be set on the Managing module so that secondary sensor operation is deactivated;



Par.147 – No. thermal modules

Parameter 147 defines the number of thermal modules in the system (it is important to set the number of connected modules for the system to work properly). This parameter must only be set on the "Managing" module.



4.2 Connection in a cascade of cascades

This connection must be done only to connect more than 10 modules in cascade.

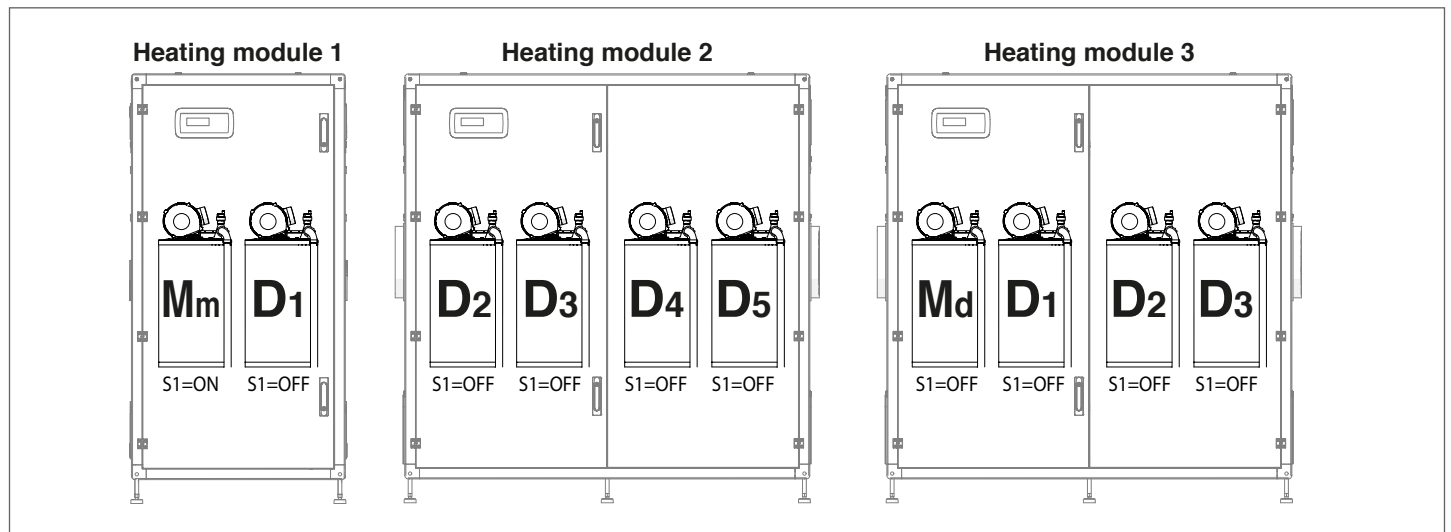
This connection joins two cascades created in "direct cascade" mode (please see the paragraph "Connection in a direct cascade") so that the managing unit in one of the two direct cascades commands the managing unit in the second direct cascade.

The overall operation of the cascade of cascades is identical to the direct cascade. The only different is that each of the two managing units can control the units connected in its own direct cascade.

Once the connections have been made for the two direct cascades (please see the paragraph "Connection in a direct cascade"), decide which of the two managing units will be the managing unit for the cascade of the cascades. In the example below, there is a direct cascade of six units and a direct cascade of four units (the direct cascade of four units is made up of a thermal module which is itself made up of four units, but two thermal modules made up of two units could also be joined). Here, the managing unit for the direct cascade composed of six units has been chosen as the managing unit for the cascade of cascades.

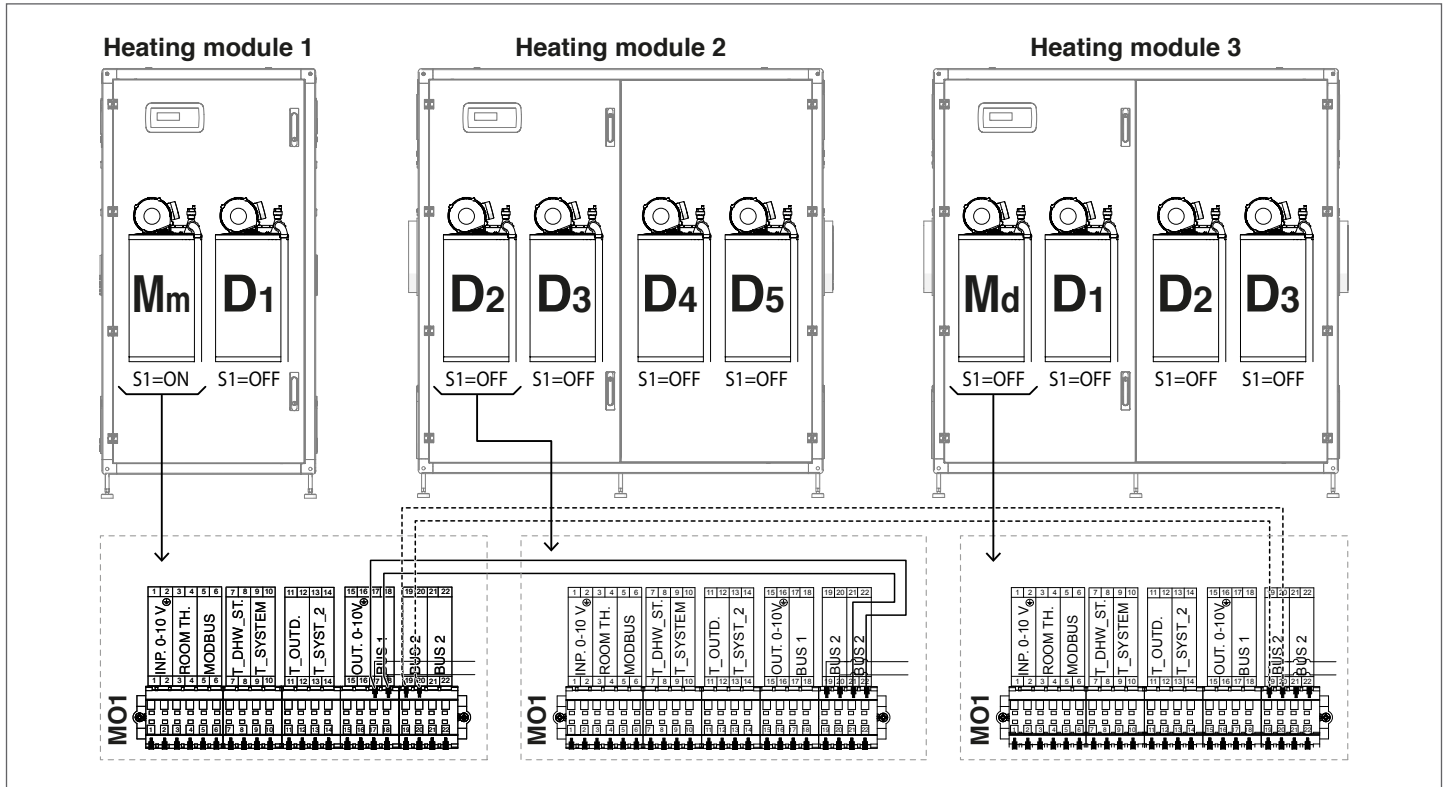
The configuration of addresses is as follows:

⚠ NOTE: Switch S1 must be set to OFF (factory setting) on all of the boards, except the Mm (the managing unit of the cascade of cascades), which must be set to ON.



4.2.1 Bus connection

The bus connections are made on the MANAGING "M01" low voltage terminal blocks of the connected thermal modules in cascade.



N.B. The cable marked with a dotted line is the one joining BUS 2 on the first managing unit (Mm) with BUS 2 on the second managing unit (Md) (connect terminal 19 to 19 and 20 to 20). Connect the system sensor (T_sys_2) to terminals 13 and 14 on the Mm.

4.2.2 Setting the main parameters

Some parameters are essential in order for the system to operate in cascade and setting these parameters is a determining factor for correct system operation.

Par.73

Parameter 73 must be set as follows:

- On the Mm module, set: **Managing**
- On the Md module, set: **DEP 1**

Connect the Cascade Probe (T_System_2) to terminal 13-14 of the Mm module.

Typical parameters for a cascade of cascades

The parameters below are specific to controlling a cascade of a cascades. All of these parameters must be set on the Mm. The parameter 167 is used for defining the number of direct cascades connected together to form a cascade of cascades. This parameter must be set on the Mm. In the example shown, the following must be set:

- Parameter 167 = 2

The parameters 158,159, 160 and 161 must be set using the formula below:

- Par. 158 = Par. 75*(N+1)
- Par. 159 = Par. 76*(N+1)
- Par. 160 = Par. 142*(N+1)
- Par. 161 = Par. 143*(N+1)

Where N is the number of modules in the cascade connected to the Mm.

4.3 Operation with the primary sensor

The system sensor present on the primary system (see block diagram 1) allows the setpoint sent to the individual modules to be modulated on the basis of the difference between the setpoint and the value read on the delivery manifold of the primary system.

The following parameters regulate this modulation:

- 79** defines the maximum setpoint decrease
- 80** defines the maximum setpoint increase
- 81** defines the time (from the start of the request) from which the setpoint modulation is started
- 86** proportional parameter for setpoint modulation
- 87** integrative parameter for setpoint modulation

4.4 Operation with the secondary sensor

When the secondary system is present (see diagram 2), the setpoint sent to the individual modules to be modulated on the basis of the difference between the setpoint and the value read on the delivery manifold of the secondary system.

In the same way that modulation is based on the system sensor, the following parameters intervene:

- 169** defines the maximum setpoint decrease
- 170** defines the maximum setpoint increase
- 171** defines the time (from the start of the request) from which the setpoint modulation is started
- 176** defines the proportional term for setpoint modulation
- 177** defines the integrative term for setpoint modulation

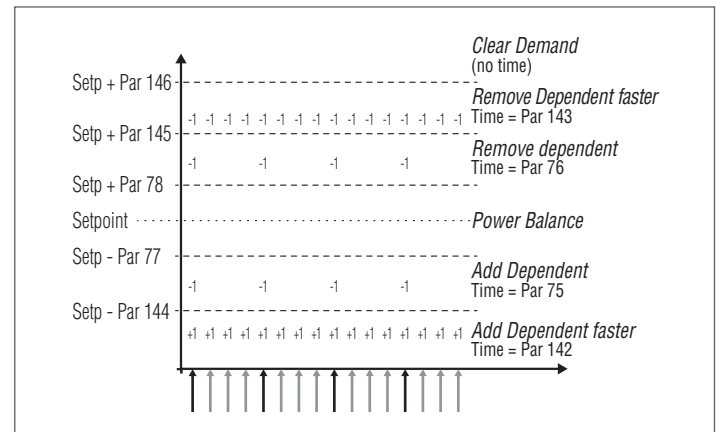
4.5 Parameter 148: operating mode of the cascade

It is possible to adopt cascade management which can be modified according to different strategies. These different strategies can be set using the parameter known as "Cascade mode" Par. 148.

4.5.1 Par 148 = 0

The start-up/shutdown law of each module is based on the following graph.

The shut-off values of the lines with the y axis are the sum or the difference of the values of the corresponding parameter in relation to the value of the setpoint sent by the Manging module to the modules.

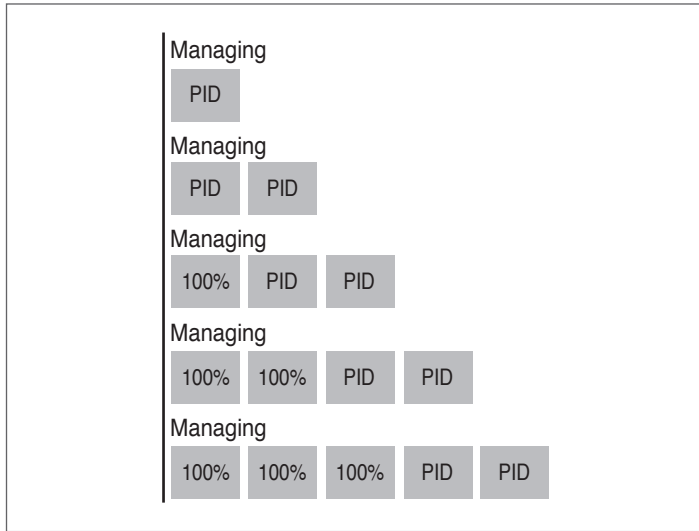


4.5.2 Par 148 = 1

In this mode the system manages the cascade so that the minimum number of modules is on.

The first difference in relation to mode 0 refers to the logic with which the modulation of Dependent modules within the cascade is managed.

While each module modulates with its own PID in mode 0, no more than two dependent modules modulate with the same criteria in mode 1, while the remaining modules operate at maximum power. The diagram is represented in the following figure:



Practically speaking, if more than two modules are on, only two modules are controlled via PID, while the others receive a signal to move to maximum power.

The second difference refers to the start-up/shutdown rules of the individual modules.

In any case, the start-up and shutdown rules are managed according to the indications shown in the previous graph. The difference is that it is also possible to have start-ups/shutdowns of the Dependent modules in the "balancing" zone.

This additional start-up criteria (valid in the balancing band only) ensures that a module is started-up when any one of the two modules controlled by a PID adjustment has reached a threshold power (Par 82) once a specific wait time defined by Par 75 has elapsed.

Similarly (still within the balancing band), a module is shutdown if both modules controlled by a PID adjustment have reached a percentage of power which is below the minimum power threshold (Par 83) once a specific wait time defined by Par 75 has elapsed.

4.5.3 Par 148 = 2

In this mode the system manages the cascade so that the maximum number of modules is on.

This mode is similar to mode 0 apart from the start-up and shutdown rules.

In this case the rules based on the information illustrated by the previous graph are still valid, with the following differences (in any case, always applicable to the "balancing" band only):

To add an additional dependent module, the managing module evaluates whether the sum of the power (calculated on the basis of the fan speed) of all the active modules is greater than the product between the number of the active dependent modules increased by one and the minimum power value (Par 152) increased by a hysteresis value (defined by Par 153). $[\sum(P_1, P_2, \dots, P_n) > (n+1) * (Par\ 152) + (Par\ 153)]$.

To shutdown a dependent access, the managing module evaluates whether the sum of the power (calculated on the basis of the fan speed) of all the active modules is less than the product between the number of the active dependent modules and the minimum power value (Par 152). $[\sum(P_1, P_2, \dots, P_n) < (n) * (Par\ 152)]$.

⚠ We must consider that the percentage of power varies from a minimum of 1% and a maximum of 100% and therefore, the parameter values 152 and 153 are not to be taken as the percentage of absolute power.

4.6 Parameters specific to cascade systems

Parameters are listed base on the reference menu.

Reference Menu

| | |
|-----------|------------------------------------|
| M1 | Parameters Menu |
| M2 | Cascaded module configuration menu |
| M3 | Cascaded boiler configuration menu |
| M4 | Appliance configuration menu |

Access type

| | |
|----------|--------------|
| U | End user |
| I | Installer |
| O | Manufacturer |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|---------------------------|--|--|-----------------|------|-------------|----------|
| M2 | 189 | Burner Address | It is used to address the module. | Stand-alone (0) Managing (1) Dependent (2...16) | Managing (1) | | I | DHW |
| M2 | 194 | Dip-switch Config. | Enable or disable the dipswitch function. | Enabled/Disabled | Disabled | | I | Cascade |
| M2 | | Boiler demand disabled | All requests for this boiler are disabled. | Yes/No | No | | I | Cascade |
| M2 | 72 | Permit Emergency Mode | Activates the emergency mode. This mode comes on when communication between Managing and the primary circuit's probe is lost. In this event, if Par. 72 is set to "Yes", the cascade is initiated, working to the fixed set-point determined by Par. 74. | Yes/No | Yes | | U | Cascade |
| M2 | 74 | Emergency Set-point | Set-point active in emergency mode. | 20...90 | 70 | °C | I | Cascade |
| M2 | 75 | Delay Per Start Next Mod. | Defines the stand-by time in seconds to restart the subsequent cascade module in normal start mode. | 5...255 | 120 | Sec. | I | Cascade |
| M2 | 76 | Delay Per Stop Next Mod. | Defines the stand-by time in seconds to switch off the last cascade module on in normal Off mode. | 5...255 | 30 | Sec. | I | Cascade |
| M2 | 142 | Delay Quick Start Next | Defines the stand-by time in seconds to restart the next cascade module in quick start mode. | 5...255 | 60 | Sec. | I | Cascade |
| M2 | 143 | Delay Quick Stop Next | Defines the stand-by time in seconds to switch off the last cascade module on in Quick Stop mode. | 5...255 | 15 | Sec. | I | Cascade |
| M2 | 77 | Hyst. Down Start Module | Defines by how many degrees the temperature measured by the primary circuit's probe must fall below the set-point in order for the subsequent module to be started after the time interval set by Par. 75. | 0...40 | 5 | °C | I | Cascade |
| M2 | 78 | Hyst. Up Stop Module | Defines by how many degrees the temperature measured by the primary circuit's probe must go above the set-point in order for the subsequent module to be switched off after the time interval set by Par. 76. | 0...40 | 4 | °C | I | Cascade |
| M2 | 144 | Hyst. Down Quick Start | Defines by how many degrees the temperature measured by the primary circuit's probe must go below the set-point in order for the subsequent module to be started after the time interval set by Par. 142 (quick-start mode). | 0...40 | 20 | °C | I | Cascade |
| M2 | 145 | Hyst. Up Quick Stop | Defines by how many degrees the temperature measured by the primary circuit's probe must go above the set-point in order for the subsequent module to be switched off after the time interval set by Par. 143 (quick stop mode). | 0...40 | 6 | °C | I | Cascade |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|--------------------------|---|----------|-----------------|------|-------------|----------|
| M2 | 146 | Hyst. Up Stop All | Defines by how many degrees the temperature measured by the primary circuit's probe must go above the set-point in order for all "On" modules to be switched off at the same time. | 0...40 | 8 | °C | I | Cascade |
| M2 | 147 | Number of Units | Defines the number of modules of which the cascade consists. | 1...16 | 8 | | I | Cascade |
| M2 | 148 | Power Mode | Defines the cascade operation mode. 0 = Disabled 1 = Min burners 2 = Max burners | 0,1,2 | 2 | | I | Cascade |
| M2 | 79 | Max. Setp. Offset Down | Defines the maximum decrease in the primary circuit's cascade set-point. Is based on the primary circuit's probe reading. | 0...40 | 2 | °C | I | Cascade |
| M2 | 80 | Max. Setp. Offset Up | Defines the maximum increase in the primary circuit's cascade set-point. Is based on the primary circuit's probe reading. | 0...40 | 5 | °C | I | Cascade |
| M2 | 81 | Start Mod. Delay Fact. | Defines the time in minutes from the moment the demand is triggered until the activation of the set-point increases or decreases provided for by Par. 79 e 80. | 0...60 | 60 | Min. | I | Cascade |
| M2 | 82 | Next Module Start Rate | It defines the minimum power for at least one of the modules in the cascade in order for the next module to be switched on (if the other conditions linked to Par. 75 and 77 are met). | 10...100 | 80 | % | I | Cascade |
| M2 | 83 | Next Module Stop Rate | It defines the maximum power for all the modules in the cascade in order for the last module on to be switched off (if the other conditions linked to Par. 76 and 78 are met). | 10...100 | 25 | % | I | Cascade |
| M2 | 84 | Module Rotation Interval | It defines the time interval (in days) after which modules are rotated. | 0...30 | 1 | Days | I | Cascade |
| M2 | 149 | First Module to Start | Establishes the number of the next module to be rotated (this value is automatically updated at each rotation). | 1..16 | 1 | | I | Cascade |
| M2 | 86 | PID P | Defines the proportional term to change the setpoint of the cascade module. | 0...1275 | 50 | | 0 | Cascade |
| M2 | 87 | PID I | Defines the integral term to change the setpoint of the cascade module. | 0...1275 | 500 | | 0 | Cascade |
| M2 | 150 | PID Slew Rate Up | Defines the speed (in °C/100 ms) with which the set-point of individual modules is increased in the event the primary circuit's set-point is not achieved (if the value is set to zero, the change is controlled by the PI of Par. 86 and 87 without restrictions). | 0...25.5 | 1 | | 0 | Cascade |
| M2 | 151 | PID Slew Rate Dn | Defines the speed (in °C/100 ms) with which the set-point of individual modules is decreased in the event the primary circuit's set-point is exceeded (if the value is set to zero, the change is controlled by the PI of Par. 86 and 87 without restrictions). | 0...25.5 | 1 | | 0 | Cascade |
| M2 | 152 | Pwr-Mode2 Min Power | Defines the power value (in percentage terms) against which the average power of all on modules in cascade operation mode must be compared (Par. 148 = 2). | 0...100 | 20 | % | I | Cascade |
| M2 | 153 | Pwr-Mode2 Hysteresis | Defines the extra power value (in percentage terms) compared to the average power of all on modules in cascade operation mode (Par. 148 = 2). | 0...100 | 40 | % | I | Cascade |
| M2 | 154 | Post-Pump Period | Defines overrun time in seconds at the end of the cascade heat demand. | 0...255 | 60 | Sec. | I | Cascade |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|---------------------------|---|---|-----------------|------|-------------|----------|
| M1 | 155 | Frost Protection | This defines the temperature (detected by the primary sensor) below which the module pump and the system pump (with cascade configuration) are activated. If the temperature of the primary sensor falls below the value set by Par. 155 by another five degrees, then a request is generated that turns on the cascade. When the temperature of the primary sensor reaches the value defined by Par.155 increased by 5 degrees, then the request ceases and the cascade returns to stand-by mode. | 10...30 | 15 | °C | I | General |
| M2 | 184 | N. active burner in DHW | With this setting it is possible to set the number of burners that are used for cascade DHW. | 0...16 | 16 | | I | Cascade |
| M2 | 205 | Dep. Zone Control | Enables the control of the additional heating zone managed by the Dependent module. 0 = Disabled 1 = Enabled | 0...1 | 0 | | U | General |
| M3 | 73 | Boiler Address | Defines the way in which the boiler is managed. | Managing, Stand-alone, Dependent | Stand-alone | | I | Cascade |
| M3 | 156 | Permit Emergency Mode | Enable/disable emergency mode. | Yes/No | Yes | | U | Cascade |
| M3 | 157 | Emergency Set-point | Defines the emergency mode setpoint. | 20...90 | 70 | °C | I | Cascade |
| M3 | 158 | Delay Per Start Next Blr. | This defines the waiting time in seconds for the next cascade to start up in normal start mode. | 0...1275 | 1275 | Sec. | I | Cascade |
| M3 | 159 | Delay Per Stop Next Blr. | This defines the waiting time in seconds for the last switched-on cascade to switch off in normal off mode. | 0...1275 | 1275 | Sec. | I | Cascade |
| M3 | 160 | Delay Quick Start Next | This defines the waiting time in seconds for the next cascade to start up in quick start mode. | 0...1275 | 400 | Sec. | I | Cascade |
| M3 | 161 | Delay Quick Stop Next | This defines the waiting time in seconds for the last switched-on cascade to switch off in quick off mode. | 0...1275 | 240 | Sec. | I | Cascade |
| M3 | 162 | Hyst. Down Start Boiler | "reserved" | 0...40 | 5 | °C | I | Cascade |
| M3 | 163 | Hyst. Up Stop Boiler | "reserved" | 0...40 | 2 | °C | I | Cascade |
| M3 | 164 | Hyst. Down Quick Start | "reserved" | 0...40 | 10 | °C | I | Cascade |
| M3 | 165 | Hyst. Up Quick Stop | "reserved" | 0...40 | 4 | °C | I | Cascade |
| M3 | 166 | Hyst. Up Stop All | "reserved" | 0...60 | 8 | °C | I | Cascade |
| M3 | 167 | Number of boilers | This defines the number of boilers connected (cascade of cascades). | 1...16 (basic cascade) 1...8 (full cascade) | 1 | | I | Cascade |
| M3 | 168 | Power Mode | "reserved" | 0 = Disabled 2 = Max burners 3 = Balanced burners | 2 | | I | Cascade |
| M3 | 169 | Max. Setp. Offset Down | Defines the maximum decrease in the primary circuit's cascade set-point. Is based on the secondary circuit's probe reading. | 0...40 | 2 | °C | I | Cascade |

| Menu | Par. No. | Display visualisation | Description | Range | Default setting | UM | Access type | Category |
|------|----------|--------------------------|---|----------|-----------------|------|-------------|----------|
| M3 | 170 | Max. Setp. Offset Up | Defines the maximum increase in the primary circuit's cascade set-point. Is based on the secondary circuit's probe reading. | 0...40 | 5 | °C | I | Cascade |
| M3 | 171 | Start Mod. Delay Fact. | Defines the time in minutes from the moment the request is triggered until the activation of the set-point increases or decreases provided for by Par.169 e 170. | 0...60 | 40 | Min. | I | Cascade |
| M3 | 172 | Next Boiler Start Rate | "reserved" | 10...100 | 80 | % | I | Cascade |
| M3 | 173 | Next Boiler Stop Rate | "reserved" | 10...100 | 25 | % | I | Cascade |
| M3 | 174 | Module Rotation Interval | "reserved" | 0...30 | 5 | Days | I | Cascade |
| M3 | 175 | First Boiler to Start | "reserved" | 1...8 | - | | I | Cascade |
| M3 | 176 | PID P | Defines the proportional term to change the set-point of the cascade module based on the secondary circuit's temperature. | 0...1275 | 25 | | 0 | Cascade |
| M3 | 177 | PID I | Defines the integral term to change the set-point of the cascade module based on the secondary circuit's temperature. | 0...1275 | 1000 | | 0 | Cascade |
| M3 | 178 | PID Slew Rate Up | Defines the speed (in °C/100 ms) with which the set-point of individual modules is increased in the event the secondary circuit's set-point not reached (if the value is set to zero, the change is controlled by the PI of Par. 176 and 177 without restrictions). | 0...25.5 | 1 | | 0 | Cascade |
| M3 | 179 | PID Slew Rate Dn | Defines the speed (in °C/100 ms) with which the set-point of individual modules is decreased in the event the primary circuit's set-point is exceeded (if the value is set to zero, the change is controlled by the PI of Par. 176 and 177 without restrictions). | 0...25.5 | 1 | | 0 | Cascade |
| M3 | 180 | Pwr-Mode2 Min Power | "reserved" | 0...100 | 20 | % | I | Cascade |
| M3 | 181 | Pwr-Mode2 Hysteresis | "reserved" | 0...100 | 40 | % | I | Cascade |
| M3 | 182 | Post-Pump period | "reserved" | 0...255 | 30 | Sec. | I | Cascade |

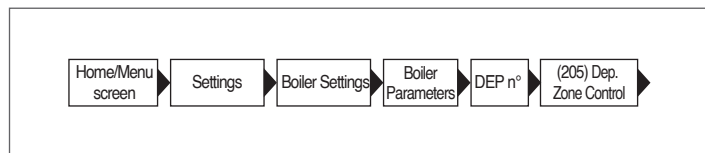
5 ZONE DEPENDENT

5.1 Zone control with Dependent module

The thermal elements Dependent on the **Steel Pro Power** are prepared as standard to be configured as zones.

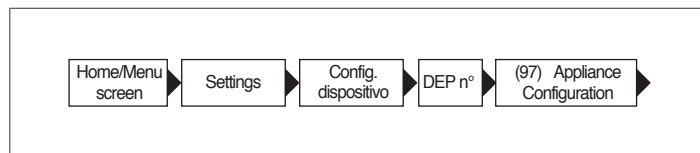
Thus, for example, a thermal module with 4 thermal elements will be set up as standard for the management of 3 zones (one for each Second thermal element) installed inside the thermal module itself.

To enable the functioning of the element as a zone, the procedure described below must be carried out.



- Select "Enabled" and confirm

Access the following menu:



- Choose 19
- Select "CONFIRMED CONFIG"
- Select "YES"
- Wait for initialization and finalization.

The (temporary) error appears on the initial screen 164 and then the error 208 that signals that the zone probe is not connected. At this point the zone is ready to be connected as reported in the paragraph "Typical water system schematics".

5.2 Setting zone parameters (accessible only with installer password)

Menu → "Settings" → "Config. area dep "

This menu allows you to separately set the parameters of all the connected zones with the exception of the "Extra setpoint zone" which is the same for all zones.

To select the zone for controlling/changing the parameters, proceed as follows:

- press the ► button so that the number to the right of the word "zona dep." is highlighted;
- once the number is highlighted use the ▲ and ▼ keys to change the number of the zone;
- once the zone is selected, confirm with the ● key.

The zone parameters are the following:

| Description | Standard value that is set | Range | Explanation | UM |
|--------------------------|----------------------------|-------|--|------|
| Mix Valve Max Op/Cl Time | 25 | 0-255 | Fixes the time in second of the total opening/closing of the mix valve (valid for three point mix valve) | Secs |
| PID P Zone | 10 | 0-255 | Proportional parameter for the valve control | |
| PID I Zone | 150 | 0-255 | integrative parameter for the valve control | |
| PID D Zone | 0 | 0-255 | Derivative parameter for the valve control | |
| Extra zone setpoint | 10 | 0-30 | Establishes the increase for the primary setpoint with respect to the zone setpoint | °C |

The setting of the parameters of the climatic curve and the programming of the dependent zone is identical to that of the additional external zone, as described in the paragraphs "Setting zone's climatic curve parameters (accessible only with installer password)" and "Programming the zone".

5.2.1 Deleting dependent zone

To remove a Dependent zone operate in the reverse way to its installation:

- enter the parameters menu and select the par. 205. Change its value from "Enabled" to "Disabled";
- change the par. 97. If par. 97 = 19 change to = 16; if par. 97 = 18 change to = 17.

On the "Information" menu:

- enter "Status zone dep.";
- select the number of the dependent zone;
- The "Detection" field will indicate "NO";
- select "Remove zone" changing to "YES" and confirm.

Now in the "Settings" and "Information" menus the dependent zone will no longer be displayed.

The electronic control of the thermal module will automatically check which zones are connected to the bus.

The menu items of the zone in the electronic control of the thermal module will be available when one or more zone management devices are detected.

The electronic control of the thermal module remembers the zone number detected when a device is connected.

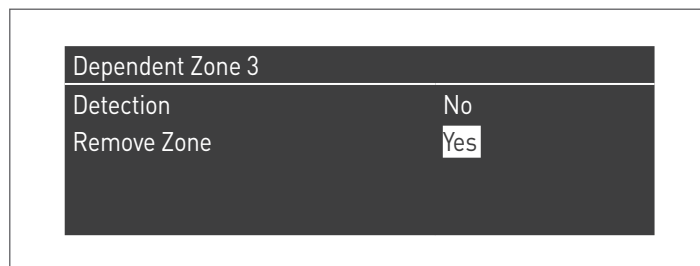
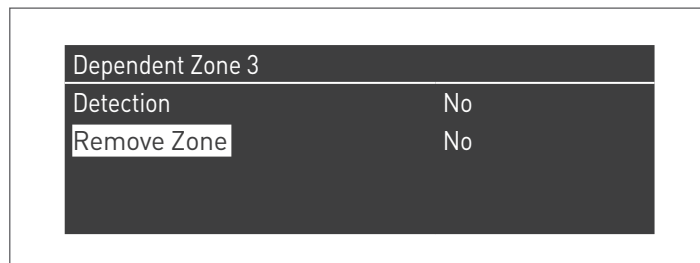
The zone number detected is not automatically removed when the corresponding accessory is no longer connected.

The zone number needs to be removed manually.

Removing the zone number

- remove the bus connection of the zone to be deleted;
- access the Settings/Zone Config./Zone;
- select the disconnected zone;
- go to Remove Zone;
- press the ► key to highlight the values, change them to "Yes" with the ▲ / ▼ keys, press the ● key to confirm and remove the zone from the display menus.

Example:




6 MANAGING ADDITIONAL ZONE

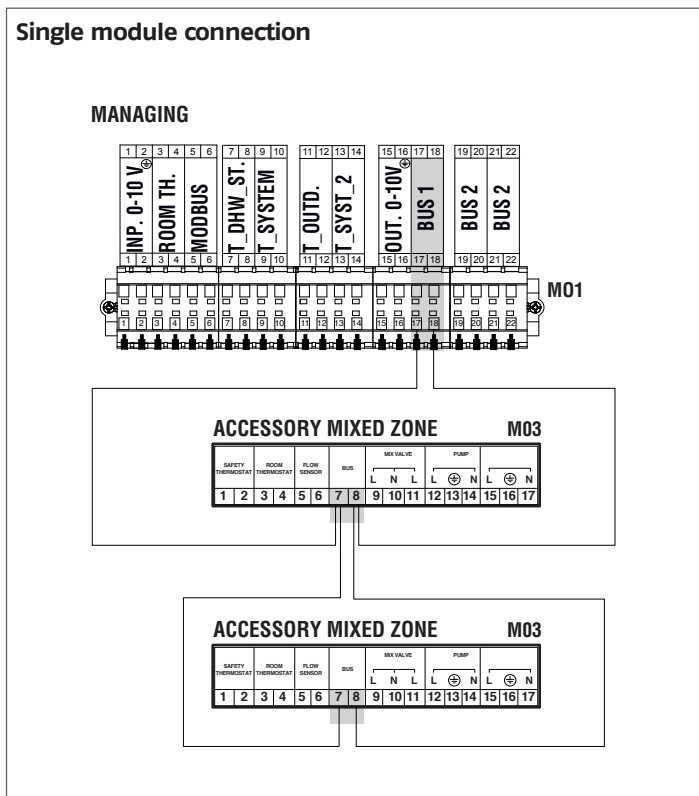
6.1 Controlling zone with additional zone accessory

When using on a system with just one thermal module or cascade systems, where the number of heating zones to be controlled exceeds the number of DEPENDENT thermal modules, the additional Zone accessory module must be installed. After connecting the Zone module as indicated below, wait for the module to be detected.

At the end of the detection, the following new functions will be available:

- in the "Information" menu "Ext. Zone Status." will be displayed, from where it is possible to display information regarding the selected zone;
- in the "Settings" menu two new lines will be displayed:
 - "Zone Config."
 - "Zone Clim. Curve"

 See the additional Zone accessory booklet for further details.



The electronic control of the thermal module will automatically check which zones are connected to the bus.

The menu items of the zone in the electronic control of the thermal module will be available when one or more zone management devices are detected.

The electronic control of the thermal module remembers the zone number detected when a device is connected.

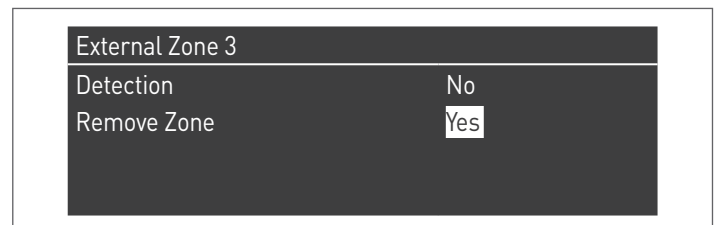
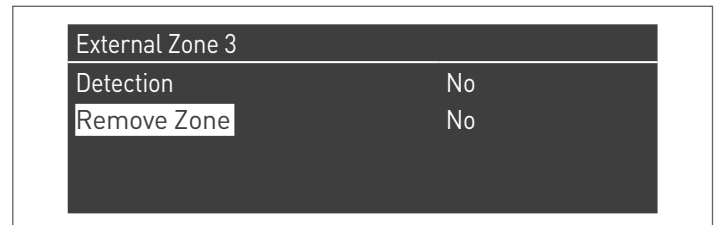
The zone number detected is not automatically removed when the corresponding accessory is no longer connected.

The zone number needs to be removed manually.

Removing the zone number

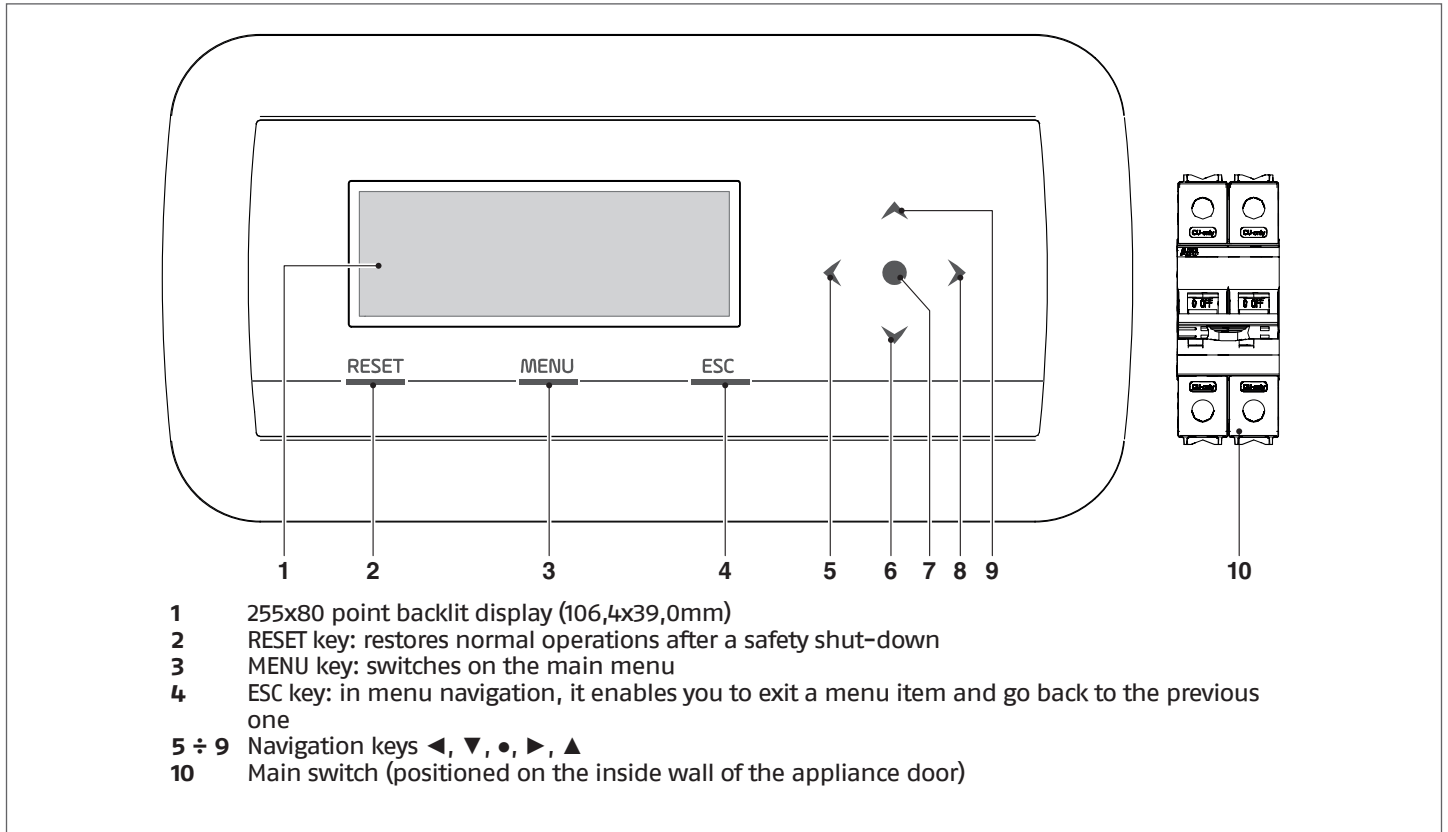
- remove the bus connection of the zone to be deleted;
- access the Settings/Zone Config./Zone;
- select the disconnected zone;
- go to Remove Zone;
- press the ► key to highlight the values, change them to "Yes" with the ▲ / ▼ keys, press the ● key to confirm and remove the zone from the display menus.

Example:



6.2 Setting parameters of the additional zone

Controls interface



6.3 Setting zone parameters (accessible only with installer password)

Menu → "Settings" → "Zone Config."

This menu allows you to separately set the parameters of all the connected zones with the exception of the "Extra setpoint zone" which is the same for all zones.

To select the zone for controlling/changing the parameters, proceed as follows:

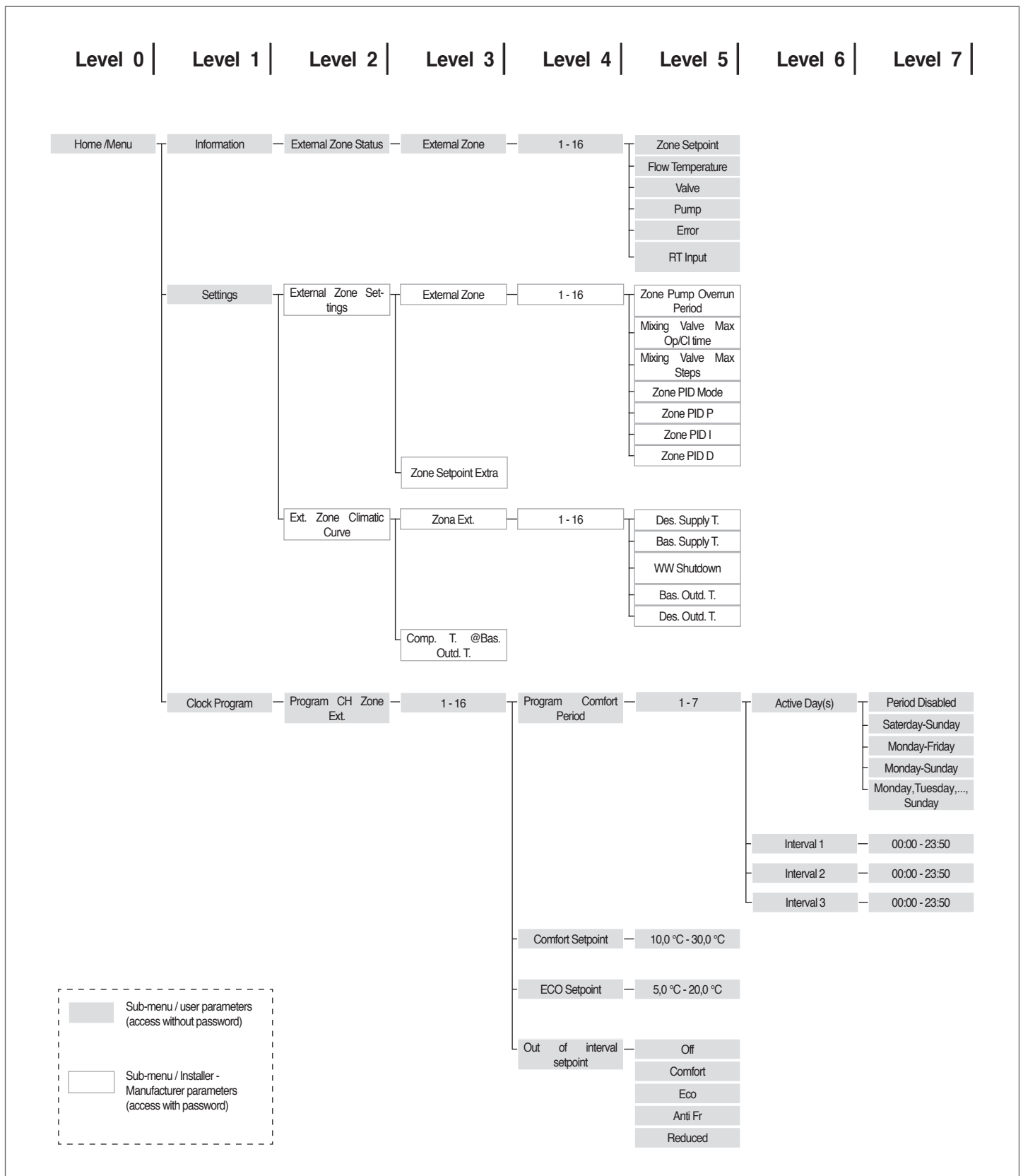
- press the ▶ key so that the number to the right of "zone" is highlighted;
- once the number is highlighted use the ▲ and ▼ keys to change the number of the zone;
- once the zone is selected, confirm with the • key.

The zone parameters are the following:

| Description | Standard value that is set | Range | Explanation | UM |
|--------------------------|----------------------------|------------------------------|--|------|
| Post-circ. Zone Pump | 120 | 0-255 | Establishes the time in seconds of the post-circulation | Secs |
| Mix Valve Max Op/Cl Time | 25 | 0-255 | Fixes the time in second of the total opening/closing of the mix valve (valid for three point mix valve) | Secs |
| Mix Valve Max steps | 700 | 0-65535 | Fixes the number of steps for the total opening of the mix valve (valid for step-by-step mix valve) | |
| PID zone mode | Symmetrical | Symmetrical/ Asymmetrical | Fixes the PID control mode | |
| PID P Zone | 10 | 0-255 | Proportional parameter for the valve control | |
| PID I Zone | 150 | 0-255 | integrative parameter for the valve control | |
| PID D Zone | 0 | 0-255 | Derivative parameter for the valve control | |
| Extra zone setpoint | 10 | 0-30 | Establishes the increase for the primary setpoint with respect to the zone setpoint | °C |

⚠ For more information regarding navigating the commands interface (thermal module display) see the paragraph "Electronic control".

6.3.1 Menu structure

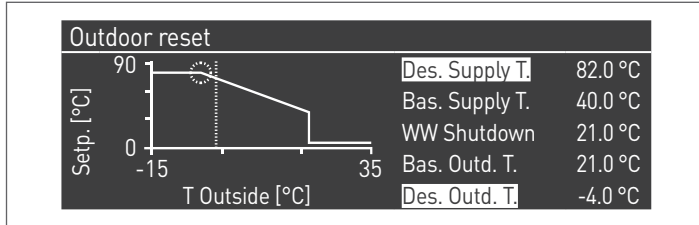


6.4 Setting zone's climatic curve parameters (accessible only with installer password)

Menu → "Settings" → "Zone Clim. Curve"

- press the ► key so that the number is highlighted on the right of the word "Zone";
- use the ▲ and ▼ keys to change the zone number;
- press the ● key.

The following is displayed:

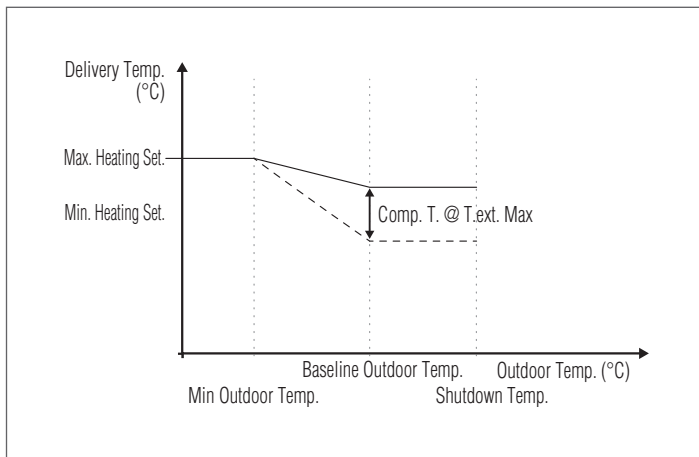


The "Comp. T. @ T.ext. Max" parameter, if other than 0, transforms the climatic curve from linear to quadratic allowing you to best adapt the variation of the setpoint to the variation of the outdoor temperature.

The resulting quadratic climatic curve will have three parameters:

- Heat. Set. Max
- Baseline Outdoor Temp.
- Text. Min

of the basic linear climatic curve and a value of the Heat. Set. Min. diminished by the value of the parameter "Comp. T. @ T.ext. Max", as can be seen in the example in the figure.



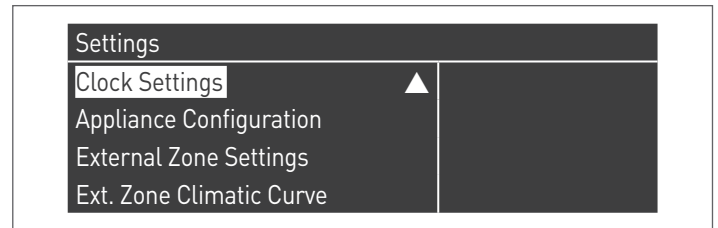
6.5 Programming the zone

By default the schedule timer is disabled.

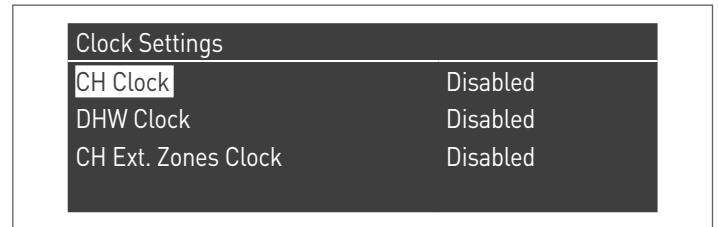
To start a request from the zone, simply close the contact of the zone request. In this case the module (or the cascade of modules) will start with a setpoint equal to the value calculated on the zone climatic curve increased by the "Zone Extra Setpoint" value and the mix valve will modulate to maintain the delivery temperature of the zone at the calculated setpoint.

To activate zone programming:

Menu → "Settings" → "Clock Settings"



Confirming with ● the following screen is displayed:

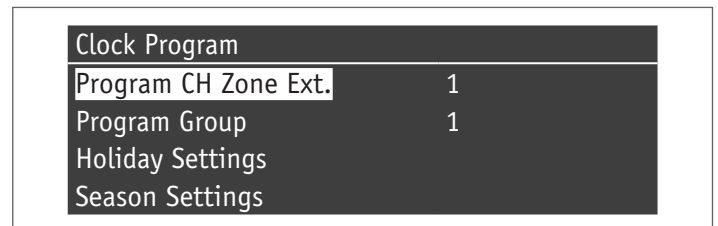


- with the ▲ / ▼ keys select "CH Zones clock"
- with the ► key move to "Disabled", change it to "Enabled" with the ▲ / ▼ keys
- confirm with the ● key

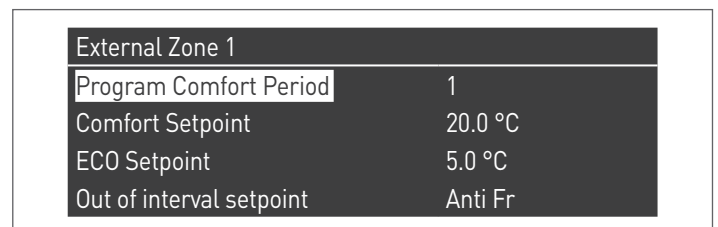
Go to:

Menu → "Clock program"

Confirming with the ● key:



At this point select the number of the zone to be programmed and confirm with the ● key.



The programmable periods for each zone are 7 and they can be selected by changing the number that appears beside "Program Comfort period".

The "Comfort Setpoint" is the setpoint that is set for the area served by the zone in the active time band established within the period and can be set between ten and forty degrees.

Setting the "Comfort Setpoint" at a default of 20°C, the climatic curve that regulates the setpoint of the zone is exactly that which was set in paragraph Setting zone's climatic curve parameters (accessible only with installer password) on page 104.


By changing the "Comfort Setpoint" the climatic curve is moved upwards or downwards depending on whether the setpoint is higher or lower than 20°C. The curve will shift by two degrees for each degree of difference between the value of the setpoint and the value 20.

The "ECO Setpoint" is a setpoint that can be set between 5 and 20 degrees and can be selected as a setpoint for the area served by the zone outside the active time band.

The "Out of the interval Setpoint" defines how the zone outside the active time bands are managed (within which the setpoint of the area is always set on "comfort").

The selections for the "Out of the interval Setpoint" are the following:

- **Eco:** the ambient setpoint is set to ECO. The zone setpoint is changed by two degrees less for each degree of difference between the ECO setpoint and the value 20 (for example, if at 20° I have a setpoint of 50, at 18 degrees I have a setpoint of $50+2*(18-20)=46$).
- **Night-time:** the zone setpoint is lowered by 10 degrees with respect to the value of the zone setpoint set for a $T_{comfort} = 20^\circ$.
- **Antifreeze:** the ambient setpoint is set at 5°C, thereby obtaining a reduction with respect to the comfort setpoint of 30 degrees.
- **Off:** in this case the delivery of heat is interrupted.
- **Comfort:** the setpoint remains the same as that for the active time bands. This choice clearly makes no sense when scheduling is desired, but it can be useful if you want to provide heat continuously without changing the programming itself.

 So that the zone programming works the "heat request" contact should be closed. Otherwise the zone will ignore any request from the schedule timer.

6.6 Scheduling the time bands

By going to:
Menu → "Clock program" → "Zones CH Program "

| External Zone 1 | |
|--------------------------|---------|
| Program Comfort Period | 1 |
| Comfort Setpoint | 20.0 °C |
| ECO Setpoint | 5.0 °C |
| Out of interval setpoint | Anti Fr |

Entering in "Program Comfort Period":

| External Zone 1 - Period 1 | | |
|----------------------------|---------------|-------|
| Active Day(s) | Monday-Sunday | |
| Interval 1 | 07:10 | 11:00 |
| Interval 2 | 00:00 | 00:00 |
| Interval 3 | 00:00 | 00:00 |

Using the option "Active Day(s)" it is possible to select the scheduling period. You can select a day of the week or else one of these three groups of days:

- Mon-Sun
- Mon-Fri
- Sat-Sun

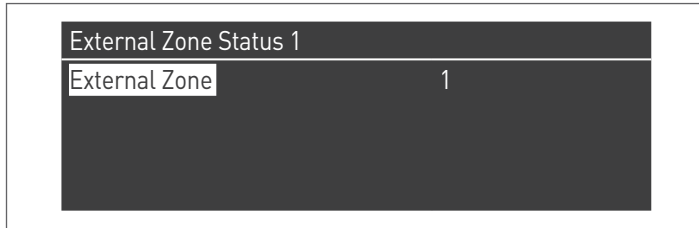
This facilitates weekly scheduling or else scheduling that is different during the work week and the week-end.

There are three active time bands for each period. The time resolution is 10 minutes.

6.7 Information on the operation of the zone

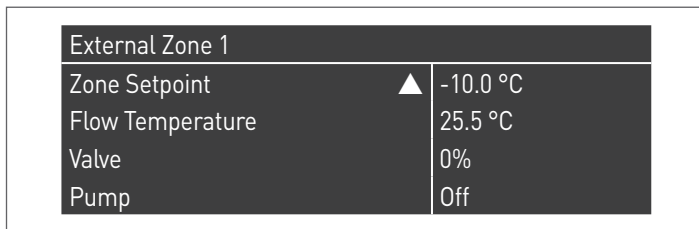
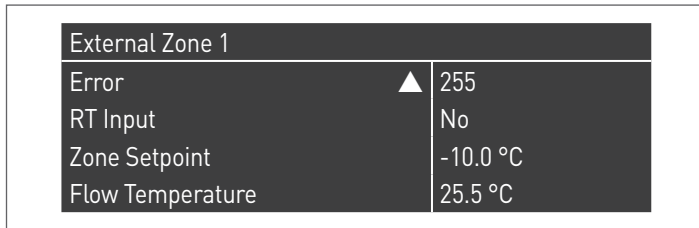
By going to:

Menu → "Information" → "Zone Status"



To choose the zone whose information will be displayed, proceed in the same way as in the previous paragraph.

Once the ● key is selected the following display appears:



The information displayed is the following:

| Error code | Description |
|----------------------|--|
| Err | Indicates the error code of the board (255 = no error) |
| Input Heat | Indicates whether there is a request (namely, if the contact for the heat request is open (NO, no request) or closed (Yes, request present)) |
| Zone set-point | Indicates the zone setpoint |
| Delivery temperature | Indicates the temperature measured by the zone probe |
| Valve | Indicates the opening percentage of the valve (100% = fully open) |
| Pump | Indicates if the pump is stopped (off) or active (on) |

Zone board errors table:

| Error code | Description | Solution |
|------------|---|--|
| 22 | Zone probe disconnected | Check probe |
| 23 | Zone probe short-circuit | Check probe |
| 24 | Overtemperature detected (opening of safety thermostat) | Check parameters Check operation of mixer |

7 SYSTEM MANAGER

7.1 Putting into service

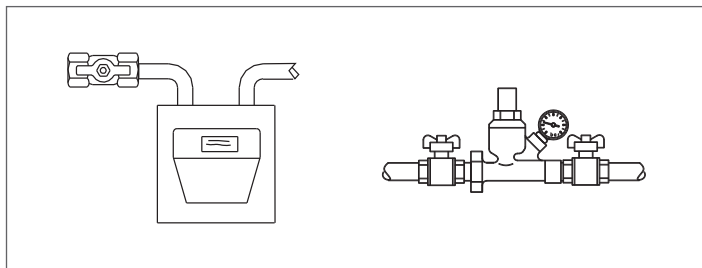
- ⚠** The appliance must be maintained and adjusted at least once a year by Technical Assistance Service or by professionally qualified staff in compliance with all applicable National and Local provisions.
- ⚠** Incorrect maintenance or adjustment may damage the appliance and cause damage to people or create a hazard.
- ⚠** The system manager is forbidden from opening and removing the appliance's casing. These activities must be carried out only by Technical Assistance Service or by professionally qualified personnel.

The first commissioning of the **RIELLO Steel Pro Power** module must be carried out by **RIELLO** Technical Assistance Service after which the appliance can operate automatically.

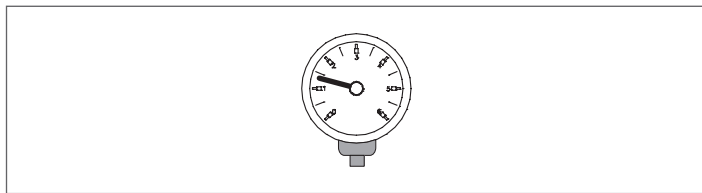
However, the system manager may be required to restart the appliance independently, without involving Technical Assistance Service; for example after a long period of absence.

To do so, perform the following checks and operations:

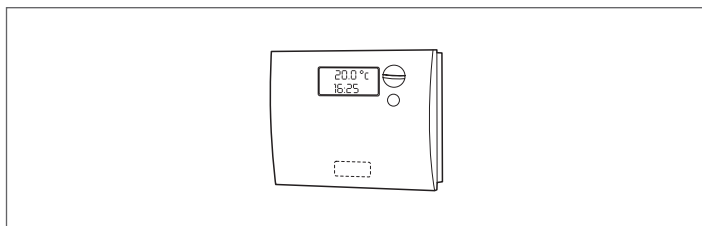
- Check that the gas cock and heating water cock are open



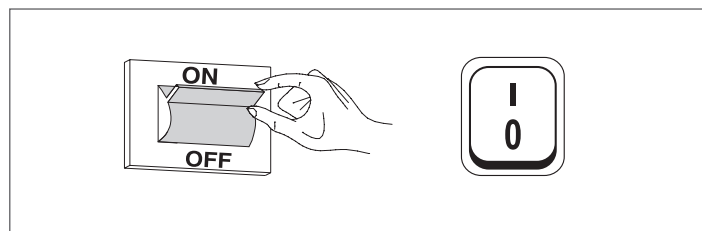
- While the system is still cold, check that working pressure in the central heating circuit is **over 1 bar** but below the maximum limit specified for the boiler



- Adjust the room thermostats for the high and low temperature zones to the required temperature (~20°C) or, if the systems are equipped with timer thermostats or a time programming unit, make sure it is on and adjusted (~20°C)



- Switch the system's master switch to the ON position and the thermal module's master switch to (I).



The appliance will go through the switch-on stage and, after starting, it will continue to operate until set temperatures are achieved.

The burner will then switch off and on automatically to maintain the set temperature without further operator action.

In the event of ignition or operation faults, the display will show a numeric error code that will enable the user to interpret the possible cause as detailed in Paragraph "Error List".

- ⚠** In the event of a permanent error, to reset starting conditions press the "RESET" key and wait for the thermal module to restart.

Repeat this operation 2-3 times at the most. If the problem persists after that, call **RIELLO's** Technical Assistance Service.

7.2 Temporary or short-term shut-down

In the event of temporary or short-term shut-down (e.g. due to holidays), proceed as follows:

- Press the MENU key and select with keys ▲ / ▼ "Time schedule", confirm with key ●.
- Select with keys ▲ / ▼ "Holiday Schedule" and confirm with key ●.

| |
|-------------------------|
| Clock Program |
| Program Group |
| Burn hours till service |
| Reset Service Reminder |
| Holiday Settings |

- Select with keys ▲ / ▼ "Mode" and confirm with key ●. Select "System" mode and confirm.

| | |
|------------------|---------------------|
| Holiday Settings | |
| Mode | System |
| Holiday Setpoint | Comfort |
| Begin Date | Saturday 01-08-2015 |
| End Date | Saturday 01-08-2015 |

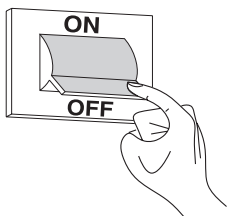
- Select with keys ▲ / ▼ "Holiday Setpoint" and confirm with key ●.
- Select "Antifreeze" holiday setpoint and confirm.

| | |
|------------------|---------------------|
| Holiday Settings | |
| Mode | System |
| Holiday Setpoint | Anti Fr |
| Begin Date | Saturday 01-08-2015 |
| End Date | Saturday 01-08-2015 |

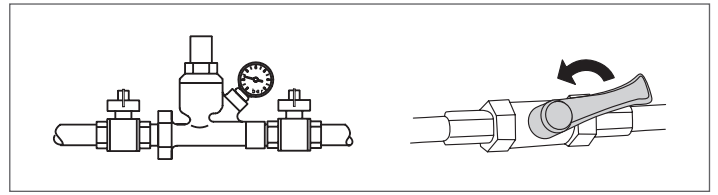
7.3 Preparing for extended periods of disuse

The following operations shall be necessary if the thermal module is not used for a long period of time:

- set the modules' main switch and the system's main switch to "off"



- Close the fuel and water valves for the heating and domestic hot water system.



- ⚠ Empty the thermal and sanitary system if there is a danger of frost.

7.4 Cleaning

Use a cloth damped in soapy water to clean the boiler's external casing.

To remove stubborn marks, use a cloth damped in a 50% mix of water and denatured alcohol or a suitable cleaning product. Carefully dry after cleaning.

- ⊘ Do not use abrasive cleaning pads or powder detergents.

- ⊘ Never clean the boiler without first disconnecting it from the mains electricity supply by turning the mains power switch and the control panel switch OFF.

- ⚠ The combustion chamber and flue pipes must be cleaned periodically by the manufacturer's Technical Assistance Service or by a qualified heating engineer.

7.5 Maintenance

Please remember that THE PERSON RESPONSIBLE FOR SYSTEM MANAGEMENT MUST ENSURE THAT PROFESSIONALLY QUALIFIED HEATING ENGINEERS UNDERTAKE PERIODIC MAINTENANCE AND COMBUSTION EFFICIENCY MEASUREMENTS.

RIELLO's Technical Assistance Service is qualified to satisfy these legal requirements and can also provide useful information on MAINTENANCE PROGRAMMES designed to guarantee:

- Greater safety
- Compliance with applicable legislation
- Freedom from the risk of fines in the event of spot checks.

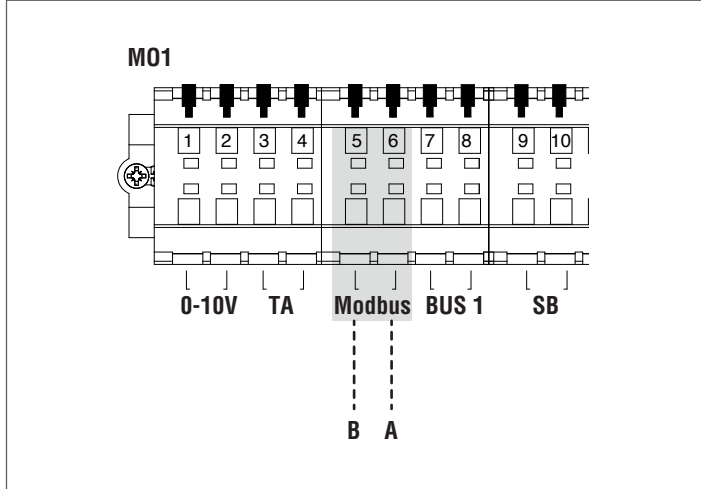
Regular maintenance is essential for the safety, efficiency and durability of the boiler.

Servicing is a legal requirement and must be performed at least once a year by a professionally qualified heating engineer.

8 MODBUS CONNECTION

The thermal mode is equipped with a Modbus connection (based on the RS485 communication standard) that supports the remote management and adjustment of the aforementioned thermal module.

The Modbus connection is available in the low-voltage terminal board.



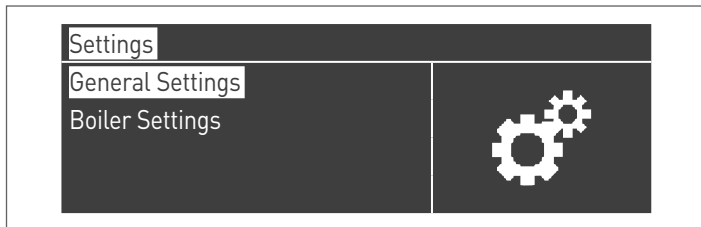
Configuration

The following table shows the connection details.

| | |
|---------------------------|--|
| Protocol | Modbus RTU |
| Slave address | Adjustable from the display. Default: 1 |
| Supported Modbus controls | Read Holding registers (03) Write single holding register (06) Write multiple holding registers (10) |
| Baud rate | 9600 bps. |
| Length | 8 |
| Parity | No |
| Stop Bits | 1 or 2 (adjustable from PB or PC software) |
| Connection | RS485 (2 wires + optional earthing) |

As shown in the table above, the thermal module's address (meant as the address of the slave device in the Modbus system) and the number of "Stop Bits" are two adjustable values.

To modify one or the other, from the home screen, access the "Settings" menu, select "General settings" and confirm.



Access the "Other settings" menu and select "Modbus Address"



Registers

Depending on the type of Modbus device used to connect to the thermal module, the registers' addressing may start from 0x0000 or 0x0001.

If addressing starts from 0x0000, the numbers of the registers listed in the table below may be used directly for reading/writing operations; if addressing starts from 0x0001, the numbers of registers shown in the table, plus one, must be used for reading/writing operations.

Control register

The control register is used for special functions.

The first one is that of enabling writing on registers. All accessible registers, including write ones, must be first enabled to receive data. To prevent undesired entries, it is possible to change the value in a register only during the first four seconds after the status change of the 0 bit in the control register.

Therefore, before changing the value of a register, it is necessary to change the status of 0 bit of the control register (register No. 99), sending the string 1 to it.

The control register also supports the remote resetting of the board, by changing the status of the 14 bit. Therefore, by sending the value 16384 to register No. 99, it is possible to reset the board.

! By sending a value other than 1 and from 16384 to register No. 99, the latter will return to the write-protected status (bit 0=0).

The table that summarises the control register's operation is provided below:

| Register number | Access | Access | | Description | Value range |
|-----------------|--------|--------|---|------------------|--|
| | | L | S | | |
| 99 | 0063 | X | X | Control register | Bit 0: enables writing Bit 14: controller reset |

Measurement unit selection register

Register 98 is used to change the format of the data stored in registers (those containing temperature or pressure values).

Before changing the value of the selection register, it is necessary to enable it for writing by forwarding the enabling command to the 99 control register.

The table for measurement unit selection register is the following:

| Register number | Access | Access | | Description | Value range |
|-----------------|--------|--------|---|-------------------------------------|--------------------------------|
| | | L | S | | |
| 98 | 0062 | X | X | Measurement unit selection register | Bit 0: °C/°F Bit 1: bar/psi |

Types of data

| Type of data | Unit |
|--------------------|-------------------------------------|
| Temperature | °C/°F |
| Voltage | Volt |
| Pressure | bar/psi |
| Ionisation current | µA |
| Percentage | % |
| Connection | RS485 (2 wires + optional earthing) |

Status parameters

| Register number | Access | | Description | Automatic conversion | Value range |
|-------------------|--------|---|----------------|----------------------|--------------------|
| | L | S | | | |
| 100 | X | | State | | See "State" table |
| 101 | X | | Status | | Same "State" value |
| 102 | X | | Error code (*) | | See "Error" tables |
| 110 | X | | Heating pump | | 0=off; 1=on |
| 111 | X | | DHW pump | | 0=off; 1=on |
| 112 | X | | Module pump | | 0=off; 1=on |
| (*) 255= no error | | | | | |

Temperatures/Information

| Register number | Access | | Description | Automatic conversion | Value range |
|-----------------|--------|---|---------------------------------------|----------------------|------------------------|
| | L | S | | | |
| 120 | X | | Delivery temperature | Yes | Depends on °C/°F units |
| 121 | X | | Return temperature | Yes | Depends on °C/°F units |
| 122 | X | | DHW temperature | Yes | Depends on °C/°F units |
| 123 | X | | Flue gas temperature | Yes | Depends on °C/°F units |
| 124 | X | | System temperatures (where available) | Yes | Depends on °C/°F units |
| 125 | X | | Outdoor temperature (where available) | Yes | Depends on °C/°F units |
| 140 | X | | Power | Yes | 0..100% |
| 142 | X | | Ionisation current | Yes | 0..x µA |

Dependent information

| Register number | Access | | Description | Automatic conversion | Value range |
|-----------------|--------|---|-------------|----------------------|--------------------|
| | L | S | | | |
| Dependent 01 | | | | | |
| 300 | X | | State | | See "State" table |
| 302 | X | | Error code | | See "Error" tables |
| 303 | X | | Power | Yes | 0..100% |
| Dependent 02 | | | | | |
| 306 | X | | State | | See "State" table |
| 308 | X | | Error code | | See "Error" tables |
| 309 | X | | Power | Yes | 0..100% |
| Dependent 03 | | | | | |
| 312 | X | | State | | See "State" table |
| 314 | X | | Error code | | See "Error" tables |
| 315 | X | | Power | Yes | 0..100% |
| Dependent 04 | | | | | |
| 318 | X | | State | | See "State" table |
| 320 | X | | Error code | | See "Error" tables |
| 321 | X | | Power | Yes | 0..100% |
| Dependent 05 | | | | | |
| 324 | X | | State | | See "State" table |
| 326 | X | | Error code | | See "Error" tables |
| 327 | X | | Power | Yes | 0..100% |
| Dependent 06 | | | | | |
| 330 | X | | State | | See "State" table |
| 332 | X | | Error code | | See "Error" tables |
| 333 | X | | Power | Yes | 0..100% |
| Dependent 07 | | | | | |
| 336 | X | | State | | See "State" table |
| 338 | X | | Error code | | See "Error" tables |
| 339 | X | | Power | Yes | 0..100% |
| Dependent 08 | | | | | |
| 342 | X | | State | | See "State" table |
| 344 | X | | Error code | | See "Error" tables |
| 345 | X | | Power | Yes | 0..100% |

| Register number | Access | | Description | Automatic conversion | Value range |
|-----------------|--------|---|-------------|----------------------|--------------------|
| | L | S | | | |
| Dependent 09 | | | | | |
| 348 | X | | State | | See "State" table |
| 350 | X | | Error code | | See "Error" tables |
| 351 | X | | Power | Yes | 0..100% |
| Dependent 10 | | | | | |
| 354 | X | | State | | See "State" table |
| 356 | X | | Error code | | See "Error" tables |
| 357 | X | | Power | Yes | 0..100% |
| Dependent 11 | | | | | |
| 360 | X | | State | | See "State" table |
| 362 | X | | Error code | | See "Error" tables |
| 363 | X | | Power | Yes | 0..100% |
| Dependent 12 | | | | | |
| 366 | X | | State | | See "State" table |
| 368 | X | | Error code | | See "Error" tables |
| 369 | X | | Power | Yes | 0..100% |
| Dependent 13 | | | | | |
| 372 | X | | State | | See "State" table |
| 374 | X | | Error code | | See "Error" tables |
| 375 | X | | Power | Yes | 0..100% |
| Dependent 14 | | | | | |
| 378 | X | | State | | See "State" table |
| 380 | X | | Error code | | See "Error" tables |
| 381 | X | | Power | Yes | 0..100% |
| Dependent 15 | | | | | |
| 384 | X | | State | | See "State" table |
| 386 | X | | Error code | | See "Error" tables |
| 387 | X | | Power | Yes | 0..100% |

Parameters registers

| Register number | Access | | Description | Note | Automatic conversion | Value range |
|-----------------|--------|---|---|------|----------------------|------------------------|
| | L | S | | | | |
| 500 | X | X | Heating mode (Par. 1) | NV | | 0..x |
| 501 | X | X | DHW mode (Par. 35) | NV | | 0..x |
| 502 | X | X | Heating set-point (Par. 3) | V | Yes | Depends on °C/°F units |
| 503 | X | X | DHW set-point (Par. 48) | V | Yes | Depends on °C/°F units |
| 504 | X | X | Set-point at min. climatic T (Par. 19) | NV | Yes | Depends on °C/°F units |
| 505 | X | X | Set-point at max. climatic T (Par. 21) | NV | Yes | Depends on °C/°F units |
| 506 | X | X | Out. temperature for climatic minimum (Par. 22) | NV | Yes | Depends on °C/°F units |
| 507 | X | X | Out. temperature for climatic maximum (Par. 20) | NV | Yes | Depends on °C/°F units |
| 508 | X | X | Climatic shut-off (Par. 25) | NV | Yes | Depends on °C/°F units |
| 509 | X | X | Maximum value that can be assigned to the heating set-point (Par. 24) | NV | Yes | Depends on °C/°F units |

| Register number | Access | | Description | Note | Automatic conversion | Value range |
|-----------------|--------|---|---|------|----------------------|------------------------|
| | L | S | | | | |
| 510 | X | X | Minimum value that can be assigned to the heating set-point (Par. 23) | NV | Yes | Depends on °C/°F units |
| 511 | X | X | Night-time attenuation (Par. 28) | NV | Yes | Depends on °C/°F units |
| 512 | X | X | Extra primary setpoint for DHW (Par. 38) | NV | Yes | Depends on °C/°F units |

In the "Note" column, the registers marked with "V" can be written on an ongoing basis (and be used for dynamic size control). Registers marked with "NV", on the other hand, can be overwritten only for a limited number of times (around 10,000 times with an average of twice a day).

Service reminder

| Register number | Access | | Description | Automatic conversion | Value range |
|-----------------|--------|---|--|----------------------|-------------------------------|
| | L | S | | | |
| 1500 | X | | Hours elapsed from the last maintenance activity | | 0...65534 hours |
| 1501 | X | | Hours from the next maintenance activity | | .. 0...main-tenance intervals |
| 1504 | X | | Counter delay index | | 0...14 |
| 1505 | X | | Delay counter 0 | | 0...65534 hours |
| 1506 | X | | Delay counter 1 | | 0...65534 hours |
| 1507 | X | | Delay counter 2 | | 0...65534 hours |

| Register number | Access | | Description | Automatic conversion | Value range |
|-----------------|--------|---|---|----------------------|--|
| | L | S | | | |
| 1508÷1518 | X | | Delay counter 3÷13 | | 0...65534 hours |
| 1519 | X | | Delay counter 14 | | 0...65534 hours |
| 1540 | X | X | Service reminder reset | | 0...1 (1=reset) |
| 1541 | X | X | Setting the hour counting mode for logs 33000-33001 | | 0= burner ON hours counted 1= boiler ON hours counted |
| 1542 | X | X | Maintenance interval hours | | 0..25500 hours (in steps of 100) |

Note: If a counter shows the value 65535, this means that either it is inactive or has exceeded the limit value.

History


| Register number | Access | | Description | Automatic conversion | Value range |
|-----------------|--------|---|-------------------------------------|----------------------|--------------------|
| | L | S | | | |
| 200 | X | | No. of successful ignitions | | 0...65534 |
| 201 | X | | No. of failed ignitions | | 0...65534 |
| 202 | X | | No. of flame losses | | 0...65534 |
| 203 | X | | Hours CH demand | | 0...65534 hours |
| 204 | X | | Hours DHW demand | | 0...65534 hours |
| 220÷235 | X | | Non-volatile error sequence | | See "Error" tables |
| 236÷251 | X | | Hours since last non-volatile error | | 0...65534 hours |
| 260÷275 | X | | Volatile error sequence | | See "Error" tables |
| 276÷291 | X | X | Hours since last volatile error | | 0...65534 hours |

STATE

| Nr. | Description |
|-----|----------------------------|
| 0 | Initialisation |
| 1 | Reset |
| 2 | Standby |
| 3 | Pre-wash |
| 4 | Pre-wash |
| 5 | Pre-ignition |
| 6 | Pre-ignition |
| 7 | Flame detection test |
| 8 | Burner ON |
| 9 | Burner ON |
| 10 | Post-purging |
| 11 | Post-purging |
| 12 | Volatile lockout error |
| 13 | Non-volatile lockout error |

9 RECYCLING AND DISPOSAL

The appliance is manufactured using various materials, such as metal, plastics, and electric and electronic components. At the end of the life cycle, safely remove the components and dispose of them in a responsible manner, in compliance with the installation country's applicable environmental legislation.

 Adequate sorted waste collection, processing and environmentally-friendly disposal contribute to preventing possible negative impacts on the environment and health and promote the reuse and/or recycling of the materials of which the appliance consists.

 Illegal disposal of the product by the owner shall be subject to administrative fines provided for by applicable laws.

RIELLO

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The manufacturer strives to continuously improve all products. Appearance, dimensions, technical specifications, standard equipment and accessories are therefore liable to modification without notice.