ENSURE THAT THESE INSTRUCTIONS ARE LEFT FOR THE USER AFTER COMPLETION OF THE BENCHMARK SECTION

PLEASE READ THE IMPORTANT NOTICE WITHIN THIS GUIDE REGARDING YOUR BOILER WARRANTY

ORIGINAL INSTRUCTIONS
SAFE HANDLING

This boiler may require 2 or more operatives to move it into its installation site, remove it from its packaging and during movement into its installation location. Manoeuvring the boiler may include the use of a sack truck and involve lifting pushing and pulling.

Caution should be exercised during these operations.

Operatives should be knowledgeable in handling techniques when performing these tasks and the following precautions should be considered:
- Grip the boiler at the base
- Be physically capable
- Use personal protective equipment as appropriate e.g. gloves, safety footwear.

During all manoeuvres and handling actions, every attempt should be made to ensure the following unless unavoidable and/or the weight is light.
- Keep back straight
- Avoid twisting at the waist
- Always grip with the palm of the hand
- Keep load as close to the body as possible
- Always use assistance

WARNING

Caution should be exercised when performing any work on this appliance.
Protective gloves and safety glasses are recommended.
- Avoid direct contact with sharp edges.
- Avoid contact with any hot surfaces.

NOTICE

Please be aware that due to the wet testing of the appliance, there may some residual water in the hydraulic circuit.
- Protect any surfaces, carpets or floorings.
- Use a suitable container to catch any water that escape when removing the protective caps from the connections.

CONFORMITY

Our Company declares that MURELLE EQUIPE 220-330-440-550 BOX ErP boilers comply with the essential requirements of the following directives:
- Boiler Efficiency Directive 92/42/EEC
- Gas Appliances Directive 2009/142/EC
- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Ecodesign Directive 2009/125/EC
- Regulation (EU) N. 813/2013 - 811/2013
Important Information

IT IS A STATUTORY REQUIREMENT THAT ALL GAS APPLIANCES ARE INSTALLED BY COMPETENT PERSONS, IN ACCORDANCE WITH THE GAS SAFETY (INSTALLATION AND USE) REGULATIONS (CURRENT EDITION). The manufacturer’s instructions must not be taken as overriding any statutory requirements, and failure to comply with these regulations may lead to prosecution.

No modifications to the appliance should be made unless they are fully approved by the manufacturer.

GAS LEAKS: DO NOT OPERATE ANY ELECTRICAL SWITCH, OR USE A NAKED FLAME. TURN OFF THE GAS SUPPLY AND VENTILATE THE AREA BY OPENING DOORS AND WINDOWS contact the gas emergency service on 0800111999.

Please refer to commissioning instructions for filling in the checklist at the back of this installation guide.

Note: All Gas Safe registered installers carry a ID Card.
You can check your installer is Gas Safe Registered by calling 0800 408 5577

IMPORTANT

Prior to switching on the boiler for the first time, check the following:
– Make sure that there are no liquids or inflammable materials in the immediate vicinity of the boiler.
– Make sure that the electrical connections have been made correctly and that the earth wire is connected to a good earthing system.
– Ensure that tightness and let by test have been conducted, including the internal gas pipe work.
– Make sure that the boiler is set for operation for the type of gas supplied.
– Check that the flue pipe for the outlet of the products of the combustion is unobstructed and has been properly installed.
– Make sure that any isolation valves are open.
– Make sure that the system is filled with water and is thoroughly vented.
– Check that the circulating pump is not jammed.
– Purge the gas supply pipe work.
– Ensure that the checklist is filled in when the commissioning has been completed.

All descriptions and illustrations provided in this manual have been carefully prepared but we reserve the right to make changes and improvements in our products that may affect the accuracy of the information contained in this manual.
1 DEVICE DESCRIPTION

1.1 INTRODUCTION

“MURELLE EQUIPE 220-330-440-550 BOX ErP” are pre-mixed condensation heating modules intended only for heating, designed to work in sequence/cascade.

1.2 DIMENSIONS MODULES

1.2.1 “MURELLE EQUIPE 220 BOX ErP” (fig. 1)

NOTE: The installation must incorporate a hydraulic separator or plate heat exchanger. The hydraulic separator available from Sime Ltd is supplied with modules in a kit code 8101552 and the tubes connecting the hydraulic separator in the kit code 8101532. It can be assembled on the left-hand side by moving the system supply/return manifold blind flanges.

Fig. 1
1.2.2 "MURELLE EQUIPE 330 BOX ErP" (fig. 1/a)

**FIXTURES**
- M System supply (Flange PN6-DN100)
- R System return (Flange PN6-DN100)
- G Gas (Flange PN6-DN50)
- S3 Condensation drain ø 40

**NOTE:** The installation must incorporate a hydraulic separator or plate heat exchanger. The hydraulic separator available from Sime Ltd is supplied with modules in a kit code 8101552 and the tubes connecting the hydraulic separator in the kit code 8101532. It can be assembled on the left-hand side by moving the system supply/return manifold blind flanges.

Fig. 1/a
1.2.3 “MURELLE EQUIPE 440-550 BOX ErP” (fig. 1/b)

**MURELLE EQUIPE 440 BOX ErP**

**MURELLE EQUIPE 550 BOX ErP**

**FIXTURES**

M  System supply (Flange PN6-DN100)
R  System return (Flange PN6-DN100)
G  Gas (Flange PN6-DN50)
S3  Condensation drain ø 40

**NOTE:** The installation must incorporate a hydraulic separator or plate heat exchanger. The hydraulic separator available from Sime Ltd is supplied with modules in a kit code 8101553 and the tubes connecting the hydraulic separator in the kit code 8101533. It can be assembled on the left-hand side by moving the system supply/return manifold blind flanges.

Fig. 1/b
## 1.3 TECHNICAL SPECIFICATIONS

### MURELLE EQUIPE

<table>
<thead>
<tr>
<th>Generators with a heat output kW 105.4</th>
<th>220 BOX ErP</th>
<th>330 BOX ErP</th>
<th>440 BOX ErP</th>
<th>550 BOX ErP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat output</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal (80-60°C) (Pn max) kW</td>
<td>210.8</td>
<td>316.2</td>
<td>421.6</td>
<td>527.0</td>
</tr>
<tr>
<td>Nominal (50-30°C) (Pn max) kW</td>
<td>225.2</td>
<td>337.8</td>
<td>454.0</td>
<td>543.0</td>
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<tr>
<td>Minimum (80-60°C) (Pn min) kW</td>
<td>20.8</td>
<td>20.8</td>
<td>20.8</td>
<td>20.8</td>
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<tr>
<td>Minimum (50-30°C) (Pn min) kW</td>
<td>23.2</td>
<td>23.2</td>
<td>23.2</td>
<td>23.2</td>
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<tr>
<td><strong>Heat input (</strong>)**</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Nominal (Qn max - Qnw max) kW</td>
<td>216</td>
<td>324</td>
<td>432</td>
<td>540</td>
</tr>
<tr>
<td>Minimum (Qn min - Qnw min) kW</td>
<td>21.6</td>
<td>21.6</td>
<td>21.6</td>
<td>21.6</td>
</tr>
<tr>
<td>Min-max operating yield (80-60°C) %</td>
<td>96.4 - 97.6</td>
<td>96.4 - 97.6</td>
<td>96.4 - 97.6</td>
<td>96.4 - 97.6</td>
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<tr>
<td>Min-max operating yield (50-30°C) %</td>
<td>107.4 - 104.2</td>
<td>107.4 - 104.2</td>
<td>107.4 - 104.2</td>
<td>107.4 - 104.2</td>
</tr>
<tr>
<td>Operating yield at 30% (40-30°C) %</td>
<td>105.4</td>
<td>105.4</td>
<td>105.4</td>
<td>105.4</td>
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<td>Losses after shutdown to 50°C (EN 15502) W</td>
<td>498</td>
<td>747</td>
<td>996</td>
<td>1245</td>
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<tr>
<td><strong>Feeding tension</strong></td>
<td>V-Hz</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>230-50</td>
<td>230-50</td>
<td>230-50</td>
<td>230-50</td>
</tr>
<tr>
<td><strong>Absorbed power consumption (Qn max)</strong> W</td>
<td>516</td>
<td>774</td>
<td>1032</td>
<td>1290</td>
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<tr>
<td>Absorbed power consumption (Qn min) W</td>
<td>134</td>
<td>138</td>
<td>142</td>
<td>144</td>
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<tr>
<td>Absorbed power consumption C.H. pump W</td>
<td>260 (130 x 2)</td>
<td>390 (130 x 3)</td>
<td>520 (130 x 4)</td>
<td>650 (130 x 5)</td>
</tr>
<tr>
<td><strong>Electrical protection grade</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>IPX4D</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Energy efficiency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Seasonal energy efficiency class of the heating system %</td>
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<td>A</td>
<td>A</td>
<td>A</td>
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<td>Seasonal energy efficiency of the heating system %</td>
<td>90</td>
<td>91</td>
<td>91</td>
<td>91</td>
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<tr>
<td>Sound power of the heating system dB (A)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Single module temperature regulation</strong> °C</td>
<td>20/80</td>
<td>20/80</td>
<td>20/80</td>
<td>20/80</td>
</tr>
<tr>
<td>Water content modules l</td>
<td>36.3</td>
<td>55.9</td>
<td>72.6</td>
<td>92.2</td>
</tr>
<tr>
<td>Max operating pressure (PMS) bar (kPa)</td>
<td>5 (490)</td>
<td>5 (490)</td>
<td>5 (490)</td>
<td>5 (490)</td>
</tr>
<tr>
<td>Max operating temperature (T max) °C</td>
<td>85</td>
<td>85</td>
<td>85</td>
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<tr>
<td>Exhaust temperature at max flow rate (80-60°C) °C</td>
<td>64</td>
<td>64</td>
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<td>64</td>
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<td>Exhaust temperature at min flow rate (80-60°C) °C</td>
<td>51</td>
<td>51</td>
<td>51</td>
<td>51</td>
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<tr>
<td>Exhaust temperature at max flow rate (50-30°C) °C</td>
<td>45</td>
<td>45</td>
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<td>45</td>
</tr>
<tr>
<td>Exhaust temperature at min flow rate (50-30°C) °C</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Exhauster flow min/max g/s</td>
<td>10.28 / 103.34</td>
<td>10.28 / 155.00</td>
<td>10.28 / 206.47</td>
<td>10.28 / 258.34</td>
</tr>
<tr>
<td>CO₂ at max/min flow rate G20 %</td>
<td>9.0 / 9.0</td>
<td>9.0 / 9.0</td>
<td>9.0 / 9.0</td>
<td>9.0 / 9.0</td>
</tr>
<tr>
<td>NOx measured (EN15502 - 1:2015) mg/kWh</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Max. output pressure fumes manifold Pa</td>
<td>375</td>
<td>375</td>
<td>375</td>
<td>375</td>
</tr>
<tr>
<td>Max. pressure independent fumes Pa</td>
<td>428</td>
<td>428</td>
<td>428</td>
<td>428</td>
</tr>
<tr>
<td>PIN number</td>
<td>1312CM5621</td>
<td>1312CM5621</td>
<td>1312CM5621</td>
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<tr>
<td>Category</td>
<td>I2H3P</td>
<td>I2H3P</td>
<td>I2H3P</td>
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<tr>
<td>NOx emission class (EN15502 - 1:2015)</td>
<td>6 (≤ 56 mg/kWh)</td>
<td>6 (≤ 56 mg/kWh)</td>
<td>6 (≤ 56 mg/kWh)</td>
<td>6 (≤ 56 mg/kWh)</td>
</tr>
<tr>
<td>Weight when empty kg</td>
<td>380</td>
<td>615</td>
<td>760</td>
<td>995</td>
</tr>
</tbody>
</table>

### Gas and nozzle pressure

| Supply pressure G20 mbar (kPa) | 20 (1.96) | 20 (1.96) | 20 (1.96) | 20 (1.96) |
| Supply pressure G31 mbar (kPa) | 37 (3.63) | 37 (3.63) | 37 (3.63) | 37 (3.63) |
| Number of nozzles n° | 2 | 3 | 4 | 5 |
| Nozzle diameter G20 ø | 17.2 | 17.2 | 17.2 | 17.2 |
| Nozzle diameter G31 ø | 9.8 | 9.8 | 9.8 | 9.8 |
| Consumption at nominal output G20 m³/h | 22.84 | 34.26 | 45.68 | 57.10 |
| Consumption at minimum output G20 m³/h | 2.28 | 2.28 | 2.28 | 2.28 |
| Consumption at nominal output G31 kg/h | 16.76 | 25.14 | 33.52 | 41.90 |
| Consumption at minimum output G31 kg/h | 1.68 | 1.68 | 1.68 | 1.68 |

(*) Heat input of the heating system measured using lower heating value (LHV)
1.4 OPERATING DIAGRAM (fig. 2)

KEY
1. Cascade delivery supply probe (SMC)
2. Hydraulic compensator
3. Antifreeze siphon sensor (SB/SA)
4. Safety valve 5 bar
5. Condensation drain siphon
6. Gas valve
7. 8 litre expansion tank
8. Fan
9. Heating supply probe (SM)
10. Safety thermostat 100°C
11. Exhaust temperature probe (SF)
12. Heat exchanger
13. Gas isolation valve
14. Heating return probe (SR)
15. Water pressure transducer
16. Air release vent
17. Non return valve
18. Pump high efficiency
19. 3-way isolation/drain valve
20. Isolation valve
21. Single module drain

FIXTURES
M  System supply
R  System return
G  Gas
S3  Condensation drain

Fig. 2
1.5 MAIN COMPONENTS (fig. 3)

KEY
1 System return manifold
2 Gas isolation valve
3 System supply manifold
4 Gas valve
5 Fan
6 Ignition electrode
7 Primary exchanger
8 Ignition transformer
9 Control panel
10 Heating return probe [SR]
11 Heating supply probe [SM]
12 Safety thermostat 100°C
13 Ionisation electrode
14 Pump high efficiency
15 Isolation valve
16 3-way isolation/drain valve
17 Gas manifold

1.6 TECHNICAL DATA PLATE (fig. 3/a)
The unit is suitable for external installation in a fixed location. It must be installed by qualified engineers in compliance with all instructions contained in this manual. Furthermore, the installation must be in accordance with current standards and regulations.

2.1 SUPPLY (fig. 4)

"MURELLE EQUIPE 110 BOX ErP" heat modules are available in single or double generators and can be coupled together to a maximum of 5 generators. The cabinet is pre painted, zinc coated. They are supplied complete with flow and return, gas and condensate manifolds, external temperature probe kit, cascade supply and RS-485 code 8092250 board connection cable. Available separately:
- Connection kit for the hydraulic separator code 8101532 for modules "220-330 BOX ErP" and code 8101533 for modules "440-550 BOX ErP"
- Double box (size: 1100 x 790 x 1600) for hydraulic separator code 8101527
- Hydraulic separator kit code 8101552 for modules "220-330 BOX ErP" and code 8101553 for modules "440-550 BOX ErP"
- Polypropylene exhaust manifold kit for indoor installation (purposely treated to resist weathering when installed outdoors): code 8102530 for "220 BOX ErP" module code 8102531 for "330 BOX ErP" module code 8102532 for "440 BOX ErP" module code 8102533 for "550 BOX ErP" module
- Exhaust terminal code 8089530 (1 per generator) for outdoor installations.

To electrically connect the modules and to assemble the exhaust for indoor or outdoor installations, see points 2.6, 2.7 and 2.10 in this manual.

2.2 INSTALLATION

2.2.1 Indoors

"MURELLE EQUIPE 220-330-440-550 BOX ErP" heat modules can be installed in boiler rooms whose size and requirements meet current regulations.

VENTILATION

The following is provide for your guidance only, and assumes the ventilation air is taken directly from outside. The sizes of the vents may need to be increased in respect of other appliances installed in the same area, and seasonal use. Take care that the position of low

![Diagram of the installation process](image-url)
level vents would not subject to adverse weather conditions, ie flooding. **Ventilation requirements for Murelle HE 110 R ErP boilers and cascade systems.**

BS6644 has a requirement that the temperatures in a room or compartment do not exceed certain levels:
- 25°C at floor level (0-100mm)
- 32°C at mid level (1.5M above the floor level)
- 40°C at ceiling level (0-100mm from ceiling)

Installed as a class B appliance (open flued).

Installed in a room
- High level [within 15% of the room height from ceiling] - 2cm²/KW of net heat input
- Low level [low as possible within 1 metre from floor natural gas, 250mm LPG] - 4cm²/KW of net heat input

A single generator (120KW net input) would require 600cm² at high level and 1200cm² at low level.

Installed in a compartment or enclosure
- High level [within 15% of the room height from ceiling] - 5cm²/KW of net heat input
- Low level [low as possible within 1 metre from floor natural gas, 250mm LPG] - 10cm²/KW of net heat input.

A single generator (120KW net input) would require 600cm² at high level and 1200cm² at low level.

### 2.2.2 Outdoors

"MURELLE EQUIPE 220-330-440-550 BOX ErP" heat modules can also be installed outdoors with the specific exhaust for single module code 8089530.

### 2.3 SYSTEM REQUIREMENTS

The heating system should be flushed prior to the connection of the heating modules. The system should be treated in accordance with BS 7593. Sime Ltd recommend only the use of Fernox products for the flushing and final treatment of the system water. This is particularly important in hard water areas. It is recommended that the inhibitor concentration is checked at installation, system modification and at every service in accordance with the manufacturers instructions. Test kits are available from inhibitor stockist.

**WARNING:** Failure to clean the heat system or add an adequate inhibitor invalidates the device’s warranty.

Gas connections must be made in accordance with current standards and regulations. When dimensioning gas pipes from the meter to the module, both capacity volume (consumption) in m³/h and gas density must be taken into account.

System pipe sections must be able to guarantee sufficient supply to cover maximum demand, limiting pressure loss between the meter and any utility device no greater than 1.0 mbar for second family gas [natural gas].

A sticker inside the module includes identification and gas type data specific to the module.

#### 2.3.1 Condensation drain connection

The condensate drain must be connected to the civil drain by a pipe with minimum 5 mm per meter gradient for condensation collection.

**Only stainless steel or plastic pipes are suitable to convey condensate.**
2.3.2 Filter on the gas pipe

The gas valve on each generator is supplied ex factory with an inlet filter, which, however, is not adequate to entrap all the impurities in the gas or in gas main pipes. To prevent malfunctioning of the valve, or in certain cases even to cut out the safety device with which the valve is equipped, install an adequate filter on the gas pipe.

2.5 FILLING THE SYSTEM

Cold system filling pressure must be 1 bar. The system must be filled slowly so that air bubbles are released through the specific escapes.

2.6 EXHAUST FOR OUTDOOR INSTALLATION (fig. 5)

The exhaust terminal for single module code 8089530 is required for this type of installation. For separately supplied accessory assembly see fig. 5.
MURELLE EQUIPE 440 BOX ErP
exhaust manifold kit
code 8102532

Fig. 6/a
MURELLE EQUIPE 550 BOX ErP
exhaust manifold kit
code 8102533

MURELLE EQUIPE 550 BOX ErP
(with box container for hydraulic separator
code 8101527)
2.7 INDOOR INSTALLATION
EXHAUST KIT (fig. 6 - 6/a - 6/b)

Refer to fig. 6 and 6/a-b for this type of installation. The indicated solutions have the exhaust manifold (available separately) positioned on the module’s to right.
It is however possible to move the exhaust of the left by simply rotating the manifold 180°.

NOTE: The kits are purposely treated also to resist weathering when installed outdoors.
In these cases the compensator and safety device must be inserted in the double container box code 8101927.

2.8 TUBES CONNECTING THE
HYDRAULIC SEPARATOR KIT
(fig. 7 - fig. 7/a)

Tubes connecting the hydraulic separator kit code 8101532 supplied as option for "MURELLE EQUIPE 220-330 BOX ErP" models it is formed (fig. 7):
– System supply flanged section code 6291968
– System return flanged section code 6291968
– Gaskets, nuts and fastening screws M16
– Expansion vessel 8 liters code 6245108 (Preload pressure 1.5 bar – Maximum pressure 10 bar) and connection pipe code 6227661

WARNING: In models "220-330 BOX ErP" the tubes connecting hydraulic separator kit can be inserted in a specific protective
Tubes connecting the hydraulic separator kit code 8101533 supplied as option for “MURELLE EQUIPE 440-550 BOX ErP” models it is formed (fig. 7/a):
- System supply flanged section code 6291969
- System return flanged section code 6291971
- Gaskets, nuts and fastening screws M16
- Expansion vessel 8 liters code 6245108 (Preload pressure 1.5 bar – Maximum pressure 10 bar) and connection pipe code 6227661.

**WARNING:** In models “440-550 BOX ErP” the tubes connecting hydraulic separator kit can be inserted in a specific protective box code 8101527 supplied separately (see fig. 4).

### 2.9 RS-485 BOARD (fig. 8)

Each generator is supplied with the RS-485 board which allows you to manage the boilers in sequence/cascade (see fig 8). The board is placed on the back of the control panel.

#### 2.9.1 MODBUS mode

This mode allows for MODBUS communication of at least two boilers in cascade and is performed by requesting MODBUS INTERFACE KIT code 8092278.
2.10 SYSTEM AVAILABLE HEAD
(fig. 9)

The head available of the generator supply/return manifolds vs. the flow rate is shown on the chart of figure 9.

2.10.1 Load loss hydraulic separator

Hydraulic separator load losses are indicated in the diagram in fig. 9.
WARNING: The hydraulic separator can be inserted in a specific protective box code 8101527 supplied separately.

2.10.2 Hydraulic separator
"220-330 BOX ErP" (fig. 10)

The hydraulic separator is supplied separately in a kit code 8101552 complete with gaskets, nuts and fastening screws (figure 10).

2.10.3 Hydraulic separator
"440-550 BOX ErP" (fig. 10/a)

The hydraulic separator is supplied separately in a kit code 8101553 complete with gaskets, nuts and fastening screws (figure 10/a). The plant is supplied with three supporting “C” brackets that should be used only to rest the compensator onto the ground.
2.11 ELECTRICAL CONNECTIONS

Each module is supplied with a power cord which, if replacement is required, it must be replaced with one of similar type and dimensions. 230V – 50 Hz single phase voltage is required using a fuse protected main switch with at least 3 mm. between contacts. Observe the L – N polarity and grounding connection. Each generator should be fused at 3 A.

NOTE: Sime declines all responsibility for injury or damage to persons, animals or property resulting from the failure to provide for proper earthing of the appliance.

2.11.1 Wiring diagram single generator (fig. 11)

For BMS (0-10v dc) operation:
- Remove the jumper JP1 and ensure that TA1 link is fitted
- Connect the positive signal at terminal 10 of CN6
- Connect the negative signal at terminal 4 of the CN4.

NOTE: Connect TA1 to the clamps 7-8 after having removed the bridge.
2.11.2 Electrical connection of generators in sequence/cascade (fig. 11/a)

**KEY**
- L: Line
- N: Neutral
- SE: External sensor
- SMC: Cascade supply probe
- RS-485: Cascade management board

**NOTICE:** The external temperature probe (SE) must be connected to the MASTER generator and the cascade supply probe (SMC) to the SLAVE 1 generator.

The SE, SMC probes and the RS-485 board connection cable are supplied together with the modules in the probe kit code 8092250.

The RS-485 board for management in sequence/cascade is placed at the rear of the control panel of each individual generator as shown in the figure.

**CONFIGURATION OF CASCADE PARAMETERS**
Sequence/cascade installations must have the following INST parameter set on all connected generators:
- **PAR 15** = 0 for the first generator (MASTER)
- 1 .... 7 for the other generators (SLAVE)
(Avoid assigning the same number to SLAVE generators)

Set the following INST parameter if polypropylene smoke collectors with a clapet valve are used in sequence/cascade installations:
- **PAR 1** = 8 (for NATURAL GAS generators)
- 16 (for PROPANE generators)

To access the INST parameters, see point 3.3.

In addition, when the number of connected generators in cascade is more than two, parameter OEM A1 of the MASTER generator must be configured as well.

To access the OEM parameters press simultaneously the buttons ( and ) for 2 seconds.

Having entered the INST level, press ( and ) simultaneously for another 2 seconds. At this point insert the access code formed by this sequence of INSTALLATOR BUTTONS:

"+/ - / < / > / < ".

Set the parameter:
- **PAR A1** = Number of cascade generators (3 ... 8)
2.11.3 Room Thermostat and/or Timer (clean contact)

The heating demand can be controlled by a thermostat and/or timer (TA) con-
nected to CN6 terminals 7-8 [see fig 11], after having removed the existing bridge. The control being used must be of a class conforming to the standard EN 607301 (clean electrical contact).

2.11.4 Remote control SIME HOME connection (optional)

The heating demand can be controlled by use of remote control unit SIME HOME (code 8092281)
The remote control unit allows for complete control.
The generator will display CR.
For installation and use of the control follow the instructions in the package.

NOTE, Ensure PAR 10 set to 1 (PAR 10 = 1)

2.11.5 External Sensor (8094101)

An external sensor (code 8091401) can be connected, which can automatically regulate the flow temperature value of the cascade delivery according to the external temperature.
For installation follow the instructions in the package. It is possible to make corrections to the values by adjustment of PAR 11.

2.11.7 Heat Demand by 230v

The heat demand can be controlled by 230v applied to terminal 14 of CN7, and removal of the bridge on CN6 terminals 7 & 8.

2.11.6 BMS (Building Management Systems)

The cascade of generators can be controlled by a BMS signal, and should be connected as shown in fig 11.
Set PAR 14 according to the maximum (10v) flow temperature required.
3 CHARACTERISTICS

3.1 CONTROL PANEL (fig. 12)

1 - DESCRIPTION OF DISPLAY ICONS

- SUMMER MODE ICON
- WINTER MODE ICON
- D.H.W. MODE ICON
- HEATING DEMAND ICON
- GRADED POWER SCALE
  The segments of the bar light up in proportion to boiler power output.
- BURNER FUNCTIONING AND LOCKOUT ICON
- RESET REQUIRED ICON
- CHIMNEY SWEEP ICON

2 - DESCRIPTION OF CONTROLS

- ON/OFF KEYS
  ON = Electricity supply to boiler is on
  OFF = Electricity supply to boiler is on but not ready for functioning. However, the protection functions are active.

- SUMMER MODE KEY
  When this key is pressed, the boiler functions only when D.H.W. is requested (function not available)

- WINTER MODE KEY
  When this key is pressed, the boiler provides heating and D.H.W.

- D.H.W. TEMP KEY
  When this key is pressed, the temperature of the D.H.W. is shown on the display (function not available)

- HEATING TEMP KEY
  The first time the key is pressed, the temperature of heating circuit 1 is shown.
  The second time the key is pressed, the temperature of heating circuit 2 is shown.
  The third time the key is pressed, the temperature of heating circuit 3 is shown (Three zones).

- RE-SET KEY
  This allows for restoring functioning after a functioning error.

- INCREASE AND DECREASE KEY
  By pressing this key the set value increases or decreases.

3 - KEYS RESERVED FOR THE INSTALLER

4 - LUMINOUS BAR
  Blue = Functioning
  Red = Functioning error

5 - PROGRAMMING CLOCK (optional)
  Mechanical clock (code 8092228) or digital clock (code 8092229) to program heating (single zone only).

ATTENTION: Communication port sensitive to electrostatic charges. Before use, it is advisable to touch an earthed metallic surface to discharge static electricity.
3.2 ACCESS TO INSTALLER’S INFORMATION

1. Display of external temperature, only with external sensor connected

2. Display of Heating flow sensor (SM)

3. Display of D.H.W. temperature sensor (SS) only for instantaneous boilers

4. Display of auxiliary temperature sensor or D.H.W. sensor (SB)

5. Display of exhaust temperature sensor (SF)

6. Display of heating temperature of first circuit

7. Display of heating temperature of second circuit

8. Display of ionisation current in µA

9. Display of fan speed in rpm x 100 (e.g. 4,800 and 1,850 rpm)

10. Display of hours of functioning of the burner in h x 100 (e.g. 14,000 and 10)

11. Display of number of times the burner has ignited x 1000 (e.g. 97,000 and 500)

12.

13. Parameter access counter–Installer (i.e. 140 accesses)

14. Parameter access counter–OEM (i.e. 48 accesses)

15. Parameter access counter–CASCADE OEM (i.e. 05 accesses)

16.

17. Display of D.H.W. flowmeter load (i.e. 18 l/min and 0.3 l/min) or flow switch (respectively ON and OFF) (Not this boiler)
18. Display of Heating return sensor value [SR]

19. Display of cascade delivery sensor [SMC] value

20. Display of delivery probe value mixed with board MIXED ZONE 1 (input S2)

21. Display of safety thermostat MIXED ZONE [input S1] respectively ON and OFF

22. Display of pump with board MIXED ZONE 1 (respectively ON and OFF)

23. Display of valve opening control with board MIXED ZONE 1 (respectively ON and OFF)

24. Display of valve closing control with board MIXED ZONE 1 (respectively ON and OFF)

25. Display of the plant delivery probe mixed with board MIXED ZONE 2

26. Display of safety thermostat with board MIXED ZONE 2 [input S1] respectively ON and OFF

27. Display of pump with board MIXED ZONE 2 (respectively ON and OFF)

28. Display of valve opening control with board MIXED ZONE 2 (respectively ON and OFF)

29. Display of valve closing opening control with board MIXED ZONE 2 (respectively ON and OFF)

30. Display of solar probe temperature value S1 with SOLAR board

31. Display of solar probe temperature value S2 with SOLAR board

32. Display of solar probe temperature value S3 with SOLAR board

33. Display of solar relay R1 with SOLAR board (respectively ON and OFF)

34. Display of solar relay R2 with SOLAR board (respectively ON and OFF)

35. Display of solar relay R3 with SOLAR card (respectively ON and OFF)

36. Display of solar flow meter state (respectively ON and OFF)

37. Display of Heating return sensor value (SR)

38. Display of cascaded delivery sensor (SMC) value

39. Display of solar probe temperature value S1 with SOLAR board

40. Display of % value pump control PWM

41. Display of code of last error

42. Display of code of penultimate error

43. Code warning

44. Software version on RS-485 (e.g. version 01)

45. Software version on EXP (configuration MIXED ZONE)

46. Software version on 2nd EXP (configuration MIXED ZONE)
3.3 ACCESS TO INSTALLER’S PARAMETERS

For access to the installer’s parameters, press simultaneously the keys and or 2 seconds (fig. 12).

For example, the parameter PAR 23 is displayed on the display of the control panel in the following way:

The parameters scroll forwards and backwards with the key and and the default parameters can be changed with the keys and . The standard visualisation returns automatically after 60 seconds, or by pressing one of the control keys (2 fig. 12).

3.3.1 Replacing the board or_RESETTING parameters

If the PCB is replaced or reset, it is necessary to configure PAR 1 and PAR 2 by associating the following values to each type of boiler to be able to restart the boiler:

<table>
<thead>
<tr>
<th>GAS</th>
<th>MODEL</th>
<th>PAR 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHANE</td>
<td>220 BOX ErP</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>330 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>440 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>550 BOX ErP</td>
<td></td>
</tr>
<tr>
<td>PROPANE</td>
<td>220 BOX ErP</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>330 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>440 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>550 BOX ErP</td>
<td></td>
</tr>
</tbody>
</table>

PARAMETERS INSTALLER

### FAST CONFIGURATION

<table>
<thead>
<tr>
<th>PAR DESCRIPTION</th>
<th>RANGE</th>
<th>UNIT OF MEASUREMENT</th>
<th>INC/DEC UNIT</th>
<th>DEFAULT SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Combustion configuration</td>
<td>-- = ND</td>
<td>=</td>
<td>=</td>
<td>- -</td>
</tr>
<tr>
<td>2 Hydraulic configuration</td>
<td>-- = ND</td>
<td>=</td>
<td>=</td>
<td>- -</td>
</tr>
<tr>
<td>3 Timetable 2 programmer</td>
<td>1 = DHW + Recirc. pump</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>4 Pressure transducer disabler</td>
<td>1 = Enabled</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>5 Assignment of auxiliary relay AUX</td>
<td>1 = Remote alarm NC</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>6 Luminous bar indicating presence of voltage</td>
<td>1 = Enabled</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>7 Allocation of SIM HOME channels</td>
<td>1 = Circuit 1</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>8 Fan rpm Step ignition</td>
<td>0,0 ... 81</td>
<td>rpmx100</td>
<td>0,1 from 0,1 to 19,9</td>
<td>0,0</td>
</tr>
<tr>
<td>9 Long chimneys</td>
<td>0 ... 20</td>
<td>%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>10 Remote control option setting</td>
<td>1 = SIM HOME</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>11 Correction values external sensor</td>
<td>3 Timetable 2 programmer</td>
<td>1 = DHW + Recirc. pump</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>12 Backlighting duration</td>
<td>0 = Never</td>
<td>sec. x 10</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>13 Modulating pump speed</td>
<td>1 = Automatic mod.</td>
<td>%</td>
<td>10</td>
<td>Au</td>
</tr>
<tr>
<td>14 Setting second input TA</td>
<td>1 = Enabled</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>15 Cascade address</td>
<td>1 = Enabled</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>16 Modbus address</td>
<td>1 = Not enabled</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>17 ModBus communication configuration</td>
<td>1 = Enabled</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
<tr>
<td>18 Type circuit</td>
<td>1 = Not enabled</td>
<td>=</td>
<td>=</td>
<td>1</td>
</tr>
</tbody>
</table>

### D.H.W. - HEATING

<table>
<thead>
<tr>
<th>PAR DESCRIPTION</th>
<th>RANGE</th>
<th>UNIT OF MEASUREMENT</th>
<th>INC/DEC UNIT</th>
<th>DEFAULT SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Minimum heating temperature Zone 1</td>
<td>PAR 64 OEM ... PAR 21</td>
<td>°C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>21 Maximum heating temperature Zone 1</td>
<td>PAR 20 ... PAR 65 OEM</td>
<td>°C</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>22 Heating curve slope Zone 1</td>
<td>3 ... 40</td>
<td>%</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>23 Minimum heating temperature Zone 2</td>
<td>PAR 24</td>
<td>°C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>24 Maximum heating temperature Zone 2</td>
<td>PAR 28</td>
<td>°C</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>25 Heating curve slope Zone 2</td>
<td>3 ... 40</td>
<td>%</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>26 Minimum heating temperature Zone 3</td>
<td>PAR 24</td>
<td>°C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>27 Maximum heating temperature Zone 3</td>
<td>PAR 30</td>
<td>°C</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>28 Heating curve slope Zone 3</td>
<td>3 ... 40</td>
<td>%</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>29 At heating circuit</td>
<td>10 ... 40</td>
<td>°C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>30 Post-circulation heating time</td>
<td>0 ... 199</td>
<td>Sec.</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>31 Maximum heating capacity</td>
<td>30 ... 100</td>
<td>%</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>32 Zone 1 pump activation delay</td>
<td>0 ... 199</td>
<td>10 sec.</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>33 Start-up delay</td>
<td>0 ... 10</td>
<td>Min.</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>34 Additional source activation threshold</td>
<td>0 ... 40</td>
<td>°C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>35 Boiler antifreeze</td>
<td>0 ... 20</td>
<td>°C</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>36 External sensor antifreeze</td>
<td>0 ... 20</td>
<td>°C</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>37 Band saturation</td>
<td>0 ... 100</td>
<td>%</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>38 Flowmeter modulation</td>
<td>0 ... 100</td>
<td>%</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>39 Anti-legionella</td>
<td>0 ... 100</td>
<td>%</td>
<td>1</td>
<td>100</td>
</tr>
</tbody>
</table>
NOTE: the inside of the upper door of the generator panel has a label with the values that have to be set for PAR 1 and PAR 2 (fig. 19).

3.3.2 Warning

Should the generator operation not be optimal but no alarm sets off, press the button 53124 until info 70 and the warning code associated to the ongoing event are displayed. Once optimal operation is restored, info 70 will display: "--".

Below is the table of warning codes:

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>E0</td>
<td>Reduced capacity operation (Δt between delivery and return over 40°C)</td>
</tr>
<tr>
<td>E1</td>
<td>Shorted external sensor (SE)</td>
</tr>
<tr>
<td>E2</td>
<td>Preheating function active</td>
</tr>
<tr>
<td>E3</td>
<td>TBD</td>
</tr>
<tr>
<td>E4</td>
<td>TBD</td>
</tr>
<tr>
<td>E5</td>
<td>TBD</td>
</tr>
<tr>
<td>E6</td>
<td>TBD</td>
</tr>
<tr>
<td>E7</td>
<td>TBD</td>
</tr>
<tr>
<td>E8</td>
<td>TBD</td>
</tr>
<tr>
<td>E9</td>
<td>TBD</td>
</tr>
</tbody>
</table>

PARAMETERS INSTALLER

<table>
<thead>
<tr>
<th>PAR DESCRIPTION</th>
<th>RANGE</th>
<th>UNIT OF MEASUREMENT</th>
<th>INC/DEC UNIT</th>
<th>DEFAULT SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 Number of expansion boards</td>
<td>0 ... 3</td>
<td>=</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>41 Mix valve stroke time</td>
<td>0 ... 199</td>
<td>10 sec.</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>42 Priority of D.H.W. over mixed zone</td>
<td>=</td>
<td>=</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>43 Floor drying</td>
<td>=</td>
<td>=</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>44 Type of solar system</td>
<td>1 ... 8</td>
<td>=</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>45 ∆t solar collector pump 1</td>
<td>PAR 74 OEM – 1 ... 50 °C</td>
<td>1</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>46 Solar integration delay</td>
<td>&quot;--&quot;, 0 ... 199 Min</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>47 Tmax solar collector</td>
<td>&quot;--&quot;, 30 ... 0 °C</td>
<td>1</td>
<td>-18</td>
<td></td>
</tr>
<tr>
<td>48 Tmmax solar collector</td>
<td>&quot;--&quot;, 80 ... 199 °C</td>
<td>1</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

PARAMETERS RESTORATION

<table>
<thead>
<tr>
<th>PAR DESCRIPTION</th>
<th>RANGE</th>
<th>UNIT OF MEASUREMENT</th>
<th>INC/DEC UNIT</th>
<th>DEFAULT SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>49 * Reset default parameters (par 01 - par 02 = &quot;--&quot;)</td>
<td>--, 1</td>
<td>=</td>
<td>=</td>
<td>=</td>
</tr>
</tbody>
</table>

* In case of difficulty in understanding the current setting or in case of an anomalous or incomprehensible conduct of the generator, we suggest to restore the initial values of the parameters setting PAR 49 = 1 and the PAR 1 and PAR 2 as specified at point 3.3.1.

CASCADE CONNECTION PARAMETERS

When the appliance is installed in sequence/cascade (modular system with several generators) it is necessary to set on all the generators the following INST PAR parameters:

PAR 15 = 0 for the first generator (MASTER)
PAR 1 ... 7 for the other generators (SLAVE)
(Avoid assigning the same number to SLAVE generators)

Set the following INST parameter if polypropylene smoke collectors with a clapet valve are used in sequence/cascade installations:

PAR 1 = 8 (for NATURAL GAS generators)
PAR 1 = 16 (for PROPANE generators)

In addition, when the number of generators in cascade is more than two, configure the parameters OEM A1 of the MASTER generator.

To access the OEM parameters press simultaneously the buttons 53124 and 53124 for 2 seconds. Entered in the INST level again press simultaneously he buttons 53124 and 53124 for another 2 seconds. At this point insert the access code formed by this sequence of INSTALLATOR BUTTONS: "+/ - / ← / → / ←".

Set the parameter:

PAR A1 = Number of cascade generators (3 ... 8)
3.4 EXTERNAL SENSOR
(fig. 13)

If there is an external sensor, the heating settings SET can be taken from the climatic curves according to the external temperature and, in any case, limited to with the range values described in point 3.3 (parameters PAR 22 for zone 1, PAR 25 for zone 2 and PAR 28 for zone 3). The climatic curve to be set can be selected from a value of 3 and 40 (at step 1).

Increasing the steepness of the curves of fig. 13 will increase the output temperature as the external temperature decreases.

3.5 CARD FUNCTIONING

The electronic card has the following functions:
- Antifreeze protection of the heating and sanitary water circuits (ICE).
- Ignition and flame detection system.
- Control panel setting for the power and the gas for boiler functioning.
- Anti-jamming for the pump which is fed for a few seconds after 24 hours of inactivity.
- Antifreeze protection for boilers with an accumulation boiling unit.
- Chimney sweep function which can be activated from the control panel.
- Temperature which can be shifted with the external sensor connected. It can be set from the control panel and is active on the heating systems of both circuit 1 and circuit 2 and 3.
- Management of 3 independent heating circuit systems.
- Automatic regulation of the ignition power and maximum heating. Adjustments are managed automatically by the electronic card to guarantee maximum flexibility in use of the system.
- Interface with the following electronic systems: remote control SIME HOME code 8092281, thermal regulator RVS, connected to a management card of a MIXED ZONE code 8092275/76, card SOLAR code 8092277 and to board MODBUS code 8092278.

NOTE: If using RVS 43 set parameter 10 to 3 (PAR 10 = 3).

3.6 TEMPERATURE DETECTION SENSOR

Table 4 shows the resistance values of the heating, DHW and exhaust fumes thermistors.

If the heating flow sensor (SM), heating return sensor (SR) or the exhaust fumes sensor (SF) is faulty or open circuit, the generator will not function.

3.7 ELECTRONIC IGNITION

Table 4 shows the resistance values of the heating, DHW and exhaust fumes thermistors.

If the heating flow sensor (SM), heating return sensor (SR) or the exhaust fumes sensor (SF) is faulty or open circuit, the generator will not function.

3.7.1 Functioning cycle

Burner ignition should occur within max. 10 seconds after the opening of the gas valve. Ignition failure with consequent activation of block can be due to:

- Lack of gas
  The ignition electrode persists in discharging for max. 10 seconds. If after 3 attempts to light the ignition is not detected the generator will lockout. This can happen the first time the boiler is switched on after a long period of inactivity due to the presence of air in the gas pipes.

- No Ionisation
  The boiler will make three attempts to light. If after the third attempt the flame has no been recognised, the generator will lockout, ALL 06.

This may be due to a disconnected,
worn or distorted ionisation electrode.

In the case of a sudden loss of voltage, the burner will immediately switch off. When voltage returns, the generator will automatically start up again.

3.8 HEAD AVAILABLE TO SYSTEM (fig. 14)

Residual head for the heating system is shown as a function of rate of flow in the graph in fig. 14.

### Wilo-Stratos Para

<table>
<thead>
<tr>
<th>Flow rate (l/h)</th>
<th>Residual head (mbar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>782</td>
</tr>
<tr>
<td>400</td>
<td>773</td>
</tr>
<tr>
<td>800</td>
<td>763</td>
</tr>
<tr>
<td>1200</td>
<td>748</td>
</tr>
<tr>
<td>1500</td>
<td>737</td>
</tr>
<tr>
<td>2000</td>
<td>728</td>
</tr>
<tr>
<td>2500</td>
<td>718</td>
</tr>
<tr>
<td>3000</td>
<td>708</td>
</tr>
<tr>
<td>3500</td>
<td>698</td>
</tr>
<tr>
<td>4000</td>
<td>688</td>
</tr>
</tbody>
</table>

Fig. 14
4 COMMISSIONING, USE and MAINTENANCE

COMMISSIONING INSTRUCTIONS

A Commissioning checklist is included in this manual and must be completed by the engineer at the time of commissioning.

General

Please note: the combustion for this appliance has been checked, adjusted and preset at the factory for operation on the gas type defined on the appliance data plate. However, it is advisable to check for correct combustion having first checked the following:

- That the boiler has been installed in accordance with these instructions
- The integrity of the flue system and the flue seals
- That PAR 9 has been set according to the calculated flue head losses (single boilers)
- That PAR 1 is set correctly for boilers connected to cascade flues
- The integrity of the boiler combustion circuit

Proceed to put the boiler into operation as follows:

1. **Check the operational (working) gas inlet pressure.**
   Set up the boiler(s) to operate at maximum rate as described in 4.5.1 (chimney sweep)
   With the boiler operating in the maximum rate condition check that the operational (working) gas pressure at the inlet gas pressure test point (see fig 16 item 1) complies with the requirements of table 1.3.
   Ensure that this inlet pressure can be obtained with all other gas appliances in the property working.

2. **Competence to carry out the check of combustion performance**
   - The person carrying out a combustion measurement should have been assessed as competent in the use of a flue gas analyser and the interpretation of the results.
   - The flue gas analyser used should be one meeting the requirements of BS7927 or BS-EN50379-3 and be calibrated in accordance with the analyser manufacturers requirements, and
   - Competence can be demonstrated by satisfactory completion of the CPA1 ACS assessment, which covers the use of electronic portable gas analysers in accordance with BS 7967, parts 1 to 4.

3. **Combustion check**
   Connect the flue gas analyser to the flue gas sampling point as shown in the diagram (fig. 15/a).
   Procedure for checking the combustion.
   Operate the boilers in "Chimney Sweep" mode as described in section 4.5.1 and record the measurements from the flue gas analyser on both minimum and maximum output. Compare the results to the following:
   - CO less than 200ppm
   - CO2 between 8.9% and 9.7% natural gas, and 9.9% and 10.5% LPG. Ratio less than 0.004.

   If the combustion reading is greater than the acceptable value AND the integrity of the complete flue system, combustion circuit seals have been verified, AND the gas inlet pressure has been verified, AND the boiler parameter settings are correct, proceed as shown in 4.2.2.
   Any adjustments should be done in small steps and adjustments of no more than 1/8th of a turn should be made, waiting at least 1 minute between adjustments to allow the settings to stabilise.
   Using the CO2 reading, adjustments should be made to the "OFF-SET" screw (fig 16) if it is incorrect at the minimum output, or to the "SHUTTER" (fig 16) if it incorrect at the maximum output.
   If an acceptable setting level cannot be achieved, re-confirm that the integrity of the flue system, combustion circuit and working gas supply pressure. If required contact Sime Ltd for further assistance.
4.1 GAS VALVE (fig. 16)

The generator is supplied as standard with a gas valve, model SIT 822 NOVA-MIX (fig. 16).

4.2 GAS CONVERSION (fig. 17)

This operation must be performed by authorised personnel using original Sime components.

To convert from natural gas to LPG or vice versa, perform the following operations:
- Close the gas cock.
- Replace the nozzle with OR (1) and gasket (2) with the one supplied in the kit.
- On completion of the conversion, test all gas connections using a suitable leak detection fluid. Do not use naked flames.
- Apply the nameplate with the new gas flow layout.
- Reconfigure PAR 1 as shown in 4.2.1 and check the combustion performance as described in 4.2.2.

4.2.1 New fuel configuration

For access to the installer’s parameters, press simultaneously keys for 5 seconds (fig. 12).

The parameters will scroll up and down with the keys and .

The display pane will show the values of the parameter PAR 1.

If the generator is a methane [G20] model, SET 8 will be displayed.

To change the fuel to propane [G31], it is necessary to set SET 16, by pressing the key .

The standard display will automatically return after 10 seconds. The table below shows the SET settings to enter when the type of gas fuel is changed.

<table>
<thead>
<tr>
<th>GAS</th>
<th>MODEL</th>
<th>PAR 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHANE</td>
<td>G 20</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>220 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>330 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>440 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>550 BOX ErP</td>
<td></td>
</tr>
<tr>
<td>PROPANE</td>
<td>G 31</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>220 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>330 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>440 BOX ErP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>550 BOX ErP</td>
<td></td>
</tr>
</tbody>
</table>

4.2.2 Calibrating the gas valve pressures

This can only be done using a flue gas analyser. If the combustion reading is greater than the acceptable value AND the integrity of the complete flue system and combustion seals have been verified AND the inlet working gas pressure has been verified, adjustments to the gas valve can be made as described below. Make only small adjustments (1/8 turn max), and allow time for the combustion analysis to be made before making further adjustments.

Sequence of operations:
1) Press and hold the button down for a few seconds .
2) Press the button for a few seconds .
3) Identify the CO₂ values at max. power by adjusting the shutter [5 fig. 16]:

<table>
<thead>
<tr>
<th>MAX power</th>
<th>CO₂ (Methane)</th>
<th>CO₂ (Propane)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9,0 ±0,3</td>
<td>10,2 ±0,3</td>
</tr>
</tbody>
</table>

4) Press the button for a few seconds .

5) Identify the CO₂ values at min. power by adjusting the OFF-SET regulation screw (6 fig. 16):

<table>
<thead>
<tr>
<th>MIN power</th>
<th>CO₂ (Methane)</th>
<th>CO₂ (Propane)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9,0 ±0,3</td>
<td>10,2 ±0,3</td>
</tr>
</tbody>
</table>

6) Press the buttons several times to check the pressures , and change them if required.
7) Press the button once more to quit the function.

4.3 CO / CO₂ RATIO

<table>
<thead>
<tr>
<th>CO ppm</th>
<th>CO₂ (NG 9%)</th>
<th>CO₂ (LPG 10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0,0011</td>
<td>0,0044</td>
</tr>
<tr>
<td>400</td>
<td>0,0010</td>
<td>0,0040</td>
</tr>
</tbody>
</table>

4.5 MAINTENANCE (fig. 20)

To ensure correct operation and efficiency it is important that the boiler is serviced at regular intervals, at least once a year (this may also be a condition of the warranty). Servicing must only be done by a qualified technician. Dur-
ing the routine service the condensate drain can be checked, by carefully pouring water into the combustion chamber, while the burner is removed. Should the boiler not be used for long periods of time, it is important that the condensate trap is checked and filled if required. It can be filled via the filling vent (see fig 20).

4.5.1 Chimney sweep function (fig. 21)

To check boiler combustion, press the installer’s key for a few seconds. The chimney sweep function will switch on and will continue for 15 minutes. From that moment, the boiler will start working in heating mode at maximum power, with cut off at 80°C and re-ignition at 70°C [ATTENTION! Ensure adequate circulation to the heating system is available before activating chimney sweep]. If the key and are pressed during the 15 minutes of the chimney sweep function, the boiler will be brought respectively to maximum and minimum power.

The chimney sweep function will automatically switch off after 15 minutes or when the key is pressed again.

4.5.2 Operation floor drying (fig. 22)

The operation floor drying keeps the floor at a pre-established temperature profile and it is activated only for those systems combined with the mixed zone card MIXED ZONE code 8092245/76. The temperature profiles can be selected by means of the installer parameter PAR 43:

0 = Not activated function
1 = Curve setting A
2 = Curve setting B
3 = Curve setting A + B

The turning off of the function happens clicking on the button OFF (return of PAR 43 to the value 0) or automatically at the end of the function. The set of the mixed zone follows the development of the selected curve and reaches a maximum of 55°C. During the function all the other heating demands are ignored (heating, sanitary, antifreeze and chimney sweep). During the functioning the display shows the remaining days for the completion of the function (example mains digits -15 = 15 days lack to the end of the function). The diagram fig. 22 reports the development of the curve.

ATTENTION:
- Observe the relevant standards and regulations of the floor manufacturer!
- Proper functioning is ensured only when the plant is correctly installed (hydraulic system, electrical installation, settings)! If not observed, the floor might get damaged!

4.6 FUNCTIONING ERRORS

When there is a functioning error, an alarm appears on the display and the blue luminous bar becomes red. Descriptions of the errors with relative alarms and solutions are given below:

- LOW WATER PRESSURE ERROR
  ALARM 02 (fig. 23/1)
  If the pressure detected by the transducer is lower than 0.5 bar, the generator stops and the display shows the alarm ALL 02. Using the external filling device, fill the system until the pressure indicated by the transducer is between 1 and 1.5 bars. If the refilling procedure has to be repeated several times, it is advisable to check that the soundness of the heating circuit is intact (check that there are no leaks).

- HIGH WATER PRESSURE ERROR
  ALARM 03 (fig. 23/2)
  If the pressure detected by the transducer is more than 4.8 bar, the generator stops and the display shows error ALL 03.

- HEATING FLOW SENSOR ERROR
  ALARM 05 (fig. 23/4)
  If the heating flow sensor (SM) is open or short circuited, the generator will not function and the display will show the alarm ALL 05.

- LOCKOUT ALARM 06 (fig. 23/5)
  If a flame has not been detected after a complete ignition sequence, or for any other reason the card cannot “see” the flame, the generator will stop and the display will show the alarm ALL 06. Press the key of the controls [2] to start up the generator again.
SAFETY/LIMIT THERMOSTAT ERROR ALARM 07 (fig. 23/6)
If either the 95 degree stat or the heat exchanger safety stat opens, the burner will turn off and ALL 07 will be displayed.

Press the key of the controls (2) to start up the boiler again.

PARASITE FLAME ERROR ALARM 08 (fig. 23/7)
If the flame control section recognises the presence of a flame in phases when one should not be present, it means there is a breakdown in the flame detection circuit; the generator will stop and the display will show error ALL 08.

WATER CIRCULATION ERROR ALARM 09 (fig. 23/8)
1. Water circulation has not been detected in the primary (generator) circuit. If this error is detected the generator will make two further attempts. If the circulation is not detected the it will stop and indicate ALL 09.

Note: circulation is detected by a small rise in the system pressure when the pump is energised. In large systems this may not be detected, and can be disabled by alteration of PAR 4.

2. The flow temperature sensor has detected a rise in excess of 5 degrees per second.

AUXILIARY SENSOR ALARM 10 (fig. 23/9)
When the antifreeze siphon sensor (SA) is open or short circuited, the display will show anomaly ALL 10.

ACTIVATION OF THE “ALL 13” EXHAUST TEMPERATURE SENSOR (fig. 23/10)
The activation of this probe causes the boiler to stop and error message ALL 13 to display.
Press the key of the controls (2) to start up the boiler again.

“ALL 14” EXHAUST TEMPERATURE SENSOR ERROR (fig. 23/11)
If the exhaust temperature sensor is open or short-circuited, the boiler stops and error message ALL 14 displays.
- **"ALL 15" FAN ERROR** (fig. 23/12)
The fan speed does not fall within the rated speed range. If the error conditions persists for two minutes, the generator activates a forced stop for thirty minutes. A new start attempt is repeated after the expiry of this interval of time.

- **EXTERNAL PROBE ERROR ** "flash" (fig. 23/13)
When the external probe (SE) is short-circuited, the display symbol flashes "flash". During such error the boiler continues normal functioning.

- **SAFETY THERMOSTAT INTERVENTION FIRST MIXED ZONE "ALL 20"** (fig. 23/14)
When it results that the MIXED ZONE board is connected to the boiler the safety thermostat intervention switches the mixed zone plant pump, the mix zone valve closes and on the display the anomaly ALL 20. During this anomaly the generator continues to function normally.

- **DELIVERY PROBE BREAKDOWN ANOMALY FIRST MIXED ZONE "ALL 21"** (fig. 23/15)
When it results that the MIXED ZONE board is connected to the boiler and the delivery probe is open or short circuited on the display the anomaly ALL 21 appears. During this anomaly the boiler continues to function normally.

- **SAFETY THERMOSTAT INTERVENTION SECOND MIXED ZONE "ALL 22"** (fig. 23/16)
When it results that the MIXED ZONE board is connected to the boiler and the safety thermostat switches the mixed zone plant pump, the mix zone valve closes and on the display the anomaly ALL 22. During this anomaly the boiler continues to function normally.

- **DELIVERY PROBE BREAKDOWN ANOMALY SECOND MIXED ZONE "ALL 23"** (fig. 23/17)
When it results that the MIXED ZONE board is connected to the boiler and the delivery probe is open or short circuited on the display the anomaly ALL 23 appears. During this anomaly the boiler continues to function normally.

- **SOLAR COLLECTOR SENSOR ANOMALY (S1) "ALL 24"** (fig. 23/18)
When the solar probe is open or short circuited, on the display the anomaly ALL 24 appears. During this anomaly the boiler continues to function normally but loses the solar function that is no longer available.

- **SOLAR PROBE ANOMALY STORAGE TANK (S2) "ALL 25"** (fig. 23/19)
When the solar probe is open or short circuited, on the display the anomaly ALL 25 appears. During this anomaly the boiler continues to function normally but loses the solar function that is no longer available.

- **ANOMALY NUMBERS RELATED BOARD "ALL 29"** (fig. 23/23)
When one of the board MIXED ZONE/ SOLAR failure or does not communicate, the display shows anomaly ALL 29. The boiler functional excluding the

- **AUXILIARY SENSOR ANOMALY (S3) "ALL 26"** (fig. 23/20)
When the solar probe is open or short circuited, on the display the anomaly ALL 26 appears. During this anomaly the boiler continues to function normally but loses the solar function that is no longer available.

- **ANOMALY SOLAR APPLICATION COMPATIBILITY "ALL 27"** (fig. 23/21)
When the hydraulic configuration is not consistent with the selection solar application, on the display the anomaly ALL 27 appears. During this anomaly the boiler continues to function normally but for the board is active in the solar anomaly, the function is only available antifreeze collector.

- **COMPATIBILITY INPUT (S3) ANOMALY ONLY FOR SYSTEM 7 "ALL 28"** (fig. 23/22)
When a probe is connected instead of a clean contact on entry S3 the board on display shows the anomaly ALL 28. During this anomaly the boiler continues to function normally but for the board is active in the solar anomaly, the function is only available antifreeze collector.
function MIXED ZONE/SOLAR.

- **HEATING RETURN SENSOR ERROR “ALL 30” (fig. 23/24)**
  When the heating return sensor (SR) is open or short-circuited, the display shows anomaly ALL 30. During such anomaly the generator continues normal functioning.

- **CASCADE DELIVERY SENSOR ERROR “ALL 31” (fig. 23/25)**
  When the cascade delivery sensor (SMC) is open or shorted, ALL 31 will be displayed.

- **THREE-ZONE SYSTEM CONFIGURATION ANOMALY “ALL 32” (fig. 23/26)**
  When the boards connected to the RS-485 are not enough and/or at least one of them is not mixing zone board, the boiler stops and anomaly ALL 32 is displayed. The boiler restarts when the boiler three-zone system configuration is activated.

- **RS-485 BOARD COMMUNICATION ANOMALY IN MODBUS MODE “ALL 33” (fig. 23/27)**
  When PAR 16 is different from “- -” and there is no communication between the boiler board and the RS-485 board in MODBUS mode for at least four minutes, the boiler stops and anomaly ALL 33 is displayed. The boiler restarts when communication is restored or when PAR 16 = “- -” is set.

- **RS-485 BOARD COMMUNICATION ANOMALY IN CASCADE MODE “ALL 34” (fig. 23/28)**
  When PAR 15 is different from “- -” and there is no communication between the boiler board and the RS-485 board in CASCADE mode, the boiler stops and anomaly ALL 34 is displayed. The boiler restarts when communication is restored or when PAR 15 = “- -” is set.

- **RS-485 AND RS-485 COMMUNICATION ANOMALY “ALL 35” (fig. 23/29)**
  When PAR 15 is different from “- -” and there is no communication between the two RS-485 boards, the boiler stops and anomaly ALL 35 is displayed. The boiler restarts when communication is restored or when PAR 15 = “- -” is set.

**CAUTION:** In the event of sequence/cascade connection, error codes 70 and 71 will appear on the SIME HOME remote control display:
- **ALARM 70**
  When an anomaly affects cascade operation (cascade delivery sensor ALL 31), SIME HOME remote control display will show alarm 70. Verify the anomaly in the cascade.
- **ALARM 71**
  When an anomaly occurs in one of the modules and the others keep operating to the extent permitted, the SIME HOME remote control display will show alarm 71. Verify the anomaly in the cascade.
**SERVICE RECORD**

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

**Service Provider**

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer’s instructions. Always use the manufacturer’s specified spare part when replacing controls.

<table>
<thead>
<tr>
<th>Service 01</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Service 02</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Service 03</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Service 04</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Service 05</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Service 06</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Service 07</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Service 08</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Service 09</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Service 10</th>
<th>Date:</th>
<th>Engineer name:</th>
<th>Company name:</th>
<th>Telephone No:</th>
<th>Gas safe register No:</th>
<th>Record: At max. rate: CO ppm AND CO₂ %</th>
<th>At min. rate: (Where Possible) CO ppm AND CO₂ %</th>
<th>Comments:</th>
<th>Signature</th>
</tr>
</thead>
</table>

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

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## INSTALLATION CHECKLIST

### SINGLE BOILER INSTALLATION

**PAR 14** (See section 2.6.6) When BMS input used, and input is 10v, the required flow temperature = °C  Set value of PAR 14

### BOILERS INSTALLED IN CASCADE

**ALL BOILERS IN THE CASCADE**

**PAR 15** (see fig 4/b) The cascade address must be set in each boiler in the cascade, denoting the master and each slave (Master = 0)

<table>
<thead>
<tr>
<th>Boiler 1</th>
<th>Boiler 2</th>
<th>Boiler 3</th>
<th>Boiler 4</th>
<th>Boiler 5</th>
<th>Boiler 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Set value of PAR 15

**PAR 1** (see section 2.2.2) When installed with a cascade flue, incorporating a clappet (non return) valve, PAR 1 must be set accordingly on each boiler in the cascade

<table>
<thead>
<tr>
<th>Boiler 1</th>
<th>Boiler 2</th>
<th>Boiler 3</th>
<th>Boiler 4</th>
<th>Boiler 5</th>
<th>Boiler 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Set value of PAR 1

### MASTER BOILER

**OEM A1** (see section 2.2.2) When the number of boilers in the cascade is greater than two, the OEM A1 on the MASTER boiler (boiler with PAR 15=0), must be set to the same value as the number of boilers in the cascade. This can only be done after PAR 15 has been set.

Number of boilers in cascade          
Set value of OEM A1 on boiler number

**PAR 14** (See section 2.6.6) When BMS input used, and input is 10v, the required flow temperature = °C  Set value of PAR 14 on the master boiler
Commissioning Checklist for Boilers in Cascade

This checklist is for guidance only, and is not a full installation safety check

Address

Engineer

<table>
<thead>
<tr>
<th>Satisfactory visual check of flue Y/N</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flue within allowable length and correctly terminated Y/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm Tightness of installation pipework downstream of Isolating valve using leak detection fluid Y/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check tightness of all valves Y/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carry out ignition test of boiler with gas isolated to ensure boiler fails safe Y/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn on gas supply to boiler and isolate main burner (disconnect gas valve) and ensure boiler goes to lockout Y/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reset boiler lockout and retry, ensuring boiler again locks out Y/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reconnect gas valve, reset boiler lockout, and ensure boiler lights and is stable Y/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test safety devices Y/N</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Safety stat(TS) - Disconnect - the boiler locks out Y/N

<table>
<thead>
<tr>
<th>Flue analysis</th>
<th>Boiler 1</th>
<th>Boiler 2</th>
<th>Boiler 3</th>
<th>Boiler 4</th>
<th>Boiler 5</th>
<th>Boiler 6</th>
<th>Boiler 7</th>
<th>Boiler 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO</td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>CO ppm</td>
<td></td>
<td></td>
<td></td>
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</table>
5 FAULT FINDING

If an electrical fault occurs on the appliance the preliminary electrical system checks must be carried out first. When any service or replacement of electrical components which has required the breaking and re-making of electrical connections has taken place, the following tests must be repeated:

– earth continuity;
– short circuit;
– polarity;
– resistance to earth.

5.1 EARTH CONTINUITY CHECK

Appliances must be electrically disconnected, meter set on ø (ohm) x 1 scale and adjust zero if necessary. Tests leads from any appliance earth point (e.g. inside control box) see wiring diagrams (section 7) to earth pin on plug. Resistance should be less than 1 ø (ohm). If the resistance is greater than 1 ø (ohm) check all earth wires for continuity and all contacts are clean and tight. If the resistance to earth is still greater than 1 ø (ohm) then this should be investigated further.

5.2 SHORT CIRCUIT CHECK

Switches turned FULL ON – meter set on ø (ohms) x 1 scale. Test leads from L to N on appliance terminal block, if meter reads 0 then there is a short circuit. Meter set on ø (ohm) x 100 scale. Repeat it with leads from L to E. If meter reads less than infinity (?) there is a fault.

NOTE: Should it be found that the fuse has failed but no fault is indicated, a detailed continuity check (i.e. by disconnecting and checking each component) is required to trace the faulty component. It is possible that a fault could occur as a result of local burning/arc-ing but no fault could be found under test. However, a detailed visual inspection should reveal evidence of burning around the fault.

5.3 POLARITY CHECK

Appliance reconnected to mains supply and meter set on 300 V ac scale. Test at appliance terminal block.

– Test leads from L to N meter reads approx.: 240 V ac.
– Test leads from L to E meter reads approx. 240 V ac.
– Test leads from N to E meter reads from 0 to 15 V ac.

5.4 RESISTANCE TO EARTH CHECK

Appliance must be disconnected from main supply and meter on ø (ohm) x 100 scale. All switches including thermostat on test leads from L to E - if meter reads other than infinity (?) there is a fault which should be isolated. A detailed continuity check is required to trace the faulty component.

IMPORTANT: These series of checks are the first electrical checks to be carried out during a fault finding procedure. On completion of the service/fault finding task which has required the breaking and remaking of electrical connections then the checks 5.1 Earth continuity, 5.3 Polarity and 5.4 Resistance to earth must be repeated.
Manufacturers Instructions

Manufacturer’s instructions must be followed for the correct connection of the condensate discharge pipe from the boiler as this may vary due to the design of the boiler. For example a visible air break and trap is not required if there is a trap with a minimum condensate seal of 75 mm incorporated into the boiler.

Internal Pipe Run In Unheated Spaces
Condensate discharge pipes that are routed in an unheated space such as a loft or garage should be insulated to prevent freezing.

Internal Condensate Pipe Discharge Termination

Internal condensate discharge pipework must be a minimum of 19mm ID (typically 22mm OD) plastic pipe or as per manufacturer’s instructions and this should “fall” a minimum of 45mm per metre away from the boiler, taking the shortest practicable route to the termination point.

(45mm as per BS6798, 52mm per metre as per industry practice is specified in the following diagrams)

To minimise the risk of freezing during prolonged sub-zero conditions, an internal “gravity discharge point” such as an internal soil stack (preferred method), internal kitchen, utility room or bathroom waste pipe e.g. from a sink, basin, bath or shower should be adopted, where possible.

Note - A suitable permanent connection to the foul waste pipe should be used. Figures 1, 2(a), 2(b) show appropriate connection methods.
Figure 1 – Connection of condensate discharge pipe to internal soil and vent stack. Note – Check manufacturer’s instructions to see if an air break is required.

Key

1 Boiler
2 Visible air break
3 75 mm trap
4 Visible air break and trap not required if there is a trap with a minimum condensate seal of 75 mm incorporated into the boiler
5 Soil and vent stack
6 Invert
7 450 mm minimum up to three storeys
8 Minimum internal diameter 19 mm
Internal Condensate Pipe Discharge Termination

Figure 2(a) – Connection of a condensate discharge pipe downstream of a sink, basin, bath or shower waste trap.
Note – Check manufacturer’s instructions to see if an air break is required.

Key
1 Boiler
2 Visible air break
3 75 mm trap
4 Visible air break and trap not required if there is a trap with a minimum condensate seal of 75 mm incorporated into the boiler. In this case the 100 mm is measured to the trap in the boiler.
5 Sink, basin, bath or shower
6 Open end of condensate discharge pipe direct into gully 25 mm min below grating but above water level; end cut at 45°
   Note – the maximum external condensate discharge length is 3 metres
7 Sink lip
8 Minimum internal diameter 19 mm
9 Pipe size transition
10 Minimum internal diameter 30 mm
11 Water/weather proof insulation
12 Drain cover/leaf guard
Manufacturers Instructions must be referred to when installing boiler condensate discharge pipes.

Key
1 Boiler
2 Visible air break at plug hole – alternative connection can be below sink trap
3 75 mm sink, basin, bath or shower waste trap
4 Sink, basin, bath or shower with integral overflow
5 Open end of condensate discharge pipe direct into gully 25 mm min below grating but above water level; end cut at 45°
Note – the maximum external condensate discharge length is 3 metres
6 Minimum internal diameter 19 mm
7 Pipe size transition
8 Minimum internal diameter 30 mm
9 Water/weather proof insulation
10 Fit drain cover/leaf guard

Figure 2(b) – Connection of a condensate discharge pipe upstream of a sink, basin, bath or shower waste trap
Internal Condensate Pipe Discharge Termination

The possibility of waste pipes freezing downstream of the connection point should be considered when determining a suitable connection point - e.g. a slightly longer pipe run to an internal soil stack may be preferable to a shorter run connecting into a kitchen waste pipe discharging directly through the wall to an external drain.

Note - Where “gravity discharge” to an internal termination is not physically possible (e.g. the discharge point is above the appliance location, or access is obstructed by a doorway), or where very long internal pipe runs would be required to reach a suitable discharge point, then a condensate pump should be used.

External waste pipes from kitchens, utility rooms or bathrooms such as sink, basin, and bath or shower waste outlets should be insulated with waterproof UV resistant, class 0 material, terminated below the grid but above the water line and a drain/leaf guard fitted. The waste pipe should be cut at 45 degrees where it terminates into the grid. (See insulation section for guidance on suitable materials).

Condensate Pumps

Use of a Condensate Pump to an Internal Termination
Condensate can be removed using a proprietary condensate pump, of a specification recommended by the boiler or pump manufacturer. In order to minimise the risk of freezing during prolonged sub-zero spells, one of the following methods internal to the property for terminating the boiler condensate pump to a foul water discharge point should be adopted such as an internal soil stack (preferred method), internal kitchen, utility room or bathroom waste pipe such as sink, basin, and bath or shower waste. Figure 3 shows a typical connection method.
Internal Condensate Pipe Discharge Termination

Figure 3 – Connection of a condensate pump - typical method (NB manufacturer’s detailed instructions should be followed).

Note – Any external pipe work should be insulated, pipe cut at 45 degrees and a drain/leaf guard fitted.

Key
1 Condensate discharge from boiler
2 Condensate pump
3 Visible air break at plug hole
4 Sink or basin with integrated overflow
5 75mm sink waste trap

Key
1 Boiler
2 Visible air break at plug hole
3 75 mm sink, basin, bath or shower waste trap
4 Sink, basin, bath or shower with integral overflow
5 Open end of condensate discharge pipe direct into gully 25 mm min below grating but above water level; end cut at 45 ° Note – the maximum external condensate discharge length is 3 metres
6 Minimum internal diameter 19 mm
7 Pipe size transition
8 Minimum internal diameter 30 mm
9 Water/weather proof insulation
10 Fit drain cover/leaf guard
External Connections

Only fit an external boiler condensate drain connection if an internal gravity or pumped connection is impractical to install.

The pipe work from the boiler should be of a minimum 19mm ID or as per manufacturer’s instructions and the condensate discharge pipe shall be run in a standard drainpipe material, e.g. poly (vinyl chloride) (PVC), un-plasticized poly (vinyl chloride) (PVC-U), acrylonitrile butadiene-styrene (ABS), polypropylene (PP) or chlorinated poly (vinyl chloride) (PVC-C).

Note - Fixing centres for brackets should be a maximum of 300mm for flexible pipe and 500mm for solid pipe and manufacturer’s recommendations should be followed.

The condensate pipe should be run internally as far as possible before going externally and the pipe diameter should be increased to a minimum of 30mm ID (typically 32mm OD) before it passes through the wall. The angle of the pipe should slope downwards by at least 3 degrees as it passes through the wall to assist in maintaining a good velocity as the condensate exits the building.

The external pipe run should be kept as short as possible to a maximum of 3 metres, taking the most direct and “most vertical” route to the discharge point, with no horizontal sections in which condensate might collect.
External Connections

Figure 4 – Connection of condensate discharge pipe to external soil and vent stack

Key
1 Boiler
2 Visible air break
3 75 mm trap
4 Visible air break and trap not required if there is a trap with a minimum condensate seal of 75mm incorporated into the boiler.
5 Soil and vent stack
6 Invert
7 450mm minimum up to three storeys
8 Minimum internal diameter 19 mm
9 Pipe size transition point
10 Minimum internal diameter 30mm
11 Water/weather proof insulation
External Connections

Alternative Solutions
Cold weather protection methods approved or endorsed by boiler manufacturers and/or service organisations may be adopted if these are considered suitable by the parties involved. It is the responsibility of the manufacturer of these products to ensure they have completed the necessary testing or calculations to ensure the product offers suitable protection to prevent the condensate pipe from freezing. The product manufacturer should provide information as to what level of external temperature and for what time period the product can protect against sub-zero temperatures, i.e. -15°C for 48 hours. BS6798 refers to devices that pump the condensate produced by a condensing boiler to a fine misting nozzle in the boiler flue terminal so that the condensate is discharged with the hot flue gas. (BS6798 section 6.3.8 note 4). The boiler manufacturer’s instructions will provide advice regarding fitting and siting of the flue terminal to ensure safe disposal of the condensate.

Additional Measures
At least one of the following measures should be fitted in addition to the measures detailed above for external condensate discharge pipes

- **Insulate external pipe with a minimum thickness of insulation to be 19mm “O” class PVC coated material.**
- **Fit trace heating – with insulation as recommended by manufacturer.**
- **Fit internal auxiliary(additional) high volume syphon unit**

Auxiliary Syphon – Fitted Internally
Auxiliary siphons fitted inside the premises assist with the siting of the boiler where an external condensate pipe **must** be fitted. The storage capacity of the auxiliary siphon increases the volume of condensate discharge reducing the risk of freezing. A further reduction in the potential for the pipe to freeze is achieved when combined with the external insulation requirements.
**External Connections**

**Electric Trace Heating**
Trace heating with an external thermostat can be fitted to the external condensate pipe to raise the temperature of the condensate pipe in freezing conditions. Trace heating takes the form of an electrical heating element run in physical contact along the length of the condensate pipe. The pipe is usually covered with thermal insulation to retain heat losses from the pipe. Heat generated by the element then maintains the temperature of the pipe. If such a system is used then the installation instructions of the trace heating manufacturer and any specific recommendations regarding pipe diameter, insulation, etc. should be followed. All other relevant guidance on condensate discharge pipe installation should also be followed.

**Insulation Materials**
Insulation used for external condensate pipes, sink or washing machine waste pipes should be of class ‘O’ grade with an outer coating that is weather proof, bird/animal proof, and UV resistant finish. A minimum of 19mm thick insulation is recommended for 32mm external pipes.

**Use of Air Breaks In Condensate Discharge Pipes**
Heating engineers should follow manufacturer’s instructions on the use of air breaks in condensate discharge pipes. A visible air break is not required if the boiler condensate trap has a minimum condensate seal of 75mm incorporated into the boiler.

**Connecting to a rain water downpipe/External Soil Stack**
When an external soil stack or rain water downpipe is used as the termination (NB only permissible if this downpipe passes to a combined foul and rainwater drainage system) an external air break must be installed between the condensate discharge pipe and the downpipe to avoid reverse flow of rainwater/sewage into the boiler should the downpipe itself become flooded or frozen.

Figure 5 shows a suitable connection method. Pipe insulation should be fitted.
External Connections

Figure 5 – External termination to rainwater downpipe (NB only combined foul/rainwater drain)

Key
1 Condensate discharge pipe from boiler
2 Pipe size transition point
3 Water/weather proof insulation
4 43mm 90° male/female bend
5 External rain water pipe into foul water
6 External air break
7 Air gap
8 68mm PVCu strap on fitting
9 Minimum internal diameter 19mm
10 Minimum internal diameter 30mm
11 End cut at 45°
External Connections

External Termination of the Condensate Pipe
Where the condensate discharge pipe is terminated over an open foul drain or gully, the pipe should terminate below the grating level, but above water level, in order to minimise “wind chill” at the open end. Pipe drainage and resistance to freezing will be improved if the termination end of the condensate pipe is cut at 45 degrees as opposed to a straight cut.

The use of a drain cover (such as those used to prevent blockage by leaves) **must** be fitted to offer further protection from wind chill. Figure 6 (following page) shows a suitable connection method. Where the condensate drain pipe terminates in a purpose-designed soakaway (see BS 6798:2014 or boiler installation manual for soakaway design requirements) any above-ground section of condensate discharge pipe should be run and insulated as described above. Figure 7 (following page) shows a suitable connection method.

Unheated Areas in Buildings
Internal condensate drainage pipes run in unheated areas such as lofts, basements and garages should be treated as external connections and insulated accordingly. Weather proof materials may not be necessary and should be assessed by the heating engineer.

Use of Air Breaks In Condensate Discharge Pipes
Installers should follow the manufacturer’s instructions on the use of air breaks in condensate discharge pipes. A visible air break and trap is not required if the boiler condensate trap has a minimum condensate seal of 75 mm incorporated into the boiler.
External Connections

Figure 6 – External drain, gully or rainwater hopper

Key
1 Boiler
2 Visible air break
3 38mm minimum trap
4 Visible air break and trap not required if there is a trap with a minimum condensate seal of 38 mm incorporated into the boiler – refer to manufacturers instructions
5 External length of pipe 3 m maximum
6 Open end of condensate discharge pipe direct into gully 25 mm min below grating but above water level; end cut at 45°
7 Minimum internal diameter 19 mm
8 Pipe size transition point
9 Minimum internal diameter 30 mm
10 Water/weather proof insulation
11 Fit drain cover/leaf guard
External Connections

Figure 7 – Example of a purpose made soakaway

Key
1 Condensate discharge pipe from boiler
2 Ground (this section of the condensate discharge pipe may be run either above or below round level); End cut at 45°
3 Diameter 100 mm minimum plastic tube
4 Bottom of tube sealed
5 Limestone chippings
6 Two rows of three 12 mm holes at 25 mm centres, 50 mm from bottom of tube and facing away from house
7 Hole depth 400 mm minimum by 300 mm diameter
8 Minimum internal diameter 19 mm
9 Pipe size transition point
10 Minimum internal diameter 30 mm
11 Water/weather proof insulation
SINGLE MODULE IGNITION (fig. 24)

The first ignition of the boiler must be carried out by qualified technical personnel.
Successively, if it is necessary to start up the boiler again, adhere strictly to the following instructions: open the gas tap to allow the flow of the fuel and move the main switch of the system to "ON". When fuel is fed to the boiler, a sequence of checks will be carried out and the display shows the normal condition of the functioning, always indicating the pressure of the system.
If the blue luminous bar is on, this indicates the presence of voltage.
Press the key of the controls (pos. 2) to activate the winter function. The display will be as shown in the figure.
N.B.: The first key press acts only to illuminate the display, successive key presses will be recognised to alter the mode or value.

REGULATION OF THE WATER TEMPERATURE FOR HEATING (fig. 25)

To set the temperature of the water for heating, press the key of the controls (2). The first time the key is pressed, the SET of heating circuit 1 is selected. The second time it is pressed, the SET of heating circuit 2 is selected. The display will be as shown in the figure. Change the values with the key and .
Standard visualisation will return to the display by pressing the key again, or after 10 seconds if no key is pressed.

Regulation of the external sensor (fig. 25/a)

If an external sensor is installed, the value of the output temperature is automatically chosen by the system, which quickly adjusts the environmental temperature on the basis of the external temperature.
If you wish to change the value of the temperature, increasing or decreasing that calculated automatically by the electronic card, proceed as indicated in the preceding paragraph.
The level of various correction of a value of temperature proportional calculated. The display will be as shown in fig. 25/a.

TO SWITCH OFF THE BOILER (fig. 24)

In the case of a short absence, press the key of the controls (pos. 2). The display will be as shown in the fig. 24. In this way, leaving the electricity and the fuel supply connected, the boiler is protected from frost and from the pump becoming jammed. If the boiler is not used for a prolonged period, it is advisable to disconnect the electricity supply, by switching off the main switch of the sy-
stem, and to close the gas isolation valve and, if low temperatures are expected, to completely empty the hydraulic circuits to avoid pipes being damaged by frost.

ERRORS AND SOLUTIONS

When there is a functioning error, the display shows an alarm and the blue luminous bar becomes red. Descriptions of the errors with the relative alarms and solutions are given below:

- **ALARM 02** (fig. 27/a)
  If the water pressure detected is lower than 0.5 bar, the boiler will stop and the display will show “ALL 02”.
  Using the external filling device until the pressure indicated by the display is between 1 and 1.5 bars.
  If it is necessary to repeat the system refilling procedure, it is advisable to contact qualified technical personnel to check the seal of the heating system (to check whether there are any leaks).

- **ALL 03**
  Request assistance from qualified technical personnel.

- **ALL 05**
  Request assistance from qualified technical personnel.

- **ALL 06** (fig. 27/c)
  Press the key \( \text{of the controls (2)} \) to re-start the boiler.
  If the error persists, request assistance from qualified technical personnel.

- **ALL 07** (fig. 27/d)
  Press the key \( \text{of the controls (2)} \) to re-start the boiler.
  If the anomaly persists, request assistance from qualified technical personnel.

- From “ALL 08” to “ALL 10”
  Request assistance from qualified technical personnel.

- **ALL 13** (fig. 27/e)
  Press the key \( \text{of the controls (2)} \) to re-start the boiler.
  If the error persists, request assistance from qualified technical personnel.

- **ALL 14 and ALL 15**
  Request assistance from qualified technical personnel.

- “\( \text{FLASHING} \)”
  If an external sensor(SE) is fitted should it become short circuited the symbol flashes on the display.
  During such error the boiler continues to function normally.
  Request assistance from qualified technical personnel.

- From “ALL 20” to “ALL 35”
  Request assistance from qualified technical personnel.

- **ALL 70 and ALL 71**
  These alarms appear on the SIME HOME remote control display. Request assistance from qualified technical personnel.

GAS CONVERSION

If it is necessary to change to a different type of gas, request assistance only from authorised technical personnel.

MAINTENANCE

Annual maintenance of the appliance should be planned sufficiently in advance, requesting the assistance of authorised technical personnel.

The boiler is supplied complete with a mains cable, which should only be replaced with one of similar dimensions.

DEMOLITION AND DISPOSAL OF THE APPLIANCE (2012/19/EU)

At the end of its life cycle the appliance MUST BE DISPOSED AND RECYCLED, as required by current law.

It MUST NOT be disposed of with domestic waste. It can be taken to waste recycling centres, where they exist, or to a dealer providing this service.

Recycling waste prevents potential damage to the environment and harm to health. It also allows you to recover many recyclable materials with significant economic and energy savings.
## PRODUCT DETAILS

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<th>Murelle Equipe</th>
<th>110 BOX ErP</th>
<th>220 BOX ErP</th>
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Specific precautionary measures to be adopted at the time of assembly, installation or maintenance of the equipment are contained in the boiler instruction manual.

Conforme all’allegato IV (punto 1) del regolamento delegato (UE) N° 811/2013 che integra la Direttiva 2010/30/UE

Con arreglo al anexo IV (punto 1) del Reglamento Delegado (UE) Nº 811/2013 que completa la Directiva 2010/30/UE

Em conformidade com o anexo IV (ponto 1) do regulamento delegado (UE) N.o 811/2013 que complementa a Diretiva 2010/30/UE

Conforming to Annex IV (item 1) of the Delegated Regulations (EU) No. 811/2013 which supplements Directive 2010/30/EU
**ANNEX AA.1**

Murelle Equipe 220 BOX ErP (Code 8117080)

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**Apparecchio di cogenerazione per il riscaldamento d’ambiente**

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**Efficienza energetica stagionale del riscaldamento di ambiente**

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**Consumo di energia del bruciatore di accensione**

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**Ignition burner power consumtion**

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**Dispersione termica in stand-by**

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**Per gli apparecchi di riscaldamento misto**

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**Consumo diario di combustibile**

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**Informazioni da fornire per le caldaie per il riscaldamento d’ambiente e le caldaie miste**

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**Informazioni sulla modellazione termica e sull’impiego energetico**

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<td>Potenza termica nominale</td>
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**Efficienza energetica stagionale del riscaldamento di ambiente**

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<td>( \eta_s )</td>
<td>90</td>
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Murelle Equipe 330 BOX ErP (Code 8117081)

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<tr>
<th>Modello / Model</th>
<th>MURELLE EQUIPE 330 BOX ErP</th>
</tr>
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</table>

**Caldaia a condensazione / Caldera de condensación:**
- Yes

**Caldaia a bassa temperatura / Caldera de baja temperatura:**
- Yes

**Caldaia di tipo B11 / Caldera de tipo B11 / Caldeira B11 / B11 boiler:**
- No

**Apparecchio di cogenerazione per il riscaldamento di ambiente:**
- Equipado con un aparato de calefacción suplementario.
  - Equipado con un aparato de calefacción suplementario.

**Apparecchio di riscaldamento misto / Equipo de calefacción mixto:**
- No

**Elemento / Elemento: Symbol Value Unit Elemento / Elemento: Symbol Value Unit**

<table>
<thead>
<tr>
<th>Potenza termica nominale / Potencia térmica nominal</th>
<th>Pmax</th>
<th>kW</th>
</tr>
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<tr>
<td>Efficienza energetica stagionale / Eficiencia energética estacional del riscaldamento / Eficiencia energética del calefacción</td>
<td>η4</td>
<td>87,8 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All'30% di potenza termica nominale e a un regime a bassa temperatura / A 30% de potencia calorífica nominal y régimen de baja temperatura</th>
<th>P1</th>
<th>94,9 kW</th>
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<tbody>
<tr>
<td>A pieno carico / Em pleno carga</td>
<td>Em full load</td>
<td>0,384 kW</td>
<td></td>
</tr>
<tr>
<td>A carico parziale / Em carga parcial</td>
<td>Em part load</td>
<td>0,027 kW</td>
<td></td>
</tr>
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**Consumo quotidiano di energia / Consumo di combustibile:**
- 22 mg/kWh

**Consumo diario de electricidad / Consumo eléctrico diaria / Daily electricity consumption**
- Qelec | kWh |

**Consumo quotidiano di energia / Consumo di combustibile:**
- 0 kW

**Consumo quotidiano di energia / Consumo di combustibile:**
- Qfuel | kWh |

**Recapiti / Datos de contacto / Elementos de contacto / Contact details**
- Fonderie Sime S.p.A. Via Garbo 27, 37045 Legnago (VR) ITALIA
<table>
<thead>
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<td>kW</td>
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<td>421,6</td>
<td>kW</td>
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<td>–</td>
<td>%</td>
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b. Low-temperature regime means for condensing boilers 30°C, for low-temperature boilers 37°C and for other heaters 50°C return temperature.

At full load

High-temperature regime

Low-temperature regime

le altre caldaie 50°C

(*) Dati di rendimento calcolati con potere calorifico superiore Hs / Datos de rendimiento calculado con el valor calorico superior Hs

Os valores do desempenho calculados com valor calorífico superior Hs / Performance data calculated with gross calorific value Hs

Murelle Equipe 550 BOX ErP (Code 8117083)