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

USER, INSTALLATION AND SERVICING INSTRUCTIONS

MURELLE HE 50 R ErP

Original Instructions

benchmark

THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

GAS SAFE REGISTER

199839

Qualified for Energy Technology List

Sime
IMPORTANT NOTICE

For the first year all of our appliances are protected by our manufacturer’s guarantee which covers both parts and labour. As you would expect from Sime Ltd, it is our aim to provide our valued customers with the best in after sales and service. To take advantage of any extended warranty offered, all you have to do is to adhere to these 3 simple conditions:

• The installation must be carried out to Manufacturers Standards by a Gas Safe Registered Engineer, and recorded in the installation manual.
• The appliance must be registered with both Sime Ltd and Gas Safe within 30 days of installation.
• The appliance must be serviced every 12 months, within 30 days of the anniversary of the installation date, by either Sime Ltd or a Gas Safe registered engineer- ensuring that the Benchmark service record in the installation manual is completed.

Failure to comply with the above will result in only the 12 month warranty being offered. In the absence of any proof of purchase, the 12 month warranty period will commence from the date of manufacture of the boiler as shown on the appliance data plate.

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.
Benchmark places responsibilities on both manufacturers and installers.* The purpose is to ensure that customers** are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer’s instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. Installers are required to carry out work in accordance with the following:

**Benchmark Checklist/Service Record when carrying out commissioning or servicing of a product or system.

Customer Service

*Show the customer any identity card that is relevant to the work being carried out prior to commencement or on request.

*Give a full and clear explanation/demonstration of the product or system and its operation to the customer.

*Hand over the manufacturer’s instructions, including the Benchmark Checklist, to the customer on completion of an installation.

*Obtain the customer’s signature, on the Benchmark Checklist, to confirm satisfactory demonstration and receipt of manufacturer’s instructions.

*Advise the customer that regular product servicing is needed, in line with manufacturers’ recommendations, to ensure that safety and efficiency is maintained.

*Respond promptly to calls from a customer following completion of work, providing advice and assistance by phone and, if necessary, visiting the customer.

*Rectify any installation problems at no cost to the customer during the installer’s guarantee period.

*The use of the word “installer” is not limited to installation itself and covers those carrying out installation, commissioning and/or servicing of heating and hot water products, or the use of supporting products (such as water treatment or test equipment).

**Customer includes householders, landlords and tenants.
The Benchmark Scheme

Sime Ltd is a licensed member of the Benchmark Scheme which aims to improve the standards of installation and commissioning of domestic heating and hot water systems in the UK and to encourage regular servicing to optimisesafety, efficiency and performance.

Benchmark is managed and promoted by the Heating and Hotwater Industry Council.

For more information visit www.centralheating.co.uk.

Please ensure that the installer has fully completed the Benchmark Checklist in the use and maintenance section of the installation instructions supplied with the product and that you have signed it to say that you have received a full and clear explanation of its operation.

The installer is legally required to complete a commissioning checklist as a means of complying with the appropriate Building Regulations (England and Wales).

All installations must be notified to Local Area Building Control either directly or through a Competent Persons Scheme.

A Building Regulations Compliance Certificate will then be issued to the customer who should, on receipt, write the Notification Number on the Benchmark Checklist.

This product should be serviced regularly to optimise its safety, efficiency and performance.

The service engineer should complete the relevant Service Record on the Benchmark Checklist after each service. The Benchmark Checklist may be required in the event of any warranty work and as supporting documentation relating to home improvements in the optional documents section of the Home Information Pack.

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.

Our Company declares that MURELLE HE 50 R ErP boilers comply with the essential requirements of the following directives:
- Boiler Efficiency Directive 92/42/EEC
- Gas Regulation 2016/426/EC
- Electromagnetic Compatibility Directive 2014/30/UE
- Low Voltage Directive 2014/35/UE
- Ecodesign Directive 2009/125/EC
- Regulation (EU) N. 813/2013 - 811/2013
- Energy Labelling 2010/30/CE
VERY IMPORTANT!

PLEASE MAKE SURE YOUR COMMISSIONING CHECKLIST AND THE SERVICE INTERVAL RECORDS ENCLOSED FILLED IN CORRECTLY.
ALL GAS SAFE REGISTERED INSTALLERS CARRY A GAS SAFE ID CARD.
BOTH SHOULD BE RECORDED IN YOUR COMMISSIONING CHECKLIST AND A SERVICE INTERVAL RECORDS.
YOU CAN CHECK YOUR INSTALLER IS GAS SAFE REGISTERED BY CALLING ON 0800 408 5500 OR ALTERNATIVELY WWW.GASSAFEREGISTER.CO.UK

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

When carrying out commissioning of the boiler, you are highly recommended to perform the following checks:
- 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.
- Open the gas valve and check the soundness of the connections, including that of the burner.
- 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 shutoff valves are open.
- Make sure that the system is charged with water and is thoroughly vented.
- Check that the circulating pump is not jammed.
- Purge the system, bleeding off the air present in the gas pipe by operating the pressure relief valve on the gas valve inlet.
- Complete the checklist included in this manual.
1  DESCRIPTION OF THE BOILER

1.1  INTRODUCTION

MURELLE HE 50 R ErP are premixed gas condensing heating modules for heating only with wide range of power modulation (from 20% to 100% of power) designed for single installation and in modular systems with several generators connected in sequence/cascade and independent from each other. For optimum installation and operation, always follow the instructions provided in this manual.

1.2  DIMENSIONS (fig. 1)

- **R**: Heating return (G 1" [UNI - ISO 228/1])
- **M**: Heating flow (G 1" [UNI - ISO 228/1])
- **G**: Gas connection (G 3/4" [UNI - ISO 228/1])
- **R3**: D.H.W. tank return (G 1" [UNI - ISO 228/1])
- **C**: Optional filling connection (G 1/2" [UNI - ISO 228/1])
- **S3**: Condensation outlet (Ø 25)
- **S1**: Safety valve discharge
- **CA**: Air inlet (Ø 80)
- **CS**: Exhaust (Ø 80)

![Diagram of the boiler](image-url)
1.3 TECHNICAL FEATURES

<table>
<thead>
<tr>
<th>MURELLE HE 50 R ErP</th>
</tr>
</thead>
</table>

**Heat output**
- Nominal (80-60°C) \([Pn \text{ max}]\) kW 46.8
- Nominal (50-30°C) \([Pn \text{ max}]\) kW 51.2
- Reduced (80-60°C) \([Pn \text{ min}]\) kW 9.3
- Reduced (50-30°C) \([Pn \text{ min}]\) kW 10.5

**Heat input (*)**
- Nominal (\(Qn \text{ max} - Qnw \text{ max}\)) kW 48.0
- Reduced (\(Qn \text{ min} - Qnw \text{ min}\)) kW 9.6

<table>
<thead>
<tr>
<th>Min/max useful yield (80-60°C) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% 96.9 / 97.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min/max useful yield (50-30°C) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% 109.0 / 106.7</td>
</tr>
</tbody>
</table>

**Useful yield at 30% of the load (40-30°C) \(\%\) 108.5

**Lostes after shutdown to 50°C (EN 15502)** W 76

**Supply voltage \(V-Hz\)** 230-50

**Adsorbed power consumption (\(Qn \text{ max} - Qn \text{ min}\)) W** 141 - 90

**Electrical protection grade** IP X4D

**Energy efficiency**
- Seasonal energy efficiency class of the heating system A
- Seasonal energy efficiency of the heating system % 93
- Power supply of the heating system dB (A) 53

<table>
<thead>
<tr>
<th>C.H. setting range °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/80</td>
</tr>
</tbody>
</table>

**Water content boiler l** 2.3

**Maximum water head (PMS) bar (kPa)** 3.5 (343)

**Maximum temperature (\(T \text{ max}\)) °C** 85

**Capacity of the heating expansion vessel l** --

**Pressure of the heating expansion vessel bar (kPa)** --

**Exhaust fumes temperature at max flow rate (80-60°C) °C** 85

**Exhaust fumes temperature at min. flow rate (80-60°C) °C** 70

**Exhaust fumes temperature at max flow rate (50-30°C) °C** 52

**Exhaust fumes temperature at min. flow rate (50-30°C) °C** 45

**Smokes flow min/max g/s** 4.2 / 21.9

**CO₂ at max/min flow rate (G20) %** 9.5 / 9.2

**CO₂ at max/min flow rate (G31) %** 10.0 / 10.3

**NOₓ measured (EN 15502-1:2015) mg/kWh** 20

**PIN number** 1312CM5613

**Category** II2H3P

**Type** B23-B53-B23P-B53P-C13-C33-C43-C53-C83

**NOₓ emission class (EN 15502-1:2015) \(\delta < 56 \text{ mg} / \text{kWh}\)**

**Weight when empty kg** 38

**Main burner nozzle**
- Quantity nozzles \(n°\) 1
- G20 nozzle diameter \(\alpha \text{ mm}\) 7.5
- G31 nozzle diameter \(\alpha \text{ mm}\) 5.5

**Consumption at maximum/minimum flow rate**
- Maximum (G20) m³/h 5.15
- Minimum (G20) m³/h 1.01
- Maximum (G31) kg/h 3.73
- Minimum (G31) kg/h 0.75

**Gas supply pressure (G20) mbar (kPa)** 20 (1.96)

**Gas supply pressure (G31) mbar (kPa)** 37 (3.63)

\(\text{(*) Heat input of the heating system measured using lower heating value \(LHV\)}\)
1.4 FUNCTIONAL DIAGRAM (fig. 2)

KEY
1. Gas valve
2. Condensate drain trap
4. Fan
5. Heating flow sensor (SM)
6. Safety thermostat 100°C
7. Exhaust sensor (SF)
8. Primary heat exchanger
10. Heating return sensor (SR)
11. Water pressure transducer
12. Auto air vent
13. Pump high efficiency
14. Drain vent
17. Safety valve 3.5 bar

CONNECTIONS
R  Heating return
M  Heating flow
G  Gas connection
S3  Condensation outlet
C  Optional filling point
R3  D.H.W. tank return

1.5 MAIN COMPONENTS (fig. 3)

KEY
1. Control panel
2. Safety thermostat
3. Heating flow sensor (SM)
4. Ignition transformer
5. Ionisation electrode
6. Primary heat exchanger
7. Air release vent
8. Exhaust probe (SF)
9. Detection electrode
10. Fan
11. Pump high efficiency
1.6 TECHNICAL DATA PLATE (fig. 3/a)
2 INSTALLATION

The boiler must be installed in a fixed location, by qualified engineers in compliance with all instructions contained in this manual. Furthermore, the installation must be in accordance with current standards and regulations.

CAUTION: Before assembling the appliance, the installer MUST make sure that the wall supports the weight.

2.1 VENTILATION

MURELLE HE 50 R ErP 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 level vents would not subject to adverse weather conditions, ie flooding.

Ventilation requirements for Murelle HE 50 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)

When installed as a class B appliance (open flued, not roomed sealed).

---

**Single installation with kit optional code 8101586**

![Diagram of single installation]

- M Heating flow R 2” [UNI-ISO 7/1]
- R Heating return R 2” [UNI-ISO 7/1]
- M2 D.H.W. tank flow G 1” [UNI-ISO 228/1]
- R3 D.H.W. tank return G 1” [UNI-ISO 228/1]

**WARNING:**

- The use of a hydraulic separator is mandatory.
- When replacing boilers in existing installations, it is advisable to install a heat exchanger to separate the boiler circuit from the secondary circuits. See the pressure curve for the boiler supply shown in figure 14.

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**Installation in sequence/cascade**

![Diagram of installation in sequence/cascade]

- R Heating return
- M Heating flow
- G Gas connection
- S3 Condensation outlet

Fig. 4
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 Murelle HE 50 R (48KW net input) boiler would require 96cm² at high level and 192cm² 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 Murelle HE 50 R (48KW net input) boiler would require 240cm² at high level and 480cm² at low level.

When installed as a class C appliance (room sealed)

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) – 2cm²/KW of net heat input
A single Murelle HE 50 R (48KW net input) boiler would require 96cm² at high level and 96cm² 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) – 5cm²/KW of net heat input
A single Murelle HE50 R (48KW net input) boiler would require 240cm² at high level and 240cm² at low level.

2.2 INSTALLATION

2.2.1 Single boiler (fig. 4)
For single boiler installations a kit is available upon request: cod. 8101585.

2.2.2 Sequence/cascade boilers
(fig. 4 - fig. 4/a)
For sequence/cascade installations where the boilers are connected to a cascade (common)flue system, PAR 1 of each boiler in the cascade must be reset as follows:
- PAR 1 = 6 (for G20 NATURAL GAS boilers)
- PAR 1 = 14 (for G31 PROPANE boilers)
Refer to section 3.3 to access the INSTALLER PARAMETERS section.
The boiler supplied with RS-485 that board that allows management of up to 8 boilers in cascade and communication in MODBUS.
The board is placed on the back of the control panel.
Access the board and chose the desired operating mode [CASCADE or MODBUS] by selecting the DIP SWITCH of the board as indicated in figure 4/a.

CASCADE mode (fig. 4/b)
Electrically connect all the boilers that form the modular cascade thermal system and set installer parameters PAR 15 on every single boiler as indicated in fig. 4/b.

CASCADE WITH MORE THAN TWO BOILERS
When more than two boilers are connected in cascade, it is essential that the OEM parameter on the “Master” boiler is reset to coincide with the number of boilers in the cascade.
This must be done after setting PAR 15 on the designated Master boiler to “0”
On the “Master” boiler press any key to wake up the display.
Then press simultaneously the and the buttons for 5 seconds until the display is as shown.

CASCADE WITH MORE THAN TWO BOILERS
When more than two boilers are connected in cascade, it is essential that the OEM parameter on the “Master” boiler is reset to coincide with the number of boilers in the cascade.
This must be done after setting PAR 15 on the designated Master boiler to “0”
On the “Master” boiler press any key to wake up the display.
Then press simultaneously the and the buttons for 2 seconds until the display shows.

The display will be as shown.

Press the button, and the display will show.

Use the and buttons to set the number of boilers in the cascade.
Then press to confirm the settings.
CHARACTERISTICS OF ELECTRIC CABLE:
- 3 wires of 24 AWG
- Screened and twisted
- Characteristic impedance 100 Ω
- Shield connected to ground with only one side of the line

INSTALLER PARAMETERS SETTING:
PAR 15 CASCADE ADDRESS
--- = Disabled
0 = Master
1...7 = Slave
(N.B. Ensure that each slave is numbered separately!)

ATTENTION:
- CONNECT UP TO A MAXIMUM OF 8 RS-485 BOARDS.
- THE EXTERNAL SENSOR MUST BE CONNECTED TO THE MASTER BOILER (SE).
- CONNECT CASCADE DELIVERY SENSOR (SMC) TO THE SLAVE 1 BOILER.
- SE, SMC sensor and the RS-485 boards wired connector are provided in a kit at the request code 8092250.
- NOTE: RS485 LED, THIS WILL BE ILLUMINATED GREEN ON THE ASSIGNED MASTER BOILER, AND ORANGE ON SLAVE BOILERS.
- THE RED LED WILL FLASH WHEN THE DIP SWITCH IS SET INCORRECTLY.
MODBUS mode (fig. 4/c)

The RS-485 board can be used for MODBUS communication of every MURELLE HE 50 R ErP boiler.

In this case, proceed as follows:

- Set the DIP SWITCH of the RS-485 board and the PAR 16 as indicated in the figure.

- Choose the communication configuration suited to the MODBUS network (PAR 17 INST) according to **Table PAR 17 INST**.

---

**TABLE PAR 17 INST / Tab. PAR 17 INST**

<table>
<thead>
<tr>
<th>Par 17 INST</th>
<th>Baud Rate</th>
<th>No. Data Bit</th>
<th>Parity</th>
<th>Stop Bit</th>
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<tr>
<td>30</td>
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**PAR 17 INST Baud Rate No. Data Bit Parity Stop Bit**

1 1200 8 Even 1
2 1200 8 Even 2
3 1200 8 Odd 1
4 1200 8 Odd 2
5 2400 8 No 1
6 2400 8 No 2
7 2400 8 Even 1
8 2400 8 Even 2
9 2400 8 Odd 1
10 2400 8 Odd 2
11 4800 8 No 1
12 4800 8 No 2
13 4800 8 Even 1
14 4800 8 Even 2
15 4800 8 Odd 1
16 4800 8 Odd 2
17 9600 8 No 1
18 9600 8 No 2
19 9600 8 Even 1
20 9600 8 Even 2
21 9600 8 Odd 1
22 9600 8 Odd 2
23 19200 8 No 1
24 19200 8 No 2
25 19200 8 Even 1
26 19200 8 Even 2
27 19200 8 Odd 1
28 19200 8 Odd 2

**ATTENTION:** Switch off and restart the boiler after setting PAR 17!
<table>
<thead>
<tr>
<th>Modbus address</th>
<th>Variable description</th>
<th>Type</th>
<th>Read/Write</th>
<th>U.M.</th>
<th>Min value</th>
<th>Max value</th>
<th>Function</th>
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<tbody>
<tr>
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<td>Boiler CH Enable/Request</td>
<td>D</td>
<td>R/W</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>Request CH zone 1</td>
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<td>Boiler DHW Enable</td>
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<td>R/W</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>Enable DHW preparation</td>
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<td>Not used</td>
</tr>
<tr>
<td>32</td>
<td>Boiler CH Mode</td>
<td>D</td>
<td>R</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>State CH zone 1</td>
</tr>
<tr>
<td>33</td>
<td>Boiler DHW Mode</td>
<td>D</td>
<td>R</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>State preparation DHW</td>
</tr>
<tr>
<td>34</td>
<td>Boiler Flame Status</td>
<td>D</td>
<td>R</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>State presence flame</td>
</tr>
<tr>
<td>35</td>
<td>Boiler Alarm Status</td>
<td>D</td>
<td>R</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>State presence alarm</td>
</tr>
</tbody>
</table>

**Digital variables**

1. **Boiler CH Primary Setpoint**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0,1°C
   - Min: 20,0
   - Max: 80,0
   - Function: Setpoint CH zone 1. 
     If you receive a value out of range so the value isn’t received and the boiler temperature control is maintained of fixed point or a temperature curve.

2. **Boiler DHW Primary Setpoint**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0,1°C
   - Min: 20,0
   - Max: 80,0
   - Function: Setpoint ACS during ACS preparation (for PAR 66 installer parameters)
     If you receive a value out of range the value isn’t received and it is used the boiler value regulation.

3. **Boiler DHW Setpoint**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0,1°C
   - Min: 10,0
   - Max: 80,0
   - Function: Setpoint ACS. 
     If you receive a value out of range the value isn’t received and it is used the boiler value regulation.

4. **Outside Temperature MB**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0,1°C
   - Min: -55,0
   - Max: 95,0
   - Function: External value of temperature by ModBus.
     If you receive a value out of range the value isn’t received. In case of conflict the boiler will give priority to the value of the probe connected to it.

5. **Boiler CH Curve Slope**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0.1
   - Min: 3,0
   - Max: 40,0
   - Function: Slope of heating curve of zone 1
     (It is used instead of the curve set in the boiler). 
     If you receive a value out of range the value isn’t received and it is used the boiler heating curve.

6. **Boiler CH Curve Displacement**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0.1
   - Min: -5,0
   - Max: 5,0
   - Function: Shift value of room zone 1 set
     (It is used instead of the shift set in the boiler). 
     If you receive a value out of range the value isn’t received and it is used the boiler heating curve.

<table>
<thead>
<tr>
<th>Modbus address</th>
<th>Variable description</th>
<th>Type</th>
<th>Read/Write</th>
<th>Unit</th>
<th>Min value</th>
<th>Max value</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>Boiler DHW Water Temperature</td>
<td>A</td>
<td>R</td>
<td>0,1°C</td>
<td>0.0</td>
<td>100,0</td>
<td>DHW temperature sensor</td>
</tr>
<tr>
<td>65</td>
<td>Boiler Primary Temperature</td>
<td>A</td>
<td>R</td>
<td>0,1°C</td>
<td>0.0</td>
<td>100,0</td>
<td>CH temperature sensor (Delivery)</td>
</tr>
<tr>
<td>66</td>
<td>Boiler Return Temperature</td>
<td>A</td>
<td>R</td>
<td>0,1°C</td>
<td>0.0</td>
<td>100,0</td>
<td>CH temperature sensor (Return)</td>
</tr>
<tr>
<td>67</td>
<td>Boiler Flue Gas Temperature</td>
<td>A</td>
<td>R</td>
<td>0.1°C</td>
<td>0.0</td>
<td>200,0</td>
<td>Smoke temperature sensor</td>
</tr>
<tr>
<td>68</td>
<td>Boiler Relative Modulation Level</td>
<td>A</td>
<td>R</td>
<td>0.1%</td>
<td>0.0</td>
<td>100,0</td>
<td>Modulation level: (0% = minimum boiler power 100% = maximum boiler power)</td>
</tr>
<tr>
<td>69</td>
<td>Boiler Primary Water Pressure</td>
<td>A</td>
<td>R</td>
<td>0.1 bar</td>
<td>0.0</td>
<td>6,0</td>
<td>Pressure value water CH</td>
</tr>
<tr>
<td>70</td>
<td>Boiler Outside Temperature</td>
<td>A</td>
<td>R</td>
<td>0.1°C</td>
<td>-100,0</td>
<td>100,0</td>
<td>Outside temperature read from the boiler through the probe connected to it</td>
</tr>
</tbody>
</table>

**Analog variables**

1. **Boiler CH Primary Setpoint**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0,1°C
   - Min: 20,0
   - Max: 80,0
   - Function: Setpoint CH zone 1. 
     If you receive a value out of range so the value isn’t received and the boiler temperature control is maintained of fixed point or a temperature curve.

2. **Boiler DHW Primary Setpoint**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0,1°C
   - Min: 20,0
   - Max: 80,0
   - Function: Setpoint ACS during ACS preparation (for PAR 66 installer parameters)
     If you receive a value out of range the value isn’t received and it is used the boiler value regulation.

3. **Boiler DHW Setpoint**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0,1°C
   - Min: 10,0
   - Max: 80,0
   - Function: Setpoint ACS. 
     If you receive a value out of range the value isn’t received and it is used the boiler value regulation.

4. **Outside Temperature MB**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0,1°C
   - Min: -55,0
   - Max: 95,0
   - Function: External value of temperature by ModBus.
     If you receive a value out of range the value isn’t received. In case of conflict the boiler will give priority to the value of the probe connected to it.

5. **Boiler CH Curve Slope**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0.1
   - Min: 3,0
   - Max: 40,0
   - Function: Slope of heating curve of zone 1
     (It is used instead of the curve set in the boiler). 
     If you receive a value out of range the value isn’t received and it is used the boiler heating curve.

6. **Boiler CH Curve Displacement**
   - Type: A/R
   - Read/Write: R/W
   - U.M.: 0.1
   - Min: -5,0
   - Max: 5,0
   - Function: Shift value of room zone 1 set
     (It is used instead of the shift set in the boiler). 
     If you receive a value out of range the value isn’t received and it is used the boiler heating curve.

7. **DHW temperature sensor**
8. **CH temperature sensor (Delivery)**
9. **CH temperature sensor (Return)**
10. **Smoke temperature sensor**
11. **Modulation level: (0% = minimum boiler power 100% = maximum boiler power)**
12. **Pressure value water CH**
13. **Outside temperature read from the boiler through the probe connected to it**

**Integer variables**

1. **Boiler CH Enable/Request**
2. **Boiler DHW Enable**
3. **Boiler Water Filling Function**
4. **Boiler CH Mode**
5. **Boiler DHW Mode**
6. **Boiler Flame Status**
7. **Boiler Alarm Status**
8. **Boiler CH Primary Setpoint**
9. **Boiler DHW Primary Setpoint**
10. **Boiler DHW Setpoint**
11. **Outside Temperature MB**
12. **Boiler CH Curve Slope**
13. **Boiler CH Curve Displacement**
14. **Boiler DHW Water Temperature**
15. **Boiler Primary Temperature**
16. **Boiler Return Temperature**
17. **Boiler Flue Gas Temperature**
18. **Boiler Relative Modulation Level**
19. **Boiler Primary Water Pressure**
20. **Boiler Outside Temperature**
21. **Boiler Current Hour**
22. **Boiler Current Day of the Week**
23. **Boiler Current Day of the Month**
24. **Boiler Current Month**
25. **Boiler Current Year**
26. **Boiler Alarm Code**
27. **Boiler Slave 1 Alarm Code**
28. **Boiler Slave 2 Alarm Code**
29. **Boiler Slave 3 Alarm Code**
30. **Boiler Slave 4 Alarm Code**
31. **Boiler Slave 5 Alarm Code**
32. **Boiler Slave 6 Alarm Code**
33. **Boiler Slave 7 Alarm Code**
34. **Boiler Combustion Parameter (Par1)**
35. **Boiler Hydraulic Parameter (Par2)**

- **Boiler Current Minute**
- **Boiler Current Hour**
- **Boiler Current Day of the Week**
- **Boiler Current Day of the Month**
- **Boiler Current Month**
- **Boiler Current Year**
- **Boiler Alarm Code**
- **Boiler Slave 1 Alarm Code**
- **Boiler Slave 2 Alarm Code**
- **Boiler Slave 3 Alarm Code**
- **Boiler Slave 4 Alarm Code**
- **Boiler Slave 5 Alarm Code**
- **Boiler Slave 6 Alarm Code**
- **Boiler Slave 7 Alarm Code**
- **Boiler Combustion Parameter (Par1)**
- **Boiler Hydraulic Parameter (Par2)**
CASCADE+MODBUS mode (fig. 4/d)

This mode allows for MODBUS communication of at least two boilers in cascade and is performed by requesting another RS-485 board provided in the kit code 8092244.

ATTENTION: Communication will occur only with the MASTER boiler, (boiler with PAR 15 = 0), interpreting the cascade as a single heat capacity generator:

\[ P_{\text{CASCADE}} = P_{\text{BOILER}} \times \text{No. BOILERS}. \]

To install the second board, proceed as follows:

- Remove the cover and electrically connect the second RS-485 board equipped with lid to the RS-485 board already installed in the MASTER boiler (boiler with PAR 15 = 0) with the wired connector provided in the kit.

CAUTION: Insert the wired connector with caution.

- Set the DIP SWITCH of the new board in MODBUS mode.
- Close the lid of the second board.
- Choose the communication configuration suited to the MODBUS network (PAR 17 INST) according to Table PAR 17 INST.

RS-485 connection to the INSOL/MIXED ZONE (fig. 4/e)

The RS-485 board can be connected to optional INSOL kit code 8092254 or MIXED ZONE code 8092252. Both require the board housing kite code 8092236. Carry out the electrical connections as indicated in the figure.

CAUTION: For electrically connecting the INSOL/MIXED ZONE board to the boiler board, refer to the instruction leaflet provided in the kit.

**INSTALLER PARAMETER SETTING:**

**PAR 16 MODBUS ADDRESS**

- -- = Not enabled
- 1...31 = Slave from 1 to 31

(ATTENTION: Avoid calling the boiler with the same number assigned to other appliances)

**PAR 17 MODBUS CONFIGURATION**

- -- = Not enabled
- 1...30 = Default value: 25

(See Table PAR 17 INST)
2.3 CONNECTING UP SYSTEM

To protect the heat exchanger becoming damaged by corrosion, incrustation or deposits, after installation it is extremely important to clean the system using suitable products. Sime recommend the use of FERNOX products for the flushing and final treatment of the system water. This is particularly important in hard water areas.

Artificially softened water must not be used to fill the heating system. It is important to check the concentration of the inhibitor after each system modification and during maintenance, following the product manufacturers instructions [specific test kits are available].

A suitable connection must be made to the safety valve, extending it to a safe termination, incorporating a tun dish if required. Isolation valves must be incorporated in the heating flow and return, to enable boiler maintenance or repair without the need to drain the entire heating system.

**WARNING:** Failure to clean, or adequately treat the heating system could invalidate the boiler 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 m$^3$/h and gas density must be taken into account.

The sections of the piping making up the system must be such as to guarantee a supply of gas sufficient to cover the maximum demand, limiting pressure loss between the gas meter and any apparatus being used to not greater than:
- 1.0 mbar for family II gases (natural gas);
- 2.0 mbar for family III gases (butane or propane).

An adhesive data plate is positioned inside the front panel; it contains all the technical data identifying the boiler and the type of gas for which the boiler is arranged.

2.3.1 Connection of condensation water trap

To ensure safe disposal of the condensate produced by the flue gases, reference should be made to BS6798:2009. The boiler incorporates a condensate trap which has a seal of 75mm, therefore no additional trap is required. The condensate should ideally be discharged internally into an internal waste pipe (washing machine/sink waste) or a soil pipe to avoid the risk of freezing. External pipe runs should be avoided, but if it is necessary, the pipework should be at least 32 mm and protected from the risk of freezing with a waterproof insulation and the length kept to a minimum and not exceeding 3 m. termination should be into an external gully or purpose made soakaway. We recommend that the condensate drain at the boiler is in 20 mm solvent weld pipe with a socket covering the connection to the trap. Alternatively a suitable hose can be secured to the trap and terminated as required [see Appendix 1 - Dealing with condensate].

**NOTE:** All pipework must have a continuous fall from the boiler and must be resistant to corrosion by condensate, copper or steel is NOT suitable. It should be noted that the connection of a condensate pipe to a drain may be subject to local building control requirements.

2.3.2 Filter on the gas pipe

The gas valve 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.

---

### KEY

1. Manual drain vent
2. Pump high efficiency
3. Safety valve 3.5 bar

---

Fig. 5
2.4 INITIAL PHASE
SYSTEM FILLING
(fig. 5)

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

2.4.1 System draining (fig. 5)

To drain the system, turn off the boiler, isolate the flow and return, and use the boiler drain vent (1 fig. 5).

2.4.2 Dealing with condensate

See Appendix 1 “Dealing with condensate”

2.4.3 Requirements for sealed water systems MURELLE HE 50 R ErP (fig. 5/b)

The heating system design should be based on the following information:

a) The available pump head is given in fig. 14.
b) A filling device as shown in fig 5/b must be incorporated.

2.5 EXHAUST

The boiler is supplied with a 80 mm gasket, which must be fitted over the exhaust terminal prior to the flue being installed (11 fig. 6 - fig. 7 - fig. 8). See fig 8a for examples of suitable flue termination positions.

2.5.1 Type B (fig. 6)

If the inlet is not connected, the boiler should be regarded a Type B device. When installing the boiler in locations where it needs to be protected from water, replace the intake terminal inserted in the flange with terminal code 8089510. For information on how to configure the boiler in this mode see figure 6.

The maximum overall length of ø 80 exhaust flues is determined by the load losses of the single accessories installed and should not exceed 16 mmH2O. The exhaust pipe can be connected to existing chimneys.

When the boiler works at low temperature is possible to use normal chimneys at the following conditions:

- The chimney must not be used by other boilers.
- The inside of the chimney must be protected from direct contact with the boiler condensation. Combustion products must be conveyed with a flexible piping or rigid plastic pipes with a diameter of about 100-150 mm providing so to the condensation siphoned drainage at the end of the pipe. The useful height of the siphon must be at least 150 mm.

2.5.2 Type C (fig. 7 - fig. 8)

The boiler becomes a Type C device when the intake terminal is removed from the flange and the intake is connected to separate exhaust ducts (fig. 7) or with coaxial exhaust (fig. 8).

2.5.3 Maximum usable length for separate ø 80 flues

The maximum overall length of ø 80 suction and exhaust flues is determined by the load losses of the single accessories installed and should not exceed 16 mmH2O.

When the segment of piping is between 11-16 mm H2O it is necessary to check and, if needed, recalibrate the gas valve as specified in point 4.2.2.

2.5.4 Maximum usable length for coaxial ø 80/125 flues

In installations with ø 80/125 coaxial exhaust, the maximum horizontal length including the 90° elbow, should not exceed 5 m.

For roof exits it should not exceed 8 m along vertical.

When the segment of pipe is between 2-5 m horizontal / 4-8 m vertical, it is necessary to check and, if needed, recalibrate the gas valve as specified in point 4.2.2.
WARNING:
Before installing accessories, lubricate the internal part of gaskets with silicon-based products. Avoid using oils and greases.

<table>
<thead>
<tr>
<th>Key</th>
<th>Code</th>
<th>Description</th>
<th>Load loss mm H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8077450A (single)</td>
<td>90° bend</td>
<td>0,8</td>
</tr>
<tr>
<td></td>
<td>8077450 (6 pieces)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2a</td>
<td>8077351A (single)</td>
<td>1000mm Extension</td>
<td>0,4</td>
</tr>
<tr>
<td></td>
<td>8077351 (6 pieces)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2b</td>
<td>8077350A (single)</td>
<td>500mm Extension</td>
<td>0,2</td>
</tr>
<tr>
<td></td>
<td>8077350 (6 pieces)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8091300</td>
<td>Articulated Tile</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>8091212B</td>
<td>Roof terminal (1381mm)</td>
<td>1,3</td>
</tr>
<tr>
<td>5</td>
<td>6296513</td>
<td>Extension with test point (250mm)</td>
<td>0,1</td>
</tr>
<tr>
<td>6</td>
<td>8077451A (single)</td>
<td>45° bend</td>
<td>0,4</td>
</tr>
<tr>
<td></td>
<td>8077451 (6 pieces)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8089501</td>
<td>Exhaust terminal</td>
<td>1,5</td>
</tr>
<tr>
<td>8</td>
<td>8091500</td>
<td>Inner/outer wall seal (2 of each)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Gasket (supplied with boiler)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WARNING:

- Installations with roof exit terminal (4a) and coaxial exhaust (13) require the use of a condensation recovery (12) that has to be connected to the water drain siphon (waste water).

- Before installing accessories, lubricate the internal part of gaskets with silicon-based products. Avoid using oils and greases.

---

### 80 mm accessories

<table>
<thead>
<tr>
<th>Key</th>
<th>Code</th>
<th>Description</th>
<th>Load loss mm</th>
<th>H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8077450A (single)</td>
<td>90° bend - 80 mm</td>
<td>0,8</td>
<td>0,8</td>
</tr>
<tr>
<td></td>
<td>8077450 (6 pieces)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2a</td>
<td>8077351A (single)</td>
<td>1000mm Extension - 80mm</td>
<td>0,35</td>
<td>0,45</td>
</tr>
<tr>
<td></td>
<td>8077351 (6 pieces)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2b</td>
<td>8077350A (single)</td>
<td>500mm Extension - 80mm</td>
<td>0,15</td>
<td>0,2</td>
</tr>
<tr>
<td></td>
<td>8077350 (6 pieces)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8091300</td>
<td>Articulated Tile</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>8091212B</td>
<td>Roof terminal [L 1381mm]</td>
<td>-</td>
<td>1,3</td>
</tr>
<tr>
<td>4a</td>
<td>8091212B</td>
<td>Coaxial roof exit terminal</td>
<td>-</td>
<td>4,0*</td>
</tr>
<tr>
<td>5</td>
<td>6296513</td>
<td>Extension with test point [L 250mm]</td>
<td>-</td>
<td>6,1</td>
</tr>
<tr>
<td>6</td>
<td>8077451A (single)</td>
<td>45° bend - 80mm</td>
<td>0,45</td>
<td>0,45</td>
</tr>
<tr>
<td></td>
<td>8077451 (6 pieces)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8091500</td>
<td>Exhaust terminal - 80mm</td>
<td>-</td>
<td>1,5</td>
</tr>
<tr>
<td>8</td>
<td>8091500</td>
<td>Inner/outer wall seal (2 of each)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>8099500</td>
<td>Inlet terminal - 80mm</td>
<td>0,2</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>8091401</td>
<td>Inlet/ exhaust fitting</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>8091401</td>
<td>Gasket [supplied with boiler]</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>8091210</td>
<td>Coaxial exaust ø80/125 L.885</td>
<td>-</td>
<td>5,0*</td>
</tr>
</tbody>
</table>

* This loss includes the losses of item 10
NOTES:
- Installation requires the use of a condensation recovery (12) that must be connected to a water drain siphon (waste water).
- Before installing accessories, lubricate the internal part of gaskets with silicon-based products. Avoid using oils and greases.
- Inserting each supplementary 90° elbow reduces the available segment by 2 metres and inserting each supplementary 45° elbow reduces the available segment by 1 metre.

---

2.5 ELECTRICAL CONNECTION

The boiler is supplied with an electric cable. Should this require replacement, it must be purchased exclusively from SIME.

The electric power supply to the boiler must be 230V - 50Hz single-phase through a 3 A fused main switch, with at least 3 mm spacing between contacts. Respect the L and N polarities and the earth connection.

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.

2.5.1 Room thermostat and/or Timer (clean contact)

The heating demand can be controlled by a thermostat and/or timer (TA) connected 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).

2.5.2 Remote control SIME HOME connection (optional)

The boiler is designed for connection to a remote control unit SIME HOME, supplied on request (code 8092280/81). The remote control unit SIME HOME allows for complete remote control of the boiler. The boiler display will show the following message:

For installation and use of the remote control, follow the instructions in the package.

NOTE: Ensure PAR 10 set to 1 (PAR 10 = 1).

2.5.3 Heat Demand by 230v

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

2.5.5 BMS (Building Management Systems)

Single or cascade boilers can be integrated into a building management system. The BMS signal should be connected to the single, or master boiler as shown in fig 11. Set PAR 14 according to the maximum (10v) flow temperature required.
– If the terminal discharges into a pathway or passageway check that combustion products will not cause nuisance and that the terminal will not obstruct the passageway.

– Where the lowest part of the terminal is fitted less than 2 m (78 in) above ground, above a balcony or above a flat roof to which people have access, the terminal MUST be protected by a purpose designed guard.

– Where the terminal is fitted within 850 mm (34 in) of a plastic or painted gutter, or 450 mm (18 in) of painted eaves, an aluminium shield at least 1,500 mm (59 in) long must be fitted to the underside of the painted surface.

– The air inlet/outlet flue duct MUST NOT be closer than 25 mm (1 in) to combustible material.

– In certain weather conditions the terminal may emit a plume of steam. This is normal but positions where this would cause a nuisance should be avoided.

### Table 2

<table>
<thead>
<tr>
<th>Terminal position</th>
<th>Minimum spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>300 mm, 12 in</td>
</tr>
<tr>
<td>B</td>
<td>75 mm, 3 in</td>
</tr>
<tr>
<td>C/D</td>
<td>200 mm, 8 in</td>
</tr>
<tr>
<td>E</td>
<td>75 mm, 3 in</td>
</tr>
<tr>
<td>F</td>
<td>300 mm, 12 in</td>
</tr>
<tr>
<td>G</td>
<td>300 mm, 12 in</td>
</tr>
<tr>
<td>H</td>
<td>600 mm, 24 in</td>
</tr>
<tr>
<td>I</td>
<td>1,200 mm, 48 in</td>
</tr>
<tr>
<td>J</td>
<td>1,200 mm, 48 in</td>
</tr>
<tr>
<td>K</td>
<td>1,500 mm, 60 in</td>
</tr>
<tr>
<td>L</td>
<td>300 mm, 12 in</td>
</tr>
<tr>
<td>M</td>
<td>300 mm, 12 in</td>
</tr>
<tr>
<td>N</td>
<td>300 mm, 12 in</td>
</tr>
<tr>
<td>P</td>
<td>300 mm, 12 in</td>
</tr>
<tr>
<td>Q</td>
<td>600 mm, 24 in</td>
</tr>
</tbody>
</table>

(*) Note: this can be reduced to 25 mm, but it would be necessary to protect the surfaces from the effects of condensate.

![Fig. 8/a](image-url)
NOTE - JP1 link
With JP1 link fitted TA2 input is by operation of a clean contact.
For operation by a BMS (0-10v dc) signal, JP1 must be removed, TA1 link fitted and the BMS connected, +ve to terminal 10 - CN6, -ve to terminal 4 - CN4.
PAR 14 will require setting to the maximum flow temperature required.”
### 3 CHARACTERISTICS

#### 3.1 CONTROL PANEL (fig. 12)

**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 (3-zone system).

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

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

**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**

**SECONDARY DIGITS**
- The boiler visualises the value of the pressure of the system (correct value is between 1 and 1.5 bar).

**MAIN DIGITS**
- The boiler visualises the values set, the state of anomaly and the external temperature.

**INTEGRATIVE SOURCES ICON**

**3 - KEYS RESERVED FOR THE INSTALLER**

- **INFORMATION KEY**
  - This key can be pressed several times to view the parameters.

- **CHIMNEY SWEEP KEY**
  - This key can be pressed several times to view the parameters.

- **DECREASE KEY**
  - This key changes the default settings.

- **INCREASE KEY**
  - This key changes the default settings.

**4 - LUMINOUS BAR**
- Blue = Functioning
- Red = Functioning anomaly

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

Fig. 12
### 3.2 ACCESS TO INSTALLER’S INFORMATION

For access to information for the installer, press the key (3 fig. 14). Each time the key is pressed, the display moves to the next item of information. If expansion boards (MIXED ZONE or INSOL) are connected, the related info will be displayed. If the key is not pressed, the system automatically quits the function. Please note the first press of any key acts to illuminate the display only.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Display of external temperature, only when external sensor connected</td>
</tr>
<tr>
<td>2.</td>
<td>Display of heating flow temperature sensor (SM)</td>
</tr>
<tr>
<td>3.</td>
<td>Display of D.H.W. temperature sensor (SS) only for instantaneous boilers</td>
</tr>
<tr>
<td>4.</td>
<td>Display of auxiliary temperature sensor or D.H.W. sensor (SB)</td>
</tr>
<tr>
<td>5.</td>
<td>Display of exhaust temperature sensor (SF)</td>
</tr>
<tr>
<td>6.</td>
<td>Display of heating temperature of first circuit</td>
</tr>
<tr>
<td>7.</td>
<td>Display of heating temperature of second circuit</td>
</tr>
<tr>
<td>8.</td>
<td>Display of ionisation current in µA</td>
</tr>
<tr>
<td>9.</td>
<td>Display fan speed in rpm x 100 (e.g. 4.800 and 1850 rpm)</td>
</tr>
<tr>
<td>10.</td>
<td>Display of number of hours of functioning of the burner in h x 100 (e.g. 14000 and 10)</td>
</tr>
<tr>
<td>11.</td>
<td>Display of number of times the burner has ignited x 1000 (e.g. 97000 and 500)</td>
</tr>
<tr>
<td>12.</td>
<td>Display of total number of errors</td>
</tr>
<tr>
<td>13.</td>
<td>Parameter access counter–Installer (i.e. 140 accesses)</td>
</tr>
<tr>
<td>14.</td>
<td>Parameter access counter–OEM (i.e. 48 accesses)</td>
</tr>
<tr>
<td>15. Access counter parameters CASCADE OEM (i.e. 05 access)</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Display of D.H.W. flowmeter load (i.e. 18 l/min and 0.3 l/min) or flow switch respectively ON and OFF. Combi boiler only.</td>
</tr>
</tbody>
</table>
18. Display of heating return temperature sensor (SR)

19. Display of the Cascade flow temperature value (when fitted)

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

21. Display safety thermostat MIXED ZONE (input S1) respectively ON and OFF

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

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

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

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

26. Display safety thermostat with board MIXED ZONE 2 (input S1) respectively ON and OFF

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

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

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

30. Display solar probe temperature value S1 with solar board INSOL

31. Display solar probe temperature value S2 with solar board INSOL

32. Display solar probe temperature value S3 with solar board INSOL

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

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

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

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

37. Display of valve operation with board MIXED ZONE 2 (respectively ON and OFF)

38. Display solar probe temperature value S1 with solar board INSOL

39. Display solar probe temperature value S2 with solar board INSOL

40. Display solar probe temperature value S3 with solar board INSOL

41. Display solar relay R1 with solar board INSOL (respectively ON and OFF)

42. Display solar relay R2 with solar board INSOL (respectively ON and OFF)

43. Display solar relay R3 with solar card INSOL (respectively ON and OFF)

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

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

46. Display % value pump control PWM (Modulating pump version only)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

92. Display solar flow meter state (respectively ON and OFF)
3.3 ACCESS TO INSTALLER’S PARAMETERS

For access to the installer’s parameters, press simultaneously the keys \( \text{SET} \) and \( \text{PAR} \) or 2 seconds (3 fig. 12).

For example, the parameter \( \text{PAR} 23 \) is shown on the display of the control panel in the following way:

The parameters scroll forwards and backwards with the key \( \text{SET} \) and \( \text{PAR} \) and the default parameters can be changed with the keys \( \text{SET} \) and \( \text{PAR} \).

The standard display 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 changed, or reset (PAR49), then PAR1 and PAR2 will need to be reset to the correct values, see tables below:

### PARAMETERS INSTALLER

**FAST CONFIGURATION**

<table>
<thead>
<tr>
<th>FAST CONFIGURATION</th>
<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>( = ) NO</td>
<td>1...63</td>
<td>( \circ )C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Hydraulic configuration</td>
<td>( = ) NO</td>
<td>1...14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Timetable 2 programmer</td>
<td>DHW + Recirc. pump</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Pressure transducer disabler</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Assignment of auxiliary relay AUX</td>
<td>Remote alarm NO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Luminous bar indicating presence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Allocation of SIME HOME channels</td>
<td>Not assigned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Fan rpm Step ignition</td>
<td>rpm/100</td>
<td>0.1 from 0.1 to 19.9</td>
<td>1 from 20 to 81</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>9 Long chimneys</td>
<td></td>
<td>0...20</td>
<td>%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>10 Remote control option setting</td>
<td>SIME HOME</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Correction values external sensor</td>
<td>-5...+5</td>
<td>°C</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>12 Backlighting duration</td>
<td></td>
<td>sec. x 10</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>13 Modulating pump speed</td>
<td></td>
<td>%</td>
<td>10</td>
<td>Au</td>
<td></td>
</tr>
<tr>
<td>14 Setting second input TA</td>
<td>Contact TA</td>
<td>5...140</td>
<td>Input 0...10VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 Cascade address</td>
<td>Not enabled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 ModBus address</td>
<td>Not enabled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 ModBus communication configuration</td>
<td>1...30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 Type circuit</td>
<td>Two zones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 D.H.W. - HEATING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MEASUREMENT UNIT SETTING**

<table>
<thead>
<tr>
<th>MEASUREMENT UNIT SETTING</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></td>
<td>( \circ )C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>2 Maximum heating temperature Zone 1</td>
<td>PAR 46 OEM...PAR 21</td>
<td>°C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>3 Heating curve slope Zone 1</td>
<td>3...40</td>
<td></td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>4 Minimum heating temperature Zone 1</td>
<td>PAR 20...PAR 65 OEM</td>
<td>°C</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>5 Heating curve slope Zone 2</td>
<td>3...40</td>
<td></td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>6 Minimum heating temperature Zone 2</td>
<td>PAR 64 OEM...PAR 24</td>
<td>°C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>7 Maximum heating temperature Zone 2</td>
<td>PAR 23...PAR 65 OEM</td>
<td>°C</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>8 Heating curve slope Zone 3</td>
<td>3...40</td>
<td></td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>9 Minimum heating temperature Zone 3</td>
<td>PAR 64 OEM...PAR 27</td>
<td>°C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>10 Maximum heating temperature Zone 3</td>
<td>PAR 26...PAR 65 OEM</td>
<td>°C</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>11 Post-circulation heating time</td>
<td>0...199</td>
<td>Sec.</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>12 Maximum capacity</td>
<td>30...100</td>
<td>%</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>13 Zone 1 pump activation delay</td>
<td>0...199</td>
<td>10 sec.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>14 Start-up delay</td>
<td>0...199</td>
<td>Min.</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>15 Additional source activation threshold</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 Boiler antifreeze</td>
<td>0...+20</td>
<td>°C</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>17 External sensor antifreeze</td>
<td>-5...+5</td>
<td>°C</td>
<td>1</td>
<td>-2</td>
</tr>
<tr>
<td>18 Band saturation</td>
<td></td>
<td></td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>19 Flowmeter modulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 D.H.W. post-circulation time</td>
<td>0...199</td>
<td>Sec.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>21 Anti-legionella</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NOTE: the inside of the upper door of the boiler panel has a label with the values that have to be set for PAR 1 and PAR 2 (fig. 19).

### 3.3.2 Warning

If the boiler is functioning but not operating optimally, and not showing any error, press the button 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>E0E1</td>
<td></td>
</tr>
<tr>
<td>E2E3E4E5E6E7E8E9</td>
<td></td>
</tr>
</tbody>
</table>

### CASCADE CONNECTION PARAMETERS

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

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

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 boilers) 16 (for PROPANE boilers)

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

See 2.2.2 Item CASCADE WITH MORE THAN TWO BOILERS.

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 cylinder.
- 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 8092280/81, thermal regulator RVS, connected to a management card of a mixed zone MIXED ZONE code 8092234, card solar INSOL code 8092235 and to board RS-485 for managing up to 8 boilers in cascade or implement a communication type Modbus (slave RTU-RS485, Reference Guide PI-MBUS-300 Rev. J) code 8092243.

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, 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 boiler will not function.

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Resistance (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>12.090</td>
</tr>
<tr>
<td>30</td>
<td>8.313</td>
</tr>
<tr>
<td>40</td>
<td>5.828</td>
</tr>
<tr>
<td>50</td>
<td>4.161</td>
</tr>
<tr>
<td>60</td>
<td>3.021</td>
</tr>
<tr>
<td>70</td>
<td>2.299</td>
</tr>
<tr>
<td>80</td>
<td>1.669</td>
</tr>
</tbody>
</table>

ATTENTION: curves are calculated at an ambient temperature of 20°C. The user can act on the boiler controls to change the environment set for which the bend has been calculated by ±5°C.

3.7 ELECTRONIC IGNITION

Ignition and flame detection is controlled by a electrodes on the burner which guarantees reaction in the case of accidental extinction or lack of gas within one second.

3.7.1 Functioning cycle

Burner ignition occurs within max. 10 seconds after the opening of the gas valve. If after three attempts to light, the ignition is not detected, the boiler will lockout. this can be due to:
- Lack of gas
  The ignition electrode will discharge for max. 10 seconds. If the burner does not ignite, the error ALL 06 is signalled. 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. It can be caused by a closed gas tap or by a broken valve coil (the interruption does not allow for opening).
- No Ionisation.
  The boiler will make three attempts
to light. If after the third attempt the flame has not been recognised, the boiler will lockout ALL06. This may be due to worn or distorted ionisation electrode.

In the case of a sudden lack of voltage, the burner will immediately switch off. When voltage returns, the boiler 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. If fitted, the speed of the modulating pump system is set as default (installation parameter PAR 13 = Au).

<table>
<thead>
<tr>
<th>Flow rate (l/h)</th>
<th>RESIDUAL HEAD (mbar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>820</td>
</tr>
<tr>
<td>200</td>
<td>779</td>
</tr>
<tr>
<td>400</td>
<td>756</td>
</tr>
<tr>
<td>600</td>
<td>731</td>
</tr>
<tr>
<td>800</td>
<td>716</td>
</tr>
<tr>
<td>1000</td>
<td>696</td>
</tr>
<tr>
<td>1200</td>
<td>650</td>
</tr>
<tr>
<td>1400</td>
<td>564</td>
</tr>
<tr>
<td>1600</td>
<td>447</td>
</tr>
<tr>
<td>1700</td>
<td>260</td>
</tr>
</tbody>
</table>

Fig. 14
3.9 "MURELLE HE 50 R ErP" WITH KIT COMPENSATOR CODE 8101586 AND DHW CYLINDER (fig. 15)

KEY
1 Gas valve
2 Condensation drain trap
3 DHW Cylinder pump [not supplied]
4 Fan
5 Heating flow sensor (SM)
6 Safety thermostat 100°C
7 Exhaust sensor (SF)
8 Primary exchanger
9 Heating return sensor (SR)
10 Water pressure transducer
11 Auto air vent
12 Fan
13 Manual drain vent
14 Gas cock [supplied in kit]
15 Non return valve
16 Safety valve 3.5 bar
17 Non return valve [not supplied]
18 Hydraulic compensator [supplied in the kit]
19 Drain tap [supplied in kit]
20 Expansion vessel 8 liter [ supplied in the kit]
21 Air relief valve [supplied in kit]
22 Oblique filter [not supplied]
23 DHW cylinder [not supplied]
24 Isolation valves [two supplied in the kit]

CONNECTIONS
M Heating flow
R Heating return
G Gas
S3 Condensation drain
C System filling
M2 D.H.W. tank flow
R3 D.H.W. tank return

The DHW cylinder pump (3) should be sized according to the losses of the domestic circuit (cylinder and pipework) and ensure the minimum flow rate (2,200 l/h).

Fig. 15
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 (6 fig 16) if it is incorrect at the minimum output, or to the “SHUT-TER” (5 fig16) 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 boiler is supplied as standard with the SIT 848 SIGMA gas valve (fig. 16).

![Diagram of SIT 848 SIGMA gas valve](Fig. 16)

**KEY**

1. Inlet pressure intake
2. Outlet pressure intake
3. Capacity step shutter
4. OFF-SET

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 seal gasket OR (1) with the one supplied in the transformation kit.
- On completion of the conversion test all gas connections using suitable leak detection fluid. Do not use naked flames.
- Apply the new data plate information, showing the correct gas used.
- Re configure PAR1, 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 and for 5 seconds (3 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 boiler is a methane (G20) model, SET 5 will be displayed:

![Key for new fuel configuration](Fig. 16)

To change the fuel to propane (G31), it is necessary to set SET 13, 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 (G20)</td>
<td>Single (50 R ErP)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Sequence/cascade</td>
<td>6</td>
</tr>
<tr>
<td>PROPANE (G31)</td>
<td>Single (50 R ErP)</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Sequence/cascade</td>
<td>14</td>
</tr>
</tbody>
</table>

4.2.2 Calibrating the gas valve pressures

To change the fuel to propane (G31), it is necessary to set SET 13, 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 (G20)</td>
<td>Single (50 R ErP)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Sequence/cascade</td>
<td>6</td>
</tr>
<tr>
<td>PROPANE (G31)</td>
<td>Single (50 R ErP)</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Sequence/cascade</td>
<td>14</td>
</tr>
</tbody>
</table>

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 gas pressure has been verified, then 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>9,2 ±0,2</td>
<td>10,3 ±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>9,5 ±0,2</td>
<td>10,0 ±0,3</td>
</tr>
</tbody>
</table>
6) Press the buttons several times to check the pressures $D$ and $E$ and change them if required.

7) Press the button $F$ once more to quit the function.

### 4.3 CO / CO$_2$ RATIO

<table>
<thead>
<tr>
<th>CO ppm</th>
<th>100</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>NG 9%</td>
<td>0.0011</td>
<td>0.0044</td>
</tr>
<tr>
<td>LPG 10%</td>
<td>0.0010</td>
<td>0.0040</td>
</tr>
</tbody>
</table>

### 4.4 DISASSEMBLING THE SHELL (fig. 19)

To simplify maintenance operations on the boiler, it is also possible to completely remove the shell, as shown in figure 19.

Turn the control panel to move it forward and be able to access the internal components of the boiler.

### 4.5 MAINTENANCE (fig. 20)

To ensure correct operation and efficiency it is important that the appliance 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 suitably qualified technicians. It is recommended that the service should include removal and inspection of the burner and its insulation. On completion a combustion analysis must be done.

During 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.

**ATTENTION:** Before performing any work on the boiler, make sure that the...
same and its components have cooled in order to prevent the risk of burns due to high temperatures.

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. 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 8092234. 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!
4.5.3 Pump high efficiency diagnose and remedy (fig. 22/a)

On the pump there is a signal LED which indicates:

<table>
<thead>
<tr>
<th>Colour LED</th>
<th>Status</th>
<th>Diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED Off</td>
<td></td>
<td>Electrical power failure</td>
</tr>
<tr>
<td>Green</td>
<td>Steady</td>
<td>Normal operation</td>
</tr>
<tr>
<td>Red/Green</td>
<td>Flashing</td>
<td>Fault in progress</td>
</tr>
<tr>
<td>Red</td>
<td>Flashing</td>
<td>Fault in progress</td>
</tr>
<tr>
<td>Red</td>
<td>Steady</td>
<td>Permanent Lockout</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Colour of LED</th>
<th>Possible fault</th>
<th>Cause</th>
<th>Possible solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashing Red-Green</td>
<td>Turbine operation</td>
<td>The hydraulic system of the pump is powered, but the pump has no mains voltage</td>
<td>- Check the mains voltage</td>
</tr>
<tr>
<td></td>
<td>Idle operation</td>
<td>Air in the pump</td>
<td>- Check that there are no leaks in the system</td>
</tr>
</tbody>
</table>
|                | Overload               | The motor runs with difficulty. The number of revolutions is lower compared to normal operation | - Check the mains voltage  
- Check the system flow rate/pressure  
- Check the characteristics of the water in the system; remove debris from the system |
| Flashing red  | Under/overvoltage      | Supply voltage too low/high                                           | - Check the mains voltage                                                        |
|                | Excessive temperature  | Excessive temperature inside the pump                                | - Check the water temperature level in relation to that of the ambient temperature  
- Check the mains voltage  
- Check the environmental operating conditions |
|                | Short circuit          | Motor current too high                                               | - Check the mains voltage                                                        |
| Steady red    | “Permanent lockout” stop| Rotor blocked                                                        | - REPLACE THE PUMP                                                               |
|                | Circuit board and/or motor failure |                                                                     | - REPLACE THE PUMP                                                               |
| LED Off       | Stopped                | Electrical power failure                                             | - Check the connection to the power supply                                         |
|                | Faulty LED             |                                                                       | - Check to see if the pump can work                                              |
|                | Faulty circuit board   |                                                                       | - REPLACE THE PUMP                                                               |

Fig. 22/a
4.6 FUNCTIONING ERRORS

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

- **LOW WATER PRESSURE ERRORS**
  **ALARM 02 (fig. 23/a)**
  If the pressure detected by the transducer is lower than 0.5 bar, the boiler 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 seal of the heating circuit is intact (check that there are no leaks).

- **HIGH WATER PRESSURE ERRORS**
  **ALARM 03 (fig. 23/b)**
  If the pressure detected by the transducer is more than 2.8 bar, the boiler stops and the display shows error ALL 03.

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

- **LOCKOUT ALARM 06 (fig. 23/e)**
  If the flame control has not detected the presence of the flame after a complete ignition sequence, or for any other reason the card cannot “see” the flame, the boiler will stop and the display will show the alarm ALL 06. Press the key of the controls (2) to start up the boiler again.
– **SAFETY/LIMIT THERMOSTAT ERROR ALARM 07** (fig. 23/f)
  If the connection with the safety thermostat/limit thermostat is interrupted, the boiler will stop; the flame control will remain waiting to be switched off for one minute, keeping the system pump on for that period. If, the thermostat connection is restored within the minute, the boiler will start up working normally again, otherwise it will stop and the display will show the alarm ALL 07. Press the key of the controls [2] to start up the boiler again.

– **FLAME DETECTION ERROR ALARM 08** (fig. 23/g)
  If the flame control section recognises the presence of flames also in phases when they should not be present, it means there is a breakdown in the flame detection circuit; the boiler will stop and the display will show error ALL 08.

– **WATER CIRCULATION ERRORS ALARM 09** (fig. 23/h)
  1. Water circulation has not been detected in the primary(boiler) circuit. If this error is detected the boiler will make two further attempts. If circulation is not detected it will stop and display ALL09.
  
  Note, circulation is detected by a small rise in system pressure at the boiler transducer 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 temperature rise in excess of 5 degrees per second.

– **AUXILIARY SENSOR ERRORS ALARM 10** (fig. 23/i)
  SB sensor (if fitted), shorted or open circuit. Confirm correct setting of PAR2.
  On BOX version shorted or open circuit of SA sensor

– **ACTIVATION OF THE EXHAUST TEMPERATURE SENSOR “ALL 13”** (fig. 23/j)
  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.

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

![Fig. 23/m](image)

- **EXTERNAL PROBE ERROR “Ω” FLASHING** (fig. 23/p)
When fitted if the external probe (SE) is short-circuited, the display symbol flashes “Ω”.
During such anomaly the boiler continues normal functioning.

![Fig. 23/p](image)

- **SAFETY THERMOSTAT INTERVENTION FIRST MIXED ZONE “ALL 20”** (fig. 23/q)
When the mixed zone board is connected to the boiler, a safety thermostat intervention switches on the mixed zone pump, the mixed zone valve closes and the display indicates error ALL 20.
During this error the boiler continues to function normally.

![Fig. 23/q](image)

- **DELIVERY PROBE BREAKDOWN ERROR SECOND MIXED ZONE “ALL 22”** (fig. 23/s)
When a mixed zone board is connected to the boiler, an intervention of the safety thermostat switches on the mixed zone pump, the mixed zone valve closes and the display indicates ALL 22.
During this anomaly the boiler continues to function normally.

![Fig. 23/s](image)

- **DELIVERY PROBE BREAKDOWN ERROR SECOND MIXED ZONE “ALL 23”** (fig. 23/t)
When a mixed zone board is connected to the boiler, if the delivery probe is open or short circuited, the display will indicate ALL 23 appears.
During this anomaly the boiler continues to function normally.

![Fig. 23/t](image)

- **SOLAR COLLECTOR SENSOR ERROR (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.

![Fig. 23/18](image)

- **SOLAR COLLECTOR ERROR**
- **COMPATIBILITY INPUT (S3) ERROR 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.

![Fig. 23/22](image)

- **EXTERNAL PROBE ERROR**
- **ERROR SOLAR APPLICATION COMPATIBILITY “ALL 27”** (fig. 23/21)
When the hydraulic configuration PAR 2 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.

![Fig. 23/21](image)

- **COMPATIBILITY INPUT (S3) ERROR**
- **ERROR NUMBERS RELATED BOARD “ALL 29”** (fig. 23/23)
When there is no communication with a fitted expansion board, the display will indicate ALLL29.

![Fig. 23/23](image)
- HEATING RETURN SENSOR ERROR "ALL 30" (fig. 23/u)
When the heating return sensor (SR) is open or shorted, ALL 30 will be displayed.
During such anomaly, the boiler will continue to operate normally.

- CASCADE DELIVERY SENSOR ERRORS "ALL 31" (fig. 23/v)
In cascade systems, should the delivery probe sensor (SMC) become open or short circuited, the display will show ALL31. During such anomaly, the boiler will continue to operate normally.

- THREE-ZONE SYSTEM CONFIGURATION ERROR "ALL 32" (fig. 23/w)
When the boards connected to the RS-485 are not enough and/or at least one of them it is not mixing zone board, the boiler stops and anomaly ALL32 is displayed. The boiler restarts when the boiler three-zone system configuration is activated.

- RS-485 BOARD COMMUNICATION ERROR IN MODBUS MODE "ALL 33" (fig. 23/k)
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 ERROR IN CASCADE MODE "ALL 34" (fig. 23/j)
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 ERROR "ALL 35" (fig. 23/x)
When PAR 15 is different from "- -" and there is no communication between the two RS-485 boards, the boiler stops and error 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.
**GAS BOILER SYSTEM COMMISSIONING CHECKLIST**

This Commissioning Checklist is to be completed in full by the competent person who commissioned the boiler as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission according to the manufacturer’s instructions and complete this Benchmark Commissioning Checklist will invalidate the warranty. This does not affect the customer’s statutory rights.

<table>
<thead>
<tr>
<th>Customer name:</th>
<th>Telephone number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Boiler make and model:</td>
<td></td>
</tr>
<tr>
<td>Boiler serial number:</td>
<td></td>
</tr>
<tr>
<td>Commissioned by (PRINT NAME):</td>
<td></td>
</tr>
<tr>
<td>Gas Safe register number:</td>
<td></td>
</tr>
<tr>
<td>Company name:</td>
<td>Telephone number:</td>
</tr>
<tr>
<td>Company address:</td>
<td>Commissioning date:</td>
</tr>
</tbody>
</table>

To be completed by the customer on receipt of a Building Regulations Compliance Certificate*  
Building Regulations Notification Number (if applicable):

**CONTROLS**

**Room thermostat and programmer/timer**

- Time and temperature control to heating  
- Load/weather compensation  
- Temperature control to hot water  
- Combination Boiler

**Thermostat**

- Heating zone valves  
- Hot water zone valves  
- Thermostatic radiator valves  
- Automatic bypass to system

**Boiler interlock**

- Provided

**ALL SYSTEMS**

The system has been flushed and cleaned in accordance with BS7593 and boiler manufacturer’s instructions  
What system cleaner was used?  
What inhibitor was used?  
Has a primary water system filter been installed?  
- Yes  
- No

**CENTRAL HEATING MODE**

Measure and record:

- Gas rate m³/hr  
- Burner operating pressure (if applicable) mbar  
- Central heating flow temperature °C  
- Central heating return temperature °C

**COMBINATION BOILERS ONLY**

- Is the installation in a hard water area (above 200ppm)?  
- Yes  
- No

**DOMESTIC HOT WATER MODE**

Measure and Record:

- Gas rate m³/hr  
- Burner operating pressure (at maximum rate) mbar  
- Cold water inlet temperature °C  
- Hot water has been checked at all outlets  
- Water flow rate l/min

**CONDENSING BOILERS ONLY**

The condensate drain has been installed in accordance with the manufacturer’s instructions and/or BS5546/BS6798  
- Yes

**ALL INSTALLATIONS**

Record the following:

<table>
<thead>
<tr>
<th>At max. rate:</th>
<th>CO ppm</th>
<th>AND</th>
<th>CO/CO₂ Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>At min. rate: (where possible)</td>
<td>CO ppm</td>
<td>AND</td>
<td>CO/CO₂ Ratio</td>
</tr>
</tbody>
</table>

The heating and hot water system complies with the appropriate Building Regulations  
The boiler and associated products have been installed and commissioned in accordance with the manufacturer’s instructions  
The operation of the boiler and system controls have been demonstrated to and understood by the customer  
The manufacturer’s literature, including Benchmark Checklist and Service Record, has been explained and left with the customer  
Commissioning Engineer’s Signature  
Customer’s Signature

*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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www.centralheating.co.uk
**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</th>
<th>Date</th>
<th>Engineer name</th>
<th>Company name</th>
<th>Telephone No</th>
<th>Gas safe register No</th>
<th>Record</th>
<th>Comments</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVICE 01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVICE 02</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SERVICE 03</td>
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<td>SERVICE 04</td>
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<td>SERVICE 05</td>
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<tr>
<td>SERVICE 10</td>
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<td></td>
</tr>
</tbody>
</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>
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<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.

<table>
<thead>
<tr>
<th>Number of boilers in cascade</th>
<th>Set value of OEM A1</th>
<th>on boiler number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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>
<td></td>
<td></td>
<td></td>
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</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>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test safety devices Y/N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Safety stat (TS) - Disconnect - the boiler locks out Y/N</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<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>Boiler Output</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>
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<tr>
<td>CO ppm</td>
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<tr>
<td>CO2 %</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Ratio</td>
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<tr>
<td>Boiler size</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Serial Number</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Completed By</td>
<td></td>
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<tr>
<td>Date</td>
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</tr>
</tbody>
</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 Ω (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 Ω (ohm). If the resistance is greater than 1 Ω (ohm) check all earth wires for continuity and all contacts are clean and tight. If the resistance to earth is still greater than 1 Ω (ohm) then this should be investigated further.

5.2 SHORT CIRCUIT CHECK

Switches turned FULL ON - meter set on Ω (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 Ω (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 Ω (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.
The boiler certification and warranty will be void should spares or replacement parts be used that are not supplied by Sime Ltd and only suitable qualified personnel are permitted to work on gas appliances.

Ensure that the boiler is isolated from the gas and electrical supply before commencing work.

Use appropriate personal safety equipment and be aware of hot surfaces and hot water.

Close the flow and return valves, and use the drain vents provided before removal of any part of the hydraulic circuit.

The boiler shell can be removed to improve access, see 4.4.

The control panel can be lowered after removal of the securing screw.

6.1 BURNER INSPECTION

Isolate the electrical and gas supply.

Lower the control panel.

Disconnect the ignition and ionisation electrodes.

Disconnect the air inlet to the fan.

Disconnect the gas connection at the fan.

Disconnect the two electrical connections from the fan.

While supporting the assembly, remove the four nuts securing the burner plate.

Carefully remove the burner / fan assembly from the heat exchanger.

Inspect the internal section of the heat exchanger, clean if required using a soft brush and vacuum cleaner.

Inspect the burner seals and insulation, replace if damaged.

Check the position and condition of the ignition and ionisation electrodes, replace if required.

Refit in reverse order.

On completion a flue gas analysis must be taken. See section 4- Commissioning.

6.2 FAN

Remove the burner / fan assembly as described in 6.1.

Remove the four fixing bolts and remove the fan.

Transfer the air inlet connector to the new fan.

Inspect the gasket and replace if necessary.

Fit the fan and replace in reverse order.

On completion a flue gas analysis must be taken. See section 4- Commissioning.

6.3 PUMP

Isolate the electrical and gas supply.

Lower the control panel.

Where possible to improve access, remove the RHS panel.

Isolate the flow and return valves, and drain the boiler using the drain vents provided.

Protect any electrical equipment from possible spills of system water.

Disconnect the electrical connection.

Unscrew the transducer.

Ensure the waterway is clear.

Refit in reverse order.

6.4 WATER PRESSURE TRANSDUCER

Isolate the electrical and gas supply.

Lower the control panel.

Where possible to improve access, remove the RHS panel.

Isolate the flow and return valves, and drain the boiler using the drain vents provided.

Protect any electrical equipment from possible spills of system water.

Disconnect the electrical connection.

Unscrew the transducer.

Ensure the waterway is clear.

Refit in reverse order.

6.5 PCB (PRINTED CIRCUIT BOARD)

Isolate the electrical and gas supply.

Lower the control panel.

Remove the PCB covers.

Disconnect all the plugs around the circuit board noting positions of single connections.

Remove the PCB fixing screws.

Replace in reverse order.

The new or replacement PCB will need to be reconfigured to suit the boiler.

PAR 1 will need to be set according to the gas used.

PAR 2 will need to be set according to the boiler configuration.

See section 3.3.

Boilers used in cascade may require additional configuration, see installation checklist.

6.6 GAS VALVE

Isolate the electrical and gas supply.

Lower the control panel.

Where possible to improve access, remove the LHS panel, see 4.4.

Remove the electrical connection to the gas valve.

Remove the air sensing tube, noting its position.

Disconnect the gas cock.

Remove the gas valve securing screws at base of boiler.

Disconnect the gas connection at then fan.

Remove the pipework from the gas valve and fit to the replacement valve.

Replace the gaskets as required.

Replace in reverse order.

On completion the gas valve will require adjustment. See section 4.

6.7 FLOW SENSORS (SM)

Isolate the electrical and gas supply.

Lower the control panel.

Where possible to improve access, remove the RHS panel, see 4.4.

Isolate the flow and return valves, and drain the boiler using the drain vents provided.

Protect any electrical equipment from possible spills of system water.

Disconnect the electrical connection to the sensor.

Unscrew the sensor.

Refit in reverse order.

6.8 RETURN SENSOR (SR)

Isolate the electrical and gas supply.

Lower the control panel.

Disconnect the electrical connection to the sensor.

Unclip the sensor from the pipe.

Refit in reverse order.

6.9 SAFETY STAT

Isolate the electrical and gas supply.

Lower the control panel.

Disconnect the electrical connection.

Remove the two fixing screws.

Apply heat conducting paste to the replacement stat.

Refit in reverse order.

6.10 EXHAUST SENSOR (SF)

Isolate the electrical and gas supply.

Disconnect the exhaust sensor.

Unscrew the exhaust sensor from the heat exchanger.

Refit in reverse order.

6.11 IGNITION TRANSFORMER

Isolate the electrical and gas supply.

Disconnect the electrical connections from the ignition transformer.

Remove the securing screws.

Replace in reverse order.

6.12 IGNITION ELECTRODE

Isolate the electrical and gas supply.

Disconnect the ignition electrode wiring from the ignition transformer.

Remove the Ignition electrode fixing screws.

Remove the ignition electrode.

Check the gasket and replace if required.

Refit in reverse order.

6.13 IONISATION ELECTRODE

Isolate the electrical and gas supply.

Disconnect the ionisation electrode wiring.

Remove the ionisation electrode fixing screws.

Remove the ionisation electrode.

Check the gasket and replace if required.

Refit in reverse order.

6.14 SAFETY DISCHARGE VALVE

Isolate the electrical and gas supply.

Lower the control panel.

Where possible to improve access, remove the RHS panel, see 4.4.

Isolate the flow and return valves, and drain the boiler using the drain vents provided.

Protect any electrical equipment from possible spills of system water.

Disconnect the discharge pipe.

Disconnect the safety discharge valve.

Remove the washer.

Replace in reverse order using a new washer.
<table>
<thead>
<tr>
<th>Posiz.</th>
<th>Codice</th>
<th>Descrizione</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>6138533</td>
<td>Right hand side frame part</td>
</tr>
<tr>
<td>002</td>
<td>6138632</td>
<td>Left hand side frame part</td>
</tr>
<tr>
<td>003</td>
<td>6255431</td>
<td>Expansion vessel lower support</td>
</tr>
<tr>
<td>004</td>
<td>6010864</td>
<td>Water trap bracket</td>
</tr>
<tr>
<td>005</td>
<td>6256750</td>
<td>Transformer fixing bracket</td>
</tr>
<tr>
<td>006</td>
<td>6138897</td>
<td>Frame assembly lower side</td>
</tr>
<tr>
<td>007</td>
<td>6266081</td>
<td>Rear panel</td>
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<td>008</td>
<td>6256751</td>
<td>Upper protection fixing bracket</td>
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<td>6267131</td>
<td>Main exchanger supporting bracket</td>
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<td>6277207</td>
<td>Water trap</td>
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<td>011</td>
<td>6010860</td>
<td>Main exchanger supporting bracket</td>
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<td>6010829</td>
<td>Main exchanger fixing bracket</td>
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<td>6278917</td>
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<td>014</td>
<td>6269011</td>
<td>Main exchanger door insulation</td>
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<td>6248861</td>
<td>Combustion chamber O-ring</td>
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<td>6278361</td>
<td>Burner</td>
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<tr>
<td>019</td>
<td>6174823</td>
<td>Gasket for burner flange</td>
</tr>
<tr>
<td>020</td>
<td>6278891</td>
<td>Side low air-gas hose</td>
</tr>
<tr>
<td>021</td>
<td>6174819</td>
<td>Air-gas hose gasket</td>
</tr>
<tr>
<td>022</td>
<td>6278890</td>
<td>Air-gas hose cover</td>
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<tr>
<td>023</td>
<td>6174809</td>
<td>Gasket for ignition electrode</td>
</tr>
<tr>
<td>024</td>
<td>6221632</td>
<td>Ignition electrode</td>
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<tr>
<td>025</td>
<td>6221623</td>
<td>Ionisation electrode</td>
</tr>
<tr>
<td>026</td>
<td>6174812</td>
<td>Mixer/hose gasket</td>
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<tr>
<td>027</td>
<td>6239206</td>
<td>Mixer closing plate</td>
</tr>
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<td>028</td>
<td>6274307</td>
<td>Air/gas mixer</td>
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<tr>
<td>029</td>
<td>6274122</td>
<td>Main burner nozzle 750 MET</td>
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<tr>
<td>029A</td>
<td>6274121</td>
<td>Burner nozzle ø 6,00 GPL</td>
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<tr>
<td>030</td>
<td>6226414</td>
<td>O-ring 117 Ø 13,1x2,62</td>
</tr>
<tr>
<td>031</td>
<td>2050228</td>
<td>Gasket Ø 17x24x2</td>
</tr>
<tr>
<td>032</td>
<td>6261405</td>
<td>Fan</td>
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<td>033</td>
<td>6174816</td>
<td>Gasket for fan flange</td>
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<td>6226410</td>
<td>O-Ring Ø 63 x 3</td>
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<td>6083055</td>
<td>Duct flange 60</td>
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<td>6034155</td>
<td>Condensate drainage pipe</td>
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<td>2051132</td>
<td>Clamp diam. 22,1</td>
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<tr>
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<td>2051133</td>
<td>Clamp diam. 24,2</td>
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<td>6147412</td>
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<td>6175401</td>
<td>Cover for micro switches</td>
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<td>6226464</td>
<td>O-ring 115 diam. 11,91x2,62</td>
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<td>6226624</td>
<td>Spring air vent knob</td>
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<tr>
<td>044</td>
<td>6277943</td>
<td>Pipe conn. C.H. flow - pump</td>
</tr>
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<td>6124822</td>
<td>Circulating pump</td>
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<tr>
<td>046</td>
<td>6013182</td>
<td>Automatic air vent</td>
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<tr>
<td>047</td>
<td>2050257</td>
<td>Gasket diam. 30x22x3</td>
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<td>048</td>
<td>6277944</td>
<td>Pipe connecting pump-exchanger</td>
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<td>049</td>
<td>6231350</td>
<td>Temperature sensor</td>
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<td>6227438</td>
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<td>100°C safety stat</td>
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<td>6022010</td>
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INDUSTRY GUIDANCE FOR INSTALLERS ON CONDENSATE DRAINAGE PIPE INSTALLATION

This guidance is endorsed by HHIC members.

1. BACKGROUND

During recent winters the UK has experienced prolonged spells of extremely cold weather - down to minus 20°C and below in many areas. This resulted in a significant increase in the number of calls to boiler manufacturers and heating engineers from householders with condensing (high efficiency) boilers where the condensate drainage pipe had frozen and become blocked with ice, causing the boiler to shut down. In the vast majority of cases such problems occur where the condensate drainage pipe is located externally to the building for some part of its length.

British Standards, Building Regulations etc. currently allow condensate drainage pipes to be run either internally or externally, or a combination of these. These documents give guidance on how to install the pipes in order to reduce the possibility of freezing. However this guidance may not be sufficient to prevent freezing in extreme conditions - with widespread and prolonged very low temperatures.

In view of the possibility that UK weather patterns will show more “extremes” in future due to the effects of global climate change, the following guidance updates previous recommendations on condensate drainage pipe installation. All other technical requirements for condensate drain installation given in British Standard BS 6798:2009, or in boiler manufacturers’ installation instructions should still be followed.

2. REVISED GUIDANCE ON CONDENSATE DRAINAGE PIPE INSTALLATION

Where a new or replacement boiler is being installed, access to an internal “gravity discharge” termination should be one of the main factors considered when determining potential boiler locations, so that the condensate drainage pipe can be terminated as recommended below. On an existing installation, the guidance below should also be followed if work is carried out to “upgrade” the condensate drainage system to reduce the risk of freezing in extreme conditions.

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

In order to minimise the risk of freezing during prolonged very cold spells, one of the following methods of terminating condensate drainage pipe should be adopted -
2.1 INTERNAL TERMINATION:

Wherever possible, the condensate drainage pipe should be terminated at a suitable internal foul water discharge point such as (a) an internal soil and vent stack or (b) an internal kitchen or bathroom waste pipe, washing machine waste pipe etc. A suitable permanent connection to the foul waste pipe should be used. Figures 1, 2(a), 2(b) show appropriate connection methods.

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.

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, the following measures may be adopted -

2.2 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.

The pump outlet should discharge to a suitable internal foul water discharge point, such as (a) an internal soil and vent stack or (b) an internal kitchen or bathroom waste pipe, washing machine waste pipe etc. Figure 3 shows a typical connection method.

A suitable permanent connection to the foul waste pipe should be used and the manufacturer’s detailed installation instructions for the pump should be followed.

2.3 EXTERNAL TERMINATION:

The use of an externally-run condensate drainage pipe, terminating at a suitable foul water discharge point or purpose-designed soakaway, may be also be considered; however if this termination method is chosen then the following measures should be adopted -

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

   The external pipe should be insulated using suitable waterproof and weatherproof insulation (“Class O” pipe insulation is suitable for this purpose).
The use of fittings, elbows etc should be kept to a minimum and any internal “burrs” on cut pipework should be removed so that the internal pipe section is as smooth as possible.

The customer/householder should be advised that even with the above measures this type of installation could freeze, and that if this were to occur then boiler shutdown could result, requiring remedial action - possibly involving a chargeable engineer call-out.

Where there are likely to be extremes of temperature or wind-chill, the use of a proprietary trace-heating system for external condensate drainage pipework, incorporating an external frost thermostat, should therefore be considered. 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 drainage pipe installation should also be followed.

*Other 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.*

If an external soil/vent stack is used as the external termination then the connection method shown in Figure 4 should be used, together with the measures on insulation etc. as described above and shown in the diagram.

When a rain water downpipe is used as the termination (*NB only permissible if this downpipe passes to a combined foul and rainwater drainage system*) an air break must be installed between the condensate drainage pipe and the downpipe to avoid reverse flow of rainwater into the boiler should the downpipe itself become flooded or frozen. Figure 5 shows a suitable connection method.

Where the condensate drainage 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 will be improved if the end is cut at 45° as opposed to a straight cut. The use of a drain cover (such as those used to prevent blockage by leaves) may offer further protection from wind chill. Figure 6 shows a suitable connection method.

Where the condensate drain pipe terminates in a purpose-designed soakaway (see BS 6798:2009 or boiler installation manual for soakaway design requirements) any above-ground section of condensate drainage pipe should be run and insulated as described above. Figure 7 shows a suitable connection method.

3. **UNHEATED INTERNAL AREAS:**

Internal condensate drainage pipes run in unheated areas such as lofts, basements and garages should be treated as external pipe.
NOTES

The Benchmark Commissioning Checklist should be completed as required to record details of the condensate drainage pipe installation.

Where an external condensate drainage pipe is installed, the customer should be made aware of the risks and consequences of its freezing and offered the option to fit trace heating (or other measures approved by the boiler manufacturer or service organisation).

Separate guidance has been published for householders on remedial actions which can be taken if a condensate drainage pipe freezes. This may result in requests for alteration to condensate drainage pipework, in which case the guidance above should be followed.

In some instances (e.g. where an elderly person’s heating needs to be reinstated as an emergency measure) condensate drainage pipes may have been cut in order to bypass any blockage and allow re-ignition of the boiler, with condensate being collected in a suitable container as a temporary solution.

While not unsafe, this is not recommended practice and if such action has been taken then the condensate drainage pipe must be reinstated as soon as possible, using the above guidance to reduce risk of freezing in future.
Figure 1 – Connection of condensate drainage pipe to internal 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 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
Figure 2(a) – Connection of a condensate drainage pipe downstream of a sink, basin, bath or shower waste trap

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 drainage pipe direct into gully 25 mm min below grating but above water level; end cut at 45°
7. Sink lip
8. Minimum internal diameter 19 mm
9. Pipe size transition
10. Minimum internal diameter 30 mm
11. Water/weather proof insulation
Figure 2(b) – Connection of a condensate drainage pipe upstream of a sink, basin, bath or shower 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 drainage pipe direct into gully 25 mm min below grating but above water level; end cut at 45°
6  Minimum internal diameter 19 mm
7  Pipe size transition
8  Minimum internal diameter 30 mm
9  Water/weather proof insulation
Figure 3 – Connection of a condensate pump - typical method (NB manufacturer’s detailed instructions should be followed).

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.
Figure 4 – Connection of condensate drainage 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 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
9. Pipe size transition point
10. Minimum internal diameter 30 mm
11. Water/weather proof insulation
Figure 6 – External drain, gully or rainwater hopper

Key
1  Boiler
2  Visible air break
3  38 mm 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
5  External length of pipe 3 m maximum
6  Open end of condensate drainage 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
Figure 6 – External drain, gully or rainwater hopper

Key
1  Boiler
2  Visible air break
3  38 mm 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
5  External length of pipe 3 m maximum
6  Open end of condensate drainage 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
Figure 7 – Example of a purpose-made soakaway

Key
1. Condensate discharge pipe from boiler
2. Ground (this section of the condensate drainage pipe may be run either above or below ground 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
BOILER 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 isolation valve 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 illuminates 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 system, and to close the gas tap and, if low temperatures are expected, to completely empty the hydraulic circuits to avoid pipes being 

Fig. 24

Fig. 25

Fig. 25/a
damaged by frost.

**ERRORS AND SOLUTIONS**

When there is a functioning anomaly, the display shows an alarm and the blue luminous bar becomes red.

Descriptions of the anomalies 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, repressurise the heating system until the pressure indicated by transducer is between 1 and 1.5 bar.
  If it is necessary to repeat the system refilling procedure, it is advisable to contact qualified technical personnel to check the soundness 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 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 of the controls (2) to re-start the boiler.
  If the error persists, request assistance from qualified technical personnel.

- **ALL 08, ALL 09, ALL 10**
  Request assistance from qualified technical personnel.

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

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

- **“FLASHING”**
  If an external sensor (SE) is fitted, should it become short circuited, this symbol will flash on the display. During such error the boiler will continue normal functioning.
  - 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.

**GREEN LED PUMP HIGH EFFICIENCY (fig. 28)**

If the LED signal is missing or the colour changes (blinking red/green, blinking red or fixed), contact an authorised technician.

**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 with an mains cable which should only be replaced with one of similar dimensions.

**ATTENTION:** It is mandatory that the dedicated power cable is replaced only with a spare cable ordered and connected by professionally qualified personnel.

**DEMOLITION AND DISPOSAL OF THE APPLIANCE (2012/19/UE)**

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.
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</tbody>
</table>

Specific precautionary measures to be adopted at the time of assembly, installation or maintenance of the equipment are contained in the boiler instruction manual.

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Conforme all’allegato IV (punto 1) del regolamento delegato (UE) N° 811/2013 che integra la Direttiva 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 HE 50 R ErP (Code 8111202)

Information for boiler space heaters, boiler combination heaters

<table>
<thead>
<tr>
<th>Model / Modelos / Modelo:</th>
<th>MURELLE HE 50 R ErP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caldaia a condensazione / Calderas de condensación / Condensing boiler:</td>
<td>Yes</td>
</tr>
<tr>
<td>Caldaia a bassa temperatura / Caldera de baja temperatura:</td>
<td>Yes</td>
</tr>
<tr>
<td>Caldaia di tipo B11 / Caldera de tipo B11 / B11 boiler:</td>
<td>No</td>
</tr>
</tbody>
</table>

Apparecchio di cogenerazione per il riscaldamento d’ambiente: | No |
| A: Aquecedor de ambiente com cogeração: | No |

Apparecchio di riscaldamento misto / Equipo de calefacción mixto: | No |
| A: Aquecedor combinado / Combination heater: | No |

Elemento / Elemento / Item: | Symbol | Value | Unit |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Potenza termica nominale / Potencia térmica nominal</td>
<td>P_n</td>
<td>47 kW</td>
<td></td>
</tr>
<tr>
<td>Potência calórica nominal / Ónima térmica nominal</td>
<td>P_n</td>
<td>46,8 kW</td>
<td></td>
</tr>
<tr>
<td>Nominal heat output for space heating / Nominal calorific output for space heating</td>
<td>P_n</td>
<td>14,0 kW</td>
<td></td>
</tr>
</tbody>
</table>

Consumo assistitivo de eletricidade / Consumos eléctricos auxiliares / Auxiliary electricity consumption

<table>
<thead>
<tr>
<th>A pieno carico / Em carga parcial / At full load</th>
<th>el_val</th>
<th>0,096 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>A pieno carico / Em carga parcial / At full load</td>
<td>el_val</td>
<td>0,024 kW</td>
</tr>
</tbody>
</table>

In modo standby / En modo de espera / In standby mode

| PSB | 0,004 kW |
| Emissioni di NOx / Emisiones de Nox / Emissions of nitrogen oxides | NOx | 20 mg/kWh |

Profilo di carico dichiarato / Perfil de carga declarado / Declared load profile

| Qelec | -- kWh |
| Consumo quotidiano di energia / Consumo di diario de electricidad / Daily electricity consumption | Qfuel | -- kWh |

Recapiti / Datos de contacto / Elementos de contacto

Annexe S.p.A. Via Garbo 27, 37045 Legnago (VR) ITALIA

- Regime ad alta temperatura: temperatura di ritorno di 60°C all’entrata e 80°C di temperatura di fruizione all’uscita dell’apparecchio.
- Bassa temperatura: temperatura di ritorno (all’entrata della caldaia) per le caldaie a condensazione 30°C, per le caldaie a bassa temperatura 37°C e per le altre caldaie 50°C.
- Regime di alta temperatura: temperatura di ritorno del 60°C alla caldaia e di temperatura di alimentazione alla saldatura del apparecchio.
- Bassa temperatura: temperatura di ritorno (a cestazione della caldaia) per le caldaie di condensazione, 37°C per le caldaie a bassa temperatura e 50°C per le caldaie a bassa temperatura.
- Regime di alta temperatura: temperatura di ritorno del 60°C alla caldaia e di temperatura di alimentazione alla saldatura del apparecchio.
- Regime di alta temperatura: temperatura di ritorno del 60°C alla caldaia e di temperatura di alimentazione alla saldatura del apparecchio.