These instructions include the Benchmark Commissioning Checklist and should be left with the user for safe keeping. They must be read in conjunction with the Flue Installation Guide.
Dear customer,

Thank you for purchasing this appliance.

Please read this manual carefully before using the product and keep it in a safe place for future reference.

In order to ensure continued safe and efficient operation we recommend that the product is regularly maintained. Our Service and After Sales organization can assist with this.

We hope you will receive many years of satisfactory service.
# Contents

1.1 Building Regulations and the Benchmark Commissioning Checklist ........................................6
1.2 The Benchmark Scheme ........................................6
1.3 Installer Notification Guidelines .........................7

2 Introduction ........................................................................................................8

2.1 Symbols used .................................................................................................8
2.2 Abbreviations ...............................................................................................8
2.3 General ..........................................................................................................8
   2.3.1 Manufacturer’s liability .................................................................8
   2.3.2 Installer’s liability ..............................................................................9
   2.3.3 User’s liability ....................................................................................9

2.4 Homologations .............................................................................................10
   2.4.1 Certifications ....................................................................................10
   2.4.2 Additional Directives ......................................................................10

3 Safety instructions and recommendations ....................................................11

3.1 Safety instructions .......................................................................................11
3.2 Recommendations .........................................................................................11

4 Technical description .....................................................................................13

4.1 General description ......................................................................................13
4.2 Main parts .....................................................................................................13
4.3 Skeleton Diagrams .......................................................................................14
4.4 Operating principle ......................................................................................14
   4.4.1 Gas/air setting ..................................................................................14
   4.4.2 Combustion .....................................................................................15
   4.4.3 Heating and domestic hot water production ................................15
   4.4.4 Control system ................................................................................15
   4.4.5 Adjustment ......................................................................................15
   4.4.6 Regulation of the water temperature ............................................16
   4.4.7 Protection against low water or no circulation ................................16
   4.4.8 Overheat temperature protection ..................................................16
4.5 Circulating pump (Available pump head) ........16
4.6 Technical specifications ......................................17

5 Installation .........................................................................................................................19

5.1 Regulations governing installation ..................19

5.2 Choice of the location .................................................20
  5.2.1 Type plate ..........................................................20
  5.2.2 Location of the boiler ..............................................20

5.3 Main dimensions .........................................................22

5.4 Positioning the boiler .............................................23

5.5 Hydraulic connections .............................................23
  5.5.1 Flushing the system ...............................................24
  5.5.2 Water flow rate ......................................................24
  5.5.3 Connection of the heating circuit .........................24
  5.5.4 Connection of the water circuit for domestic use ........25
  5.5.5 Connecting the expansion vessel .......................25
  5.5.6 Connecting the safety valve discharge pipe ........26
  5.5.7 Connecting the condensate discharge pipe ........26
  5.5.8 Automatic air bleed ...........................................28

5.6 Gas connection ...........................................................29

5.7 Connections for the air and exhaust pipes .........29
  5.7.1 Classification ......................................................29
  5.7.2 Outlets ...............................................................30
  5.7.3 Lengths of the air/flue gas pipes ......................31
  5.7.4 Additional Directives ...........................................32
  5.7.5 Connection of the combustion gas exhaust pipe ...32

5.8 Electrical connections .............................................32
  5.8.1 Control unit ..........................................................32
  5.8.2 Recommendations ...............................................33
  5.8.3 Access to the connector block / Boiler HMI ..........34
  5.8.4 Connection options .............................................34

5.9 Electrical diagram .......................................................38

5.10 Filling the system .......................................................38
  5.10.1 Water treatment ....................................................38
  5.10.2 Filling the condensate trap ..................................39
  5.10.3 Filling the system .................................................40
  5.10.4 Venting the system .............................................41
6 Commissioning ........................................................................................ 42

6.1 Control panel .................................................................................... 42

6.2 Check points before commissioning ................................................. 43

6.2.1 Preparing the boiler for commissioning ....................................... 43
6.2.2 Hydraulic circuit ........................................................................... 43
6.2.3 Electrical connections ................................................................. 43

6.3 Commissioning the boiler .................................................................. 43

6.4 Gas settings ........................................................................................ 45

6.4.1 Gas circuit .................................................................................... 45
6.4.2 Checking combustion .................................................................... 45
6.4.3 Setting the air/gas ratio ............................................................... 48

6.5 Finalizing work .................................................................................. 49

6.6 Parameter descriptions ...................................................................... 50

7 Switching off the boiler ......................................................................... 52

7.1 Installation shutdown ......................................................................... 52

7.2 Antifreeze protection ......................................................................... 52

8 Checking and maintenance .................................................................... 53

8.1 General instructions ........................................................................... 53

8.2 Standard inspection and maintenance operations ............................... 53

8.2.1 Open the boiler ............................................................................ 53
8.2.2 Checking the hydraulic pressure ................................................. 54
8.2.3 Checking the expansion vessel .................................................... 54
8.2.4 Checking the ionization current ................................................... 54
8.2.5 Checking the DHW transfer capacity .......................................... 55
8.2.6 Checking the flue gas discharge and the air supply .................... 55
8.2.7 Checking combustion ................................................................... 55
8.2.8 Checking the automatic air vent .................................................. 55
8.2.9 Checking the condensate trap ...................................................... 56
8.2.10 Checking the burner and cleaning the heat exchanger ................. 57

8.3 Specific maintenance operations ....................................................... 58

8.3.1 Replacing the ionization/ignition electrode ................................. 58
8.3.2 Replacing the 3-way valve .......................................................... 59
8.3.3 Cleaning the plate heat exchanger ............................................... 59
8.3.4 Cleaning the domestic water cartridge ....................................... 60
8.3.5 Replacement of the expansion vessel ......................................... 60
8.3.6 Re-assembling the boiler ............................................................. 61
EC declaration of conformity

The device complies with the standard type described in the EG declaration of conformity. It was manufactured and commissioned in accordance with European directives.

The original declaration of conformity is available from the manufacturer.
1.1 Building Regulations and the Benchmark Commissioning Checklist

Building Regulations (England & Wales) require notification of the installation of a heating appliance to the relevant Local Authority Building Control Department. This can be achieved via a Competent Persons Self Certification Scheme as an option to notifying the Local Authority directly.

The Health & Safety Executive operates the 'Gas Safe Register', a selfcertification scheme for gas heating appliances.

This company is a member of the Benchmark initiative and fully supports the aims of the programme. Its aim is to improve the standards of installation and commissioning of central heating systems in the UK and to encourage the regular servicing of all central heating systems to ensure safety and efficiency.

Building Regulations require that installations should comply with manufacturer’s instructions. It is therefore important that the commissioning checklist is completed by the installer. The relevant section of Building Regulations only relates to dwellings. Therefore the checklist only applies if the appliance is being installed in a dwelling or some related structure.

The flowchart opposite gives guidance for installers on the process necessary to ensure compliance with Building Regulations.

1.2 The Benchmark Scheme

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. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit www.centralheating.co.uk for more information.
1.3 Installer Notification Guidelines

Choose Building Regulations Notification Route

Competent Person's Self Certification Scheme

- Install and Commission this appliance to manufacturer's instructions
- Complete the Benchmark Checklist
- If you notify via the ‘Gas Safe Register’, the register will issue the Building Regulations certificate on members’ behalf

Scheme Members only

Call ‘Gas Safe Register’ on: 0800 408 5577
or log onto: www.gassaferegister.co.uk within 10 days

- You must ensure that the certificate number issued by the ‘Gas Safe Register’ is written onto the Benchmark Checklist
- ‘Gas Safe Register’ will issue a Building Regulations Compliance Certificate to the property owner and inform the relevant LABC

Building Control

- Contact your relevant Local Authority Building Control (LABC) who will arrange an inspection or contact a government approved inspector
- Install and Commission this appliance to manufacturer's instructions
- Complete the Benchmark Checklist
- LABC will record the data and will issue a certificate of compliance
2 Introduction

2.1 Symbols used

In these instructions, various danger levels are employed to draw the user’s attention to particular information. In so doing, we wish to safeguard the user’s safety, highlight hazards and guarantee correct operation of the appliance.

- **DANGER**
  Risk of a dangerous situation causing serious physical injury.

- **WARNING**
  Risk of a dangerous situation causing slight physical injury.

- **CAUTION**
  Risk of material damage.

- **Signals important information.**

- **Signals a referral to other instructions or other pages in the instructions.**

2.2 Abbreviations

- **LTH**: Low temperature heating
- **DHW**: Domestic hot water
- **HRU**: Heat Recovery Unit
- **PCU**: Primary Control Unit - Electronic system to control burner function
- **SCU**: Secondary Control Unit - Additional electronic system

2.3 General

2.3.1 Manufacturer’s liability

Our products are manufactured in compliance with the requirements of the various applicable European Directives. They are therefore delivered with **CE** marking and all relevant documentation.
In the interest of customers, we are continuously endeavouring to make improvements in product quality. All the specifications stated in this document are therefore subject to change without notice.

Our liability as the manufacturer may not be invoked in the following cases:

- Failure to abide by the instructions on using the appliance.
- Faulty or insufficient maintenance of the appliance.
- Failure to abide by the instructions on installing the appliance.

2.3.2. Installer’s liability

The installer is responsible for the installation and commissioning of the appliance. The installer must respect the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Carry out installation in compliance with the prevailing legislation and standards.
- Perform the initial start up and carry out any checks necessary.
- Explain the installation to the user.
- If a maintenance is necessary, warn the user of the obligation to check the appliance and maintain it in good working order.
- Give all the instruction manuals to the user.

2.3.3. User’s liability

To guarantee optimum operation of the appliance, the user must respect the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Call on qualified professionals to carry out installation and initial start up.
- Get your installer to explain your installation to you.
- Ensure the Appliance is serviced in accordance with the manufacturer’s instructions by a suitable qualified person.
- Keep the instruction manuals in good condition close to the appliance.

This appliance is not intended to be used by persons (including children) whose physical, sensory or mental capacity is impaired or persons with no experience or knowledge, unless they have the benefit, through the intermediary of a person responsible for their safety, of supervision or prior instructions regarding use of the appliance. Care should be taken to ensure that children do not play with the appliance.

If the mains power lead is damaged it must be replaced by the original manufacturer, the manufacturer's dealer or another competent person to prevent hazardous situations.
2.4 Homologations

2.4.1. Certifications

<table>
<thead>
<tr>
<th>CE identification no</th>
<th>PIN 0063CM3019</th>
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<tr>
<td>NOx classification</td>
<td>5 (Standards EN)</td>
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<tr>
<td>Type of connection (Flue gas outlet)</td>
<td>C13, C33, C53</td>
</tr>
<tr>
<td>Gas Council number</td>
<td>MainEco Combi 24: 47–075–93</td>
</tr>
<tr>
<td></td>
<td>MainEco Combi 28: 47–075–94</td>
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<tr>
<td></td>
<td>MainEco Combi 35: 47–075–95</td>
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<tr>
<td></td>
<td>MainEco System 18: 41–470–13</td>
</tr>
<tr>
<td></td>
<td>MainEco System 24: 41–470–14</td>
</tr>
</tbody>
</table>

2.4.2. Additional Directives

Apart from the legal provisions and Directives, the additional Directives described in these instructions must also be observed.

For all provisions and Directives referred to in these instructions, it is agreed that all addenda or subsequent provisions will apply at the time of installation.
3 Safety instructions and recommendations

3.1 Safety instructions

DANGER
If you smell gas:
1. Do not use a naked flame, do not smoke, do not operate electrical contacts or switches (doorbell, light, motor, lift, etc.).
2. Shut off the gas supply.
3. Open the windows.
5. Trace possible leaks and seal them immediately.
6. If the gas leak is before the gas meter, contact the gas supplier.

DANGER
If you smell flue gases:
1. Switch the appliance off.
2. Open the windows.
4. Trace possible leaks and seal them immediately.

3.2 Recommendations

WARNING
- Installation and maintenance of the boiler must be carried out by a qualified professional in compliance with prevailing local and national regulations.
- When working on the boiler, always disconnect the boiler from the mains and close the main gas inlet valve.
- After maintenance or repair work, check all installations to ensure that there are no leaks.

CAUTION
The boiler must be installed in a frost-free environment.

Keep this document close to the place where the boiler is installed.
Casing components
Only remove the casing for maintenance and repair operations. Put the casing back in place after maintenance and repair operations.

Instructions stickers
The instructions and warnings affixed to the appliance must never be removed or covered and must remain legible during the entire lifespan of the appliance. Immediately replace damaged or illegible instructions and warning stickers.

Modifications
Modifications may only be made to the boiler after the written permission of BAXI to do so.
4 Technical description

4.1 General description

Wall-hung gas condensing boilers
- High efficiency heating.
- Low pollutant emissions.
- Installation and connection facilitated by the mounting frame delivered with the appliance.
- Flue gas discharge via a forced flue or chimney type connection.
- **Baxi MainEco Combi 24 - 28 - 35**: Heating and domestic hot water production.
- **Baxi MainEco System 18 - 24**: Heating only.

4.2 Main parts

1. Flue gas outlet/Air intake (Combustion air/flue gas adapter 60/100)
2. Casing/air box
3. Outlet for measuring combustion gases
4. Ignition/ionization electrode
5. Flue gas discharge pipe
6. Gas/air system with a fan, gas block and automatic burner unit
7. Air intake silencer
8. Plate heat exchanger (DHW) (Only for Combi models)
9. Connection box
10. Condensate trap
11. Circulation pump
12. 3-way valve
13. Primary heat exchanger
14. Expansion vessel
15. Automatic air vent
4.3 Skeleton Diagrams

**Combi 24 - 28 - 35**

1. Primary heat exchanger
2. Hydroblock
3. Plate heat exchanger (DHW)
4. Safety valve
5. Heating flow
6. Domestic hot water outlet (DHW)
7. Domestic cold water inlet
8. Heating return
9. Circulation pump (Central heating)
10. 3-way valve

**System 18 - 24**

1. Primary heat exchanger
2. Safety valve
3. Heating flow
4. Heating return
5. Circulation pump (Central heating)

4.4 Operating principle

4.4.1. Gas/air setting

The casing fitted to the boiler is also used as an air box. Air is sucked in by the fan and gas injected into the venturi by the fan intake. The fan rotation speed is set according to the settings parameters, the thermal energy requirement and the temperatures measured by the temperature sensors. The gas and air are mixed in the venturi. The gas/air ratio ensures that the quantities of gas and air are adjusted to each other. This provides optimum combustion on the entire output range. The gas/air mixture is fed into the burner on top of the exchanger.
4.4.2. Combustion

The burner heats the heating water circulating in the heat exchanger. At a return temperature lower than around 55°C, the flue gases cool down to a temperature lower than the dew point, thus causing the condensation of the water vapour contained in the flue gases in the lower section of the heat exchanger. The heat released during this condensation process (the latent heat or condensing heat) is also transferred to the heating water. The cooled combustion gases are evacuated via the combustion gas outlet flue. The condensation water is evacuated via a condensate trap.

4.4.3. Heating and domestic hot water production

On combi boilers, an integrated plate exchanger heats the domestic water. A 3-way valve determines whether the heated water is fed into the heating system or the plate exchanger. A pick-up sensor signals that a hot water tap is being opened. This signal is transmitted to the control panel, which then switches the 3-way valve to the hot water position and trips the heating pump. The 3-way valve is spring-loaded but only consumes electricity when it switches to another position.

The heating water reheats the domestic water in the plate exchanger. In comfort mode, if there is no hot water draw-off, the boiler handles the periodic reheating of the plate exchanger. Any limescale particles are kept out of the plate exchanger by a self-cleaning water filter (self-cleans once every 76 hours).

4.4.4. Control system

Control of the boiler ensures reliable delivery of heat. This means that the boiler treats external negative influences in a practical manner (notably when the water-flow is insufficient or there are problems with air supply). In the presence of such influences, the boiler doesn’t switch into locking mode, but first reduces his power and, depending on the nature of the circumstances, will be temporarily out of service (blocking or stop). The boiler will continue to supply heat as long as the situation does not become dangerous.

4.4.5. Adjustment

The power of the boiler can be adjusted in the following ways:

- **On/Off setting**
  The output between the minimum and maximum values varies based on the heating flow set point temperature.

- **Adjustable control**
  The output between the minimum and maximum values varies based on the heating flow temperature determined by the modulating control system.
4.4.6. Regulation of the water temperature

The boiler is fitted with an electronic temperature regulator having an outlet and return temperature probe. The flow temperature can be set between 20°C and 90°C. The boiler reduces its power when the set outlet-temperature is attained. The cutout temperature is the set heating outlet-temperature + 5 °C.

4.4.7. Protection against low water or no circulation

The boiler is fitted with a safety device to prevent the shortage of water based on temperature measurements. By reducing its output when the water flow rate is in danger of becoming insufficient, the boiler continues to operate as long as possible. In case of insufficient ΔT ≥ 50°C flow or an excessive increase in flow temperature, the boiler will enter shutdown mode for 10 minutes. When there is no water in the boiler, or if the pump is not running, the system is locked (breakdown)

In the event of a fault, the status signal for the button on the connection box flashes red.

For more detailed information, see chapter: "Shutdowns and lock-outs", page 63.

4.4.8. Overheat temperature protection

The maximum temperature protection locks the boiler if the water temperature becomes too high (110°C).

In the event of a fault, the status signal for the button on the connection box flashes red.

For more detailed information, see chapter: "Shutdowns and lock-outs", page 63.

Anticycle function is active when heat demand is active and the flow temperature is too high with respect to the setpoint. The anticycle time can be active between 3 and 9 minutes depending on system temperatures.

4.5 Circulating pump (Available pump head)

The boiler is fitted with an on/off circulation pump.

1. Combi 24 - 28
2. Combi 35

H Manometric height central heating circuit
Q Water flow (ΔT=20K)
4.6 Technical specifications

<table>
<thead>
<tr>
<th>Boiler type</th>
<th>MainEco</th>
<th>Combi 24</th>
<th>Combi 28</th>
<th>Combi 35</th>
<th>System 18</th>
<th>System 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td></td>
<td></td>
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<td>EC indentification no.</td>
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</tr>
<tr>
<td></td>
<td>Adjustable</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input control</td>
<td>Modulating, Start/Stop</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Nominal output (Pn) Heating System (80/60 °C)</td>
<td>min - max kW</td>
<td>5.5 - 19.5</td>
<td>5.5 - 23.4</td>
<td>7.7 - 29.2</td>
<td>5.5 - 17.7</td>
<td>5.5 - 23.4</td>
</tr>
<tr>
<td>Factory setting kW</td>
<td>19.5</td>
<td>19.5</td>
<td>29.2</td>
<td>17.7</td>
<td>23.4</td>
<td></td>
</tr>
<tr>
<td>Nominal output (Pn) Heating System (50/30 °C)</td>
<td>min - max kW</td>
<td>6.1 - 20.9</td>
<td>6.1 - 24.8</td>
<td>8.5 - 31.0</td>
<td>6.1 - 18.8</td>
<td>6.1 - 24.8</td>
</tr>
<tr>
<td>Factory setting kW</td>
<td>20.9</td>
<td>20.7</td>
<td>31.0</td>
<td>18.8</td>
<td>24.8</td>
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<tr>
<td>Nominal output (Pn) DHW System</td>
<td>min - max kW</td>
<td>5.5 - 23.4</td>
<td>5.5 - 27.5</td>
<td>7.7 - 33.9</td>
<td>-</td>
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<tr>
<td>Factory setting kW</td>
<td>23.4</td>
<td>27.5</td>
<td>33.9</td>
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<tr>
<td>Nominal input (Qn) Heating System (Hi)</td>
<td>min - max kW</td>
<td>5.6 - 20.0</td>
<td>5.6 - 24.0</td>
<td>7.8 - 30.0</td>
<td>5.6 - 18.0</td>
<td>5.6 - 24.0</td>
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<td>30.0</td>
<td>18.0</td>
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<tr>
<td>Nominal input (Qn) Heating System (Hs)</td>
<td>min - max kW</td>
<td>6.2 - 22.2</td>
<td>6.2 - 26.7</td>
<td>8.7 - 33.3</td>
<td>6.2 - 20.0</td>
<td>6.2 - 26.7</td>
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<tr>
<td>Factory setting kW</td>
<td>22.2</td>
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<td>33.3</td>
<td>20.0</td>
<td>26.7</td>
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<tr>
<td>Nominal input (Qnw) DHW System (Hi)</td>
<td>min - max kW</td>
<td>5.6 - 24.0</td>
<td>5.6 - 28.2</td>
<td>7.8 - 34.9</td>
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<td>Factory setting kW</td>
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<td>28.2</td>
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<tr>
<td>Nominal input (Qnw) DHW System (Hs)</td>
<td>min - max kW</td>
<td>6.2 - 26.7</td>
<td>6.2 - 31.3</td>
<td>8.7 - 38.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting kW</td>
<td>26.7</td>
<td>31.3</td>
<td>38.8</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Heating efficiency under full load (Hi) (80/60 °C)</td>
<td>%</td>
<td>97.8</td>
<td>97.6</td>
<td>97.2</td>
<td>98.2</td>
<td>97.6</td>
</tr>
<tr>
<td>Heating efficiency under full load (Hs) (50/30 °C)</td>
<td>%</td>
<td>104.5</td>
<td>103.3</td>
<td>103.3</td>
<td>104.5</td>
<td>103.3</td>
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<tr>
<td>Heating efficiency under partial load (Hi) (Return temperature 60°C)</td>
<td>%</td>
<td>97.8</td>
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<td>97.8</td>
<td>97.8</td>
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<td>Heating efficiency under partial load (Hi) (92/42 EEG) (Return temperature 30°C)</td>
<td>%</td>
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<td>108.8</td>
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<td>SEDBUK</td>
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Data on the gases and combustion gases

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<thead>
<tr>
<th>Equipment categories</th>
<th>I\textsubscript{2}H</th>
<th>C\textsubscript{13}, C\textsubscript{33}, C\textsubscript{53}</th>
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<tr>
<td>Type of air/flue gas connection</td>
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<tr>
<td>Gas inlet pressure G20</td>
<td>min - max mbar</td>
<td>17 - 23</td>
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<td>Connecting pressure G20</td>
<td>mbar</td>
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<tr>
<td>Gas consumption G20</td>
<td>max m\textsuperscript{3}/h</td>
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<tr>
<td>NOx annual emission (n=1)</td>
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<tr>
<td>Mass flue gas flow rate</td>
<td>maximum kg/h</td>
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</tr>
</tbody>
</table>

(1) Front panel removed
### Boiler type

<table>
<thead>
<tr>
<th>Boiler type</th>
<th>MainEco</th>
<th>Combi 24</th>
<th>Combi 28</th>
<th>Combi 35</th>
<th>System 18</th>
<th>System 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flue gas temperature</td>
<td>°C</td>
<td>32 - 78</td>
<td>32 - 84</td>
<td>31 - 82</td>
<td>32 - 65</td>
<td>32 - 78</td>
</tr>
<tr>
<td>Maximum counter pressure</td>
<td>Pa</td>
<td>80</td>
<td>116</td>
<td>105</td>
<td>-</td>
<td>80</td>
</tr>
</tbody>
</table>

### Characteristics of the heating circuit

<table>
<thead>
<tr>
<th>Water content</th>
<th>min</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water operating pressure (minimum)</td>
<td>Pa</td>
<td>0.8</td>
</tr>
<tr>
<td>Water operating pressure (maximum)</td>
<td>Pa</td>
<td>2.5</td>
</tr>
<tr>
<td>Water temperature (maximum)</td>
<td>°C</td>
<td>110</td>
</tr>
<tr>
<td>Operating temperature (maximum)</td>
<td>°C</td>
<td>90</td>
</tr>
<tr>
<td>Manometric height central heating circuit (ΔT = 20K)</td>
<td>mbar</td>
<td>253</td>
</tr>
</tbody>
</table>

### Characteristics of the domestic hot water circuit

| Specific hot water flow Rate 35 °C Rise | l/min | 9.8 | 11.4 | 14.3 |
| Domestic water resistance (without flow restrictor) | mbar | 96 | 123 | 215 |
| Flow rate threshold (minimum) | l/min | 1.2 | 1.2 | 1.2 |
| Water content | l | 0.16 | 0.16 | 0.18 |
| Operating pressure (Pmw) (maximum) | bar | 8 | 8 | 8 |

### Electrical characteristics

| Power supply voltage | VAC | 230 | 230 | 230 | 230 | 230 |
| Power consumption - Full load | maximum | W | 105 | 117 | 145 | 92 | 103 |
| Power consumption - Part load | maximum | W | 82 | 82 | 101 | 82 | 82 |
| Power consumption - Standby | maximum | W | 3 | 3 | 3 | 3 |

### Other characteristics

| Weight (empty) | Total | kg | 26 | 26 | 28.5 | 25 | 24.5 |
| Mounting(1) | kg | 24 | 24 | 27 | 23 | 23 |
| Acoustic level at 1 metre | maximum Heating System | dB(A) | 38 | 38 | 42 | 38 | 40 |
| Acoustic level at 1 metre | maximum DHW System | dB(A) | 40 | 42 | 45 | - | - |

(1) Front panel removed
5 Installation

5.1 Regulations governing installation

WARNING
The engineer must be Gas Safe registered and have the correct ACS qualifications.

Codes of Practice - refer to the most recent version.

In GB the following Codes of Practice apply:

- BS 6891: Gas installation.
- BS 5546: Installation of hot water supplies for domestic purposes.
- BS EN 12828: Heating systems in buildings.
- BS EN 14336: Installation & commissioning of water based heating systems.
- BS 6798: Installation of gas fired hot water boilers.
- BS 5440 Part 1: Flues.
- BS 5440 Part 2: Ventilation.
- BS 7074: Expansion vessels and ancillary equipment for sealed water systems.
- BS 7593: Treatment of water in domestic hot water central heating systems.
5.2 Choice of the location

5.2.1. Type plate

The identification plate on top of the boiler features the boiler serial number and important boiler specifications, for example the model and unit category. The dF and dU codes are also stated on the type plate.

5.2.2. Location of the boiler

(1) Clearance when operating
(2) Clearance for maintenance

- Before mounting the boiler, decide on the ideal position for mounting, bearing the Directives and the dimensions of the appliance in mind.
- Ensure that there is sufficient space under the boiler to fit and remove the condensate trap and the connection box.
- To ensure adequate accessibility to the appliance and facilitate maintenance, leave enough space around the boiler.
- Mount the boiler onto a flat surface.
When choosing the position for mounting the boiler, bear in mind the authorised position of the combustion gas discharge outlets and the air intake opening.

For more information, see chapter: "Connections for the air and exhaust pipes", page 29.

For more detailed information, see: Flue Accessories & Fitting Guide.

**WARNING**

- Fix the appliance to a solid wall capable of bearing the weight of the appliance when full of water and fully equipped.
- Do not place the appliance above a heat source or a cooking appliance.
- Do not locate the boiler in direct sunlight.
- It is forbidden to store inflammable products and materials in the boiler room or close to the boiler, even temporarily.

**CAUTION**

- The boiler must be installed in a frost-free environment.
- An earthed electrical connection must be available close to the boiler.
- A connection to the mains drainage system for the discharge of condensate must be available close to the boiler.

### Safety rating

**Z** Zones

**OZ** Breakdown of the exterior zone

**B** Bathtub or shower tray

For safety rating IP X4D, installation in the bathroom is possible in zones 2 and 3 and in the breakdown of the exterior zone.

In this case, connect the 230 V power supply as a fixed connection to a fused spur.

**CAUTION**

In the case of a fixed connection to the power cord, you must always install a main bipolar switch with an opening gap of at least 3 mm (EN 60335-1).
5.3 Main dimensions

<table>
<thead>
<tr>
<th>Boiler</th>
<th>Connection kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection of the combustion gas exhaust pipe; Ø 60 mm</td>
<td>Connection kit</td>
</tr>
<tr>
<td>Connection of the air intake pipe; Ø 100 mm</td>
<td>Connection kit</td>
</tr>
<tr>
<td>Safety valve outlet pipe; Ø 15 mm</td>
<td>Connection kit</td>
</tr>
<tr>
<td>Condensates discharge; Ø 25 mm</td>
<td>Connection kit</td>
</tr>
<tr>
<td>Heating circuit flow; G¾”</td>
<td>Pipe diameter; Ø 22 mm</td>
</tr>
<tr>
<td>Domestic hot water outlet; G½”</td>
<td>Pipe diameter; Ø 15 mm</td>
</tr>
<tr>
<td>Gas / Gaz</td>
<td>Connection kit</td>
</tr>
<tr>
<td>Gas connection; G½”</td>
<td>Pipe diameter; Ø 22 mm</td>
</tr>
<tr>
<td>Domestic cold water inlet; G½”</td>
<td>Pipe diameter; Ø 15 mm</td>
</tr>
<tr>
<td>Heating circuit return; G¾”</td>
<td>Pipe diameter; Ø 22 mm</td>
</tr>
<tr>
<td>Clearance when operating; ± 5 mm</td>
<td>Connection kit</td>
</tr>
</tbody>
</table>
5.4 Positioning the boiler

The following components are supplied as standard with the boiler:

- Mounting rail and mounting accessories for wall mounting
- Connection kit comprising sleeves and clamping rings
- Condensate trap with drain hose
- PRV hose
- Set rubber hose connectors and clips
- Filling loop
- Air/Exhaust adapter
- Thermo-pressure gauge
- Connection box

Please fit these components in the order described in this manual.

A suspension clamp situated at the rear of the casing enables the boiler to be directly suspended on the mounting bracket.

**CAUTION**

During mounting, cover up the connection points for the air supply and the combustion gas exhaust, to protect the boiler and its connections from dust. Only remove this protection at the time when these connections are made.

1. Determine the position of the two fixing holes. Make sure that the holes are level. Drill 2 holes with a Ø of 8 mm.
2. Insert the rawplugs with a Ø of 8 mm. Secure with Ø 6 mm bolts and corresponding washers.
3. Mount the boiler using the suspension bracket on the back of the boiler.

---

5.5 Hydraulic connections

**CAUTION**

When fitting pipes, remember that the condensate trap will need to be installed and removed. Maintain at least 25 cm distance from the boiler to allow for bends or taps to be installed.
5.5.1. Flushing the system

Installing the boiler in new installations (installations less than 6 months old)

- Clean the installation with a universal cleaner to eliminate debris from the system (copper, hemp, flux).
- Thoroughly flush the installation until the water runs clear and shows no impurities.

Installing the boiler in existing installations

- Remove sludge from the installation.
- Flush the installation.
- Clean the installation with a universal cleaner to eliminate debris from the system (copper, hemp, flux).
- Thoroughly flush the installation until the water runs clear and shows no impurities.

5.5.2. Water flow rate

The boiler’s modulating control system limits the maximum difference in temperature between the heating flow and return and the maximum speed at which the flow temperature increases. In this way, the boiler does not require a minimum water flow rate.

If using a heating and domestic hot water production type boiler on an installation in which the flow can be fully disconnected from the return (e.g. by using thermostatic valves), you should either fit a bypass or fit an expansion vessel to the heating flow conduit.

5.5.3. Connection of the heating circuit

1. Connect the heating water return pipe to the heating return connection \(\text{\#1}\).
2. Install a filling and drainage valve on the installation for filling and draining the boiler.
3. Connect the heating water outlet pipe to the heating flow connection \(\text{\#2}\).
4. Mount the supplied thermomanometer onto the central heating flow connection. Place the thermomanometer no more than 0.5 m away from the boiler.

A PRV safety valve is fitted to the flow side of the boiler as standard.
5.5.4. Connection of the water circuit for domestic use

1. Connect the cold water inlet pipe to the domestic cold water connection ①.
2. Connect the domestic hot water outlet pipe to the domestic hot water connection ②.

CAUTION
- The domestic water pipes must be connected in accordance with prevailing provisions.
- Carry out any soldering work required at a safe distance from the boiler or before the boiler is fitted.
- If using synthetic pipes, follow the manufacturer’s (connection) instructions.

5.5.5. Connecting the expansion vessel

The boiler is fitted as standard with an 8-litre expansion vessel.

If the water volume is greater than 100 litres or the static height of the system exceeds 5 metres, an additional expansion vessel must be fitted. Refer to the table below to determine the expansion vessel required for the installation.

Conditions of validity of the table:
- 3-bar safety valve
- Average water temperature: 70 °C
  Flow temperature: 80 °C
  Return temperature: 60 °C
- The filling pressure in the system is lower than or equal to the initial pressure in the expansion vessel

<table>
<thead>
<tr>
<th>Initial pressure of the expansion vessel</th>
<th>Volume of the expansion vessel depending on the volume of the installation (in litres)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td>0.5 bar</td>
<td>4.6</td>
</tr>
<tr>
<td>1 bar</td>
<td>8.0(1)</td>
</tr>
<tr>
<td>1.5 bar</td>
<td>13.3</td>
</tr>
</tbody>
</table>

(1) Factory configuration
5.5.6. Connecting the safety valve discharge pipe

1. Connect the safety valve pipe to the safety valve outlet.

**CAUTION**
- Any soldering must be completed before fitting the pipework to prevent damage from heat.
- Do not fit the condensate trap until the discharge pipe has been soldered and fitted.

5.5.7. Connecting the condensate discharge pipe

The condensate trap is supplied separately as standard with the boiler (Includes flexible plastic drain hose and adapter). Fit these parts underneath the boiler. To do this, proceed as follows:

1. Fill the condensate trap with water up to the mark.

**CAUTION**
Fill the condensate trap with water before starting the boiler to avoid combustion products escaping from the boiler.

2. Press the condensate trap firmly into the opening provided for it underneath the boiler. The condensate trap must click into place.

**CAUTION**
Check whether the condensate trap is solidly fitted in the boiler.

3. Insert the flexible drain hose from the condensate trap into a drain pipe.
4. Mount a trap or a siphon in the discharge pipe.

**CAUTION**
Do not make a permanent rigid connection owing to maintenance work on the condensate trap.

- Do not plug the condensate discharge pipe.
- Do not drain condensation water into a roof gutter at any time.
- Connect the condensate discharge pipe in accordance with prevailing standards.
Termination to an internal soil and vent pipe

1. Set the discharge pipe at a gradient of at least 50 mm per metre, maximum horizontal length 5 metres.
2. 450 mm is applicable to properties up to 3 storeys.

For multi-storey building installations consult BS 6798.

External termination via internal discharge branch e.g sink waste - downstream

1. Set the discharge pipe at a gradient of at least 50 mm per metre, maximum horizontal length 5 metres.
2. Pipe must terminate above water level but below surrounding surface. Cut end at 45°.

It is not recommended to connect upstream of the sink or other waste water receptacle!

Termination to a drain or gully

1. Set the discharge pipe at a gradient of at least 50 mm per metre, maximum horizontal length 5 metres.
2. Pipe must terminate above water level but below surrounding surface. Cut end at 45°.

Termination to a purpose made soakaway

1. Set the discharge pipe at a gradient of at least 50 mm per metre, maximum horizontal length 5 metres.
2. Holes in the soak-away must face away from the building.

Further specific requirements for soakaway design are referred to in BS 6798.
5. Installation

5.5.8. Automatic air bleed

Check that the automatic bleed valve is open: This is visible on the right on top of the boiler. If necessary, the air vent can be closed off with the cap that can be found next to it.
5.6 Gas connection

1. Connect the gas inlet pipe GAS / GAZ.

   The pipe must have a diameter of at least 22 mm.

   ![Image]

   **WARNING**
   - Close the main gas valve before starting work on the gas pipes.
   - Before mounting, check that the gas meter has sufficient capacity. To do this, you should keep in mind the consumption of all domestic appliances.
   - If the gas meter has a too low capacity, inform the energy supply company.

   **CAUTION**
   - Connect the gas pipe in accordance with prevailing standards and regulations.
   - Carry out any soldering work required at a safe distance from the boiler or before the boiler is fitted.
   - Ensure that there is no dust in the gas pipe. Blow into the pipe or shake it before mounting.

5.7 Connections for the air and exhaust pipes

   ![Image]

   Only use approved flue gas discharge and air supply materials supplied by BAXI.

   ![Image]

   For more detailed information, see: Flue Accessories & Fitting Guide.

   **5.7.1. Classification**

   The table specifies this classification in detail according to ☉☺.

<table>
<thead>
<tr>
<th>Type</th>
<th>Execution</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C13</td>
<td>Room sealed</td>
<td>Vent in the outside wall.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The opening for the air-supply inlet is located in the same pressure zone as the vent (For example, a common passage through the outside wall).</td>
</tr>
<tr>
<td>C33</td>
<td>Room sealed</td>
<td>Exhaust of combustion gases above the roof.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The opening for the air-supply inlet is located in the same pressure zone as the vent (For example, a concentric passage to the roof).</td>
</tr>
<tr>
<td>C53</td>
<td>Room sealed</td>
<td>Closed equipment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Separate channelling for the air-supply.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Separate channelling for the combustion gases.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terminating on different pressure surfaces.</td>
</tr>
</tbody>
</table>
5.7.2. Outlets

When codes of practice dictate the use of a terminal guard use a suitable guard of stainless steel construction. There must be a clearance of at least 50 mm between any part of the terminal and the guard.

---

**Terminal position with minimum distance**

<table>
<thead>
<tr>
<th>Letter</th>
<th>Description</th>
<th>Minimum Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A(^1)</td>
<td>Directly below an opening, air brick, opening windows, etc.</td>
<td>300 mm</td>
</tr>
<tr>
<td>B(^1)</td>
<td>Above an opening, air brick, opening window etc.</td>
<td>300 mm</td>
</tr>
<tr>
<td>C(^1)</td>
<td>Horizontally to an opening, air brick, opening window etc.</td>
<td>300 mm</td>
</tr>
<tr>
<td>D(^2)</td>
<td>Below gutters, soil pipes or drain pipes.</td>
<td>25 (75) mm</td>
</tr>
<tr>
<td>E(^2)</td>
<td>Below eaves.</td>
<td>25 (200) mm</td>
</tr>
<tr>
<td>F(^2)</td>
<td>Below balconies or car port roof.</td>
<td>25 (200) mm</td>
</tr>
<tr>
<td>G(^2)</td>
<td>From a vertical drain pipe or soil pipe.</td>
<td>25 (150) mm</td>
</tr>
<tr>
<td>H(^2)</td>
<td>From an internal or external corner.</td>
<td>25 (300) mm</td>
</tr>
<tr>
<td>I</td>
<td>Above ground, roof or balcony level.</td>
<td>300 mm</td>
</tr>
<tr>
<td>J</td>
<td>From a surface or boundary line facing a terminal.</td>
<td>600 mm</td>
</tr>
<tr>
<td>K</td>
<td>From a terminal facing a terminal (Horizontal flue).</td>
<td>1200 mm</td>
</tr>
<tr>
<td></td>
<td>From a terminal facing a terminal (Vertical flue).</td>
<td>600 mm</td>
</tr>
<tr>
<td>L</td>
<td>From an opening in carport (e.g. door, window) into the dwelling.</td>
<td>1200 mm</td>
</tr>
<tr>
<td>M</td>
<td>Vertically from a terminal on the same wall.</td>
<td>1500 mm</td>
</tr>
<tr>
<td>N</td>
<td>Horizontally from a terminal on the same wall.</td>
<td>300 mm</td>
</tr>
<tr>
<td>R</td>
<td>From adjacent wall to flue (vertical only).</td>
<td>300 mm</td>
</tr>
<tr>
<td>S</td>
<td>From an adjacent opening window (vertical only).</td>
<td>1000 mm</td>
</tr>
<tr>
<td>T</td>
<td>Adjacent to windows or openings on pitched and flat roofs.</td>
<td>600 mm</td>
</tr>
<tr>
<td>U</td>
<td>Below windows or openings on pitched roofs.</td>
<td>2000 mm</td>
</tr>
</tbody>
</table>

\(^1\) In addition, the terminal should be no nearer than 150 mm to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a window frame.

\(^2\) Only one 25 mm clearance is allowed per installation. If one of the dimensions D, E, F, G or H is 25 mm then the remainder MUST be as shown in brackets, in accordance with BS 5440-1.
5.7.3. Lengths of the air/flue gas pipes

To define the maximum final length, you must deduct the pipe length in accordance with the reduction table.

■ Room sealed flue

Concentric
If using a room sealed version, both the combustion gas exhaust opening and the air supply opening must be connected (concentrically). Refer to the table to determine the maximum pipe length of the flue gas pipes in room sealed operation.

### Maximum chimney length for room sealed operation

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Combi 24</th>
<th>Combi 28</th>
<th>Combi 35</th>
<th>System 18</th>
<th>System 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-100 mm</td>
<td>9 m</td>
<td>9 m</td>
<td>5 m</td>
<td>9 m</td>
<td>9 m</td>
</tr>
<tr>
<td>80-125 mm</td>
<td>12 m(1)</td>
<td>12 m(1)</td>
<td>12 m(1)</td>
<td>12 m(1)</td>
<td>12 m(1)</td>
</tr>
</tbody>
</table>

(1) With retention of the maximum chimney length it is possible to apply an extra 10 times 45° or 5 times 90° elbows

Eccentric

An 80/80 mm flue gas adapter (accessory) must be fitted for this connection.

If using a room sealed version, it is necessary to connect both the combustion gas exhaust and the air-supply opening (parallel). The pipes must be run in parallel and terminate in the same pressure zone using the concentric vertical terminal.

### Maximum chimney length for room sealed operation

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Combi 24</th>
<th>Combi 28</th>
<th>Combi 35</th>
<th>System 18</th>
<th>System 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-80 mm</td>
<td>15 m</td>
<td>15 m</td>
<td>15 m</td>
<td>15 m</td>
<td>15 m</td>
</tr>
</tbody>
</table>

■ Reduction table

### Pipe reductions per element used

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Elbow 45°</th>
<th>Elbow 90°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe reduction</td>
<td>Pipe reduction</td>
<td></td>
</tr>
<tr>
<td>60-100 mm</td>
<td>1.0 m</td>
<td>2.0 m</td>
</tr>
<tr>
<td>80-125 mm</td>
<td>1.0 m</td>
<td>2.0 m</td>
</tr>
<tr>
<td>80 mm</td>
<td>1.2 m(1)</td>
<td>4.0 m(1)</td>
</tr>
</tbody>
</table>

(1) Reduction for both air and exhaust
5.7.4. Additional Directives

- Please refer to the manufacturer’s instructions for the material in question when installing the flue gas discharge and air supply materials. If the flue gas discharge and air supply materials are not installed according to the instructions (e.g. they are not leakproof, not clamped in place etc.), this may cause hazardous situations and/or result in bodily injury.
- It must be possible to inspect the flue or chimney.

Please contact us for further information.

5.7.5. Connection of the combustion gas exhaust pipe

**Mounting**

Fit together the combustion gas exhaust pipes, without welding.

**CAUTION**

- The flue gas discharge pipe must be smooth and deburred.
- Do not rest the pipes on the boiler.
- Take in account the insertion depth of 30 mm when measuring the length of pipe prior to cutting.
- The pipes must allow no leakage of flue gases and be resistant to corrosion.
- Connect the pipes together without stress between the sections.
- The horizontal sections need to be constructed with a gradient of 50 mm per metre: Back to the boiler.

5.8 Electrical connections

5.8.1. Control unit

The boiler is not line- and neutral sensitive. The control unit is fully integrated with the fan, venturi and gas block. The boiler is fully pre-wired. The PCB has a connection to the connection box with instrument panel, via the HMI connector. The PCB has a RS232 connection for a PC/laptop via the RS232 connector. The main characteristics of the control unit are described in the table below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply voltage</td>
<td>230 VAC/50Hz</td>
</tr>
<tr>
<td>Fuse rating F1 (230 VAC)</td>
<td>1.6 AT</td>
</tr>
</tbody>
</table>
The boiler is fitted with a 3-wire power supply cable (cable length 1.5 m) suitable for a 230VAC/50Hz power supply with phase/neutral/earth system. The power supply cable is connected to the MAINS connector. A spare fuse can be found in the housing of the control system.

**CAUTION**
- When the power supply cable has to be replaced, it must be ordered from BAXI. The power supply cable should only be replaced by BAXI, or by an installer certified by BAXI.
- The switch must be easily accessible

### 5.8.2. Recommendations

**WARNING**
- Only qualified professionals may carry out electrical connections, always with the power off.
- The boiler is entirely pre-wired. Do not modify the connections inside the control panel.
- Earth the appliance before making any electrical connections.

Make the electrical connections of the boiler according to:
- The instructions of the prevailing standards.
- The instructions on the electrical diagrams provided with the boiler.
- The manufacturer’s instructions.

**CAUTION**
- Separate the sensor cables from the 230 V cables.
5.8.3. Access to the connector block / Boiler HMI

The connection box with instrument panel is supplied separately as standard with this unit. The connection box must be connected to the automatic control unit using the cable supplied. To do this, proceed as follows:

- Under the boiler, there is a cable with a connector for the control unit.

1. Carefully open the latch on the rear of the connection box using a screwdriver.
2. Open the cover of the connection box.
3. Disconnect a pull relief clip. Turn the pull relief clip round.
4. Insert the plug from the cable into the HMI plug on the PCB for the connection box.
5. Press the pull relief clip firmly into place.
6. Now connect the required external controllers to the remaining connectors. To do this, proceed as follows:
   - Disconnect a pull relief clip.
   - Turn the pull relief clip round.
   - Place the cable underneath the pull relief clip.
   - Press the pull relief clip firmly into place.
   - Connect the connection box and check that the box is sealed properly.
7. Slide the User instruction card supplied into the guides underneath the connection box.
8. Slide the connection box into the guides underneath the boiler once all the connections have been made.
9. Secure the connection box using the screw found in the guides.

The connection box can also be attached to the wall using the screw holes on the back of the connection box. The connection box should be screwed to the wall using the fixing points inside the unit.

The connection options for external system controls to the boiler HMI are explained in the following paragraphs.

For more detailed information, see: Connecting External Controls Sheet.

5.8.4. Connection options

Various external thermostats and controllers can be connected to the control PCB.

- **Mains voltage**
- **Low voltage**

**On/off-OT** connection is only suitable for:
- 24V power stealing thermostat
- Potential free on/off thermostat
- OT thermostat (iSense or qSense)
Please read in conjunction with separate sheet "Connecting External Controls".

■ Connecting modulating controller

The boiler is fitted with a OpenTherm connection as standard. As a result, modulating OpenTherm controllers can be connected without further modifications.

> In the case of a room temperature thermostat or a programmable room thermostat, fit the thermostat in accordance with the manufacturer's instructions.
> Connect the two-wire cable to terminals On/off-OT of the connector.

■ Connect on/off thermostat

The boiler is suitable for connecting a 2 wire on/off room thermostat or weather compensator.

> In the case of a room temperature thermostat or a programmable room thermostat, fit the thermostat in accordance with the manufacturer's instructions.
> Connect the 2 wire 24V room thermostat to the On/off-OT terminals of the connector.
> Connect the power stealing thermostat to the On/off-OT terminals of the connector.

■ Connecting the outside temperature sensor

An outside sensor can be connected to the Tout terminals of the connector. In the case of an on/off thermostat, the boiler will control the temperature with the set point from the internal heating curve.

⚠️ CAUTION
Check whether the outside sensor is suitable for this boiler. A suitable outside sensor can be obtained as an accessory.

> A OpenTherm controller can also use this outside sensor. The heating curve required must then be set on the controller.

Heating curve setting

If an outside temperature sensor is connected, it is possible to adapt the heating curve. The setting can be modified using parameters \( p_1, p_2, p_5, p_6 \) and \( p_7 \).

> This is only possible with an iSense or qSense.
Connect frost protection

Frost protection in combination with on/off thermostat

If an on/off thermostat is used, it is advisable to protect any rooms where there is risk of frost by using a frost thermostat. The radiator valve in a room where there is a risk of frost must be open.

- In rooms where there is a risk of frost, a frost thermostat (Tv) should preferably be installed.
- Connect the frost thermostat in parallel with an on/off room thermostat (Tk) to the On/off-OT terminals of the connector.

When using a OpenTherm thermostat, a frost thermostat cannot be connected in parallel to the On/off-OT terminals. Implement frost protection for the central heating system in combination with an external sensor.

Frost protection in combination with an outside sensor

The central heating system can also be protected against frost in combination with an outside sensor. The radiator valve in a room where there is a risk of frost must be open. Connect the outside sensor to the Tout terminals of the connector. The frost protection functions as follows where an outside sensor is used:

- At an outside temperature lower than -10°C (can be set with parameter p30): the circulation pump switches on.
- At an outside temperature higher than -10°C (can be set with parameter p30): the circulation pump continues to run and then switches off.

This is only possible with an iSense or qSense.

Operation signal and failure signal (Status)

The alarm or operation signal is selected using parameter p40.

- If the boiler is operating, the operation signal can be switched via a potential-free contact (maximum 230 VAC, 1 A) on the No and C terminals of the connector.
- If the boiler locks out, the alarm can be transmitted via a potential-free contact (maximum 230 VAC, 1 A) on the Nc and C terminals of the connector.
- The external 3-way valve (230 VAC, 1 A) can be used when connecting an indirectly heated calorifier via a volt-free contact. The neutral position of the three-way valve can be set using parameter p34. The three-way valve is connected as follows:
  - Nc = Central heating
  - No = Domestic hot water
  - C = Phase on

This is only possible with an iSense or qSense.

Status connection can be used for standalone condensate pump.
**Connect on/off contact (Enable)**

A 10-230 V signal can be connected to the CH and DHW connectors to switch the production of heating water or sanitary warm water on or off.

- + = L
- - = N

**DANGER**

If the power to the boiler is interrupted, a voltage will still be present at connectors CH and DHW.

When using the Enable-CH connection a bridge must be placed on the On/off-OT terminals of the connector.

The production of heating water or domestic hot water is switched on as standard. The automatic control unit will only respond to the switch and control the heating/domestic hot water function once a 10-230 V signal has been connected to the connectors. If the power to the boiler is interrupted, the status of the CH and DHW input will be reset to the factory setting (= enabled). Check whether this is the status required.

**Connecting control panel**

The control panel for the boiler is connected to connector BUS HMI.

See chapter: "Access to the connector block / Boiler HMI", page 34
5.9 Electrical diagram

RS232  Connecting a computer
IT     Ignition transformer
E      Ignition/ionization electrode
P      Power supply
PUMP A Circulation pump
3WV    3-way valve
TA     Flow sensor
PSU    Storage parameter
HMI    Connection box

5.10 Filling the system

5.10.1. Water treatment

WARNING
Do not add chemical products to the central heating water without consulting BAXI. For example: antifreeze, water softeners and/or products to increase or reduce the pH value. These may cause faults in the boiler and damage the heat exchanger.

Flush the central heating installation with at least 3x the volume of the central heating installation. Flush the DHW pipes with at least 20 times the volume of the pipes.

For an optimum functioning of the boiler, the water of the installation must comply with following characteristics:
### Total installed heat output (kW)

<table>
<thead>
<tr>
<th>Total installed heat output (kW)</th>
<th>≤ 70</th>
<th>70 - 200</th>
<th>200 - 550</th>
<th>&gt; 550</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of acidity (water non-treated)</td>
<td>pH</td>
<td>7 - 9</td>
<td>7 - 9</td>
<td>7 - 9</td>
</tr>
<tr>
<td>Degree of acidity (water treated)</td>
<td>pH</td>
<td>7 - 8.5</td>
<td>7 - 8.5</td>
<td>7 - 8.5</td>
</tr>
<tr>
<td>Conductivity at 25°C</td>
<td>µS/cm</td>
<td>≤ 800</td>
<td>≤ 800</td>
<td>≤ 800</td>
</tr>
<tr>
<td>Chlorides</td>
<td>mg/l</td>
<td>≤ 150</td>
<td>≤ 150</td>
<td>≤ 150</td>
</tr>
<tr>
<td>Other components</td>
<td>mg/l</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Total water hardness(1)</td>
<td>°f</td>
<td>1 - 35</td>
<td>1 - 20</td>
<td>1 - 15</td>
</tr>
<tr>
<td>°dH</td>
<td>0.5 - 20.0</td>
<td>0.5 - 11.2</td>
<td>0.5 - 8.4</td>
<td>0.5 - 2.8</td>
</tr>
<tr>
<td>mmol/l</td>
<td>0.1 - 3.5</td>
<td>0.1 - 2.0</td>
<td>0.1 - 1.5</td>
<td>0.1 - 0.5</td>
</tr>
</tbody>
</table>

(1) For installations that are heated at constant high temperatures with a total installed heat output; up to 200 kW a maximum total water hardness of 8.4 °dH (1.5 mmol/l, 15 °f) applies and for above 200 kW a maximum total water hardness of 2.8 °dH (0.5 mmol/l, 5 °f) applies

---

**Failure to flush and add inhibitor to the system will invalidate the appliance warranty. Reputable manufacturers and their products include:**

- **Fernox**
- **Sentinel Performance Solution Ltd**

### 5.10.2. Filling the condensate trap

Check whether the condensate trap is filled up to the mark. If the condensate trap has to be topped up, proceed as follows:

#### CAUTION

First remove the front housing of the boiler so that you can disconnect the condensate trap.

**See paragraph: "Open the boiler", page 53**

1. Move the lever underneath the hydroblock to the right to disconnect the condensate trap.
2. Remove the condensate trap and clean it.
3. Replace the seal ring for the condensate trap.
4. Fill the condensate trap with water up to the mark.
5. Press the condensate trap firmly into the opening provided for it underneath the boiler. The condensate trap must click into place.
6. Check whether the condensate trap is solidly fitted in the boiler.

#### CAUTION

Fill the condensate trap with water before starting the boiler to avoid combustion products escaping from the boiler.
5.10.3. Filling the system

**CAUTION**

- Before filling, open the valves on every radiator in the installation.
- Ensure that the boiler is switched off.

1. Fill the system with clean tap water (advised water pressure is between 1 and 2 bar).
2. Check the tightness of the water connections.
3. Turn the boiler on.

*After the power is switched on, the boiler always runs through an automatic venting programme lasting approx. 4 minutes (During filling, air can escape from the system via the automatic air vent). If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1 and 2 bar).*

**CAUTION**

When venting, ensure that no water enters or makes contact with the casing and electrical parts of the boiler.
5.10.4. Venting the system

It is essential that you bleed any air in the calorifier, the conduits or the taps to prevent the annoying noises likely to be produced during heating or when tapping water. To do this, proceed as follows:

1. Open the valves on all radiators connected to the heating system.
2. Set the room thermostat as high as possible.
3. Wait until the radiators are hot.
4. Ensure that the boiler is switched off.
5. Wait around 10 minutes until the radiators are cold.
6. Bleed the radiators. Start with the lower floors.
7. Open the bleed connection using the bleed key provided whilst keeping a rag pressed against the bleed connection.

**CAUTION**

The water may still be hot.

8. Wait until water comes out of the bleed valve and then close the bleed connection.
9. Turn the boiler on. A vent cycle of a duration of around 4 minutes is carried out automatically.
10. After venting, check whether the pressure in the installation is still sufficient.

    If the water pressure is lower than 0.8 bar, more water should be added. If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1 and 2 bar).

    See chapter: "Filling the system", page 40

11. Set the room thermostat or the regulator.
6 Commissioning

6.1 Control panel

MainEco Combi 24 - 28 - 35

1. Domestic hot water temperature rotary knob
2. Heating water temperature rotary knob
3. Sweep key and Status signals
4. RESET-button and on/off signal

MainEco System 18 - 24

1. No function
2. Heating water temperature rotary knob
3. Sweep key and Status signals
4. RESET-button and on/off signal

The instrument panel for the connection box has 2 push buttons with signals. The signals provide information about the operating condition of the boiler. The RESET button lights up green when the boiler is connected to the mains. The status signal for the button can flash in a range of colours and at different frequencies. The meaning of these signals can be found in the User instruction card supplied with the boiler. See also: "User instruction card", page 71

CAUTION

The instruction card must be slid underneath the connection box after the boiler installation or use of the card.

The instrument panel for the connection box also has 2 rotary knobs. The rotary knob can be used to set the temperature of the domestic hot water. The rotary knob can be used to set the maximum flow temperature of the heating water. The heating/domestic hot water function can be switched off by turning the rotary knob to position off.
6.2 Check points before commissioning

6.2.1. Preparing the boiler for commissioning

**WARNING**

Do not put the boiler into operation if the supplied gas is not in accordance with the approved gas types.

Preparatory procedure for boiler commissioning:

- Check that the gas type supplied matches the data shown on the boiler’s data plate.
- Check the hydraulic circuit.
- Check the water pressure in the heating system.
- Check the electrical connections to the thermostat and the other external controls.
- Check the other connections.

6.2.2. Hydraulic circuit

- Use the pressure gauge to check the water pressure in the heating system. The hydraulic pressure must reach a minimum of 0.8 bar. If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1 and 2 bar).
- Check the condensate discharge trap; it must be filled with clean water up to the mark.
- Check that there are no leaks on the hydraulic connections.

6.2.3. Electrical connections

- Check the electrical connections, particularly the earth.
- Check the electrical connections to the thermostat and the other external controls.

6.3 Commissioning the boiler

**WARNING**

Initial commissioning must be done by a qualified professional.
6. Commissioning

CAUTION

On first firing the boiler, an odour may be present for a short period.

1. Open the main gas supply.
2. Open the gas valve on the boiler.
3. Turn the boiler on.
4. Set the controls (thermostats, control system) so that they request heat.
5. The boiler will begin an automatic venting-programme (which lasts approx. 4 minutes) and will do this every time the power supply is isolated. Both push buttons on the instrument panel light up green during the venting cycle.

The boiler will begin an automatic venting-programme (which lasts approx. 4 minutes) and will do this every time the power supply is isolated.

6. Check the boiler pump venting. Remove the middle screw if necessary before venting the pump (Central heating pump).
7. Check the gas connections into and out of the gas block in the boiler for tightness.

The current operating condition of the boiler is shown by the status signal on the instrument panel. The status signal for the button can flash in a range of colours and at different frequencies. The meaning of these signals can be found in the User instruction card supplied with the boiler.

See also:

- "User instruction card", page 71
- "Error codes", page 63

Error during the start-up procedure:

- Both buttons on the instrument panel are in the out position:
  - Check the mains supply voltage
  - Check the main fuses
  - Check the connection cable to the connection box.
  - Check the fuses on the control panel: \( F1 = 1,6 \, \text{AT 230VAC} \)
  - Check the connection between the mains lead and the MAINS connector for the automatic control unit.
- In the event of a fault, the status signal for the button flashes red. Press the **RESET** button for 5 seconds to restart the boiler.
6.4 Gas settings

The boiler is preset in the factory to operate on natural gas G20.

6.4.1. Gas circuit

WARNING
Ensure that the boiler is switched off.

1. Remove the front panel.
   
   See paragraph: "Open the boiler", page 53

2. Check that the boiler is properly set for the type of gas used (See the identification plate on top of the boiler).

WARNING
To ascertain the gas types permitted, see chapter: "Technical specifications", page 17

3. Open the main gas supply.

4. Open the gas valve on the boiler.

5. Check the gas supply pressure at the pressure test point C on the gas inlet pipe. The pressure must be the same as the one shown on the rating plate.

   See the diagram for the position of measuring point C for the inlet gas pressure.

6. Purge the gas supply pipe by unscrewing the screw from the measure point C. Tighten the measurement point when the pipe has been sufficiently purged.

7. Check the leak tightness of the gas pipe, including the gas block.

6.4.2. Checking combustion

1. Unscrew the plug of the flue gas measurement point.

2. Insert the probe for the flue gas analyser into the measurement opening.

WARNING
Ensure that the opening around the sensor is completely sealed when taking measurements.

CAUTION
The flue gas analyser must have a minimum accuracy of ±0.25% CO₂.
- **Set the boiler to full load**

1. Continue pressing for around 3 seconds on the key. The status signal for the button is orange and always flashes green briefly; Part load is set.

2. Press the button again 2 times. The status signal for the button is orange and always goes off briefly 2 times; Full load is set.

- The full load status can only be reached via the part load status.

3. Measure the percentage CO\textsubscript{2} in the flue gases (Front panel removed).

- Full load CO\textsubscript{2} must be between 9.15 and 9.50 %.

- **Set the boiler to part load**

1. Continue pressing for around 3 seconds on the key. The status signal for the button is orange and always flashes green briefly; Part load is set.

2. Measure the percentage CO\textsubscript{2} in the flue gases (Front panel removed).

- Part load CO\textsubscript{2} must be between 8.70 and 9.05 %.

- **WARNING**

There MUST remain a "gap" between the full load and part load values. The full load value must be 0.4% higher than the part load value.

3. Briefly press the RESET button to return the boiler to normal operating status.
6. Commissioning

**Perform Flue Integrity Combustion Check**
Insert the analyser probe into the air inlet test point, allowing the reading to stabilise.

**Set Boiler to Maximum Rate**
Allow the combustion to stabilise. Do not insert probe to avoid ‘flooding’ the analyser.

**Check CO & Combustion Ratio at Maximum Rate**
Whilst the boiler is still operating at maximum insert the analyser probe into the flue gas test point, allowing the reading to stabilise.

**Verify Integrity of Seals**
Check all burner seals, internal flue seals, door & case seals. Replace any seals that appear unsound.

**Set Boiler to Minimum Rate**
Allow the combustion to stabilise. Do not insert probe to avoid ‘flooding’ the analyser.

**Check CO & Combustion Ratio at Minimum Rate**
Whilst the boiler is operating at minimum insert the analyser probe into the flue gas test point, allowing the reading to stabilise.

**Verify Flue Integrity**
Indication that products of combustion & inlet air are mixing - further investigation is required. Check all flue components are correctly assembled, fixed & supported. Check the flue & terminal are unobstructed.

**Turn Appliance Off!**
Call 0844 871 1555 for advice. The appliance MUST NOT be commissioned until all problems are identified and resolved.

**Is CO < 350ppm and CO/CO₂ ratio < 0.004 ?**
Yes

**Verify Integrity of Seals**
Check all burner seals, internal flue seals, door & case seals. Replace any seals that appear unsound.

**Is CO < 350ppm and CO/CO₂ ratio < 0.004 ?**
Yes

**Turn Appliance Off!**
Call 0844 871 1555 for advice. The appliance MUST NOT be commissioned until all problems are identified and resolved.

**Note:** Check & record the CO & combustion ratio at both maximum & minimum rates before calling 0844 871 1555.
6.4.3. Setting the air/gas ratio

1. Unscrew the plug of the flue gas measurement point.
2. Insert the probe for the flue gas analyser into the measurement opening.

⚠️ WARNING
Ensure that the opening around the sensor is completely sealed when taking measurements.

⚠️ CAUTION
The flue gas analyser must have a minimum accuracy of ±0.25% CO₂.

Set the boiler to full load

1. Continue pressing for around 3 seconds on the B key. The status signal for the B button is orange and always flashes green briefly; Part load is set.
2. Press the B button again 2 times. The status signal for the B button is orange and always goes off briefly 2 times; Full load is set.

- The full load status can only be reached via the part load status.
- See drawing for the position of control screw A for full load.

3. Set the percentage CO₂ for the gas type being used to the nominal value. This should always be inside the highest and lowest setting limit.

- If the percentage CO₂ is too low, turn the screw A anticlockwise for a higher percentage.
- If the percentage CO₂ is too high, turn the screw A clockwise for a lower percentage.

Full load CO₂ must be between 9.15 and 9.50 %.

Set the boiler to part load

1. Continue pressing for around 3 seconds on the B key. The status signal for the B button is orange and always flashes green briefly; The low speed mode is parameterised.

See drawing for the position of control screw B for part load.
2. Set the percentage CO₂ for the gas type being used inside the highest and the lowest setting limit, as determined after the full load setting. (Front panel removed).

- If the percentage CO₂ is too high, turn the screw B anticlockwise for a lower percentage.
- If the percentage CO₂ is too low, turn the screw B clockwise for a higher percentage.

Part load CO₂ must be between 8.70 and 9.05 %.

**WARNING**

There MUST remain a "gap" between the full load and part load values. The full load value must be 0.4% higher than the part load value.

3. Briefly press the **RESET** button to return the boiler to normal operating status.

### 6.5 Finalizing work

1. Remove the measuring equipment.
2. Put the flue gas sampling plug back in place.
3. Refit the front panel.
4. Raise the temperature in the heating system to approximately 70°C.
5. Shut down the boiler.
6. After about 10 minutes, vent the air in the heating system.
7. Switch on the boiler.
8. Check the tightness of the flue gases evacuation and air inlet connections.
9. Checking the hydraulic pressure. If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1 and 2 bar).
10. Tick the gas category used on the data plate.
11. Explain the operation of the installation, the boiler and the regulator to the users.
12. Slide the User instruction card supplied into the guides underneath the connection box.
13. Fill in Commissioning sheet, can be found in the appendix.
14. Give all the instruction manuals to the user.
### 6.6 Parameter descriptions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Adjustment range</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Flow temperature: $T_{SET}$</td>
<td>20 to 90 °C</td>
<td>80 80 80 80 80</td>
</tr>
<tr>
<td>P2</td>
<td>Domestic hot water temperature: $T_{SET}$</td>
<td>40 to 65 °C</td>
<td>55 55 55 55 55</td>
</tr>
<tr>
<td>P3</td>
<td>Heating / DHW mode</td>
<td>0 = Heating deactivated / DHW deactivated 1 = Heating activated / DHW activated 2 = Heating activated / DHW deactivated 3 = Heating deactivated / DHW activated</td>
<td>1 1 1 1 1</td>
</tr>
<tr>
<td>P4</td>
<td>ECO mode</td>
<td>0 = Comfort 1 = Energy-saving mode 2 = Management using a programmable thermostat</td>
<td>2 2 2 2 2</td>
</tr>
<tr>
<td>P5</td>
<td>Post-circulation of the pump</td>
<td>1 to 98 minutes 99 minutes = continuous</td>
<td>2 2 2 2 2</td>
</tr>
<tr>
<td>P6</td>
<td>Maximum fan volume flow (Heating)</td>
<td>G20 (x100)</td>
<td>39 39 60 36 47</td>
</tr>
<tr>
<td>P7</td>
<td>Maximum fan volume flow (DHW)</td>
<td>G20 (x100)</td>
<td>47 56 70 36 47</td>
</tr>
<tr>
<td>P8</td>
<td>Minimum fan volume flow (Heating +DHW)</td>
<td>G20 (x100)</td>
<td>11 11 15 11 11</td>
</tr>
<tr>
<td>P9</td>
<td>Minimum fan volume flow (offset)</td>
<td>G20</td>
<td>80 80 60 80 80</td>
</tr>
<tr>
<td>P10</td>
<td>Starting volume flow</td>
<td>Do not modify (x100)</td>
<td>23 23 30 23 23</td>
</tr>
<tr>
<td>P11</td>
<td>Maximum flow temperature of system</td>
<td>20 to 90 °C</td>
<td>90 90 90 90 90</td>
</tr>
<tr>
<td>P12</td>
<td>Time factor of average flow calculation</td>
<td>Do not modify (x10 seconds)</td>
<td>35 35 35 35 35</td>
</tr>
<tr>
<td>P13</td>
<td>Heat curve set point (Maximum outside temperature)</td>
<td>0 to 30 °C (Only with an outside temperature sensor)</td>
<td>20 20 20 20 20</td>
</tr>
<tr>
<td>P14</td>
<td>Heat curve set point (Flow temperature)</td>
<td>0 to 90 °C (Only with an outside temperature sensor)</td>
<td>20 20 20 20 20</td>
</tr>
<tr>
<td>P16</td>
<td>Minimum pump speed for central heating operation (Setting the pump speed)</td>
<td>2 - 10 (x 10 %)</td>
<td>2 2 2 2 2</td>
</tr>
<tr>
<td>P17</td>
<td>Maximum pump speed for central heating operation (Setting the pump speed)</td>
<td>2 - 10 (x 10 %)</td>
<td>7 7 10 10 10</td>
</tr>
<tr>
<td>P18</td>
<td>Antifreeze temperature</td>
<td>from -30 to 0°C</td>
<td>-10 -10 -10 -10 -10</td>
</tr>
<tr>
<td>P19</td>
<td>Legionella protection</td>
<td>0 = Stop 1 = Start(1) 2 = Management using a programmable thermostat</td>
<td>1 1 1 1 1</td>
</tr>
<tr>
<td>P20</td>
<td>Set point increase for calorifier</td>
<td>0 to 25°C</td>
<td>15 15 15 15 15</td>
</tr>
<tr>
<td>P21</td>
<td>DHW cut-in temperature DHW sensor</td>
<td>from 2 to 15°C</td>
<td>4 4 4 4 4</td>
</tr>
<tr>
<td>P22</td>
<td>Control of external 3-way valve</td>
<td>0 = Normal 1 = Reverse</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>P23</td>
<td>Boiler type</td>
<td>0 = Heating and instant domestic hot water 1 = Heating only</td>
<td>0 0 0 1 1</td>
</tr>
</tbody>
</table>

(1) After commissioning, the boiler will operate once a week at 65°C for DHW.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Adjustment range</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p36</td>
<td>Shutdown input function</td>
<td>1 = Shutdown without frost-protection</td>
<td>Combi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 = Shutdown with frost protection</td>
<td>24  28  35  18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 = Lock-out with frost protection (Pump only)</td>
<td>1  1  1  1</td>
</tr>
<tr>
<td>p37</td>
<td>Minimum gas pressure switch (GpS)</td>
<td>0 = Not connected</td>
<td>System</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Connected</td>
<td>24  28  35  18</td>
</tr>
<tr>
<td>p38</td>
<td>Heat recovery unit (HRU)</td>
<td>0 = Not connected</td>
<td>1  1  1  1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Connected</td>
<td>0  0  0  0</td>
</tr>
<tr>
<td>p39</td>
<td>Flue gas damper running time</td>
<td>0 to 255 seconds</td>
<td>0  0  0  0</td>
</tr>
<tr>
<td>p40</td>
<td>Fault relay function</td>
<td>0 = Operation signal</td>
<td>0  0  0  0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Alarm signal</td>
<td>2  2  2  2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 = External 3-way valve</td>
<td>2  2  2  2</td>
</tr>
<tr>
<td>p41</td>
<td>Maintenance message</td>
<td>Do not modify</td>
<td>0  0  0  0</td>
</tr>
<tr>
<td>p42</td>
<td>Service operating hours</td>
<td>Do not modify</td>
<td>175 175 175 175</td>
</tr>
<tr>
<td>p43</td>
<td>Service burning hours</td>
<td>Do not modify</td>
<td>30 30 30 30</td>
</tr>
<tr>
<td>p44</td>
<td>Venting cycle</td>
<td>0 = Stop</td>
<td>1  1  1  1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Multiple speed pump</td>
<td>1  1  1  1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 = Modulating pump</td>
<td>1  1  1  1</td>
</tr>
</tbody>
</table>

(1) After commissioning, the boiler will operate once a week at 65°C for DHW.
7 Switching off the boiler

7.1 Installation shutdown

If the central heating system is not used for a long period, we recommend switching the boiler off.

- Switch off the boiler electrical power supply.
- Shut off the gas supply.
- Ensure that the boiler and system are protected against frost damage.

7.2 Antifreeze protection

⚠️ **CAUTION**

Drain the boiler and central heating system if you are not going to use your home or the building for a long time and there is a chance of frost.

Set the temperature control low, for example at 10°C.

To prevent radiators and the system from freezing in rooms where there is a risk of frost (e.g. a garage or storage room), a frost thermostat or outside sensor can be connected to the boiler.

See also: "Connection options", page 34.

⚠️ **CAUTION**

- The antifreeze protection does not function if the boiler is switched off.
- The integrated protection system only protects the boiler, not the installation.
- Open the valves on all radiators connected to the heating system
- If the boiler has been placed in a room at risk of frost, the condensate drain and condensate trap should preferably be protected against freezing with a frost protection cable.

When the heating water temperature in the boiler falls by too much, the integrated protection system in the boiler starts up. This protection functions as follows:

- If the water temperature is lower than 7°C, the heating pump starts up.
- If the water temperature is lower than 4°C, the boiler starts up.
- If the water temperature is higher than 10°C, the boiler shuts down and the circulation pump continues to run for a short time.
8 Checking and maintenance

8.1 General instructions

**WARNING**
- Maintenance operations must be done by a qualified engineer.
- An annual inspection is compulsory.
- Only original spare parts must be used.

- Carry out the inspection and standard maintenance operations once a year.
- Carry out specific maintenance operations if necessary.

8.2 Standard inspection and maintenance operations

**WARNING**
Ensure that the boiler is switched off. Electrical isolation can be checked at the electrical test point.

**CAUTION**
- Always examine any seals or gaskets, replacing where necessary. Where a seal or gasket is supplied with a spare part it should be used, irrespective of the condition of the original.
- Use only original spare parts that are intended for use with this type of boiler.

8.2.1 Open the boiler

1. Unscrew the 2 screws, located on the front panel.
2. Remove the front panel.

### 8.2.2. Checking the hydraulic pressure

The hydraulic pressure must reach a minimum of 0.8 bar. If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1 and 2 bar).

**CAUTION**

- Before filling, open the valves on every radiator in the installation.
- Ensure that the boiler is switched off.

1. Fill the system with clean tap water (advised water pressure is between 1 and 2 bar).
2. Check the tightness of the water connections.
3. Turn the boiler on.

### 8.2.3. Checking the expansion vessel

Check the expansion vessel and replace it if necessary.

*Initial pressure of the expansion vessel is 1.0 bar (± 0.2).*

### 8.2.4. Checking the ionization current

Check the ionization current at full load and low load. The value is stable after 1 minute. If the value lies below 3 µA, replace the ignition electrode.

See chapter: "Replacing the ionization/ignition electrode", page 58.
8.2.5. Checking the DHW transfer capacity

If tap capacity falls significantly (due to insufficient temperature and/or flow rate), clean the plate heat exchanger (hot water side) and the tap water cartridge:

See chapter: "Cleaning the plate heat exchanger", page 59.

8.2.6. Checking the flue gas discharge and the air supply

Check the tightness of the flue gases evacuation and air inlet connections.

8.2.7. Checking combustion

Measure the percentage CO$_2$ in the flue gases. To do this, proceed as follows:

1. Heat the water in the boiler to a temperature of approx. 70 °C.

   Allow the combustion to stabilise before inserting the combustion analyser probe into the measurement opening. This will prevent saturation of the analyser.

2. Unscrew the plug of the flue gas measurement point.

3. Insert the probe for the flue gas analyser into the measurement opening.

4. Measure the percentage CO$_2$ in the flue gases. Perform measurements at full capacity and low capacity. Compare this with the control value.

   For further information: See chapter: "Checking combustion", page 45

8.2.8. Checking the automatic air vent

1. Check that the automatic bleed is working (This is visible on the right on top of the boiler).

2. The air vent can be closed off with the cap that can be found next to it.

3. If any leaks are detected, replace the air vent.
8.2.9. Checking the condensate trap

**CAUTION**
First remove the front housing of the boiler so that you can disconnect the condensate trap.

1. Move the lever underneath the hydroblock to the right to disconnect the condensate trap.
2. Remove the condensate trap and clean it.
3. Replace the seal ring for the condensate trap.
4. Fill the condensate trap with water up to the mark.
5. Press the condensate trap firmly into the opening provided for it underneath the boiler. The condensate trap must click into place.
6. Check whether the condensate trap is solidly fitted in the boiler.
8.2.10. Checking the burner and cleaning the heat exchanger

**CAUTION**
Always examine any seals or gaskets, replacing where necessary. Where a seal or gasket is supplied with a spare part it should be used, irrespective of the condition of the original.

1. Ensure that the boiler is switched off. Close the gas valve of the boiler. Remove the front panel.
2. Take the bracket off the flue gas discharge pipe. Remove the flue gas discharge pipe.
3. Remove the air inlet flue on the venturi.
4. Unscrew the gland underneath the gas block.
5. Open the protective cover for the fan on the top and remove all the plugs from the PCB.
6. Close the fan’s protective cover.
7. Disassemble the ignition electrode. Check the ignition electrode for wear. Replace if necessary.
8. Unclip the 2 locking clips that attach the gas/air unit to the heat exchanger.
9. Remove the gas/air unit by moving the gas/air unit upwards and then forwards.
10. Tilt the burner and remove it, along with the heat exchanger gasket.
11. Use a vacuum cleaner fitted with a special endpiece (accessory) to clean the top part of the heat exchanger (combustion chamber).
12. Thoroughly clean with the vacuum cleaner again without the top cleaning brush on the endpiece.
13. Check (using a mirror, for example) whether any dust can still be seen. If so, hoover it up.
14. The burner does not require any maintenance, it is self-cleaning. Check that there are no cracks and/or other tears on the surface of the dismantled burner. If this is not the case, replace the burner.
15. Install the ignition electrode.
16. To re-assemble, perform the above actions in reverse order.

**CAUTION**
- Remember to replace the plugs on the PCB for the gas/air unit.
- Check that the gasket is correctly positioned between the mixing elbow and the heat exchanger. (Completely flat in the appropriate groove means it is leak proof).

17. Open the gas inlet valves and switch on the mains supply to the boiler.
8.3 Specific maintenance operations

**WARNING**

Ensure that the boiler is switched off. Electrical isolation can be checked at the electrical test point.

**CAUTION**

- Always examine any seals or gaskets, replacing where necessary. Where a seal or gasket is supplied with a spare part it should be used, irrespective of the condition of the original.
- Use only original spare parts that are intended for use with this type of boiler.

If the standard inspection and maintenance operations have revealed the necessity to carry out additional maintenance work, proceed as follows, depending on the nature of the work:

### 8.3.1. Replacing the ionization/ignition electrode

Replace the ionization/ignition electrode in the following cases:

- Ionization current <3 µA.
- Electrode worn.

1. Open the protective cover for the fan at the top.
2. Remove the ignition electrode plugs from the PCB.
3. Unscrew the 2 screws on the ignition electrode. Remove the unit.
4. Fit the new ionisation/ignition electrode.
5. To re-assemble, perform the above actions in reverse order.
8.3.2. Replacing the 3-way valve

If it becomes necessary to replace the 3-way valve, proceed as follows:

1. Close the main water valve.
2. Drain the boiler:
   - Open a domestic hot water tap to release the pressure and drain any water from the circuit.
   - Connect the filling loop to the heating return connection.
   - Open the isolation tap and drain the circuit into a suitable receptacle.
   - When the water has stopped flowing, close all the isolation taps.
3. Open the protective cover for the fan at the top.
4. Disconnect the three-way valve cable from the automatic control unit.
5. Unclip the locking clip that holds the 3-way valve.
6. Dismantle the 3-way valve by rotating a screwdriver.
7. Remove the 3-way valve.
8. To re-assemble, perform the above actions in reverse order.

**CAUTION**
Be careful of the positioning cams on the 3-way valve.

8.3.3. Cleaning the plate heat exchanger

Depending on the water quality and the operating mode, limescale deposits may form in the plate exchanger. As a general rule, a periodic inspection, along with cleaning, if necessary, is sufficient. The following factors may affect the periodicity:

- Water hardness.
- Composition of the limescale.
- Number of hours' operation of the boiler.
- Draw-off rate.
- Domestic hot water set point temperature.
If descaling of the plate exchanger is necessary, proceed as follows:

1. Ensure that the boiler is switched off.
2. Close the gas valve of the boiler.
3. Close the main water valve.
4. Drain the boiler:
   - Open a domestic hot water tap to release the pressure and drain any water from the circuit.
   - Connect the filling loop to the heating return connection.
   - Open the isolation tap and drain the circuit into a suitable receptacle.
   - When the water has stopped flowing, close all the isolation taps.
5. Unscrew the screw on the left-hand side of the heat exchanger.
6. Remove the plate heat exchanger by moving the left-hand side forwards and tipping the right-hand side out of the bracket.
7. Clean the plate heat exchanger with a descaling product (citric acid pH 3). To do this, a specific cleaning appliance is available as an accessory. After cleaning, rinse thoroughly under running water.

8.3.4. Cleaning the domestic water cartridge

The plate heat exchanger should be removed in order to clean the tap water cartridge. Then proceed as follows:

1. Dismantle the domestic water cartridge by rotating a screwdriver.
2. Remove the domestic water cartridge.
3. Clean or replace the domestic water cartridge if required.
4. Re-assemble all of the components.

8.3.5. Replacement of the expansion vessel

The following procedures have to be carried out before the expansion vessel can be replaced:

- Close the gas valve of the boiler.
- Close the main water valve.
- Close the flow central heating pipe and the return central heating pipe.
- Drain the boiler.
The expansion vessel is inside the boiler at the rear. To replace the expansion vessel, the front section of the boiler should be removed first.

- **Removing the front section of the boiler**

1. Disconnect the flue gas discharge and air flow pipes from the boiler.
2. Remove the connection box.
3. Disconnect all incoming and outgoing pipes from the underside of the boiler.
4. Disconnect the gas supply pipe GAS / GAZ from the boiler.
5. Remove the condensate trap and drain hose.
   To check how to remove the condensate trap, see: "Checking the condensate trap", page 56.
6. Disconnect the expansion vessel hose from the underside of the boiler.
7. Press down the mounting clip on top of the boiler and remove the front of the boiler.

- **Remove the expansion vessel**

1. Bring the tab above the expansion vessel forwards and hold onto it while disconnecting the expansion vessel.
2. Move the expansion vessel slightly upwards and lift the vessel from the mounting bracket.
3. Tip the expansion vessel forwards and allow it drop slightly.
4. Carefully lift the expansion vessel out of the boiler.
5. Replace the defective expansion vessel.
6. To re-assemble, perform the above actions in reverse order.

**CAUTION**

- Replace all removed gaskets.
- Fill the system with clean tap water (advised water pressure is between 1 and 2 bar). "Water treatment", page 38

8.3.6. **Re-assembling the boiler**

1. Follow the procedure in reverse to re-assemble all of the components.

**CAUTION**

Always examine any seals or gaskets, replacing where necessary. Where a seal or gasket is supplied with a spare part it should be used, irrespective of the condition of the original.

2. Fill the condensate trap with water up to the mark.
3. Put the condensate trap back in place.
4. Carefully open the main water valve, fill the installation, vent it and, if need be, top it up with water. The hydraulic pressure must be a minimum of 0.8 bars. Check for any water leaks.
5. Check the seals on the gas and water connections.
6. Switch the boiler back on.
7. Check the setting of the gas/air ratio and, if necessary, correct it.
   - See chapter: "Checking combustion", page 45
   - See chapter: "Setting the air/gas ratio", page 48
9 Troubleshooting

9.1 Error codes

MainEco Combi 24 - 28 - 35

1 Domestic hot water temperature rotary knob
2 Heating water temperature rotary knob
3 Sweep key and Status signals
4 RESET-button and on/off signal

MainEco System 18 - 24

1 No function
2 Heating water temperature rotary knob
3 Sweep key and Status signals
4 RESET-button and on/off signal

The status signal for the button can flash in a range of colours and at different frequencies. The meaning of these signals can be found in the User instruction card supplied with the boiler.

See also: "User instruction card", page 71.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The instruction card must be slid underneath the connection box after the boiler installation or use of the card.</td>
</tr>
</tbody>
</table>

9.2 Shutdowns and lock-outs

9.2.1 Blocking

A (temporary) blocking mode is a boiler operating function caused by an unusual situation. The boiler control will try to re-start several times. The boiler will start up again after the blocking conditions have been eliminated.

In the event of a shutdown, the status signal for the button flashes green. The meaning of the shutdown codes can be found in the shutdown table.
### Status signals

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame loss</td>
<td>5v[2]</td>
</tr>
</tbody>
</table>

### Shutdown Codes

The boiler starts up again automatically when the reason for the blocking has been removed.

The shutdown codes from the status signals are related to the shutdown codes that can be read by the Recom software or a suitable controller. The meaning of the shutdown codes can be found in the shutdown table:

<table>
<thead>
<tr>
<th>Shutdown code</th>
<th>Description</th>
<th>Probable causes</th>
<th>Checking / solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>5v[0]</td>
<td>Parameter error</td>
<td>Parameters faulty</td>
<td>reset $dF$ and $dF$  &lt;br&gt; restore parameters with Recom</td>
</tr>
<tr>
<td>5v[1]</td>
<td>Maximum flow temperature exceeded</td>
<td>Non-existent or insufficient circulation</td>
<td>check the circulation (direction, pump, valves) &lt;br&gt; reasons for the heat demand</td>
</tr>
<tr>
<td>5v[2]</td>
<td>Maximum increase of the flow temperature has been exceeded</td>
<td>Non-existent or insufficient circulation  &lt;br&gt; Sensor error</td>
<td>check the circulation (direction, pump, valves) &lt;br&gt; check the water pressure &lt;br&gt; check that the sensors are operating correctly &lt;br&gt; check that the sensor has been correctly fitted &lt;br&gt; check the cleanliness of the heat exchanger</td>
</tr>
<tr>
<td>5v[7]</td>
<td>Maximum difference between the flow and return temperature exceeded</td>
<td>Non-existent or insufficient circulation  &lt;br&gt; Sensor error</td>
<td>check the circulation (direction, pump, valves) &lt;br&gt; check the water pressure &lt;br&gt; check that the sensors are operating correctly &lt;br&gt; check that the sensor has been correctly fitted &lt;br&gt; check the cleanliness of the heat exchanger</td>
</tr>
<tr>
<td>5v[10]</td>
<td>Shutdown input is open</td>
<td>External cause</td>
<td>suppress the external cause</td>
</tr>
<tr>
<td>5v[11]</td>
<td>Shutdown input active or frost protection active</td>
<td>Parameter error  &lt;br&gt; Bad connection</td>
<td>check the parameters &lt;br&gt; check the wiring</td>
</tr>
<tr>
<td>5v[12]</td>
<td>Communication error with the HMI PCB</td>
<td>Connection box not connected</td>
<td>check the wiring</td>
</tr>
</tbody>
</table>

(1) These lock-outs are not stored in the fault memory
### Shutdown code

<table>
<thead>
<tr>
<th>Shutdown code</th>
<th>Description</th>
<th>Probable causes</th>
<th>Checking / solution</th>
</tr>
</thead>
</table>
| 5v[13         | Communication error with the SCU PCB                             | Bad connection with BUS  
SCU PCB missing from connection box                                                                                                                               | Check the wiring  
Carry out automatic detection                                                                                                                             |
| 5v[15         | Gas pressure too low                                            | Non-existent or insufficient circulation  
Incorrect gas switch Gps adjustment (connected to PCB SCU)                                                                                                    | Check that the gas valve is fully opened  
Check the supply pressure  
Check whether the Gps gas pressure control system has been correctly fitted  
Replace the Gps gas pressure control system if need be                                           |
|               | Configuration error                                              | Internal fault in gas/air unit                                                                                                                                                                                          | Replace the gas/air unit                                                                                                                               |
| 5v[17         | Configuration fault or default parameter table incorrect         | Parameter fault in gas/air unit                                                                                                                                                                                          | Replace the gas/air unit                                                                                                                               |
| 5v[19         | Configuration error (Boiler/PSU not recognised)                  | Incorrect PSU for this boiler                                                                                                                                                                                             | Replace the PSU                                                                                                                                           |
|               | Configuration fault or parameters \(dF,dU\) unknown              | Reset \(dF\) and \(dU\)                                                                                                                                                                                                | Reset \(dF\) and \(dU\)                                                                                                                                 |
| 5v[21         | Communication fault                                              | Internal fault in gas/air unit                                                                                                                                                                                          | Replace the gas/air unit                                                                                                                               |
| 5v[22         | No flame during operation                                        | No ionization current                                                                                                                                                                                                  | Purge the gas supply to remove air  
Check that the gas valve is fully opened  
Check the supply pressure  
Check the operation and setting of the gas valve unit  
Check that the air inlet and flue gas discharge flues are not blocked  
Check that there is no recirculation of flue gases                                                                                           |
|               | Internal fault in gas/air unit                                   |                                                                                                                                                                                                                     | Replace the gas/air unit                                                                                                                                |

1) These lock-outs are not stored in the fault memory

### 9.2.2. Lock out

If the blocking conditions still exist after several start up attempts, the boiler will switch into locking mode (fault). The boiler can only start operating again once the causes of the lock-out have been rectified and after pressing the **reset** key.

In the event of a fault, the status signal for the \(\text{\textbf{F}}\) button flashes red. The meaning of the error codes is given in the error table:

<table>
<thead>
<tr>
<th>Status signals</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error code 1</td>
<td>Sensor error</td>
<td>(E:02) / (E:03) / (E:04) / (E:05) / (E:06) / (E:07) / (E:08) / (E:09) / (E:10) / (E:11) / (E:35)</td>
</tr>
<tr>
<td>Error code 2</td>
<td>Overheat temperature protection</td>
<td>(E:12) / (E:41)</td>
</tr>
<tr>
<td>Error code 3</td>
<td>Ignition fault</td>
<td>(E:14) / (E:16) / (E:36)</td>
</tr>
</tbody>
</table>
9. Troubleshooting

### Status signals

| Error code 4 (4 times red signal) | Fan fault | Code: E:34 |
| Error code 5 (5 times red signal) | Parameter error | Code: E:00 / E:01 |
| Error code 6 (6 times red signal) | Miscellaneous | The fault codes can be read with the Recom service software, a suitable controller or a service tool. |

Press the **reset** key for 5 seconds: The status signals will flash red quickly and the boiler will start its reset procedure. The boiler will also start an automatic venting cycle lasting around 4 minutes. If the error code continues to display, search for the cause in the error table and apply the solution.

The fault codes from the status signals are related to the fault codes that can be read by the **Recom** software or a suitable controller. The meaning of the error codes is given in the error table:

### Lock out (Status signals)

<table>
<thead>
<tr>
<th>Status signals</th>
<th>Description</th>
<th>Probable causes</th>
<th>Checking / solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error code 1 (1 times red signal)</td>
<td>Sensor fault, temperature fault or flow fault</td>
<td>♦ Sensor not or badly connected ♦ Bad connection ♦ Non-existent or insufficient circulation ♦ Water circulation direction reversed ♦ Sensor fault</td>
<td>♦ Check the wiring ♦ Check that the sensors are operating correctly ♦ Check that the sensor has been correctly fitted ♦ Vent the air in the heating system ♦ Check the water pressure ♦ Check the cleanliness of the heat exchanger ♦ Check the circulation (direction, pump, valves) ♦ Replace the sensor if necessary</td>
</tr>
<tr>
<td>Error code 2 (2 times red signal)</td>
<td>Maximum temperature of heat exchanger or control unit exceeded</td>
<td>♦ Non-existent or insufficient circulation ♦ Sensor not or badly connected ♦ Bad connection ♦ Sensor fault ♦ No air supply or insufficient air supply ♦ No flue gas flow or insufficient flue gas flow ♦ Circulation</td>
<td>♦ Vent the air in the heating system ♦ Check the water pressure ♦ Check the cleanliness of the heat exchanger ♦ Check the circulation (direction, pump, valves) ♦ Check the wiring ♦ Check that the sensors are operating correctly ♦ Check that the sensor has been correctly fitted ♦ Replace the sensor if necessary ♦ Check air supply ♦ Check flue gas flow ♦ Replace seals</td>
</tr>
<tr>
<td>Error code 3 (3 times red signal)</td>
<td>Ignition fault:</td>
<td>♦ 5 burner startup failures ♦ False flame signal ♦ 5x Flame loss</td>
<td>♦ No ignition ♦ Ignition arc, but no flame formation ♦ Presence of the flame but insufficient ionization (&lt;1 µA)</td>
</tr>
</tbody>
</table>
### Lock out (Status signals)

<table>
<thead>
<tr>
<th>Error code 4 (4 times red signal)</th>
<th>Description</th>
<th>Probable causes</th>
<th>Checking / solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan fault</td>
<td>External draught over the boiler</td>
<td></td>
<td>Check for adequate draw on the chimney connection</td>
</tr>
<tr>
<td></td>
<td>Defective gas/air unit</td>
<td></td>
<td>Replace the gas/air unit</td>
</tr>
<tr>
<td>Error code 5 (5 times red signal)</td>
<td>Parameter error</td>
<td>Bad connection</td>
<td>Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Safety parameters not found</td>
<td>Reset dF/dU code with Recom software, controller or service tool</td>
</tr>
<tr>
<td>Error code 6 (6 times red signal)</td>
<td>Miscellaneous</td>
<td>Several possible causes</td>
<td>The fault codes can be read with the Recom service software, a suitable controller or a service tool</td>
</tr>
</tbody>
</table>

### Lock out (Error code - 红色信号)

<table>
<thead>
<tr>
<th>Error code</th>
<th>Description</th>
<th>Probable causes</th>
<th>Checking / solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>e[00]</td>
<td>Storage unit PSU parameter not found</td>
<td>Bad connection</td>
<td>Check the wiring</td>
</tr>
<tr>
<td>e[01]</td>
<td>The safety parameters are incorrect</td>
<td>Bad connection</td>
<td>Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PSU defective</td>
<td>Replace PSU</td>
</tr>
<tr>
<td>e[02]</td>
<td>Flow temperature sensor short circuited</td>
<td>Sensor not or badly connected</td>
<td>Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bad connection</td>
<td>Check that the sensors are operating correctly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor fault</td>
<td>Replace the sensor if necessary</td>
</tr>
<tr>
<td>e[03]</td>
<td>Flow temperature sensor open circuit</td>
<td>Sensor not or badly connected</td>
<td>Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bad connection</td>
<td>Check that the sensors are operating correctly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor fault</td>
<td>Replace the sensor if necessary</td>
</tr>
<tr>
<td>e[04]</td>
<td>Flow temperature too low</td>
<td>No circulation</td>
<td>Vent the air in the heating system</td>
</tr>
<tr>
<td>e[05]</td>
<td>Flow temperature too high</td>
<td>Bad connection</td>
<td>Check the water pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor not or badly connected</td>
<td>Check the circulation (direction, pump, valves)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor fault</td>
<td>Check the cleanliness of the heat exchanger</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check that the sensors are operating correctly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check that the sensor has been correctly fitted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Replace the sensor if necessary</td>
</tr>
<tr>
<td>e[06]</td>
<td>Return temperature sensor short circuited</td>
<td>Sensor not or badly connected</td>
<td>Check that the sensor has been correctly fitted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bad connection</td>
<td>Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor fault</td>
<td>Check that the sensors are operating correctly</td>
</tr>
<tr>
<td>e[07]</td>
<td>Return temperature sensor open circuit</td>
<td>Sensor not or badly connected</td>
<td>Check that the sensor has been correctly fitted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bad connection</td>
<td>Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor fault</td>
<td>Check that the sensors are operating correctly</td>
</tr>
<tr>
<td>e[08]</td>
<td>Return temperature too low</td>
<td>No circulation</td>
<td>Vent the air in the heating system</td>
</tr>
<tr>
<td>e[09]</td>
<td>Return temperature too high</td>
<td>Bad connection</td>
<td>Check the water pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor not or badly connected</td>
<td>Check the circulation (direction, pump, valves)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor fault</td>
<td>Check the cleanliness of the heat exchanger</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check that the sensors are operating correctly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check that the sensor has been correctly fitted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Replace the sensor if necessary</td>
</tr>
<tr>
<td>Error code</td>
<td>Description</td>
<td>Probable causes</td>
<td>Checking / solution</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>E10</td>
<td>Difference between the flow and return temperatures too great</td>
<td>No circulation</td>
<td>Vent the air in the heating system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor not or badly connected</td>
<td>Check the water pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor fault</td>
<td>Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the circulation (direction, pump, valves)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the cleanliness of the heat exchanger</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check that the sensors are operating correctly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check that the sensor has been correctly fitted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Replace the sensor if necessary</td>
</tr>
<tr>
<td>E11</td>
<td>Temperature of heat exchanger above normal range (high-limit thermostat STB)</td>
<td>No circulation</td>
<td>Vent the air in the heating system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bad connection</td>
<td>Check the water pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor not or badly connected</td>
<td>Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensor fault</td>
<td>Check the circulation (direction, pump, valves)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the cleanliness of the heat exchanger</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check that the sensors are operating correctly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check that the sensor has been correctly fitted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Replace the sensor if necessary</td>
</tr>
<tr>
<td>E12</td>
<td>5 burner start-up failures</td>
<td>Ignition arc, but no flame formation</td>
<td>Check cabling of ignition transformer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Replace the ionization/ignition electrode</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check breakdown to earth</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the condition of the burner set</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the earthing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Defective gas/air unit</td>
</tr>
<tr>
<td>E14</td>
<td>False flame signal</td>
<td>Presence of the flame but insufficient ionization (&lt;1 µA)</td>
<td>Check that the gas valve is fully opened</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the supply pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Purge the gas supply to remove air</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the operation and setting of the gas valve unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check that the air inlet and flue gas discharge flues are not blocked</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the wiring on the gas valve unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Defective gas/air unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the gas/air unit and replace it if necessary</td>
</tr>
<tr>
<td>E16</td>
<td>Problem on the gas valve</td>
<td>Short-term fluctuations of the mains</td>
<td>Press the <strong>RESET</strong> key for 5 seconds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ionization current present even though there is no flame</td>
<td>Replace the ionization/ignition electrode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The burner remains very hot: CO₂ too high</td>
<td>Set the CO₂</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defective gas/air unit</td>
<td>Check the gas/air unit and replace it if necessary</td>
</tr>
<tr>
<td>E34</td>
<td>Fan fault</td>
<td>Defective gas/air unit</td>
<td>Replace the gas/air unit</td>
</tr>
<tr>
<td>E34</td>
<td></td>
<td>External draught over the boiler</td>
<td>Check for adequate draw on the chimney connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defective gas/air unit</td>
<td>Check the gas/air unit and replace it if necessary</td>
</tr>
<tr>
<td>Error code</td>
<td>Description</td>
<td>Probable causes</td>
<td>Checking / solution</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------</td>
<td>------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>e35</td>
<td>Flow and return reversed</td>
<td>• Bad connection</td>
<td>• Replace the sensor if necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sensor fault</td>
<td>• Check the circulation (direction, pump, valves)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sensor not or badly connected</td>
<td>• Check that the sensors are operating correctly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Water circulation direction reversed</td>
<td>• Check that the sensor has been correctly fitted</td>
</tr>
<tr>
<td>e36</td>
<td>5x Flame loss</td>
<td>• No ionization current</td>
<td>• Purge the gas supply to remove air</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Check that the gas valve is fully opened</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Check the supply pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Check the operation and setting of the gas valve unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Check that the air inlet and flue gas discharge flues are not blocked</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Check that there is no recirculation of flue gases</td>
</tr>
<tr>
<td>e37</td>
<td>Communication fault</td>
<td>• Internal fault in gas/air unit</td>
<td>• Replace the gas/air unit</td>
</tr>
<tr>
<td>e38</td>
<td>Communication error with the SCU PCB</td>
<td>• Bad connection</td>
<td>• Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Defective SCU PCB</td>
<td>• Replace SCU PCB</td>
</tr>
<tr>
<td>e39</td>
<td>Shutdown input in locked-out mode</td>
<td>• External cause</td>
<td>• Suppress the external cause</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bad connection</td>
<td>• Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Parameter incorrectly set</td>
<td>• Check the parameters</td>
</tr>
<tr>
<td>e40</td>
<td>HRU/URC unit test error</td>
<td>• HRU/URC unit test error</td>
<td>• Check the HRU/WTW unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• External cause</td>
<td>• Suppress the external cause</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bad connection</td>
<td>• Check the wiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Parameter incorrectly set</td>
<td>• Check the parameters</td>
</tr>
<tr>
<td>e41</td>
<td>Maximum control unit</td>
<td>• No air supply or insufficient air supply</td>
<td>• Check air supply</td>
</tr>
<tr>
<td></td>
<td>temperature exceeded</td>
<td>• No flue gas flow or insufficient flue gas flow</td>
<td>• Check flue gas flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recirculation</td>
<td>• Replace seals</td>
</tr>
</tbody>
</table>
10 Spare parts

10.1 General

When it is observed subsequent to inspection or maintenance work that a component in the boiler needs to be replaced, use only original spare parts or recommended spare parts and equipment.

To order a spare part, give the reference number shown on the list.

10.2 Spare parts

<table>
<thead>
<tr>
<th>Code no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7616301</td>
<td>Sensor Kit</td>
</tr>
<tr>
<td>7216300</td>
<td>Airvent inc Clip</td>
</tr>
<tr>
<td>7216299</td>
<td>Electrode Set Inc Screw &amp; Gasket</td>
</tr>
<tr>
<td>7216613</td>
<td>Pressure Gauge</td>
</tr>
<tr>
<td>7216292</td>
<td>Combustion Control Unit</td>
</tr>
<tr>
<td>7618106</td>
<td>Control &amp; Fan Assy</td>
</tr>
<tr>
<td>7618108</td>
<td>Gas Valve &amp; Outlet Assy</td>
</tr>
<tr>
<td>7216603</td>
<td>Pump inc Seal - 24 - 28 kW Combi - 18 - 24 kW System</td>
</tr>
<tr>
<td>7216604</td>
<td>Pump inc Seal - 35 kW Combi</td>
</tr>
<tr>
<td>7216602</td>
<td>User Interaction Controller Combi</td>
</tr>
<tr>
<td>7622585</td>
<td>User Interaction Controller System</td>
</tr>
<tr>
<td>7601283</td>
<td>Hydraulic Group 24 Kw Combi</td>
</tr>
<tr>
<td>7601060</td>
<td>Hydraulic Group 28 kW Combi</td>
</tr>
<tr>
<td>7601214</td>
<td>Hydraulic Group 35 kW Combi</td>
</tr>
<tr>
<td>7216624</td>
<td>Hydraulic Group 12 - 24 kW System</td>
</tr>
</tbody>
</table>
## 11 Appendix

### 11.1 User instruction card

<table>
<thead>
<tr>
<th>Group</th>
<th>Signal</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiler in service (Intermittent green signal)</td>
<td></td>
<td>Central heating heat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hot tap water</td>
</tr>
<tr>
<td>Maintenance message(^{(1)}) (Flashing orange signal)</td>
<td></td>
<td>Code A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Code B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Code C</td>
</tr>
<tr>
<td>Blockage (Flashing green signal)</td>
<td></td>
<td>Temperature protection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shutdown input</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flame loss</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Parameter error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Miscellaneous</td>
</tr>
<tr>
<td>Repair (Flashing red signal)</td>
<td></td>
<td>Sensor error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overheat temperature protection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ignition fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fan fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Parameter error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Miscellaneous</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reinitialisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resetting...</td>
</tr>
<tr>
<td>Chimney-sweeping position (Intermittent orange signal)</td>
<td></td>
<td>Part load</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Full load Central heating heat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Full load Hot tap water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC programming mode</td>
</tr>
</tbody>
</table>

\(^{(1)}\) This function is not applicable to every type
# 11.2 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>Company name:</td>
<td>Telephone number:</td>
</tr>
<tr>
<td>Company address:</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Time and temperature control to heating</th>
<th>Room thermostat and programmer/timer</th>
<th>Programmable room thermostat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating zone valves</td>
<td>Fitted</td>
<td></td>
</tr>
<tr>
<td>Hot water zone valves</td>
<td>Fitted</td>
<td></td>
</tr>
<tr>
<td>Thermostatic radiator valves</td>
<td>Fitted</td>
<td></td>
</tr>
<tr>
<td>Automatic bypass to system</td>
<td>Fitted</td>
<td></td>
</tr>
<tr>
<td>Boiler interlock</td>
<td>Provided</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time and temperature control to hot water</th>
<th>Cylinder thermostat and programmer/timer</th>
<th>Combination Boiler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating zone valves</td>
<td>Fitted</td>
<td></td>
</tr>
<tr>
<td>Hot water zone valves</td>
<td>Fitted</td>
<td></td>
</tr>
<tr>
<td>Thermostatic radiator valves</td>
<td>Fitted</td>
<td></td>
</tr>
<tr>
<td>Automatic bypass to system</td>
<td>Fitted</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALL SYSTEMS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The system has been flushed and cleaned in accordance with BS7593 and boiler manufacturer’s instructions</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>What system cleaner was used?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What inhibitor was used?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has a primary water system filter been installed?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CENTRAL HEATING MODE measure and record:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas rate</td>
<td>m³/hr</td>
<td>OR</td>
</tr>
<tr>
<td>Burner operating pressure (if applicable)</td>
<td>mbar</td>
<td>OR Gas inlet pressure</td>
</tr>
<tr>
<td>Central heating flow temperature</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Central heating return temperature</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMBINATION BOILERS ONLY</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the installation in a hard water area (above 200ppm)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>If yes, and if required by the manufacturer, has a water scale reducer been fitted?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOMESTIC HOT WATER MODE Measure and Record:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas rate</td>
<td>m³/hr</td>
<td>OR</td>
</tr>
<tr>
<td>Burner operating pressure (at maximum rate)</td>
<td>mbar</td>
<td>OR Gas inlet pressure at maximum rate</td>
</tr>
<tr>
<td>Cold water inlet temperature</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Hot water has been checked at all outlets</td>
<td>Yes</td>
<td>Temperature</td>
</tr>
<tr>
<td>Water flow rate</td>
<td>l/min</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONDENSING BOILERS ONLY</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The condensate drain has been installed in accordance with the manufacturer’s instructions and/or BS5546/BS6798</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

---

---

---

---
11.3 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.

| SERVICE 01 | Date: |
| Engineer name: | Company name: |
| Telephone No: | Gas safe register No: |
| Record: | At max. rate: CO ppm AND CO₂ % |
| Comments: | Signature |

| SERVICE 02 | Date: |
| Engineer name: | Company name: |
| Telephone No: | Gas safe register No: |
| Record: | At max. rate: CO ppm AND CO₂ % |
| Comments: | Signature |

| SERVICE 03 | Date: |
| Engineer name: | Company name: |
| Telephone No: | Gas safe register No: |
| Record: | At max. rate: CO ppm AND CO₂ % |
| Comments: | Signature |

| SERVICE 04 | Date: |
| Engineer name: | Company name: |
| Telephone No: | Gas safe register No: |
| Record: | At max. rate: CO ppm AND CO₂ % |
| Comments: | Signature |

| SERVICE 05 | Date: |
| Engineer name: | Company name: |
| Telephone No: | Gas safe register No: |
| Record: | At max. rate: CO ppm AND CO₂ % |
| Comments: | Signature |

| SERVICE 06 | Date: |
| Engineer name: | Company name: |
| Telephone No: | Gas safe register No: |
| Record: | At max. rate: CO ppm AND CO₂ % |
| Comments: | 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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0844 871 1525
Please note calls may be monitored or recorded

www.baxi.co.uk

Open Monday - Friday, 8am - 6pm
Weekends & Bank Holidays, 8.30am - 2pm
We are closed on Christmas Day and New Year’s Day.

Please note calls may be monitored or recorded.

Baxi, Brooks House
Coventry Road, Warwick, CV34 4LL.

Please ensure the boiler is installed in accordance with these installation instructions and regulations adhered too.

e&oe
All descriptions and illustrations provided in this document have been carefully prepared but we reserve the right to make changes and improvements in our products which may affect the accuracy of the information contained in this leaflet. All goods are sold subject to our standard Conditions of Sale which are available on request.