



Installation and Service Manual

Wall Mounted Gas Condensing Boiler

Baxi MainEco Combi and System

24-28-35 / 18-24



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.

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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.

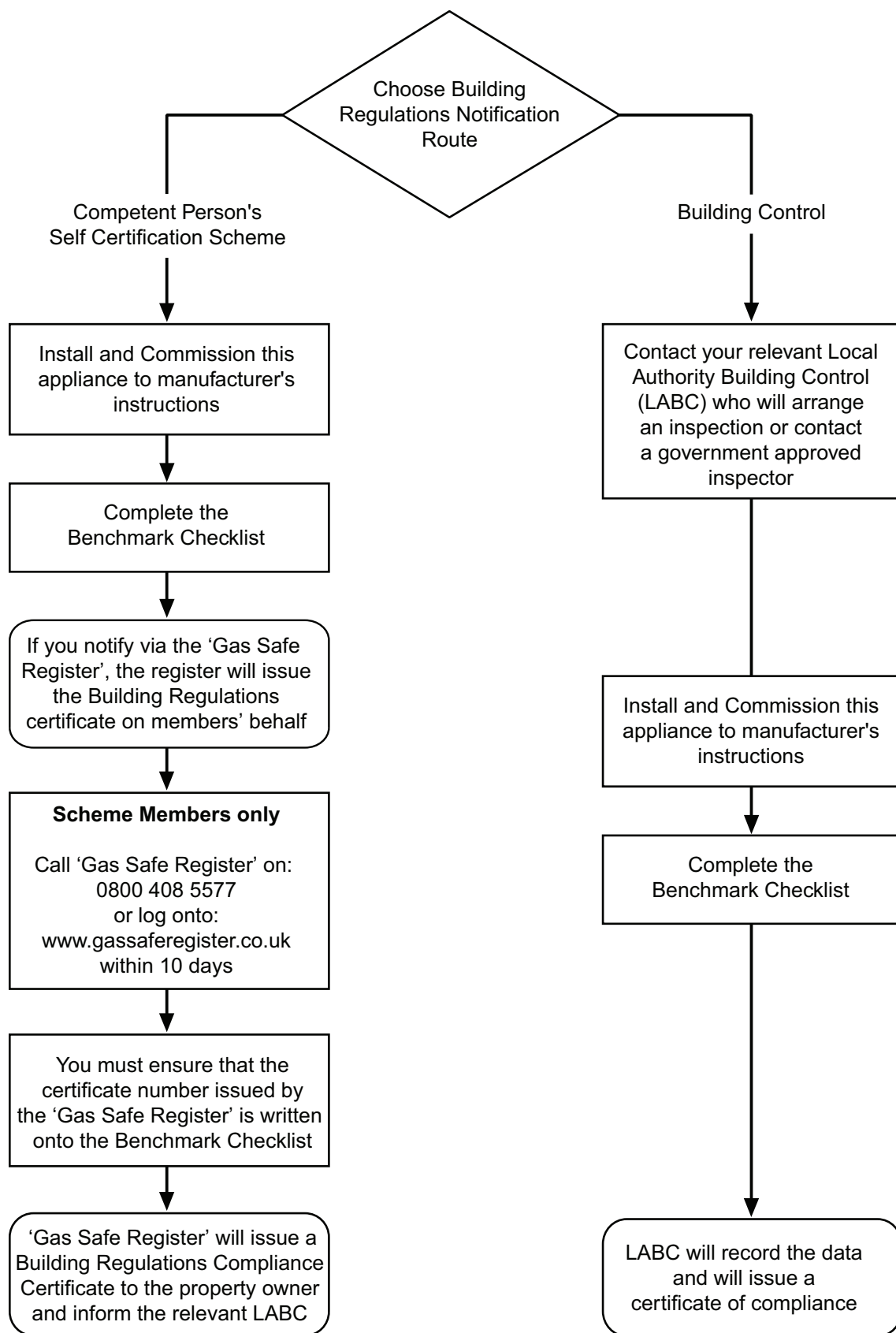
1.2 The Benchmark Scheme



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



R000696-01

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

CE identification no	PIN 0063CM3019
NOx classification	5 (Standards EN)
Type of connection (Flue gas outlet)	C ₁₃ , C ₃₃ , C ₅₃
Gas Council number	MainEco Combi 24: 47-075-93 MainEco Combi 28: 47-075-94 MainEco Combi 35: 47-075-95 MainEco System 18: 41-470-13 MainEco System 24: 41-470-14

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.
4. Report any leaks immediately.
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.
3. Report any leaks immediately.
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.

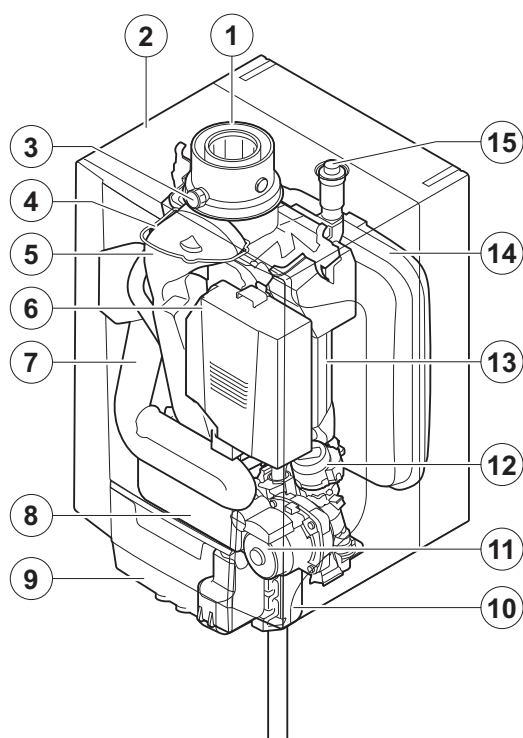
4 Technical description

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.

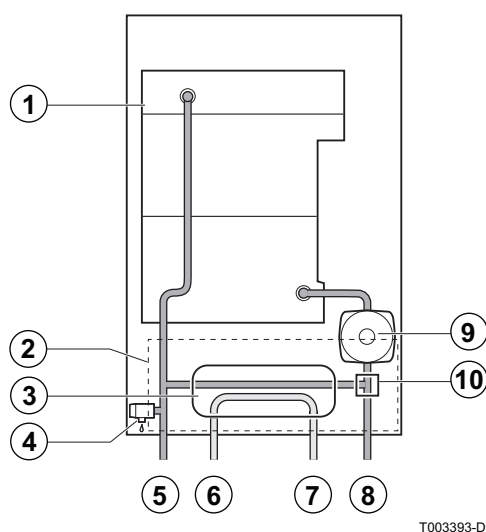
4.2 Main parts



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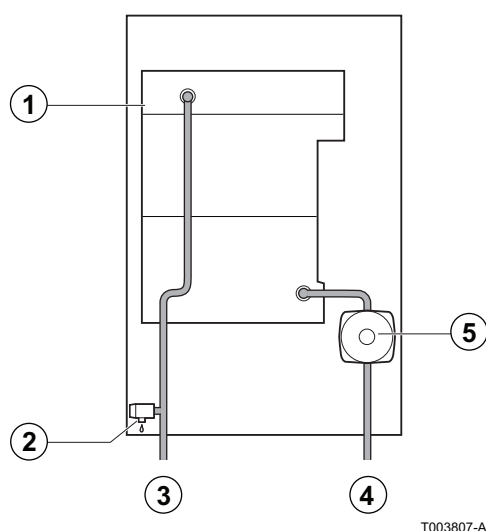
- | | |
|----|---|
| 1 | Flue gas outlet/Air intake (Combustion air/flue gas adapter 60/100) |
| 2 | Casing/air box |
| 3 | Outlet for measuring combustion gases |
| 4 | Ignition/ionization electrode |
| 5 | Flue gas discharge pipe |
| 6 | Gas/air system with a fan, gas block and automatic burner unit |
| 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 $\Delta T \geq 50^\circ\text{C}$ 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)

i 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

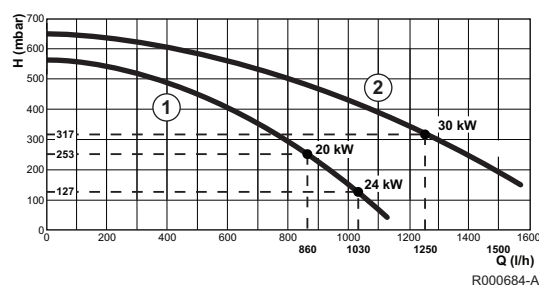
The maximum temperature protection locks the boiler if the water temperature becomes too high (110°C).

i 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.

i 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)



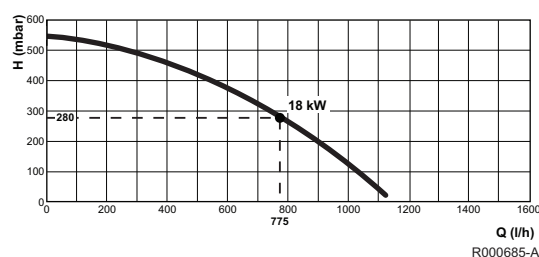
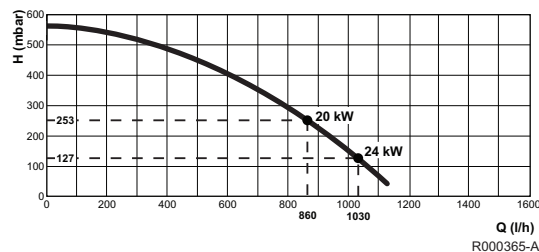
The boiler is fitted with an on/off circulation pump.

1 **Combi 24 - 28**

2 **Combi 35**

H Manometric height central heating circuit

Q Water flow ($\Delta T=20\text{K}$)

**System 18****H** Manometric height central heating circuit**Q** Water flow ($\Delta T=20K$)**System 24****H** Manometric height central heating circuit**Q** Water flow ($\Delta T=20K$)**4.6 Technical specifications**

Boiler type	MainEco		Combi 24	Combi 28	Combi 35	System 18	System 24
General							
EC identification no.	PIN		0063CM3019				
Input control	Adjustable		Modulating, Start/Stop				
Nominal output (Pn) Heating System (80/60 °C)	min - max	kW	5.5 - 19.5	5.5 - 23.4	7.7 - 29.2	5.5 - 17.7	5.5 - 23.4
	Factory setting	kW	19.5	19.5	29.2	17.7	23.4
Nominal output (Pn) Heating System (50/30 °C)	min - max	kW	6.1 - 20.9	6.1 - 24.8	8.5 - 31.0	6.1 - 18.8	6.1 - 24.8
	Factory setting	kW	20.9	20.7	31.0	18.8	24.8
Nominal output (Pn) DHW System	min - max	kW	5.5 - 23.4	5.5 - 27.5	7.7 - 33.9	-	-
	Factory setting	kW	23.4	27.5	33.9	-	-
Nominal input (Qn) Heating System (Hi)	min - max	kW	5.6 - 20.0	5.6 - 24.0	7.8 - 30.0	5.6 - 18.0	5.6 - 24.0
	Factory setting	kW	20.0	20.0	30.0	18.0	24.0
Nominal input (Qn) Heating System (Hs)	min - max	kW	6.2 - 22.2	6.2 - 26.7	8.7 - 33.3	6.2 - 20.0	6.2 - 26.7
	Factory setting	kW	22.2	22.2	33.3	20.0	26.7
Nominal input (Qnw) DHW System (Hi)	min - max	kW	5.6 - 24.0	5.6 - 28.2	7.8 - 34.9	-	-
	Factory setting	kW	24.0	28.2	34.9	-	-
Nominal input (Qnw) DHW System (Hs)	min - max	kW	6.2 - 26.7	6.2 - 31.3	8.7 - 38.8	-	-
	Factory setting	kW	26.7	31.3	38.8	-	-
Heating efficiency under full load (Hi) (80/60 °C)		%	97.6	97.6	97.2	98.2	97.6
Heating efficiency under full load (Hi) (50/30 °C)		%	104.5	103.3	103.3	104.5	103.3
Heating efficiency under partial load (Hi) (Return temperature 60°C)		%	97.8	97.8	98.4	97.8	97.8
Heating efficiency under partial load (Hi) (92/42 EEG) (Return temperature 30°C)		%	109.2	109.2	108.8	109.3	109.2
SEDBUK	2005 - 2009	%	90.4 - 89.4	90.3 - 89.3	90.1 - 89.1	90.4 - 89.4	90.3 - 89.3
Data on the gases and combustion gases							
Equipment categories		-	I ₂ H				
Type of air/flue gas connection		-	C ₁₃ , C ₃₃ , C ₅₃				
Gas inlet pressure G20	min - max	mbar	17 - 23				
Connecting pressure G20		mbar	20				
Gas consumption G20	max	m ³ /h	2.54	2.98	3.68	1.90	2.54
NOx annual emission (n=1)		mg/kWh	53	58	52	41	58
Mass flue gas flow rate	maximum	kg/h	9.4 - 38.7	9.4 - 45.5	13.1 - 56.2	9.4 - 29.1	9.4 - 38.7
(1) Front panel removed							

Boiler type		MainEco		Combi 24	Combi 28	Combi 35	System 18	System 24
Flue gas temperature		min - max	°C	32 - 78	32 - 84	31 - 82	32 - 65	32 - 78
Maximum counter pressure			Pa	80	116	105	-	80
Characteristics of the heating circuit								
Water content			l	1.6	1.6	1.7	1.4	1.4
Water operating pressure		minimum	bar	0.8	0.8	0.8	0.8	0.8
Water operating pressure (PMS)		maximum	bar	2.5	2.5	2.5	2.5	2.5
Water temperature		maximum	°C	110	110	110	110	110
Operating temperature		maximum	°C	90	90	90	90	90
Manometric height central heating circuit (ΔT = 20K)			mbar	253	127	317	280	275
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	3
Electrical protection index			IP	X4D				
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
	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.



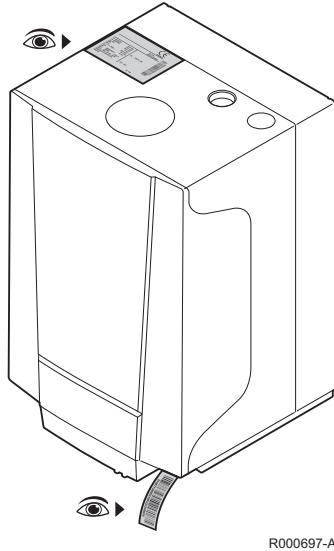
Codes of Practice - refer to the most recent version.

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



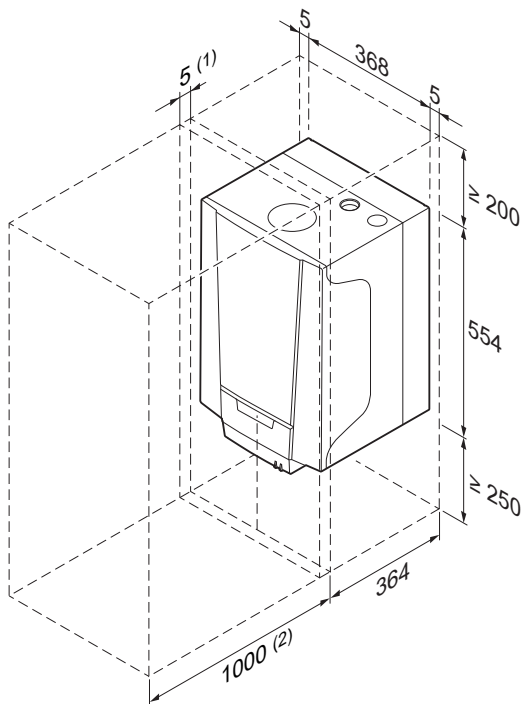
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The identification plate on top of the boiler features the boiler serial number and important boiler specifications, for example the model and unit category. The dF and dU codes are also stated on the type plate.

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.



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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

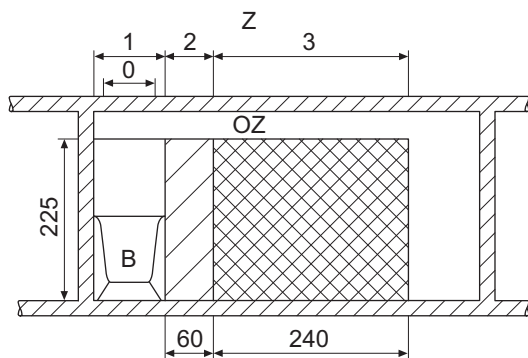
- ▶ Fix the appliance to a solid wall capable of bearing the weight of the appliance when full of water and fully equipped.
- ▶ Do not place the appliance above a heat source or a cooking appliance.
- ▶ Do not locate the boiler in direct sunlight.
- ▶ It is forbidden to store inflammable products and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

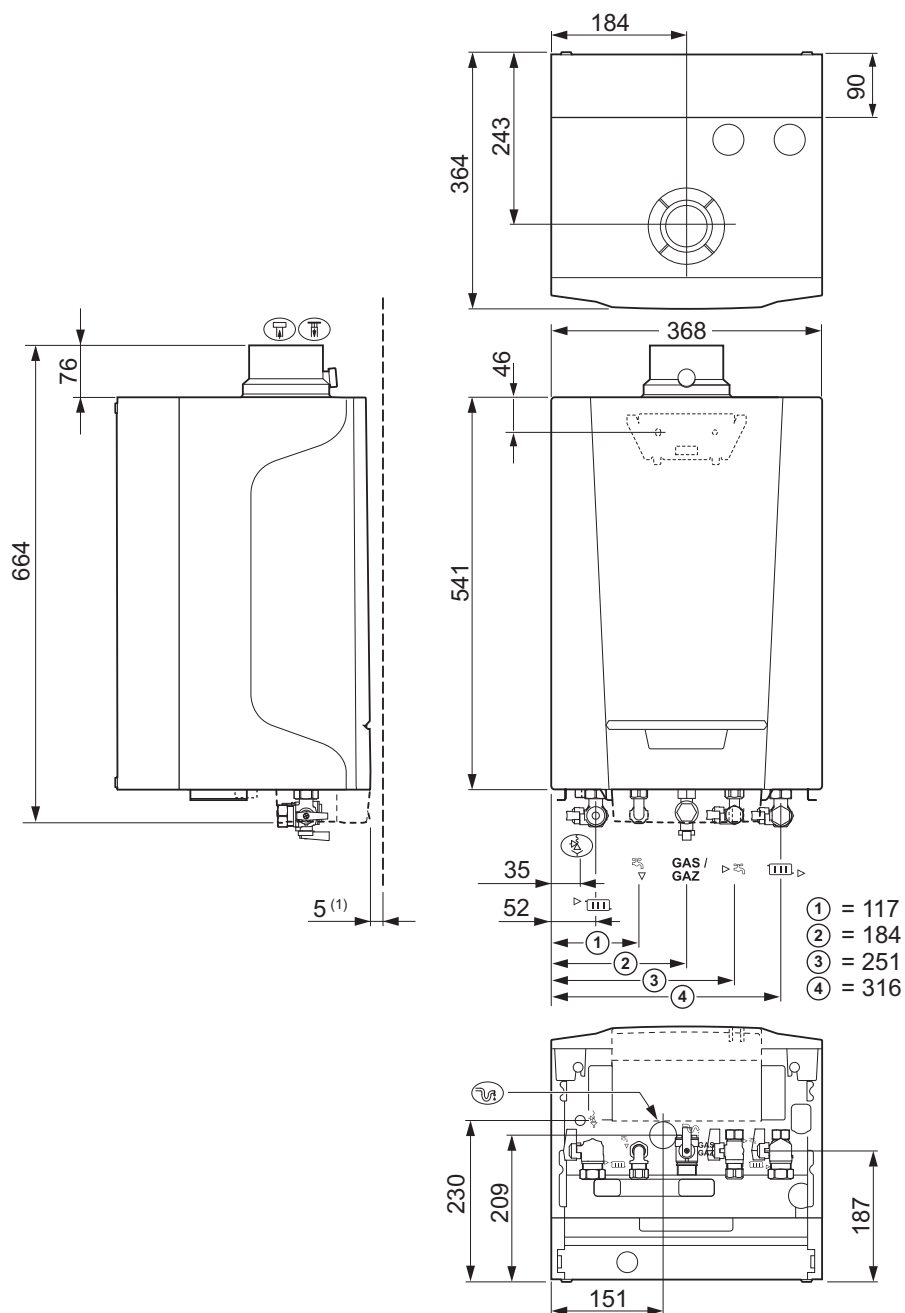
In this case, connect the 230 V power supply as a fixed connection to a fused spur.



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



R000699-B

Boiler		Connection kit
	Connection of the combustion gas exhaust pipe; Ø 60 mm	
	Connection of the air intake pipe; Ø 100 mm	
	Safety valve outlet pipe; Ø 15 mm	To Ø 15 mm using supplied adapter
	Condensates discharge; Ø 25 mm	To Ø 21.5 mm using supplied adapter
	Heating circuit flow; G $\frac{3}{4}$ "	Pipe diameter; Ø 22 mm
	Domestic hot water outlet; G $\frac{1}{2}$ "	Pipe diameter; Ø 15 mm
Gas / Gaz	Gas connection; G $\frac{1}{2}$ "	Pipe diameter; Ø 22 mm
	Domestic cold water inlet; G $\frac{1}{2}$ "	Pipe diameter; Ø 15 mm
	Heating circuit return; G $\frac{3}{4}$ "	Pipe diameter; Ø 22 mm
(1)	Clearance when operating; ≥ 5 mm	

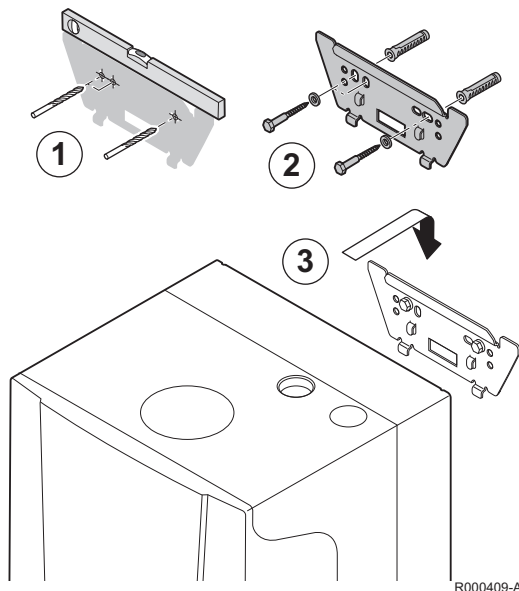
5.4 Positioning the boiler

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.

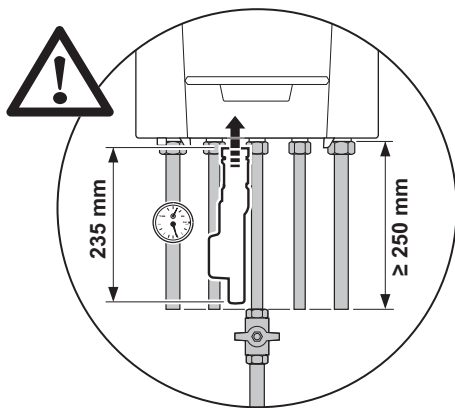


CAUTION

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.

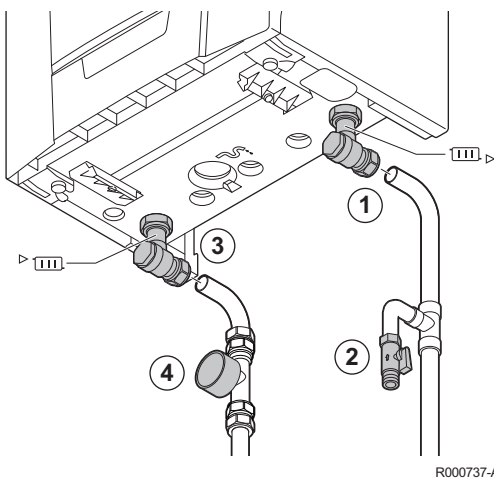
5.5.2. Water flow rate

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 .
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 .
4. Mount the supplied thermomanometer onto the central heating flow connection. Place the thermomanometer no more than 0.5 m away from the boiler.

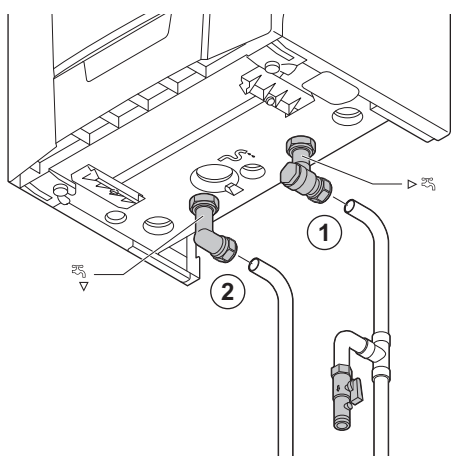


A PRV safety valve is fitted to the flow side of the boiler as standard.

**CAUTION**

- ▶ The heating pipe must be mounted 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 you are installing a service shut-off valve, place the filling and drain cock, the expansion vessel and the thermomanometer between the shut-off valve and the boiler.
- ▶ Install a drain under the safety valve leading to the drainage system .

5.5.4. Connection of the water circuit for domestic use



R000738-A

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

**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.

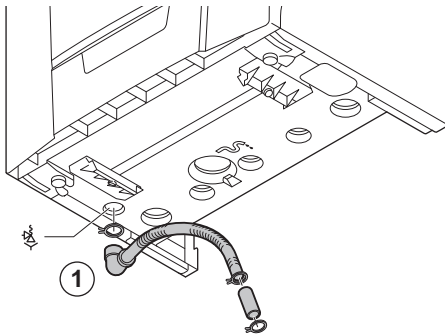
If the water volume is greater than 100 litres or the static height of the system exceeds 5 metres, an additional expansion vessel must be fitted. Refer to the table below to determine the expansion vessel required for the installation.

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

Initial pressure of the expansion vessel	Volume of the expansion vessel depending on the volume of the installation (in litres)							
	100	125	150	175	200	250	300	> 300
0.5 bar	4.8	6.0	7.2	8.4	9.6	12.0	14.4	Volume of the installation x 0.048
1 bar	8.0 ⁽¹⁾	10.0	12.0	14.0	16.0	20.0	24.0	Volume of the installation x 0.080
1.5 bar	13.3	16.6	20.0	23.3	26.6	33.3	39.9	Volume of the installation x 0.133
(1) Factory configuration								

5.5.6. Connecting the safety valve discharge pipe



R000739-A

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.

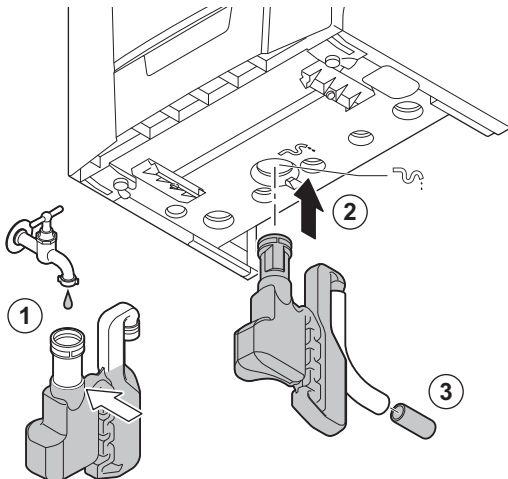


CAUTION

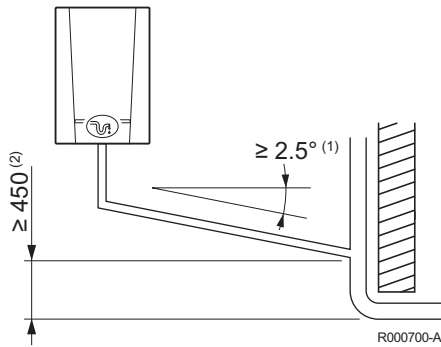
Do not make a permanent rigid connection owing to maintenance work on the condensate trap.



- ▶ 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.



R000740-A

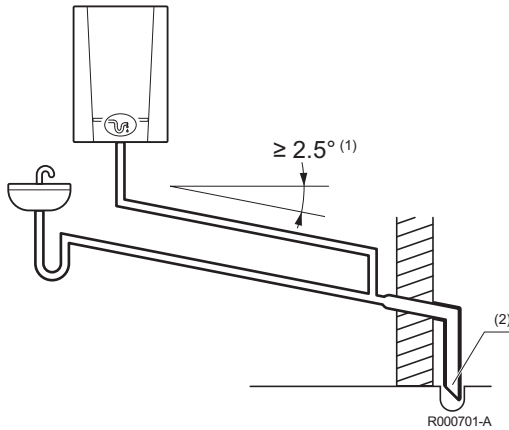


Termination to an internal soil and vent pipe

- (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.

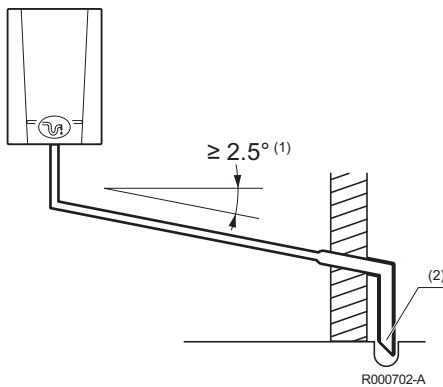


External termination via internal discharge branch e.g sink waste - downstream

- (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°.

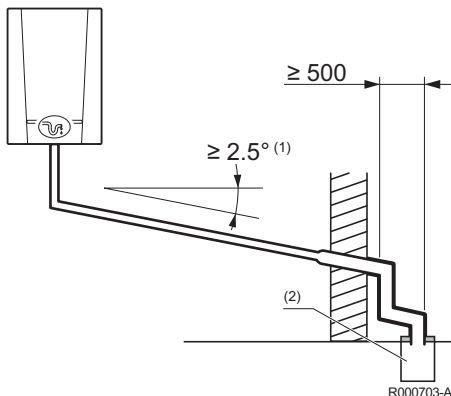


It is not recommended to connect upstream of the sink or other waste water receptacle!



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°.

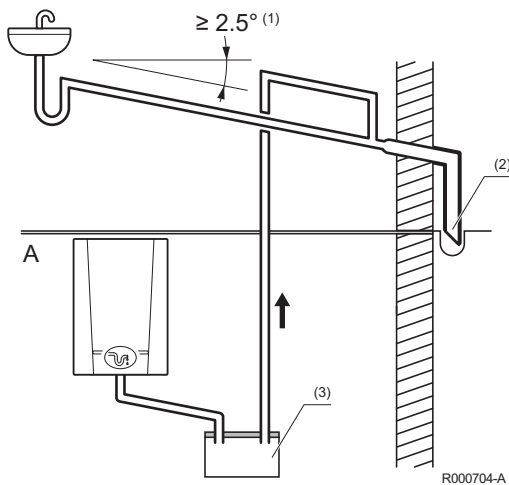


Termination to a purpose made soakaway

- (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.

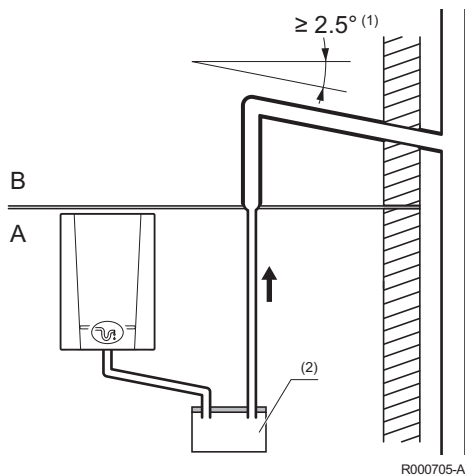


Further specific requirements for soakaway design are referred to in BS 6798.



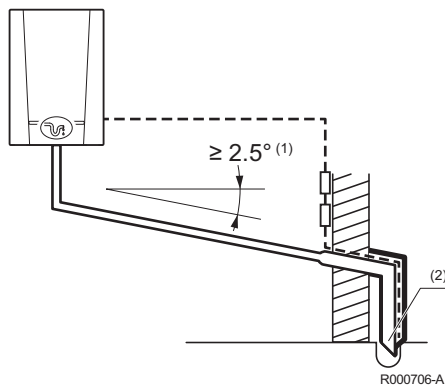
Pumped into an internal discharge branch (e.g. sink waste) downstream of the trap

- A** Basement or similar (heated).
- (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°.
- (3)** Condensate pump.



Pumped into an external soil & vent pipe

- A** Basement or similar (heated).
- B** Unheated location (e.g. garage).
- (1)** Set the discharge pipe at a gradient of at least 50 mm per metre, maximum horizontal length 5 metres.
- (2)** Condensate pump.



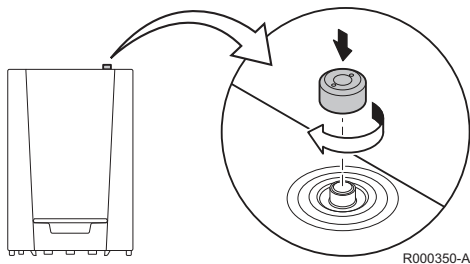
To a drain or gully with extended external run & trace heating

- (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°.



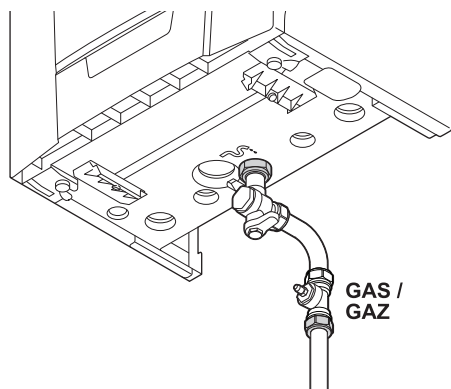
The 'Trace Heating' element must be installed in accordance with the instructions supplied. External runs & those in unheated locations still require insulation.

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



R000735-A

1. Connect the gas inlet pipe **GAS / GAZ**.



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



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



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



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

5.7.1. Classification

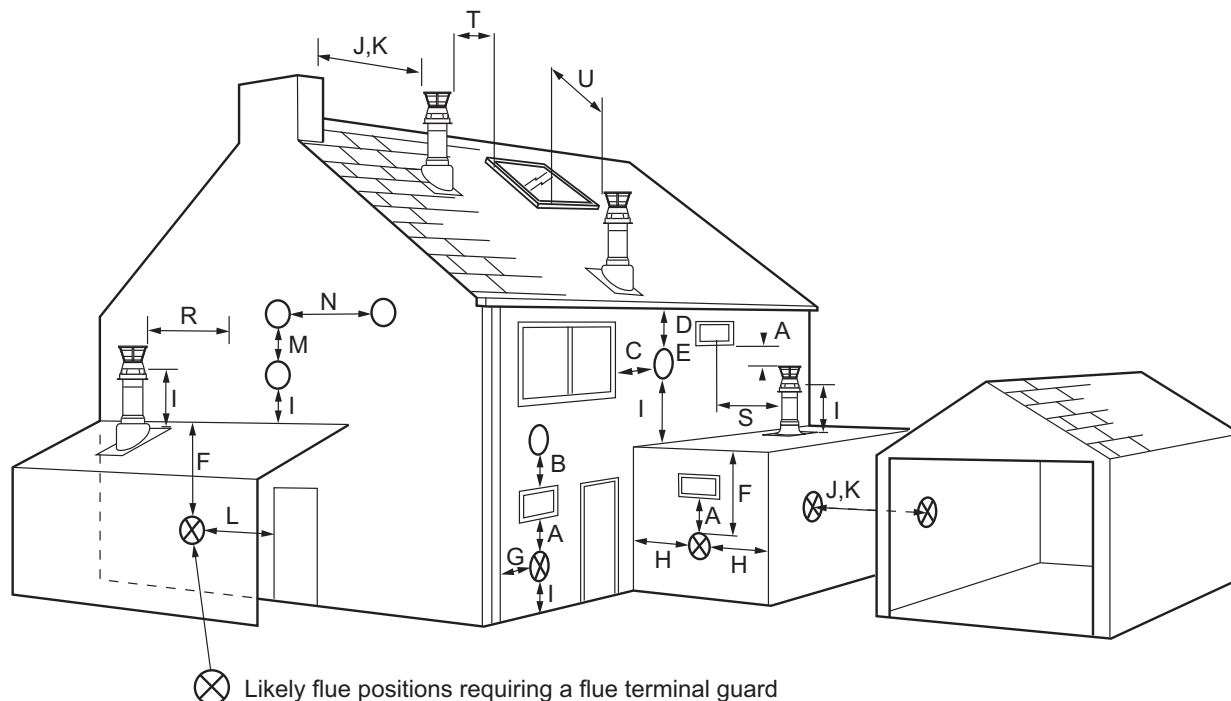
The table specifies this classification in detail according to **CE**.

Type	Execution	Description
C13	Room sealed	▶ Vent in the outside wall. ▶ 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).
C33	Room sealed	▶ Exhaust of combustion gases above the roof. ▶ 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).
C53	Room sealed	▶ Closed equipment. ▶ Separate channelling for the air-supply. ▶ Separate channelling for the combustion gases. ▶ Terminating on different pressure surfaces.

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.



R000707-A

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

(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

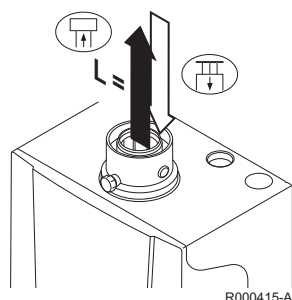


To define the maximum final length, you must deduct the pipe length in accordance with the reduction table.

■ 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.



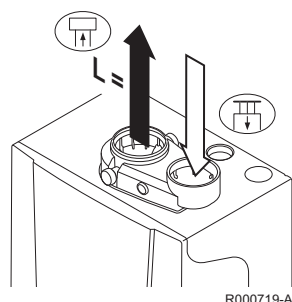
Maximum chimney length for room sealed operation					
Diameter	Combi 24	Combi 28	Combi 35	System 18	System 24
60-100 mm	9 m	9 m	5 m	9 m	9 m
80-125 mm	12 m ⁽¹⁾	12 m ⁽¹⁾	12 m ⁽¹⁾	12 m ⁽¹⁾	12 m ⁽¹⁾
(1) With retention of the maximum chimney length it is possible to apply an extra 10 times 45° or 5 times 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					
Diameter	Combi 24	Combi 28	Combi 35	System 18	System 24
80-80 mm	15 m	15 m	15 m	15 m	15 m

■ Reduction table

Pipe reductions per element used		
Diameter	Elbow 45°	Elbow 90°
	Pipe reduction	Pipe reduction
60-100 mm	1,0 m	2,0 m
80-125 mm	1,0 m	2,0 m
80 mm	1.2 m ⁽¹⁾	4.0 m ⁽¹⁾
(1) Reduction for both air and exhaust		

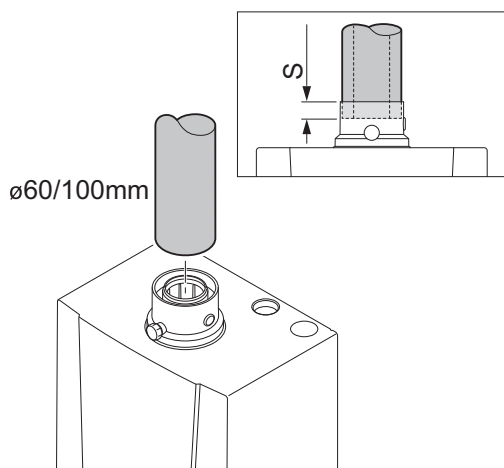
5.7.4. Additional Directives

- ▶ 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



R000437-A

S Insertion depth 30 mm

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.

Power supply voltage	230 VAC/50Hz
Fuse rating F1 (230 VAC)	1,6 AT

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.

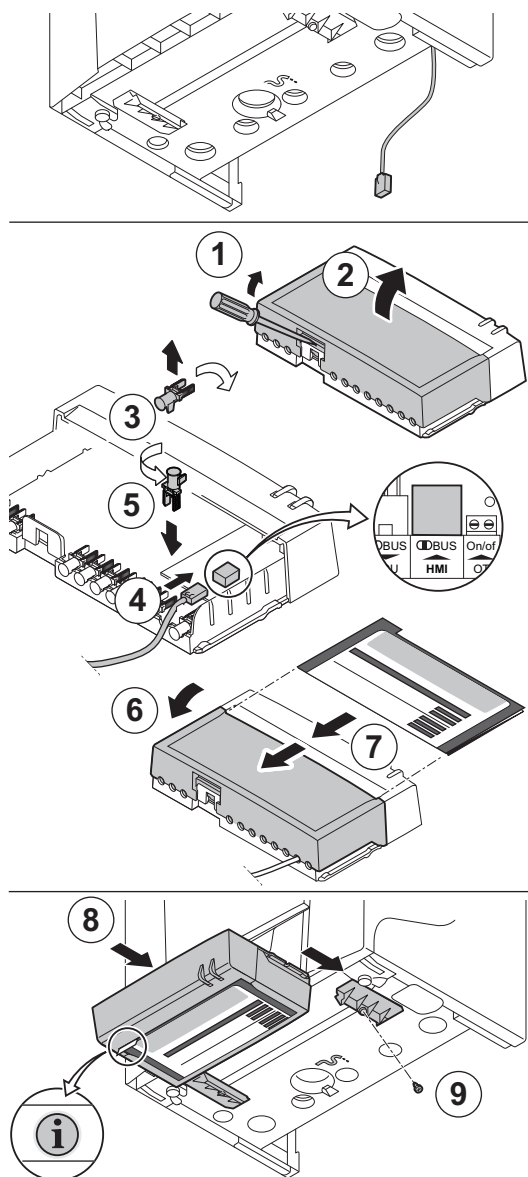
Make the electrical connections of the boiler according to:

- ▶ 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



R000411-C

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.

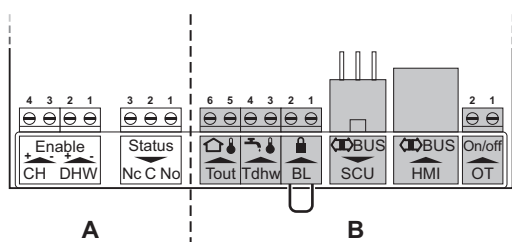
The connection options for external system controls to the boiler HMI are explained in the following paragraphs.



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.



R000734-A

- A** Mains voltage
B 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.



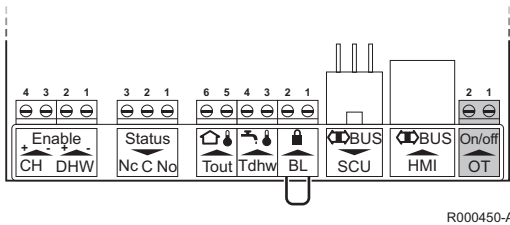
A OpenTherm controller can also use this outside sensor. The heating curve required must then be set on the controller.

Heating curve setting

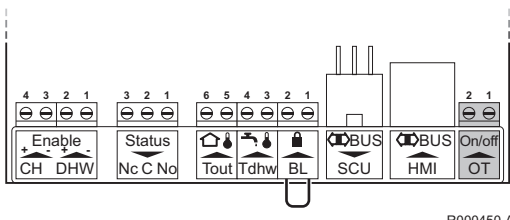
If an outside temperature sensor is connected, it is possible to adapt the heating curve. The setting can be modified using parameters **P1**, **P25**, **P26** and **P27**.



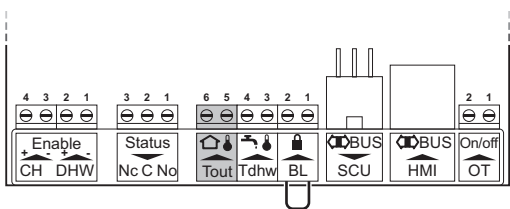
This is only possible with an iSense or qSense.



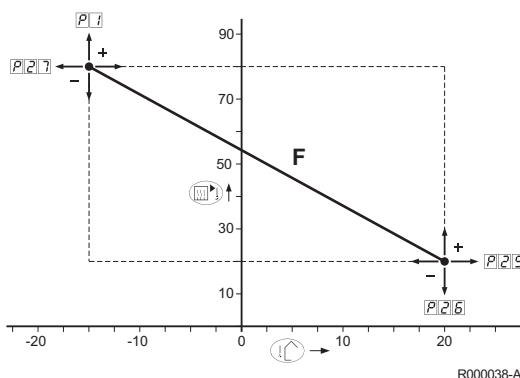
R000450-A



R000450-A



R000451-A



■ 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.

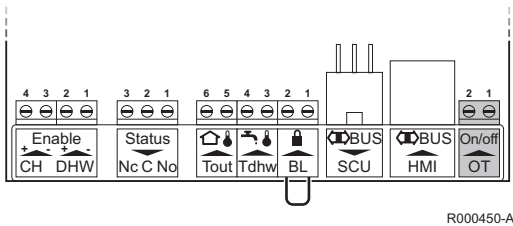
■ Operation signal and failure signal (Status)

The alarm or operation signal is selected using parameter **P40**.

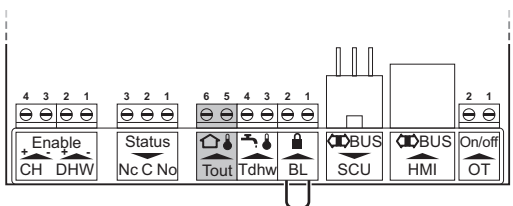
- ▶ If the boiler is operating, the operation signal can be switched via a potential-free contact (maximum 230 VAC, 1 A) on the **No** and **C** terminals of the connector.
- ▶ If the boiler locks out, the alarm can be transmitted via a potential-free contact (maximum 230 VAC, 1 A) on the **Nc** and **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



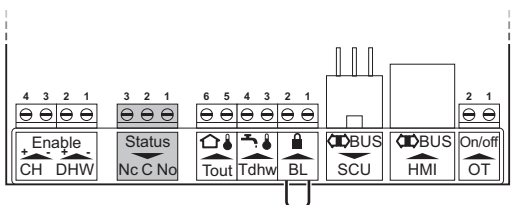
- ▶ This is only possible with an iSense or qSense.
- ▶ **Status** connection can be used for standalone condensate pump.



R000450-A

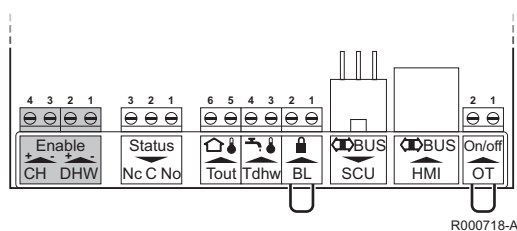


R000451-A



R000453-A

■ 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**.

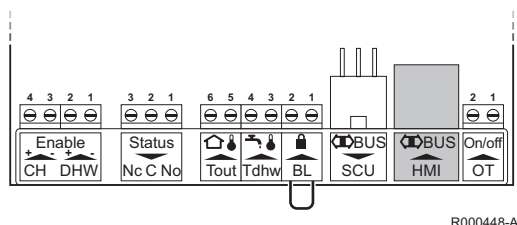


When using the **Enable-CH** connection a bridge must be placed on the **On/off-OT** terminals of the connector.



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

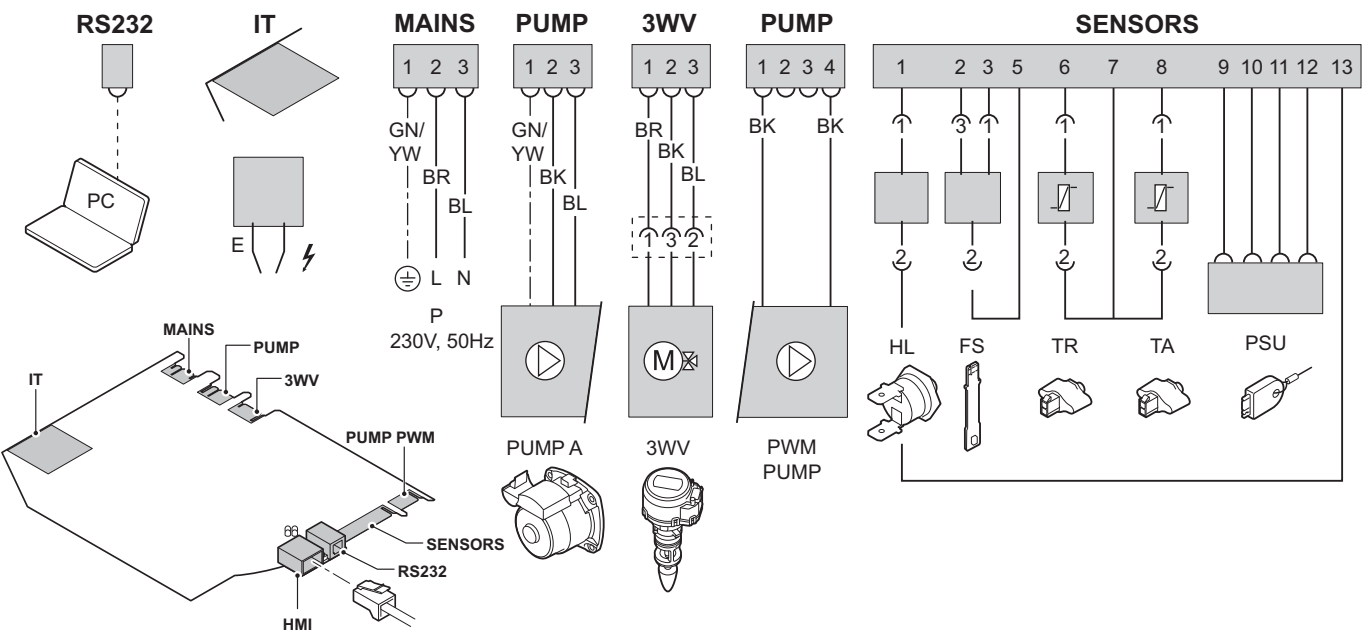


The control panel for the boiler is connected to connector **BUS HMI**.



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

5.9 Electrical diagram



R000291-A

RS232	Connecting a computer	PUMP A	Circulation pump	TR	Return sensor
IT	Ignition transformer	3WV	3-way valve	TA	Flow sensor
E	Ignition/ionization electrode	HL	Safety thermostat	PSU	Storage parameter
P	Power supply	FS	Flow switch	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)			
		≤ 70	70 - 200	200 - 550	> 550
Degree of acidity (water non-treated)	pH	7 - 9	7 - 9	7 - 9	7 - 9
Degree of acidity (water treated)	pH	7 - 8.5	7 - 8.5	7 - 8.5	7 - 8.5
Conductivity at 25°C	μS/cm	≤ 800	≤ 800	≤ 800	≤ 800
Chlorides	mg/l	≤ 150	≤ 150	≤ 150	≤ 150
Other components	mg/l	< 1	< 1	< 1	< 1
Total water hardness ⁽¹⁾	°f	1 - 35	1 - 20	1 - 15	1 - 5
	°dH	0.5 - 20.0	0.5 - 11.2	0.5 - 8.4	0.5 - 2.8
	mmol/l	0.1 - 3.5	0.1 - 2.0	0.1 - 1.5	0.1 - 0.5

(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

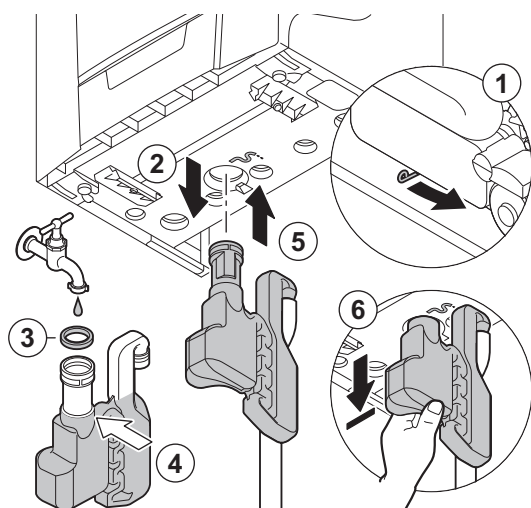
Check whether the condensate trap is filled up to the mark. If the condensate trap has to be topped up, proceed as follows:



CAUTION

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

See paragraph: "Open the boiler", page 53



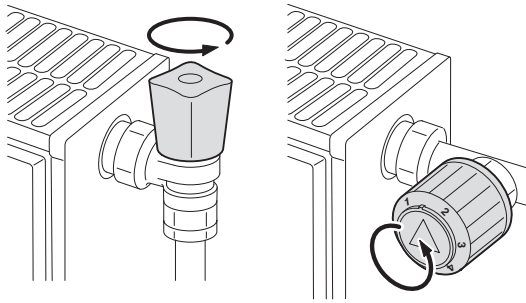
R000431-B



CAUTION

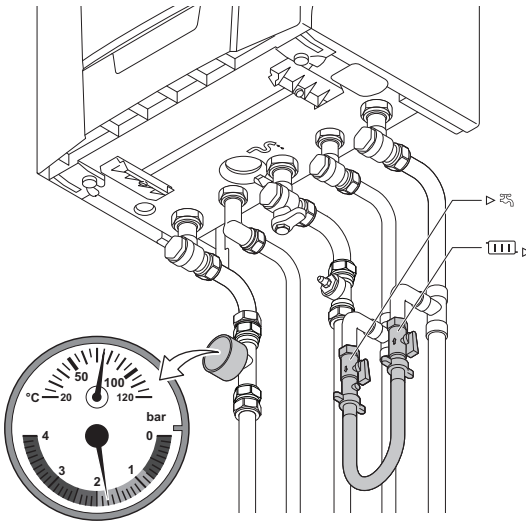
Fill the condensate trap with water before starting the boiler to avoid combustion products escaping from the boiler.

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.

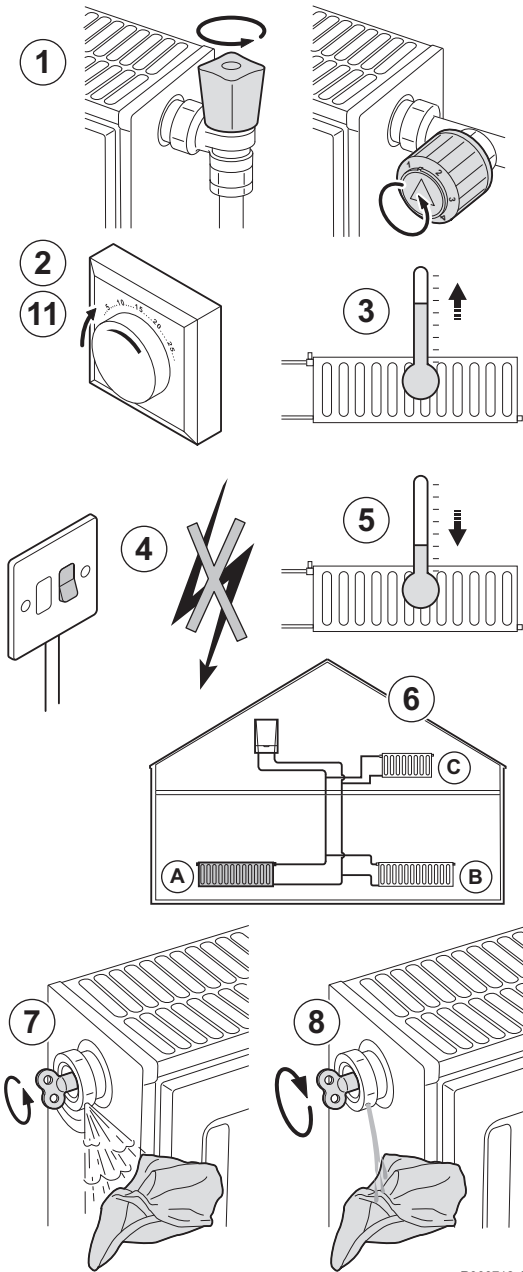
8. Wait until water comes out of the bleed valve and then close the bleed connection.
9. Turn the boiler on. A vent cycle of a duration of around 4 minutes is carried out automatically.
10. After venting, check whether the pressure in the installation is still sufficient.



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

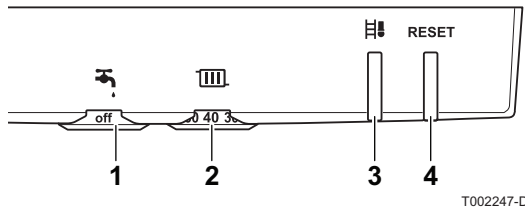
11. Set the room thermostat or the regulator.



R000712-A

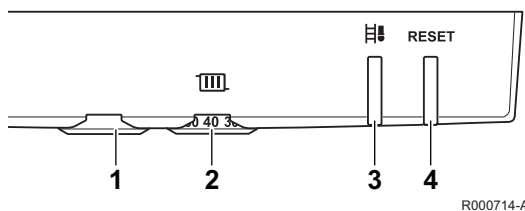
6 Commissioning

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.

**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 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

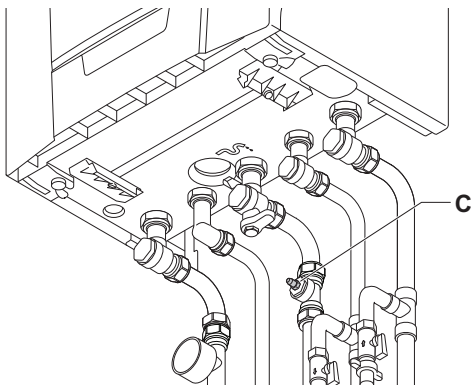
To ascertain the gas types permitted, see chapter: "Technical specifications", page 17

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.



R000736-A

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.



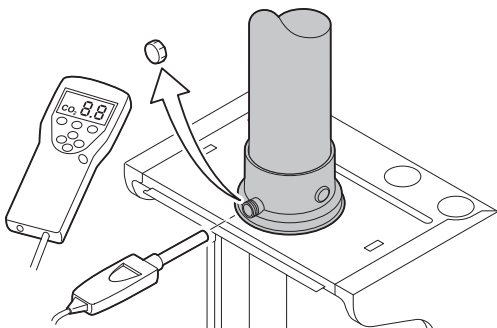
WARNING

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



CAUTION

The flue gas analyser must have a minimum accuracy of $\pm 0.25\% \text{ CO}_2$.



T003127-B

■ 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 CO₂ in the flue gases (Front panel removed).



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  key. The status signal for the  button is orange and always flashes green briefly; Part load is set.
2. Measure the percentage CO₂ in the flue gases (Front panel removed).



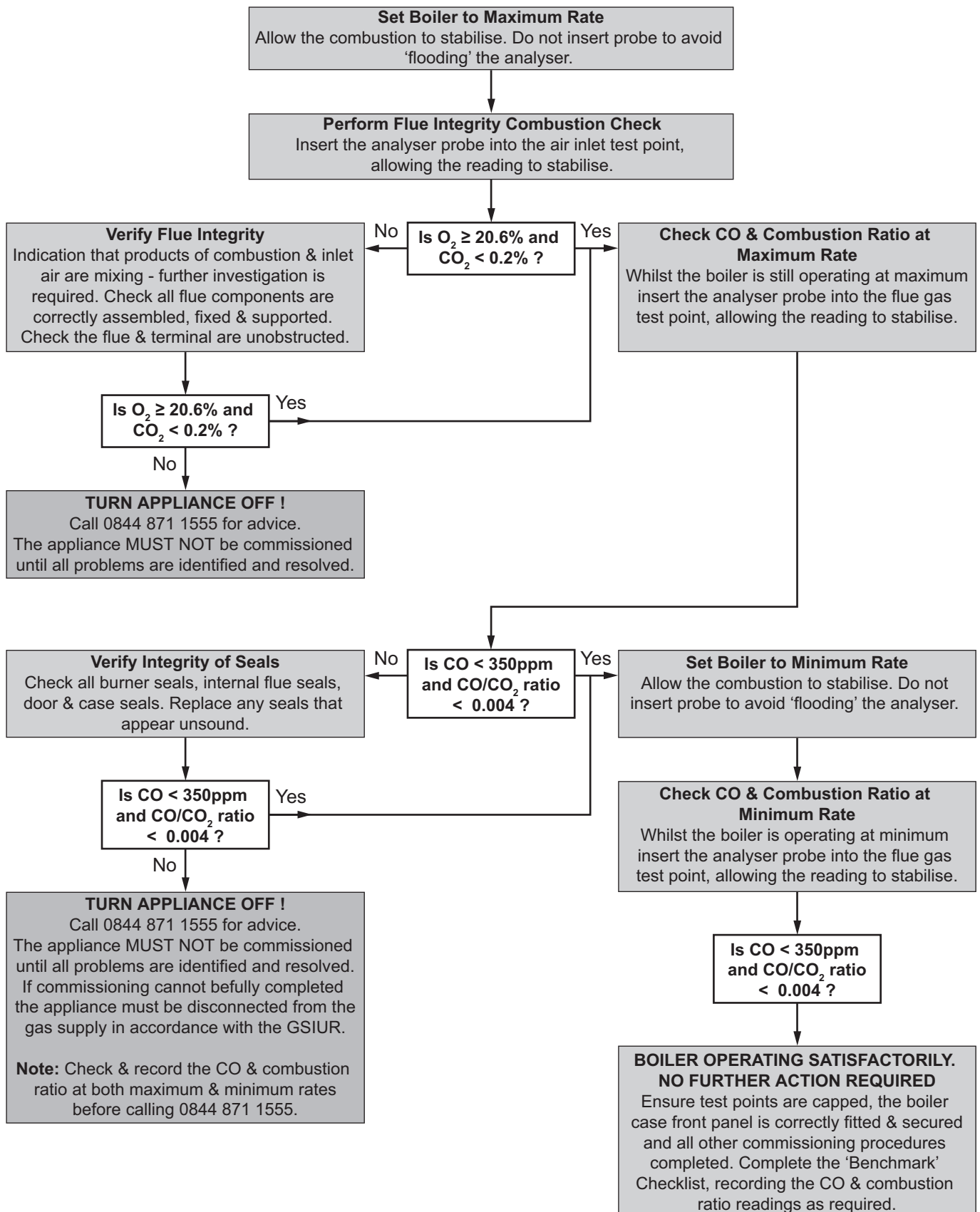
Part load CO₂ must be between 8.70 and 9.05 %.



WARNING

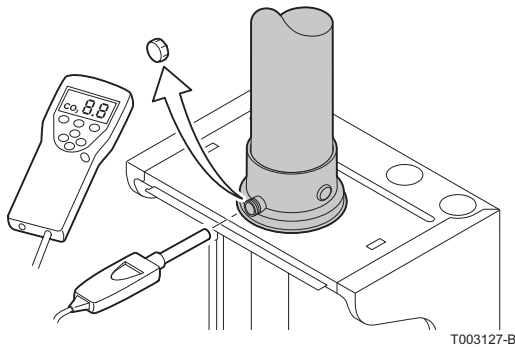
There MUST remain a "gap" between the full load and part load values. The full load value must be 0.4% higher than the part load value.

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



R000715-A

6.4.3. Setting the air/gas ratio



WARNING

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



CAUTION

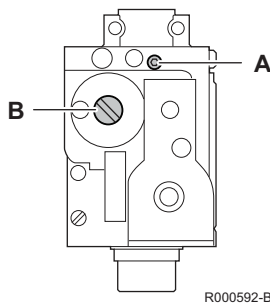
The flue gas analyser must have a minimum accuracy of $\pm 0.25\%$ CO₂.

■ 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.
- ▶ See drawing for the position of control screw **A** for full load.



- ▶ 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.



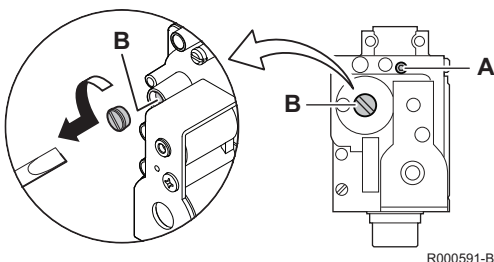
Full load CO₂ must be between 9.15 and 9.50 %.

■ Set the boiler to part load

1. Continue pressing for around 3 seconds on the  key. The status signal for the  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 %.

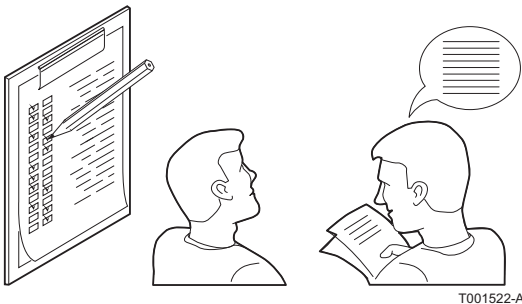


WARNING

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

Parameter	Description	Adjustment range	Factory setting				
			Combi			System	
			24	28	35	18	24
P1	Flow temperature: T _{SET}	20 to 90 °C	80	80	80	80	80
P2	Domestic hot water temperature: T _{SET}	40 to 65 °C	55	55	55	55	55
P3	Heating / DHW mode	0 = Heating deactivated / DHW deactivated 1 = Heating activated / DHW activated 2 = Heating activated / DHW deactivated 3 = Heating deactivated / DHW activated	1	1	1	1	1
P4	ECO mode	0 = Comfort 1 = Energy-saving mode 2 = Management using a programmable thermostat	2	2	2	2	2
P5	Post-circulation of the pump	1 to 98 minutes 99 minutes = continuous	2	2	2	2	2
P17	Maximum fan volume flow (Heating)	G20 (x100)	39	39	60	36	47
P18	Maximum fan volume flow (DHW)	G20 (x100)	47	56	70	36	47
P19	Minimum fan volume flow (Heating +DHW)	G20 (x100)	11	11	15	11	11
P20	Minimum fan volume flow (offset)	G20	80	80	60	80	80
P21	Starting volume flow	Do not modify (x100)	23	23	30	23	23
P23	Maximum flow temperature of system	20 to 90 °C	90	90	90	90	90
P24	Time factor of average flow calculation	Do not modify (x10 seconds)	35	35	35	35	35
P25	Heat curve set point (Maximum outside temperature)	0 to 30 °C (Only with an outside temperature sensor)	20	20	20	20	20
P26	Heat curve set point (Flow temperature)	0 to 90 °C (Only with an outside temperature sensor)	20	20	20	20	20
P27	Heat curve set point (Minimum outside temperature)	-30 to 0 °C (Only with an outside temperature sensor)	-15	-15	-15	-15	-15
P28	Minimum pump speed for central heating operation (Setting the pump speed)	2 - 10 (x 10 %)	2	2	2	2	2
P29	Maximum pump speed for central heating operation (Setting the pump speed)	2 - 10 (x 10 %)	7	7	10	10	10
P30	Antifreeze temperature	from - 30 to 0°C	-10	-10	-10	-10	-10
P31	Legionella protection	0 = Stop 1 = Start ⁽¹⁾ 2 = Management using a programmable thermostat	1	1	1	1	1
P32	Set point increase for calorifier	0 to 25 °C	15	15	15	15	15
P33	DHW cut-in temperature DHW sensor	from 2 to 15°C	4	4	4	4	4
P34	Control of external 3-way valve	0 = Normal 1 = Reverse	0	0	0	0	0
P35	Boiler type	0 = Heating and instant domestic hot water 1 = Heating only	0	0	0	1	1

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

Parameter	Description	Adjustment range	Factory setting				
			Combi			System	
			24	28	35	18	24
P36	Shutdown input function	1 = Shutdown without frost-protection 2 = Shutdown with frost protection 3 = Lock-out with frost protection (Pump only)	1	1	1	1	1
P37	Minimum gas pressure switch (GpS)	0 = Not connected 1 = Connected	0	0	0	0	0
P38	Heat recovery unit (HRU)	0 = Not connected 1 = Connected	0	0	0	0	0
P39	Flue gas damper running time	0 to 255 seconds	0	0	0	0	0
P40	Fault relay function	0 = Operation signal 1 = Alarm signal 2 = External 3-way valve	2	2	2	2	2
P41	Maintenance message	Do not modify	0	0	0	0	0
P42	Service operating hours	Do not modify	175	175	175	175	175
P43	Service burning hours	Do not modify	30	30	30	30	30
P44	Venting cycle	0 = Stop 1 = Multiple speed pump 2 = Modulating pump	1	1	1	1	1

(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

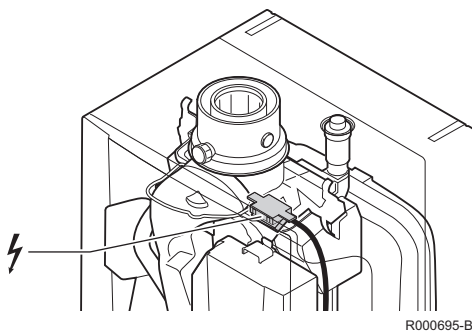


WARNING

- ▶ 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

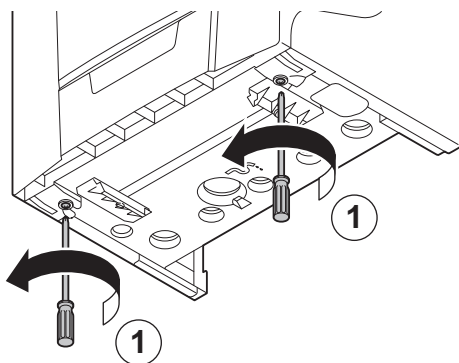
Ensure that the boiler is switched off. Electrical isolation can be checked at the electrical test point.



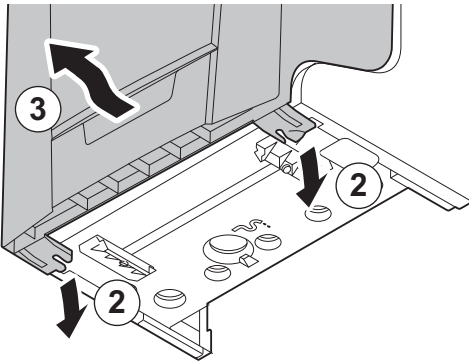
CAUTION

- ▶ 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.



R000405-A

2. Remove the front panel.

8.2.2. Checking the hydraulic pressure

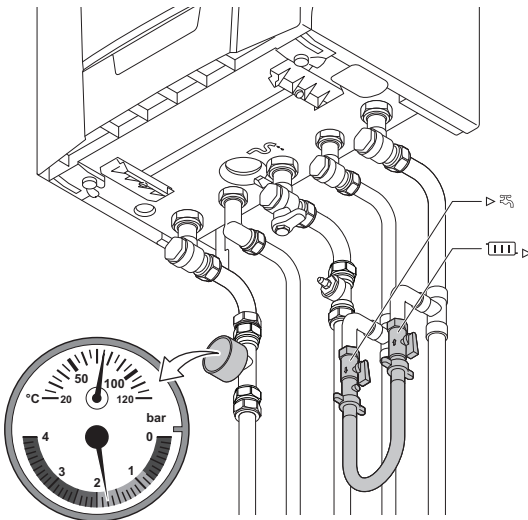
The hydraulic pressure must reach a minimum of 0.8 bar. If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1 and 2 bar).



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.



R000733-A

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.

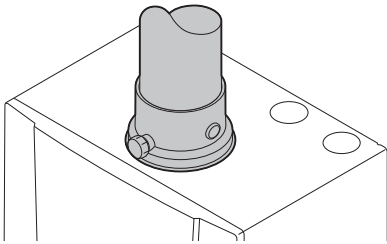
8.2.5. Checking the DHW transfer capacity

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.



R000406-A

8.2.7. Checking combustion

Measure the percentage CO₂ in the flue gases. To do this, proceed as follows:

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

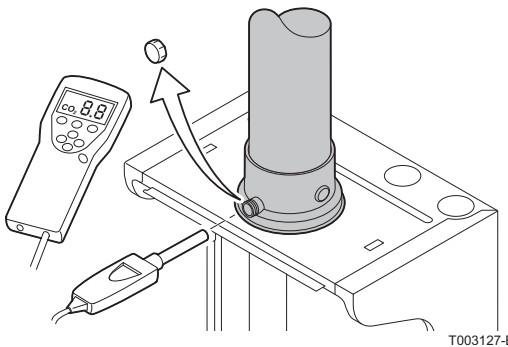


Allow the combustion to stabilise before inserting the combustion analyser probe into the measurement opening. This will prevent saturation of the analyser.

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 CO₂ in the flue gases. Perform measurements at full capacity and low capacity. Compare this with the control value.



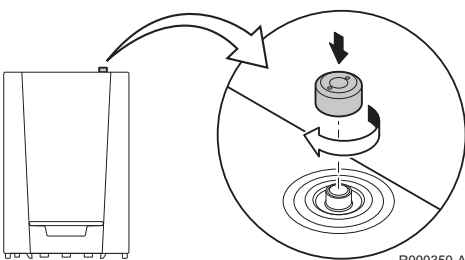
For further information: See chapter: "Checking combustion", page 45



T003127-B

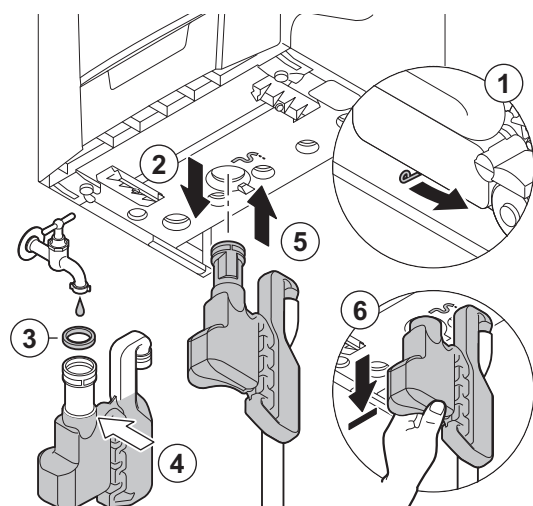
8.2.8. Checking the automatic air vent

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.



R000350-A

8.2.9. Checking the condensate trap



R000431-B

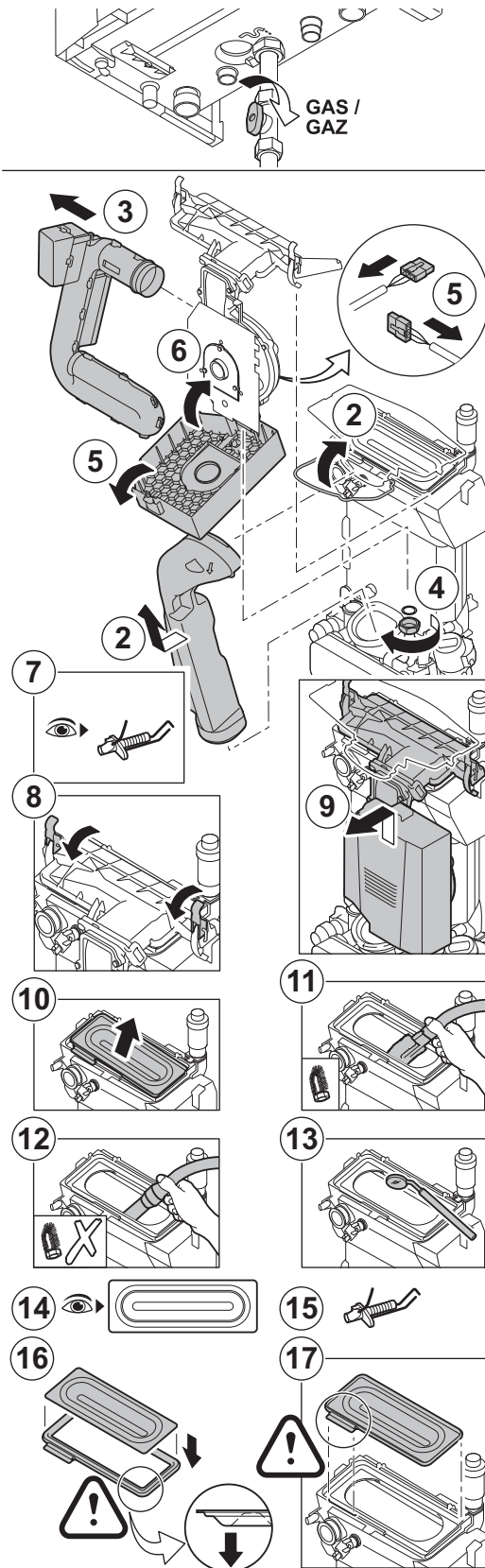


CAUTION

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



T004777-B



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.
 See also: "Replacing the ionization/ignition electrode", page 58
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.

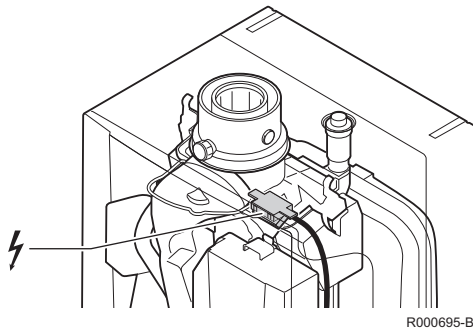


CAUTION

- ▶ 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

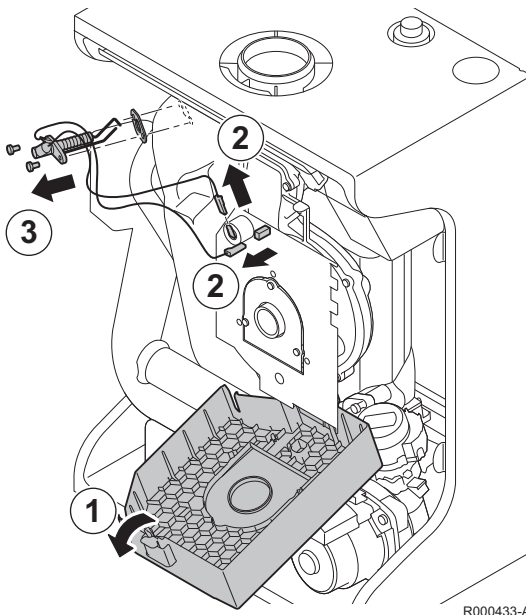
- ▶ Always examine any seals or gaskets, replacing where necessary. Where a seal or gasket is supplied with a spare part it should be used, irrespective of the condition of the original.
- ▶ Use only original spare parts that are intended for use with this type of boiler.

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:

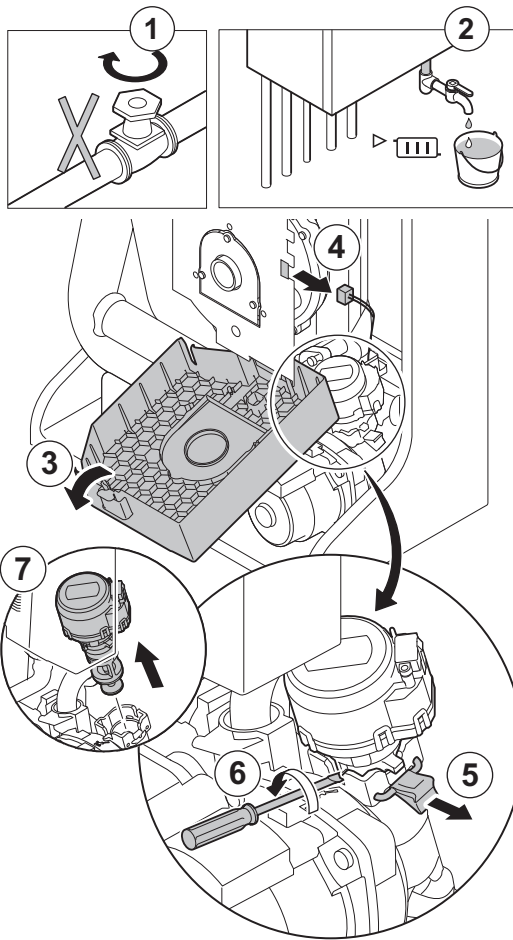
8.3.1. Replacing the ionization/ignition electrode

Replace the ionization/ignition electrode in the following cases:

- ▶ Ionization current $< 3 \mu\text{A}$.
 - ▶ 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



R000400-A

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.



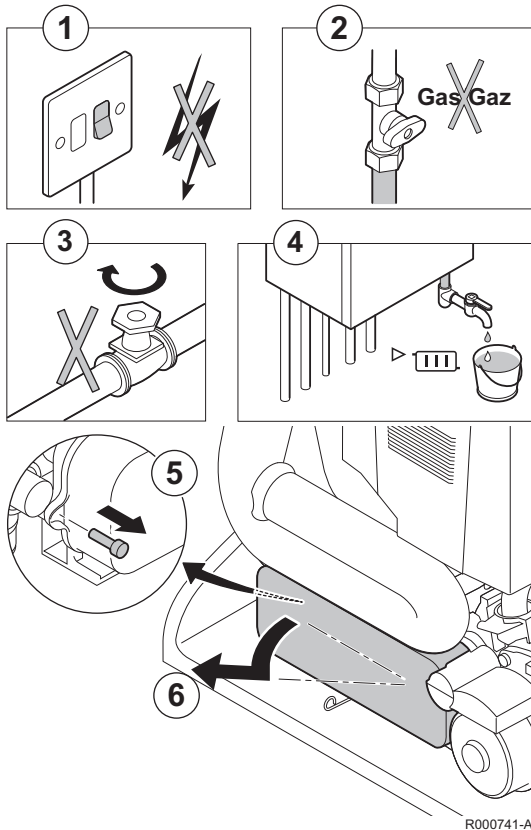
CAUTION

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:

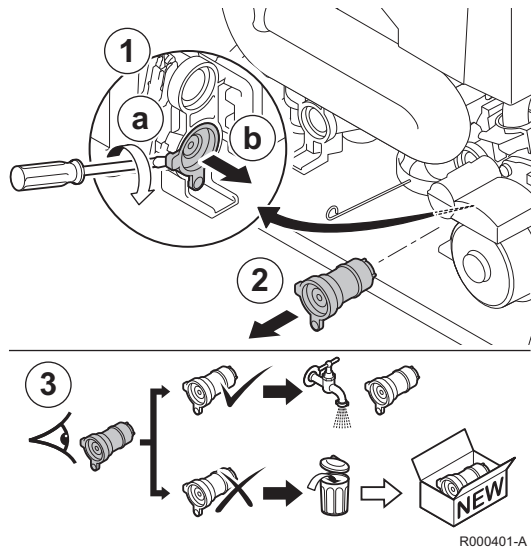
- ▶ Water hardness.
- ▶ Composition of the limescale.
- ▶ Number of hours' operation of the boiler.
- ▶ Draw-off rate.
- ▶ Domestic hot water set point temperature.



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.

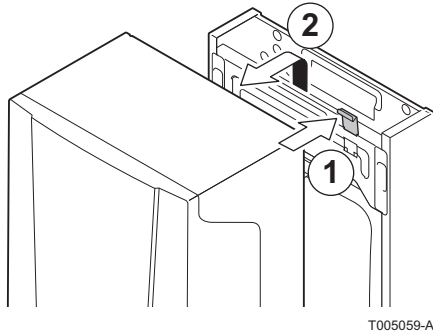
8.3.5. Replacement of the expansion vessel

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.

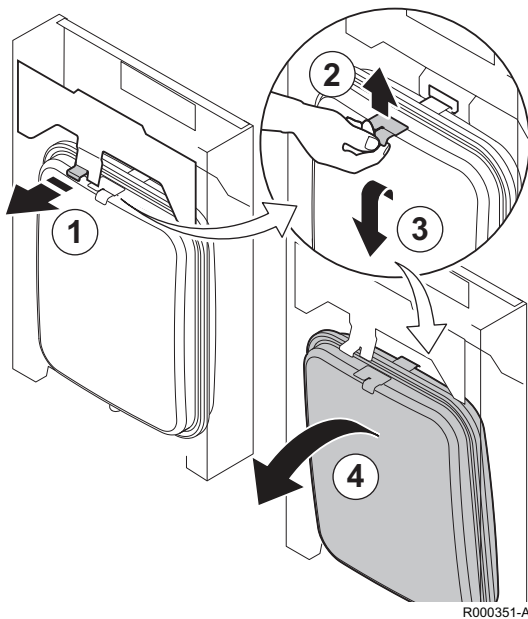
The expansion vessel is inside the boiler at the rear. To replace the expansion vessel, the front section of the boiler should be removed first.

■ 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.



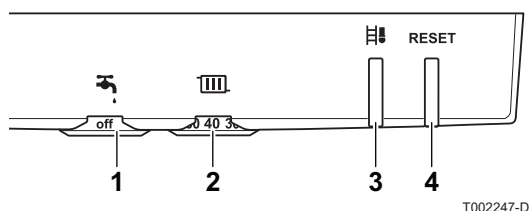
See chapter: "Checking combustion", page 45



See chapter: "Setting the air/gas ratio", page 48

9 Troubleshooting

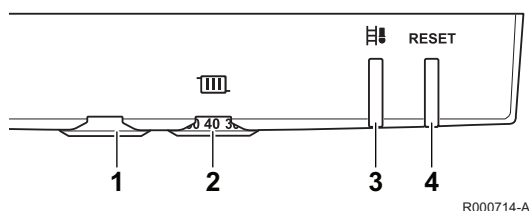
9.1 Error codes



T002247-D

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



R000714-A

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.



CAUTION

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

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	Description	Code
Shutdown code 1 (1 times green signal)	Temperature protection	Su:1 / Su:2 / Su:7
Shutdown code 2 (2 times green signal)	Shutdown input	Su:10 / Su:11
Shutdown code 3 (3 times green signal)	Flame loss	Su:22
Shutdown code 4 (4 times green signal)	Communication fault	Su:12 / Su:13 / Su:21
Shutdown code 5 (5 times green signal)	Parameter or identification fault	Su:0 / Su:16 / Su:17 / Su:18 / Su:19
Shutdown code 6 (6 times green signal)	Miscellaneous	Su:15 / Su:25



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:

Shutdown code	Description	Probable causes	Checking / solution
Su:0	Parameter error	▶ Parameters faulty	▶ Reset dF and dU ▶ Restore parameters with Recom
Su:1	Maximum flow temperature exceeded	▶ Non-existent or insufficient circulation	▶ Check the circulation (direction, pump, valves) ▶ Reasons for the heat demand
Su:2	Maximum increase of the flow temperature has been exceeded	▶ Non-existent or insufficient circulation ▶ Sensor error	▶ Check the circulation (direction, pump, valves) ▶ Check the water pressure ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Check the cleanliness of the heat exchanger
Su:7	Maximum difference between the flow and return temperature exceeded	▶ Non-existent or insufficient circulation ▶ Sensor error	▶ Check the circulation (direction, pump, valves) ▶ Check the water pressure ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Check the cleanliness of the heat exchanger
Su:10	Shutdown input is open	▶ External cause ▶ Parameter error ▶ Bad connection	▶ Suppress the external cause ▶ Check the parameters ▶ Check the wiring
Su:11	Shutdown input active or frost protection active	▶ External cause ▶ Parameter error ▶ Bad connection	▶ Suppress the external cause ▶ Check the parameters ▶ Check the wiring
Su:12	Communication error with the HMI PCB	▶ Connection box not connected	▶ Check the wiring

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

Shutdown code	Description	Probable causes	Checking / solution
Su:13	Communication error with the SCU PCB	▶ Bad connection with BUS ▶ SCU PCB missing from connection box	▶ Check the wiring ▶ Carry out automatic detection
Su: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
Su:16⁽¹⁾	Configuration error	▶ Internal fault in gas/air unit	▶ Replace the gas/air unit
Su:17⁽¹⁾	Configuration fault or default parameter table incorrect	▶ Parameter fault in gas/air unit	▶ Replace the gas/air unit
Su:18⁽¹⁾	Configuration error (Boiler/ PSU not recognised)	▶ Incorrect PSU for this boiler	▶ Replace the PSU
Su:19⁽¹⁾	Configuration fault or parameters dF-dU unknown	▶ Reset dF and dU	▶ Reset dF and dU
Su:20⁽¹⁾	Configuration procedure active	▶ Active for a short time after switching on the boiler	▶ No action required (Normal behaviour)
Su:21	Communication fault	▶ Internal fault in gas/air unit	▶ Replace the gas/air unit
Su: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
Su:25	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 **H!** button flashes red. The meaning of the error codes is given in the error table:

Status signals	Description	Code
Error code 1 (1 times red signal)	Sensor error	E:02 / E:03 / E:04 / E:05 / E:06 / E:07 / E:08 / E:09 / E:10 / E:11 / E:35
Error code 2 (2 times red signal)	Overheat temperature protection	E:12 / E:41
Error code 3 (3 times red signal)	Ignition fault	E:14 / E:16 / E:36

Status signals	Description	Code
Error code 4 (4 times red signal)	Fan fault	E:34
Error code 5 (5 times red signal)	Parameter error	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)			
Status signals	Description	Probable causes	Checking / solution
Error code 1 (1 times red signal)	Sensor fault, temperature fault or flow fault	▶ Sensor not or badly connected ▶ Bad connection ▶ Non-existent or insufficient circulation ▶ Water circulation direction reversed ▶ Sensor fault	▶ 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
Error code 2 (2 times red signal)	Maximum temperature of heat exchanger or control unit exceeded	▶ 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	▶ 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
Error code 3 (3 times red signal)	Ignition fault: ▶ 5 burner start-up failures ▶ False flame signal ▶ 5x Flame loss	▶ No ignition ▶ Ignition arc, but no flame formation ▶ Presence of the flame but insufficient ionization (<1 µA)	▶ Check the wiring ▶ Check breakdown to earth ▶ Check the condition of the burner set ▶ Check the earthing ▶ Check that the gas valve is fully opened ▶ Check the supply pressure ▶ Purge the gas supply to remove air ▶ Check the operation and setting of the gas valve unit ▶ Check that the air inlet and flue gas discharge flues are not blocked ▶ Replace the ionization/ignition electrode

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

Lock out (Error code - E:□□)			
Error code	Description	Probable causes	Checking / solution
E:00	Storage unit PSU parameter not found	▶ Bad connection	▶ Check the wiring
E:01	The safety parameters are incorrect	▶ Bad connection ▶ PSU defective	▶ Check the wiring ▶ Replace PSU
E:02	Flow temperature sensor short circuited	▶ Sensor not or badly connected ▶ Bad connection ▶ Sensor fault	▶ Check the wiring ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Replace the sensor if necessary
E:03	Flow temperature sensor open circuit	▶ Sensor not or badly connected ▶ Bad connection ▶ Sensor fault	▶ Check the wiring ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Replace the sensor if necessary
E:04 E:05	Flow temperature too low Flow temperature too high	▶ No circulation ▶ Bad connection ▶ Sensor not or badly connected ▶ Sensor fault	▶ Vent the air in the heating system ▶ Check the water pressure ▶ Check the wiring ▶ Check the circulation (direction, pump, valves) ▶ Check the cleanliness of the heat exchanger ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Replace the sensor if necessary
E:06	Return temperature sensor short circuited	▶ Sensor not or badly connected ▶ Bad connection ▶ Sensor fault	▶ Check that the sensor has been correctly fitted ▶ Check the wiring ▶ Check that the sensors are operating correctly
E:07	Return temperature sensor open circuit	▶ Sensor not or badly connected ▶ Bad connection ▶ Sensor fault	▶ Check that the sensor has been correctly fitted ▶ Check the wiring ▶ Check that the sensors are operating correctly
E:08 E:09	Return temperature too low Return temperature too high	▶ No circulation ▶ Bad connection ▶ Sensor not or badly connected ▶ Sensor fault	▶ Vent the air in the heating system ▶ Check the water pressure ▶ Check the wiring ▶ Check the circulation (direction, pump, valves) ▶ Check the cleanliness of the heat exchanger ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Replace the sensor if necessary

Lock out (Error code - E:)			
Error code	Description	Probable causes	Checking / solution
E:10 E:11	Difference between the flow and return temperatures too great	▶ No circulation ▶ Sensor not or badly connected ▶ Sensor fault	▶ Vent the air in the heating system ▶ Check the water pressure ▶ Check the wiring ▶ Check the circulation (direction, pump, valves) ▶ Check the cleanliness of the heat exchanger ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Replace the sensor if necessary
E:12	Temperature of heat exchanger above normal range (high-limit thermostat STB)	▶ No circulation ▶ Bad connection ▶ Sensor not or badly connected ▶ Sensor fault	▶ Vent the air in the heating system ▶ Check the water pressure ▶ Check the wiring ▶ Check the circulation (direction, pump, valves) ▶ Check the cleanliness of the heat exchanger ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Replace the sensor if necessary
E:14	5 burner start-up failures	▶ No ignition	▶ Check cabling of ignition transformer ▶ Replace the ionization/ignition electrode ▶ Check breakdown to earth ▶ Check the condition of the burner set ▶ Check the earthing ▶ Defective gas/air unit
		▶ Ignition arc, but no flame formation	▶ Check that the gas valve is fully opened ▶ Check the supply pressure ▶ Purge the gas supply to remove air ▶ Check the operation and setting of the gas valve unit ▶ Check that the air inlet and flue gas discharge flues are not blocked ▶ Check the wiring on the gas valve unit ▶ Defective gas/air unit
		▶ Presence of the flame but insufficient ionization (<1 µA)	▶ Check that the gas valve is fully opened ▶ Check the supply pressure ▶ Replace the ionization/ignition electrode ▶ Check the earthing ▶ Check the wiring on the ionization/ignition electrode
E:16	False flame signal	▶ Short-term fluctuations of the mains ▶ Ionization current present even though there is no flame ▶ The burner remains very hot: CO₂ too high ▶ Defective gas/air unit	▶ Press the RESET key for 5 seconds ▶ Replace the ionization/ignition electrode ▶ Set the CO₂ ▶ Check the gas/air unit and replace it if necessary
E:17	Problem on the gas valve	▶ Defective gas/air unit	▶ Replace the gas/air unit
E:34	Fan fault	▶ External draught over the boiler ▶ Defective gas/air unit	▶ Check for adequate draw on the chimney connection ▶ Check the gas/air unit and replace it if necessary

Lock out (Error code - E:□□)			
Error code	Description	Probable causes	Checking / solution
E:35	Flow and return reversed	▶ Bad connection ▶ Sensor fault ▶ Sensor not or badly connected ▶ Water circulation direction reversed	▶ Replace the sensor if necessary ▶ Check the circulation (direction, pump, valves) ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted
E:36	5x Flame loss	▶ 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
E:37	Communication fault	▶ Internal fault in gas/air unit	▶ Replace the gas/air unit
E:38	Communication error with the SCU PCB	▶ Bad connection ▶ Defective SCU PCB	▶ Check the wiring ▶ Replace SCU PCB
E:39	Shutdown input in locked-out mode	▶ External cause ▶ Bad connection ▶ Parameter incorrectly set	▶ Suppress the external cause ▶ Check the wiring ▶ Check the parameters
E:40	HRU/URC unit test error	▶ HRU/URC unit test error ▶ External cause ▶ Bad connection ▶ Parameter incorrectly set	▶ Check the HRU/WTW unit ▶ Suppress the external cause ▶ Check the wiring ▶ Check the parameters
E:41	Maximum control unit temperature exceeded	▶ No air supply or insufficient air supply ▶ No flue gas flow or insufficient flue gas flow ▶ Recirculation	▶ Check air supply ▶ Check flue gas flow ▶ Replace seals

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.



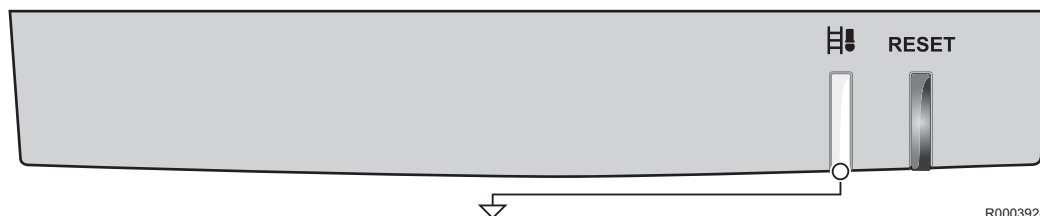
To order a spare part, give the reference number shown on the list.

10.2 Spare parts

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

11 Appendix

11.1 User instruction card



R000392-A

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

(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.

Customer name:										Telephone number:														
Address:																								
Boiler make and model:																								
Boiler serial number:																								
Commissioned by (PRINT NAME):										Gas Safe register number:														
Company name:										Telephone number:														
Company address:																								
										Commissioning date:														
To be completed by the customer on receipt of a Building Regulations Compliance Certificate*																								
Building Regulations Notification Number (if applicable):																								
CONTROLS (tick the appropriate boxes)																								
Time and temperature control to heating										Room thermostat and programmer/timer					Programmable room thermostat									
										Load/weather compensation					Optimum start control									
Time and temperature control to hot water										Cylinder thermostat and programmer/timer					Combination Boiler									
Heating zone valves										Fitted					Not required									
Hot water zone valves										Fitted					Not required									
Thermostatic radiator valves										Fitted					Not required									
Automatic bypass to system										Fitted					Not required									
Boiler interlock															Provided									
ALL SYSTEMS																								
The system has been flushed and cleaned in accordance with BS7593 and boiler manufacturer's instructions										Yes														
What system cleaner was used?																								
What inhibitor was used?										Quantity					litres									
Has a primary water system filter been installed?										Yes					No									
CENTRAL HEATING MODE measure and record:																								
Gas rate										m ³ /hr					OR					ft ³ /hr				
Burner operating pressure (if applicable)										mbar					OR Gas inlet pressure					mbar				
Central heating flow temperature																				°C				
Central heating return temperature																				°C				
COMBINATION BOILERS ONLY																								
Is the installation in a hard water area (above 200ppm)?										Yes					No									
If yes, and if required by the manufacturer, has a water scale reducer been fitted?										Yes					No									
What type of scale reducer has been fitted?																								
DOMESTIC HOT WATER MODE Measure and Record:																								
Gas rate										m ³ /hr					OR					ft ³ /hr				
Burner operating pressure (at maximum rate)										mbar					OR Gas inlet pressure at maximum rate					mbar				
Cold water inlet temperature																				°C				
Hot water has been checked at all outlets										Yes					Temperature					°C				
Water flow rate																				l/min				
CONDENSING BOILERS ONLY																								
The condensate drain has been installed in accordance with the manufacturer's instructions and/or BS5546/BS6798										Yes														

ALL INSTALLATIONS					
Record the following:	At max. rate:	CO	ppm	AND	CO/CO ₂ Ratio
	At min. rate: (where possible)	CO	ppm	AND	CO/CO ₂ Ratio
The heating and hot water system complies with the appropriate Building Regulations					Yes
The boiler and associated products have been installed and commissioned in accordance with the manufacturer's instructions					Yes
The operation of the boiler and system controls have been demonstrated to and understood by the customer					Yes
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer					Yes
Commissioning Engineer's Signature					
Customer's Signature					
(To confirm satisfactory demonstration and receipt of manufacturer's literature)					

*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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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	CO ₂ %
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %
Comments:					
Signature					
SERVICE 02		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO ₂ %
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %
Comments:					
Signature					
SERVICE 03		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO ₂ %
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %
Comments:					
Signature					
SERVICE 04		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO ₂ %
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %
Comments:					
Signature					
SERVICE 05		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO ₂ %
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %
Comments:					
Signature					
SERVICE 06		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO ₂ %
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %
Comments:					
Signature					

SERVICE 07					Date:	
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	AND	CO ₂ %	
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %	
Comments:						
Signature						

SERVICE 09					Date:	
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	AND	CO ₂ %	
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %	
Comments:						
Signature						

SERVICE 08					Date:	
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	AND	CO ₂ %	
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %	
Comments:						
Signature						

SERVICE 10					Date:	
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	AND	CO ₂ %	
	At min. rate: (Where Possible)	CO	ppm	AND	CO ₂ %	
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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Baxi, Brooks House

Coventry Road, Warwick, CV34 4LL.



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

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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.



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