

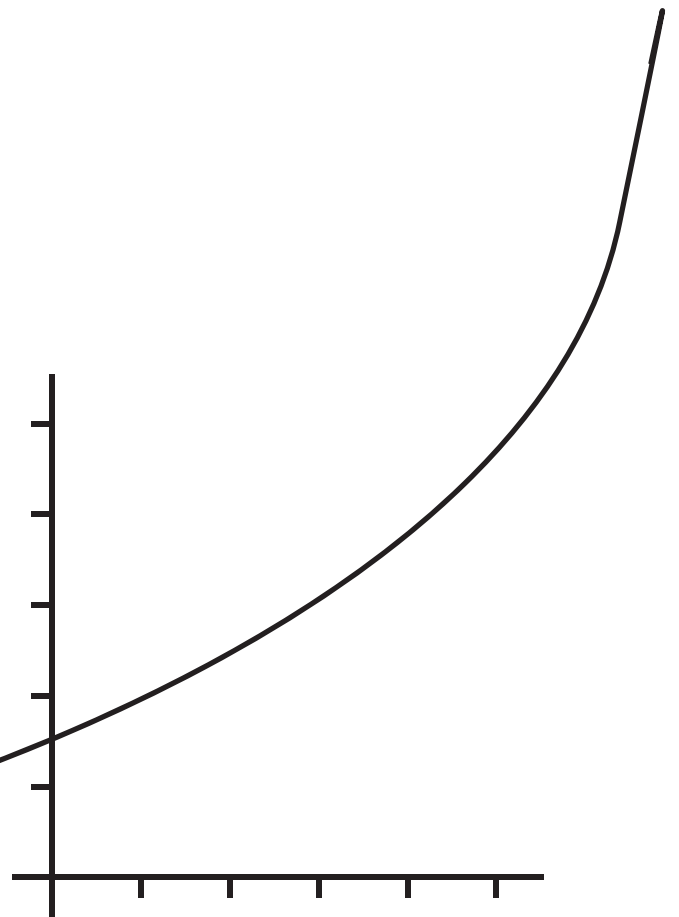


Glow-worm
The energy you need

Installation and main- tenance instructions

Energy

35 Store-A (H-GB)



GB, IE

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1 Safety

1.1 Action-related warnings

Classification of action-related warnings

The action-related warnings are classified in accordance with the severity of the possible danger using the following warning signs and signal words:

Warning symbols and signal words



Danger!

Imminent danger to life or risk of severe personal injury



Danger!

Risk of death from electric shock



Warning.

Risk of minor personal injury



Caution.

Risk of material or environmental damage

1.2 Risk caused by inadequate qualifications

Assembly and disassembly, installation, start-up, maintenance, repairs and decommissioning must only be carried out by a competent person who is sufficiently qualified to observe all of the instructions that come with the product, to proceed in accordance with the current state of the art, and to comply with all applicable directives, standards, laws and other regulations.

1.3 Intended use

There is a risk of injury or death to the user or others, or of damage to the product and other property in the event of improper use or use for which it is not intended.

The product is intended as a heat generator for closed central heating installations and for hot water generation.

The products referred to in these instructions must only be installed and operated in conjunction with the flue pipe accessories listed in other applicable documents.

Exceptions: For C63 and B23P installation types, follow the specifications in these instructions.

Intended use includes the following:

- observance of accompanying operating, installation and servicing instructions for the product and any other system components
- installing and fitting the product in accordance with the product and system approval
- compliance with all inspection and maintenance conditions listed in the instructions.

Intended use also covers installation in accordance with the IP class.

Any other use that is not specified in these instructions, or use beyond that specified in this document shall be considered improper use. Any direct commercial or industrial use is also deemed to be improper.

Caution.

Improper use of any kind is prohibited.

1.4 General safety information

1.4.1 Risk of death from escaping gas

What to do if you smell gas in the building:

- ▶ Avoid rooms that smell of gas.
- ▶ If possible, open doors and windows fully and ensure adequate ventilation.
- ▶ Do not use naked flames (e.g. lighters, matches).
- ▶ Do not smoke.
- ▶ Do not use any electrical switches, mains plugs, doorbells, telephones or other communication systems in the building.
- ▶ If it is safe to do so, close the emergency control valve or the main isolator.
- ▶ If possible, close the gas isolator cock on the product.
- ▶ Warn other occupants in the building by yelling or banging on doors or walls.
- ▶ Leave the building immediately and ensure that others do not enter the building.
- ▶ Notify the gas supply company or National Grid Transco +44 (0) 800 111999 by telephone from outside of the building.

1.4.2 Risk of death from escaping flue gas

If you operate the product with an empty condensate siphon, flue gas may escape into the room air.



1 Safety



- ▶ In order to operate the product, ensure that the condensate siphon is always full.

1.4.3 Risk of death due to blocked or leaking flue gas routes

Installation errors, damage, tampering, unauthorised installation sites or similar can cause flue gas to escape and result in a risk of poisoning.

What to do if you smell flue gas in the property:

- ▶ Open all accessible doors and windows fully to provide ventilation.
- ▶ Switch off the product.
- ▶ Check the flue gas routes in the product and the flue gas diversions.

1.4.4 Risk of death from escaping flue gas

- ▶ Ensure that all openings in the air/flue pipe that are within the building and can be opened are always closed for start-up and during operation.

Flue gas may escape from leaking pipes or damaged seals. Mineral-oil-based greases can damage the seals.

- ▶ When installing the flue gas installation, use only flue pipes of the same material.
- ▶ Do not install any damaged pipes.
- ▶ File off sharp burrs and chamfer the ends of the pipes before installing them, and dispose of the shavings.
- ▶ Never use mineral-oil-based grease for the installation.
- ▶ To facilitate the installation, use only water, standard commercial soft soap or, if required, the enclosed lubricant.

Mortar residues, shavings, etc., in the flue gas route may restrict the outward flow of the flue gas, meaning that flue gas can escape.

- ▶ After installation, remove all mortar residues, shavings, etc., from the air/flue pipe.

1.4.5 Risk of death due to explosive and flammable materials

- ▶ Do not use or store explosive or flammable materials (e.g. petrol, paper, paint) in the installation room of the product.

1.4.6 Risk of death from electric shock

There is a risk of death from electric shock if you touch live components.

Before commencing work on the product:

- ▶ Unplug the mains plug.
- ▶ Or disconnect the product from the power supply by switching off all power supplies (electrical partition with a contact opening of at least 3 mm, e.g. fuse or line protection switch).
- ▶ Secure against being switched back on again.
- ▶ Wait for at least 3 minutes until the condensers have discharged.

1.4.7 Risk of death due to lack of safety devices

The schematic drawings included in this document do not show all safety devices required for correct installation.

- ▶ Install the necessary safety devices in the system.
- ▶ Observe the applicable national and international laws, standards and guidelines.

1.4.8 Risk of poisoning and burns caused by escaping hot flue gases

- ▶ Only operate the product if the air/flue pipe has been completely installed.
- ▶ With the exception of short periods for testing purposes, only operate the product when the front casing is installed and closed.

1.4.9 Risk of being burned or scalded by hot components

- ▶ Only carry out work on these components once they have cooled down.

1.4.10 Risk of injury during transport due to a high product weight.

- ▶ Make sure that the product is transported by at least two people.

1.4.11 Risk of corrosion damage due to unsuitable combustion and room air

Sprays, solvents, chlorinated cleaning agents, paint, adhesives, ammonia compounds, dust or similar substances may lead





to corrosion on the product and in the air/flue pipe.

- ▶ Ensure that the supply of combustion air is always free of fluorine, chlorine, sulphur, dust, etc.
- ▶ Ensure that no chemical substances are stored at the installation site.
- ▶ Ensure that the combustion air is not routed through chimneys which have previously been used with floor-standing oil-fired boilers, or with other boilers, which could cause soot to build up in the chimney.
- ▶ If you are installing the product in hairdressing salons, painter's or joiner's workshops, cleaning businesses or similar locations, choose a separate installation room in which a combustion air supply is ensured that is technically free of chemical substances.

1.4.12 Risk of material damage caused by frost

- ▶ Do not install the product in rooms prone to frost.

1.4.13 Risk of material damage caused by using an unsuitable tool

- ▶ Use the correct tool to tighten or loosen screw connections.

1.4.14 Risk of injury from ice formation

Where air/flue pipes penetrate the roof, the water vapour contained in flue gas may precipitate as ice on the roof or the roof structures.

- ▶ Ensure that this ice formation does not slide from the roof.

1.4.15 Risk of fire and damage to electronics caused by lightning

- ▶ If the building is equipped with a lightning protection system, incorporate the air/flue pipe into the lightning protection.
- ▶ If the flue gas pipe (parts of the air/flue pipe situated outside the building) contains metal materials, incorporate it into the potential equalisation system.

1.4.16 Risk of corrosion caused by sooted chimneys

Chimneys that previously discharged the flue gas from oil- or solid-fuel-fired heat generators are unsuitable for supplying combustion air. Chemical deposits in the chimney may pollute the combustion air and cause corrosion in the product.

- ▶ Ensure that the supply of combustion air is free from corrosive materials.

1.4.17 Risk of explosion if the system has a galvanic copper/aluminium connection

Since the product is equipped with an automatic air vent, a certain concentration of electrolysis products in your product may cause an explosion.

- ▶ Avoid the risk of a galvanic connection arising in your system (e.g. aluminium radiators on copper pipe spigots).

1.5 Regulations (directives, laws, standards)

- ▶ Observe the national regulations, standards, guidelines and laws.



2 Notes on the documentation

2 Notes on the documentation

2.1 Observing other applicable documents

- ▶ You must observe all the operating and installation instructions included with the system components.

2.2 Storing documents

- ▶ Pass these instructions and all other applicable documents on to the system operator.

2.3 Applicability of the instructions

These instructions apply only to:

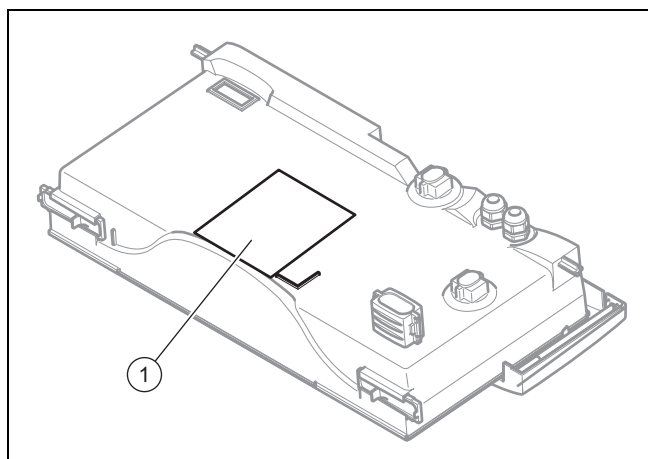
Models and article numbers

	Great Britain	Ireland
Energy 35 Store-A	0010017338	0010017338

The designation -A indicates that the product is equipped with a pneumatic gas valve.

3 Product description

3.1 Serial number



The serial number is located on the identification plate (1).

3.2 Gas Council number

Energy 35 Store-A	G.C. no. 47-019-37
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3.3 Information on the identification plate

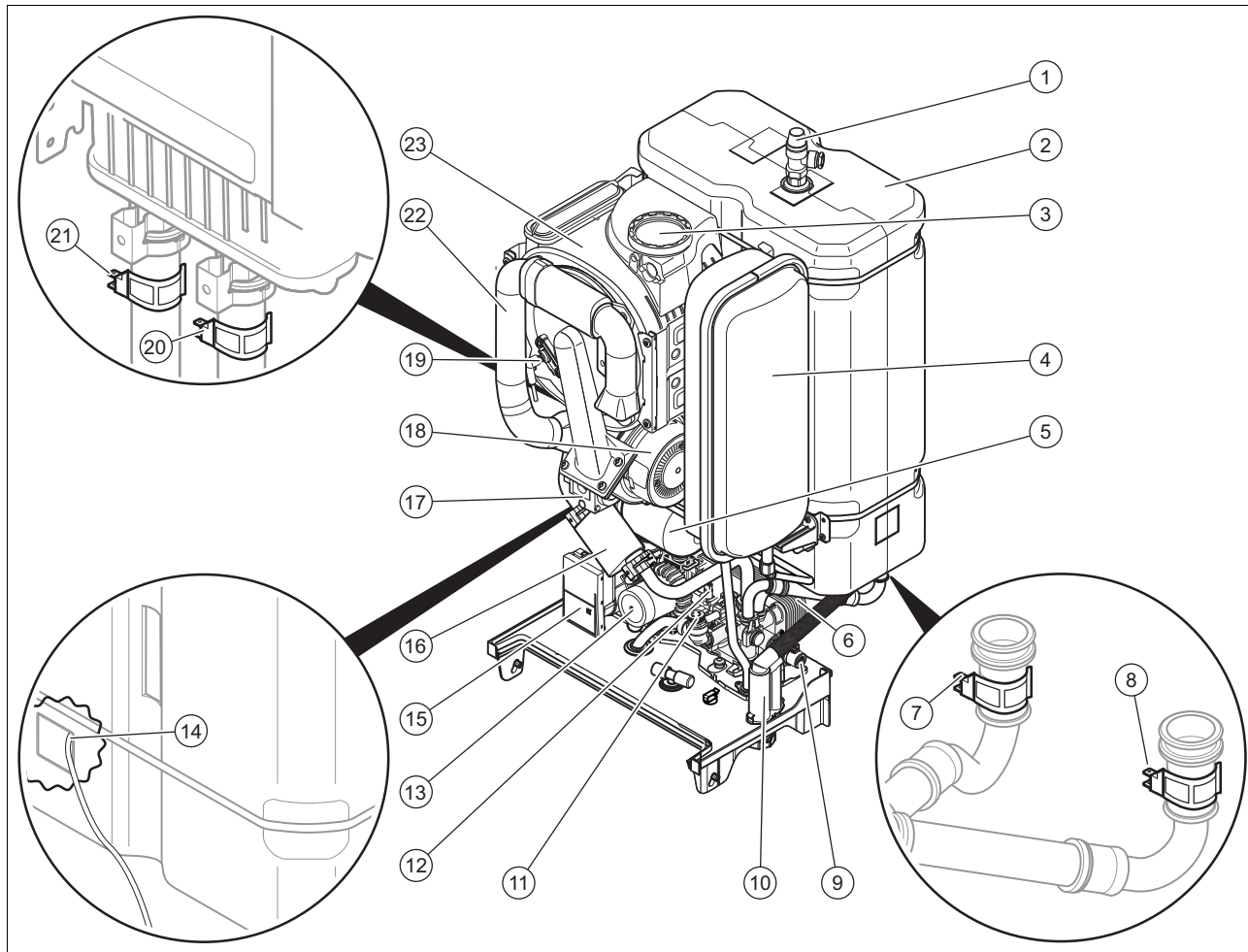
The identification plate is attached to the product at the factory.

The identification plate indicates the country in which the product is to be installed.

Information on the identification plate	Meaning
	Barcode with serial number

Information on the identification plate	Meaning
Serial number	For quality control purposes; 3rd and 4th digits = year of production For quality control purposes; 5th and 6th digits = week of production For identification purposes; 7th to 16th digits = product article number For quality control purposes; 17th to 20th digits = place of manufacture
Energy 35 Store	Product description
2H / 2E / 3P / 2L...	Gas group and gas connection pressure as set at the factory
I12H3P / I2E / I3P...	Approved gas category
Condensing technology	Efficiency class of the boiler in accordance with EC Directive 92/42/EEC
Type: Xx3(x)	Permissible flue gas connections
PMS	Maximum water pressure in heating mode
PMW	Maximum water pressure in hot water handling mode
V Hz	Electric connection
Hi	Lower gross calorific value
W	Max. electrical power consumption
IP	Protection class
	Heating mode
	Hot water generation
Pn	Nominal heat output range in heating mode
P	Nominal heat output range in hot water handling mode
Pnc	Nominal heat output range in heating mode (condensing technology)
Qn	Nominal heating load range in heating mode
Qnw	Nominal heating load range in hot water handling mode
NOx	NOx class for the product
Code (DSN)	Specific product code
	→ "CE label" section
	Read the instructions.
	→ "Recycling and disposal" section
GC no.	Gas council number

3.4 Functional elements



1	Hot water expansion relief valve	12	Heating pressure sensor
2	Domestic hot water cylinder	13	Hot water pump
3	Diversion of the combustion gases	14	Domestic hot water cylinder's temperature sensor
4	Heating expansion vessel	15	Heating pump
5	Hot water expansion vessel	16	Particle filter
6	Hot water plate heat exchanger	17	Gas valve
7	Temperature sensor at the domestic hot water cylinder's inlet	18	Fan
8	Temperature sensor at the domestic hot water cylinder's outlet	19	Ignition and flame control electrode
9	Diverter valve	20	Heating flow temperature sensor
10	Condensate siphon	21	Heating return temperature sensor
11	Expansion relief valve for heating	22	Air intake pipe
		23	CH heat exchanger

4 Installation

3.5 CE label



The CE label shows that the products comply with the basic requirements of the applicable directives as stated on the identification plate.

The declaration of conformity can be viewed at the manufacturer's site.

4 Installation

4.1 Transporting the unit

Important: With regard to the regulations of 1992 concerning the manual handling of loads, the unit exceeds the weight that can be lifted by a single person.

4.1.1 General

- ▶ Hold the load as close as possible to your body. Avoid rotational movements. Instead, reposition your feet.
- ▶ If the unit is being lifted by two persons, ensure your movements are coordinated during lifting.
- ▶ Avoid bending your upper body – do not lean forwards or to the side.
- ▶ Wear suitable non-slip protective gloves in order to protect your hands against sharp edges. Ensure that you are carrying the load securely.
- ▶ If required, get somebody to assist you in this.

4.1.2 Unloading the box from the delivery van

- ▶ It is recommended that two people lift the unit together.
- ▶ Lift the box using the straps provided.
- ▶ Use safe lifting techniques – keep your back straight and bend your legs at the knee.
- ▶ Hold the load as close as possible to your body.
- ▶ If the unit is being lifted by two persons, ensure your movements are coordinated during lifting.
- ▶ If required, get somebody to assist you in this.

4.2 Unpacking the product

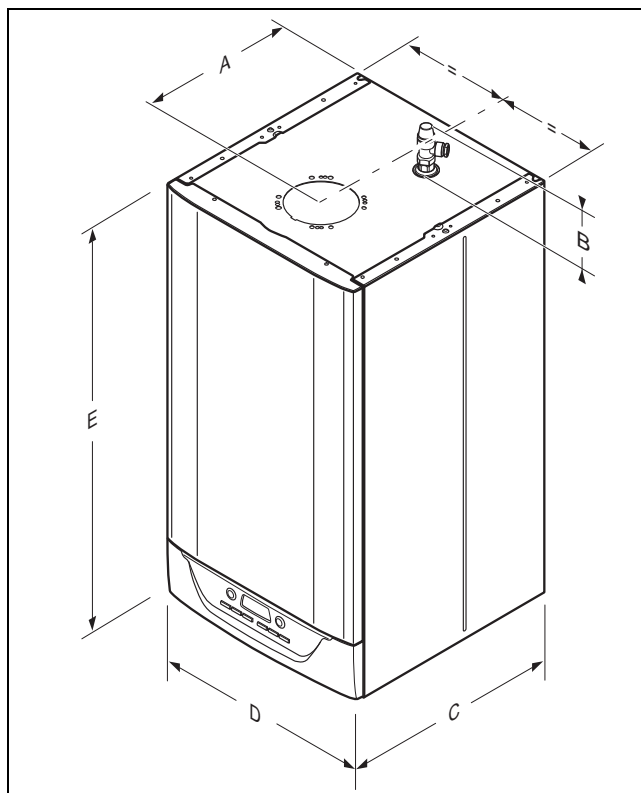
1. Remove the product from its box.
2. Remove the protective film from all of the product's components.

4.3 Checking the scope of delivery

- ▶ Check that the scope of delivery is complete.

Quantity	Description
1	Heat generator
1	Bag with accessories
1	Enclosed documentation

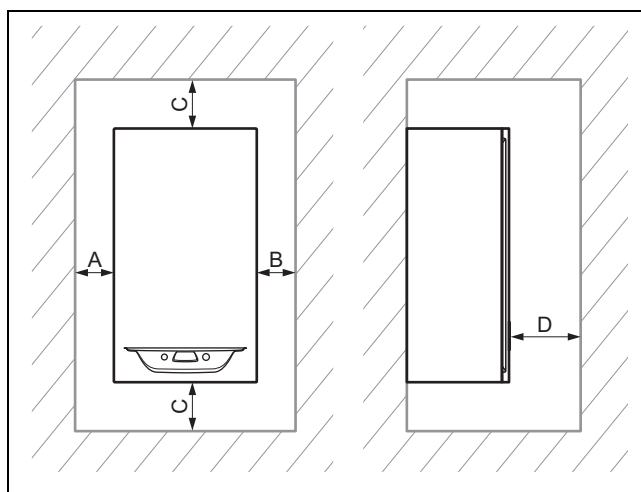
4.4 Product dimensions



Dimensions

A	B	C	D	E
361 mm	100 mm	570 mm	470 mm	892 mm

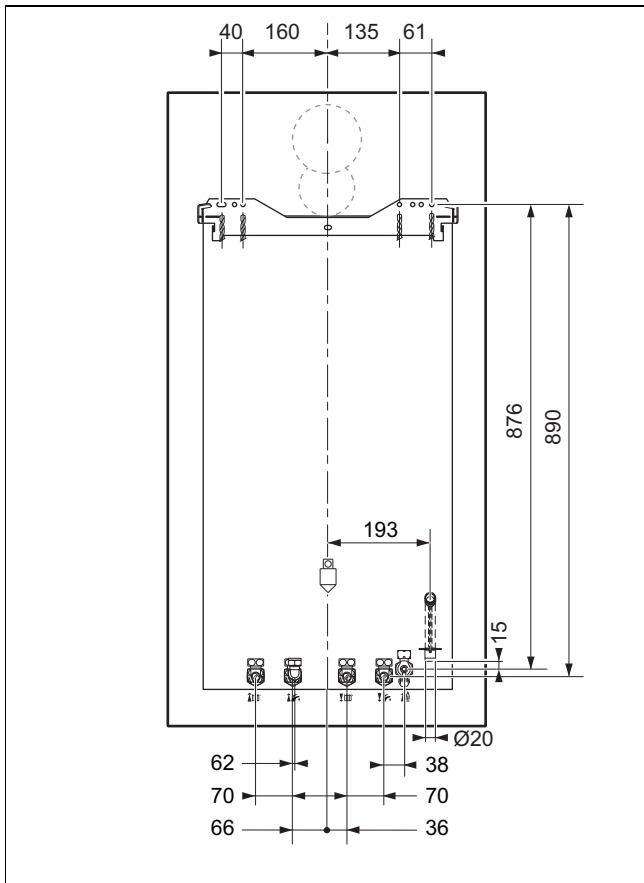
4.5 Minimum clearances



Minimum clearances

A	B	C	D
≥ 50 mm	≥ 150 mm	≥ 300 mm	≥ 600 mm

4.6 Using the installation template



- ▶ Use the installation template to ascertain the locations at which you need to drill holes and make breakthroughs.
 - ◁ The breakthroughs to be made only apply for a specific air/flue pipe connection type.
 - ◁ Please use the relevant accessory manuals to help you with the remaining air/flue pipe configurations.

4.7 Mounting the product

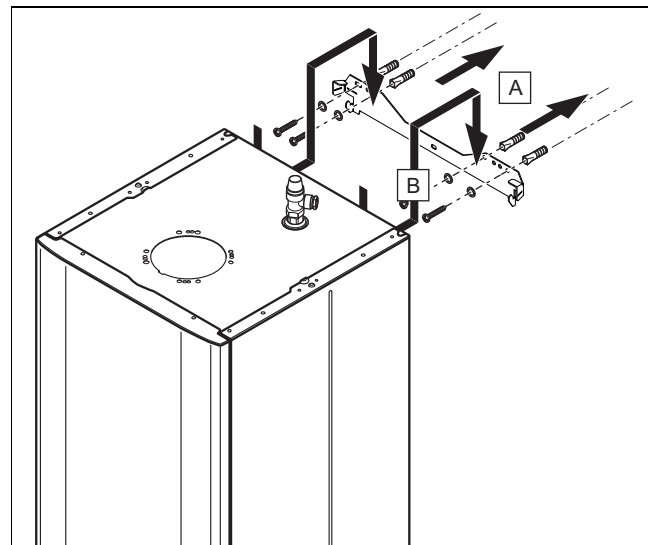
1. Check whether the wall has sufficient load-bearing capacity to bear the operational weight of the product.

Weight when filled with water

Energy 35 Store-A	118 kg
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2. Check whether the supplied fixing accessories are suitable for the wall type.

Conditions: The load-bearing capacity of the wall is sufficient, The fixing material may be used for the wall

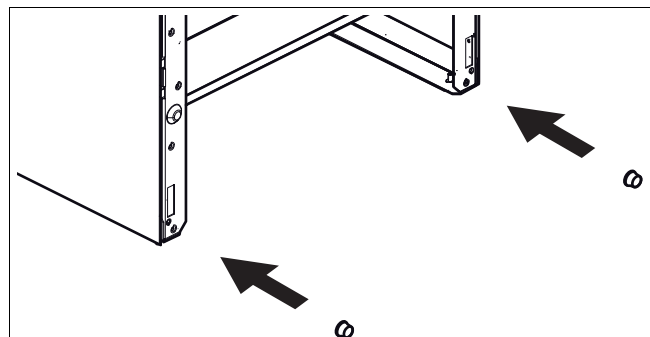


- ▶ Wall-mount the product as described.

Conditions: The load-bearing capacity of the wall is not sufficient

- ▶ Ensure that wall-mounting apparatus on-site has a sufficient load-bearing capacity. Use individual stands or primary walling, for example.

4.8 Attaching the end stops

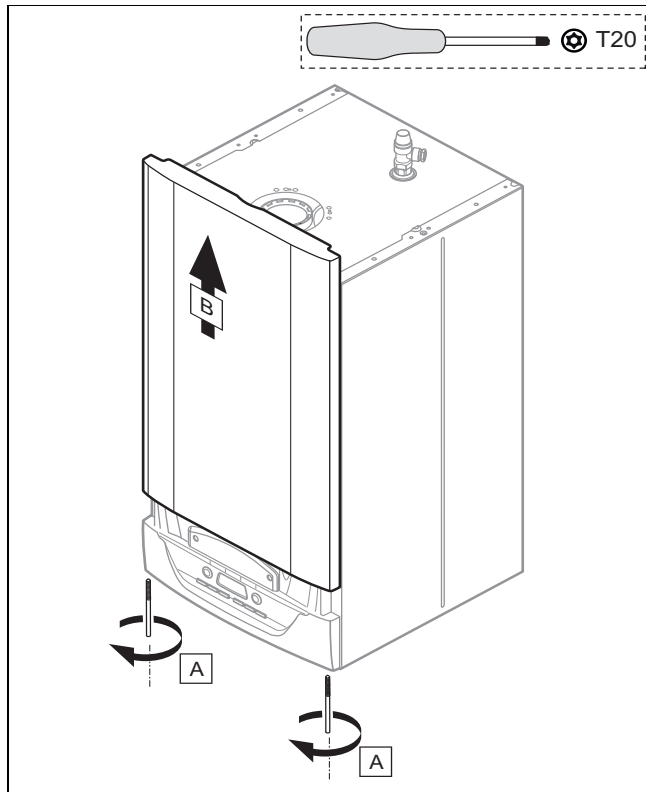


- ▶ Attach the end stops based on the clearance from the wall.

5 Installation

4.9 Removing and installing the front casing

Removing the casing



1. Follow the instructions in the specified sequence.

Installing the casing

2. Refit the components in the reverse order.

5 Installation



Danger!
Risk of explosion or scalding caused by incorrect installation.

Stresses in the supply line can cause leaks.

- ▶ Make sure there is no voltage in the supply lines when they are installed.



Caution.
Risk of damage caused by contaminated lines.

Foreign bodies, such as welding remnants, sealing residue or dirt in the water pipes, may cause damage to the boiler.

- ▶ Flush the heating installation thoroughly prior to installation.

5.1 Connecting the gas and water pipes



Caution.
Risk of damage caused by incorrect gas connection installation.

Excess test pressure or operating pressure may cause damage to the gas valve.

- ▶ Check the gas connection for leak-tightness.



Caution.
Risk of damage caused by corrosion.

If non-diffusion-tight plastic pipes are used in the heating installation, this may cause air to enter the heating water and corrosion of the heat generation circuit and the boiler.

- ▶ If using non-diffusion-tight plastic pipes in the heating installation, separate the system by installing an external heat exchanger between the boiler and the heating installation.



Caution.
Risk of material damage due to heat transfer during soldering.

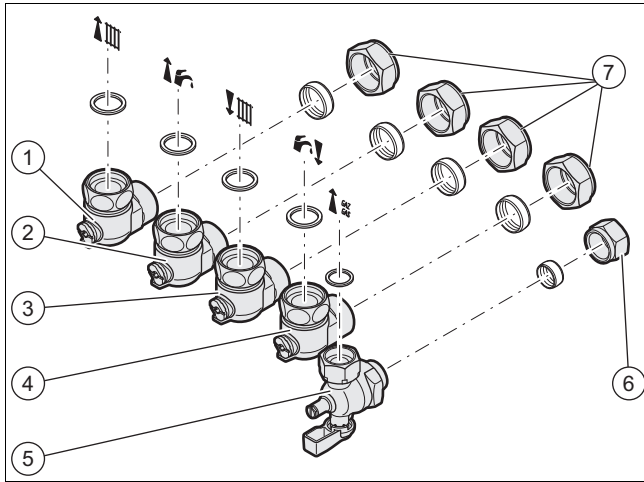
- ▶ Do not solder the connection pieces if the connection pieces are screwed to the service valves.



Note
When installing in an unheated area, we recommend that you provide thermal insulation for the water pipe spigots on the boiler's outlet and on the system.

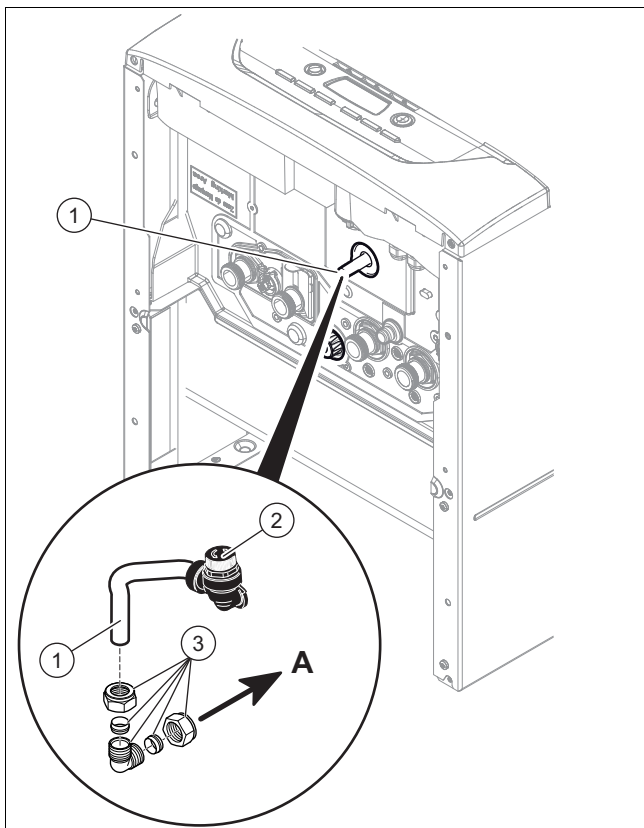
Preliminary work

1. Install the following components:
 - A stop cock in the cold water supply
 - A stop cock in the gas line
2. Check that the system volume and the volumetric capacity of the expansion vessel are the same.
 - Expansion vessel capacity: 12 l
 - ▽ If the volume of the expansion vessel is insufficient for the system, install an additional expansion vessel, connected as close to the product as possible, in the heating return.
3. Blow or flush the supply lines thoroughly prior to installation.



- | | |
|---|--|
| 1 Heating return connection, G3/4 | 5 Gas connection with valve, G1/2 |
| 2 Connection for the cold water supply line, G3/4 | 6 Outer diameter of the connection 15 mm |
| 3 Heating flow connection, G3/4 | 7 Outer diameter of the connection 22 mm |
| 4 Hot water flow connection, G3/4 | |
1. Connect the water and gas connections in accordance with the applicable standards.
 2. Purge the gas line before start-up.
 3. Check whether the connections (→ Page 20) are leak-tight.

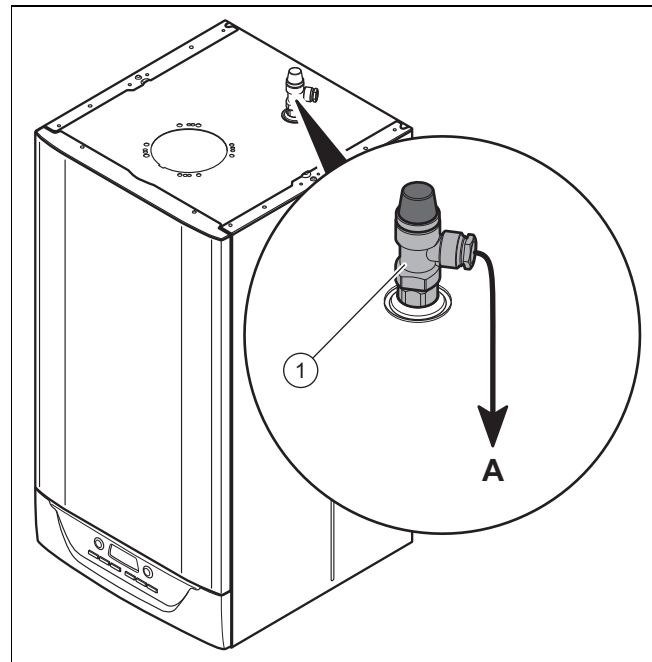
5.2 Connecting the drainage devices



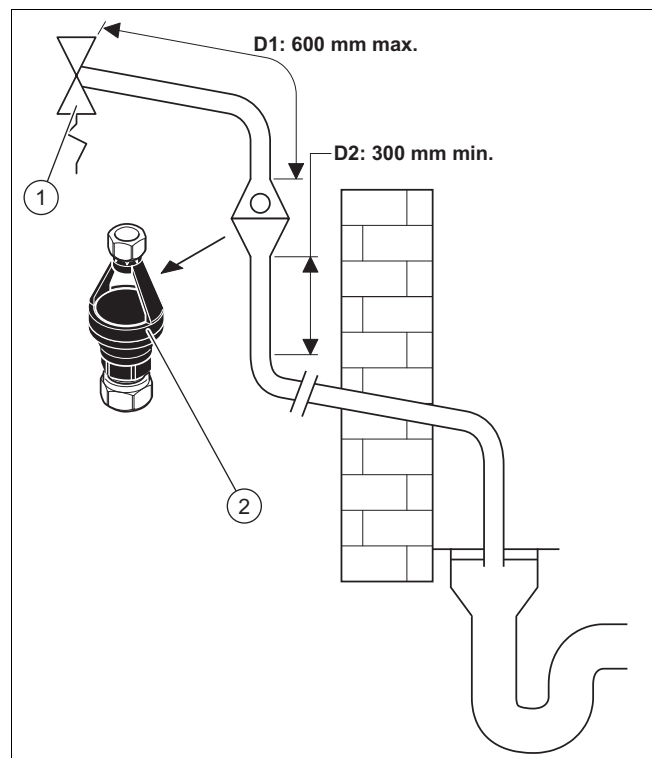
1. Ensure that the pipeline is visible.
2. Connect the discharge pipe (1) for the heating expansion relief valve (2) to a suitable draining mechanism (A). Make sure that the drain hose remains open to the

surrounding air. Use the connector (3) that is included in the product's scope of delivery.

- ◁ The components must be set up in such a way that you can see the water flowing out.



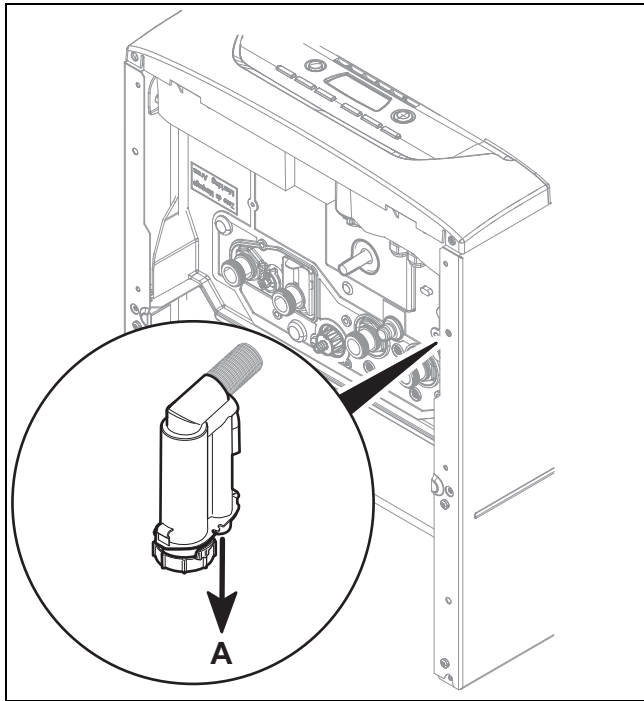
3. Connect the hot water expansion relief valve (1) to a suitable draining mechanism (A). Make sure that the drain hose remains open to the surrounding air.
- ◁ The components must be set up in such a way that you can see the water flowing out.



4. Connect the tundish (2) to the draining circuit for the hot water expansion relief valve (1). When doing so, observe the above-mentioned recommendations.

5 Installation

5.3 Connecting the condensate drain pipework



- ▶ Follow the instructions listed here and observe directives and local regulations on condensate discharge.
- ▶ Use PVC or another material that is suitable for draining the non-neutralised condensate.
- ▶ If you cannot guarantee that the materials from which the drain lines are made are suitable, install a system for neutralising the condensate.
- ▶ Ensure that the connection between the condensate drain pipework and the drain hose is not air-tight.



Note

The condensate drain pipework must have a continuous fall (45 mm per metre) and should whenever possible terminate at a suitable drain point within the heated envelope of the building that will remain frost free under long periods of low external temperatures.

- ▶ During installation remove all burrs from inside of cut pipe work and avoid excessive adhesive which may trap small pockets of water close to the pipe wall which can freeze and build into a larger ice plug.
- ▶ As with other pipe work insulate the condensate discharge pipe to minimise any risk of freezing and beware when crossing cavities that the fall is maintained and the pipe sleeved.

You can find further information in BS 6789: "Specification for installing and maintaining gas-fired boilers with a nominal heat loading less than 70 kW".

5.4 Flue gas installation

5.4.1 Installing the air/flue pipe



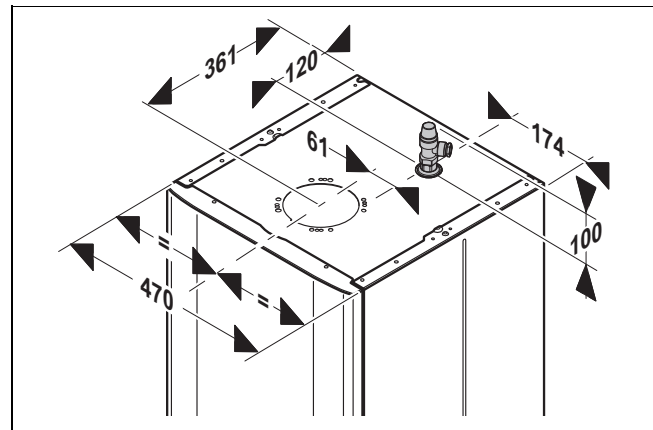
Caution.

Risk of poisoning due to escaping flue gas.

Mineral-oil-based greases can damage the seals.

- ▶ Instead of grease, use only water or commercially available soft soap to aid installation.

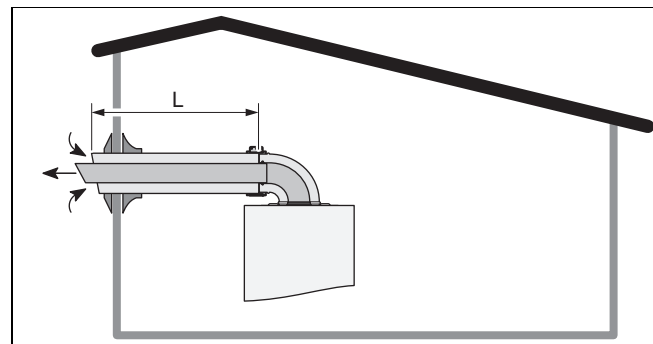
1. You can find out which air/flue pipes may be used by consulting the enclosed air/flue pipe installation manual.
2. Install the flue gas pipe in accordance with the installation instructions that are included in the scope of delivery for the air/flue pipe.



3. Ensure that the hot water expansion relief valve is not damaged when installing the flue pipe.

5.4.2 Air/flue gas system

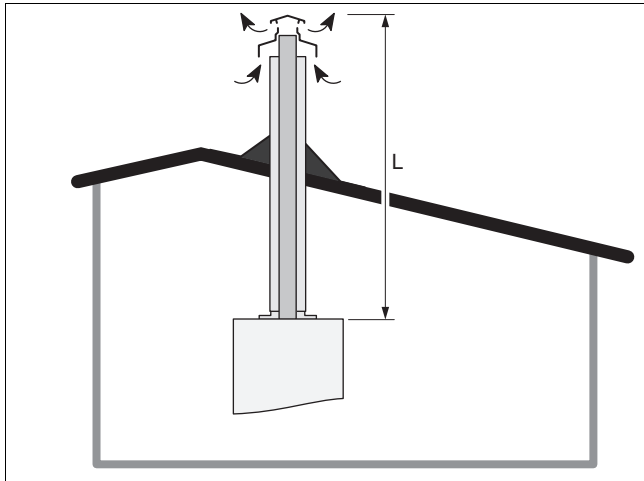
5.4.2.1 Horizontal air/flue gas system



The openings in an attachment for separate lines must open up to a 50 cm-sided square.

Length of the C13 type flue pipe (→ Page 35)

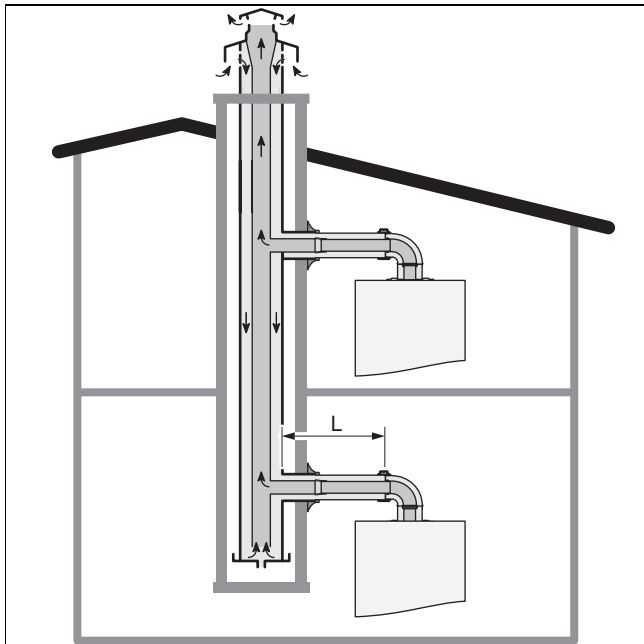
5.4.2.2 Vertical air/flue gas system



The openings in an attachment for separate lines must open up to a 50 cm-sided square.

Length of the C33 type flue pipe (→ Page 35)

5.4.2.3 Air/flue gas system for header lines



The connections with the line are established using the accessory specially developed by the product manufacturer.

A boiler that is connected to a type C43 system must only be connected to natural draught chimneys.

The condensate from header line systems must not drain into the boiler.

Length of the C43 type flue pipe (→ Page 35)

5.5 Electrical installation



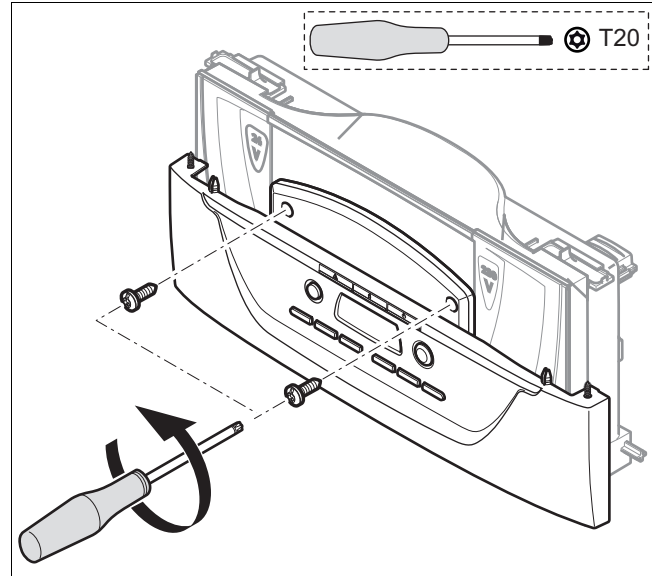
Danger!
Risk of death from electric shock!

The mains connection terminals L and N remain live even if the product is switched off:

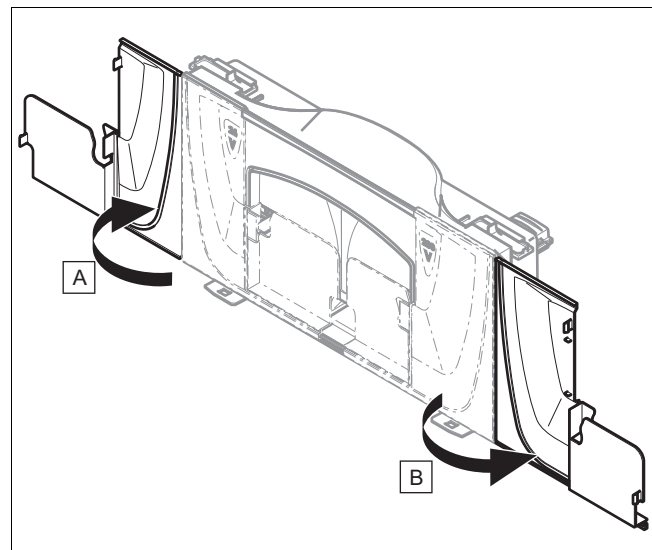
- ▶ Switch off the power supply.
- ▶ Secure the power supply against being switched on again.

5.5.1 Opening and closing the electronics box

Removing the front casing



1. Remove the fixing screws followed by the front casing.



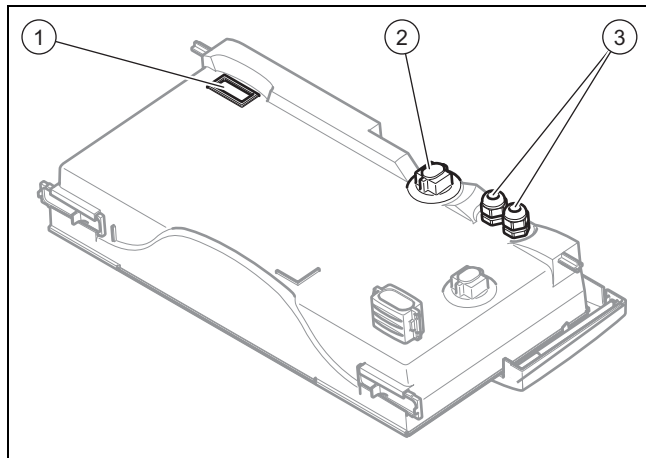
2. To open the electronics box, follow the instructions in the specified sequence.
3. To close the electronics box, follow the instructions in reverse order.

Fitting the front casing

4. Follow the instructions in the reverse order.

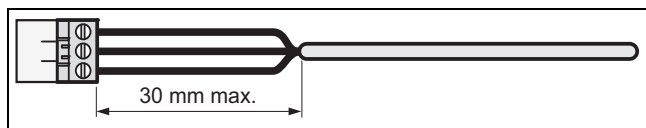
6 Start-up

5.5.2 Cable route



- 1 Outlet for extra-low voltage cable (cabled room thermostat)
- 2 Outlet for extra-low voltage cable (power supply cable)
- 3 Stuffing box (not included in the scope of delivery) for the low-voltage cable in 230 V options

5.5.3 Carrying out the wiring

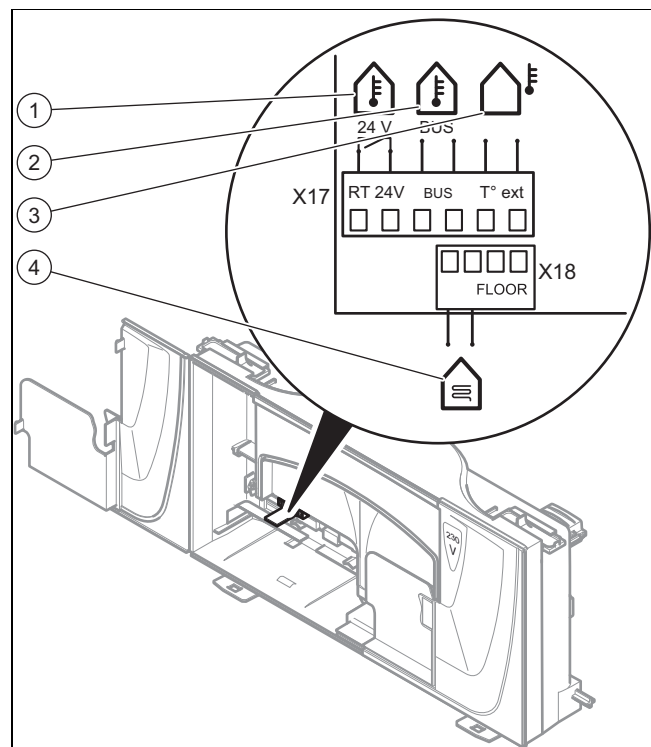


- ▶ If you connect the power cable to a plug in the electronics PCB:
 - ◁ Observe the recommended clearance between plugs and the stripped section of the casing.
 - ◁ Secure the cable in the electronics box's cable ties.
 - ◁ Check that the cable is routed correctly and lay it using the strain reliefs provided.

5.5.4 Establishing the power supply

1. Observe all relevant regulations.
 - The applicable regulations state that the connection must be made via an electrical partition with a contact opening of at least 3 mm at each pole.
2. Check the network's rated voltage.
 - Electric connection: 230 V
3. Provide one common electricity supply for the boiler and for the corresponding controller:
 - Power supply: Single-phase, 230 V, 50 Hz
 - Fuse protection: ≤ 3 A
4. Attach a plug to the mains connection cable.
5. Connect the plug for the mains connection cable.
6. Make sure that access to the mains connection is always freely available and is not covered or blocked by an obstruction.

5.5.5 Connecting controllers to the electronic system



- | | |
|--|--|
| 1 24 V controller | 3 Outside temperature sensor, wired |
| 2 eBUS controller or radio receiver unit | 4 Safety thermostat for floor-standing heating |

- ▶ Wire the individual components depending on the type of installation.

6 Start-up

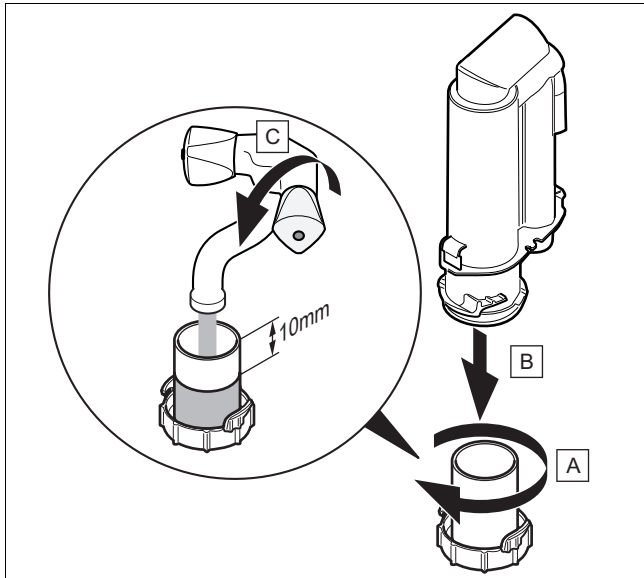
6.1 Carrying out the initial start-up

Initial start-up must be carried out by a customer service technician or an authorised competent person using the first-commissioning-checklist. The first-commissioning-checklist in the appendix (→ Page 38) of the installation instructions must be filled in and stored carefully along with the unit's documentation.

- ▶ Carry out the initial start-up using the first-commissioning-checklist in the appendix.
- ▶ Fill out and sign the first-commissioning-checklist.

6.2 Filling the condensate siphon

1. Observe the general safety information.



2. Detach the siphon.
3. Clean the lower section of the siphon with clean water.
4. Fill the lower section of the siphon with water.
 - Distance between the edge of the condensate siphon and the water: 10 mm
5. Screw in the siphon tightly.

6.3 Checking the factory setting

The product's combustion has been factory tested and pre-set for the type of gas indicated on the identification plate.

- ▶ Check the information about the type of gas indicated on the identification plate and compare this with the type of gas available at the installation location.

Conditions: The product design is **not compatible** with the local gas group

- ▶ Do not start up the product.
- ▶ Carry out a gas conversion in accordance with your system .

Conditions: The product design is **compatible** with the local gas group

- ▶ Proceed as described in the instructions below.

6.4 Checking and treating the heating water/filling and supplementary water



Caution.
Risk of material damage due to poor-quality heating water

- ▶ Ensure that the heating water is of sufficient quality.

- ▶ Before filling or topping up the system, check the quality of the heating water.

Checking the quality of the heating water

- ▶ Remove a little water from the heating circuit.
- ▶ Check the appearance of the heating water.
- ▶ If you ascertain that it contains sedimentary materials, you must desludge the system.
- ▶ Use a magnetic rod to check whether it contains magnetite (iron oxide).

- ▶ If you ascertain that it contains magnetite, clean the system and apply suitable corrosion-protection measures, or fit a magnet filter.
- ▶ Check the pH value of the removed water at 25 °C.
- ▶ If the value is below 8.2 or above 10.0, clean the system and treat the heating water.
- ▶ Ensure that oxygen cannot get into the heating water. (→ Page 20)

Checking the filling and supplementary water

- ▶ Before filling the system, measure the hardness of the filling and supplementary water.

Treating the filling and supplementary water

- ▶ Observe all applicable national regulations and technical standards when treating the filling and supplementary water.

Provided the national regulations and technical standards do not stipulate more stringent requirements, the following applies:

You must treat the heating water in the following cases:

- If the entire filling and supplementary water quantity during the operating life of the system exceeds three times the nominal volume of the heating installation, or
- If the guideline values listed in the following table are not met, or
- If the pH value of the heating water is less than 8.2 or more than 10.0.

Total heating output	Water hardness at specific system volume ¹⁾					
	≤ 20 l/kW		> 20 l/kW ≤ 50 l/kW		> 50 l/kW	
kW	ppm CaCO ₃	mol/m ³	ppm CaCO ₃	mol/m ³	ppm CaCO ₃	mol/m ³
< 50	< 300	< 3	200	2	2	0.02
> 50 to ≤ 200	200	2	150	1.5	2	0.02
> 200 to ≤ 600	150	1.5	2	0.02	2	0.02
> 600	2	0.02	2	0.02	2	0.02

1) Nominal capacity in litres/heating output; in the case of multi-boiler systems, the smallest single heating output is to be used.



Caution.
Risk of material damage if the heating water is treated with unsuitable additives.

Unsuitable additives may cause changes in the components, noises in heating mode and possibly subsequent damage.

- ▶ Do not use any unsuitable frost and corrosion protection agents, biocides or sealants.

No incompatibility with our products has been detected to date with proper use of the following additives.

- ▶ When using additives, follow the manufacturer's instructions without exception.

We accept no liability for the compatibility of any additive or its effectiveness in the rest of the heating system.

6 Start-up

Additives for cleaning measures (subsequent flushing required)

- Fernox F3
- Sentinel X 300
- Sentinel X 400

Additives intended to remain permanently in the system

- Fernox F1
- Fernox F2
- Sentinel X 100
- Sentinel X 200

Additives for frost protection intended to remain permanently in the system

- Fernox Antifreeze Alphi 11
- Sentinel X 500
- ▶ If you have used the above-mentioned additives, inform the operator about the measures that are required.
- ▶ Inform the operator about the measures required for frost protection.

6.5 Preventing low water pressure

Comply with the recommended filling pressure.

- Recommended filling pressure: 1 ... 1.5 bar (100,000 ... 150,000 Pa)

If the heating installation extends over several storeys, higher filling pressures may be required to avoid air entering the heating installation.

The value on the display starts to flash as soon as the water pressure reaches the pressure warning value.

- Pressure warning value: ≤ 0.5 bar ($\leq 50,000$ Pa)

The product switches off as soon as the water pressure reaches the operating value. The fault (**F22**) will be stored in the fault list.

- Minimum operating pressure: 0.3 bar (30,000 Pa)
- ▶ Top up the heating water to start the product up again.
 - ◁ The flashing pressure value is shown in the display until the pressure reaches or rises above the pressure warning value.

6.6 Switching on the product

- ▶ Press the product's on/off button.



Note





The hot water and the heating function must be deactivated.

6.7 Using check programmes

By activating various check programmes, you can trigger various functions on the product.





Check programmes – Overview (→ Page 28)

6.7.1 Selecting the check programmes





1. Press the on/off button to switch off the unit.
2. Press the menu button and the on/off button for 5 seconds to call up the check programme.
 - ◁ (**P01**) and (**OFF**) are shown in the display.
3. Press the   or   button to select the check programme.

6.7.2 Using check programmes


Check programme « P.01 »

- ▶ Press the menu button. « P.01 » and « 0 » are displayed on the screen.
- ▶ Press the   or   button to set the set value from « 0 » (0%) to « 100 » (100%).
- ▶ Press the menu button to exit the sub-menu or press it for longer than seven seconds to access the configuration menu.

Other check programmes

- ▶ Press the   or   button to select the appropriate check programme.
- ▶ Press the menu button to start the check programme. « P.0X » and « On » (ON) are displayed on the screen.

The check programme automatically switches off after 15 minutes.

- ▶ When you are ready, press the  button or the On/Off button to exit the check programmes.

6.8 Filling mode

1. Open the cold water inlet valve on the system.
2. Open the stop cocks on the connections.
 - ◁ The stop cocks must be positioned in the flow direction .

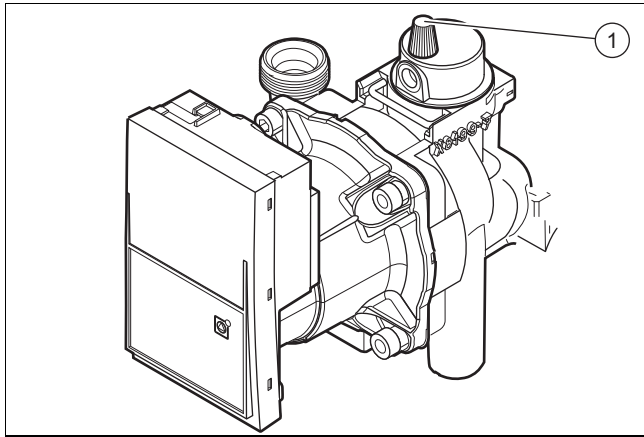
6.8.1 Filling the hot water circuit

1. Open the water tap to fill the hot water circuit.
2. Close the water tap once the appropriate volume of water has flowed out.
 - ◁ The hot water circuit is filled.
3. Check all connections and the entire system for leak-tightness.

6.8.2 Filling the heating installation

Preliminary work

- ▶ Before filling, ensure that the heating installation has been flushed out.



1. Open the purging valve cap (1) on the pump and on the automatic air vents.
2. Fill the system with water until the filling pressure is reached.
 - Recommended filling pressure: 1 ... 1.5 bar (100,000 ... 150,000 Pa)
 - ◁ The programme for automatic purging starts as soon as the pressure warning value is reached.
 - Pressure warning value: ≤ 0.5 bar ($\leq 50,000$ Pa)
 - Automatic purging time: 5 min
 - ◁ The heating and hot water functions cannot be activated.
3. Purge each radiator until the water escapes normally, and then close the system's purging valves.



Note

Leave the cap on the pump's purging valve.

4. Ensure that the hot water pressure is in the recommended range.
 - ▽ If required, refill the product.
5. Check that all connections are leak-tight.

Conditions: If the noise persists in the boiler

- ▶ Purge the product again by activating check programme (P.07) and then (P.06).
Check programmes – Overview (→ Page 28)

6.9 Building up pressure in the system again

1. Run the product in heating mode with a sufficiently high target heating temperature.
 - Product operating period: ≥ 15 min

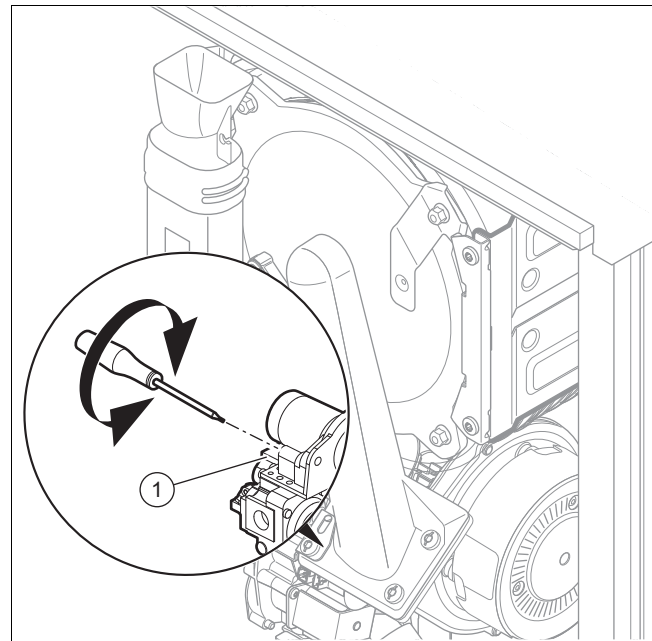
Target heating temperature	
Conditions: Heating system with high-temperature radiators	≥ 50 °C
Conditions: Heating system with low-temperature radiators OR Heating system with floor-standing heating	≤ 50 °C

2. Purge each radiator until the water escapes normally, and then retighten the system's purging valves.

Conditions: Difficulty purging the heating circuit

- ▶ Start the check programme (P.06).
Check programmes – Overview (→ Page 28)
3. Check the filling pressure.
 - Recommended filling pressure: 1 ... 1.5 bar (100,000 ... 150,000 Pa)
 - ▽ If required, refill the product.

6.10 Checking and adjusting the gas ratio setting



Only one competent person is authorised to implement the settings on the gas valve.

Each destroyed seal must be restored.

The CO₂ adjusting screw (1) may have to be sealed after a gas conversion.

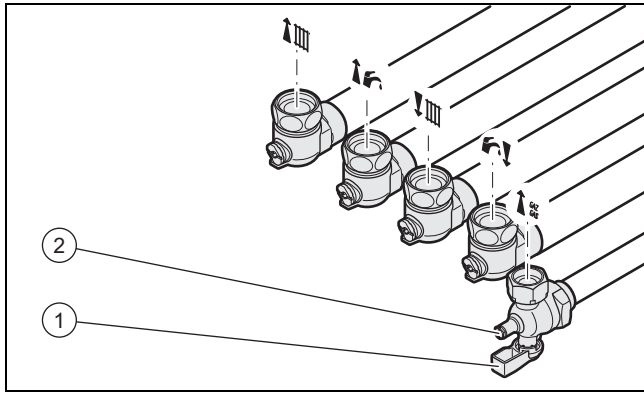
Any interference with the gas valve's adjusting screw Offset (zero point setting) is not permitted (the screw is sealed with leads after setting ex works).

6.10.1 Checking the leak-tightness of the flue gas system and for flue gas recirculation

1. Check that the flue gas system is intact, in accordance with British Gas TB 200.
2. If the flue gas installation is longer than 2 m, a flue gas recirculation test is strongly recommended. This test must be carried out in accordance with the instructions below.
3. Use the air analysis point (1) to check for flue gas recirculation.
4. Use the flue gas measuring instrument.
5. If you discover CO or CO₂ in the fresh air, search for a leak in the flue gas system or for the flue gas recirculation.
6. Eliminate the damage.
7. Repeat the above-mentioned test to determine if the fresh air contains CO or CO₂.
8. If you cannot eliminate the damage, you must not start up the boiler.

6 Start-up

6.10.2 Checking the gas flow pressure



1. Ensure that the gas inlet working pressure can be obtained with all other gas appliances in the property working.
2. Close the gas isolator cock.
3. Use a screwdriver to undo the sealing screw of the measuring nipple (2) on the gas valve.
4. Connect a pressure gauge to the measuring nipple (2).
5. Open the gas isolator cock.
6. Start up the product with check programme P.01.
7. In addition, ensure that maximum heat can be dissipated into the heating system by turning up the room thermostat.
8. With the boiler operating at full load check that the gas inlet working pressure at the reference test point (2) complies with the requirements.
 - Nominal gas pressure in G20 natural gas mode: 20 mbar (0.020 bar)
 - Nominal gas pressure in G31 natural gas mode: 37 mbar (0.037 bar)
9. Should the pressure recorded at the reference test point in the boiler be lower than indicated check if there is any blockage in the pipework or if the pipework is undersized.

Conditions: Gas flow pressure **not** in the permissible range



Caution.

Risk of material damage and operating faults caused by incorrect gas connection pressure.

If the gas connection pressure lies outside the permissible range, this can cause operating faults in and damage to the product.

- ▶ Do not make any adjustments to the product.
- ▶ Do not start up the product.

- ▶ If you cannot correct the failure, notify the gas supply company and proceed as follows:
- ▶ End check programme P.01.
- ▶ Allow the boiler to cool down by allowing pump overrun to operate for a minimum of two minutes.
- ▶ Close the gas isolator cock.
- ▶ Remove the pressure gauge and retighten the sealing screw (2) for the measuring nipple.
- ▶ Open the gas isolator cock (1).
- ▶ Check the measuring nipple for gas tightness.

- ▶ Close the gas isolator cock (1).
- ▶ Fit the panel. (→ Page 10)
- ▶ Disconnect the product from the power mains.
- ▶ You must not start up the boiler.

Conditions: Gas flow pressure in the permissible range

- ▶ End the check programme P.01.
- ▶ Allow the boiler to cool down allowing pump overrun to operate for a minimum of two minutes.
- ▶ Close the gas isolator cock (1).
- ▶ Remove the pressure gauge and retighten the sealing screw (2) for the measuring nipple.
- ▶ Open the gas isolator cock (1).
- ▶ Check the measuring nipple for gas tightness.
- ▶ Fit the panel. (→ Page 10)
- ▶ Reset boiler controls for normal operation.
- ▶ Record the appliance gas inlet working pressure (kPa resp. mbar) in the Benchmark gas boiler commissioning checklist.

6.10.3 Thoroughly flushing the heating installation ("hot")

1. Operate the appliance until the boiler and the heating system are up to temperature.
2. Check the heating system for leaks.
3. Connect a hose to the drain valve located at the lowest position of the heating system.
4. Shut off the boiler, open the drain valve and all purge valves on the radiators and allow the water to flow out of the heating system and the boiler quickly and fully.
5. Close the drain valve.
6. Re-fill the system until the system design pressure of 0,1 MPa (1,0 bar) is attained.



Note

The actual reading on the digital pressure gauge should ideally be 0,05 MPa (0,5 bar) plus an additional pressure corresponding to the highest point of the system above the base of the boiler – 10 m head equals an additional 1 bar reading on the pressure gauge. The minimum pressure should not be less than 0,1 MPa (1 bar) in any installation. If the system is to be treated with an inhibitor it should be applied at this stage in accordance with the manufacturer's instructions. Further information can be obtained from Sentinel, Betz Dearborn Ltd., Tel: 0151 420 9595, or Fernox, Alpha– Fry technologies. Tel: 0870 8700362.

7. Fit the front panel.

6.10.4 Checking the CO₂ content

1. Connect a CO₂ analyser.
2. Start up the product with the check programme (P.01) and set the value.

- Setting value for the programme P.01: 100
- Check programmes – Overview (→ Page 28)
- 3. Wait until the value that is read is stable.
 - Waiting period for reading a stable value: 2 min
- 4. Measure the CO₂ content at the flue gas analysis point.
- 5. Compare the measured value with the corresponding value in the table.



Checking the CO₂ content

Removed front casing	Natural gas	G20	9 ±0.2 %
	Liquid gas	G31	10.1 ±0.2 %
Fitted front casing	Natural gas	G20	9.2 ±0.3 %
	Liquid gas	G31	10.3 ±0.3 %

- 6. Set the CO₂ content as required.

6.10.5 Setting the CO₂ content

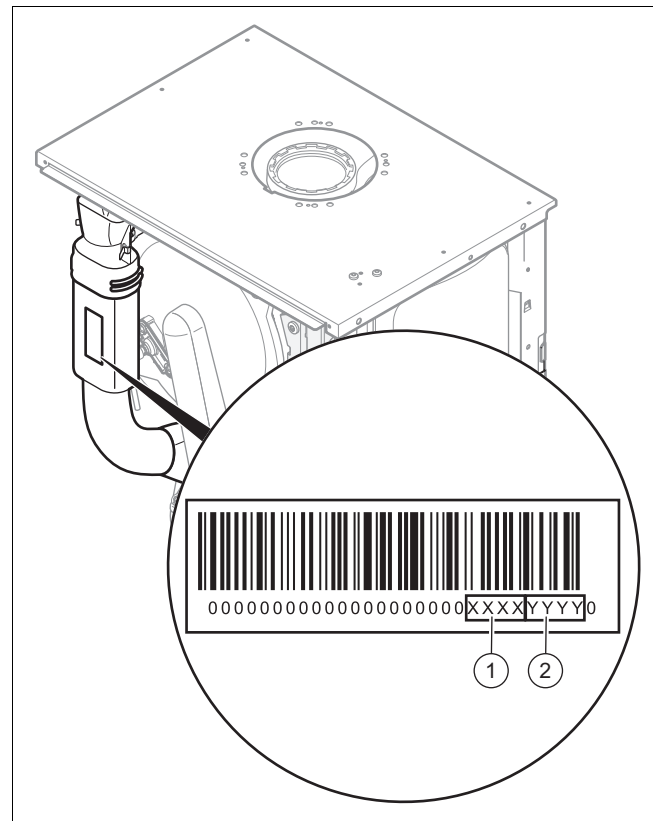
- 1. Set the CO₂ content by turning the bolt (1) and maintaining the direction of rotation. Adjust in increments of a quarter turn each time.

Gas conversion setting	% CO ₂
	↓
	↑

- 2. Check that the setting is correct.
 - ▽ If the setting is not in the specified adjustment range, you must not start up the product.
 - ▶ Inform Customer Service.
- 3. Check whether the air-quality requirements with regard to carbon monoxide are fulfilled.


6.11 Checking the gas flow rate

- 1. The gas flow rate depends on the CO₂ content and the fan speed.



- 2. Observe the information plate regarding the min. (1) and max. (2) rotational speeds on the air intake pipe.

6.11.1 Checking the maximum fan speed

- 1. Activate the check programme (P.01) and set the value.
 - Setting value for the programme P.01: 100
 - Check programmes – Overview (→ Page 28)
- 2. Press the menu button for 7 seconds to go to the settings for the product's diagnostics codes.
 - ◀ (0) appears in the display.
- 3. To check the maximum fan speed, see section Activating diagnostics codes (→ Page 20) and use the diagnostics code (d.34).
 - Overview of diagnostics codes (→ Page 28)
 - ▽ Contact Customer Service if the gas flow rate does not correspond to the value specified on the information plate.
 - Permissible tolerance for fan speed: -200 ... 200 rpm
- 4. Press the  button or the on/off button to exit this menu.

6.11.2 Checking the minimum fan speed

- 1. Activate the check programme (P.01) and set the value.
 - Setting value for the programme P.01: 0
 - Check programmes – Overview (→ Page 28)
- 2. Press the menu button for 7 seconds to go to the settings for the product's diagnostics codes.
- 3. To check the minimum fan speed, see section Activating diagnostics codes (→ Page 20) and use the diagnostics code (d.34).

7 Adapting the unit to the heating installation

Overview of diagnostics codes (→ Page 28)

- ▽ Contact Customer Service if the gas flow rate does not correspond to the value specified on the information plate.
 - Permissible tolerance for fan speed: -200 ... 200 rpm
- 4. Press the menu button for 3 seconds to go to the check programme.

6.12 Checking function and leak-tightness

Before you hand the product over to the operator:

- ▶ Check the gas line, the flue gas installation, the heating installation and the hot water pipes for leaks.
- ▶ Check that the air/flue pipe and condensate drain pipework have been installed correctly.
- ▶ Check that the front casing has been installed correctly.

6.12.1 Checking the heating mode

1. Activate the heating mode on the user interface.
2. Turn all thermostatic radiator valves on the radiators until they are fully open.
3. Start up the product.
 - Product operating period: ≥ 15 min
4. Check the current operating status code.

Status codes – Overview (→ Page 30)

 - ◁ If the product is working correctly, the display shows S.04.

6.12.2 Checking the hot water generation

1. Activate the hot water handling mode on the user interface.
2. Open a hot water valve completely.
3. Activate the display for the current operating status. (→ Page 25)

Status codes – Overview (→ Page 30)

 - ◁ If the product is working correctly, the display shows S.24.



7 Adapting the unit to the heating installation

7.1 Using diagnostics codes

You can use the parameters marked as adjustable in the table of diagnostics codes to adapt the product to the system and customer requirements.





Overview of diagnostics codes (→ Page 28)

7.1.1 Activating diagnostics codes

1. Press the menu button for 7 seconds to go to the settings for the product's diagnostics codes.
 - ◁ **(0)** appears in the display.
2. Press the  or  button to select the setting value.
 - ◁ The access code **(96)** is reserved for the competent person.

3. Press the menu button to confirm.
 - ◁ The diagnostics code and its value appear in the display.

7.1.2 Setting a diagnostics code

1. Press  or  button to select the diagnostics code.
2. Press the  or  button to select the setting value.
3. Proceed accordingly for all parameters that need to be changed.
4. Press the menu button for 3 seconds to exit the parametrisation menu.

7.2 Setting the pump output

The product is equipped with a speed-regulated high-efficiency pump, which adjusts independently to the hydraulic conditions of the heating installation.

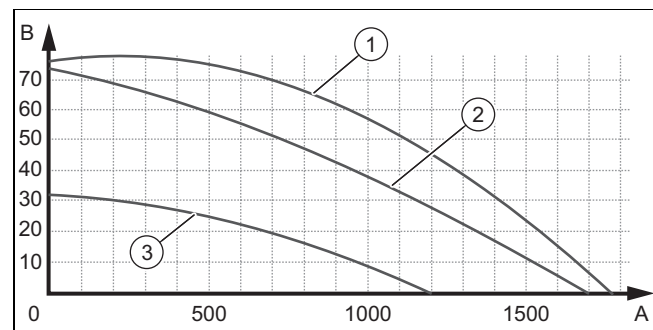
If you have installed a low loss header in the heating installation, we recommend switching off the speed regulation and setting the pump output to a fixed value.

- ▶ If required, change the setting for the pump speed, which depends on the operating mode, using diagnostics code d.14.
- ▶ Set a diagnostics code. (→ Page 20)

Overview of diagnostics codes (→ Page 28)

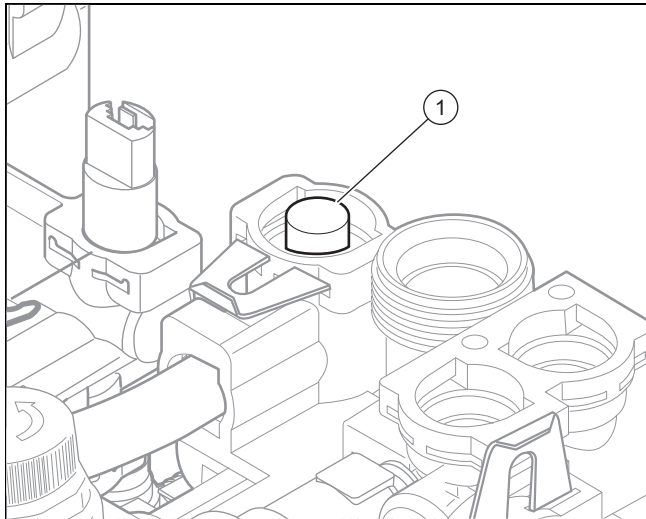
Pump characteristic lines

Flow rate-pressure curve



A	Heating circuit flow rate (l/hr)	B	Available pressure (kPa)
1	Bypass closed, max. PWM	3	Bypass in series setting, min. PWM
2	Bypass in series setting, max. PWM		

7.3 Setting the bypass valve



- ▶ Turn the adjusting screw (1).
 - Setting the bypass valve in the as-delivered condition: Open by 3/4 of a turn.

8 Adjusting the hot water temperature



Danger!

Risk of death from Legionella.

Legionella multiply at temperatures below 60 °C.

- ▶ Ensure that the operator is familiar with all of the Anti-legionella measures in order to comply with the applicable regulations regarding legionella prevention.

9 Inspection and maintenance

9.1 Observing inspection and maintenance intervals

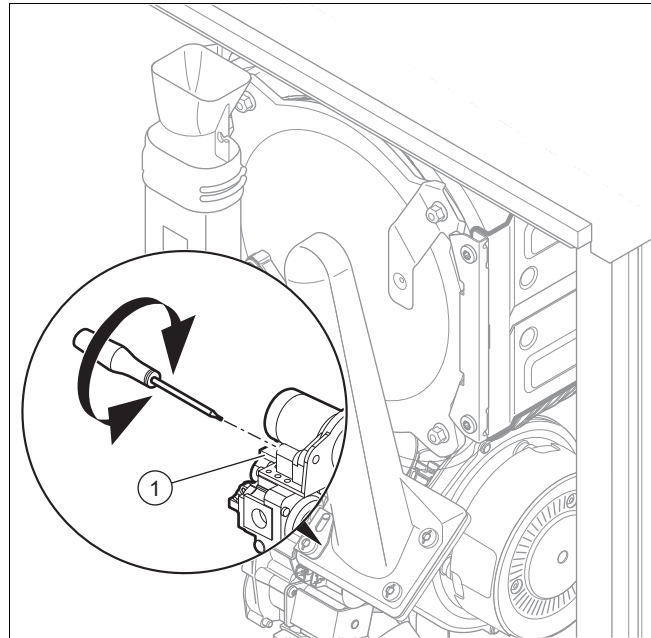
- ▶ Comply with the minimum clearances for the inspection and maintenance. Depending on the results of the inspection, it may be necessary to bring maintenance work forward.
Inspection and maintenance work – Overview

9.2 Procuring spare parts

The original components of the product were also certified as part of the declaration of conformity. If you do not use certified Glow-worm original spare parts for maintenance or repair work, this voids the conformity of the product. We therefore strongly recommend that you install Glow-worm original spare parts. Information about available Glow-worm original spare parts is available by contacting the contact address provided on the reverse of this document.

- ▶ If you require spare parts for maintenance or repair work, use only Glow-worm original spare parts.

9.3 Gas conversion procedure



1. Disconnect the product from the power mains.
2. Turn the bolt (1) in the direction specified in the table and by the number of rotations specified in the table.

Setting the gas valve

	Turning clockwise	Turning anti-clockwise
	G20 → G31	G31 → G20
Energy 35 Store-A	2.5	2.5

3. Start up the product with the check programme (P.01) and set the value.
 - Setting value for the programme P.01: 100
Check programmes – Overview (→ Page 28)



Note

If the product is in the operating cycle (ON/OFF), decrease the set value.

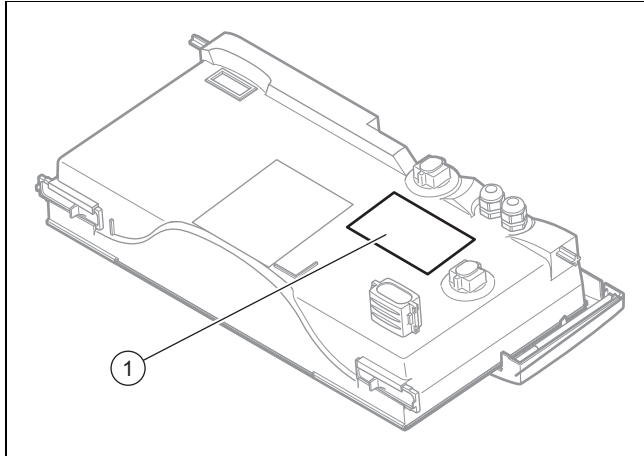
4. Wait until the value that is read is stable.
 - Waiting period for reading a stable value: 2 min
5. Measure the CO₂ content at the flue gas analysis point (2).
6. Compare the measured value with the corresponding value in the table.

Checking the CO₂ content

Removed front casing	Natural gas	G20	9 ±0.2 %
	Liquid gas	G31	10.1 ±0.2 %
Fitted front casing	Natural gas	G20	9.2 ±0.3 %
	Liquid gas	G31	10.3 ±0.3 %

- ▽ Set the CO₂ (→ Page 19) content as required.

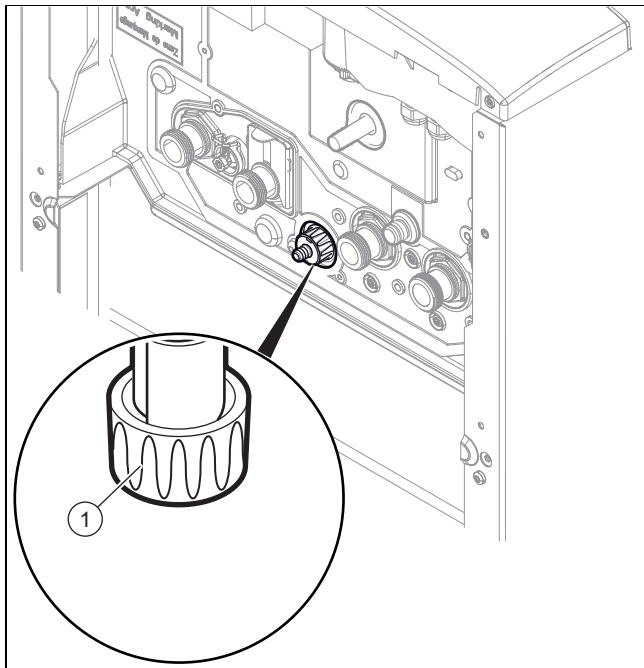
9 Inspection and maintenance



7. Mark the type of gas that is used on the gas conversion information label.
8. Stick the gas conversion information label to the electronics box.

9.4 Draining the product

Draining the heating circuit



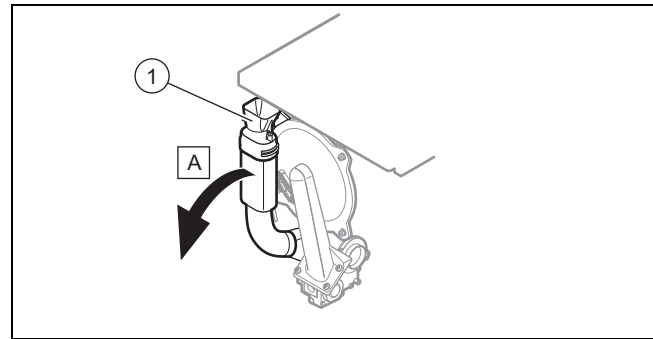
1. Close the stop cocks in the heating system's flow and return.
2. Open the drain cock (1).
3. Ensure that there is an air inlet.

Draining the hot water circuit

4. Close the cold water inlet valve on the system.
5. Close the stop cock at the cold water inlet on the underside of your product.
6. Open a valve in the domestic hot water position in order to remove the pressure, and then reconnect the valve.
7. Prepare a drain on the product's cold water inlet or on the drain cock on your pre-installation jig (if this is present in your system).
8. Create an air inlet by loosening the outlet connector.

9.5 Removing and installing the air intake pipe

Removing the air intake pipe (Authorised competent person)

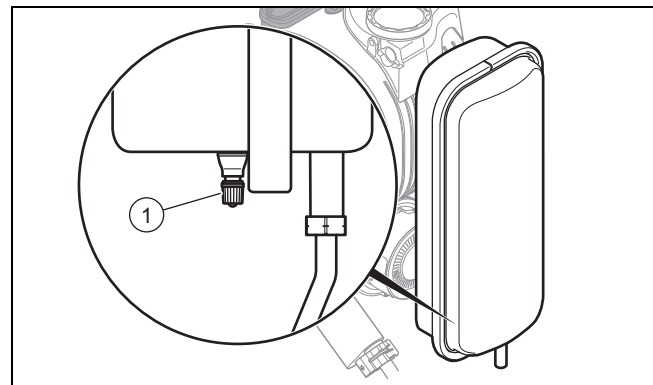


1. Unclip the air intake pipe (1) and remove it.
2. Clean the inside of the air intake pipe.
 - ▽ If necessary, use a soft cloth to help you and make sure that the foam on the inside is not damaged.

Installing the air intake pipe (Authorised competent person)

3. To reinstall the air intake pipe, carry out the steps described above in reverse.

9.6 Checking the pressure in the heating water expansion vessel



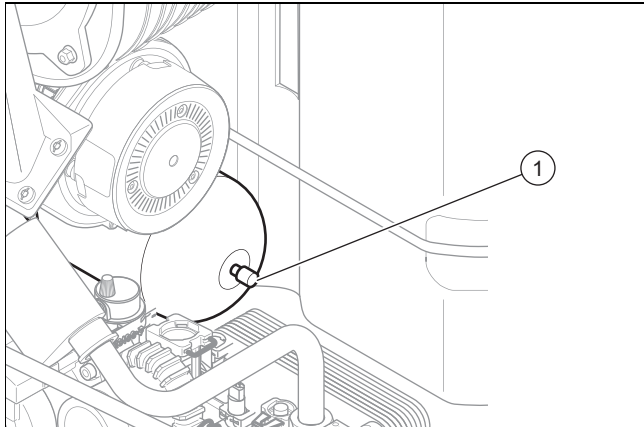
1. Drain the product. (→ Page 22)
2. Measure the pre-charge pressure of the expansion vessel at the expansion vessel valve (1).
 - Pre-charge pressure of the heating expansion vessel: 0.75 bar (75,000 Pa)
3. If the pressure is below 0,75 bar (depending on the static pressure of the heating installation), use nitrogen to fill the expansion vessel. If this is not available, use air. Check that the drain valve is open when topping up.
4. Fill and purge the heating installation. (→ Page 16)

9.7 Checking the pressure in the hot water expansion vessel



Note

The heating water expansion vessel does not need to be removed in order to remove the hot water expansion vessel.



1. Allow the pressure in the hot water circuit to fall.
2. Measure the pre-charge pressure of the expansion vessel at the vessel valve (1).
 - Pre-charge pressure in the hot water expansion vessel: 3.5 bar (350,000 Pa)

Conditions: Installing a new expansion vessel

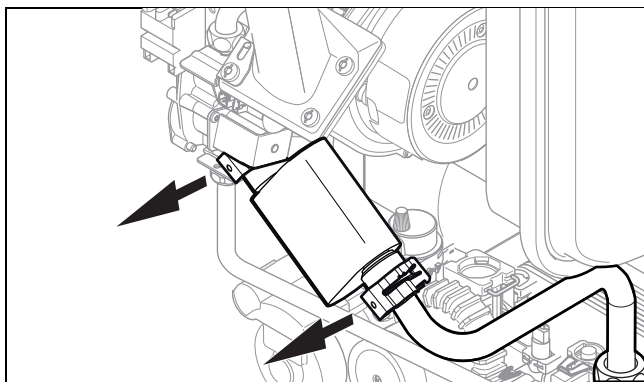
- ▶ Drain the product. (→ Page 22)
- ▶ Fill the expansion vessel.
 - ◁ Fill the vessel ideally with nitrogen, otherwise with air.
 - ◁ The drain valve must be open during levelling.
- ▶ Fill the hot water circuit. (→ Page 16)

9.8 Checking the particle filter



Note

The particle filter must be removed and cleaned at one-year intervals.



1. Drain the product. (→ Page 22)
2. Remove the clips and the particle filter.
3. Check the condition of the particle filter and clean the mesh surrounding it.

Conditions: Fitting a new particle filter

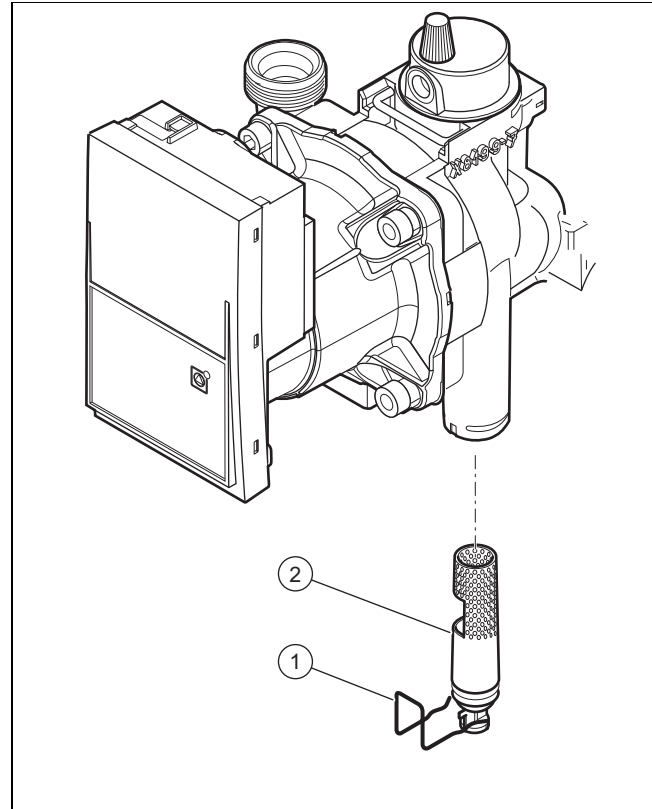
- ▶ Fill and purge the heating installation. (→ Page 16)

9.9 Cleaning the heating filter



Note

The heating filter improves the purging of the heating circuit.



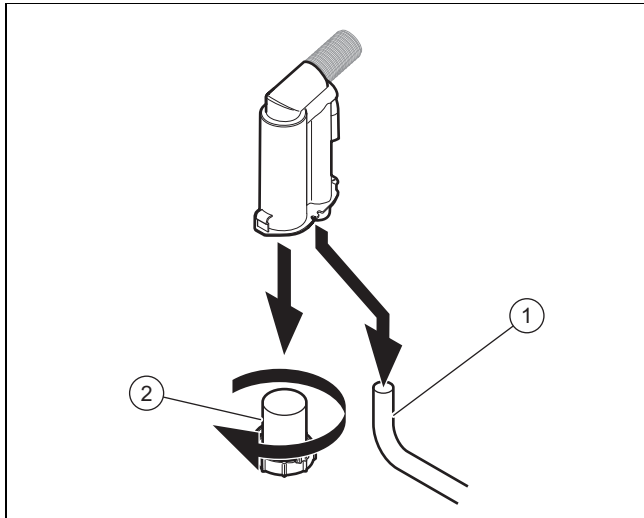
1. Drain the product. (→ Page 22)
2. Remove the clip (1).
3. Remove the heating filter (2) and clean it.
4. Reinstall the components in reverse order.

9.10 Cleaning the condensate siphon

Preliminary work

- ▶ Place a container under the condensate siphon.

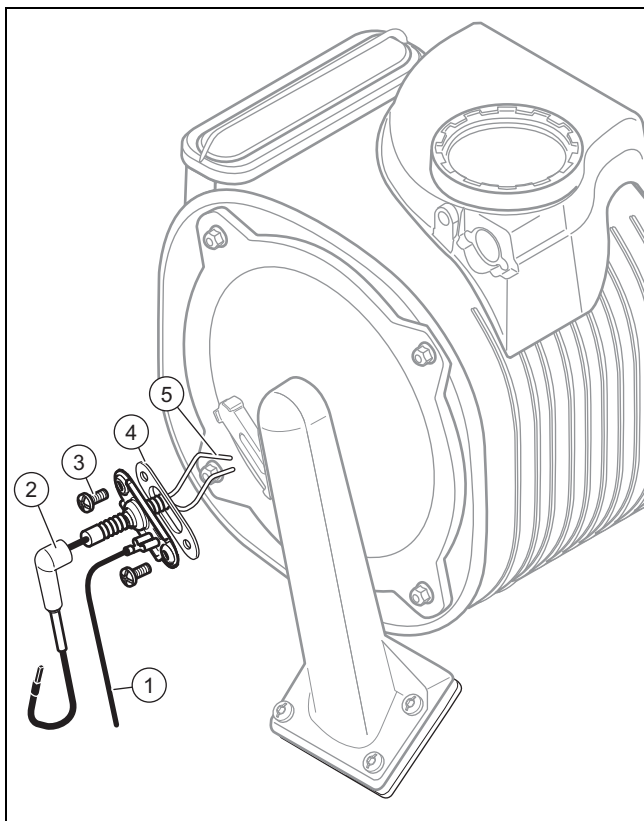
9 Inspection and maintenance



1. Detach the siphon (2).
2. Clean the lower section of the siphon with clean water.
3. Disconnect the condensate line (1).
4. Refit the unit and make sure that the seals are fitted correctly.
5. Fill the lower section of the siphon with water.
 - Distance between the edge of the condensate siphon and the water: 10 mm
6. Screw in the siphon tightly.

9.11 Combustion unit

9.11.1 Checking the ignition and flame control electrode



1. Remove the air intake pipe. (→ Page 22)
2. Disconnect the connection (2) and the earthing cable (1).
3. Remove the fixing screws (3).

4. Carefully remove the electrode from the combustion chamber.
5. Check whether the ends of the electrodes (5) are free from damage.
6. Clean and check the gap between the electrodes.
 - Distance between the ignition and flame control electrodes: 3.5 ... 4.5 mm
7. Make sure that the seal (4) is free from damage.
 - ▽ If necessary, replace the seal.

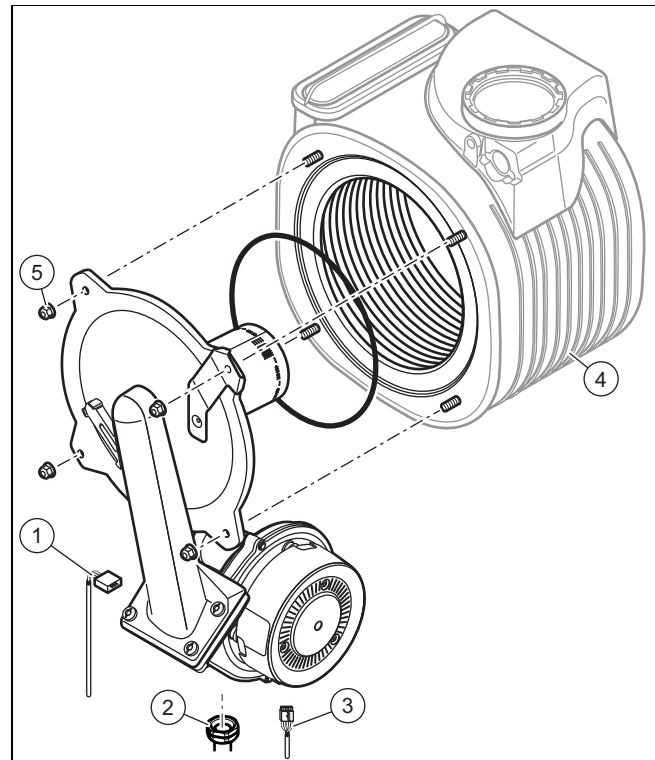
9.11.2 Removing the gas-air mixture unit



Note

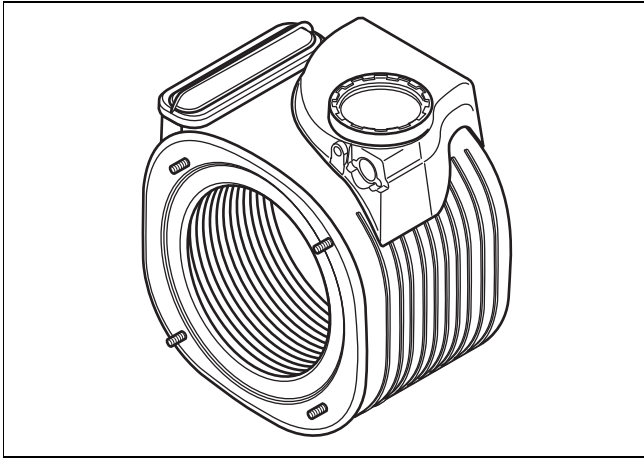
The gas-air mixture unit consists of three main components:

- Ventilator
- Gas valve,
- Burner door



1. Remove the gas spigots (2).
2. Remove the plugs (1) and (3).
3. Loosen the nuts (5).
4. Remove the burner unit from the boiler casing (4).
5. Check whether the bolts on the boiler casing are free from damage.
 - ▽ Replace the boiler casing if necessary.
6. Check whether the insulation on the burner valve is free from damage.
 - ▽ Replace the burner valve if necessary.

9.11.3 Cleaning the heat exchanger



1. Protect the folded down electronics box against sprayed water.
2. Clean the ribs of the heat exchanger with water.
 - ◀ The water runs out into the condensate tray.

9.11.4 Checking the burner

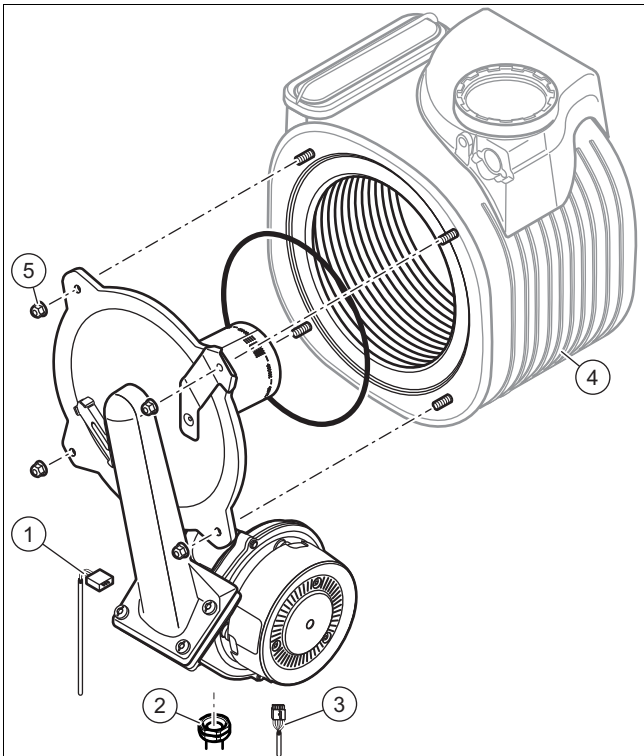
1. Scan the surface of the burner for potential damage.
 - ▽ If you see any damage, replace the burner.
2. Fit a new burner seal.

9.11.5 Installing the gas-air mixture unit



Note

When disassembling the burner, always replace the seal.



1. Insert the burner unit into the boiler casing (4).
2. Tighten the nuts (5) gradually in a cross-wise pattern.

3. Connect the gas spigots (2) with a new seal to the burner unit.
4. Connect the plug to the gas valve (1) and the fan (3).
5. Install the air intake pipe. (→ Page 22)

9.12 Completing inspection and maintenance work

- ▶ Check the CO₂ content. (→ Page 18)

10 Troubleshooting

10.1 Detecting and rectifying faults

In the event of a product malfunction, use the troubleshooting table in the operating instructions.

Troubleshooting (→ Page 32)

10.2 Rectifying faults

- ▶ If fault codes ((FXX)) appear, refer to the table in the appendix for advice, or use the check programmes.
 - Overview of fault codes (→ Page 31)
 - Check programmes – Overview (→ Page 28)
- ▶ Press the button to restart the product.
 - ▽ If you are unable to rectify the fault code and the fault recurs despite fault clearance attempts, contact Customer Service.

10.3 Calling up the fault memory

The last ten fault codes are stored in the fault memory.

- ▶ Press the and buttons for 7 seconds to display the list of fault codes.
 - Overview of fault codes (→ Page 31)
- ▶ The first fault appears in the display: (01 XX).
- ▶ Press the or button to look through the fault list.
- ▶ Press the menu button for 3 seconds to exit the fault list display.

10.4 Deleting the fault memory

1. Delete the fault memory (d.94).
2. Set a diagnostics code. (→ Page 20)
 - Overview of diagnostics codes (→ Page 28)

10.5 Displaying the status codes

The status codes display the product's current operating status.

Status codes – Overview (→ Page 30)

10.5.1 Activating the status codes display

1. Press the button for 3 seconds to display the product's current operating status.
 - ◀ The status code appears in the display.
2. Press the menu button for 3 seconds to exit the status code display.

11 Decommissioning the product

10.6 Replacing the power supply cable

**Note**

To avoid danger, if the power supply cable is damaged, it must be replaced by the manufacturer, their responsible customer service department or suitably qualified persons.

- ▶ Replace it in accordance with the recommendations for the power supply connection (→ Page 14).
 - Section of the mains power cable: 3 G 0,75mm²

11 Decommissioning the product

- ▶ Switch off the product.
- ▶ Disconnect the product from the power mains.
- ▶ Close the gas isolator cock.
- ▶ Close the cold water stop cock.
- ▶ Drain the product. (→ Page 22)

12 Customer service

For contact details for our customer service department, you can write to the address that is provided on the back page, or you can visit www.glow-worm.co.uk.

Appendix

A Inspection and maintenance work – Overview

The table below lists the manufacturer requirements with respect to minimum inspection and maintenance intervals. If national regulations and directives require shorter inspection and maintenance intervals, you should observe these instead of the intervals listed in the table.

No.	Work	Inspection (annual)	Maintenance (carry out at regular intervals)
1	Check the air/flue pipe for leak-tightness and to ensure that it is fastened correctly. Make sure that it is not blocked or damaged and has been installed in accordance with the relevant Installation Manual.	X	X
2	Check the general condition of the product. Remove any dirt from the product and the vacuum chamber.	X	X
3	Visually inspect the general condition of the Thermoblock. In doing so, pay particular attention to signs of corrosion, rust and other defects. If you notice any damage, carry out maintenance work.	X	X
4	Check the gas connection pressure at maximum heat input. If the gas connection pressure is not within the correct range, carry out maintenance work.	X	X
5	Check the CO ₂ content (the air ratio) of the product and, if necessary, adjust the CO ₂ content (the air ratio). Keep a record of this.	X	X
6	Disconnect the product from the power mains. Check that the plug connections and electrical connections are correct and make any necessary adjustments.	X	X
7	Close the gas isolator cock and the service valves.		X
8	Drain the product on the water side. Check the pre-charge pressure of the expansion vessel and top up the vessel, if necessary (approx. 0.03 MPa/0.3 bar under the system filling pressure).		X
9	Remove the gas-air mixture unit.		X
10	Check the seals in the combustion area. If you see any damage, replace the seals. Replace the burner seal each time it is opened and accordingly each time maintenance is carried out.		X
11	Clean the heat exchanger.		X
12	Check the burner for damage and replace it if necessary.		X
13	Check the condensate siphon in the product, clean and fill if necessary.	X	X
14	Install the gas-air mixture unit. Caution: Replace the seals.		X
15	If the volume of water is insufficient or the outlet temperature is not reached, replace the secondary heat exchanger if necessary.		X
16	Open the gas isolator cock, reconnect the product to the power mains and switch the product on.	X	X
17	Open the service valves, fill up the product/heating installation to 0.1-0.15 MPa/1.0-1.5 bar (depending on the static height of the heating installation) and start the purging programme P.07 .		X
18	Perform a test operation of the product and heating installation, including hot water generation (if available), and purge the system once more if necessary.	X	X
20	Check the CO ₂ content (the air ratio) of the product again.		X
21	Ensure that no gas, flue gas, hot water or condensate is leaking from the product. Restore leak-tightness if necessary.	X	X
22	Record the inspection/maintenance work carried out.	X	X

Appendix

B Check programmes – Overview



Note

Since the code table is used for various products, some codes may not be visible for the product in question.

Display	Meaning
P.01	Start up the adjustable power of the burner during heating mode: The product works at an adjustable power of "0" (0% = P min.) up to "100" (100% = P max.). For this, press the or button after the product has ignited.
P.02	Start up the burner at ignition load: The product works at ignition load after a successful ignition.
P.03	Start up the burner at maximum heating load: After a successful ignition, the product works at maximum load (diagnostics code d.00 "Maximum heating output").
P.04	Product's chimney sweep function: The product works at maximum load after a successful ignition.
P.05	Filling the product: The pump and burner switch off so that the product can be filled. The diverter valve is moved to the mid-position.
P.06	Purging the heating installation: The function is activated in the heating circuit for 5 minutes. Check that the pump's purging valve is open.
P.07	Purging the product's short cycle: The function is activated in the short cycle for 5 minutes. Check that the pump's purging valve is open.

C Overview of diagnostics codes



Note

Since the code table is used for various products, some codes may not be visible for the product in question.

Setting level	Values		Unit	Description	Default setting	User-specific setting
	Min.	Max.				
d.00 Maximum heating output	–	–	kW	The maximum heating output varies depending on the product. The factory setting values can be found in the technical data.	–	Adjustable
d.01 Internal pump overrun in heating mode	1	60	min	–	5	Adjustable
d.02 Max. burner anti-cycling time in heating mode	2	60	min	To prevent regular activation and deactivation of the burner, activation is automatically locked for a defined period after each burner switch-off cycle. The burner anti-cycling time can be adjusted to meet the heating installation's operational conditions and there is a linear relationship with the target heating temperature: – The value is defined at 80 °C (2 minutes) – The duration can be set at 10 °C: Select a value between 2 and 60 minutes	20	Adjustable
d.03 Hot water temperature at the plate heat exchanger outlet	Current value		°C	Displaying the temperature at the plate heat exchanger outlet in the hot water circuit.	–	Not adjustable
d.04 Hot water temperature in the cylinder	Current value		°C	Displaying the cylinder water temperature (if there is a sensor).	–	Not adjustable
d.05 Heating target value	Current value		°C	Current target value setting.	–	Not adjustable
d.06 Hot water target value	45	65	°C	Current setting of the hot water target value.	–	Not adjustable
d.14 Speed setpoint	0	5	–	– 0 = Auto – 1 = Minimum fixed rotational speed – 2 to 4 = Average fixed rotational speeds – 5 = Maximum fixed rotational speed	0	Adjustable

Setting level	Values		Unit	Description	Default setting	User-specific setting
	Min.	Max.				
d.15 Pump speed, actual value	Current value		%	PWM percentage for the pump that is requested by the main PCB.	–	Not adjustable
d.18 Pump operating mode setting	0	2	–	0 = Discontinuously with burner 1 = Continuously as required by the room thermostat 2 = Permanently	1	Adjustable
d.20 Maximum setting for hot water target value	50	65	°C	–	60	Adjustable
d.27 Switch from relay 1 to multi-functional module	1	10	–	Use the accessory's instructions to help you.	1	Adjustable
d.28 Switch from relay 2 to multi-functional module	1	10	–	Use the accessory's instructions to help you.	2	Adjustable
d.31 Operating mode for the automatic filling device	0	2	–	0 = Manual 1 = Not active 2 = Automatic	0 or 2	Adjustable
d.34 Fan speed, actual value	Current value		rpm	Displaying the fan speed Multiply the displayed value by 100	–	Not adjustable
d.35 Position of 3-way valve	Current value		–	0 = Heating mode 40 = Mid-position 100 = Hot water handling mode	–	Not adjustable
d.39 Temperature at the hot water inlet	Current value		°C	The water temperature that is measured by the temperature sensor upstream of the mixer valve is displayed here (if the optional accessory is installed).	–	Not adjustable
d.40 Heating flow temperature	Current value		°C	Displaying the heating flow temperature	–	Not adjustable
d.41 Heating return temperature	Current value		°C	Displaying the heating return temperature	–	Not adjustable
d.43 Heating curve	0,2	4	K	Note This code is displayed if an outside temperature sensor is connected to the product and also only if no eBUS room thermostat is connected. Consult the accessory's operating instructions in order to implement this setting.	1,2	Adjustable
d.45 Base point of the heating curve	15	25	°C	Note This code is displayed if an outside temperature sensor is connected to the product and also only if no eBUS room thermostat is connected. Consult the accessory's operating instructions in order to implement this setting.	20	Adjustable
d.47 Outside temperature	Current value		°C	Note This code is displayed if an outside temperature sensor is connected to the product and also only if no eBUS room thermostat is connected.	–	Not adjustable
d.62 Night offset	0	30	°C	Selecting the target value reduction between day (COMFORT period on the room thermostat) and night (ECO period on the room thermostat)	0	Adjustable
d.67 Remaining burner anti-cycling time	Current value		min	Displays the remaining time until the lock ends to prevent cycles that are too short.	–	Not adjustable
d.71 Maximum heating flow temperature target value	45	80	°C	–	75	Adjustable
d.85 Minimum output of the product	–	–	kW	The minimum heating output varies depending on the product.	–	Adjustable
d.90 Status of the digital eBUS controller	0	1	–	0 = Not recognised 1 = Recognised	–	Not adjustable
d.94 Delete fault list	0	1	–	Deleting the fault list: – 0 = No – 1 = Yes	0	Adjustable

Appendix

D Status codes – Overview



Note

Since the code table is used for various products, some codes may not be visible for the product in question.

Status code	Meaning
Display in heating mode	
S.00	No demand.
S.01	Fan start-up.
S.02	Pump start-up.
S.03	Burner ignition.
S.04	Burner ignited.
S.05	Pump/fan overrun.
S.06	Fan overrun
S.07	Pump overrun.
S.08	Remaining burner anti-cycling time.
Display in hot water handling mode	
S.10	DHW demand.
S.11	Fan start-up.
S.13	Burner ignition.
S.14	Burner ignited.
S.15	Pump/fan overrun.
S.16	Fan overrun.
S.17	Pump speed overrun.
Display in Comfort mode with warm start or hot water handling mode with cylinder.	
S.20	DHW demand.
S.21	Fan start-up.
S.23	Burner ignition.
S.24	Burner ignited.
S.25	Pump/fan overrun.
S.26	Fan overrun.
S.27	Pump overrun.
S.28	Burner anti-cycling time or lock against short cycles.
Special cases	
S.30	Room thermostat is blocking heating mode.
S.31	Summer mode active or no heat requirement from the eBUS controller.
S.32	Waiting mode because of fan speed deviation.
S.34	Frost protection mode active.
S.39	Underfloor heating contact open.
S.40	Comfort protection mode is active: Product running with limited heating comfort. For example, underfloor heating (contact thermostat).
S.41	Water pressure too high.
S.53	Wait cycle: Temperature difference between heating flow and return is too high. If $\Delta t > 30$, then forced operation with Pmin.
S.54	Product is in the waiting period of the operation blocking function as a result of low water pressure (temperature gradient).
S.96	Water pressure sensor test running, heating demands are blocked.
S.98	Test of the heating return temperature sensor.
S.99	Automatic filling in progress.

E Overview of fault codes



Note

Since the code table is used for various products, some codes may not be visible for the product in question.

Fault code	Meaning	Possible causes
F.00	Flow temperature sensor interruption	NTC plug not plugged in or has come loose, multiple plug on the PCB not plugged in correctly, interruption in cable harness, NTC sensor defective.
F.01	Return temperature sensor interruption	NTC plug not plugged in or has come loose, multiple plug on the PCB not plugged in correctly, interruption in cable harness, NTC sensor defective.
F.02	Cylinder charging sensor fault	NTC sensor defective, NTC cable defective, defective plug connection on NTC.
F.03	Cylinder sensor fault	NTC sensor defective, NTC cable defective, defective plug connection on NTC.
F.10	Flow NTC short circuit	NTC sensor defective, short circuit in the cable harness.
F.11	Return NTC short circuit	NTC sensor defective, short circuit in the cable harness.
F.12	Cylinder charging sensor short circuit	NTC sensor defective, short circuit in the cable harness.
F.13	Cylinder sensor short circuit	NTC sensor defective, short circuit in the cable harness.
F.20	Safety switch-off: Temperature limiter	Incorrect earth connection between cable harness and product, flow or return NTC sensor defective (loose connection), black discharge via ignition cable, ignition plug or ignition electrode, pump blocked, air present, diverter valve fault (disconnected or blocked).
F.22	Safety switch-off: Low water pressure	No or insufficient water in the product, water pressure sensor defective, cable to pump or water pressure sensor not connected/defective.
F.23	Safety switch-off: Temperature difference too great	Pump blocked, insufficient pump output, air in product, flow and return NTC sensors connected the wrong way round.
F.24	Safety switch-off: Temperature rise too fast	Pump blocked, reduced pump capacity, air in product, system pressure too low.
F.26	Fault: Gas valve without function	Gas valve stepper motor not connected, multiple plug on the PCB not plugged in correctly, interruption in cable harness, gas valve stepper motor defective, electronics defective.
F.27	Safety switch-off: Recording incorrect flames	Moisture in the electronics, electronics (flame monitor) defective, gas solenoid valve leaking.
F.28	Failure during start-up: Ignition unsuccessful	Gas meter defective or gas pressure monitor has triggered, air in gas, gas flow pressure too low, condensate duct blocked, incorrect burner jet, incorrect gas valve, fault on the gas valve, multiple plug on PCB incorrectly plugged in, break in cable harness, ignition system (ignition transformer, ignition cable, ignition plug, ignition electrode) defective, ionisation flow interrupted (cable, electrode), incorrect earthing of product, electronics defective, air supply or smoke outlet blocked.
F.29	Failure during operation: Re-ignition unsuccessful	Gas supply temporarily stopped, flue gas recirculation, condensate duct blocked, defective earthing of product, ignition transformer has spark failure, air supply or smoke outlet blocked.
F.32	Fan fault	Plug on fan not correctly plugged in, multiple plug on PCB not correctly plugged in, break in cable harness, fan blocked, electronics defective, air supply or smoke outlet blocked.
F.42	Coding resistance fault (possibly in connection with F.70)	Short circuit/interruption in performance category coding resistor (in cable harness at heat exchanger) or gas type resistor (on the PCB).
F.49	Fault: eBUS	Short circuit on eBUS, eBUS overload or two power supplies with different polarities on the eBUS.
F.52	Mass flow sensor connection fault	Flow sensor not connected/disconnected, plug not connected or incorrectly connected.
F.53	Mass flow sensor fault	Gas flow pressure too low, filter under Venturi filter cap wet or blocked, flow sensor defective, internal pressure measuring point in Venturi blocked (do not use lubricant on Venturi O-ring.).
F.54	Gas pressure fault (in combination with F.28/F.29)	No or insufficient gas inlet pressure, gas isolator cock closed.
F.56	Fault: Mass flow sensor regulation	Gas valve defective, cable harness to gas valve defective.

Appendix

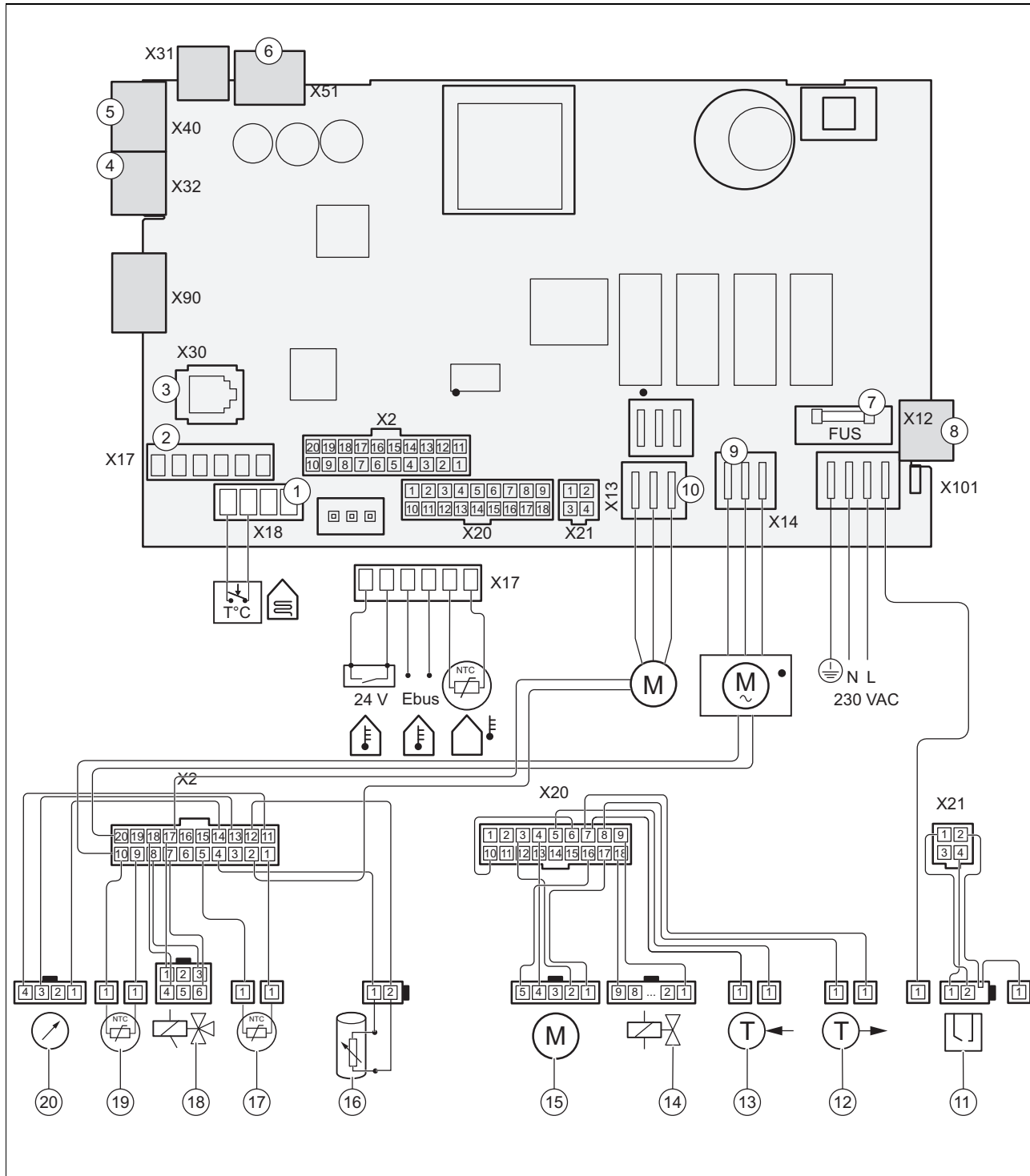
Fault code	Meaning	Possible causes
F.57	Fault during comfort safety mode	Ignition electrode highly corroded.
F.61	Gas valve actuation fault	Short to earth in cable harness for the gas valve, gas valve defective (coils shorted to earth), electronics defective.
F.62	Gas valve fault. Switch-off delay	Delayed switch-off of the gas valve, delayed extinguishing of the flame signal, gas valve leaking, electronics defective.
F.63	EEPROM fault	Electronics defective.
F.64	Fault: Electronics/NTC	Flow or return NTC sensor short circuited, electronics defective.
F.65	Fault: Electronics temp.	Electronics overheating due to external influences, electronics defective.
F.67	Fault: Electronics/flame	Implausible flame signal, electronics defective.
F.68	Fault: Unstable flame signal	Air in gas, gas flow pressure too low, incorrect air ratio, condensate duct blocked, incorrect burner jet, ionisation flow interruption (ignition cable, ignition electrode), flue gas recirculation, condensate duct, electronics defective.
F.70	Invalid product identification (DSN)	If spare parts were installed: Display and PCB replaced at same time and product code not reset, incorrect or missing output range coding resistor.
F.71	Heating flow temperature sensor fault	Flow temperature sensor signalling constant value: <ul style="list-style-type: none"> – Flow temperature sensor incorrectly positioned at supply pipe – Flow temperature sensor defective
F.72	Flow/return NTC fault	Flow/return NTC temperature difference too great => flow and/or return temperature sensor defective or not snapped into place correctly.
F.73	Water pressure sensor signal in the wrong range (too low)	Interruption/short circuit in the water pressure sensor, interruption/short to earth in the power supply cable for the water pressure sensor, or the water pressure sensor is defective.
F.74	Water pressure sensor signal in the wrong range (too low)	Cable to the water pressure sensor has a short circuit to 5 V/24 V or internal fault in the water pressure sensor.
F.77	Fault: Flue non-return flap/condensate pump	No response from the flue non-return flap or condensate pump defective.
F.79	Cylinder temperature sensor fault	Sensor plug not correctly connected/defective, interruption in the cable harness, sensor defective.
F.81	Hot water circuit overheating	Air in the heating and hot water circuit, malfunction in the charging pump, sensor at the plate heat exchanger outlet is snapped into place correctly.
F.83	Fault: Flow and/or return temperature sensor temperature change	When the burner starts, no temperature change or an excessively small temperature change is registered on the flow or return temperature sensor: <ul style="list-style-type: none"> – Insufficient water in product – Flow or return temperature sensor not positioned correctly on the pipe
F.84	Fault: Flow/return temperature sensor temperature difference implausible	Flow and return temperature sensors returning implausible values: <ul style="list-style-type: none"> – Flow and return temperature sensors have been inverted – Flow and return temperature sensors have not been correctly installed
F.85	Fault: Flow and return temperature sensors incorrectly installed	The flow and/or return temperature sensors have been installed on the same pipe/incorrect pipe.
F.86	Fault: Floor contact	Safety thermostat when underfloor heating is switched on: Setting the heating target value.

F Troubleshooting

Fault	Possible causes	Remedial action
Water noises in the system	Air in the heating installation Pump has stopped modulating/is running in at the highest speed	Check the pump's speed setting. Check the pump's PWM connection.
No hot water, heating mode working correctly	The hot water temperature set is too low or hot water handling mode is switched off	Activate hot water handling mode. Set the hot water temperature to the required value.
	Flow meter blocked	Clean the impeller in the flow meter.
The pressure display flashes	Low water pressure in the system	Fill the heating installation. Make sure that the system is not leaking. Make sure that the pressure sensor is not blocked.
	The system pressure is too high	Make sure that the pressure sensor is not blocked.

Fault	Possible causes	Remedial action
Traces of water under the product	Condensate drain pipework blocked	Check the condensate discharge pipe and clean it if necessary.
	Leak in the system or the product	Close the product's cold water inlet and identify the cause of the leak.
	Drain valves not connected correctly	Check the valve connection.

G Connection diagram: Model -A

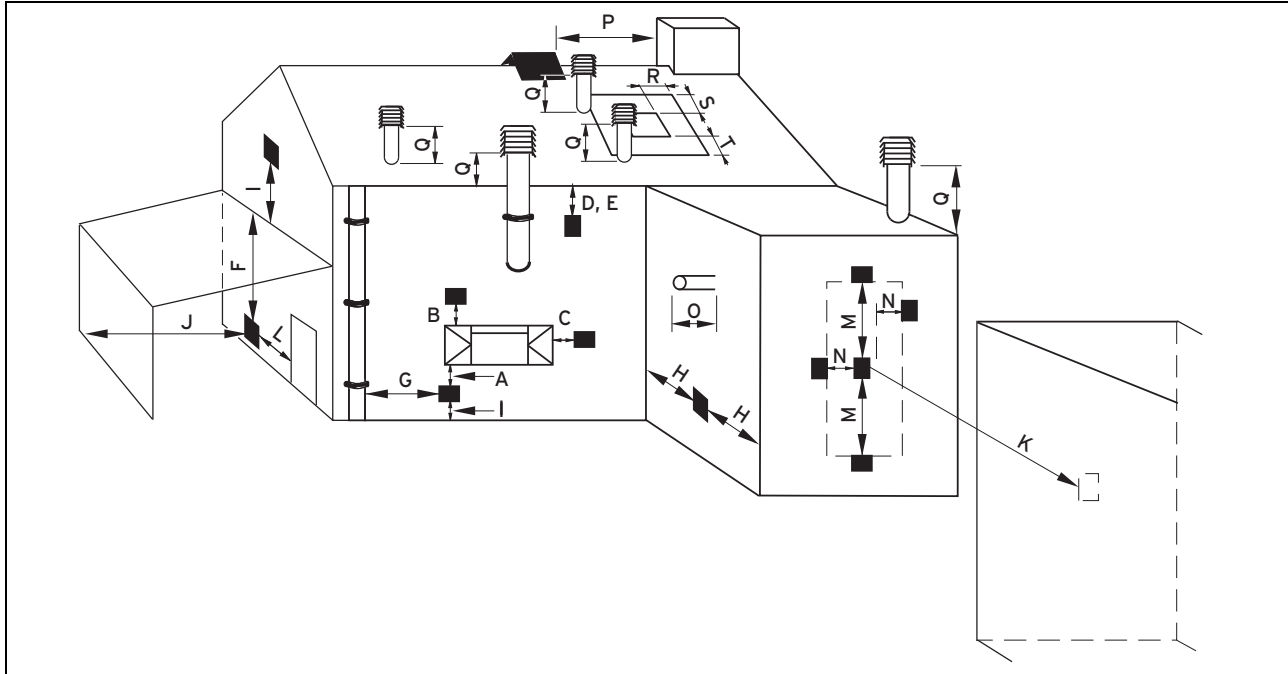


- | | | | |
|---|--------------------------------|----|-----------------------|
| 1 | Plug for the safety thermostat | 6 | User interface |
| 2 | Plug for control accessories | 7 | Fuse |
| 3 | Exalink plug | 8 | Plug for 230V options |
| 4 | Plug for temperature sensor | 9 | Pump plug |
| 5 | PCB for 24V options | 10 | Hot water pump plug |

Appendix

11	Ignition and flame control electrode	16	Temperature sensor in the cylinder
12	Temperature sensor in the heating flow	17	Temperature sensor in the heat exchanger
13	Temperature sensor in the heating return	18	Diverter valve
14	Gas valve	19	Hot water temperature sensor
15	Fan	20	Pressure sensor in the heating circuit

H Opening in the air/flue pipe



H.1 Positioning of the opening of a fan-supported flue gas pipe

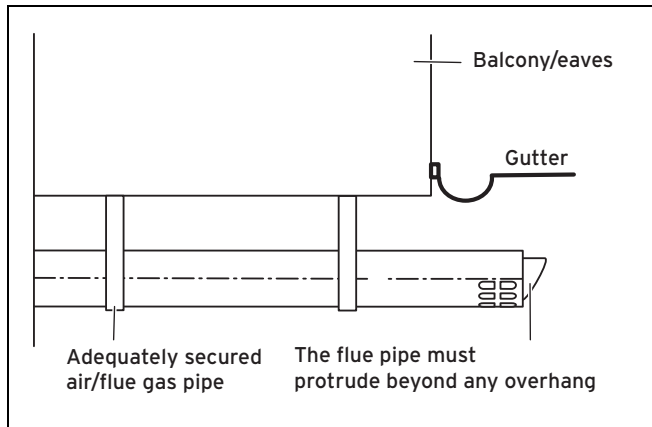
	Installation site	Minimum dimensions
A	Directly below an opening, air bricks, opening windows, etc., that can be opened.	300 mm
B	Above an opening, air bricks, opening windows, etc., that can be opened.	300 mm
C	Horizontally to an opening, air bricks, opening windows, etc., that can be opened.	300 mm
D	Below temperature-sensitive building components, e.g. plastic gutters, down pipes or wastewater pipes	75 mm
E	Below eaves	200 mm
F	Below balconies or car port roofs	200 mm
G	From vertical wastewater pipes or down pipes	150 mm
H	From external or internal corners	200 mm
I	Above floors, roofs or balconies	300 mm
J	From a surface facing a terminal	600 mm
K	From a terminal facing a terminal	1,200 mm
L	From an opening in the car port (e.g. door, window) which leads into the dwelling	1,200 mm
M	Vertical from a terminal on the same wall	1,500 mm
N	Horizontal from a terminal on the same wall	300 mm
O	From the wall on which the terminal has been installed	0 mm
P	From a vertical structure on the roof	N/A
Q	Above the roof area	300 mm
R	Horizontal from adjacent windows on pitched or flat roofs	600 mm
S	Above adjacent windows on pitched or flat roofs	600 mm
T	Below adjacent windows on pitched or flat roofs	2,000 mm

H.2 Text from BS 5440-1 on fan-supported flue gas pipes

BS 5440-1: It is recommended that the fanned flue gas system terminal is positioned as follows:

- At least 2 m from an opening in the building directly opposite, and
- So that the combustion products are not discharged directly across a property boundary.
- Dimensions D, E, F and G: These clearances may be reduced to 25 mm without affecting the performance of the boiler. In order to ensure that the condensate vapour plume does not damage adjacent surfaces, the terminal should be extended as shown.
- Dimension H: This clearance may be reduced to 25 mm without adversely affecting the performance of the boiler. However, in order to ensure that the condensate vapour plume does not damage adjacent surfaces, a clearance of 300 mm is preferred. For IE, recommendations are given in the current issue of the IS 813.

H.3 Opening of the flue pipe below eaves and balconies



H.4 Lengths of the air/flue pipe

Length of the C13 type flue pipe

For each additional 90° elbow that is required (or 2 at 45°), the length L must be reduced by 1 m.

	C13 type flue pipe	
	Max. dia. 60/100 (L)	Max. dia. 80/125 (L)
Energy 35 Store-A	≤ 10 m	≤ 25 m

Length of the C33 type flue pipe

For each additional 90° elbow that is required (or 2 at 45°), the length L must be reduced by 1 m.

	C33 type flue pipe	
	Max. dia. 60/100 (L)	Max. dia. 80/125 (L)
Energy 35 Store-A	≤ 10 m	≤ 26 m

Length of the C43 type flue pipe

For each additional 90° elbow that is required (or 2 at 45°), the length L must be reduced by 1 m.

	C43 type flue pipe
	Max. dia. 60/100 (L)
Energy 35 Store-A	≤ 10 m

Appendix

I Technical data

Technical data – Heating

	Energy 35 Store-A
Max. range of the flow temperature control	10 ... 80 °C
Maximum permissible pressure (PMS)	0.3 MPa (3.0 bar)
Maximum heat output (P max.), set at the factory	30 kW
Water flow at P max., set at the factory ($\Delta T = 20$ K)	1,292 l/h
ΔP heating at P max., set at the factory ($\Delta T = 20$ K)	39.8 kPa (398.0 mbar)
Approximate value for the condensate volume (pH value between 3.5 and 4.0) at 50/30 °C	3.18 l/h

Technical data – G20

	Energy 35 Store-A
Effective output range (P) at 50/30 °C	9.3 ... 32.5 kW
Effective output range (P) at 80/60 °C	8.5 ... 30.0 kW
Hot water heat output range (P)	8.7 ... 35.7 kW
Maximum heat input – heating (Q max.)	30.6 kW
Minimum heat input – heating (Q min.)	8.7 kW
Maximum heat input – hot water (Q max.)	35.7 kW
Minimum heat input – hot water (Q min.)	8.7 kW

Technical data – G31

	Energy 35 Store-A
Effective output range (P) at 50/30 °C	8.8 ... 31.9 kW
Effective output range (P) at 80/60 °C	8.5 ... 30.0 kW
Hot water heat output range (P)	8.7 ... 35.7 kW
Maximum heat input – heating (Q max.)	30.6 kW
Minimum heat input – heating (Q min.)	8.7 kW
Maximum heat input – hot water (Q max.)	35.7 kW
Minimum heat input – hot water (Q min.)	8.7 kW

Technical data – Domestic hot water

	Energy 35 Store-A
Minimum water flow	0.1 l/min
Specific flow rate (D) ($\Delta T = 30$ K) in accordance with EN 13203	23.0 l/min
Maximum permissible pressure (PMW)	1 MPa (10 bar)
Temperature range	45 ... 65 °C
Cylinder capacity	42.0 l

Technical data – General

	Energy 35 Store-A
Gas category	II2H3P
Diameter of the gas pipe	1/2"

	Energy 35 Store-A
Diameter of the heating pipe	3/4"
Expansion relief valve connector (min.)	13.5 mm
Condensed water discharge pipe (min.)	14 mm
G20 gas supply pressure	20 mbar
G31 gas supply pressure	37 mbar
Gas flow at P max. – hot water (G20)	3.77 m ³ /h
CE number (PIN)	1312CL5531
Smoke mass flow in heating mode at P min. (G20)	4.03 g/s
Smoke mass flow in heating mode at P max. (G20)	13.8 g/s
Smoke mass flow in hot water handling mode at P max. (G20)	16.1 g/s
Released system types	C13, C33, C43
Nominal efficiency at 80/60 °C	97.9 %
Nominal efficiency at 50/30 °C	106.3 %
Nominal efficiency in partial load operation (30%) at 40/30 °C	108.6 %
Product dimensions, width	470 mm
Product dimensions, depth	570 mm
Product dimensions, height	892 mm
Net weight	67.0 kg
Weight when filled with water	118 kg

Technical data – Electrics

	Energy 35 Store-A
Electric connection	– 230 V – 50 Hz
Built-in fuse (slow-blow)	T2H 2A 250V
Max. electrical power consumption	166 W
Standby electrical power consumption	5.4 W
Level of protection	IPX4D
Amperage	0.72 A

J Commissioning Checklist

Benchmark Commissioning and Servicing Section

It is a requirement that the boiler is installed and commissioned to the manufacturers instructions and the data fields on the commissioning checklist completed in full.

To instigate the boiler guarantee the boiler needs to be registered with the manufacturer within one month of the installation.

To maintain the boiler guarantee it is essential that the boiler is serviced annually by a Gas Safe registered engineer who has been trained on the boiler installed. The service details should be recorded on the Benchmark Service Interval Record and left with the householder.



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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.



Appendix

SERVICE RECORD

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

Service Provider

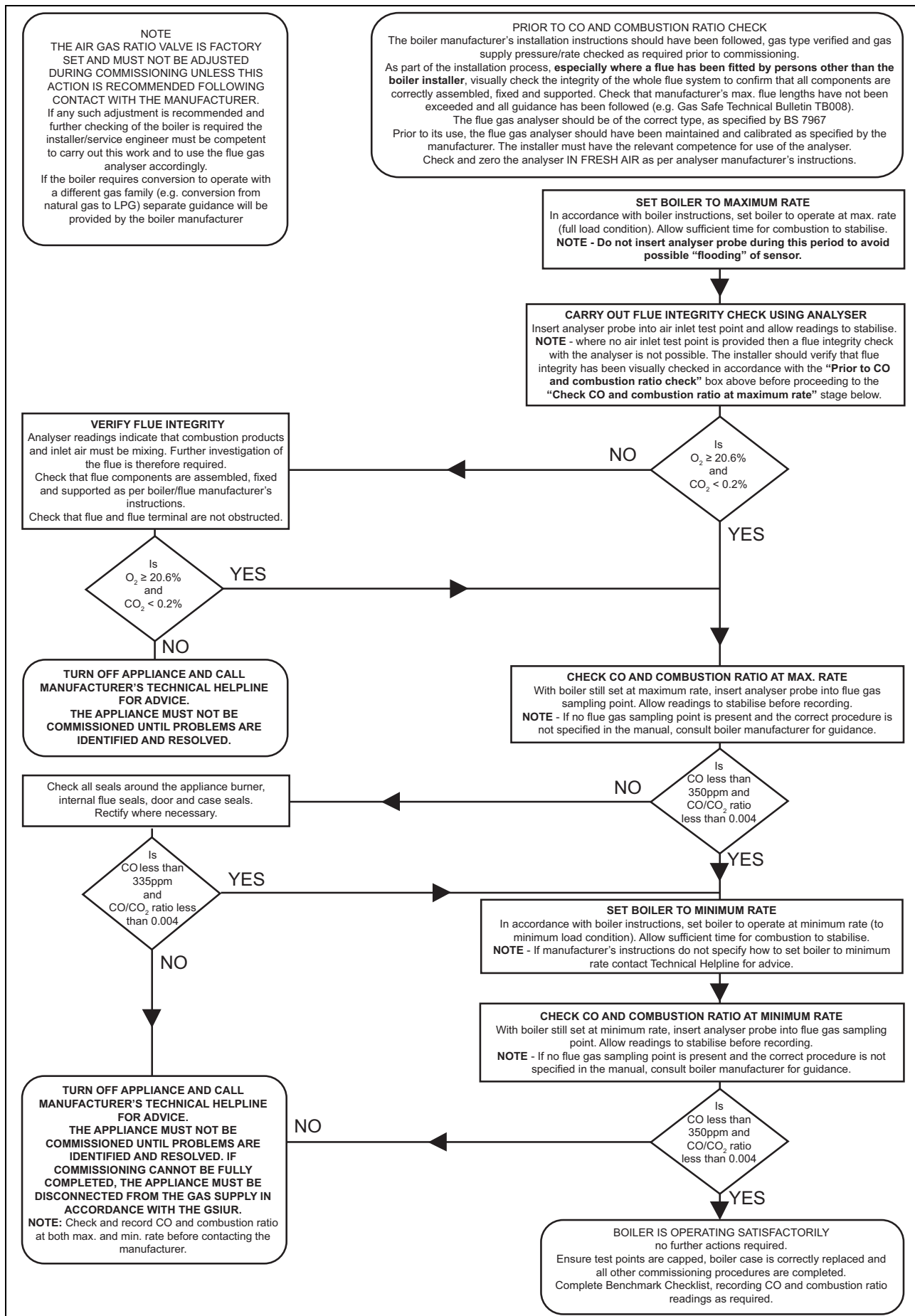
Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions. Always use the manufacturer's specified spare part when replacing controls.

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*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.



K Combustion chart



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Publisher/manufacturer

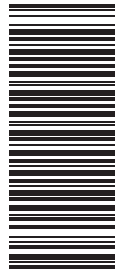
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0020201109_01 - 19.08.2015 16:30:54