



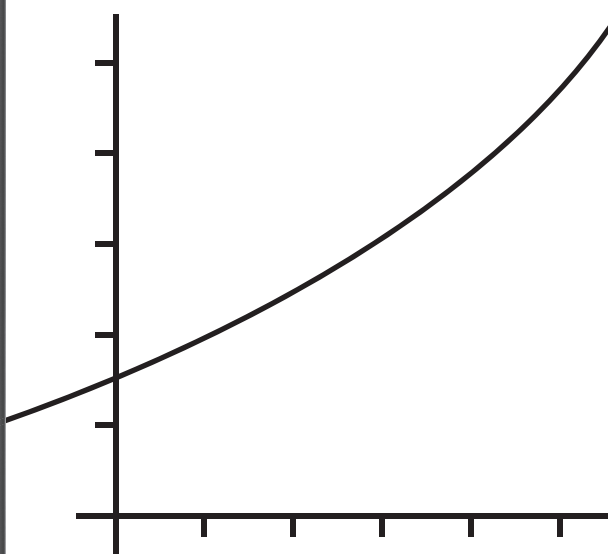
# Glow•worm

The energy you need

## Installation and maintenance 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

The following work must only be carried out by competent persons who are sufficiently qualified to do so:

- Set-up
- Dismantling
- Installation
- Start-up
- Inspection and maintenance
- Repair
- Decommissioning
- Proceed in accordance with current technology.

### 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 heating installations and for domestic hot water generation.

Depending on the unit type, the products referred to in these instructions must only be installed and operated in conjunction with the

air/flue pipe accessories listed in the other applicable documents.

The use of the product in vehicles, such as mobile homes and caravans, is not classed as intended use. Units that are not classed as vehicles are those that are installed in a fixed and permanent location (known as "fixed installation").

Intended use includes the following:

- observance of accompanying operating, installation and maintenance instructions for the product and any other system components
- installing and setting up 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 code.

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 stopcock on the product.
- Warn other occupants in the building by yelling or banging on doors or walls.

# 1 Safety

- ▶ Leave the building immediately and ensure that others do not enter the building.
- ▶ Notify the gas supply company or the Emergency Service Provider +44 (0) 800 111999 by telephone once you are outside of the building.

## 1.4.2 Risk of death due to blocked or leaking flue gas routes

Installation errors, damage, tampering, impermissible 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.

## 1.4.3 Risk of death from escaping flue gas

- ▶ Ensure that all inspection and test 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 system, use only flue pipes that are made from 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 supplied lubricant.

Mortar residues, shavings, etc., in the flue gas route may prevent the flue gas from flowing outdoors as intended, and this flue gas may escape into the dwelling instead.

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

## 1.4.4 Risk of death due to cabinet-type casing

Cabinet-type casing can give rise to dangerous situations when used on a product which is operated with an open flue.

- ▶ Ensure that the product is supplied with sufficient combustion air.

## 1.4.5 Risk of death due to explosive and flammable materials

- ▶ Do not use the product in storage rooms that contain explosive or flammable substances (such as petrol, paper or paint).

## 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 gap of at least 3 mm, e.g. fuse or circuit breaker).
- ▶ Secure against being switched back on again.
- ▶ Wait for at least 3 minutes until the capacitors have discharged.
- ▶ Check that there is no voltage.

## 1.4.7 Risk of death due to lack of safety devices

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

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

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

- ▶ Only operate the product if the flue gas guiding 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 due to the heavy weight of the product**

- ▶ 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 flue system.

- ▶ 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.
- ▶ 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 the room air 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.

#### **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 pipework (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 combustion air supply. Chemical deposits in the chimney may pollute the combustion air and cause corrosion in the product.

- ▶ Ensure that the combustion air supply 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, directives, ordinances and laws.

## 2 Notes on the documentation

### 2 Notes on the documentation

#### 2.1 Observing other applicable documents

- Always 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 end user.

#### 2.3 Applicability of the instructions

These instructions apply for the following only:

##### 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.

#### 2.4 Benchmark

Glow-worm is a licensed member of the Benchmark Scheme.

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by a competent person approved at the time by the Health and Safety Executive and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme.

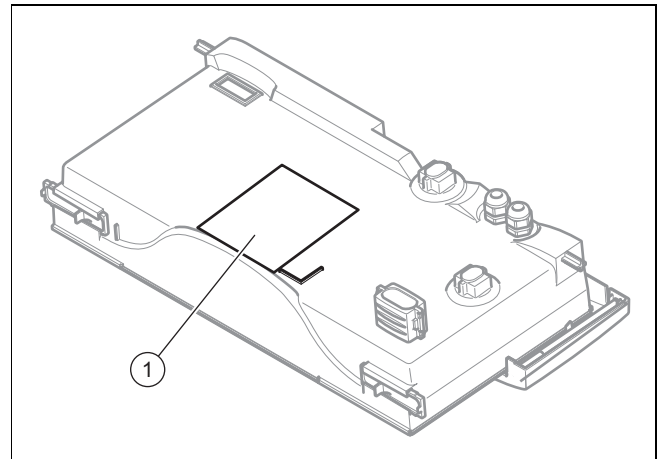
Benchmark is managed and promoted by the Heating and Hotwater Industry Council.



For more information visit [www.centralheating.co.uk](http://www.centralheating.co.uk)

### 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 data plate

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

The data plate keeps record of the country in which the product is to be installed.

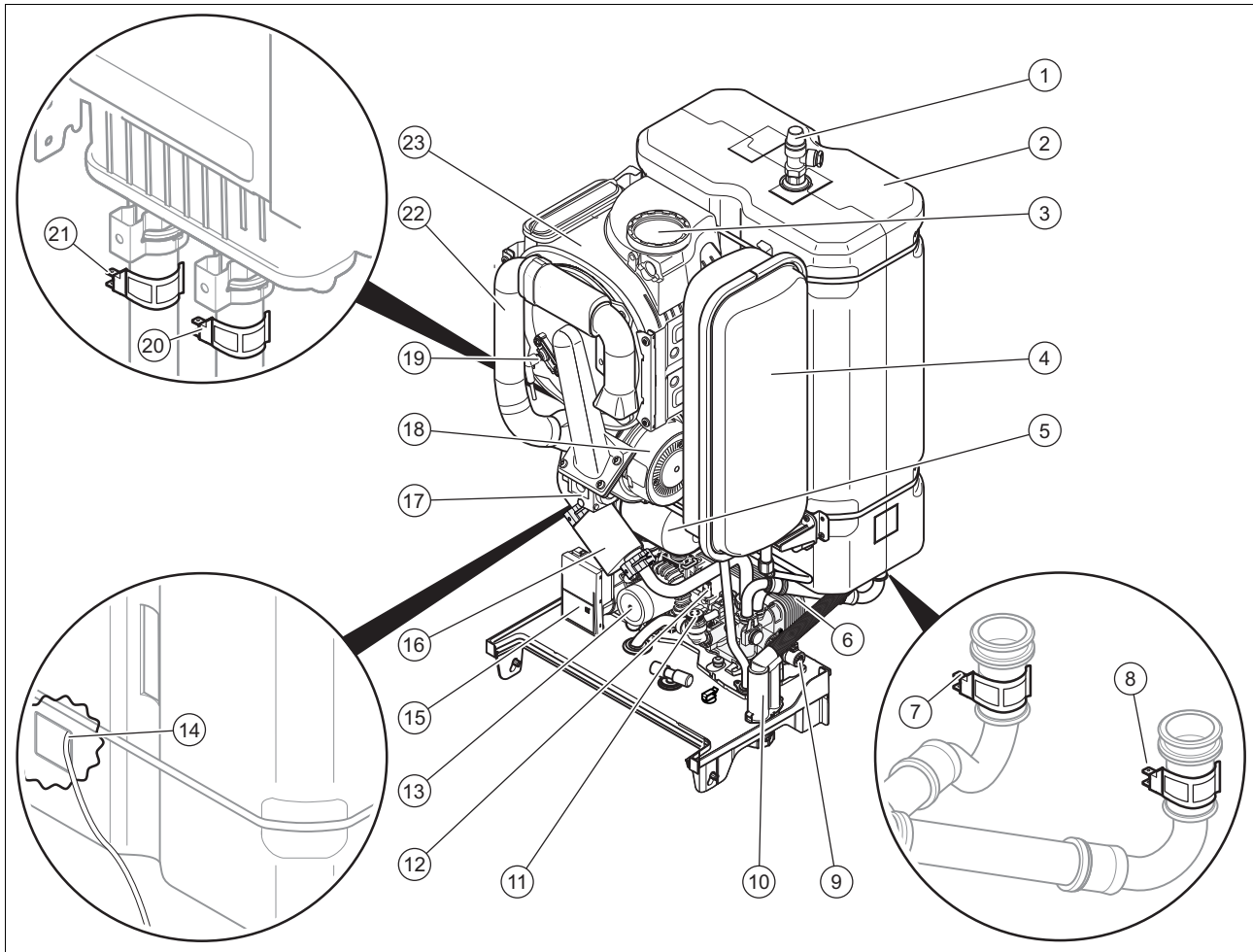
Information on the identification plate	Meaning
	Barcode with serial number
Serialnummer	For quality control purposes; 3rd and 4th digits = year of production For quality control purposes; 5th and 6th digits = week of production For identification purposes; 7th to 16th digits = product article number 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
II2H3P / I2E / I3P...	Approved gas category
Brennwerttechnik	Efficiency class of the boiler in accordance with EC Directive 92/42/EEC
Typ: 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
III	Heating mode
	Hot water generation

Information on the identification plate	Meaning
$P_n$	Nominal heat output range in heating mode
$P$	Nominal heat output range in hot water handling mode
$P_{nc}$	Nominal heat output range in heating mode (condensing technology)
$Q_n$	Nominal heating load range in heating mode
$Q_{nw}$	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 Product description

### 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



### 3.5 CE marking



The CE marking shows that the products comply with the basic requirements of the applicable directives as stated on the declaration of conformity.

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 cardboard box from the delivery van

- ▶ It is recommended that two people lift the unit together.
- ▶ Lift the cardboard 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

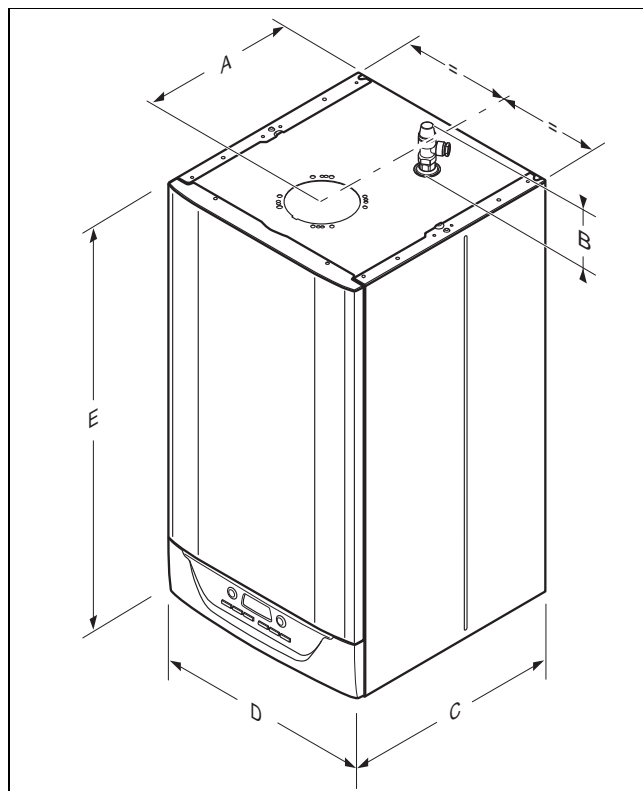
1. Remove the product from its box.
2. Remove the protective film from all of the product's components.

### 4.3 Checking the scope of delivery

- ▶ Check that the scope of delivery is complete and intact.

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

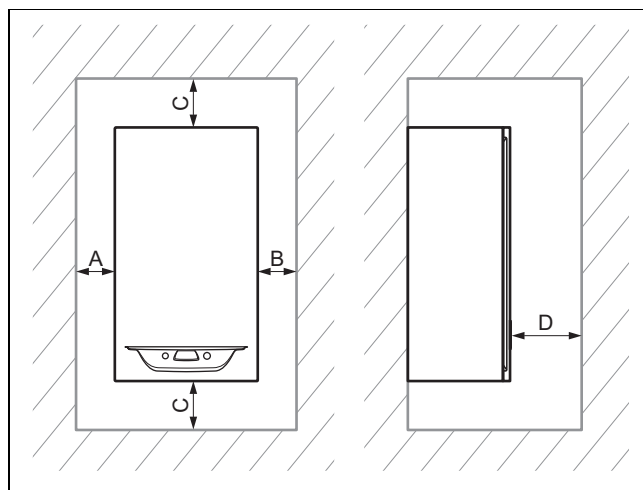
### 4.4 Product dimensions



#### Dimensions

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

### 4.5 Minimum clearances

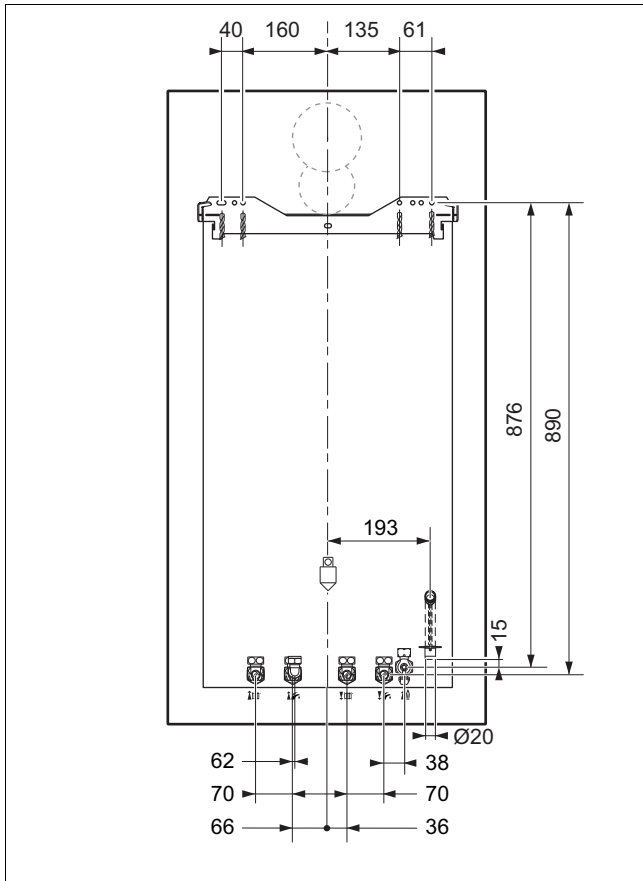


#### Minimum clearances

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

## 4 Installation

### 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 Wall-mounting the product

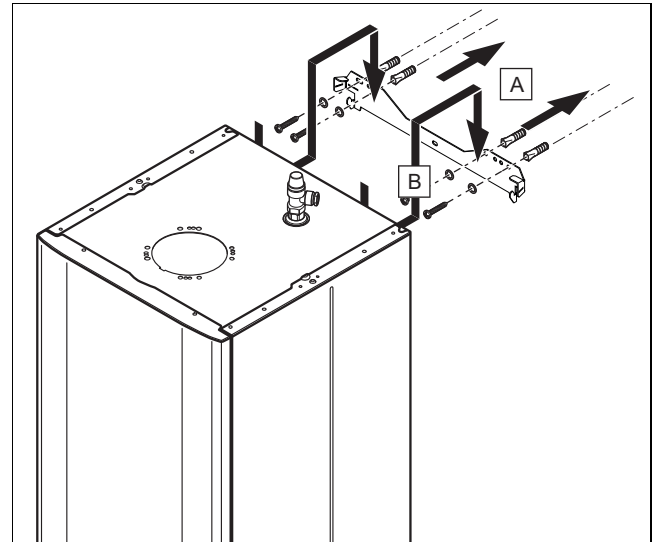
1. Check whether the wall has sufficient load-bearing capacity to bear the operational weight of the product.

#### Weight when filled with water

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

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



- Wall-mount the product as described.

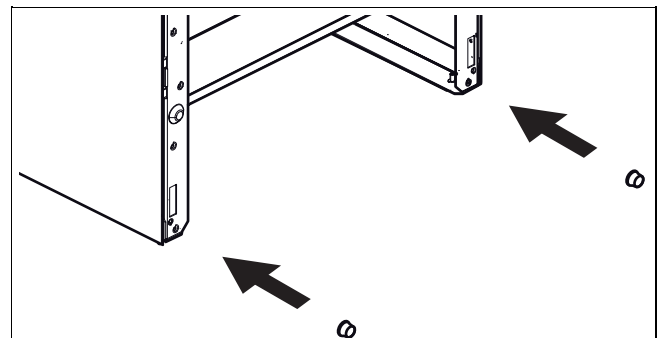
**Condition:** The load-bearing capacity of the wall is not sufficient

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

**Condition:** The fixing material may not be used for the wall

- Wall-mount the product as described using the permitted fixing material provided on-site.

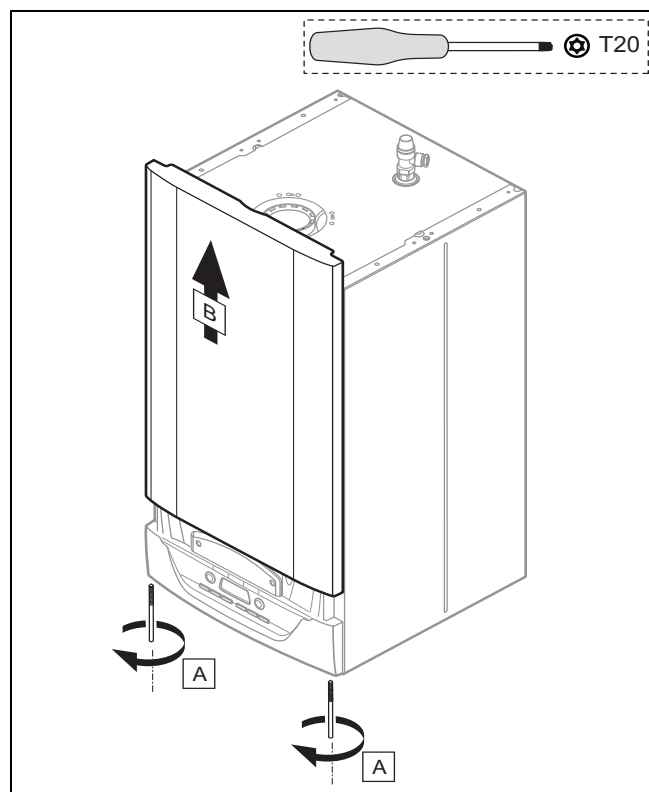
### 4.8 Attaching the end stops



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

## 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.

Mechanical stresses in the connection pipes may lead to leaks.

- Make sure that the connection pipes are free from mechanical stress when they are installed.



### Caution.

#### Risk of material damage caused by residues in the pipelines.

Welding remnants, sealing residues, dirt or other residues in the pipelines may damage the product.

- Flush the heating installation thoroughly before installing the product.



### Caution.

#### Risk of material damage caused by changes to the pipes that have already been connected.

- Only bend connection pipes if they have not yet been connected to the product.

## 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 material damage caused by corrosion

Due to non-diffusion-tight plastic pipes in the heating installation, air gets into the heating water. Air in the heating water causes corrosion in the heat generator circuit and in the product.

- If you use non-diffusion-tight plastic pipes in the heating installation, ensure that no air gets into the heat generator circuit.



### Caution.

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

- Only solder connectors if the connectors are not yet 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

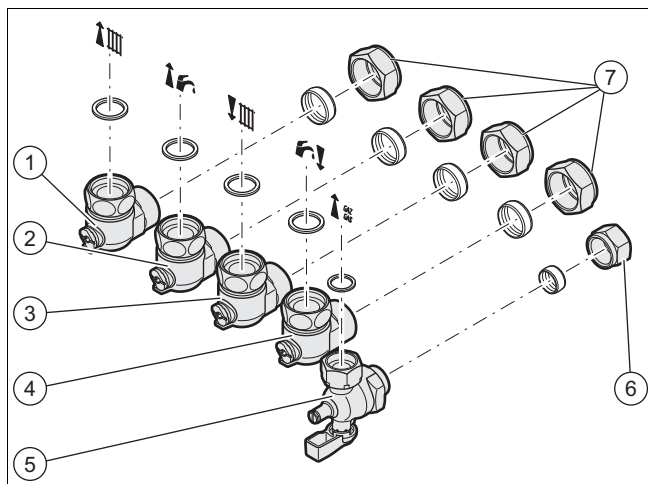
1. Install the following components:

#### Working materials

- |                                      |
|--------------------------------------|
| A stop cock in the cold water supply |
| A stop cock in the gas pipe          |

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.

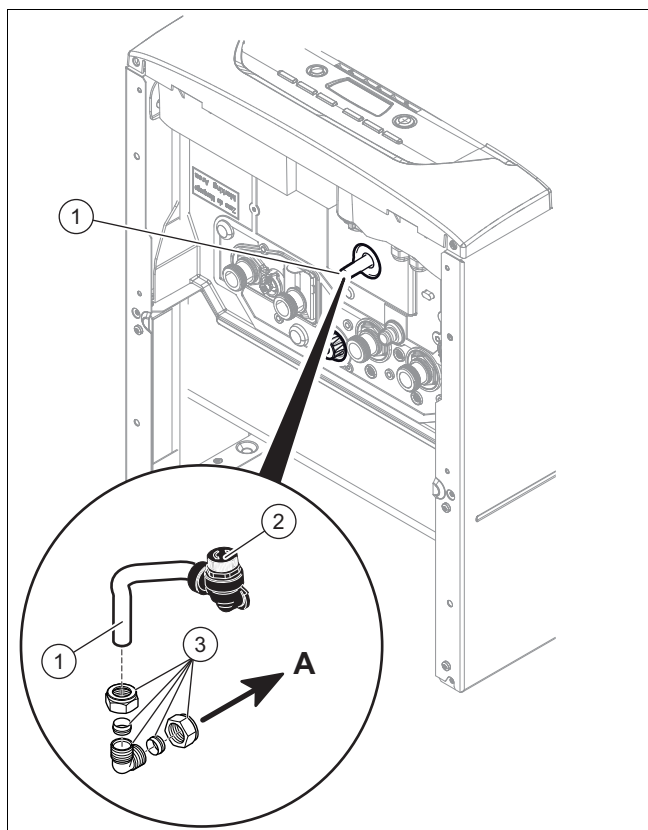
## 5 Installation



- |   |  |
|---|--|
| 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 pipe before start-up.
3. Check whether the connections (→ Page 21) are leak-tight.

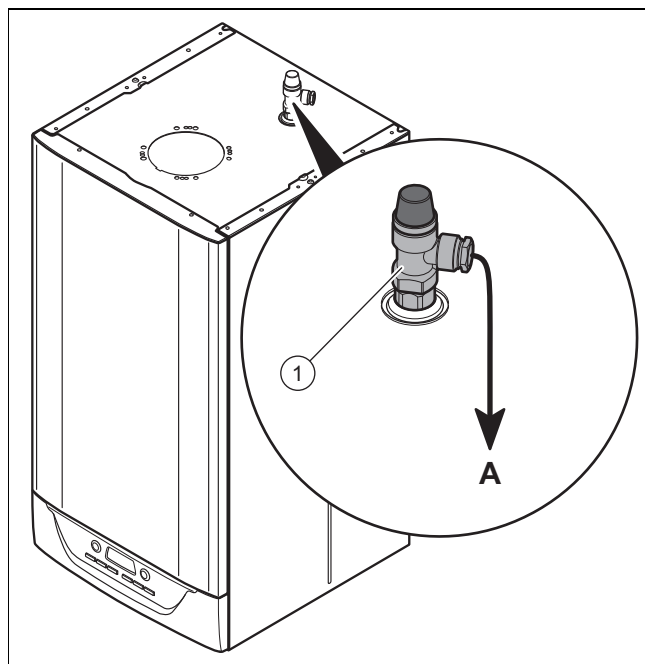
### 5.2 Connecting the drainage devices



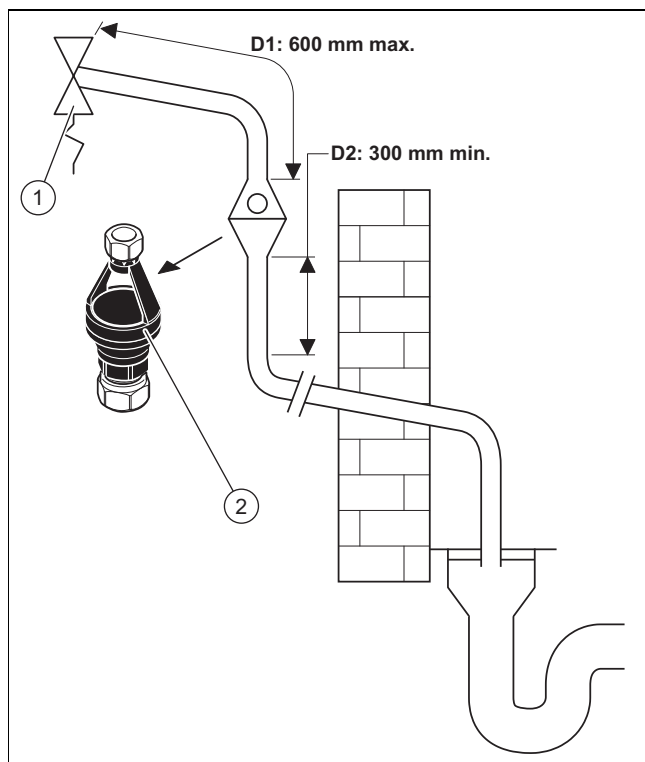
1. Ensure that the pipeline is visible.
2. Connect the discharge pipe (1) for the heating expansion relief valve (2) to a suitable draining mechanism (A). Make sure that the drain hose remains open to the

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.

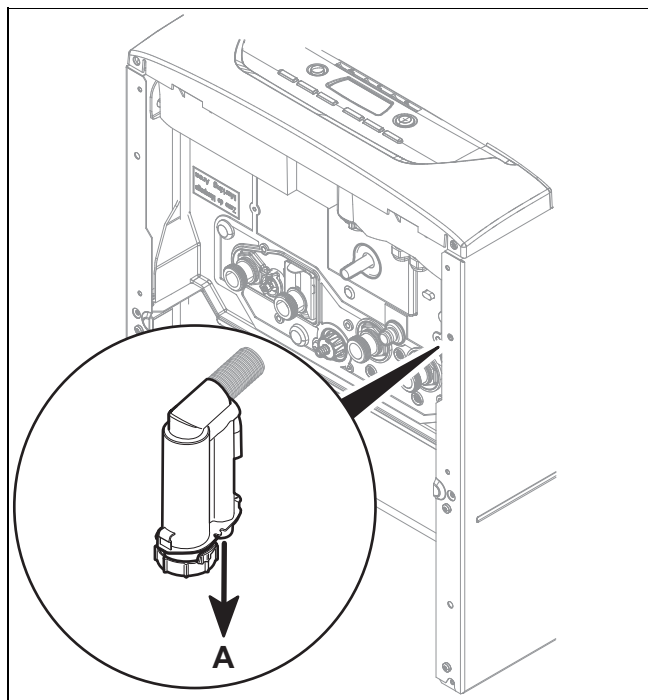


3. Connect the hot water expansion relief valve (1) to a suitable draining mechanism (A). Make sure that the drain hose remains open to the surrounding air.
- ◁ The components must be set up in such a way that you can see the water flowing out.



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.

## 5.3 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 Abgasinstallation

### 5.4.1 Installing the air/flue pipe



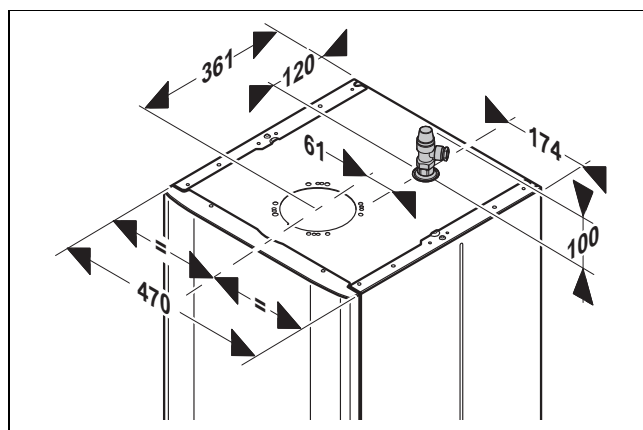
#### Caution.

**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.

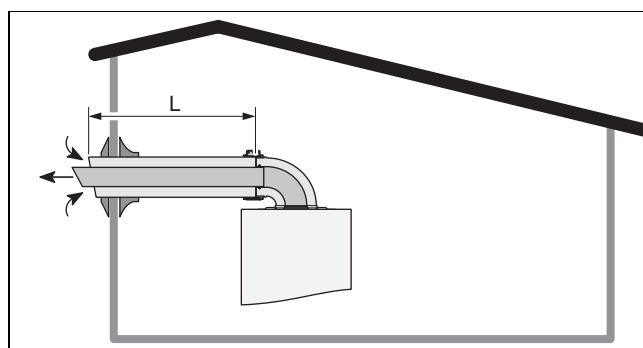
1. You can find out which air/flue pipes may be used by consulting the enclosed air/flue pipe installation manual.
2. Install the flue gas pipe in accordance with the installation instructions that are included in the scope of delivery for the air/flue pipe.



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

### 5.4.2 Air/flue gas system

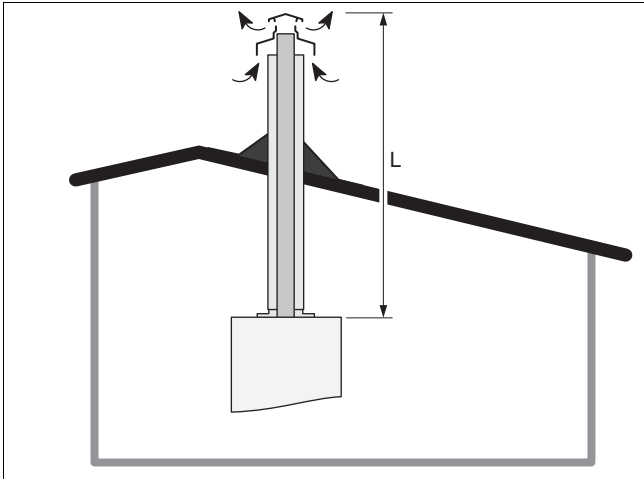
#### 5.4.2.1 Horizontal air/flue gas system



Length of the C13 type air/flue pipe (→ Page 36)

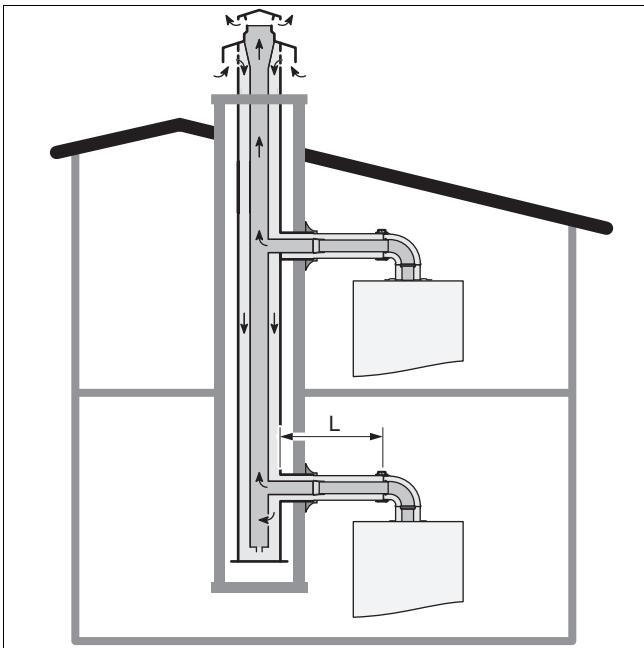
## 5 Installation

### 5.4.2.2 Vertical air/flue gas system



Length of the C33 type air/flue pipe (→ Page 36)

### 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 air/flue pipe (→ Page 37)

## 5.5 Electrical installation



### **Danger!**

#### **Risk of death from electric shock!**

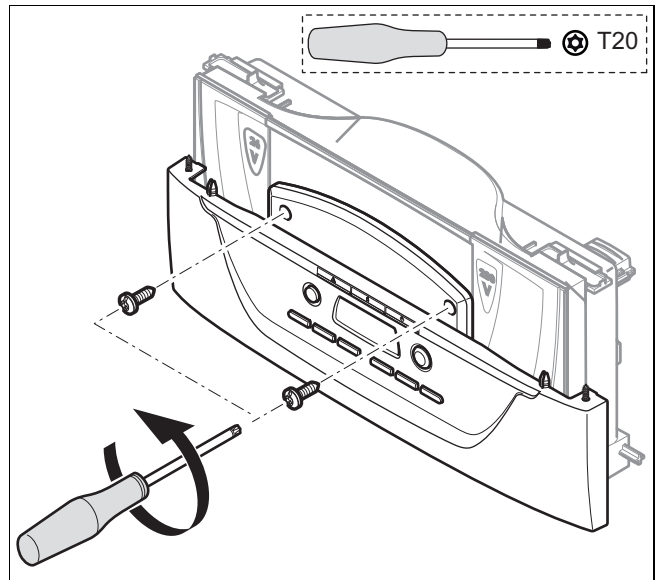
The power supply terminals L and N remain live even if the product is switched off:

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

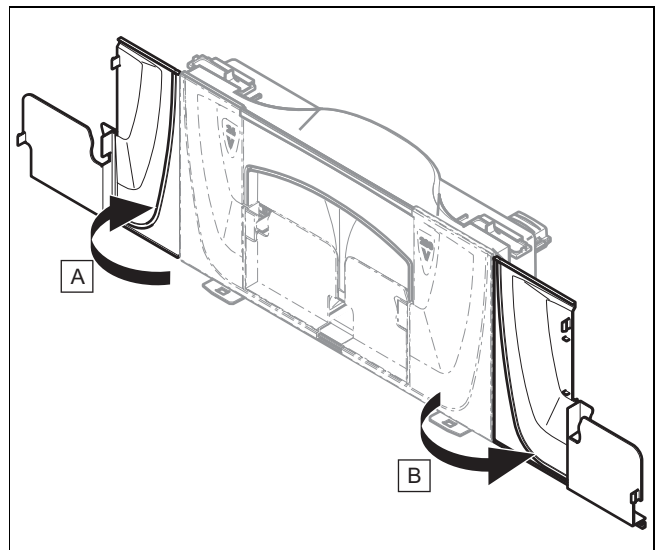
Only qualified electricians may carry out the electrical installation.

### 5.5.1 Opening and closing the electronics box

#### Removing the front casing



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

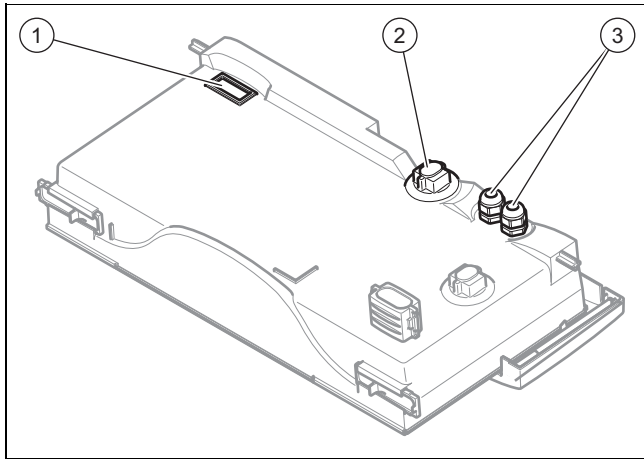


2. To open the electronics box, follow the instructions in the specified sequence.
3. To close the electronics box, follow the instructions in reverse order.

#### Fitting the front casing

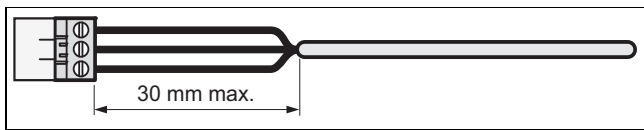
4. Follow the instructions in the reverse order.

### 5.5.2 Cable route



- |   |  |
|---|--|
| <p>1 Outlet for extra low-voltage cable (cabled room thermostat, etc.)</p> <p>2 Outlet for extra low-voltage cable (power supply cable, etc.)</p> | <p>3 Stuffing box (not included in the scope of delivery) for the low-voltage cable in 230 V options</p> |
|---|--|

### 5.5.3 Carrying out the wiring

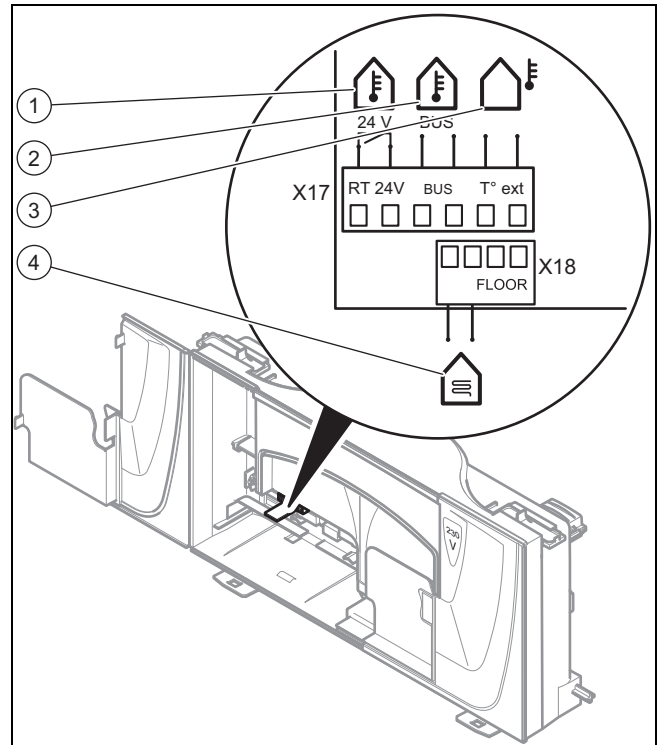


- If you connect the power cable to a plug in the electronics PCB:
  - ◁ Observe the recommended clearance between plugs and the stripped section of the casing.
  - ◁ Secure the cable in the electronics box's cable ties.
  - ◁ Check that the cable is routed correctly and lay it using the strain reliefs 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:  $\leq 3$  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



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

- 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 39) of the installation instructions must be filled in and stored carefully along with the unit's documentation.

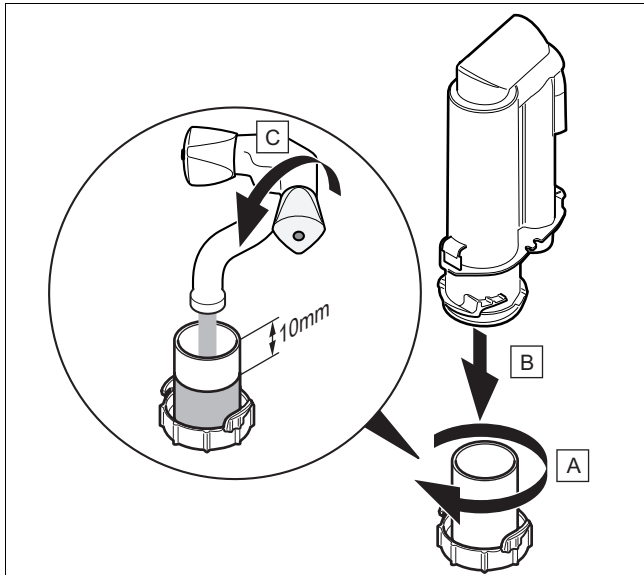
- Carry out the initial start-up using the first-commissioning-checklist in the appendix.
- Fill out and sign the first-commissioning-checklist.

### 6.2 Filling the condensate siphon

1. Observe the general safety information.



## 6 Start-up



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.

**Condition:** 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.

**Condition:** 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 installation, 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 installation.
- ▶ Use a magnetic rod to check whether it contains magnetite (iron oxide).

- ▶ If you ascertain that it contains magnetite, clean the installation and apply suitable corrosion-inhibition measures, or fit a magnetic 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 installation and treat the heating water.
- ▶ Ensure that oxygen cannot get into the heating water.

#### Checking the filling and supplementary water

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

#### Treating the filling and supplementary water

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

Provided the national regulations and technical rules 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 <sup>1)</sup>					
	≤ 20 l/kW		> 20 l/kW ≤ 50 l/kW		> 50 l/kW	
kW	ppm CaCO <sub>3</sub>	mol/m <sup>3</sup>	ppm CaCO <sub>3</sub>	mol/m <sup>3</sup>	ppm CaCO <sub>3</sub>	mol/m <sup>3</sup>
< 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 antifreeze and corrosion inhibitors, 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.

#### Additives for cleaning measures (subsequent flushing required)

- Adey MC3+
- Adey MC5

- Fernox F3
- Sentinel X 300
- Sentinel X 400

#### Additives intended to remain permanently in the installation

- Adey MC1+
- Fernox F1
- Fernox F2
- Sentinel X 100
- Sentinel X 200

#### Additives for frost protection intended to remain permanently in the installation

- Adey MC ZERO
- Fernox Antifreeze Alphi 11
- Sentinel X 500

- ▶ If you have used the above-mentioned additives, inform the end user about the measures that are required.
- ▶ Inform the end user about the measures required for frost protection.

### 6.5 Preventing low water pressure

Comply with the recommended filling pressure.

- Recommended filling pressure: 1 to 1.5 bar (100,000 to 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:  $\leq 0.5$  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 29)

### 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.OX » and « On » (ON) are displayed on the screen.

The check programme automatically switches off after 15 minutes.

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

## 6.8 Filling mode

1. Open the cold water inlet valve on the installation.
2. Open the stopcocks on the connections.
  - The stopcocks must be positioned in the flow direction.

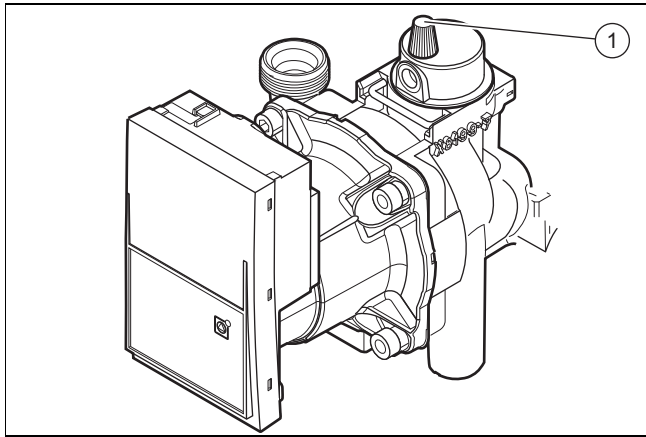
### 6.8.1 Filling the domestic hot water circuit

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

### 6.8.2 Filling the heating installation

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

## 6 Start-up



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



### Note

Leave the cap on the pump's purging valve.

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

**Condition:** 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 29)

### 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:  $\geq 15$  min

#### Target heating temperature

<b>Condition:</b> Heating system with high-temperature radiators	$\geq 50$ °C
<b>Condition:</b> Heating system with low-temperature radiators OR: Heating system with floor-standing heating	$\leq 50$ °C

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

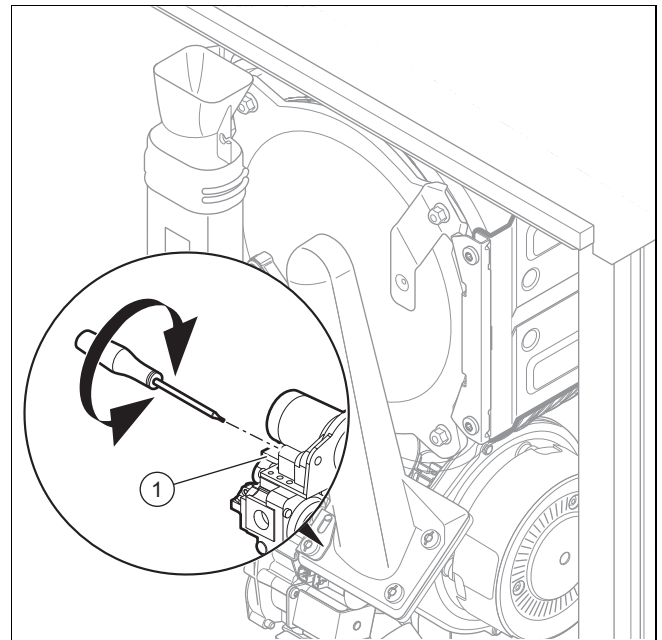
**Condition:** Difficulty purging the heating circuit

- Start the check programme **(P.06)**.

Check programmes – Overview (→ Page 29)

3. Check the filling pressure.
  - Recommended filling pressure: 1 to 1.5 bar (100,000 to 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.

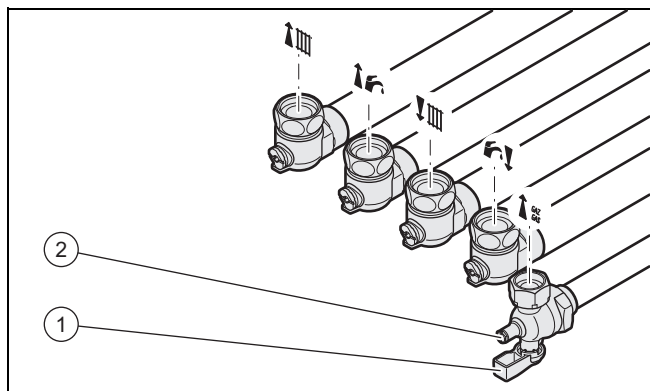
The CO<sub>2</sub> adjusting screw **(1)** may have to be sealed after a gas conversion.

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 air/flue pipe/flue gas recirculation

1. Check the flue gas installation is intact in accordance with the latest gas safe technical bulletin and information supplied in the installation instructions.
2. For extended flue gas installations check for flue gas recirculation using the air analysis point.
3. Use a flue gas analyser.
4. If you discover CO or CO<sub>2</sub> in the supply air, search for the leak in the flue system or for signs of flue gas recirculation.
5. Eliminate the damage properly.
6. Check again whether the supply air contains any CO or CO<sub>2</sub>.
7. If you cannot eliminate the damage, do not start up the product.

### 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.

**Condition:** 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 11)
- ▶ Disconnect the product from the power mains.
- ▶ You must not start up the boiler.

**Condition:** 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 11)
- ▶ 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. Install the front casing.

## 6 Start-up

### 6.10.4 Checking the CO<sub>2</sub> content

1. Connect a CO<sub>2</sub> analyser.
2. Start up the product with the check programme **(P.01)** and set the value.
  - Setting value for the programme P.01: 100
3. Wait until the value that is read is stable.
  - Waiting period for reading a stable value: 2 min
4. Measure the CO<sub>2</sub> content at the flue gas analysis point.
5. Compare the measured value with the corresponding value in the table.

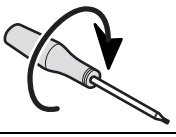

#### Checking the CO<sub>2</sub> content

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

6. Set the CO<sub>2</sub> content as required.

### 6.10.5 Setting the CO<sub>2</sub> content

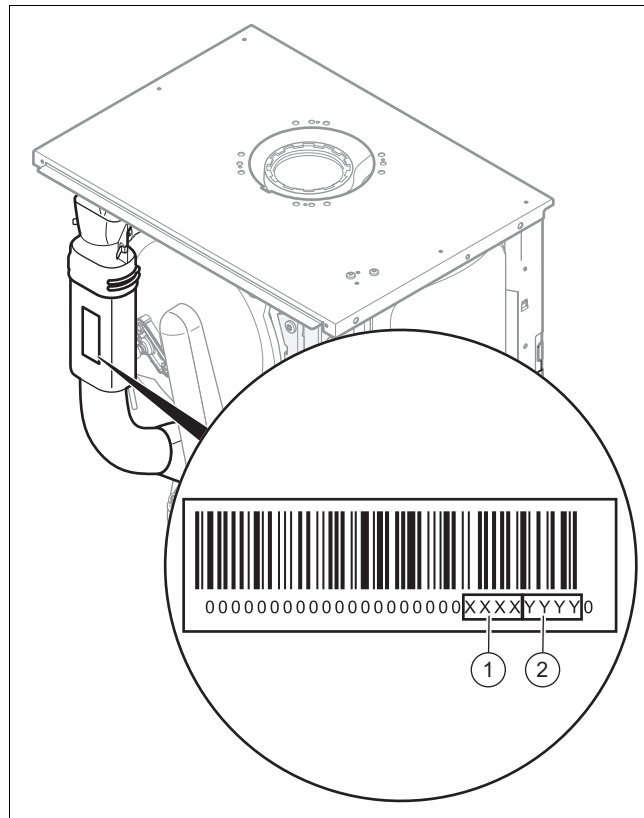
1. Set the CO<sub>2</sub> content by turning the bolt **(1)** and maintaining the direction of rotation. Adjust in increments of a quarter turn each time.

Gas conversion setting	% CO <sub>2</sub>
	↓
	↑

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 CO<sub>2</sub> 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
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 21) and use the diagnostics code **(d.34)**.

Overview of diagnostics codes (→ Page 29)

- ▽ 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 to 200 rpm

4. Press the **RESET** 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
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 21) and use the diagnostics code **(d.34)**.



Overview of diagnostics codes (→ Page 29)

- ▽ 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 to 200 rpm
- 4. Press the menu button for 3 seconds to go to the check programme.

## 6.12 Checking leak-tightness

- ▶ Check the gas pipe, the heating circuit and the hot water circuit for leak-tightness.
- ▶ Check that the flue system 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 31)

  - ◁ 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 27)
 

Status codes – Overview

  - ◁ 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 29)

#### 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.

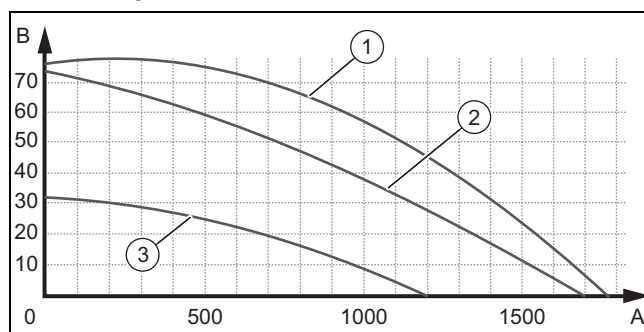
If you have installed a low loss header in the heating installation, we recommend switching off the speed regulation and setting the pump output to a fixed value.

- ▶ 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 21)
 

Overview of diagnostics codes (→ Page 29)

#### Pump characteristic lines

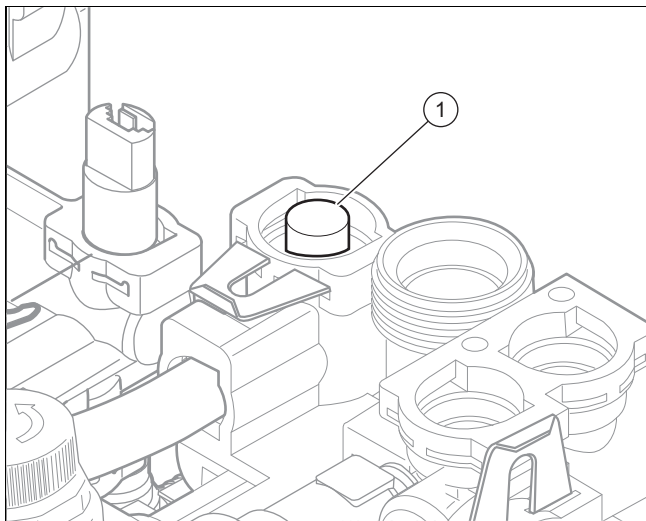
##### Flow rate-pressure curve



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		

## 8 Adjusting the hot water temperature

### 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 end user is familiar with all of the Anti-legionella measures in order to comply with the applicable regulations regarding legionella prevention.

## 9 Handing the product over to the end user

- ▶ At the time of commissioning complete all relevant sections of the Benchmark, located at the rear of this document.
- ▶ When you have finished the installation, affix the enclosed sticker (which requests that the user reads the instructions) to the front of the product in the end user's language.
- ▶ Explain to the end user how the safety devices work and where they are located.
- ▶ Inform the end user how to handle the product.
- ▶ In particular, draw attention to the safety warnings which the end user must follow.
- ▶ Inform the end user that they must have the product maintained in accordance with the specified intervals.
- ▶ Pass all of the instructions and documentation for the product to the end user for safe-keeping.
- ▶ Inform the end user about measures taken to ensure the combustion air supply and flue system, and instruct the end user that he must not make any changes.
- ▶ Inform the end user that they must not store or use explosive or highly flammable substances (such as petrol, paper or paint) in the installation room of the product.

- ▶ Complete and sign off the Benchmark commissioning check list.
- ▶ Complete and sign off the guarantee documentation.

## 10 Inspection und maintenance

### 10.1 Observing inspection and maintenance intervals

- ▶ Adhere to the minimum inspection and maintenance intervals. The inspection may require maintenance to be carried out earlier, depending on the results. You can find the inspection and maintenance work table in the appendix.

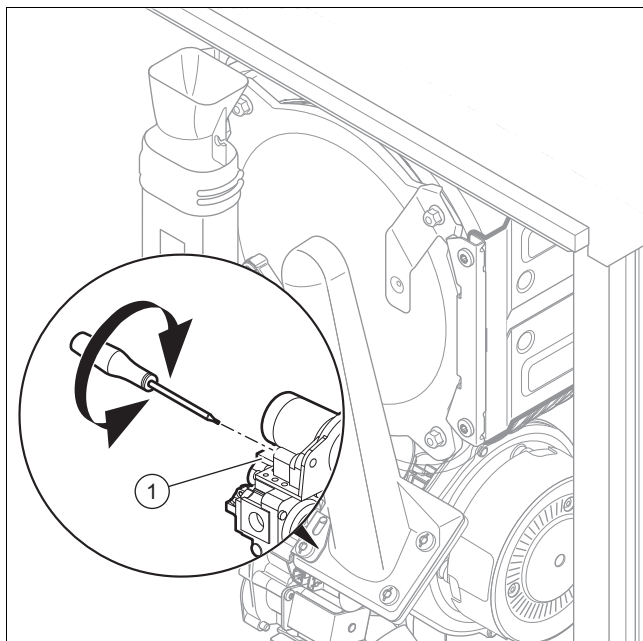
### 10.2 Procuring spare parts

The original components of the product were also certified by the manufacturer as part of the declaration of conformity. If you use other, non-certified or unauthorised parts during maintenance or repair work, this may void the conformity of the product and it will therefore no longer comply with the applicable standards.

We strongly recommend that you use original spare parts from the manufacturer as this guarantees fault-free and safe operation of the product. To receive information about the available original spare parts, contact the contact address provided on the back page of these instructions.

- ▶ If you require spare parts for maintenance or repair work, use only the spare parts that are permitted for the product.

### 10.3 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

	Clockwise rotation	Anti-clockwise rotation
	G20 → G31	G31 → G20
Energy 35 Store-A	2.5	2.5

- 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 29)



#### Note

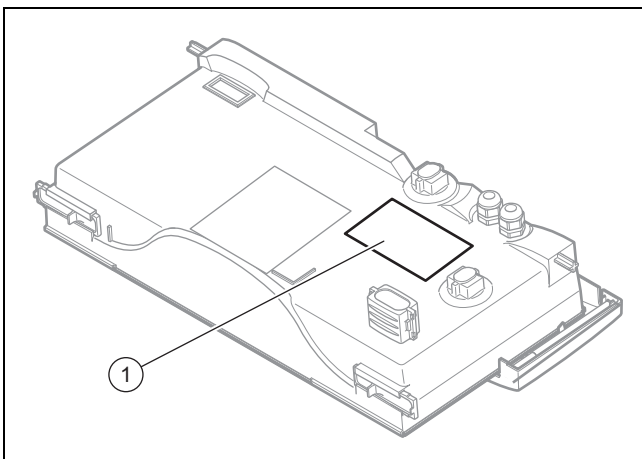
If the product is in the operating cycle (ON/OFF), decrease the set value.

- Wait until the value that is read is stable.
  - Waiting period for reading a stable value: 2 min
- Measure the CO<sub>2</sub> content at the flue gas analysis point (2).
- Compare the measured value with the corresponding value in the table.

### Checking the CO<sub>2</sub> content

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

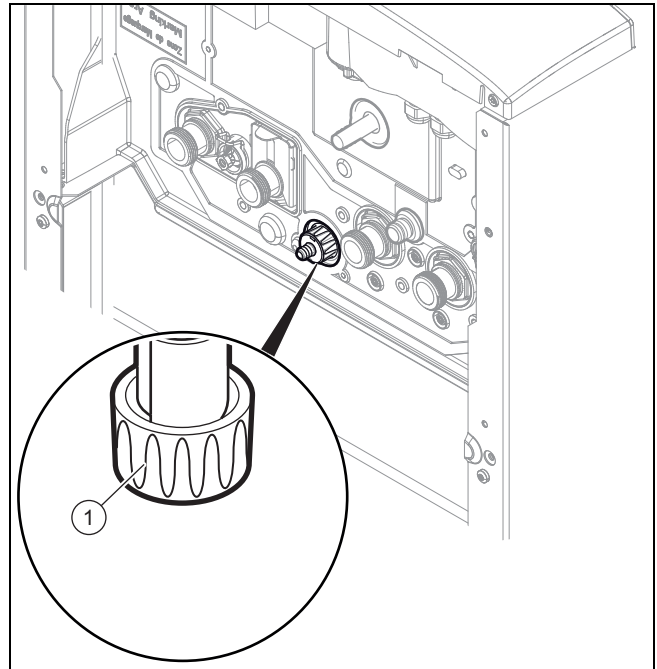
▽ Set the CO<sub>2</sub> (→ Page 20) content as required.



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

## 10.4 Draining the product

### Draining the heating circuit



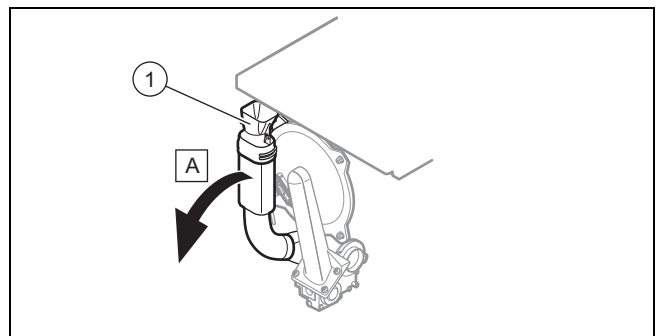
- Close the stop cocks in the heating system's flow and return.
- Open the drain cock (1).
- Ensure that there is an air inlet.

### Draining the hot water circuit

- Close the cold water inlet valve on the system.
- Close the stop cock at the cold water inlet on the underside of your product.
- Open a valve in the domestic hot water position in order to remove the pressure, and then reconnect the valve.
- 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).
- Create an air inlet by loosening the outlet connector.

## 10.5 Removing and installing the air intake pipe

### Removing the air intake pipe (Authorised competent person)



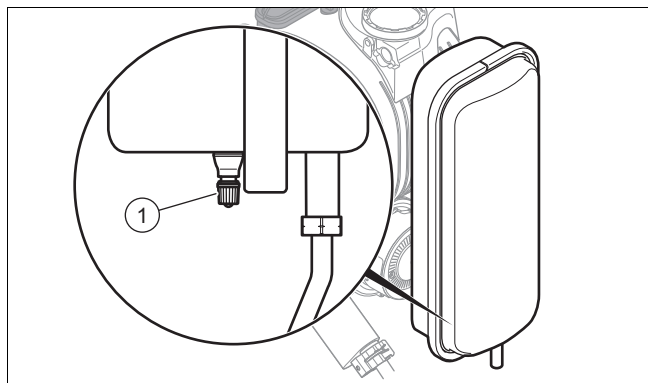
- Unclip the air intake pipe (1) and remove it.
- Clean the inside of the air intake pipe.
  - ▽ If necessary, use a soft cloth to help you and make sure that the foam on the inside is not damaged.

## 10 Inspection and maintenance

### Installing the air intake pipe (Authorised competent person)

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

### 10.6 Checking the pressure in the heating water expansion vessel



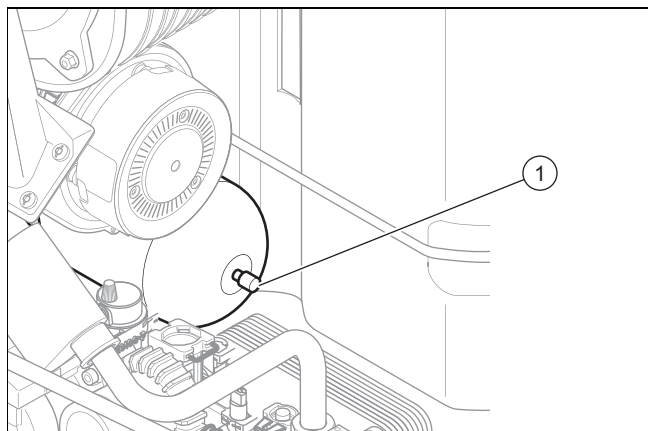
1. Drain the product. (→ Page 23)
2. Measure the pre-charge pressure of the expansion vessel at the expansion vessel valve (1).
  - Pre-charge pressure of the heating expansion vessel: 0.75 bar (75,000 Pa)
3. If the pressure is below 0,75 bar (depending on the static pressure of the heating installation), 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 17)

### 10.7 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)

**Condition:** Installing a new expansion vessel

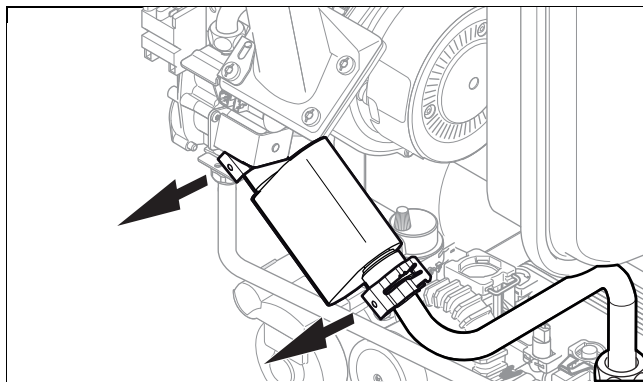
- ▶ Drain the product. (→ Page 23)
- ▶ Fill the expansion vessel.
  - ◁ Fill the vessel ideally with nitrogen, otherwise with air.
  - ◁ The drain valve must be open during levelling.
- ▶ Fill the domestic hot water circuit. (→ Page 17)

### 10.8 Checking the particle filter



#### Note

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



1. Drain the product. (→ Page 23)
2. Remove the clips and the particle filter.
3. Check the condition of the particle filter and clean the mesh surrounding it.

**Condition:** Fitting a new particle filter

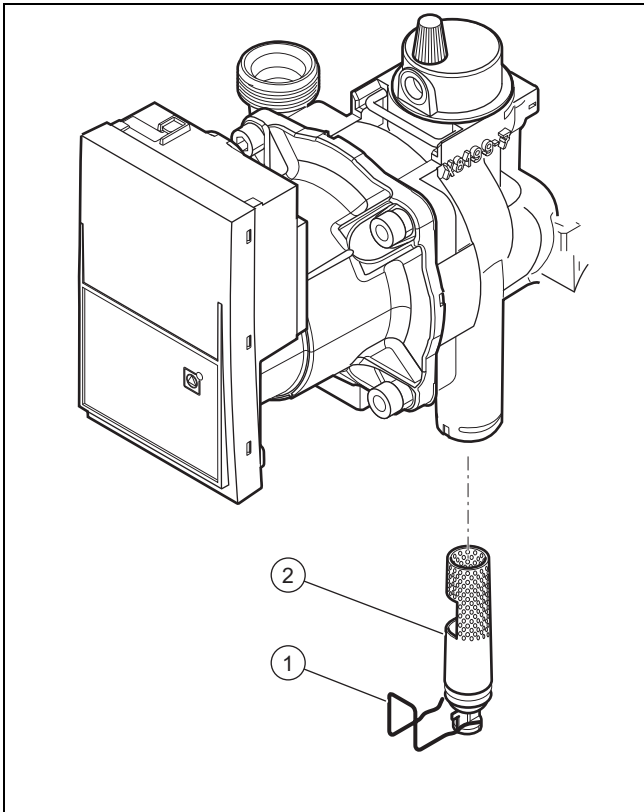
- ▶ Fill and purge the heating installation. (→ Page 17)

### 10.9 Cleaning the heating filter



#### Note

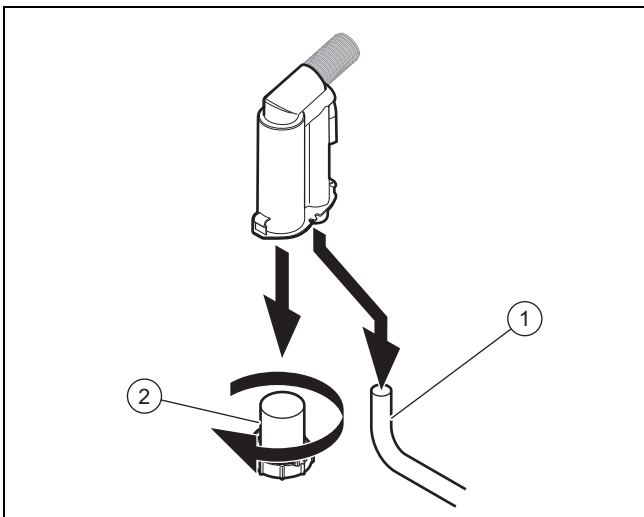
The heating filter improves the purging of the heating circuit.



1. Drain the product. (→ Page 23)
2. Remove the clip (1).
3. Remove the heating filter (2) and clean it.
4. Reinstall the components in reverse order.

## 10.10 Cleaning the condensate siphon

1. Place a container under the condensate siphon.



2. Detach the siphon (2).
3. Clean the lower section of the siphon with clean water.
4. Disconnect the condensate discharge (1).
5. Refit the unit and make sure that the seals are fitted correctly.
6. Fill the lower section of the siphon with water.

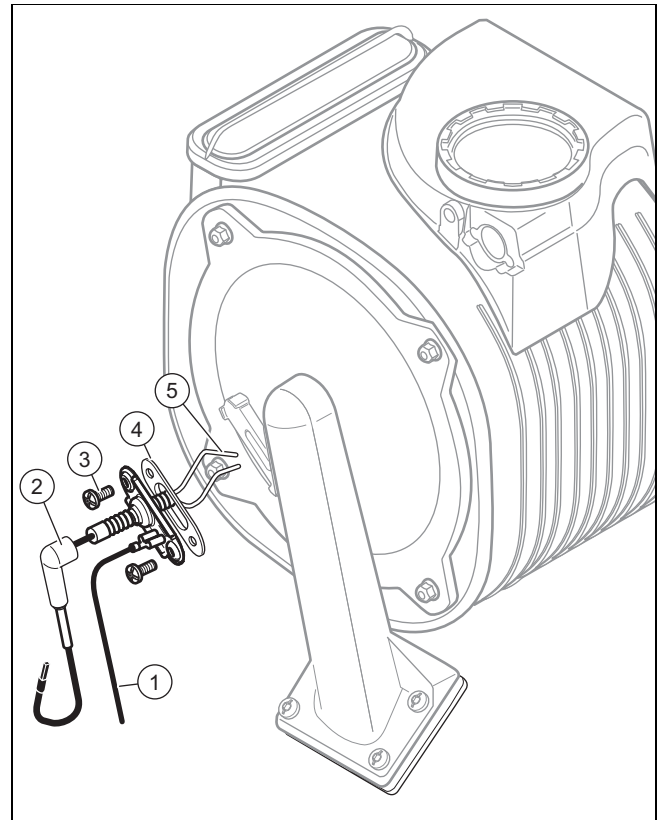
- Distance between the edge of the condensate siphon and the water: 10 mm

7. Screw in the siphon tightly.

## 10.11 7 ca Vi għcb i bjh

### 10.11.1 Checking the ignition and flame

.....control YWfcXY



1. Remove the air intake pipe. (→ Page 23)
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 to 4.5 mm
7. Make sure that the seal (4) is free from damage.
  - ▽ If necessary, replace the seal.

### 10.11.2 Removing the gas-air mixture unit

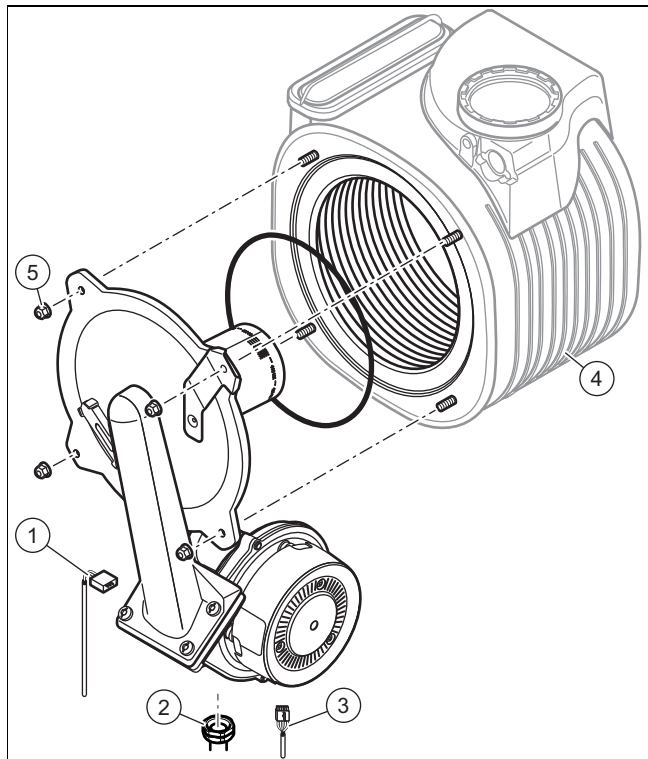


#### Note

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

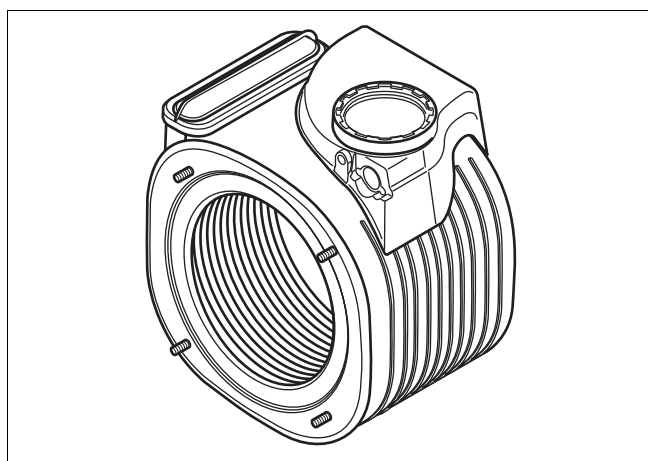
- Ventilator
- Gas valve,
- Burner door

## 10 Inspection and maintenance



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.

### 10.11.3 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.

### 10.11.4 Checking the burner

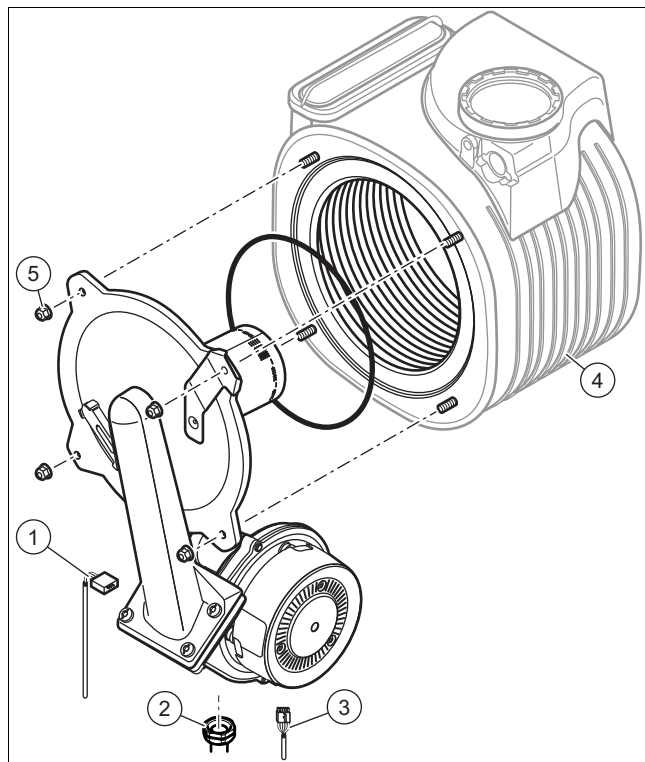
1. Scan the surface of the burner for potential damage.  
▽ If you see any damage, replace the burner.
2. Fit a new burner seal.

### 10.11.5 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 24)

### 10.12 Completing inspection and maintenance work

1. Check the CO<sub>2</sub> content.
2. Set the maintenance interval.
3. Check the product for tightness. (→ Page 21)
4. Install the front casing.
5. Fill out the relevant Service Record section in the Benchmark Checklist located at the rear of this document.

## 11 Troubleshooting

### 11.1 Detecting and rectifying faults

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

Troubleshooting (→ Page 33)

### 11.2 Eliminating faults

- ▶ If fault codes ((FXX)) appear, refer to the table in the appendix for advice, or use the check programmes.  
Overview of fault codes  
Check programmes – Overview (→ Page 29)
- ▶ Press the **RESET** button to restart the product.
  - ▽ If you are unable to rectify the fault code and the fault recurs despite reset attempts, contact Customer Service.

### 11.3 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
- ▶ 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.

### 11.4 Deleting the fault memory

1. Delete the fault memory (**d.94**).
2. Set a diagnostics code. (→ Page 21)  
Overview of diagnostics codes (→ Page 29)

### 11.5 Displaying the status codes

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

Status codes – Overview

#### 11.5.1 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.

### 11.6 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 15).
  - Section of the mains power cable: 3 G 0,75mm²

## 12 Decommissioning the product

- ▶ Switch off the product.
- ▶ Disconnect the product from the power grid.
- ▶ Close the gas stopcock.
- ▶ Close the cold-water stopcock.
- ▶ Drain the product. (→ Page 23)

## 13 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](http://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 <sub>2</sub> content (the air ratio) of the product and, if necessary, adjust the CO <sub>2</sub> 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 <b>each time</b> it is opened and accordingly <b>each time</b> 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. <b>Caution: Replace the seals.</b>		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 <b>P.07</b> .		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 <sub>2</sub> 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



## B Check programmes – Overview

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 prioritising 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 circuit: The function is activated in the short circuit for 5 minutes. Check that the pump's purging valve is open.
A.5	Can be seen, but not working

## 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.				
<b>d.00</b> 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
<b>d.01</b> Internal pump overrun in heating mode	1	60	min	–	5	Adjustable
<b>d.02</b> 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
<b>d.03</b> 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
<b>d.04</b> Hot water temperature in the cylinder	Current value		°C	Displaying the cylinder water temperature (if there is a sensor).	–	Not adjustable
<b>d.05</b> Heating target value	Current value		°C	Current target value setting.	–	Not adjustable
<b>d.06</b> Hot water target value	45	65	°C	Current setting of the hot water target value.	–	Not adjustable
<b>d.14</b> 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
<b>d.15</b> Pump speed, actual value	Current value		%	PWM percentage for the pump that is requested by the main PCB.	–	Not adjustable



Setting level	Values		Unit	Description	Default setting	User-specific setting
	Min.	Max.				
<b>d.18</b> Pump operating mode setting	0	2	–	0 = Discontinuously with burner 1 = Continuously as required by the room thermostat 2 = Permanently	1	Adjustable
<b>d.20</b> Maximum setting for hot water target value	50	65	°C	–	60	Adjustable
<b>d.27</b> Switch from relay 1 to multi-functional module	1	10	–	Use the accessory's instructions to help you.	1	Adjustable
<b>d.28</b> Switch from relay 2 to multi-functional module	1	10	–	Use the accessory's instructions to help you.	2	Adjustable
<b>d.31</b> Operating mode for the automatic filling device	0	2	–	0 = Manual 1 = Not active 2 = Automatic	0 or 2	Adjustable
<b>d.34</b> Fan speed, actual value	Current value		rpm	Displaying the fan speed Multiply the displayed value by 100	–	Not adjustable
<b>d.35</b> Position of 3-way valve	Current value		–	0 = Heating mode 40 = Mid-position 100 = Hot water handling mode	–	Not adjustable
<b>d.39</b> 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
<b>d.40</b> Heating flow temperature	Current value		°C	Displaying the heating flow temperature	–	Not adjustable
<b>d.41</b> Heating return temperature	Current value		°C	Displaying the heating return temperature	–	Not adjustable
<b>d.43</b> Heating curve	0,2	4	K	<b>Note</b> 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
<b>d.45</b> Base point of the heating curve	15	25	°C	<b>Note</b> 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
<b>d.47</b> Outside temperature	Current value		°C	<b>Note</b> 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
<b>d.62</b> 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
<b>d.67</b> 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
<b>d.71</b> Maximum heating flow temperature target value	45	80	°C	–	75	Adjustable
<b>d.85</b> Minimum output of the product	–	–	kW	The minimum heating output varies depending on the product.	–	Adjustable
<b>d.90</b> Status of the digital eBUS controller	0	1	–	0 = Not recognised 1 = Recognised	–	Not adjustable
<b>d.94</b> Delete fault list	0	1	–	Deleting the fault list: – 0 = No – 1 = Yes	0	Adjustable

## 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
<b>Display in heating mode</b>	
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.
<b>Display in hot water handling mode</b>	
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.
<b>Display in Comfort mode with warm start or hot water handling mode with cylinder.</b>	
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.
<b>Special cases</b>	
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 $P_{min}$ .
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.

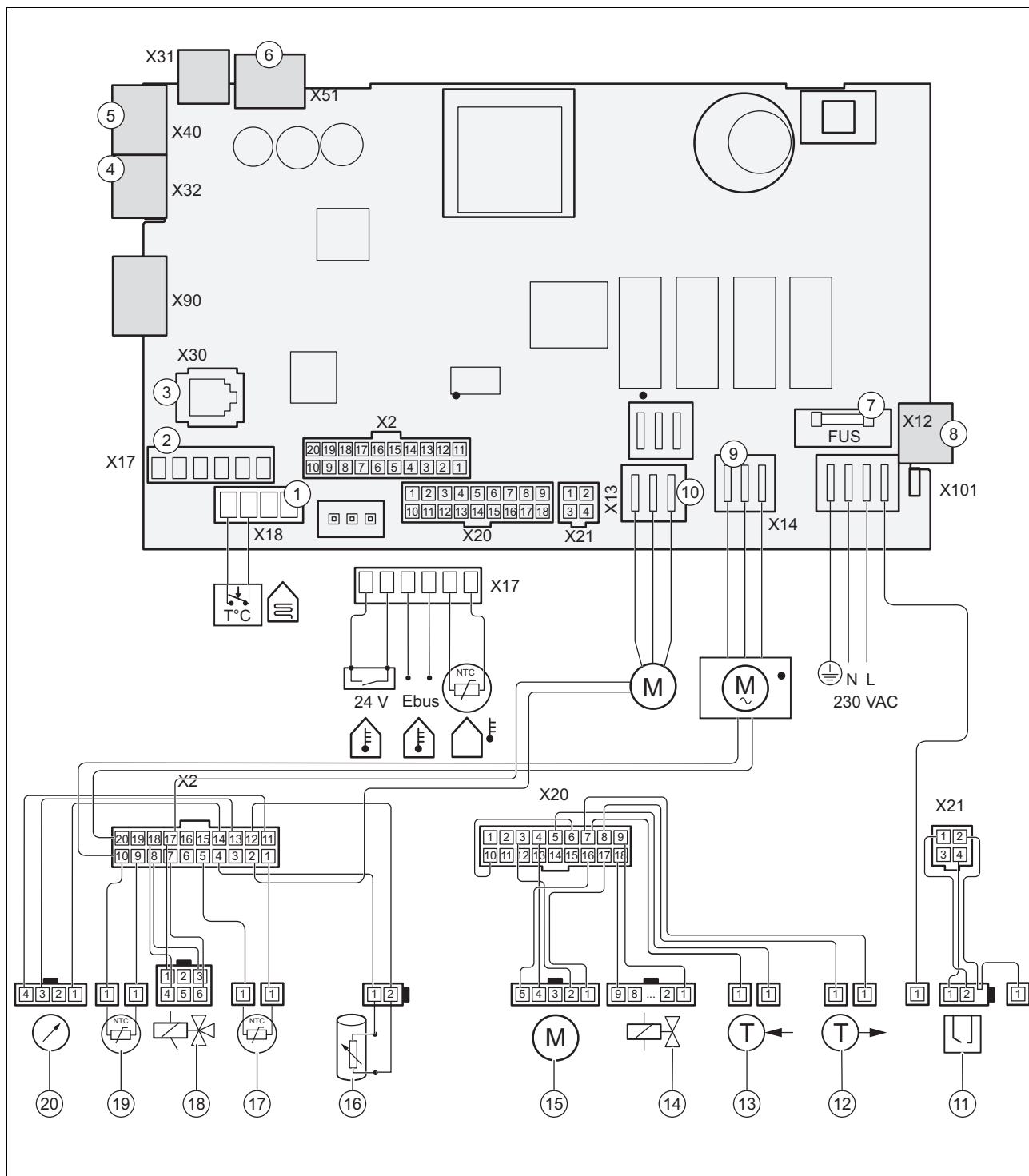
Fault code	Meaning	Possible causes
F.00	Flow temperature sensor interruption	NTC plug not plugged in or has come loose, multiple plug on the PCB not plugged in correctly, interruption in cable harness, NTC sensor defective.
F.01	Return temperature sensor interruption	NTC plug not plugged in or has come 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.
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.

Fault code	Meaning	Possible causes
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"> <li>– Flow temperature sensor incorrectly positioned at supply pipe</li> <li>– Flow temperature sensor defective</li> </ul>
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"> <li>– Insufficient water in product</li> <li>– Flow or return temperature sensor not positioned correctly on the pipe</li> </ul>
F.84	Fault: Flow/return temperature sensor temperature difference implausible	Flow and return temperature sensors returning implausible values: <ul style="list-style-type: none"> <li>– Flow and return temperature sensors have been inverted</li> <li>– Flow and return temperature sensors have not been correctly installed</li> </ul>
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

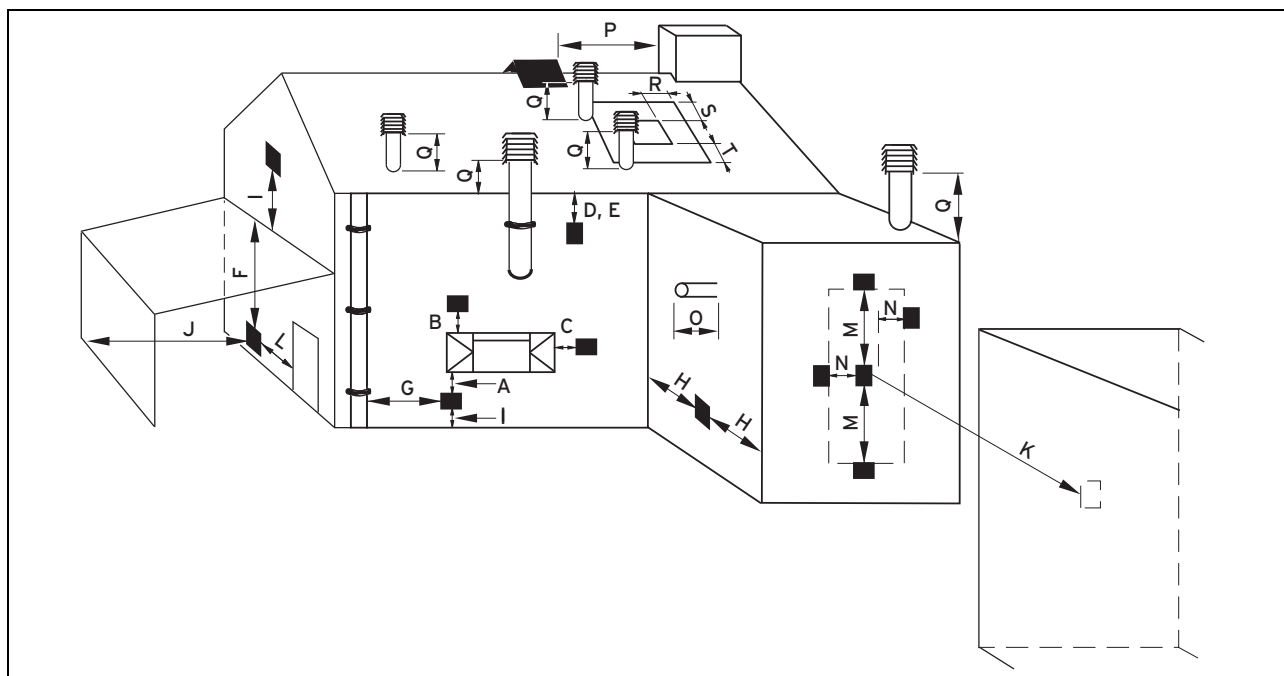
Fault	Possible causes	Remedial action
Water noises in the system	Air in the heating installation Pump has stopped modulating/is running in at the highest speed	Check the pump's speed setting. Check the pump's PWM connection.
No hot water, heating mode working correctly	The hot water temperature set is 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.
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 | 11 | Ignition and flame control electrode     |
| 2  | Plug for control accessories   | 12 | Temperature sensor in the heating flow   |
| 3  | Exalink plug                   | 13 | Temperature sensor in the heating return |
| 4  | Plug for temperature sensor    | 14 | Gas valve                                |
| 5  | PCB for 24V options            | 15 | Fan                                      |
| 6  | User interface                 | 16 | Temperature sensor in the cylinder       |
| 7  | Fuse                           | 17 | Temperature sensor in the heat exchanger |
| 8  | Plug for 230V options          | 18 | Diverter valve                           |
| 9  | Pump plug                      | 19 | Hot water temperature sensor             |
| 10 | Hot water pump plug            | 20 | Pressure sensor in the heating circuit   |

## H Air/flue terminal



### 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	300 mm
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 Horizontal terminal positioning

BS 5440-1 recommends that fanned flue chimney terminals should be positioned as follows:

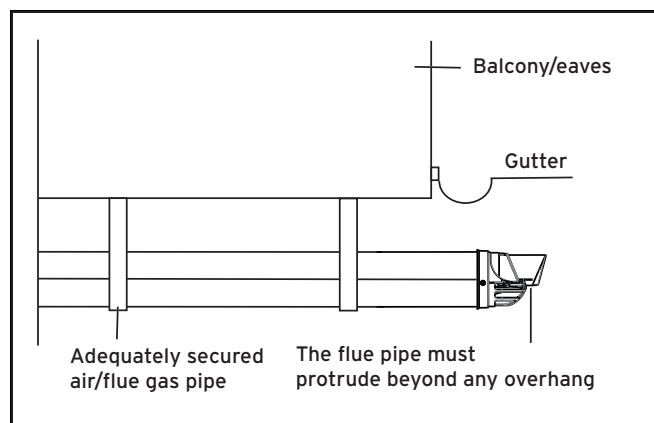
- a) at least 2 m from an opening in the building directly opposite, and
- b) so that the products of combustion are not directed to discharge directly across a boundary if the products are likely to cause a nuisance to a neighbour or discharge over a walkway or patio.

For IE see current issue of IS 813.

For boilers covered within this manual.

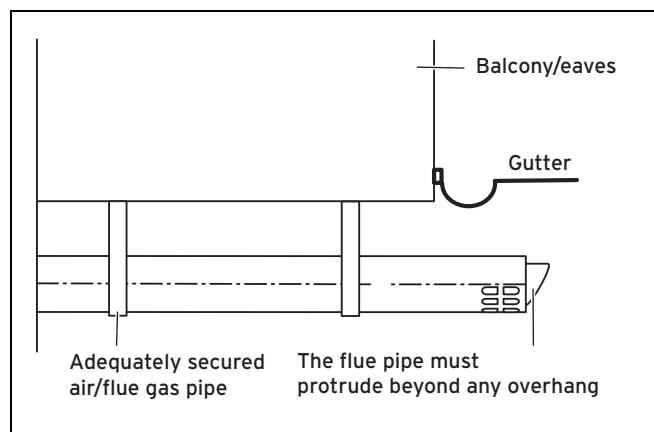
Dimensions B and R:

These clearances may be reduced to 25 mm without affecting the performance of the boiler. In order to ensure that the condensate plume does not affect adjacent surfaces the terminal should be extended as shown below.



You can use a flue gas management kit to enable the termination point to be positioned and directed away from the building fabric.

## H.3 Terminal of the flue pipe below eaves and balconies



## H.4 Lengths of the air/flue pipe

### Length of the C13 type air/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 air/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 air/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 air/flue pipe

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

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

## I Technical data

### Technical data – Heating

	<b>Energy 35 Store-A</b>
Max. range of the flow temperature control	10 to 80 °C
Maximum permissible pressure (PMS)	0.3 MPa (3.0 bar)
Maximum heating output (P max.), set at the factory	30 kW
Water flow at P max., set at the factory (ΔT = 20 K)	1,292 l/h
ΔP heating at P max., set at the factory (ΔT = 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

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

### Technical data – G31

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

### Technical data – Domestic hot water

	<b>Energy 35 Store-A</b>
Minimum water flow	0.1 l/min
Specific flow rate (D) (ΔT = 30 K) in accordance with EN 13203	23.0 l/min
Maximum permissible pressure (PMW)	1 MPa (10 bar)

	Energy 35 Store-A
Temperature range	45 to 65 °C
Cylinder capacity	42.0 l

## Technical data – General

	Energy 35 Store-A
Gas category	II2H3P
Diameter of the gas pipe	1/2"
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 volume flow at P max. – domestic hot water (G20)	3.77 m³/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 domestic hot water 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
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.



[www.centralheating.co.uk](http://www.centralheating.co.uk)

## 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:			
<b>To be completed by the customer on receipt of a Building Regulations Compliance Certificate*</b>							
Building Regulations Notification Number (if applicable):							
<b>CONTROLS</b> (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			
<b>ALL SYSTEMS</b>							
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	
<b>CENTRAL HEATING MODE</b> measure and record:							
Gas rate		m <sup>3</sup> /hr		OR		ft <sup>3</sup> /hr	
Burner operating pressure (if applicable)		mbar		OR Gas inlet pressure		mbar	
Central heating flow temperature						°C	
Central heating return temperature						°C	
<b>COMBINATION BOILERS ONLY</b>							
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?							
<b>DOMESTIC HOT WATER MODE</b> Measure and Record:							
Gas rate		m <sup>3</sup> /hr		OR		ft <sup>3</sup> /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	
<b>CONDENSING BOILERS ONLY</b>							
The condensate drain has been installed in accordance with the manufacturer's instructions and/or BS5546/BS6798						Yes	
<b>ALL INSTALLATIONS</b>							
Record the following:		At max. rate: CO ppm		AND		CO/CO <sub>2</sub> Ratio	
		At min. rate: (where possible) CO ppm		AND		CO/CO <sub>2</sub> 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.



**SERVICE RECORD**

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

**Service Provider**

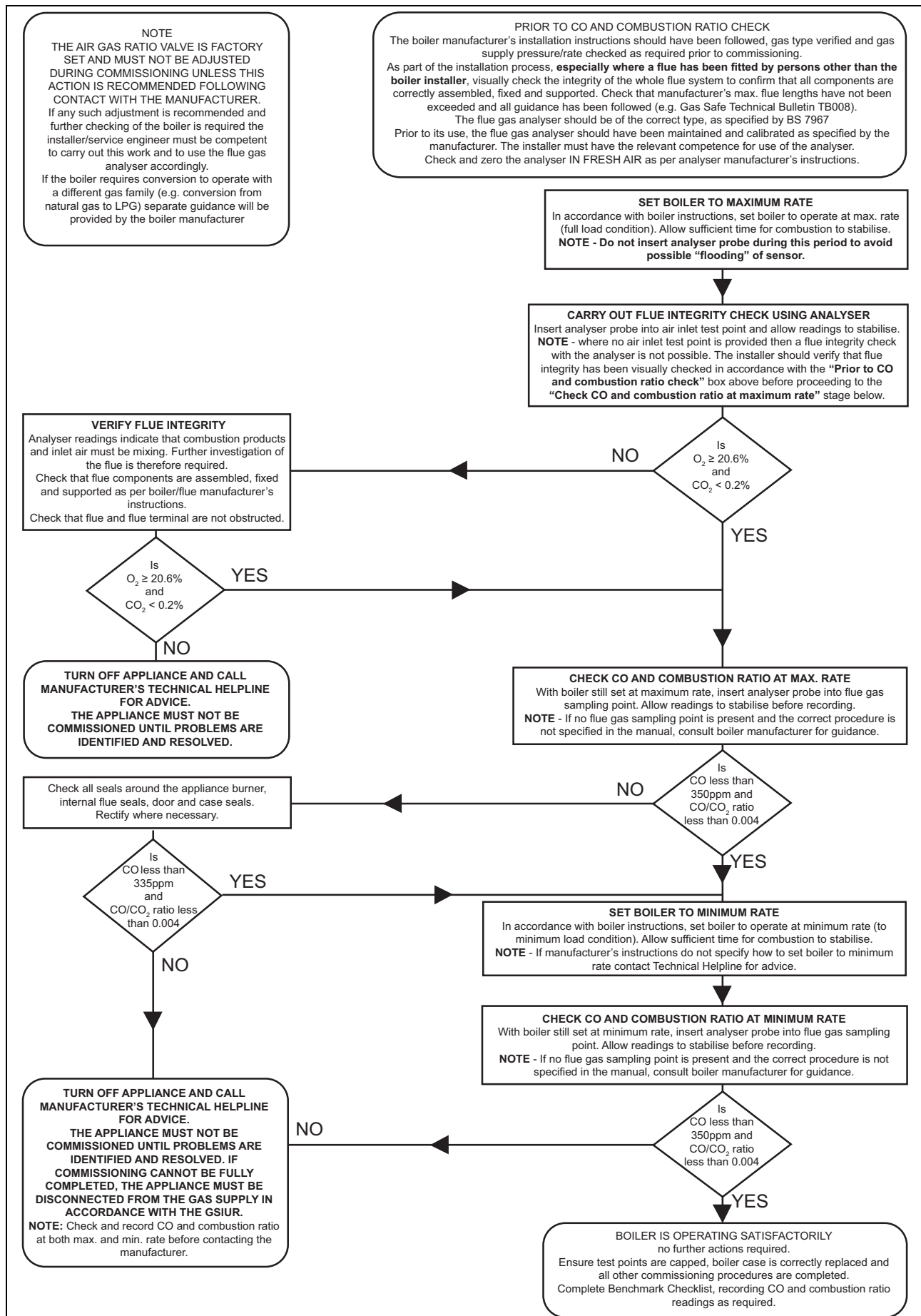
Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions. Always use the manufacturer's specified spare part when replacing controls.

<b>SERVICE 01</b> Date: _____ Engineer name: _____ Company name: _____ Telephone No: _____ Gas safe register No: _____ <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Record:</td> <td style="width: 20%;">At max. rate:</td> <td style="width: 10%;">CO</td> <td style="width: 10%;">ppm</td> <td style="width: 10%;">AND</td> <td style="width: 10%;">CO<sub>2</sub> %</td> </tr> <tr> <td></td> <td>At min. rate: (Where Possible)</td> <td>CO</td> <td>ppm</td> <td>AND</td> <td>CO<sub>2</sub> %</td> </tr> </table> Comments: _____ _____ Signature _____	Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %		At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %	<b>SERVICE 02</b> Date: _____ Engineer name: _____ Company name: _____ Telephone No: _____ Gas safe register No: _____ <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Record:</td> <td style="width: 20%;">At max. rate:</td> <td style="width: 10%;">CO</td> <td style="width: 10%;">ppm</td> <td style="width: 10%;">AND</td> <td style="width: 10%;">CO<sub>2</sub> %</td> </tr> <tr> <td></td> <td>At min. rate: (Where Possible)</td> <td>CO</td> <td>ppm</td> <td>AND</td> <td>CO<sub>2</sub> %</td> </tr> </table> Comments: _____ _____ Signature _____	Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %		At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %
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<b>SERVICE 07</b> Date: _____ Engineer name: _____ Company name: _____ Telephone No: _____ Gas safe register No: _____ <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Record:</td> <td style="width: 20%;">At max. rate:</td> <td style="width: 10%;">CO</td> <td style="width: 10%;">ppm</td> <td style="width: 10%;">AND</td> <td style="width: 10%;">CO<sub>2</sub> %</td> </tr> <tr> <td></td> <td>At min. rate: (Where Possible)</td> <td>CO</td> <td>ppm</td> <td>AND</td> <td>CO<sub>2</sub> %</td> </tr> </table> Comments: _____ _____ Signature _____	Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %		At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %	<b>SERVICE 08</b> Date: _____ Engineer name: _____ Company name: _____ Telephone No: _____ Gas safe register No: _____ <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Record:</td> <td style="width: 20%;">At max. rate:</td> <td style="width: 10%;">CO</td> <td style="width: 10%;">ppm</td> <td style="width: 10%;">AND</td> <td style="width: 10%;">CO<sub>2</sub> %</td> </tr> <tr> <td></td> <td>At min. rate: (Where Possible)</td> <td>CO</td> <td>ppm</td> <td>AND</td> <td>CO<sub>2</sub> %</td> </tr> </table> Comments: _____ _____ Signature _____	Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %		At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %
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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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