



Installation and Maintenance Instructions

Gas-fired condensing appliance

Condens 4700iW

GC4700iW 15 S | GC4700iW 18 S | GC4700iW 21 S | GC4700iW 24 S



Table of contents

1	Explanation of symbols and safety instructions	4
1.1	Explanation of symbols	4
1.2	General safety instructions	4
2	Regulations	6
3	Product Information	6
3.1	Scope of delivery	7
3.2	Declaration of Conformity	7
3.2.1	Declaration of conformity	7
3.2.2	Simplified EU Declaration of Conformity regarding radio equipment	7
3.3	Appliance type overview	7
3.4	Product identification	8
3.5	Pipework positions and flue outlet	8
3.6	Product overview	9
3.7	Standard accessories	10
3.7.1	Appliance accessories	10
3.7.2	Controls accessories	10
4	Pre-Installation	11
4.1	General notes	11
4.2	Heating	11
4.3	System preparation	11
4.3.1	Artificially softened water	11
4.3.2	Water systems and pipework	11
4.3.3	System layouts examples	12
4.3.4	System fill	15
4.4	Mains supply	16
4.4.1	Electrical supply	16
4.5	Appliance location and clearances	16
4.5.1	Appliance location	16
4.5.2	Appliance clearances	17
4.6	Flue systems considerations	18
4.6.1	Flue length	19
4.6.2	Flue options	19
4.6.3	Plume management system	22
4.6.4	Flue terminal positions	22
4.6.5	Plume re-direct and plume management terminal positions	26
4.7	Condensate discharge	28
4.7.1	Appliance siphonic condensate trap	28
4.7.2	Internal connections	28
4.7.3	External connections	28
4.8	Pressure relief discharge	28
4.9	Cleaning primary systems	28
5	Installation	29
5.1	Safety instructions	29
5.2	Installing the appliance	29
5.2.1	Preparatory work	29
5.2.2	Position the appliance	29
5.2.3	Appliance connections	31
5.2.4	Hanging the appliance	32
5.2.5	Flue turret/adaptor installation	33
5.3	Electrical connection	34

5.3.1	Safety instructions	34
5.3.2	Installer wiring connections	35
5.3.3	Accessories	37
5.3.4	External controls - Domestic installations	37
5.3.5	Appliances converted to semi-sealed system	37
6	Commissioning	39
6.1	Safety instructions	39
6.2	Pre-Commissioning checks	39
6.3	Water treatment	39
6.3.1	Filling the appliance and adding Inhibitor	39
6.4	Starting the appliance	39
6.4.1	Turning on the appliance	39
6.5	Chimney sweep mode	39
6.5.1	Setting the appliance to maximum	39
6.5.2	Setting the appliance to minimum	39
6.5.3	Exiting chimney sweep mode	39
6.6	Checking gas inlet pressure	40
6.7	Checking the gas rate	41
6.8	Checking for gas leaks during operation	41
6.9	CO and combustion check	42
6.10	Checking flue integrity	43
6.11	Flue gas analysis	43
6.12	Finishing commissioning	43
6.12.1	Appliance/product guarantee	44
7	Operation	44
7.1	Safety instructions	44
7.2	Control panel	44
7.2.1	Control panel overview	44
7.2.2	Temperature adjustment	45
7.3	Service menu	45
7.3.1	Operating the service menu	45
7.3.2	Benchmark Menu	46
7.3.3	Info menu	46
7.3.4	Settings menu	47
7.3.5	Function check Menu	50
7.3.6	Reset menu	50
7.3.7	Demo mode Menu	50
7.4	Thermal disinfection	51
8	Decommissioning	51
8.1	Safety instructions	51
8.2	Temporary Decommissioning	51
8.2.1	Setting frost protection	51
8.3	Recommissioning after Standstill	51
8.4	Final Decommissioning	52
9	Inspection and maintenance	52
9.1	Safety instructions	52
9.1.1	Safety-relevant components	53
9.2	Roof space installations	53
9.3	Inspection and maintenance considerations	53
9.4	Component access	54
9.5	Checking heat exchanger assembly	54
9.6	Fan pressure test	54
9.7	Check working gas inlet pressure	54
9.8	Flue gas analysis	55

9.9	Cleaning the siphon and heat exchanger	55
9.9.1	Checking the electrodes and cleaning the heat exchanger	55
9.9.2	Cleaning the condensate trap	58
9.10	Setting the air/gas ratio	59
9.11	Component access	59
9.12	Draining the appliance	60
9.13	Removing the heat exchanger assembly	60
9.14	Checking/replacing the motor of the 3-way valve (appliances fitted with diverter valve accessory)	61
9.15	Replacing the gas valve	61
9.16	Removing the pump	62
9.17	Replacing the expansion vessel	62
9.18	Replacing the PRV	62
9.19	Replacing the pressure sensor	62
9.20	Heat shield removal	63
9.21	Pressure gauge removal	63
9.22	Replacing the control unit	64
<hr/>		
10	Fault finding and diagnosis	65
10.1	Fault and event history	65
10.2	Operating and fault displays	65
10.2.1	General information	65
10.2.2	Operating/Fault code table	66
10.2.3	Faults that are not displayed	73
<hr/>		
11	Environmental protection and disposal	76
<hr/>		
12	Data Protection Notice	76
<hr/>		
13	Technical information and reports	77
13.1	Technical data	77
13.2	Energy consumption	79
13.2.1	Product data on energy consumption	79
13.3	Component resistance characteristics	81
13.3.1	Sensor values - Flow temperature sensor	81
13.3.2	Sensor values - Cylinder temperature sensor	81
13.3.3	Sensor values - Flue gas temperature limiter	81
13.3.4	Sensor values - Heat exchanger assembly temperate limiter	81
13.3.5	Sensor values - Outside temperature sensor	81
13.4	HCM (Code plugs)	81
13.5	Pump characteristic map of the heating pump	82
13.6	Internal wiring of the appliance	83
13.7	Gas Boiler System Commissioning Checklist and Warranty Validation Record	85
13.8	Inspection and maintenance checklist	86
13.9	Service and Interim Boiler Work Record	87

1 Explanation of symbols and safety instructions

1.1 Explanation of symbols

Warnings

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.

The following signal words are defined and can be used in this document:

 **DANGER**
DANGER indicates that severe or life-threatening personal injury will occur.

 **WARNING**
WARNING indicates that severe to life-threatening personal injury may occur.

 **CAUTION**
CAUTION indicates that minor to medium personal injury may occur.

NOTICE
NOTICE indicates that material damage may occur.

Important information


 The info symbol indicates important information where there is no risk to people or property.

Additional symbols

Symbol	Meaning
▶	a step in an action sequence
→	a reference to a related part in the document
•	a list entry
–	a list entry (second level)

Table 1

1.2 General safety instructions

Notices for the target group

These installation instructions are intended for gas, plumbing, heating and electrical contractors. All instructions must be observed. Failure to comply with instructions may result in material damage and personal injury, including danger to life.

- ▶ Read the installation, service and commissioning instructions (heat source, heating controller, pumps, etc.) before installation.
- ▶ Observe the safety instructions and warnings.
- ▶ Follow national and regional regulations, technical regulations and guidelines.
- ▶ Record all work carried out.

Intended use

The appliance may only be used for heating water or domestic hot water in domestic properties.

- ▶ Observe the details on the data plate and the specifications (installation manual) to ensure correct use of this appliance.
- ▶ Bosch offer flue gas systems which are suitable for use with the appliance. It is the responsibility of the installer of the flue to ensure this flue gas system operates correctly and in a safe manner.

System malfunctions caused by third-party equipment

This heat source is designed for operation with our control units.

System malfunctions, malfunctions and defects of system components resulting from the use of third-party equipment are excluded from liability.

Service work required to repair the damage will be invoiced.

If you smell gas

A gas leak could potentially cause an explosion. If you smell gas, observe the following rules.

- ▶ Prevent flames or sparks:
 - Do not smoke, do not use a lighter or strike matches.
 - Do not operate any electrical switches or unplug any equipment.
 - Do not use the telephone or ring doorbells.
- ▶ Turn off the gas supply at the main shut-off valve or at the gas meter.
- ▶ Open windows and doors.
- ▶ Warn your neighbours and leave the building.
- ▶ Prevent anyone from entering the building.
- ▶ Move well away from the building: call the emergency services and the gas supplier.

Danger to life from explosion

An increased and permanent ammonia concentration may lead to stress corrosion cracking on brass (e.g. gas valves, union nuts). As a result, there is a risk of explosion from gas escaping.

- ▶ Do not use wall mounted gas boilers in rooms where there is an increased or permanent ammoniac concentration (e.g. livestock stables or storage room for fertilisers).

Danger to life from poisoning by flue gas

There is a danger to life from escaping flue gas.

- ▶ Ensure that flues and gaskets are not damaged.

Danger of death from poisoning by flue gas due to inadequate combustion

Danger of death due to flue gas leak. If flues are damaged or leaking, or if you smell flue gas, observe the following rules.

- ▶ Close the fuel infeed.
- ▶ Open doors and windows.
- ▶ If necessary, warn all residents and leave the building.
- ▶ Prevent third parties from entering the building.
- ▶ Rectify any damage to the flue gas pipe immediately.
- ▶ Check the combustion air supply.
- ▶ Do not cover or reduce the size of ventilation openings in doors, windows and walls.
- ▶ Ensure that there is adequate combustion air supply, including for any appliances installed at a later date, e.g. extractor fans, kitchen fans or air conditioning units that discharge air to the outside.
- ▶ Never operate the device if there is insufficient combustion air supply.

Danger to life from carbon monoxide

Carbon monoxide (CO) is a poisonous gas, which arises during the incomplete combustion of fossil fuels such as oil, gas or solid fuels.

Dangers arise, if carbon monoxide escapes from the heating system due to a fault or a leak and collects unnoticed in enclosed spaces.

You can neither see, taste nor smell carbon monoxide.

To avoid danger from carbon monoxide:

- ▶ Have the heating system inspected and serviced regularly by an approved contractor.
- ▶ Use a CO detector, which gives an alarm in good time if CO escapes.
- ▶ If you suspect a CO leak:
 - Warn your neighbours and leave the building immediately.
 - Call an approved contractor.
 - Have any defects rectified.

Installation, commissioning and maintenance

Installation, commissioning and maintenance may be performed only by an approved contractor.

- ▶ In the case of open flue operation: ensure that the installation location meets the ventilation requirements.
- ▶ Do not repair, manipulate or deactivate safety-relevant components.
- ▶ Only install original spare parts.
- ▶ Check for gas tightness after working on gas-carrying components.

Combustion and corrosive materials

Do not store or use any combustible materials (paper, thinners, paints etc.) inside or within the vicinity of the appliance.

Chemically aggressive substances can corrode the appliance and invalidate any warranty.

Electrical work

Electrical work must only be carried out by electrical installation contractors.

Before starting electrical work:

- ▶ Isolate all poles of the mains voltage and secure against reconnection.
- ▶ Make sure the main voltage is disconnected.
- ▶ Before touching live parts: Wait at least 5 minutes to discharge the capacitors.
- ▶ Observe the wiring diagrams of other system components as well.

Handover to the user

When handing over, instruct the user how to operate the heating system and inform the user about its operating conditions.

- ▶ Explain how to operate the heating system and draw the user's attention to any safety relevant action.
- ▶ In particular, point out the following:
 - Alterations and repairs must only be carried out by an approved contractor.
 - Safe and environmentally compatible operation requires inspection at least once a year and responsive cleaning and maintenance.
 - The heat generator may only be operated with the casing fitted and closed.
- ▶ Point out the possible consequences (personal injury, including danger to life or material damage) of non-existent or improper inspection, cleaning and maintenance.
- ▶ Point out the dangers of carbon monoxide (CO) and recommend the use of CO detectors.
- ▶ Leave the installation instructions and the operating instructions with the user for safekeeping.

Annual maintenance

- ▶ Report that annual maintenance of the device is mandatory for safe and environmentally friendly operation.

Benchmark Service Record

The service engineer can prove continuing compliance with IS 813 by completed the Benchmark Service Record at the back of this manual after each service.



Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in

accordance with the manufacturer's instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

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

Visit centralheating.co.uk for more information.

Health and safety

The appliance contains no asbestos and no substances have been used in the construction process that contravene the COSHH Regulations (Control of Substances Hazardous to Health Regulations 1988).

Combustion and corrosive materials

Do not store or use any combustible materials (paper, thinners, paints etc.) inside or within the vicinity of the product.

Chemically aggressive substances can corrode the product and invalidate any warranty.

Fitting and modification

Fitting the appliance and any controls to the appliance may only be carried out by a competent engineer in accordance with the current Gas Safety (Installation and Use) Regulations.

Flue systems must not be modified in any way other than as described in the fitting instructions. Any misuse or unauthorised modifications to the appliance, flue or associated components and systems could invalidate the warranty. The manufacturer accepts no liability arising from any such actions, excluding statutory rights.

General manual handling guidelines

- ▶ Only remove packaging at the time of the final installation.
- ▶ Always use Health and Safety guidance for manual handling of an appliance.
 - Never lift or carry more than the safe guidance limit on your own.
 - Always use appropriate methods and equipment when lifting/ carrying an appliance.
- ▶ Never lift or carry packages by the shipping straps.
- ▶ During handling and unpacking, wear safety gloves to prevent injuries to your hands.
- ▶ Dispose of packing materials appropriately.

Important handling instructions

Care should be taken when transporting, lifting and carrying the appliance.

- ▶ Use a means of transport suitable for handling appliances (e.g. sack truck with strap, stair climbing or step trolley).
- ▶ When handling appliances, secure them against a fall.
- ▶ Let only trained personnel undertake the handling.
- ▶ The correct method for handling heavy objects should be strictly observed, at all times.

2 Regulations



Failure to comply with instructions may result in material damage and personal injury, including danger to life!

- ▶ Comply with all instructions.

NOTICE

System damage due to differing operating conditions!

Faults may arise when deviating from the specified operating conditions. Individual components or the boiler may be destroyed if there are deviations.

- ▶ Observe the binding information on the data plate.

Installation regulations

Current Gas Safety (Installation and Use) Regulations:

All gas appliances must be installed by a competent, registered gas engineer, in the Republic of Ireland, a Registered Gas Installer (RGI) in accordance with the current regulations.

Failure to install appliances correctly could lead to prosecution.

The appliance must be installed in accordance with, and comply to, the current:

- ▶ Gas Safety Regulations
- ▶ IET Regulations
- ▶ S.I. No. 292 - Energy Performance of Buildings Regulations (Ireland; current version)
- ▶ S.I. No. 635 (The Electricity at Work Regulations 1989) and any other local requirements
- ▶ EU Regulations No. 2017/1369 - Energy Labelling (as retained in UK law and amended)
- ▶ EU Regulations No. 811/2013 - Energy Labelling
- ▶ S.I. No. 183 - Affordable Housing Regulations (Ireland; current version)
- ▶ S.I. No. 299 - Safety, Health and Welfare at Work (General Application) Regulations (current version)

British Standards

Where no specific instruction is given, reference should be made to the relevant British Standard codes of Practice.

- BS7074:1
 - Code of practice for domestic and hot water supply
- BS6891
 - Installation of low pressure gas pipework up to 28mm (R1)
- BS5546
 - Installation of gas hot water supplies for domestic purposes
- EN12828
 - Central heating for domestic premises
- BS5440:1
 - Flues and ventilation for gas appliances of rated heating not exceeding 70kW (net): Flues
- BS5440:2
 - Flues and ventilation for gas appliances of rated heating not exceeding 70kW (net): Air Supply
- BS7593
 - Treatment of water in domestic hot water central heating systems
- BS6798
 - Installation of gas fired boilers of rated input up to 70kW (net)
- BS7671
 - IET Wiring Regulations

Irish Standards

The current relevant Irish standards should be followed, including:

- ECTI
 - National rules for electrical installations
- IS 813
 - Domestic Gas Installations

LPG Installations

An appliance using LPG must not be installed in a room or internal space below ground level unless one side of the building is open to the ground.

Timber framed buildings

Where the appliance is to be fitted to a timber framed building the guidelines laid down in BS5440: Part 1 and IGE "Gas Installations in Timber Frame Buildings" should be adhered to.

Water supply:

All seals joints and compounds (including flux and solder) and components used as part of the secondary domestic water system must meet the requirements of the WRC and hold approval by a notified body, e.g. WRAS.

CH Water

Salt based artificially softened water must not be used to fill the central heating system.

3 Product Information

Appliance features

- Aluminium-silicon heat exchanger.
- Low NOx emissions.
- Direct burner ignition.
- Built-in appliance frost protection.
- Built-in fault finding diagnostics.
- Zero pressure governor gas valve with fully modulating fan.
- Display for appliance status and access to diagnostics, system and commissioning parameters.
- Four hour memory retention after power interruption.
- Low energy modulating pump.
- Condensing in CH and DHW modes.
- Eco mode, to increase hot water cylinder hysteresis. ¹⁾
- Galvanised steel wall mounting frame provides vertical pipe route behind the appliance.
- Compatible with Worcester standard and intelligent controls.
 - See accessories list for available controls. ¹⁾
- Condensfit II flue systems 60/100 and 80/125 mm allows plume re-direction.
- Condensfit II flue systems 60/100 allows the ability to attach plume management kit.
- Front accessible components for maintenance.
- Large volume siphon mitigating the risk of condensate freezing.
- Digital Pressure sensor.
- Can be converted to operate on a low pressure (semi-sealed) heating system.

1) Function available when optional integral diverter valve kit is fitted.

3.1 Scope of delivery

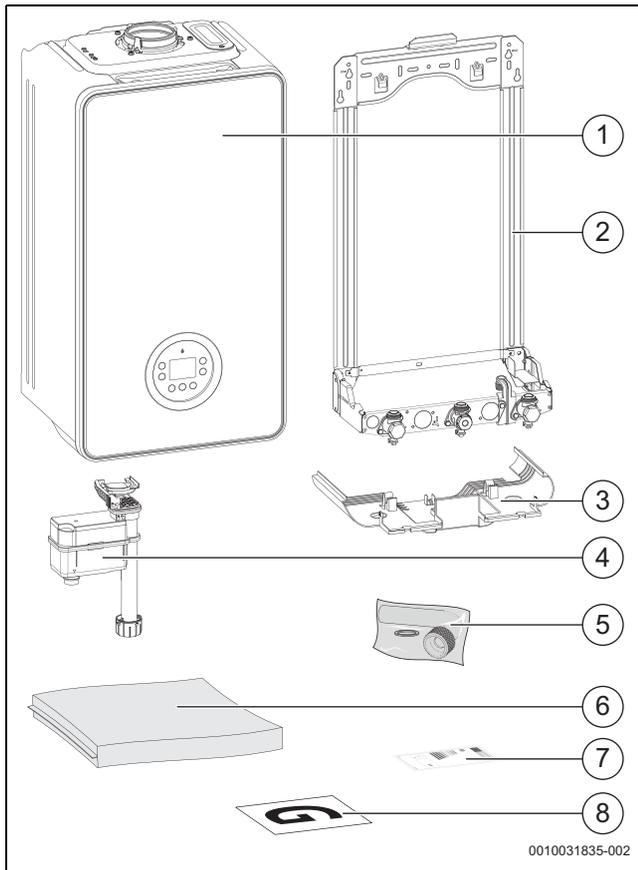


Fig. 1 Scope of delivery

- [1] Wall mounted gas-fired condensing system appliance.
- [2] Wall mounting frame.
- [3] Bottom panel.
- [4] Siphon.
- [5] PRV installer connection elbow.
- [6] Hardware literature pack:
 - Installation and Maintenance Instructions,
 - User Instructions,
 - Wall mounting template,
 - PRV installer connection elbow.
 - Condensate siphon connection elbow.
- [7] ErP label.
- [8] Guarantee card.

3.2 Declaration of Conformity

3.2.1 Declaration of conformity

The design and operating characteristics of this product comply with the European and national requirements.

CE The CE marking declares that the product complies with all the applicable EU legislation, which is stipulated by attaching this marking.

The complete text of the Declaration of Conformity is available on the Internet: worcester-bosch.ie.

3.2.2 Simplified EU Declaration of Conformity regarding radio equipment

Bosch Thermotechnik GmbH hereby declares, that the product Condens 4700iW described in these instructions complies with the Directive 2014/53/EU.

The complete text of the EU Declaration of Conformity is available on the Internet: worcester-bosch.ie.

3.3 Appliance type overview

These appliances are for use with:

- Natural Gas or L.P.G. (Cat. II 2H3P type C13, C33 & C53)

This document refers to the following appliance types:

Appliance type	Part number	Gas Council number
GC4700iW 24 S 23	7 733 601 635	41-108-31
GC4700iW 21 S 23	7 733 601 634	41-108-30
GC4700iW 18 S 23	7 733 601 633	41-108-29
GC4700iW 15 S 23	7 733 601 632	41-108-28
GC4700iW 24 S 31	7 733 601 639	41-108-35
GC4700iW 21 S 31	7 733 601 638	41-108-34
GC4700iW 18 S 31	7 733 601 637	41-108-33
GC4700iW 15 S 31	7 733 601 636	41-108-32

Table 2 Type overview

The name of the appliance consists of the following parts:

- GC4700iW: Type name
- 15, 18, 21 or 24: Heat output in kW
- S: System appliance
- 23: Gas type (Natural Gas)
- 31: Gas type (Liquid Petroleum Gas)

3.4 Product identification

Data plate

The data plate contains performance data, approval data and the serial number of the product.

The position of the data plate can be found in the product overview in this chapter.

Additional type plate

The additional type plate contains information on the product name and the most important product data.

It is located in an easily accessible place on the outside of the product.

The additional type plate can be found on the underside of the appliance.

3.5 Pipework positions and flue outlet

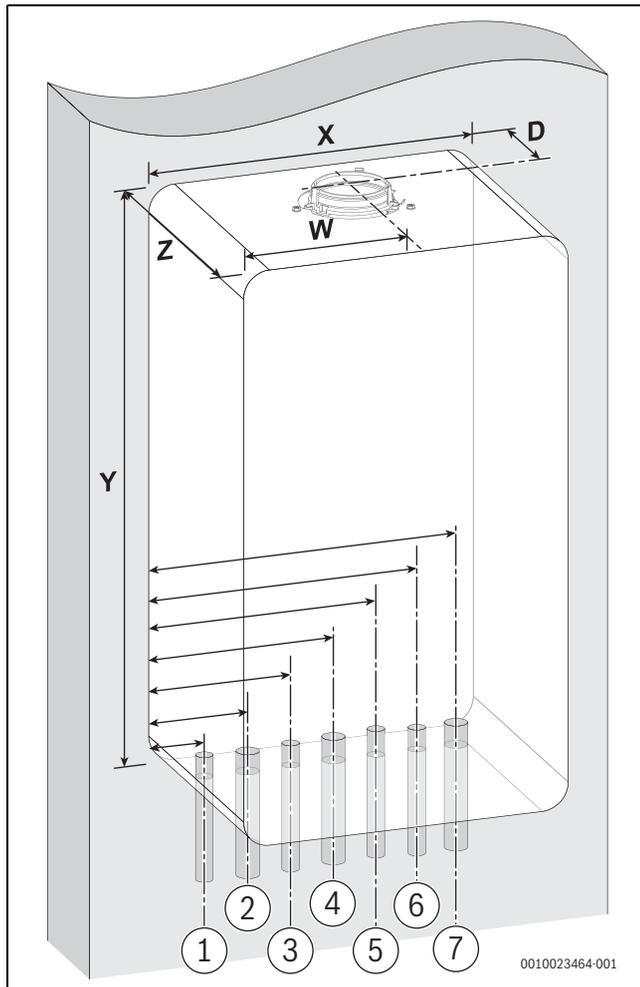


Fig. 2 Pipe and flue outlet dimensions

Description	Dimensions (mm)
X Appliance width	400
Y Appliance height	724 ¹⁾
Z Appliance depth	310
W Flue centre from appliance left side	200
D Flue centre from rear of appliance	135

1) 724mm to middle of top panel.
710mm side panel height.
Bottom panel is removable and not part of minimum clearance height requirements.

Table 3 Appliance and flue outlet dimensions

#	Function	From left case edge	Diameter of pipe
1	Condensate Outlet	38mm	22mm • Rubber push fit connection
2	Flow • CH/Cylinder ¹⁾	70mm	22mm • Compression fitting
3	Cylinder Flow ²⁾	135mm	15mm • Compression fitting
4	Gas	200mm	22mm • Compression fitting
5	Cylinder Return ²⁾	265mm	15mm • Compression fitting
6	PRV Discharge	296mm	15mm • Fittings not supplied
7	Return • CH/Cylinder ¹⁾	330mm	22mm • Compression fitting

1) Cylinder connections shared when optional integral diverter valve kit is not fitted.

2) Only available if optional integral diverter valve kit is fitted.

Table 4 Pipe dimensions

3.6 Product overview

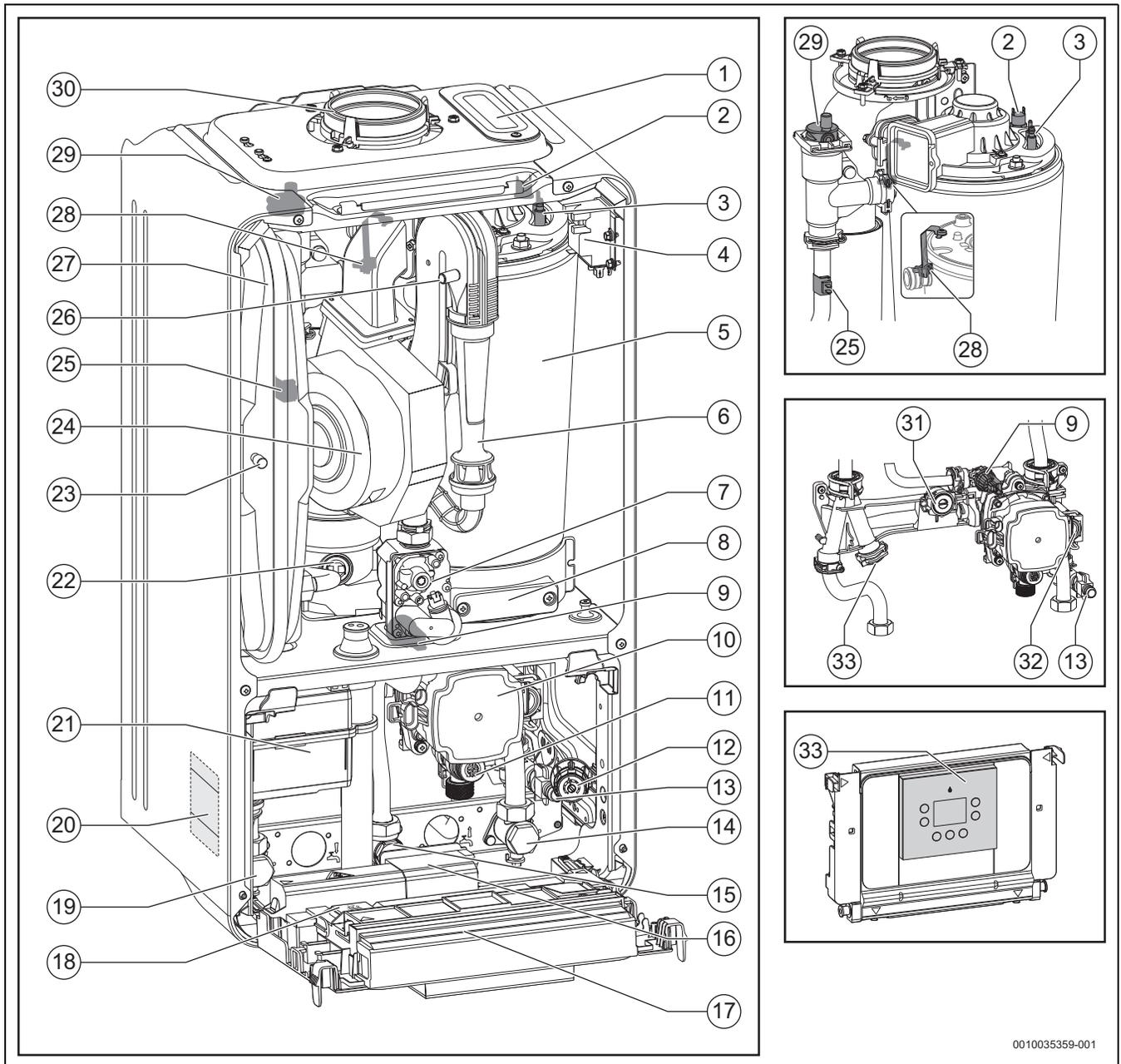


Fig. 3 Product overview

0010035359-001

Legend to figure 3:

- [1] Inspection / Heat exchanger cleaning access
- [2] Heat exchanger assembly limit temperature sensor
- [3] Electrode set
- [4] Ignition transformer
- [5] Heat exchanger assembly
- [6] Gas-air mixing chamber/venturi
- [7] Gas valve ¹⁾
- [8] Cover for inspection aperture
- [9] Pressure sensor
- [10] Pump
- [11] Pressure-relief valve (heating circuit)
- [12] Pressure gauge
- [13] Drain valve
- [14] CH return connection
- [15] Gas connection
- [16] Key control (accessory) housing ²⁾
- [17] Control unit
- [18] Fuse (replacement)
- [19] CH flow connection
- [20] Data plate
- [21] Condensate siphon
- [22] Flue gas temperature limiter
- [23] Schraeder valve
- [24] Fan
- [25] Flow temperature sensor (supply sensor) at flow pipe
- [26] Fan pressure test point
- [27] Expansion vessel
- [28] Zero flow sensor
- [29] Automatic air vent
- [30] Flue system connection
- [31] Position for cylinder flow pipe ³⁾
- [32] Position for diverter valve ^{1) 3)}
- [33] Position for cylinder return pipe ³⁾
- [34] Control panel

3.7 Standard accessories**3.7.1 Appliance accessories**

Part number	Description
7 733 601 245	4000 SimpleSwitch flue adaptor 60/100
7 733 601 250	4000/Compact Pre-piping kit
7 733 600 266	Greenstar System filter (22mm mini)
7 733 600 236	Greenstar System filter (22mm)
7 733 600 237	Greenstar System filter (28mm)
7 733 600 476	Greenstar System filter brass (22mm)
7 733 601 316	Earth bonding strip
7 733 601 314	4000/Compact Remote PRV Kit
7 733 601 251	Greenstar 4000 System Diverter Valve Kit ¹⁾
7 733 600 091	Heat exchanger cleaning kit

1) Optional Bosch controls are available if the integral diverter valve kit is used.

Table 5 Appliance accessories

3.7.2 Controls accessories

The Controls listed can be used with the appliances stated on the front of this manual **in conjunction** with the optional internal diverter valve kit.

Part number	Description
7 738 110 054	Sense I
7 738 111 064	Sense II (including weather sensor)
7 738 112 323	Comfort+ I RF
7 738 112 324	Comfort+ II RF
7 738 112 338	Comfort+ stat RF ¹⁾
7 738 112 321	Comfort+ ²⁾

1) Must be used with an additional timer.

2) Must be used with additional temperature controls.

Table 6 Control accessories

Bosch EasyControl smart control system

Part number	Description
7 736 701 341	EasyControl (white)
7 736 701 392	EasyControl (black)
7 738 112 351	EasyControl RF key
7 736 701 555	EasyControl TRV set (white)
7 736 701 556	EasyControl TRV set (black)
8 750 000 270	EasyControl smart TRV (individual)

Table 7 EasyControl accessories

Basic weather compensation sensor

Outdoor weather sensor (to activate on-board simple Weather Compensation).

Part number	Description
7 716 192 764	Outdoor weather sensor

Table 8 Control accessories



The outdoor weather sensor is supplied with the Sense II. It is optional with the Comfort+ II RF. Weather compensation is available with the EasyControl without the need for a physical outdoor sensor, however, it can improve control accuracy for installations in isolated micro-climates or highly sheltered locations such as valleys.

1) These components are sourced from multiple suppliers and therefore contain small design differences. Please refer to the relevant maintenance chapter for more detailed information. Spare parts are fully interchangeable.

2) Key accessory only available if optional integral diverter valve kit is fitted.

3) Optional integral diverter valve kit.

4 Pre-Installation

NOTICE

Risk of damage to system or appliance!

Before installation

- ▶ All the following Pre-Installation sections must be read and requirements met before starting appliance or flue installations.

4.1 General notes

- ▶ Observe all the current applicable national and regional regulations as well as all technical rules and guidelines.
- ▶ Obtain all approvals required before installation (gas supplier, etc.).
- ▶ Observe the building regulations, e.g. for the use of a neutraliser unit (accessories).
- ▶ Convert open heating systems to sealed systems.
- ▶ Do not use galvanised radiators or pipes.
- ▶ In the case of LPG, install a pressure regulator with a pressure relief valve.

4.2 Heating

Underfloor heating systems

- ▶ Observe the permissible flow temperatures for underfloor heating systems and connect a temperature switch if required.
- ▶ When using plastic pipes, use oxygen-tight pipework or create system separation by means of heat exchangers.

4.3 System preparation

4.3.1 Artificially softened water

The heating system must not be filled with water which has been treated using an ion exchange (salt based) water softener. Where these water softeners are installed, a permanent untreated water supply should be provided to maintain pressure in the heating system.

A bypass must be provided at the water softener to comply with BS:14743. Where a permanent untreated supply cannot be provided, the system must be initially filled using the bypass provided at the water softener. Occasional topping up of the system with artificially softened water is acceptable. Inhibitor must be added to the system. The pH levels must be between 6.5 and 8.0 at the time of commissioning. When a permanent untreated supply is not provided to the heating system filling point, the pH levels must be checked annually and recorded in the service record.

NOTICE

Risk of damage to appliance!

- ▶ The heating system must not be filled with water which has been treated using an ion exchange water softener.
- ▶ If the system is partially drained for maintenance or repair work, the system must be refilled by utilising the bypass valve at the water softener. The pH and inhibitor levels should be checked.

4.3.2 Water systems and pipework

Primary system plastic pipework:

- Any plastic pipework must have a polymeric barrier, complying with BS 7921 and installed to BS 5955 with 600mm (minimum) length of copper connected to the appliance.
- Plastic pipework used for under-floor heating must be correctly controlled with a thermostatic blending valve limiting the temperature of the circuits to approximately 50°C with 1000mm (minimum) length of copper or steel pipe connected to the appliance.

Primary system/connections/valves:

- Do not use galvanised pipes or radiators.
- All system connections, taps and mixing valves must be capable of sustaining a pressure of 3 bar.
- Radiator valves should conform to BS 2767:10.
- All other valves should conform to BS 1010.
- It is best practice to fit Thermostatic Radiator Valves (TRV's) to all radiators, except the area where the room thermostat is sited which must be fitted with lockshield valves that are left open.
- If the circulating pump speed is fixed, and system circulation can be significantly adjusted by TRV's or zone valves, an auto bypass should be installed and adjusted to provide constant pump head pressure to the heating circuits. If flow to the heating circuits can be stopped completely by zone valves, an auto bypass must be installed and adjusted to open during pump over-run and should provide a minimum 3 metre circuit when activated. If a constant pressure pump setting is selected, and circulation cannot be completely stopped by zone valves, an auto bypass will not be required.
- Drain cocks are required at all the lowest points on the system.
- Air vents are required at all high points on the system.

Primary system considerations - Combi & System appliances

Sealed system

- The CH sealed system must be filled using a WRAS approved filling loop or comply with examples in section 4.3.4 "System fill".
- Where the system volume is more than 100 litres or exceeds 2.5 bar at maximum heating temperature an additional expansion vessel [2] must be fitted as close as possible to the appliance in the central heating return.
- Pressurise the extra expansion vessel [2] to the same value as the built-in expansion vessel [1] (default pre-charge pressure is 0.75 bar).

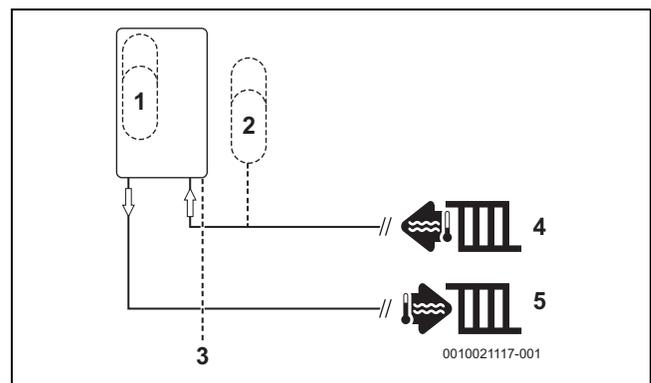


Fig. 4 Additional expansion vessel

- [1] Appliance expansion vessel
- [2] Additional expansion vessel
- [3] Pressure relief discharge
- [4] Heating return
- [5] Heating flow

Primary system considerations - Combi & System appliances

Semi-sealed system

If the system has low water pressure i.e. less than 0.6 bar, then it will need to be fitted to a semi-sealed system configuration.

- The CH semi-sealed system must be installed to current applicable national and regional regulations as well as all technical rules and guidelines for connection of an appliance to semi-sealed heating systems.
- The CH semi-sealed system must be filled using a WRAS approved filling method for semi-sealed systems or comply with semi-sealed system example in section 4.3.4 "System fill".

Check the size of the expansion vessel

To determine whether an additional expansion vessel is required: Follow the steps below:

- ▶ Calculate the total system volume (litres).
 - Plot a line vertically on the chart (→ Fig. 5).
- ▶ Determine the central heating maximum operating flow temperature.
 - Plot a line horizontally on the chart (→ Fig. 5).
- ▶ Determine the pre-charge in the expansion vessel based on static head, 1 metre = 0.1 bar.
 - Static head should be measured between the expansion vessel and the highest point on the system (top of the highest radiator).
- ▶ Select a curve from the key below (1-5).
- ▶ System pressure should be set at 0.1 - 0.25 bar higher than the vessel pre-charge.
 - It must be at least to the minimum on appliances with an analogue gauge.
 - Minimum pressure settings may need to be adjusted to suit on, appliances with a digital gauge, in the applicable menu function.
 - Intelligent filling settings may need to be adjusted to suit on, appliances with the automatic filling accessory, in the applicable menu function.

If the dissected lines are in area A then no additional expansion is required.

If the dissected line is in area B then an additional expansion vessel must be installed (→ Fig. 4).

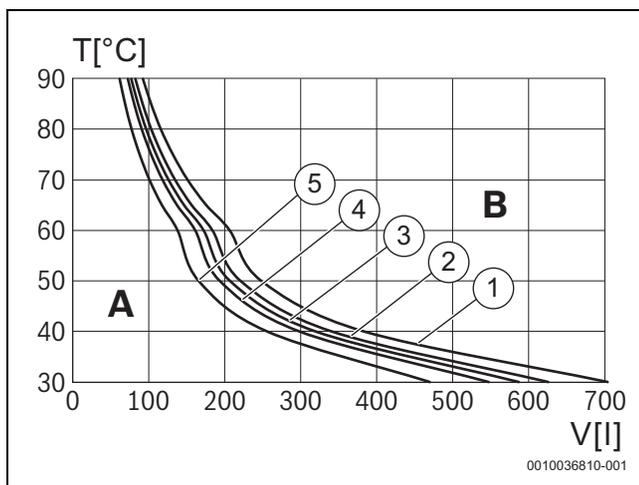


Fig. 5 Curves for the expansion vessel

- 1 Pre-charge pressure 0.5 bar (minimum)
- 2 Pre-charge pressure 0.75 bar
- 3 Pre-charge pressure 1.0 bar
- 4 Pre-charge pressure 1.2 bar
- 5 Pre-charge pressure 1.3 bar
- A Operational capacity of the expansion vessel (left of the relevant curve)
- B Additional expansion vessel required (right of the relevant curve)
- T Maximum operating temperature [°C]
- V Total System Volume [l]



The default pre-charge pressure for the expansion vessel is 0.75 bar

4.3.3 System layouts examples

Sealed primary system - Cylinder and central heating zone:

Typical S-Plan example

- The cylinder return must be the last connection on the common return pipe to prevent reverse circulation.

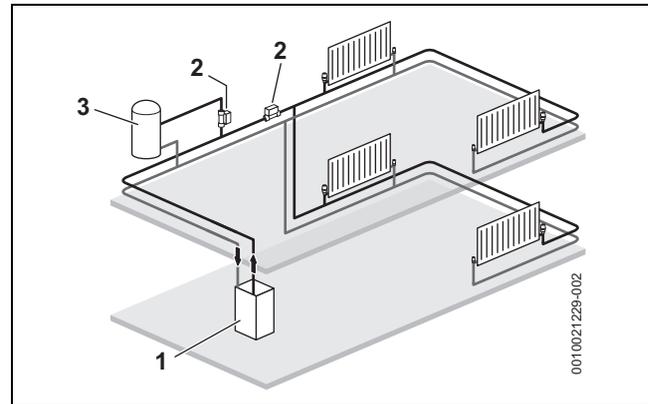


Fig. 6 Cylinder and heating zone

- [1] Appliance
- [2] Zone valves
- [3] Hot water cylinder

Sealed primary system - Cylinder and 2 x central heating zones:

Typical S-Plan Plus example

- The cylinder return must be the last connection on the common return pipe to prevent reverse circulation.

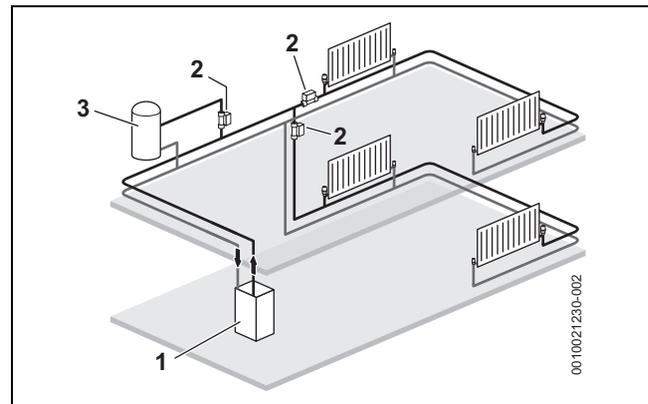


Fig. 7 Cylinder and 2 x heating zones

- [1] Appliance
- [2] Zone valves
- [3] Hot water cylinder

Sealed primary system - 3-way valve, cylinder and central heating zone:

Typical Y-Plan example

- The cylinder return must be the last connection on the common return pipe to prevent reverse circulation.

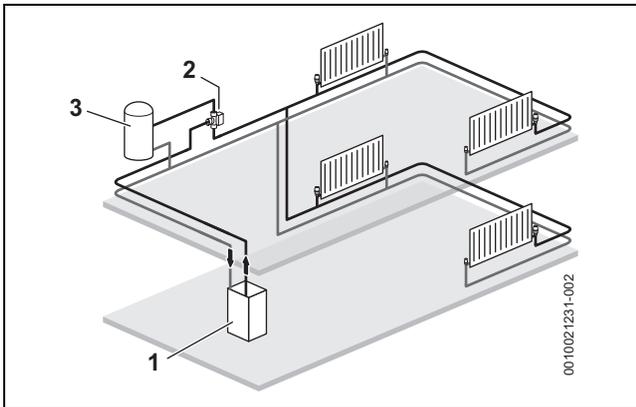


Fig. 8 3-way valve, cylinder and heating zone

- [1] Appliance
- [2] 3-Way zone valve
- [3] Hot water cylinder

Optional integral diverter valve kit

The integral diverter valve kit is designed to operate on a sealed system only. The appliance will require to fit a separate flow and return pipe from the water cylinder to the wall mounting frame and terminate in 15mm copper pipe.

Details for the connection of the integral diverter valve kit components are found within the Installation Instructions for the kit.

Sealed primary system - Internal diverter valve kit:

- This appliance is designed to operate on a sealed system only. The appliance will require a second flow and return pipe from the hot water cylinder to the wall mounting frame and terminate in 15mm copper pipe. The following system layouts show a simplified example of the pipe configuration to the appliance.

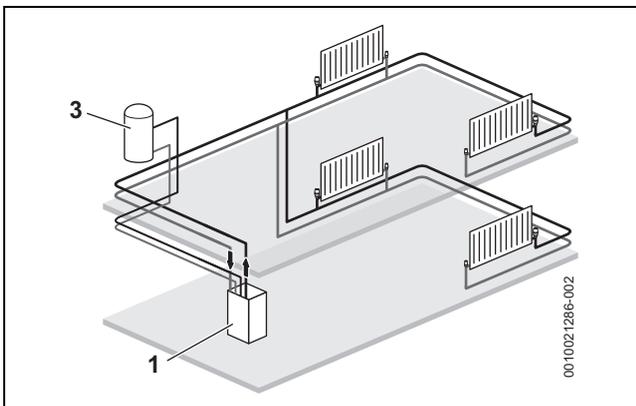


Fig. 9 Example layout - Internal diverter valve kit

- [1] Appliance with internal diverter valve kit
- [3] Unvented hot water cylinder

Unvented cylinders



In all cases the cylinder manufacturer must be contacted for confirmation their product is suitable for the installation layout shown in figure 9.

thermostat supplied with the cylinder, it is possible to use the integral diverter valve kit and not need the 2-port motorised valve to cut the flow of heat to the cylinder to comply with Building Regulation Part G3.

- The integral diverter valve kit cylinder sensor must be used.
- The general layout (figure 9) can be used for unvented cylinders by utilising the high limit thermal cut-out of the cylinder dual-thermostat to interrupt the permanent live to the appliance, preventing any heat being produced by the appliance.

Example layout with unvented cylinder & cylinder safety valve.

If required by the cylinder manufacturer to fit/use the cylinder safety valve then this can also be carried out (figure 10) with the integral diverter valve kit.

- The cylinder safety valve and dual-thermostat (control thermostat and high limit thermal cut-out) are wired to interrupt the permanent live to the appliance, preventing any heat being produced by the appliance.

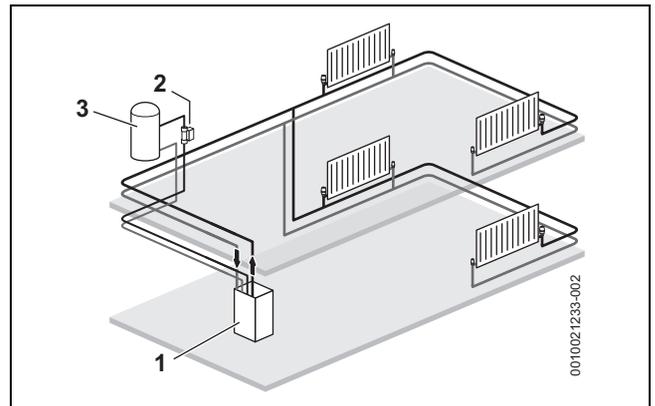


Fig. 10 Example layout - Internal diverter valve kit with unvented cylinder and cylinder safety valve

- [1] Appliance with internal diverter valve kit
- [2] Cylinder safety valve (unvented cylinder)
- [3] Unvented hot water cylinder

Although it is accepted common practice to install 2-port motorised valve in the primary flow pipe to the cylinder and wired to the dual-

Appliances converted to semi-sealed system

Semi-Sealed primary system - Cylinder and central heating zone

Typical S-plan example



Check valve operation.

- ▶ The check valve must be positioned so that the pressure from the header tank is greater than, that which is required to open the check valve.
-
- The cylinder return must be the last connection on the common return pipe to prevent reverse circulation.

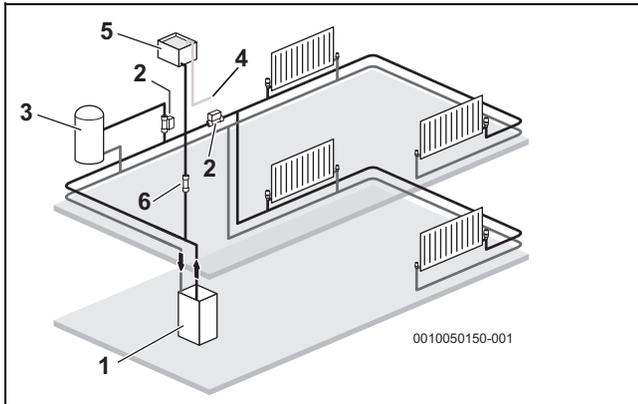


Fig. 11 Cylinder and heating zone

- [1] System appliance
- [2] Zone valves
- [3] Hot water cylinder
- [4] Domestic cold water
- [5] Header tank
- [6] Check valve

Semi-Sealed primary system - Cylinder and 2 central heating zones

Typical S-plan plus example



Check valve operation.

- ▶ The check valve must be positioned so that the pressure from the header tank is greater than, that which is required to open the check valve.
-
- The cylinder return must be the last connection on the common return pipe to prevent reverse circulation.

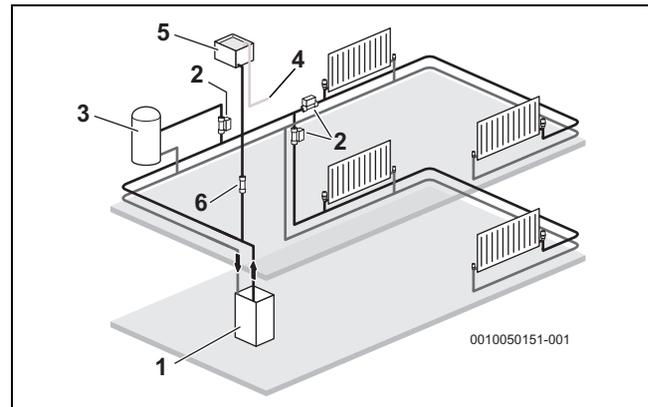


Fig. 12 Cylinder and two heating zones

- [1] System appliance
- [2] Zone valves
- [3] Hot water cylinder
- [4] Domestic cold water
- [5] Header tank
- [6] Check valve

Semi-Sealed primary system - with an external diverter valve

Typical example of Y plan system with header tank and hot water cylinder



Check valve operation.

- ▶ The check valve must be positioned so that the pressure from the header tank is greater than, that which is required to open the check valve.
-
- The cylinder return must be the last connection on the common return pipe to prevent reverse circulation.

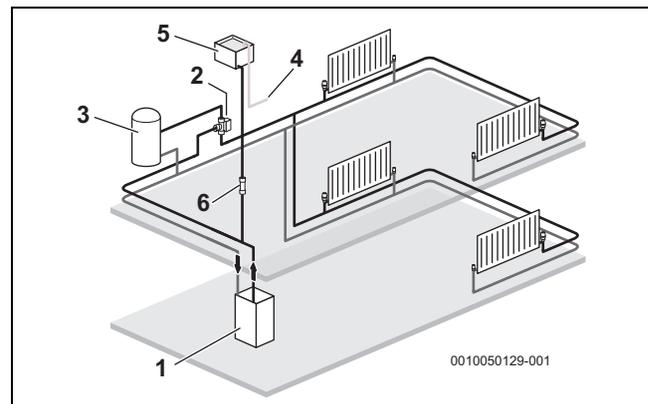


Fig. 13

- [1] Appliance
- [2] Three way zone valve
- [3] Hot water cylinder
- [4] Domestic cold water supply
- [5] Header tank
- [6] Check valve

Semi-Sealed primary system - with internal diverter valve

Typical example of a system with an internal diverter valve, header tank and hot water cylinder



Check valve operation.

- The check valve must be positioned so that the pressure from the header tank is greater than, that which is required to open the check valve.

The appliance will require a second flow and return pipe from the hot water cylinder to the wall mounting frame and terminate in 15mm copper pipe. The following system layouts show a simplified example of the pipe configuration to the appliance.

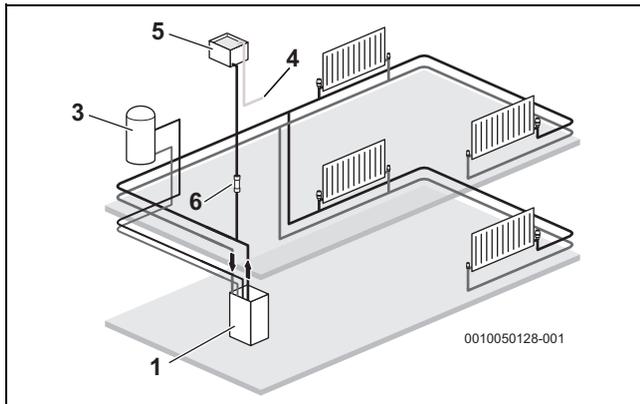


Fig. 14

- [1] Appliance with internal diverter valve
- [3] Hot water cylinder
- [4] Domestic cold water supply
- [5] Header tank
- [6] Check valve

4.3.4 System fill

Filling primary sealed systems

NOTICE

Filling the primary sealed system

The system must not be filled with salt based softened water.

- Ensure the primary water filling point uses an untreated cold water connection from the mains supply, before a water softener.

- Filling the system must comply with one of the following methods shown.
- The filling point must be at low level and must never be a permanent connection to the mains water supply.
- Filling loops must be WRAS approved.
- If the external filling link is sited away from the appliance, then a pressure gauge should be installed at the filling point.



The pressure shown on the gauge may differ from that shown on the digital display. Final system pressure adjustments must be made whilst referencing the digital display.

External filling loop

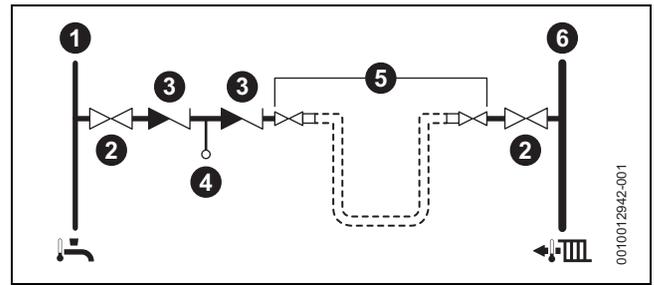


Fig. 15 External filling loop system fill example

- [1] Cold mains inlet pipe
- [2] Stop valve
- [3] Check valve
- [4] Test point
- [5] Hose union
- [6] Central heating flow pipe

Semi-sealed system fill - Top-up tank

In situations where the cold mains pressure is not sufficient to pressurise the system to between 0.6 and 1.7 bar an alternative can be to use a top-up tank.

This will allow the appliance to operate on a semi-sealed system configuration.

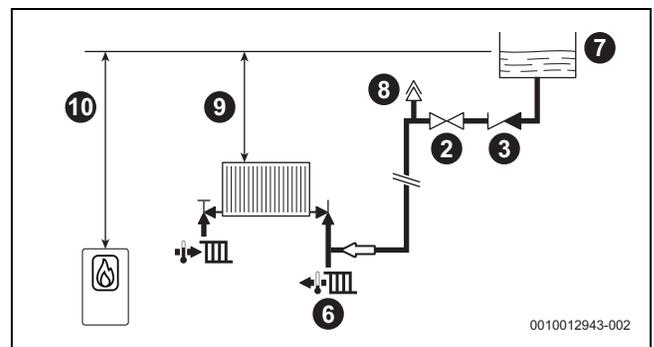


Fig. 16 Semi-sealed system top-up tank fill example

- [2] Stop valve
- [3] Check valve
- [6] Central heating flow pipe
- [7] Top-up tank
- [8] Automatic air vent
- [9] Minimum height above the highest point of the system - 1000mm (39 in)
- [10] Minimum static head above top surface of the appliance to the water level in feed and expansion tank - 2000mm (79 in).

4.4 Mains supply

4.4.1 Electrical supply

- Supply: 230V AC - 50 Hz
- This appliance must **not** be connected to a three phase supply.
- The wiring between the appliance and the electrical supply must comply with the latest IET wiring regulations that apply to wiring a fixed appliance for Class 1 equipment.
- If the installation requires RCD protection, then an RCD that is suitable for use with equipment incorporating electronic components must be used. The RCD must detect and respond to AC sinusoidal and pulsating DC earth faults.
 - Suitable RCD's are Type A, B or F.
- External 3 A fuse to BS1362.
- The appliance must be earthed.
- Cable: PVC insulated 0.75mm² (24 x 0.2mm) temperature rated to 90 °C, to BS EN50525.
- Any additional components that are connected to the appliance with mains electrical supply must not have a separate supply.
- Additional equipment wired to the appliance must comply with the latest IET wiring regulations.

4.5 Appliance location and clearances

4.5.1 Appliance location

- Follow local regulations for the location within the property that the appliance is to be installed.
- This appliance is only suitable for installing internally within a property at a suitable location onto a flat, fixed rigid surface capable of supporting the appliance weight.
- The appliance is not suitable for external installation.
- Protect installation area against dust and moisture.



No surface protection is required against heat transfer from the appliance.



DANGER

Danger from explosive and flammable materials:

Storage of explosive and flammable materials.

- ▶ Do not store flammable materials (paper, curtains, clothing, primer, paint, ...) in proximity to the appliance.



DANGER

Danger to life from explosion!

An increased and permanent ammonia concentration may lead to stress corrosion cracking on brass (e.g. gas valves, union nuts). As a result, there is a risk of explosion from gas escaping.

- ▶ Do not use wall mounted gas boilers in rooms where there is an increased or permanent ammoniac concentration (e.g. livestock stables or storage room for fertilisers).
- ▶ If contact with ammonia is unavoidable, make sure that there are no brass parts installed in the system.

NOTICE

Damage to appliance:

Contaminated combustion air.

- ▶ Do not use any cleaners containing chlorine or hydrogen halide (i.e. spray cans, primers, cleaners, paint and glue).
- ▶ Do not store or use these substances in the appliance or room.
- ▶ Avoid the build-up of dust.

NOTICE

Damage to appliance:

Extreme temperatures may cause damage to the heating system.

- ▶ Ensure the appliance location's ambient temperature is above 0 °C and below 50°C.

NOTICE

Damage to system:

The heating system pipework can be damaged by frost if installed in an internal unheated area, such as a loft, basement or garage.

The appliance internal frost protection only monitors the system water temperature within the appliance to provide protection for the appliance.

- ▶ Install a frost thermostat and pipe thermostat connected in series, to protect the system pipework.
 - We recommend that the frost thermostat is sited in the coldest unheated area in which pipework is located and that it is set to call for heat at 5 °C. The Pipe stat should be located on whichever pipe is furthest from the heated area where warmer water will be drawn from considering the direction of flow, and set to end the demand at 15 °C.
- ▶ The system pipework in the internal unheated area should be insulated.
- ▶ If the appliance is to be shut down for an extended period, drain the central heating system.



Frost protection can also be achieved for systems with Bosch weather compensating controls installed.



The appliance must be installed where:

- ▶ The area is well lit, allowing users to clearly see the appliance to carry out any work or checks.
- ▶ An engineer can gain clear and safe standing space access in front of the appliance to work on the product or component, including making adequate provision for visual inspection of flues in voids.
- ▶ The homeowner can gain clear and safe standing space access in front of the appliance to gain access to the controls or to check, top up or reset the appliance.
- ▶ Roof space installations must fully conform to BS 6798: roof space installations.
- ▶ Products in roof spaces must have permanent fixed lighting, a permanent fixed retractable ladder and a fixed floor area sufficient to allow access for normal use and servicing around the product and between the product and the access hatch.
 - For sealed system we would also recommend that a remote pressure gauge and filling loop are sited where the customer can gain easy access to assist with checking and topping up.

4.5.2 Appliance clearances

- The following details cover the installation, service and maintenance clearances for the appliance.

CAUTION

Risk of damage to appliance or property

The appliance will overheat if the clearance space around the appliance is restricted by objects.

- Do not restrict this space with the addition of cupboards, shelves etc. next to or around the appliance.
- Do not store any combustible materials on or next to the appliance, such as clothes, towels, paper or plastic bags.

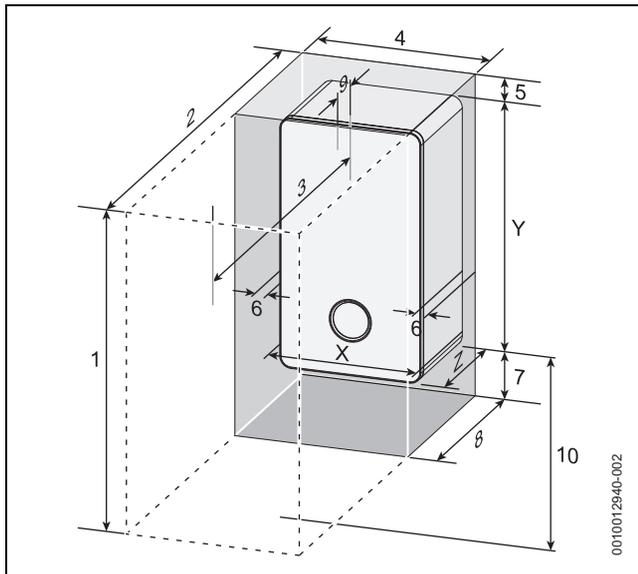


Fig. 17 Appliance minimum clearances

Minimum clearances		
	Description	Dimensions (mm)
X	Appliance width	400
Y	Appliance height	724 ¹⁾
Z	Appliance depth	310
Installation/Maintenance		
1	Overall clearance height	1,080/1,120 ²⁾
2	Overall clearance depth	760/910 ³⁾
3	Clear standing space in front of appliance	450/600 ³⁾
4	Overall clearance width	410
5	Above the appliance	170/210 ²⁾
6	Either side of appliance	5
7	Below the appliance	186
8	Compartment depth	330
9	Appliance to removable door	20
10	Below the appliance to the floor	400

- 724mm to middle of top panel.
710mm side panel height.
Bottom panel is removable and not part of minimum clearance height requirements.
- Height for either 60/100 flue or 80/125 flue.
- Front clearance can be reduced by 150mm, refer to the advice given in Reduced front maintenance minimum clearances.

Table 9 Appliance minimum clearances

Reduced front maintenance minimum clearances

The front servicing clearance for this appliance can be reduced to 450mm.

For installations with a front servicing clearance less than 600mm (minimum of 450mm), the following additional criteria must be achieved.

- The bottom of the appliance case must be between 1000mm and 1500mm from the floor.
- There must be at least 450mm clearance in front of the appliance to floor level. Anything sited below the appliance must not protrude into this clear space.
- There must be at least 186mm clearance to any structure which is sited below the appliance.
- There must be at least 300mm clear space to either the left hand or right hand side of the appliance. This clear space must be from the required clear height above the appliance to floor level.
 - This clearance will not apply if the appliance is sited within 300mm of a door way and the door frame is the only obstruction.

i

Minimum clearances must be observed to any obstruction/ surface, (dark shaded areas, figures 18 and 19).

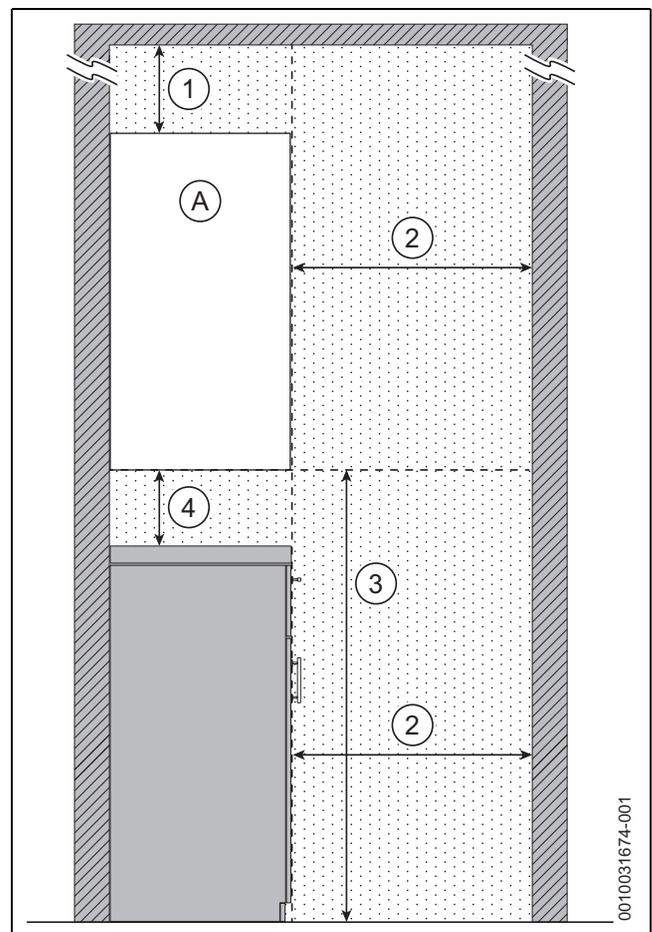


Fig. 18 Reduced front maintenance clearances - Side view

- [A] Appliance.
- [1] Above appliance - Same clearance required as for standard clearances of 60/100 flue or 80/125mm flue.
- [2] In front of appliance - Minimum 450mm.
- [3] Bottom of appliance to the floor - 1,000 - 1,500mm.
- [4] Below appliance - 186mm

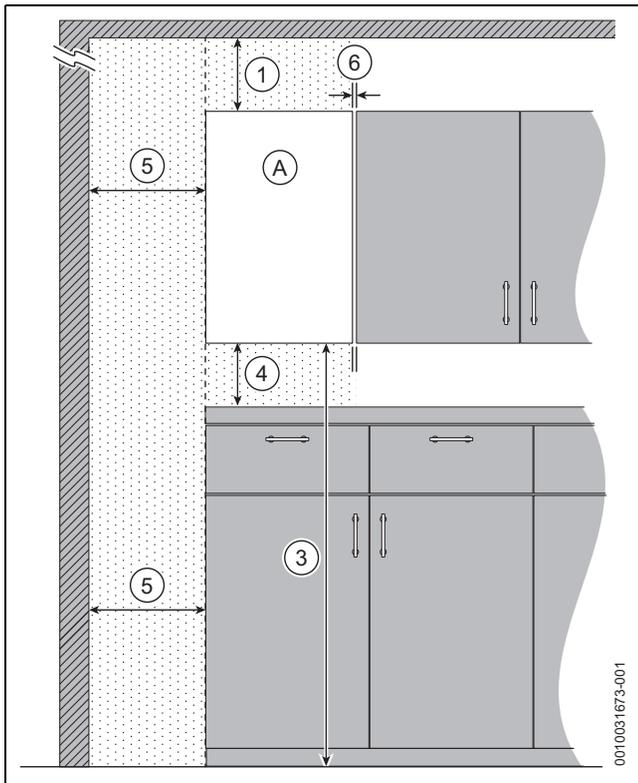


Fig. 19 Reduced front maintenance clearances - Front view

- [A] Appliance.
 [1] Above appliance - Same clearance required as for standard clearances of 60/100 flue or 80/125mm flue.
 [3] Bottom of appliance to the floor - 1,000 - 1,500mm.
 [4] Below appliance - 186mm
 [5] One side of appliance - Minimum 300mm.
 [6] One side of appliance - Minimum 5mm.

Roof space installation clearances



Important!

- In order to ensure personal safety when products are installed in roof spaces, the following criteria should be achieved. Failure to make proper provision for safe access to and maintenance of the product may affect the warranty.

Access:

- A permanently fixed, retractable loft ladder is required for safe access into the roof space.
 - The ladder must be installed to comply with the manufacturers instructions and the fixings used must be capable of safely supporting the full maximum load capacity of the ladder.
 - Step ladders, unsecured or temporarily secured ladders are not considered to provide safe access.
- Fixed lighting must be provided to ensure safe access to and at the working area.

Working area:

- The access route and working area must not be used as a storage space and must be kept completely clear.
 - It is not acceptable for anything that could result in an engineer slipping or tripping or that will obstruct his access to be stored in the access or working area.
 - If the working area does not extend to the loft hatch, any boards which are provided for access must be securely fixed to the ceiling joists. The access boarding must be at least 600mm wide. Joints must be properly supported and must not be overlapped.

- There must be provision for means of preventing accidentally stepping into the loft hatch.
 - Safety guard, handrail or safety chain to prevent accidentally stepping into the loft hatch.



The same work area and access requirements would be required for any floor standing equipment such as a cylinder.



Product clearances:

- Minimum clearances must be maintained around the product.

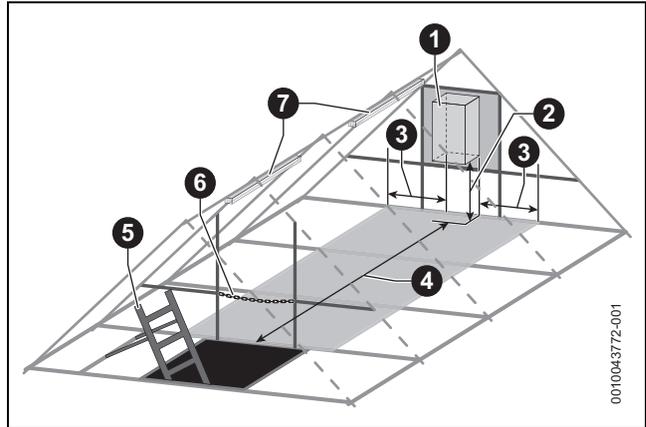


Fig. 20 Roof space installation clearances

- [1] Product
 [2] Clearance below
 [3] Side clearance
 [4] Front clearance
 [5] Permanently fixed, retractable loft ladder
 [6] Safety guard, handrail or safety chain
 [7] Fixed lighting

Minimum clearances		
	Description	Dimensions (mm)
2	Below the product to the loft floor boarding	600
3	Either side of product to the edge of the loft floor boarding	600
4	In front of product to the loft floor boarding or the loft hatch ¹⁾	1,200

- 1) The shortest distance must be applied. If the work area does not extend to the loft hatch, then there must be a safe walkway of at least 600mm wide to the boarded work area.

Table 10 Minimum clearances

4.6 Flue systems considerations



WARNING

Flue systems

Possible flue gas escape

- Use Worcester, Bosch Group approved Condensfit II flue systems only, no other manufacturer's flue have been tested or approved for use with Worcester, Bosch Group appliances.





CAUTION

Concealed flue systems:

- ▶ Where a flue system is going to be concealed, provision must be made for service and inspection.
- ▶ Voids containing concealed flues must have at least one inspection hatch no less than 300mm square.
- ▶ Flue joints within the void must not be more than 1.5 metres from the edge of the inspection hatch.
- ▶ Inspection hatches should be located at changes of direction.
- ▶ If this is not possible, bends should be viewable from both directions.



Refer to the manual supplied with the Worcester, Bosch Group flue kit for complete installation instructions.

Flue kit part numbers

Part number	Flue Ø	Description
7 733 601 245	60/100	4000 SimpleSwitch flue adaptor 60/100
7 716 191 082	60/100	Telescopic horizontal flue kit
7 716 191 171	60/100	Extended telescopic horizontal flue kit
7 733 600 048	60/100	Horizontal high level telescopic flue kit
7 719 003 702	80/125	Telescopic horizontal flue kit
7 719 002 430	60/100	Vertical balanced flue kit
7 719 002 431	80/125	Vertical balanced flue kit
7 733 600 298	60/100	1050mm horizontal fixed flue kit

Table 11 Flue kit assembly part numbers

4.6.1 Flue length

Maximum horizontal flue lengths

Appliance	Flue length [L]	
	60/100	80/125
GC4700iW 24 S	12,000mm	21,000mm
GC4700iW 21 S	12,000mm	21,000mm
GC4700iW 18 S	12,000mm	21,000mm
GC4700iW 15 S	16,000mm	20,000mm
	16,000mm	20,000mm

Table 12 Maximum flue lengths - Horizontal flues

Maximum vertical flue lengths

Appliance	Flue length [L]	
	60/100	80/125
GC4700iW 24 S	12,000mm	21,000mm
GC4700iW 21 S	12,000mm	21,000mm
GC4700iW 18 S	12,000mm	21,000mm
GC4700iW 15 S	16,000mm	20,000mm
	16,000mm	20,000mm

Table 13 Maximum flue lengths - Vertical flues

Flue system bends

NOTICE

Effective flue lengths of bends:

Each bend used has an equivalent straight flue length.

- ▶ Refer to table 14.

Bend	Effective flue length	
	60/100	80/125
45°	0.5m	0.5m
90°	1.5m	1.5m

Table 14 Effective length of bends

NOTICE

Effective flue length of SimpleSwitch flue adaptor:

The SimpleSwitch flue adaptor has an equivalent straight flue length.

- ▶ Refer to table 15.

Effective flue length	
60/100	80/125
4m	N/A

Table 15 Effective length of SimpleSwitch flue adaptor

4.6.2 Flue options

The systems have different maximum flue lengths, refer to the following example flue options for those maximum flue lengths.

Horizontal high level flue assembly

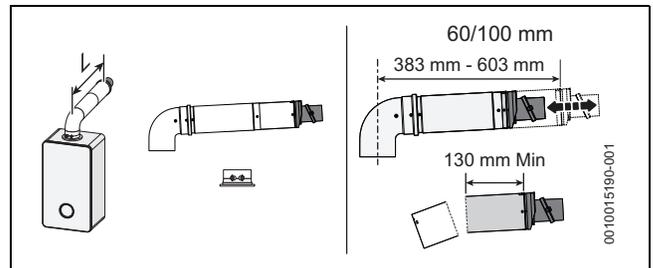


Fig. 21 Horizontal flue option

- Flue length [L] (initial bend included in length calculation)
 - 60/100 = 202 - 603mm
 - 80/125 = N/A

Telescopic horizontal flue assembly

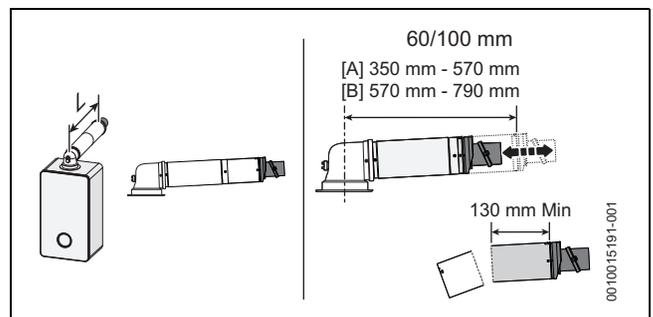


Fig. 22 Horizontal flue option

Telescopic horizontal flue assembly [A]

- Flue length [L] (adaptor bend included in length calculation)
 - 60/100 = 180 - 570mm
 - 80/125 = 405 - 600mm

Extended telescopic horizontal flue assembly [B]

- Flue length [L] (adaptor bend included in length calculation)
 - 60/100 = 570 - 790mm
 - 80/125 = N/A

Horizontal fixed length flue assembly

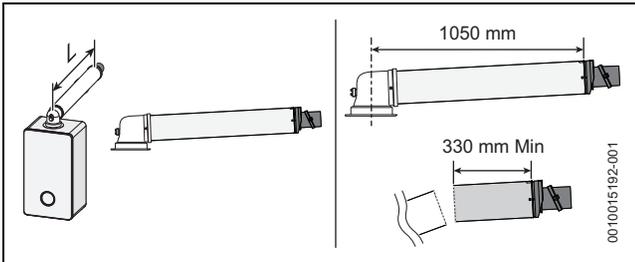


Fig. 23 Horizontal flue option

- Flue length [L] (adaptor bend included in length calculation)
 - 60/100 = 330 - 1,050mm
 - 80/125 = N/A

Extended horizontal flue

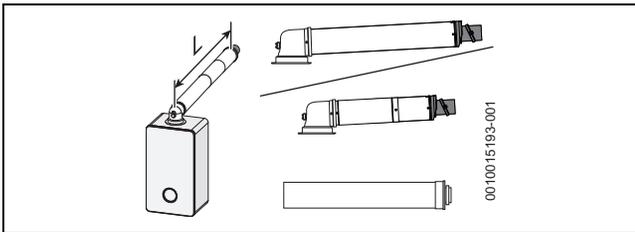


Fig. 24 Horizontal flue option

- Flue length [L] (adaptor bend included in length calculation)
 - Maximum flue length as stated in "Maximum horizontal flue lengths".

Horizontal flue with additional 90° elbow

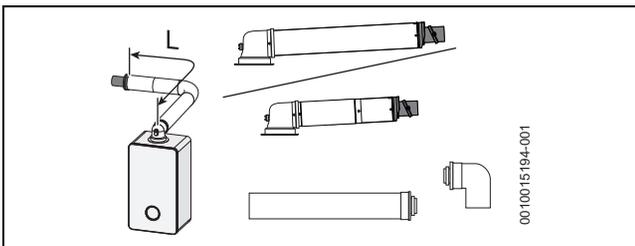


Fig. 25 Horizontal flue option

- Flue length [L] (adaptor bend included in length calculation)
 - Maximum flue length as stated in "Maximum horizontal flue lengths" minus the 90° bend equivalent straight flue length as stated in Table 14 "Effective length of bends".

Horizontal flue with additional 90° elbows

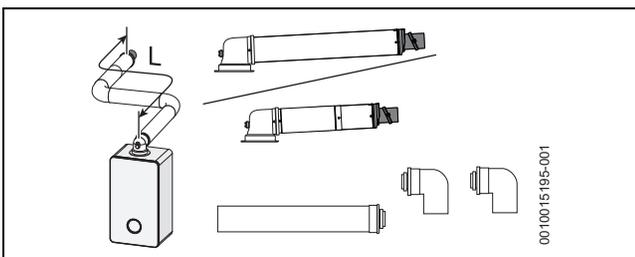


Fig. 26 Horizontal flue option

- Flue length [L] (adaptor bend included in length calculation)
 - Maximum flue length as stated in "Maximum horizontal flue lengths" minus 2 x 90° bends equivalent straight flue length as stated in Table 14 "Effective length of bends".

High level horizontal flue

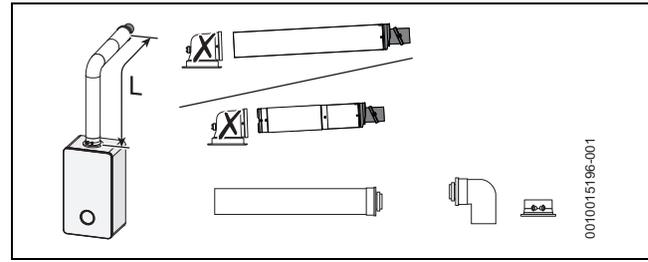


Fig. 27 Horizontal flue option

- Flue length [L] (initial bend included in length calculation)
 - Maximum flue length as stated in "Maximum horizontal flue lengths".

High level horizontal flue with additional 90° elbow

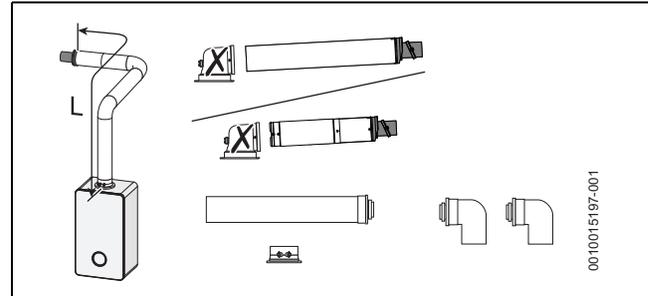


Fig. 28 Horizontal flue option

- Flue length [L] (initial bend included in length calculation)
 - Maximum flue length as stated in "Maximum horizontal flue lengths" minus the 90° bend equivalent straight flue length as stated in Table 14 "Effective length of bends".

High level horizontal flue with additional 90° elbows

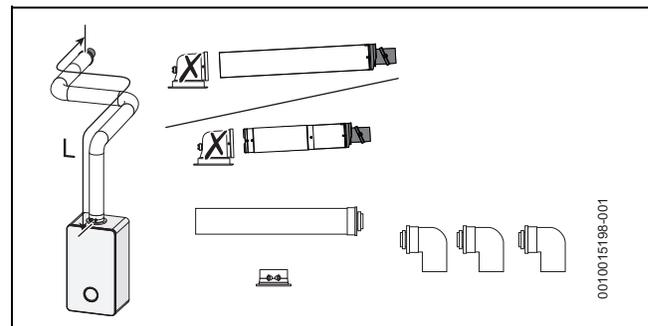


Fig. 29 Horizontal flue option

- Flue length [L] (initial bend included in length calculation)
 - Maximum flue length as stated in "Maximum horizontal flue lengths" minus 2 x 90° bends equivalent straight flue length as stated in Table 14 "Effective length of bends".

SimpleSwitch offset flue adaptor - horizontal

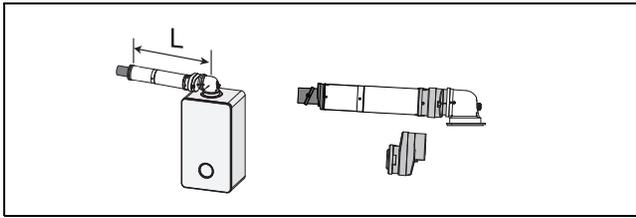


Fig. 30 SimpleSwitch flue adaptor

- Flue length [L]
 - Maximum flue length as stated in "Maximum horizontal flue lengths" minus the equivalent length of the SimpleSwitch flue adaptor as stated in table Table 15 "Effective length of SimpleSwitch flue adaptor".

Vertical balanced flue assembly

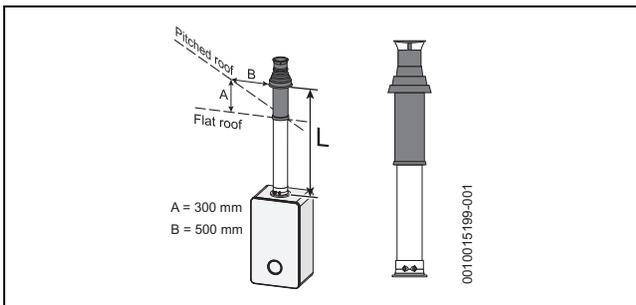


Fig. 31 Vertical flue option

- Flue length [L]
 - Maximum flue length as stated in "Maximum vertical flue lengths".

Vertical balanced flue with 90° elbow offset

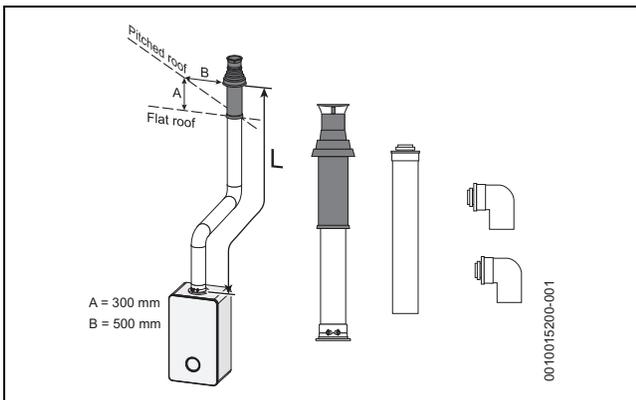


Fig. 32 Vertical flue option

- Flue length [L]
 - Maximum flue length as stated in "Maximum vertical flue lengths" minus 2 x 90° bends equivalent straight flue length as stated in Table 14 "Effective length of bends".

Vertical balanced flue with 45° elbow offset

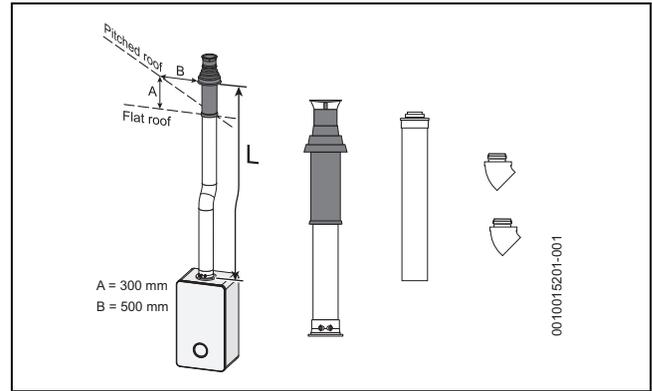


Fig. 33 Vertical flue option

- Flue length [L]
 - Maximum flue length as stated in "Maximum vertical flue lengths" minus 2 x 45° bends equivalent straight flue length as stated in Table 14 "Effective length of bends".

SimpleSwitch offset flue adaptor - vertical

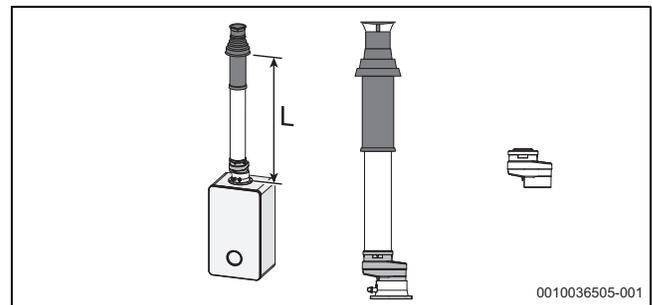


Fig. 34 SimpleSwitch flue adaptor

- Flue length [L]
 - Maximum flue length as stated in "Maximum vertical flue lengths" minus the equivalent length of the SimpleSwitch flue adaptor as stated in table Table 15 "Effective length of SimpleSwitch flue adaptor".

4.6.3 Plume management system

The maximum flue length allowed for 0.5m of plume is 9m, each additional 1m of plume reduces the flue length by 750mm, up to a maximum of 4.5m of plume management with 6m of flue.

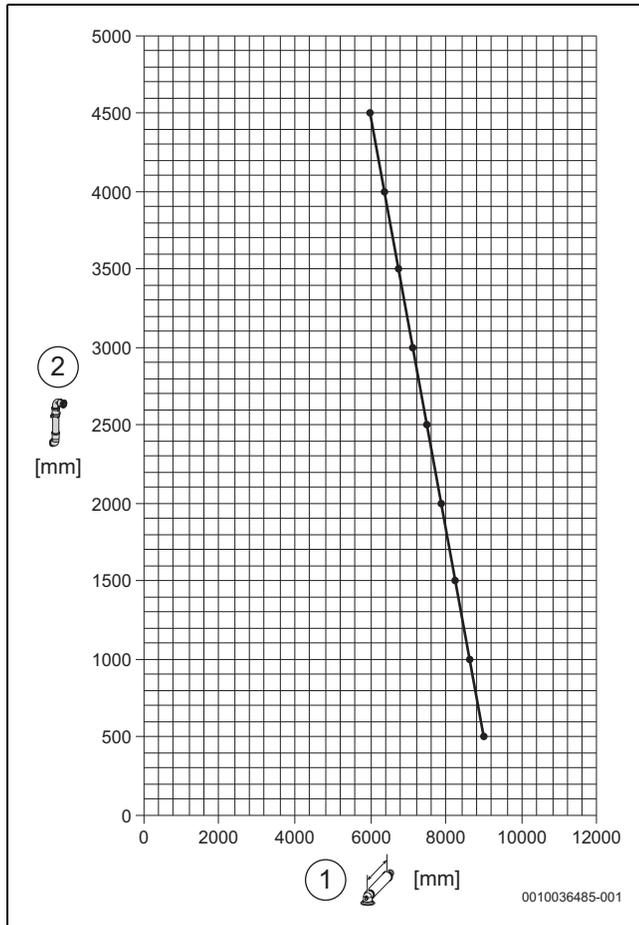


Fig. 35 Plume length to flue length graph

- [1] Flue length [mm] (maximum 9,000mm with minimum 500mm plume)
- [2] Plume length [mm] (maximum plume length 4,500mm)

NOTICE

Plume management terminal:

- ▶ The plume management terminal must not be sited within 500mm of the air intake, and must not exceed the maximum straight length for a horizontal Ø 60/100mm flue with a 60mm plume management system.



Horizontal plume management runs

- ▶ The initial horizontal run from the terminal elbow must have a minimum 10° fall back, (stop tabs in the elbow prevent less than 10°) to the appliance for proper disposal of condensate.
- ▶ Any further horizontal runs after an elbow can be 3°.

WARNING

Minimum plume management length:

The minimum distance of 500mm must be maintained between air inlet and exhaust.

- ▶ Do not terminate the plume management inside the terminal exclusion zone (shaded area) shown in figure 36.

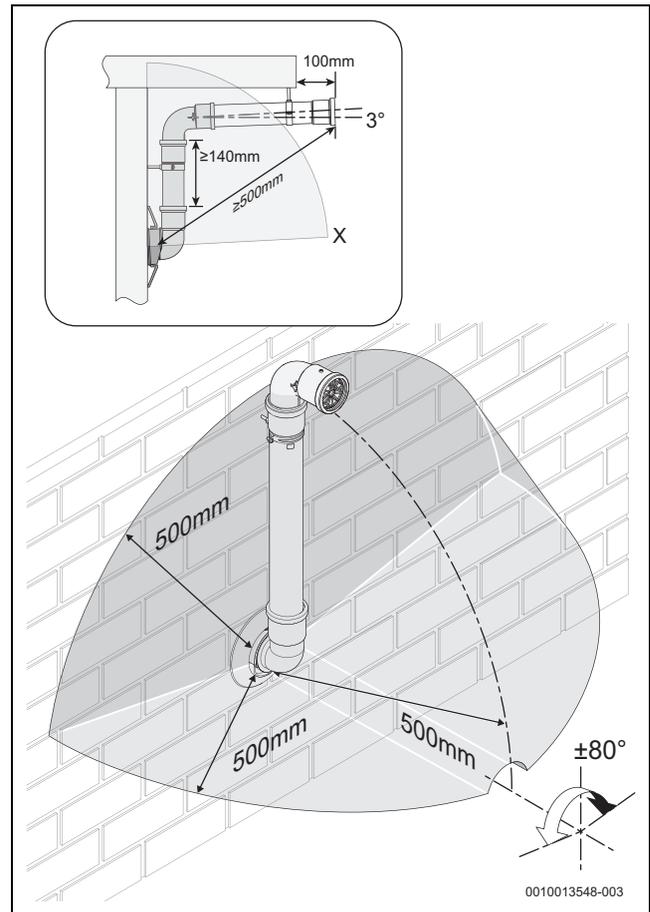


Fig. 36 Terminal exclusion zone

NOTICE

Cutting the 500mm pipe

- ▶ The Plume management extension kit contains the components required for such a configuration.

Plume management bends

NOTICE

Effective plume management lengths of bends:

Each bend used has an equivalent straight plume management length.

- ▶ Refer to the table 16.

Bend	Effective plume management length
45°	0.75 metres
90°	1.5 metres

Table 16 Effective length of bends

4.6.4 Flue terminal positions

CAUTION

Flue terminal positions

- ▶ All measurements are the minimum clearances required.
- ▶ Terminals must be positioned so to avoid combustion products entering the building.

Vertical flue terminal positions

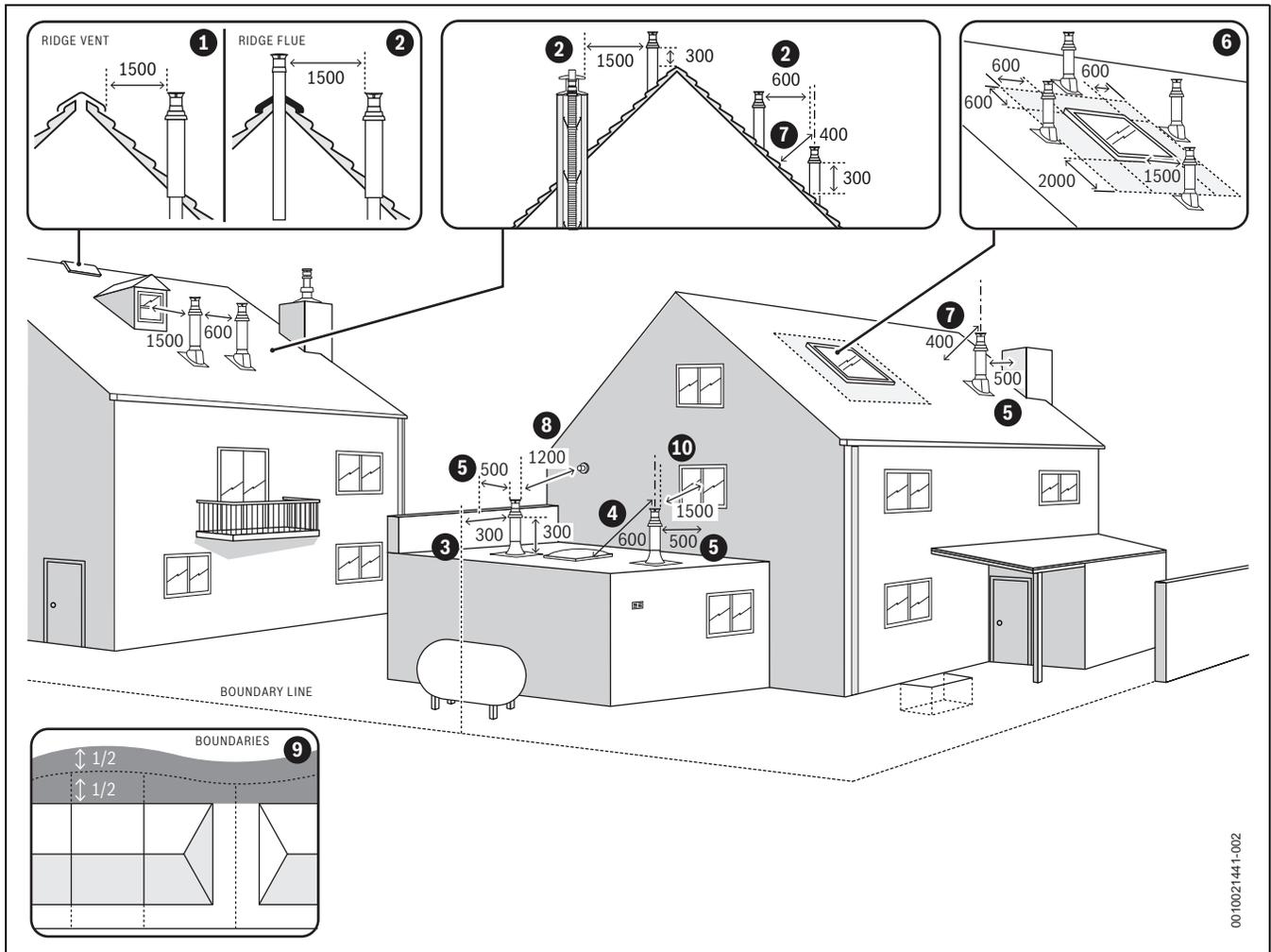


Fig. 37 Vertical flue terminal positions

Key to figure 37:

- [1] 1,500mm measured between a vertical flue terminal and an opening or vented window. 500mm measured horizontally between a vertical flue terminal and an opening or vented window providing the flue terminal is at least 300mm above the opening.
- [2] Minimum clearance to an additional flue, 600mm to a room sealed flue or 1,500mm to an open flue.
- [3] 300mm clearance from a vertical flue terminal adjacent to a boundary line, unless it will cause a nuisance. BS 5440: Part 1 recommends that care is taken when siting a terminal in relation to boundary lines.
- [4] 600mm minimum clearance measured from an opening or vented skylight to a vertical flue terminal. If the terminal is within 1,500mm of the opening or vented skylight then it must be at least 300mm above the opening.
- [5] 500mm clearance measured horizontally from a vertical flue to a vertical structure.
Not required if the terminal is 300mm above the structure.
- [6] The flue must not penetrate the roof in the shaded area. The terminal must be at least 1,500mm from the opening or vent when sited below the window or 600mm when sited to either side or above.
- [7] 400mm measured diagonally from a pitched roof or 500mm in regions with heavy snow fall. 300mm measured vertically from the air intake to the closest intersection with the roof.
- [8] 1,200mm separation measured between a vertical flue and a horizontal flue terminal.
- [9] For the purpose of determining suitable flue terminal positions for gas appliances, the boundary can be considered to extend to the

- centre line of any adjacent routes or waterways e.g. paths, streets, rights of way, canals, rivers or railways.
- [10] 1,500mm measured between a vertical flue terminal and an opening or vented window. 500mm measured horizontally between a vertical flue terminal and an opening or vented window providing the flue terminal is at least 300mm above the opening.

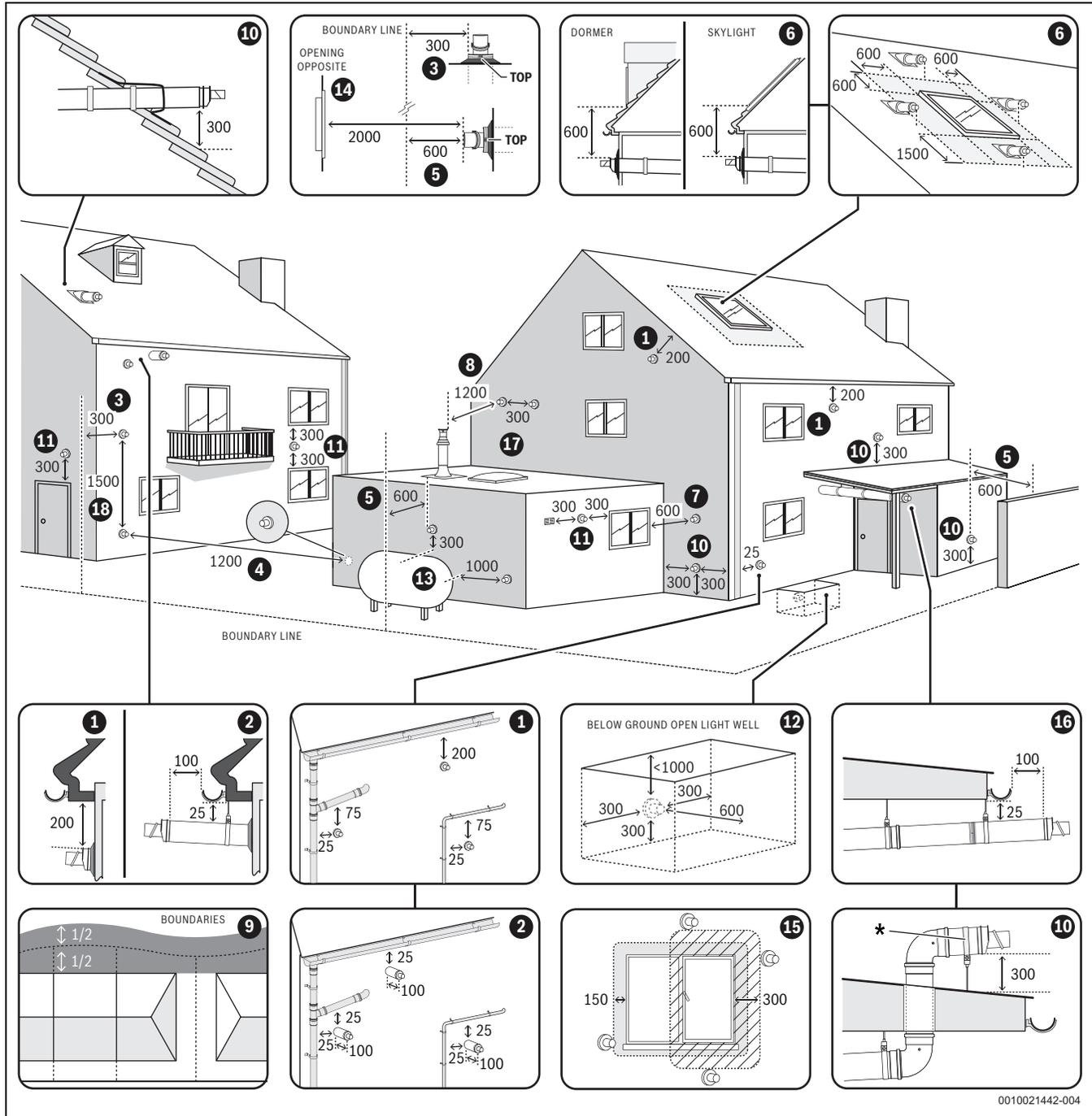


Note:

- Where a vertical flue terminates in an area that is enclosed on 3 sides, the flue must be no more than 1,000mm below the lowest roof line. You must ensure that all clearances are maintained and that products of combustion disperse safely from the area.

0010021441-002

Horizontal flue terminal positions



0010021442-004

Fig. 38 Horizontal flue terminal positions

Key to figure 38:

- [1] 200mm below eaves and 75mm below gutters, pipe and drains.
- [2] The dimension below eaves, gutters, pipes and drains can be reduced to 25mm, as long as the flue terminal is extended by 100mm past any overhang. The telescopic flue joint must be sealed with suitable silicone sealant if it is external to the building.
- [3] 300mm adjacent to a boundary line, unless it will cause a nuisance. BS 5440: Part 1 recommends that care is taken when siting terminal in relation to surfaces or boundary lines.
- [4] 1,200mm separation measured between terminals facing each other.
- [5] 600mm distance to a surface or boundary line facing a terminal, unless it will cause a nuisance. BS 5440: Part 1 recommends that care is taken when siting terminal in relation to surfaces or boundary lines.
- [6] The terminal must be at least 1,500mm from the opening or vent when sited below the window or 600mm when sited to either side or above.
- [7] 600mm diagonally to an opening door, air vent or opening window.
If the flue terminal is at least 300mm above the adjacent opening door, air vent or opening window, then the diagonal measurement does not apply.
- [8] 1,200mm separation measured between a vertical flue and a horizontal flue terminal.
- [9] For the purpose of determining suitable flue terminal positions for gas appliances, the boundary can be considered to extend to the centre line of any adjacent routes or waterways e.g. paths, streets, rights of way, canals, rivers or railways.
- [10] 300mm to an internal or external corner. 300mm above a surface, such as the ground/ floor level or roof surface.
* If the terminal section is less than 150mm and has two screws securing it to the elbow, the terminal section will not require a supporting bracket.
- [11] 300mm above, below and either side of an opening door, air vent or opening window.
- [12] Below ground level in an open lightwell. The flue must be at least 600mm from the opposing surface and have at least 300mm clearance either side and below. The flue terminal must be no more than 1,000mm from the top of the lightwell.
- [13] Flues should clear any LPG storage by 1,000mm horizontally and 300mm above.
- [14] Proximity of flue duct outlet to boundaries, 2,000mm distance to an opening in adjacent building facing a terminal. BS 5440: Part 1 recommends that care is taken when siting terminal in relation to boundary lines.
- [15] 300mm from an opening or vented window, 150mm to a fixed unvented window.
- [16] The dimension below eaves, balconies and car ports can be reduced to 25mm, as long as the flue terminal is extended to clear any overhang. The telescopic flue joint of the terminal must be sealed with suitable silicon sealant if it is external to the building.
- [17] 300mm Horizontally from a terminal on the same wall.
- [18] 1500mm Vertically from a terminal on the same wall.

**Note:**

- ▶ Installations in car ports are not recommended.
- ▶ The flue cannot be lower than 1,000mm from the top of a light well due to the build up of combustion products.
- ▶ Dimensions from a flue terminal to a fanned air inlet to be determined by the ventilation equipment manufacturer.
- ▶ A flue terminal guard shall be fitted whenever a terminal or air inlet is fitted less than 2,000mm above ground, above a balcony or above a flat roof to which people have access.

4.6.5 Plume re-direct and plume management terminal positions



Maximum and minimum plume management lengths:

- ▶ A minimum distance of 500mm must be maintained between the plume management outlet and the flue air intake.
- ▶ The maximum plume management length is 4.5 metres for the appliances detailed on the front of this manual.
- ▶ The 45° bend is equivalent to 0.75 metres of straight plume management and the 90° bend is equivalent to 1.5 metres.

NOTICE

- ▶ All measurements are the minimum clearances required.
- ▶ Refer to “Horizontal flue terminal positions” for all concentric flue terminal positions unless the flue position is specified in figure 39 “Plume re-direct and plume management terminal positions”.
- ▶ Terminals must be positioned so to avoid combustion products entering the building.
- ▶ Support the flue at approximately one metre intervals and at a change of direction, use suitable brackets and fittings.

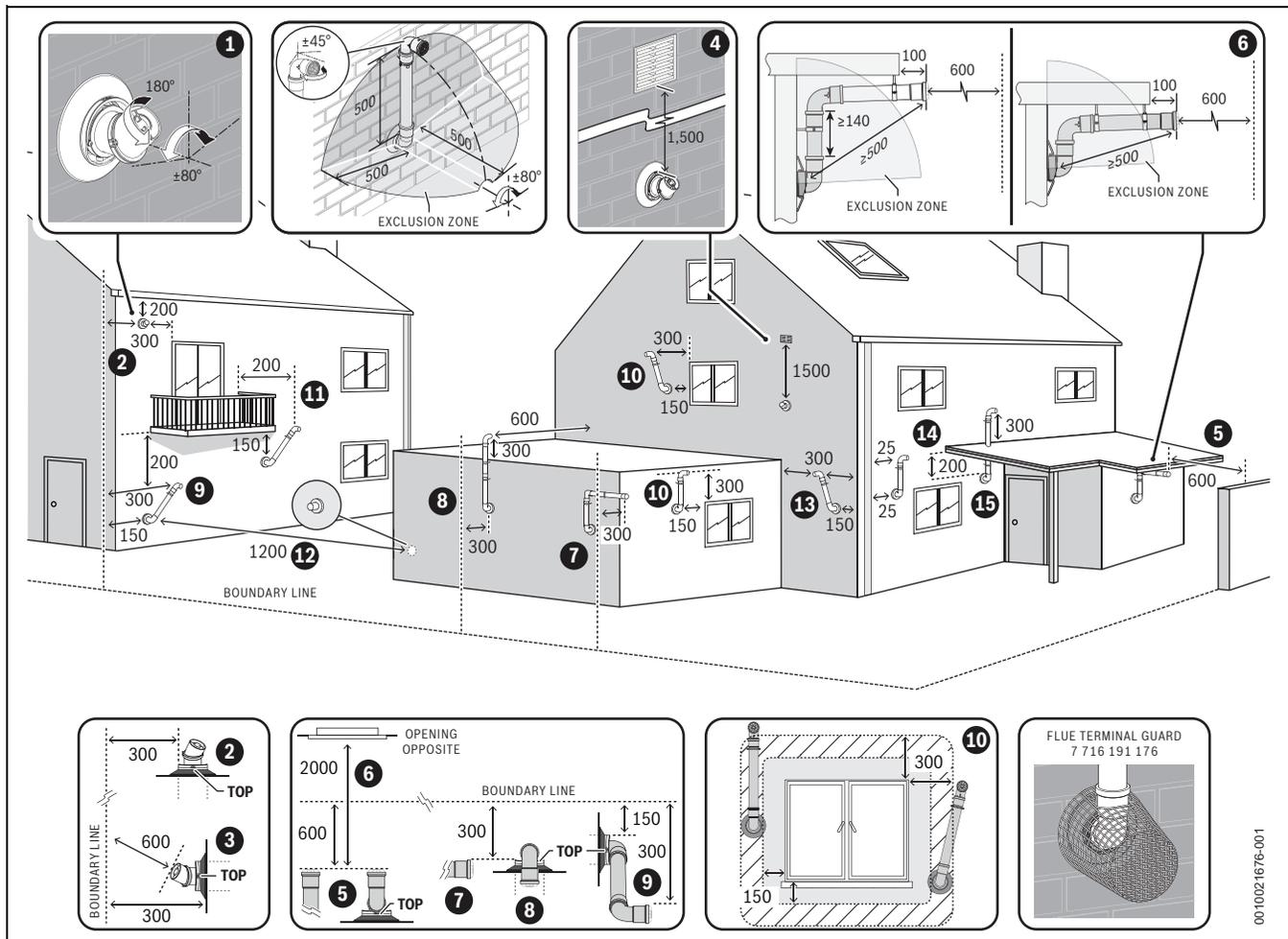


Fig. 39 Plume re-direct and plume management terminal positions

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Key to figure 39
- Plume re-direct terminal positions:

- [1] This feature allows some basic plume re-direction options on a standard telescopic horizontal flue terminal.
300mm minimum clearances to an opening e.g. window.
However the minimum clearances to an opening in the direction that the plume management is facing, must be increased to 1,500mm.
Where the flue is less than 150mm to a drainpipe and plume redirection is used the deflector should not be directed towards the drainpipe.
- [2] 300mm adjacent to a boundary line, unless it will cause a nuisance. BS 5440: Part 1 recommends that care is taken when siting terminal in relation to surfaces or boundary lines.
- [3] Where the flow of products of combustion is not at right angles to the boundary, the 600mm dimension may be measured in the direction of flow as long as the terminal is not less than 300mm from the boundary.
- [4] When redirecting the flue discharge the terminal end must be at least 1,500mm from any opening in the direction of the discharge to prevent combustion products from entering the building.

Key to figure 39
- Plume management terminal positions:

- [5] 600mm distance facing a surface or a boundary line, unless it will cause a nuisance. BS 5440: Part 1 recommends that care is taken when siting a terminal in relation to surfaces or boundary lines.
- [6] Proximity of flue duct outlet to boundaries, 2000mm distance to an opening in adjacent building facing a terminal. BS 5440: Part 1 recommends that care is taken when siting terminal in relation to boundary lines.
- [7] 300mm adjacent to a boundary line, unless it will cause a nuisance. BS 5440: Part 1 recommends that care is taken when siting terminal in relation to surfaces or boundary lines.
- [8] 300mm distance from a boundary line to the air intake as long as the exhaust terminal faces away from the boundary line. The exhaust terminal must have a minimum 300mm clearance to a surface below and there must be at least 600mm clearance when measured horizontally in a straight line from the exhaust terminal to any other surface.
- [9] Plume Management kit air intake can be reduced to 150mm providing the flue exhaust outlet is no less than 300mm adjacent to a boundary line.
- [10] Above, below and either side of an opening door, air vent or opening window.
Using a Plume Management kit the air intake measurement can be reduced to 150mm providing the flue exhaust outlet has a 300mm clearance.
- [11] Below balcony or overhang. The air intake clearance can be reduced to 150mm providing the flue exhaust outlet has a 200mm clearance.
- [12] 1,200mm between terminals facing each other¹⁾.
- [13] Internal/external corners. The air intake clearance can be reduced to 150mm providing the flue exhaust outlet has a 300mm clearance.
- [14] Clearances no less than 200mm from the lowest point of the balcony or overhang.
- [15] If a plume management kit is installed within the confines of a carport or other covered, partially enclosed extension, then the exhaust terminal must be positioned at least 1200mm away from any opening into the building which is sited within the footprint of

1) 600mm in case two plume management kits are used on opposing terminals. Each terminal should use a minimum length of 500mm plume management.

the carport.

If the exhaust terminal is extended at least 300mm beyond the footprint of the carport then the distance from the terminal to an opening within the carport can be reduced to 600mm.

The exhaust terminal can also be routed though the roof of the carport providing 25mm clearance is provided around the flue pipe to any flammable material and that it extends at least 300mm above the roof.

The air intake must have a minimum 150mm clearance to any opening in the building in order to ensure the integrity of the structure is maintained. If the exhaust terminates within the footprint of the carport then the carport must have at least 2 sides completely open. If the exhaust terminates at least 300mm beyond the footprint of the carport then the carport must have at least one completely open side. The exhaust terminal must be positioned to ensure that plume will not cause nuisance or damage to vehicles and that minimum clear distances in front of the terminal will not be impeded by vehicles.



Note:

- ▶ Installations in car ports are not recommended.
- ▶ The flue cannot be lower than 1,000mm from the top of a light well due to the build up of combustion products.
- ▶ Dimensions from a flue terminal to a fanned air inlet to be determined by the ventilation equipment manufacturer.
- ▶ Plume kits running horizontally must have at least a 3° fall back to the appliance for proper disposal of condensate, except or the initial horizontal run from the terminal.
The initial plume kit horizontal run will have at least a 10° fall back to the appliance, due to the terminal elbow design, for proper disposal of the condensate.

4.7 Condensate discharge

4.7.1 Appliance siphonic condensate trap

The appliance has a large capacity condensate trap reducing the risk of condensate discharge pipework freezing up in prolonged cold temperatures.

The expanded siphonic operation discharges every 10 to 20 minutes. Resulting in:

- Increased velocity and flow rate.
- With less frequent siphonic actions per hour, the condensate pipework is empty for longer.
- Significantly reducing freezing potential for a 48 hour period at -15 °C, provided the installation parameters listed below are followed.

4.7.2 Internal connections



Good Practice

- ▶ The following guidance indicates the good practices that must be maintained for the Installation and Maintenance of a product.

Condensate pump

→ Figure 40

Where direct connection to “gravity discharge” pipework is not physically possible, or where very long internal runs would be required to reach a suitable discharge point, condensate should be removed using a proprietary condensate pump, of a specification recommended by the condensate pump manufacturer.

- The pump outlet should discharge to a suitable “gravity discharge” outlet.
 - The condensate then flows, by gravity, through the 22mm plastic pipe to the condensate discharge point.

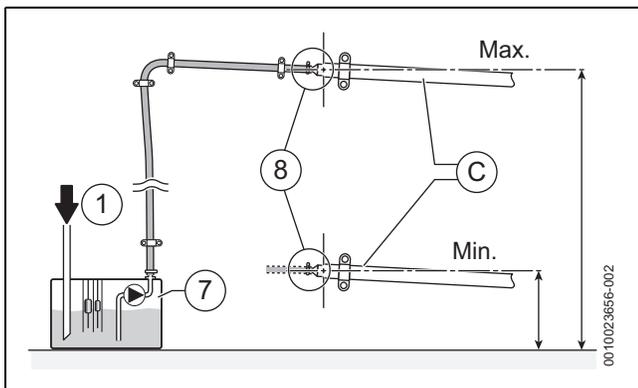


Fig. 40 Condensate pump example

- [1] Condensate discharge from appliance
- [7] Condensate pump
- [8] Pipework transition
- [C] Gravity discharge pipework



Proprietary condensate pump

- ▶ Ensure minimum and maximum pump lifting heights are followed as per condensate pump manufacturers instructions.

4.7.3 External connections

NOTICE

Septic tanks

Untreated condensate must not be allowed into septic tanks.

- ▶ Connection to systems which drain into a septic tank should be avoided due to the risk of affecting anaerobic bacteria.



Good Practice

- ▶ The following guidance indicates the good practices that must be maintained for the Installation and Maintenance of a product.



Minimum Standard

- ▶ The following guidance indicates the minimum standards that must be maintained for the Installation and Maintenance of a product.

4.8 Pressure relief discharge

4.9 Cleaning primary systems

NOTICE

Risk of damage to system or appliance!

Debris from the system can damage the appliance and reduce efficiency. Failure to comply with the guidelines for the use of water treatment with the appliance will invalidate the appliance guarantee and contravene the Building Regulations.

- ▶ It is a requirement of the Building Services Compliance Guide which is a second tier document to the Building Regulations to flush and inhibit the primary water system in accordance with BS 7593.
- ▶ The Building Services Compliance Guide recommends that a primary water cleanser is fitted to the system.
- ▶ Worcester Bosch recommend fitting a filter that will help remove both magnetite and non-magnetic debris. Bosch offers various filters that helps remove both magnetite and non-magnetic debris; see accessories list for available options.

NOTICE

Risk of damage to system or appliance!

- ▶ Salt based, artificially softened water that adjusts the pH value MUST NOT be used to fill the system.
- ▶ Alternatively there are water softening/treatment products that do not adjust or alter the pH levels of the water. With these products it may not be necessary to provide an untreated water by-pass to the primary water filling point of the heat system

NOTICE

Sealing agents

Normally the addition of sealing agents to the system water is not permitted as this can cause problems with deposits left in the heat exchanger.

- ▶ Heating systems may lose small amounts of water over time. In cases where all attempts to find a system micro leak have failed, Worcester, Bosch Group supports the use of Fernox F4 leak sealer.

Before cleaning the system:

- ▶ Ensure that the system and pipework is in good working order.
- ▶ **Where possible keep the existing appliance/circulating pump in place when flushing the system before installing the new appliance. Alternatively use an after market power flushing system or similar to remove magnetite and other debris from the central heating system.**
 - Even new central heating systems contain contaminants that need to be removed before treating the system with inhibitor/anti-freeze.
 - When an appliance is installed onto a new system then it is possible to use the appliance whilst cleaning the system. A system filter must be fitted to the return to reduce the risk of contaminants entering the appliance.
- ▶ **Follow the guidance of BS7593.**

Inhibitor

Add a suitable inhibitor or combined inhibitor/anti-freeze, if the system is exposed to freezing conditions, to the heating system in accordance with the DWTa code of practice and manufacturer’s guidelines.

Products approved to the BuildCert standard are deemed as compatible with the components and equipment within the appliance and system.



The inhibitor or combined inhibitor/anti-freeze must not cause damage to the materials within the appliance (aluminium, mild steel, stainless steel, copper and brass) and any other materials/components within the system.

- ▶ The concentration level of inhibitor in the system should be checked every 12 months or sooner if system content is lost.

5 Installation

5.1 Safety instructions

⚠ Risk of explosion from escaping gas!

Escaping gas can cause an explosion.

- ▶ Ensure the mains gas supply is isolated before starting any work and follow all relevant safety precautions.

⚠ Risk of poisoning due to escaping flue gases!

Flue gases can escape from incorrectly assembled flue system.

- ▶ Ensure the flue system is correctly installed in accordance to the flue installation instructions.
- ▶ Ensure you carry out a flue integrity check when commissioning the appliance.

5.2 Installing the appliance

5.2.1 Preparatory work



The appliance packaging and base tray are designed so that the appliance can be tilted backwards onto the outer carton. The carton then becomes a protective mat.

Now remove the front casing and set safely aside. This is to protect the casing from damage during installation.



The front casing is secured with two screws which are critical to maintain the case seal and to prevent unauthorised removal (electrical safety).

- ▶ Always secure the casing with these screws.

Removing the front casing during unpacking.

- ▶ Loosen the two screws [1] and lift the bottom of the casing clear of the screws.
- ▶ Lift off the casing.

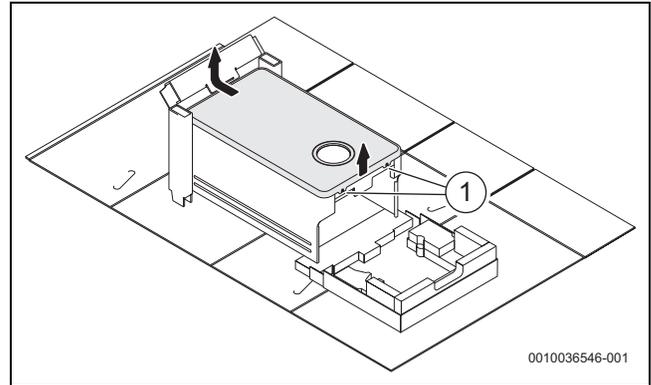


Fig. 41 Removing the front casing

Additional requirements for roof space installations

- The unpacked appliance can now be moved into the loft space
- Two sets of steps should be used.
- Two people should share the lifting of the appliance up to the loft hatch, tilt and slid on its back into the loft space.
- Ensure that the roof space has permanent fixed lighting, a permanent fixed retractable ladder and a fixed floor area, from the hatch to the appliance installation point. This will allow access for installation, normal use and servicing.



Before installing the appliance, ensure that the system has been cleaned.

5.2.2 Position the appliance

NOTICE

Incorrect mounting can cause material damage.

If the appliance is mounted incorrectly, it may fall off the wall.

- ▶ Ensure the appliance is mounted onto a flat, fixed rigid surface capable of supporting the appliance weight.
- ▶ Only use screws and rawl plugs that are suitable for the wall type and weight of the appliance.
- ▶ Ensure all aspects of the installation are considered when positioning the appliance, flue run and discharge, condensate disposal, PRV discharge etc.

Mounting frame fixing



Existing wall fixings positions may be used if the old boiler was an i System.

- ▶ The existing wall fixings can be used only if deemed suitable.
- ▶ In all cases, the 2 bottom fixings will align with i System wall frames. In SimpleSwitch cases it is recommended to fix the bottom screws and use the wall frame itself as the template for top fixings.



Alternate position for PRV pipe is available for SimpleSwitch.

- ▶ PRV pre-plumbing connector (elbow) can be rotated to the right (approx. 45°) to line up with pre-existing PRV installation pipework of i System.



If replacing an i System then a SimpleSwitch flue adaptor (7 733 601 245) is available for vertical flues or horizontal side flue outlets. This accessory enables the use of the existing flue hole. This is only relevant for 60/100mm flues.

Prepare to install the appliance

- ▶ Remove the packaging, observing all notices in the packaging.
- ▶ Make sure that the gas type specified on the data plate is the same as the gas type supplied.
- ▶ Make sure that the installation location is in the country of destination specified on the data plate.
- ▶ Affix an installation template (if available) to the wall.
- ▶ Select suitable screws and rawl plugs for the appliance mounting.
- ▶ Drill suitable holes for the selected rawl plugs and screws.
- ▶ Fasten the wall frame with connection plate to the wall using the selected rawl plugs and screws.



Wall mounting template

- ▶ The wall mounting template has been sized to allow for the minimum clearances around the appliance, (→ section 4.5.2 "Appliance clearances").

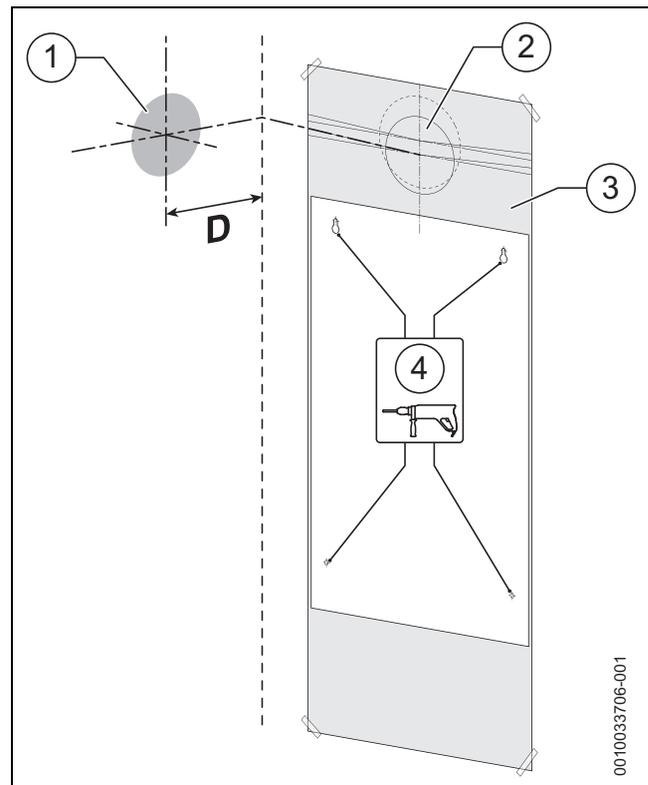


Fig. 42 Wall mounting template

- 1 Side exit flue example
- 2 Rear exit flue example
- 3 Wall mounting template
- 4 Primary fixing points
- D 135mm

The appliance wall mounting template shows the relative positions of the flue and the top and bottom fixings of the wall mounting frame.

- ▶ Fix the wall mounting template [3] to the wall in the desired position.
- ▶ Drill the holes [4] through the template for the primary fixing points as indicated on the template.
 - Additional fixing points for the appliance will be indicated on the wall mounting template.
 - The bottom fixing holes **must** be used as the plumbing manifold is not robust enough to support the appliance.

Flue outlet position.

The appliance wall mounting template has the flue centre lines for the following flue systems:

- 60/100mm
- 80/125mm



Flue turret adaptor

- ▶ The flue turret adaptor has an in-built 3° angle giving the flue assembly the rise from the appliance to ensure the condensate flows back to the appliance.

Rear flue outlet [2].

- ▶ Mark centre line of flue to be used; the external diameter of the hole can also be marked if required.
- ▶ If extensions are to be added then the complete flue must rise at an angle of 3° from the appliance.

Side flue outlet [1].

- ▶ Mark from the centre line of the wall mounting template to the wall which the flue will pass through.
- ▶ Allow for a rise of 52mm per metre length of flue, to give a 3° angle.

Example hole size.

- If a 60/100mm diameter flue is to be used, a 125mm diameter hole is required.
- If using the weather sealing collar by pushing it through from inside the property, then a 150mm diameter hole is required to accommodate this.

Flue outlet position marked and ready to drill hole.

- ▶ Drill hole using a core drill or similar.
- ▶ Clear any debris from the site.

Appliance fixings and flue outlet drilled and ready.

- ▶ Remove the wall mounting template.

5.2.3 Appliance connections

WARNING

Appliance - gas connection

- ▶ **Ensure the mains gas supply is isolated before starting any work and follow all relevant safety precautions.**

NOTICE

Appliance - hydraulic connections

- ▶ Ensure all water pipework, to be connected, are isolated/drained and follow all relevant safety precautions.
- ▶ Be careful of plastic components when using a naked flame on pipework.

i Surplus water may be present inside the appliance due to factory testing.

i External condensate pipework or internal pipe runs in unheated areas such as lofts, basements and garages exposed to prolonged cold temperatures should be protected (→ chapter 4.7).

Plumbing manifold

i Further guidance on pipe routing can be found printed on the appliance template (supplied with the appliance).

i For further ease of fitting, an optional Vertical Pre-piping Assembly kit (7 733 601 250) is available, comprising of pre-formed copper CH and DHW pipes.

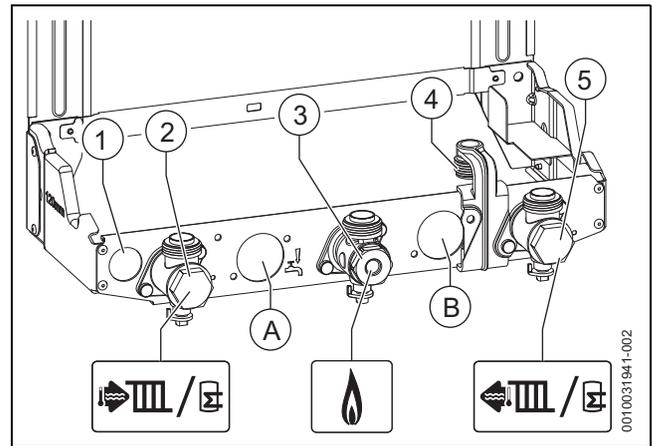


Fig. 43 Connections on the gas and water side

- [1] Position for condensate pipe.
- [2] Central Heating/ Cylinder Flow.
- [3] Gas connection.
- [4] PRV pre-plumbing connection locator bracket.
- [5] Central Heating/ Cylinder Return.
- [A] Position for optional integral diverter valve kit, Cylinder Flow connection.
- [B] Position for optional integral diverter valve kit, Cylinder Return connection.

Condensate discharge connection preparation

Pre-fit the plastic condensate drain pipe through the wall frame as shown in figure 44.

- ▶ Secure the pipe to the wall at the last joint.
- ▶ Ensure the pipe protrudes through the wall frame by 25mm [D].
- ▶ If exiting through the wall, to run externally, the pipe must have a 3° fall and be increased to a 32mm insulated pipe.

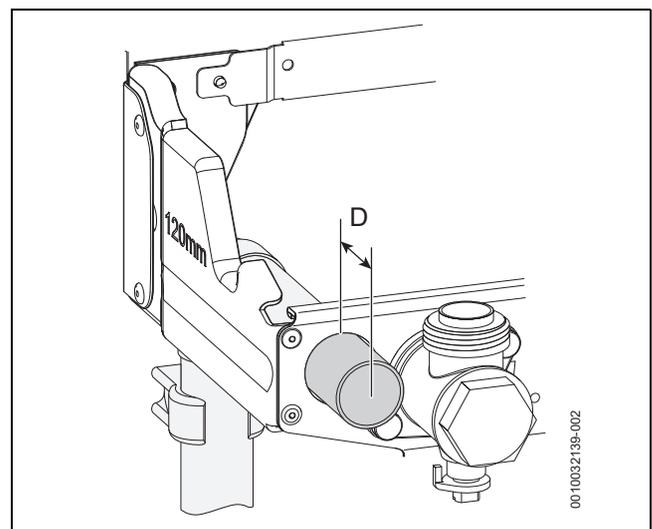


Fig. 44 Condensate drain pipework detail

[D] Protrusion dimension - 25mm

PRV pre-plumbing connection preparation

NOTICE

Risk of damage to appliance!

Hanging the appliance before the PRV pipe is installed can risk damaging hydraulic components.

- ▶ Install the PRV pipe before the appliance is mounted to the wall frame.



The PRV elbow has been designed to also be SimpleSwitch to the i Junior and Si boilers. The PRV pre-plumbing connector can be routed to the right (approx. 45°) to line up with pre-existing PRV pipework from i Junior and Si boilers.

- ▶ Connect PRV pre-plumbing connector to pre-existing PRV installation pipework
-
- ▶ Fit the PRV pre-plumbing connector [2] to the PRV locator bracket [1] as shown in the figure 45.
 - The elbow (PRV pre-plumbing connector) [2] is supplied with the appliance.
 Once the wall frame has been mounted the PRV discharge pipe can be fitted.
 - ▶ Connect the PRV discharge pipe [3] to the PRV pre-plumbing connector [2].
 - ▶ The discharge pipe [3] can be routed as required.



The PRV locator bracket [1].

- ▶ This bracket must be removed before the appliance is hung on the wall frame.

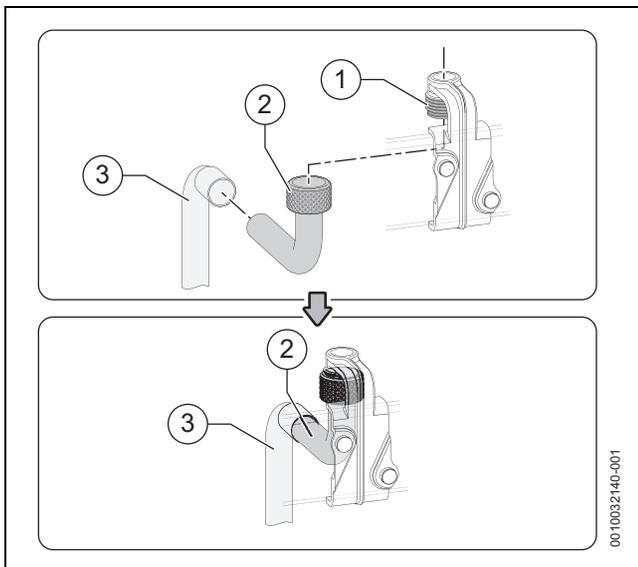


Fig. 45 PRV connection preparation

5.2.4 Hanging the appliance

NOTICE

Transport protection covers

- ▶ Remove any internal transport packaging and protection covers from the appliance where applicable.

Before hanging the appliance

- ▶ Install any accessories to the mounting frame before continuing.
- ▶ Ensure the sealing washers are fitted to the appropriate service valves before installing the appliance onto the mounting frame.
- ▶ Ensure that the control panel is in its closed position before lifting the appliance.

Preparing the service valves



The bonded washer supplied is for the Gas connection only.

- ▶ Fit the sealing washers to the service valves before hanging the appliance.

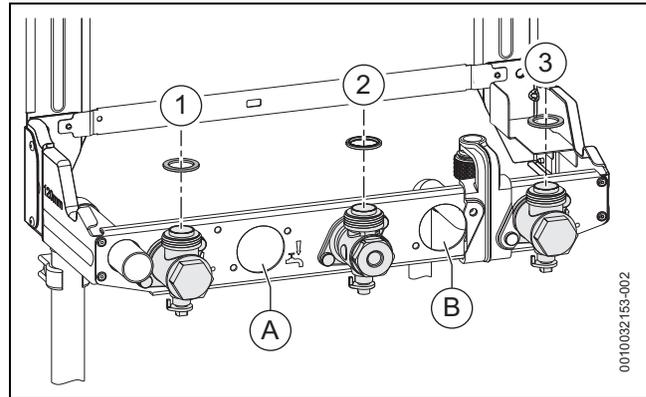


Fig. 46 Fitting the sealing washers

- [1] Central Heating Flow (22mm)
- [2] Gas Inlet (22mm bonded washer)
- [3] Central Heating Return (22mm)
- [A] Position for optional integral diverter valve kit, Cylinder Flow connection (15mm).
- [B] Position for optional integral diverter valve kit, Cylinder Return connection (15mm).

Preparing the wall frame

- ▶ Remove the temporary PRV pre-plumbing connector [3]:
 - Unscrew the PRV outlet pipe [2] from the pre-plumbing connector [3].
 - Remove the screw [4] holding the pre-plumbing connector [3] in place.
 - Remove the pre-plumbing connector [3], and discard.
 - Replace the screw [4] removed earlier and tighten firmly.



Removing the pre-plumbing connector [3] when the optional integral diverter valve kit fitted.

- ▶ There will be an additional screw for retaining the cylinder return connection service valve to be fitted.

- ▶ Fit the sealing washer for the PRV before hanging the appliance.
- ▶ The appliance is mounted on the wall frame utilising the central mounting point [1], at the top of the wall frame.

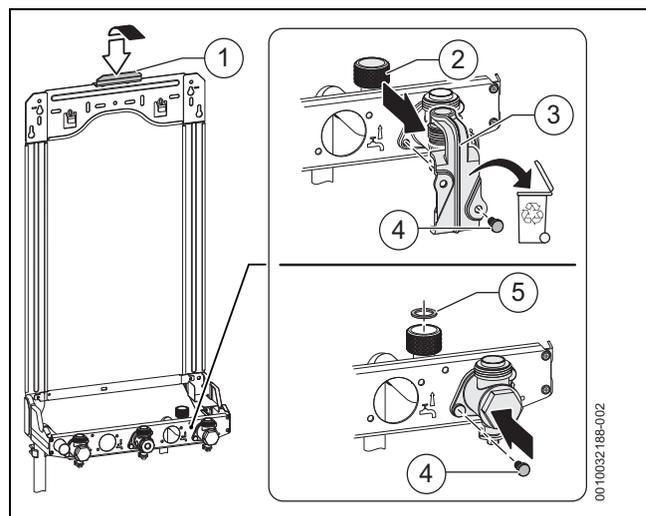


Fig. 47 Wall frame preparation

Hanging the appliance

WARNING

Bonded washer (plumbing manifold gas connection)

▶ The bonded washer must be used on the gas pipe isolating valve connection.

▶ Ensure the sealing washers are correctly seated on the appropriate service connectors before installing the appliance.

Refer to figure 48.

▶ Hang the appliance on to the wall mounting frame utilising the central mounting point, at the top of the wall frame.

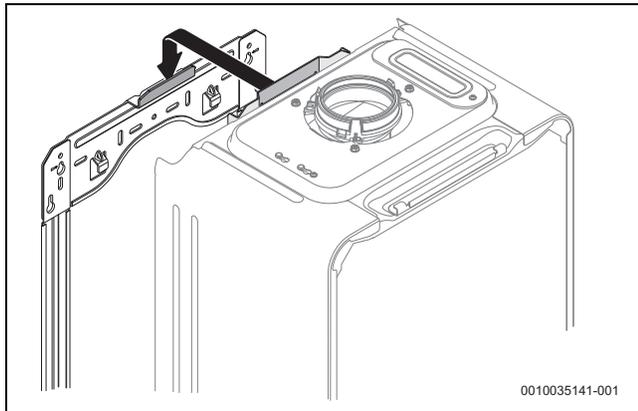


Fig. 48 Hanging the appliance

- ▶ Connect the PRV discharge pipe on the hydraulic unit onto the PRV outlet pipework, and tighten firmly.
- ▶ Tighten the gas and water connections firmly.

Fitting the siphon

WARNING

Danger to life due to poisoning!

If the condensate trap is not filled, poisonous flue gas can escape.

▶ Fill the condensate trap with approximately 250 ml water before fitting.

Refer to figure 49.

- ▶ Remove the transport piece fitted to the appliance connection point.
- ▶ Remove the seal protection cover from the siphon itself.
- ▶ Fit the discharge elbow to the 25mm condensate pipework protrusion on the wall frame.
- ▶ Fill the condensate siphon with approx. 250 ml water.
- ▶ Fit the condensate siphon [1]. Ensure the alignment arrow on the locking arm is in the locked position (refer to the siphon label for guidance).
 - Ensure the condensate siphon is secured correctly.

▶ Fit the discharge elbow [2] onto the outlet, ensuring the locating arrows are aligned.

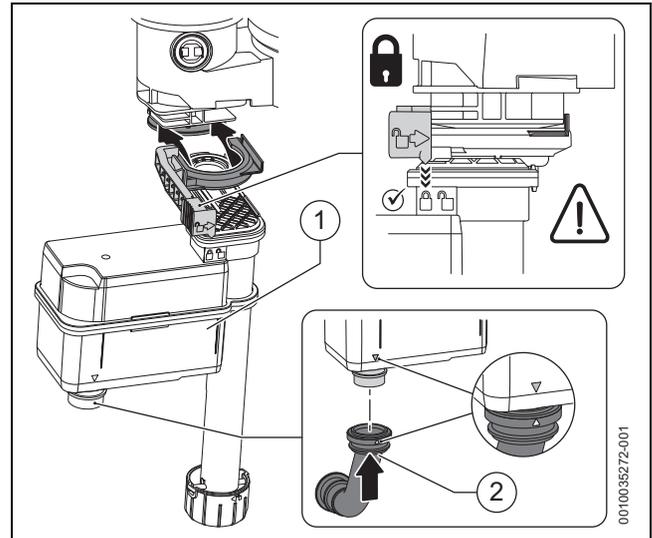


Fig. 49 Siphon fitting

5.2.5 Flue turret/adaptor installation

NOTICE

Flue installation

- ▶ Refer to the Flue Kit Installation instructions provided with your flue kit to correctly install the flue with this appliance.
- ▶ Do not exceed the maximum straight length for a horizontal or vertical flue or a 60mm plume management system (if used) as stated in chapter 4.6.

i

Telescopic flue

▶ Cutting the flue to an exact measurement is not required as the telescopic flue terminal can allow for some adjustment.

i

Apply silicone lubricant to sealing surfaces, to ease assembly of flue components.

Refer to the manual supplied with the flue kit for complete installation instructions.

▶ For plume management and effective flue lengths (→ chapter 4.6).

Additional notes and reminders:

- Ensure that all cut lengths are square and free from burrs and cutting/filing debris.
- Ensure that the flue and seals are not damaged.
- The flue is sealed when assembled correctly, ensure the components are pushed fully home and secured.
- The flue rises from the appliance at an angle of 3° or 52mm per metre length.
- Support the flue at each flue extension joint and at each change of direction, use suitable brackets and fittings:
 - Flue bracket 100mm, part number: 7 716 191 177.
 - Flue brackets 100mm x 6, part number: 7 716 191 178.
 - Flue bracket 125mm, part number: 7 716 191 179.
- Ensure the external wall seal is fitted and properly located in the groove provided on the terminal. This seal must be installed in the groove unless the flue is extended beyond a gutter or balcony as shown in the installation instructions.

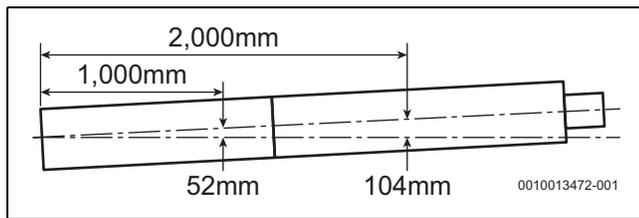


Fig. 50 Slope for condensate disposal

Refer to figure 51.

- ▶ Remove the three inner flue tube retaining screws [1].
 - The inner tube will be held in place in the appliance.
- ▶ Check the appliance flue seal [2] is correctly seated and apply silicone grease.

Flue turret [A] fitting

- ▶ Align the flue turret [A] to the appliance flue outlet with flat facing [3] to the rear of the appliance.
 - This should be pushed straight down, on to the appliance.
- ▶ The three inner flue tube retaining screws [1] are re-used to secure the flue turret [A].

Vertical adaptor [B] fitting

- ▶ Align the vertical adaptor [B] to the appliance flue outlet with flat facing [3] to the rear of the appliance.
 - This should be pushed straight down, on to the appliance.
- ▶ The three replacement retaining screws [4] supplied with the adaptor kit are used to secure the vertical adaptor [B].

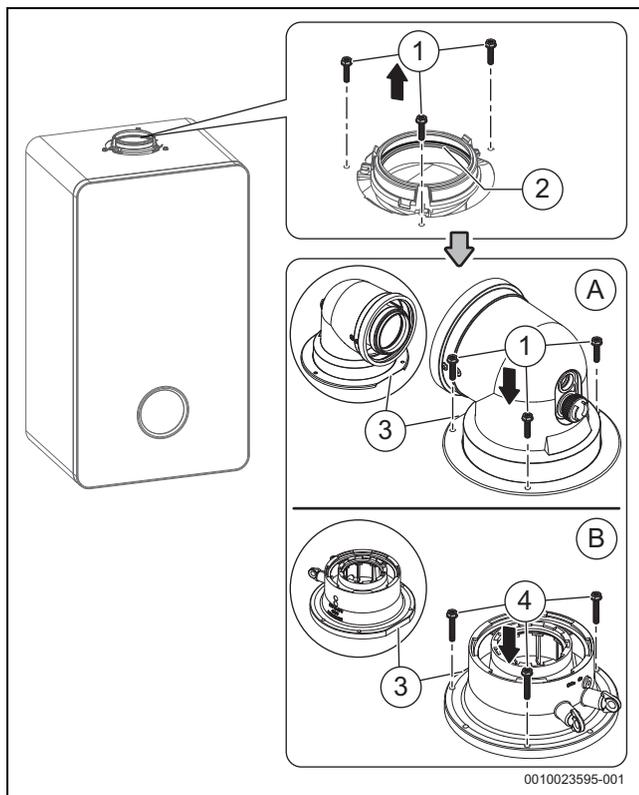


Fig. 51 Flue turret/adaptor connection

5.3 Electrical connection

5.3.1 Safety instructions



DANGER

Risk of electric shock!

- ▶ Isolate electrical components from the power supply (230 V AC) (fuse, circuit breaker) and secure against unintentional re-connection before carrying out any work. Information on safe isolation can be found in the Health and Safety Executive guidance HSG85.
- ▶ Check for zero potential before proceeding with work, using test equipment approved to GS38 to confirm that the electricity supply is disconnected.

Electrical considerations:

- All electrical work must be carried out by a competent and authorised person.
- All work must comply with the current national and regional regulations, technical regulations and guidelines for electrical installations.
- The isolator shall be situated next to the appliance for new systems and, where practicable, replacement appliances.
- The mains electrical supply to the appliance must be through a fused double pole isolator.
- The isolator must have contact separation of 3mm minimum between poles. Any system connected to the appliance must not have a separate electrical supply.
- Any additional components that are connected to the appliance that require 230 Volts must be connected to the same supply as the appliance.
- If the installation requires RCD protection, then an RCD that is suitable for use with equipment incorporating electronic components must be used. The RCD must detect and respond to AC sinusoidal and pulsating DC earth faults.
 - Suitable RCD's are Type A, B or F.
- External fuse 3 Amps.
- When stripping the wires, ensure copper strands do not fall into the control box.

NOTICE

Risk of damage from hot appliance components.

Hot appliance components can damage electrical cables.

- ▶ Ensure all electrical cables are in the correct cable guides and away from hot appliance components.



Cable routing:

- ▶ Route cables over the valve bracket avoiding any hot components.
- ▶ Run power cables separately from signal cables. Interference from power cables can induce spurious faults on signal cables, ensure that there is at least 100mm separation between power and signal cables.
- ▶ Ensure the cables are of sufficient length to allow the control box to be moved to the service position.

If the power cable is of insufficient length and is to be replaced, access the connection terminal (→ Fig. 52)

- ▶ Replace with the following cable type:
 - H05V2V2F x 0.75 mm² (heat resistant PVC, for fixed installation appliances, in accordance with the latest edition of national and local wiring regulations)
 - A spare strain relief is supplied in the hardware pack, if required.
- ▶ Connect the cable so that the protective conductor (earth) is longer than the other wires.

5.3.2 Installer wiring connections

Access to electrical connections

- ▶ Release side catches and lower control panel into the service position.
- ▶ Loosen the retaining screw [1].
- ▶ Push in the tabs and open the cover.

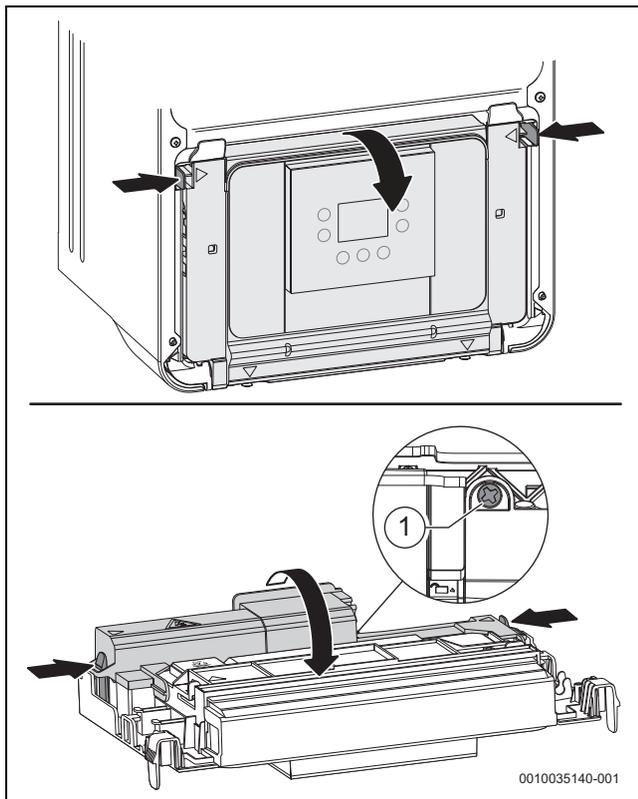


Fig. 52 Opening the cover

Stepped cable grommets

- ▶ For splash-water protection (IP): cut the stepped cable grommets to match the diameter of the cable.

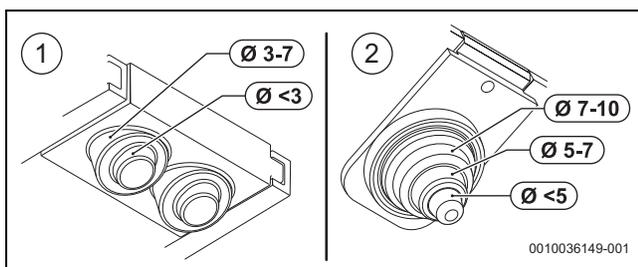


Fig. 53 Adapting the grommets to the cable diameter

- [1] Low voltage (signal cables) grommet
- [2] Power supply (power cables) grommet with strain relief

[1] Low voltage (signal cables)

- ▶ Guide the cable through the grommet.
- ▶ Connect the cable to the terminal strip for external accessories.

[2] Power supply (power cables)

- ▶ Guide the cable through the grommet.
- ▶ Connect the cable to the terminal strip for external accessories and the protective conductor (PE) to the \perp rail.
- ▶ Secure the cable on the strain relief.

Cable preparations

NOTICE

Damage to control unit!

Small pieces of wire can cause shorts and damage to electronics.

- ▶ When stripping wires always ensure copper strands do not fall into the control box.

Power supply (power cables), example → figure 54

- ▶ Ensure the conductors (C) can reach the appropriate terminal connection and that the protective conductor (PE) is longer than the other wires.
 - Power cables connected to the appliance may have different conductor lengths depending on the termination point.

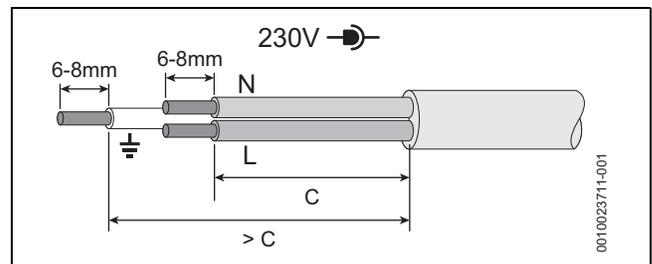


Fig. 54 Power supply (power cables) preparation

Low voltage (signal cables), example → figure 55

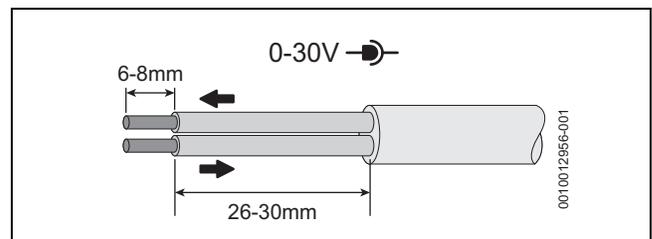


Fig. 55 Low voltage (signal cables) preparation

Power supply (power cables) terminal strip

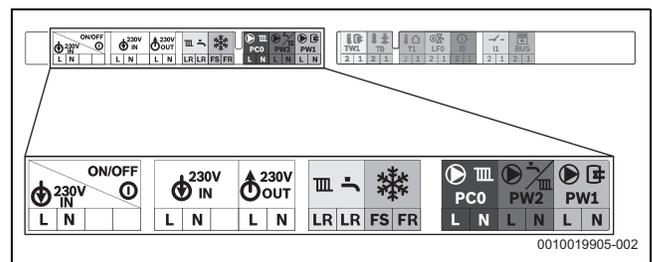


Fig. 56 Power supply (power cables) terminal strip

PE (≡) rail location



Strain relief assembly is removable via a single screw to provide easier access if required.

- ▶ Connect the protective conductor (PE) from the power cable to the PE (≡) rail [1].

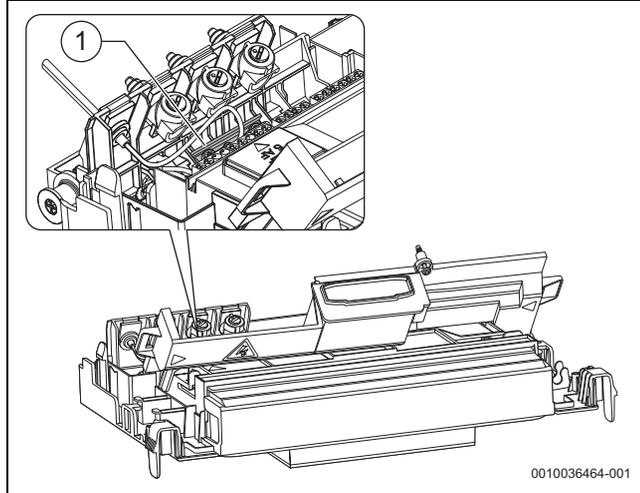


Fig. 57 PE (≡) rail

Power supply (power cables) connections

Symbol	Function
	Power supply (power cable). Pre-wired cable (Live and Neutral).
	No functionality; not used.
	230V mains output to external controls/wiring centre. ▶ If required: connect power supply for external controls.
	Switch live (Live Return) to appliance. • CH demand input. • DHW demand input (active when optional integral diverter valve is fitted).
	External frost thermostat. • FS output (frost thermostat supply). • FR input (frost thermostat return).
	No functionality; not used.
	No functionality; not used.
	No functionality; not used.

Table 17 Power supply (power cables) terminal strip for external accessories

Low voltage (signal cables) terminal strip

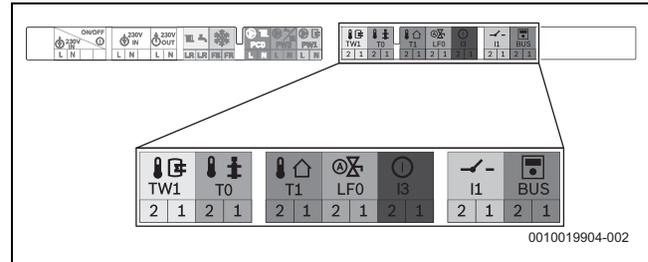


Fig. 58 Low voltage (signal cables) terminal strip

Low voltage (signal cables) connections

Symbol	Function
	Cylinder temperature sensor. ¹⁾ With optional integral diverter valve fitted ▶ Connect via a 2-core cable.
	No functionality; not used.
	Outdoor weather compensation sensor. ²⁾ ▶ Connect via a 2-core cable.
	No functionality; not used.
	No functionality; not used.
	No functionality; not used.
	Communication BUS connection for hard-wired Worcester/Bosch EMS controls. ¹⁾ With optional integral diverter valve fitted ▶ Connect via a 2-core cable.

- 1) Only applicable if optional integral diverter valve is fitted
- 2) Diverter valve kit not required for use with Simple weather compensation (accessory 7 716 192 764). Diverter valve kit is required for use with weather compensation in conjunction with Worcester controls.

Table 18 Low voltage (signal cables) terminal strip for external accessories

5.3.3 Accessories

i
Compatible controls accessories

- ▶ Refer to product accessories list for compatible controls when the internal 3-Way valve is fitted.
- ▶ Refer to control accessory literature for connection details **in conjunction** with the product electrical connections section.

5.3.4 External controls - Domestic installations

i
External equipment or Integral diverter valve kit:

- ▶ External diverter valve(s) and all other 230V parts are not supplied with the appliance.
- ▶ There is an optional integral diverter valve kit, this requires fitting a diverter valve, internal pipework, cylinder sensor & connection. See optional diverter valve kit instructions for fitting details. This kit also allows for the Bosch controls options to be used.
- ▶ The power supply to external controls must be taken from the appliance; an alternative power supply must not be used.

Appliance external control connections example

- ▶ The electrical power supply to the external equipment [2] is supplied from 230V OUT - L (Live), N (Neutral) and PE - \perp (earth) terminals.
- ▶ The Switch Live from the wiring centre [3]:
 - Both pre-wired links are removed, the CH & DHW demands are combined and wired to the **LR** terminal.
 - Control for appliance Pre-heat function, optional. The flow temperature must be set on the central heating control to a level at least 10 °C above the required cylinder temperature set on the cylinder control thermostat.
- ▶ External frost thermostat connections [4]:
 - The Live supply is terminal **FS**
 - The Switch Live is terminal **FR**

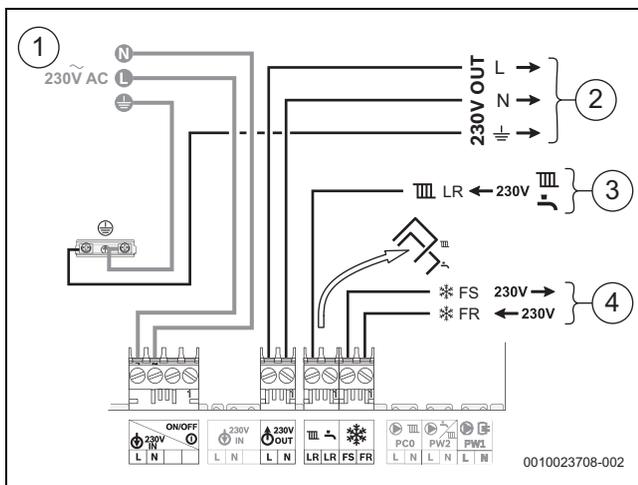


Fig. 59 External controls connections example

- [1] 230V mains supply to the appliance.
- [2] 230V supply from the appliance to the wiring centre.
- [3] CH & DHW Switch Live (Demand) from the external controls.
- [4] External frost protection Live supply and Switch Live (Demand).

5.3.5 Appliances converted to semi-sealed system

Semi-sealed systems (low water pressure) - Appliance code plug change

The appliance is factory supplied with a code plug suitable for a sealed system with water pressure of 0.6 bar or greater.

If the system pressure is gravity fed and cannot be increased via a filling link, the semi-sealed code plug is required.

The appliance can be connected to a semi-sealed system with low water pressure.

If the system has low water pressure i.e. less than 0.6 bar then the code plug will have to be replaced with the semi-sealed system code plug (supplied), which is located under the control unit cover (refer to section 5.3.5 for location and replacement instructions). The code plug is marked with a blue dot to identify it as a semi-sealed code plug.

i
The semi-sealed system code plug supplied will be correct for the appliance's output.

The following tables lists the code plug number for the various outputs for semi-sealed systems i.e. low water pressure.

i
Code Plugs

- ▶ Sealed system code plugs are for systems operating at 0.6 bar and above.
- ▶ Semi-sealed system code plugs are for gravity-fed systems or low pressure systems (below 0.6 bar).

Code plug identification
Natural gas appliances

Number	Appliance Name	Code plug number	
		Sealed System	Semi-sealed system
7 733 601 632	GC4700iW 15 S 23	20541	20548
7 733 601 633	GC4700iW 18 S 23	20540	20547
7 733 601 634	GC4700iW 21 S 23	20539	20546
7 733 601 635	GC4700iW 24 S 23	20538	20545

Table 19 Natural gas appliance

LPG appliances

Number	Appliance Name	Code plug number	
		Sealed System	Semi-sealed system
7 733 601 636	GC4700iW 15 S 31	20555	20562
7 733 601 637	GC4700iW 18 S 31	20554	20561
7 733 601 638	GC4700iW 21 S 31	20553	20560
7 733 601 639	GC4700iW 24 S 31	20552	20559

Table 20 LPG appliances

Replacing the code plug with semi-sealed system variant

Locate replacement semi-sealed system code plug.

Refer to figure 60.

- ▶ Loosen the retaining screw [1].
- ▶ Push in the tabs and open the cover.

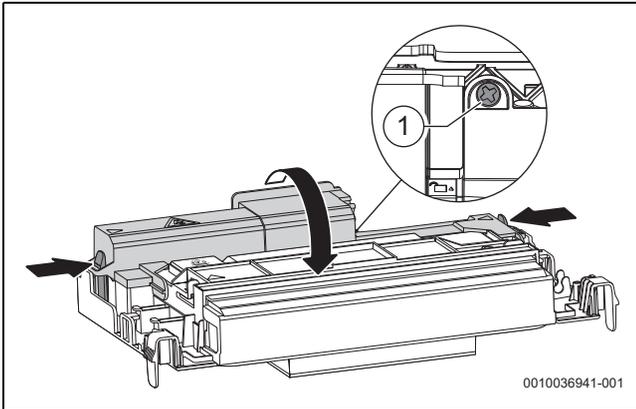


Fig. 60 Opening installer cover

Refer to figure 61.

- ▶ Locate the semi-sealed system code plug [2] within the recess beneath the installer cover [1].

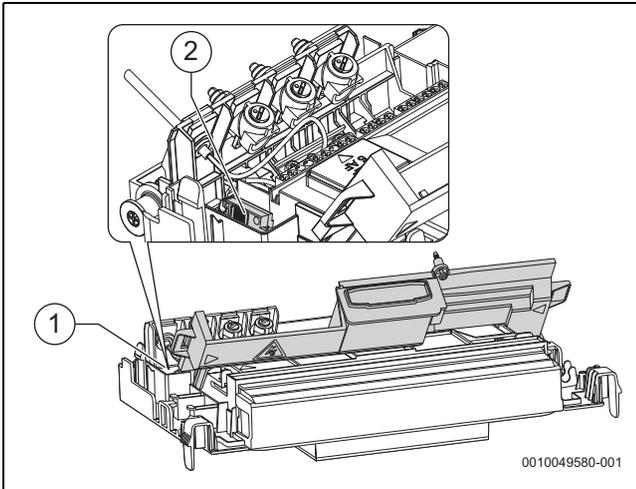


Fig. 61 Semi-sealed system code plug location

Replacing the existing code plug.

Refer to figure 62.

- ▶ Locate and remove the existing code plug [1].
 - Store the sealed system code plug in the recess that the semi-sealed system variant was located. This is in case of future system changes.

- ▶ Fit the semi-sealed system code plug, indicated by a blue dot [2].

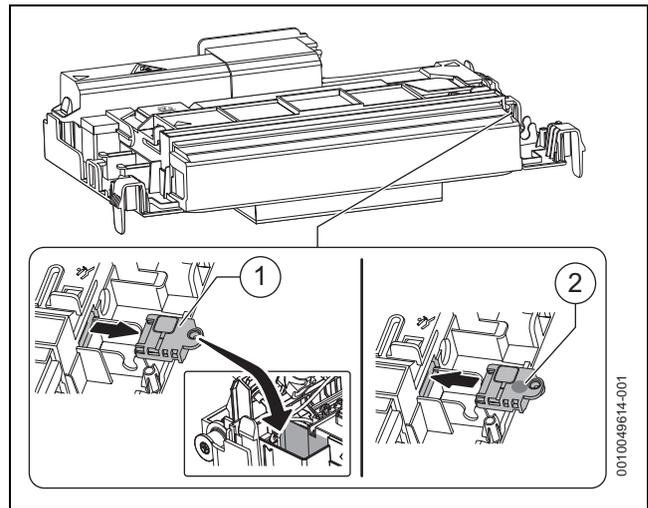


Fig. 62 Replacing the code plug with semi-sealed system variant

Filling the primary semi-sealed system

- The system pressure will be maintained by the gravity fed header tank.



Ventilation function will run on power up of appliance installed with semi-sealed code plug

6 Commissioning

6.1 Safety instructions



DANGER

Risk of electric shock!

- ▶ Isolate electrical components from the power supply (230 V AC) (fuse, circuit breaker) and secure against unintentional re-connection before carrying out any work. Information on safe isolation can be found in the Health and Safety Executive guidance HSG85.
- ▶ Check for zero potential before proceeding with work, using test equipment approved to GS38 to confirm that the electricity supply is disconnected.

6.2 Pre-Commissioning checks

NOTICE

If the appliance is not to be commissioned immediately then, after successfully completing all of the checks and any rectification work:

- ▶ Isolate the electricity supply.
- ▶ Isolate the gas supply.
- ▶ Close the water shut-off valves to the appliance.
- ▶ Label appropriately.

6.3 Water treatment

Primary system flushing (Central Heating)

Ensure that the system has been cleaned:

- Following the guidance of BS 7593:
 - Code of Practice for treatment of water in hot water central heating systems.
- Overview available in Pre-installation, Cleaning primary systems section.

6.3.1 Filling the appliance and adding Inhibitor

6.4 Starting the appliance

NOTICE

Damage to appliance or system!

Running the appliance:

- ▶ Never run the appliance when the appliance/system is empty or partially filled.

6.4.1 Turning on the appliance

- ▶ Turn on the appliance at the power supply isolator.

6.5 Chimney sweep mode



You have 15 minutes to take your measurements or to make your settings. After this time the appliance returns to normal operation. You can re-enter chimney sweep mode if necessary. When running in the chimney sweep mode, the appliance will operate both the central heating and the domestic hot water circuits. This is to allow sufficient time for this part of the commissioning procedure. It will be **necessary** to run sufficient hot water through the domestic hot water circuit to ensure that the appliance will not overheat whilst in chimney sweep mode.

In chimney sweep mode the rated output of the appliance can be selected.

- ▶ Press and hold the **ok** key for 5 seconds until **Chimney sweep** is displayed.
- ▶ Confirm you have read and understood the alert message, press **ok**.
- ▶ Set the desired rated output using **▲** or **▼** for 100% and 10% respectively. The value is accepted after 2 seconds and marked with a tick.
- ▶ To exit the chimney sweep mode, press **ok** or **↶**.

Adjustment with casing removed in chimney sweep mode

1. Set the chimney sweep mode and start up the appliance at maximum rated output.
2. Set the chimney sweep mode and set the appliance at minimum rated output.

6.5.1 Setting the appliance to maximum



Maximum output mode

- ▶ A hot water outlet must be opened to prevent the appliance from shutting down due to high temperature during testing.

- ▶ Press the **ok** key for 5 seconds until **Chimney sweep** is displayed.
- ▶ Confirm you have read and understood the alert message, press **ok**.
 - The appliance enters chimney sweep mode and automatically enters maximum output.
 - The display shows the maximum percentage power (**100%**) alternating with the flow temperature.
 - The appliance will ramp up to maximum output in approximately 30 to 35 seconds.

6.5.2 Setting the appliance to minimum

Whilst the appliance is already in chimney sweep mode - maximum output.

- ▶ Press the **▼** button to set the appliance to minimum output.
 - The display shows the minimum percentage of the power alternating with the flow temperature.
 - The appliance will take approximately 30 to 35 seconds to ramp down to minimum output.
 - Wait a further 30 seconds to allow the appliance to stabilise at minimum output.

6.5.3 Exiting chimney sweep mode

To exit the chimney sweep mode:

- ▶ Press **ok** or **↶** and the appliance will return to normal operation.
 - If left in the chimney sweep mode the boiler will return to normal operation after 15 minutes.



When exiting chimney sweep mode the pump will continue to run in order to cool the heat exchanger. Boiler status code 208 will be visible during this operation.

6.6 Checking gas inlet pressure

Measuring the inlet pressure

- ▶ Switch off the appliance and close the gas isolator.
- ▶ Unscrew the screw on the test nipple for the gas supply pressure and connect a pressure gauge.

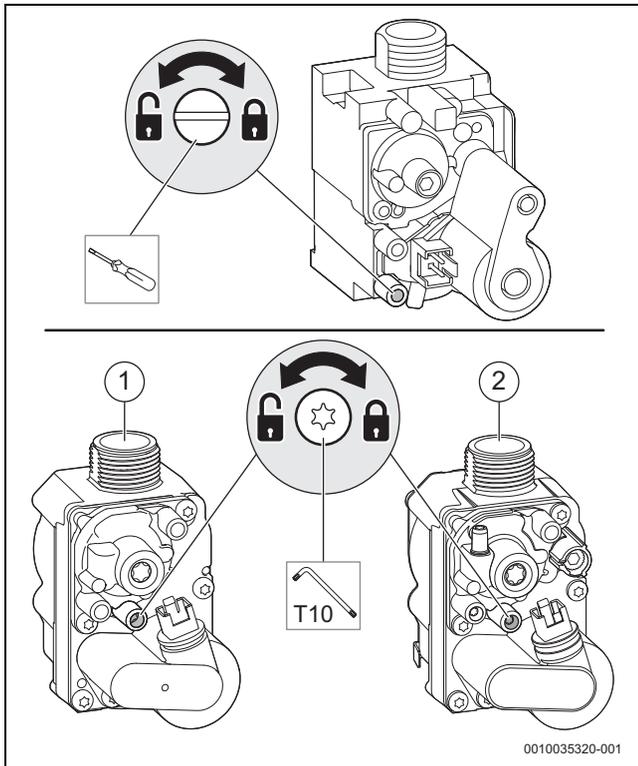


Fig. 63 Checking the gas supply pressure (above: SIT valve, below: Honeywell valves)

- [1] Gas valve - NG
[2] Gas valve - LPG

- ▶ Open the gas isolator and switch on the appliance.
- ▶ Ensure that there is heat transfer by opening the radiator valves and any zone valves fitted.



Internal diverter valve: When running in maximum output in test mode, and the water temperature is 74°C or less, the appliance will operate both the central heating and DHW circuits with the internal diverter valve in the mid position. It will be necessary to run sufficient water through the DHW circuit to ensure that the appliance will not cycle on low heating demands. This is to allow sufficient time for the setting procedure. When the water temperature reaches 75°C the diverter valve will switch to CH only and will only return to the mid position if the temperature is 65°C or less.

External diverter valve/s: When the internal diverter valve is not fitted, it is recommended to position the external diverter valve in the central heating position.

- ▶ Set the appliance running at maximum output in chimney sweep mode (→ 6.5 "Chimney sweep mode").
- ▶ Check the required gas supply pressure according to following section "Gas pressure within the system".



Commissioning must not take place outside of the permissible pressure range. If necessary:

- ▶ Identify the cause and rectify the fault.
 - ▶ If this is not possible: isolate the device on the gas side and notify the gas supplier.
-
- ▶ Exit the chimney sweep mode.
 - ▶ Switch off the appliance, close the gas isolator, remove the pressure gauge and tighten the screw.
 - ▶ Refit the casing.

Gas pressure within the system



Combi appliances

- ▶ Running a hot water tap does not guarantee the appliance will operate at maximum output throughout the test.

Natural Gas or LPG pressures.

The pressure drop from the meter or at the LPG gas supply to the gas valve inlet test point must not be more than the values stated in table 21. If the pressure drops are greater than shown in table 21, then this would indicate a problem with the pipework or connections within the system.

NOTICE

- ▶ **Do not continue commissioning until the correct gas pressure is achieved with the appliance running at maximum output.**

Description	Gas Type	
	Natural Gas	LPG
Meter/LPG Storage Supply pressure [A] (mbar range)	18.5 - 23	32 - 45
Permitted pressure drop [A1] (mbar) ¹⁾	-	0.5
Across pipework permitted pressure drop [B] (mbar)	1	2.5
Appliance inlet [C] (mbar range)	17.5 - 22	29.5 - 42.5
Across appliance permitted pressure drop [D] (mbar)	1.5	1.5
Gas valve inlet test point [E] (mbar range)	16 - 20.5	28 - 41

1) Permitted pressure drop between LPG Storage and the LPG Regulator

Table 21 Allowed mbar pressure drop

Gas supply pressure drop - Natural Gas

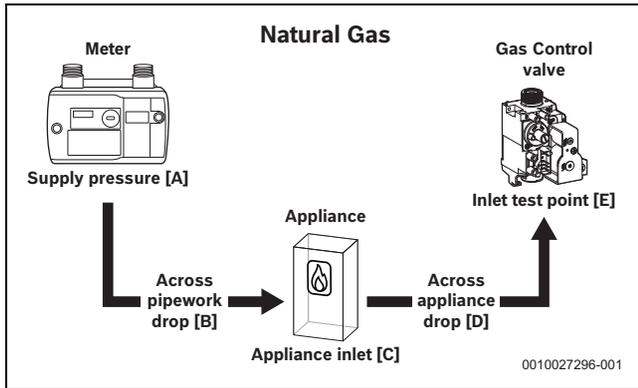


Fig. 64 Natural Gas pressures

Gas supply pressure drop - LPG

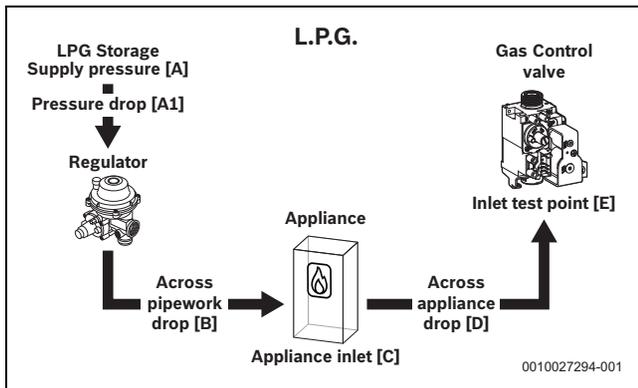


Fig. 65 L.P.G. pressures

6.7 Checking the gas rate



The appliance must be running at maximum output rate when performing the gas rate check, (→ chapter 6.5.1).

- ▶ The gas rate should be measured at the gas meter after the appliance has been operating for **a minimum of 10 minutes** at maximum output.
- ▶ Refer to Technical data section of this manual for the appliance gas rates and CO/CO₂ ratios.
- ▶ Where a gas meter is not available (e.g. LPG) the CO/CO₂ must be checked.
- ▶ Gas rate must be checked with the appliance in service, maximum output test mode.
- ▶ Carry out gas rating as per the latest advice in the Gas Safety (Installation and Use) Regulations.
- ▶ Ensure all other gas appliances are isolated when carrying out the gas rate check on the appliance.
- ▶ Set the chimney sweep mode and start up the appliance at maximum rated output.
 - Ensure that the appliance has stabilised at maximum output.
- ▶ Where a gas meter is not available (e.g. LPG) the CO/CO₂ must be checked to the units shown in the setting of the air/gas ratio.
- ▶ If pressure and gas rate are satisfactory press **ok** or **↶** and the boiler will return to normal operation.
 - If left in the service mode the control will return to normal operation after 15 minutes.
- ▶ Close the gas isolation valve.
- ▶ Remove the manometer.
- ▶ Re-seal the screw in the gas inlet pressure test point.
- ▶ Open the gas isolation valve and ensure there are no gas leaks.

6.8 Checking for gas leaks during operation

- ▶ Use an approved gas sniffer or leak detection fluid to check all connections for possible leaks. Leak detection fluid must be certified as a gas leak testing agent.
- ▶ Do not allow leak detection fluid to come into contact with the electrical components.

6.9 CO and combustion check

The following combustion and flue integrity checks are mandatory and these values must be recorded on the Benchmark check list, at the end of these instructions.

Once the gas rate and pressure have been confirmed as acceptable then the CO and combustion checks can be undertaken.

The flow chart is given for guidance, the details of the checks are given in the following sections:

- Checking flue integrity (→ chapter 6.10).
- Flue gas analysis (→ chapter 6.11).

CO and combustion check: Gas type - Natural Gas/LPG

NOTICE

Before CO and combustion checks:

- ▶ Verify the appliance is connected to the correct gas type.
- ▶ Ensure the appliance is supplied with the correct gas inlet pressure and gas rate as specified previously in the Commissioning section.
- ▶ Visually check the integrity of the whole flue system and confirm that all the components are correctly assembled, fixed and supported.
- ▶ The flue gas analyser must be the correct type as specified in BS 7967. Before use the analyser must have been calibrated as specified by the manufacturer. The installer must be competent in the use of the analyser.
- ▶ Check and zero the analyser in fresh air as specified by the manufacturer.
- ▶ The air/gas ratio valve is factory set and must not be adjusted during commissioning unless this action is recommended following contact with the Bosch help line 0330 123 3366.

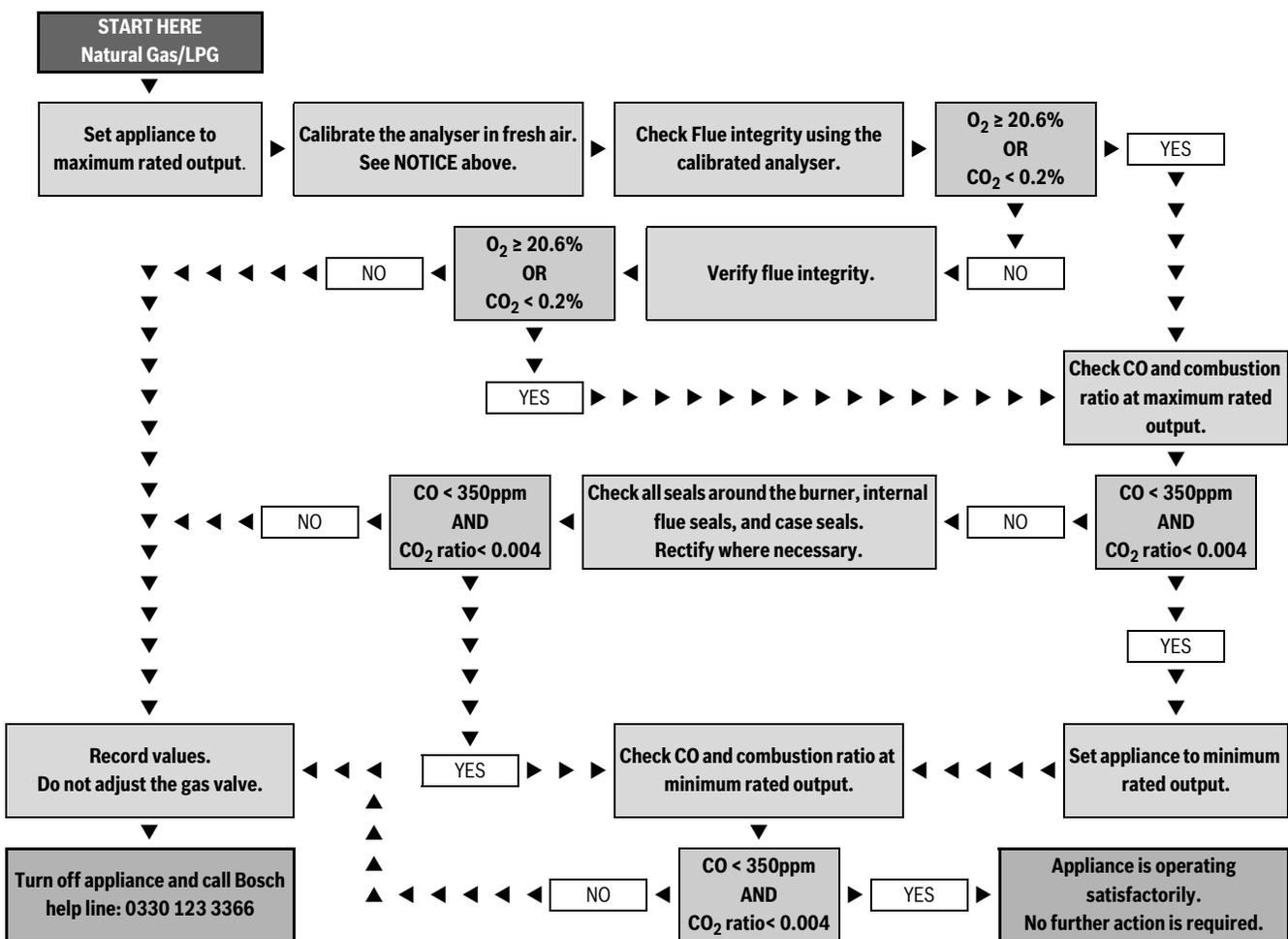


Table 22 Commissioning checks flow chart

- [<] Less than
- [≥] Greater than or equal to

6.10 Checking flue integrity



Flue integrity check

- ▶ The combustion casing must be fitted whilst this test is carried out.
- ▶ Refit the test point plugs after the test has been completed.

The integrity of the flue system and performance of the appliance can be checked via the flue turret/adaptor sample points.

Air inlet sample point location on flue turret/adaptor.

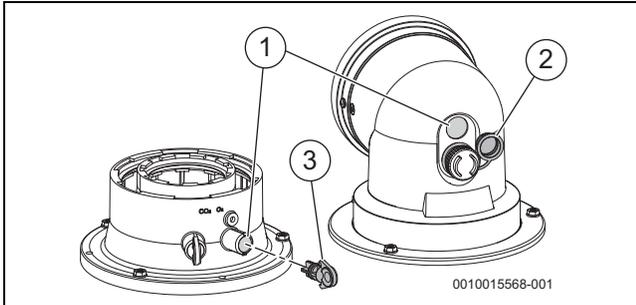


Fig. 66 Flue integrity check test point

- [1] Air inlet sample point
- [2] Flue turret air inlet blank plug (with retaining ring)
- [3] Flue adaptor air inlet blank plug

- ▶ With the appliance combustion casing on and the appliance running at maximum output in chimney sweep mode (→ chapter 6.5 "Chimney sweep mode"), remove the blanking plug [2 or 3] for the air inlet sample point [1].
- ▶ Insert the analyser probe into the air inlet sample point [1].
- ▶ Allow the readings to stabilise and check that:
 - O₂ is equal to, or greater than 20.6%
 - CO₂ is less than 0.2%
- ▶ If the readings are outside these limits then this indicates that there is a problem with the flue system or combustion circuit.

6.11 Flue gas analysis



Internal diverter valve: When running in maximum output in test mode, and the water temperature is 74°C or less, the appliance will operate both the central heating and DHW circuits with the internal diverter valve in the mid position. It will be necessary to run sufficient water through the DHW circuit to ensure that the appliance will not cycle on low heating demands. This is to allow sufficient time for the setting procedure. When the water temperature reaches 75°C the diverter valve will switch to CH only and will only return to the mid position if the temperature is 65°C or less.

External diverter valve/s: When the internal diverter valve is not fitted, it is recommended to position the external diverter valve in the central heating position.

6.12 Finishing commissioning

Fitting the front casing

- ▶ Fit the front casing making sure that the securing points are properly located.
 - Lift the front casing onto the locating bracket on the top of the appliance.
 - Push the bottom of the casing into position and tighten the bottom two screws [1].

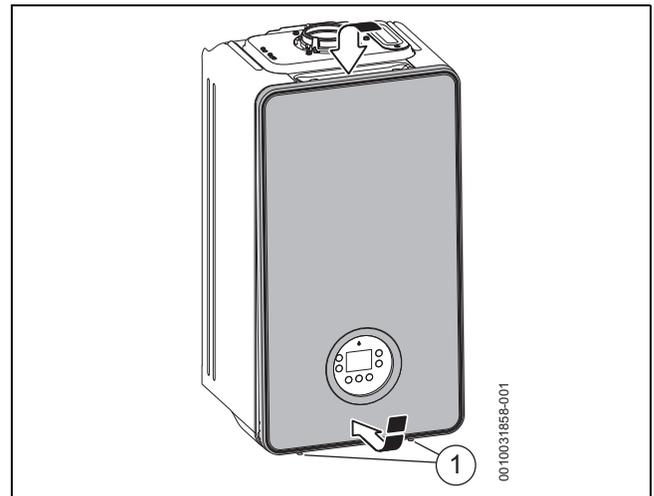


Fig. 67 Fitting the front casing



At the time of commissioning, complete all relevant sections of the Benchmark Checklist located in the Technical Specifications/Logs section of this document.

Benchmark menu

Appliance handover:

- ▶ Complete the Benchmark Gas Boiler Commissioning Checklist.
- ▶ Show the customer the special features of the appliance.
- ▶ Show the customer the efficiency tips in the User Instructions.
- ▶ Set up the appliance controls and show the customer how to operate all the control unit/s for central heating and DHW operation.
 - Also show where in the appliance/controls documentation where this information can be found.
- ▶ Where applicable, instruct the customer on:
 - how to check the system pressure and re-pressurise if necessary.
 - how to set the TRVs.
 - how to reset the appliance.
- ▶ Show the customer the fault finding section in the User Instructions.
- ▶ Show the customer where the serial number/appliance information is located, they will need this information if they call in with a problem (Benchmark Commissioning checklist on page 85 contains all relevant appliance information).
- ▶ Give the customer details of how to contact the installer/ gas emergency numbers.
- ▶ Show the customer how to safely isolate the appliance.
- ▶ Advise the customer where they can find information on the Bosch website www.worcester-bosch.ie.
- ▶ Ensure that all documentation, is left with the appliance or homeowner.
 - Appliance documentation.
 - Controls documentation.
 - Any other equipment documentation that is connected to the appliance or system.

- ▶ Appliance not in use
 - If the appliance is not going to be used immediately and may be exposed to freezing conditions, advise the customer of the precautions necessary to prevent damage to the appliance, system and building.
 - If the appliance is unused and exposed to freezing conditions, safely isolate all the mains supplies and drain the system and appliance, label accordingly.
- ▶ Show the customer the location of the condensate pipe run in unheated or external areas that may be at risk of freezing during prolonged cold spells.
- ▶ **User recommendation:**
 - Advise the user to have the appliance and heating system thoroughly serviced annually by a competent, registered gas engineer, for example, in the Republic of Ireland servicing work must be carried out by a Registered Gas Installer (RGI).
 - Present, where relevant, maintenance aids and reminders within the appliance menus.
 - Arrange an inspection/maintenance contract with an approved heating contractor.

Handover tool



To assist your customer with the handover of the boiler, including how to use its key features, please scan this QR code. QR code scanning apps are available for free on all platforms.

6.12.1 Appliance/product guarantee

This appliance/product has a guarantee against faulty materials or workmanship for a period from the date of installation subject to the terms and conditions.

For full terms and conditions, please visit:

www.worcester-bosch.co.uk/guarantee-terms-and-conditions

7 Operation

7.1 Safety instructions

NOTICE

Damage to appliance or system!

Running the appliance:

- ▶ Never run the appliance when the appliance/system is empty or partially filled.



WARNING

Risk of scalding!

- ▶ This appliance is supplied with the CH control set at approximately 65 °C, a temperature that should be suitable for most installations. When the boiler switches from CH to DHW, the temperature of the hot water may briefly exceed the DHW set point if the CH temperature is set higher than the DHW temperature. If the CH temperature is changed to above 65 °C, it is advisable to fit a thermostatic mixing valve (TMV) at the point of use (e.g. before the bath hot tap or shower) to protect vulnerable people from scalding.

7.2 Control panel

7.2.1 Control panel overview

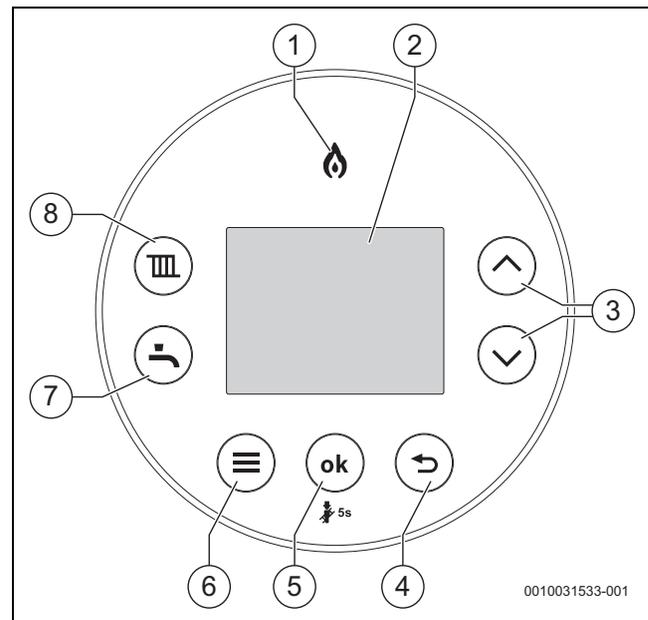


Fig. 68 Overview

- [1] Burner display: Illuminates when the burner is alight.
- [2] Display.
- [3] ▲ and ▼ buttons: To navigate through menus and increase/decrease settings.
- [4] ↶ button: Return/back.
- [5] **ok** button:
 - Confirm/save settings.
 - Chimney sweep button: Press and hold for 5 seconds for chimney sweep mode.
 - Toggle between Eco and preheat (comfort) mode.
- [6] Menu button.
- [7] Hot water button: Hot water mode home screen.
- [8] Heating button: Heating mode home screen.



See the operating instructions for a description of the user menus.

7.2.2 Temperature adjustment

Detailed operating settings



Appliance operation

- ▶ Refer to Operating Instructions for full details on setting the CH flow temperature, DHW temperature set point and the operating settings menu information.

Temperature adjustment overview

Central heating flow temperature adjustment.



With underfloor heating systems observe the maximum permissible flow temperature.

- ▶ Press the  key.
The set maximum flow temperature appears.
- ▶ Press the  or  keys to set the desired maximum flow temperature.
- ▶ The setting is saved automatically after two seconds.
Then the  symbol is briefly displayed.

Hot water temperature adjustment (only available when an optional integral diverter valve kit is fitted).

- ▶ Press the  key.
The set hot water temperature appears.
- ▶ To set the desired hot water temperature, press the  or  keys.
The setting will be saved after 5s or after pressing the **ok** key.

7.3 Service menu

Many appliance functions can be set and checked in the service menu. It includes:

- **Info:** viewing information
- **Settings:** general and appliance-specific settings
- **Function check:** settings for function checks and start of function checks
- **Reset:** restoring the factory settings, resetting the maintenance intervals
- **Demo mode:** mode for testing and demonstrating the functions.
Power off appliance for exit.

7.3.1 Operating the service menu

Opening the service menu

- ▶ Press the  key and the  key simultaneously until the service menu appears.

Closing the service menu

- ▶ Press the  key or the  key.

-or-

- ▶ Press the  key.

Navigating through the menu

- ▶ To highlight a menu or a menu item, press the  key or the  key.
- ▶ Press the **ok** key.
The menu or the menu item is displayed.
- ▶ To return to the next higher menu level, press the  key.

Changing the setting values

- ▶ Select the menu item with the **ok** key.
- ▶ To select the desired value, press the  or the  key.
- ▶ Press the **ok** key.
The new value is saved.

Exiting the menu item without saving values

- ▶ Press the  key.
The value is not saved.

7.3.2 Benchmark Menu

Menu item	Comment/restriction
Flow temp.	Flow temperature in °C

Table 23 Benchmark menu

7.3.3 Info menu

Menu item	Remark/restriction
Current status	→ 10.2.2 "Operating/Fault code table", page 66 for operating codes.
Current fault	→ 10.2.2 "Operating/Fault code table", page 66 for fault codes.
Fault history	Last 10 faults in chronological order
Boiler	
Max. heat output	Maximum heating output in kW
Actual temp.	Current flow temperature in °C
Set flow temp.	Target flow temperature in °C
HEx temperature	Primary heat exchanger temperature
Act. burner mod.	Current burner modulation %
Burner output	Current burner output in kW
Ionisation current	Current ionisation current in µA
Pump mod.	Current pump modulation %
Outside temp.	Current outside temperature in °C
Burner starts	Number of burner starts since commissioning
Hours run	Run time of the system since commissioning
System pressure	Current operating pressure in bar
Hot water	
Max. output (System/Heat only)	Maximum domestic hot water output in kW
DHW act. temp. ¹⁾	Current domestic hot water temperature in °C
S Act.temp. cyl. ¹⁾	Current domestic hot water temperature in °C
DHW set temp. ¹⁾	DHW temperature setting value
System	
Contr.device ver.	Software version of the control device
Progr. unit ver.	Software version of the control unit
SW sub-ver.	Software sub-version
Code plug no.	Code plug number
Code plug ver.	Code plug version
Key ²⁾	Type of control Key installed (→ accessory list)
Solar ³⁾	
Collector temp.	Collector temperature in °C
Cyl.temp.bottom	Cylinder temperature, bottom sensor in °C
Collector pump	Collector pump
Solar fault	Current faults

1) Menu item only visible if integral diverter kit is fitted.

2) Only available with installed Key Timer (accessory)

3) Menu items only visible if Solar connected

Table 24 Info menu

7.3.4 Settings menu

The menu is adapted to your system automatically. Some menu items are only available if the system has been set up accordingly. The menu items are only displayed in systems in which the corresponding system components are installed, e.g. Key Timer.



The factory settings are **highlighted** in the following table.

Menu item	Settings/adjustment range	Comment/restriction
Hydraulics		
Low-loss header	• Off	No functionality; not used
DHW configuration	• Not installed • 3-way valve installed • Cyl. primary pump installed	The factory default for installations without the optional diverter valve kit, is "Not installed", Where the optional diverter valve kit is installed, the boiler will automatically detect its presence and adjust the default setting to "3-way valve installed"
HC1 configuration	• No dedicated pump installed	No functionality; not used
Pump config.	• None • Heating pump	
Heating		
Max. heat output	• Dependent on the appliance output – 50... 100%	Maximum released thermal output [%] (heating). Where applicable: ▶ Measure the gas rate. ▶ Compare the measurement with the Technical Data tables (→ Chapter 13.1, page 77). ▶ Correct deviations.
Standby time	• 3... 10 ...60 min	The time interval determines the minimum delay between starting and restarting the burner.
Anticyc. temp. off	• 2... 6 ...15 K	The difference between the current flow temperature and the set flow temperature until the burner is switched off.
Anticycle temp. on	• -15...- 6 ...2 K	The difference between the current flow temperature and the set flow temperature until the burner is switched on.
Hot water		
Max. DHW output	• 50... 100%	Maximum power on hot water
DHW circ. pump	• Off • On	No functionality; not used.
Cycle circ. pump	• 1 x 3 minutes/h • 2 x 3 minutes/h • 3 x 3 minutes/h • 4 x 3 minutes/h • 5 x 3 minutes/h • 6 x 3 minutes/h • Permanent	Menu only visible if DHW circ. pump is installed and set to "On" Number and duration of hot water circulation pump starts per hour
TD-Temperature	• 60... 70 °C	Thermal Disinfection hot water temperature set point.
Start TD	Start now?	Start legionella protection cycle ▶ Perform thermal disinfection (→ Chapter 7.4, page 51).
Stop TD	Cancel now?	Stop legionella protection cycle
Pump		
Pump range map	• 0: Pump output proportional to the heat output • 1: constant pressure 150 mbar • 2: constant pressure 200 mbar • 3: constant pressure 250 mbar (Sealed System) • 4: constant pressure 300 mbar • 5: constant pressure 350 mbar (Semi-Sealed system) • 6: constant pressure 400 mbar	▶ In order to save energy and to keep potential flow noises to a minimum, set a low pump curve (→ Chapter 13.5, page 82). Heating system configuration setting • Default setting 3 for sealed system • Default setting 5 for semi-sealed system

Menu item	Settings/adjustment range	Comment/restriction
Pump ctr. mode	<ul style="list-style-type: none"> Energy saving Heat demand 	<ul style="list-style-type: none"> Save energy: intelligent shutdown of heat pump for heating systems with weather-compensated controller. The heating pump is only switched on if required. With heat demand: the flow temperature controller switches the heating pump. When there is heat energy demand, the heating pump starts up with the burner.
Min. output	• 10 ...30 %	Pump output at minimum heat output. Only available with pump map 0 (output-dependent control).
Max. output	• Min. output ... 100%	Pump output at maximum heat output. Only available with pump characteristic map 0. <ul style="list-style-type: none"> Can only be reduced to value set in Min. output.
Pump overrun	<ul style="list-style-type: none"> 1...2...60 min 24 h 	Overrun time of the heating pump: pump overrun begins when heat demand ends.
Pump outp. overr.	• 10 ... 100%	Output of the heating pump during pump overrun.
Min. Sys. Pres.	• 0.6... 0.7 ...0.8 bar	The minimum system pressure represents the threshold between the yellow and green segments of the pressure display. <ul style="list-style-type: none"> The low pressure warning will appear on the appliance display when the system pressure reaches this setting.
Target Sys. Pres.	• 1.0 ...1.7 bar	The target system pressure setting will be the recommended system pressure target displayed for end users when topping up their system pressure.
Special function		
Ventilation func.	<ul style="list-style-type: none"> Off (Sealed system) Auto (Semi-sealed system) On 	The venting function can be switched on after maintenance work. During ventilation, the following appears in the info area of the standard display Ventilation func. Heating system configuration setting <ul style="list-style-type: none"> Default setting Off for sealed system Default setting Auto for semi-sealed system
3-WV mid. pos.	<ul style="list-style-type: none"> No Yes 	The function ensures that the system is fully drained and that the motor can be easily removed. The 3-way valve remains at the middle position for approx. 15 minutes.
Maintenance		
Maintenance type	<ul style="list-style-type: none"> Without (off) <ul style="list-style-type: none"> No reminder. Burner run time: 1000...6000 h <ul style="list-style-type: none"> Service reminder based on the number of hours the burner has been active, (1000 hours up to 6000 hours, default value in bold text). Service date ¹⁾ <ul style="list-style-type: none"> Service reminder where a specific calendar date can be selected. Boiler run time: 1...12...72 months ¹⁾ <ul style="list-style-type: none"> Service reminder based no the number of months the boiler has been operating, (1 month up to 72 months (6 years), default value in bold text). Landlord ¹⁾ <ul style="list-style-type: none"> Operates in the same way as service date with the additional option of reducing CH and DHW comfort. 	Landlord: This menu item allows a date to be set for annual service/maintenance (End date). The service display appears as a reminder 30 days before the scheduled date. A contact telephone number (Installer tel. no.) is shown together with service display. The tenant should call this number to arrange a suitable maintenance date. A second reminder appears at the scheduled date. If the service display is not reset by the service engineer, the control unit limits the functions 14 days after the scheduled date. Reduced functions are set at Maint. reminder: <ul style="list-style-type: none"> DHW reduced: reduced comfort (max. 35 °C flow temperature) Boiler off: central heating and hot water functions are set off.
Limit values		
Max. flow temp.	• 30... 65 ...82 °C	Limits the adjustment range for the flow temperature.
Max. DHW temp.	• 40... 55 ...70 °C	Limits the adjustment range for the domestic hot water temperature.

Menu item	Settings/adjustment range	Comment/restriction
Min. boiler outp.	<ul style="list-style-type: none"> • “Minimum rated output” ... increases up to 30% 	Minimum heat output depending on code plug, Max = 30%.
Heating curve		
Enable	<ul style="list-style-type: none"> • Yes • No 	To turn this function on, when connecting a weather sensor, select Yes to enable. The system control unit optimises this setting. This service function activates a simple, weather-compensated controller with a linear heating curve. Depending on the on/off input, the heating is switched on or off.
Htg. curve base	<ul style="list-style-type: none"> • 20...90 °C 	This is only displayed if the heating curve has been enabled. This can be used to set the flow temperature base point of the heating curve, which corresponds to an outside temperature of +20 °C.
Htg. curve end	<ul style="list-style-type: none"> • 20...90 °C 	This is only displayed if the heating curve has been enabled. This can be used to set the flow temperature end point of the heating curve, which corresponds to an outside temperature of -10 °C.
Summer mode	<ul style="list-style-type: none"> • 0...16...30 °C 	This is only displayed if the heating curve has been enabled. This can be used to set the outside temperature threshold at which the heating system switches to summer mode i.e. heating off.
Frost prot.	<ul style="list-style-type: none"> • Yes • No 	This activates frost protection based on measured outdoor temperature.
Frost temp. limit	<ul style="list-style-type: none"> • 0...5...10 °C 	Temperature value for the system frost protection. This service function is only available if the frost protection function was activated. If the outside temperature does not exceed the frost threshold temperature, then the heating pump in the heating circuit switches on.

1) Only available with compatible heating controller (accessory), e.g. Key Timer

Table 25 Settings menu

7.3.5 Function check Menu



Visibility of the **Activate test** sub-menus.

- ▶ The **Burner** test will appear instantly in the sub-menu and after a further 10 seconds the other components that can be tested will appear in the menu.

Menu item	Settings/adjustment range	Remark/restriction
Activate test		
Burner	<ul style="list-style-type: none"> • Off ...100 % 	This service function enables you to test the burner by adjusting the appliance output.
Ignition	<ul style="list-style-type: none"> • On • Off 	Permanent ignition. Testing the ignition by means of permanent ignition without gas supply. ▶ To prevent damage to the ignition transformer: leave the function switched on for a maximum of 2 minutes .
Fan	<ul style="list-style-type: none"> • On • Off 	Permanent fan operation. Fan runs without gas supply or ignition.
Pump	<ul style="list-style-type: none"> • On • Off 	Permanent pump operation.
3-way valve	<ul style="list-style-type: none"> • Heating • Hot water 	Permanent position of the 3-way valve.
Ionisat. oscill.	<ul style="list-style-type: none"> • On • Off 	Check the ionisation measurement function at the flame.
HC1 pump ¹⁾	<ul style="list-style-type: none"> • On • Off 	Selecting "On" will permanently run the pump until switched off.
DHW circ. pump ¹⁾	<ul style="list-style-type: none"> • On • Off 	Selecting "On" will permanently run the pump until switched off.
Solar pump ¹⁾	<ul style="list-style-type: none"> • On • Off 	Selecting "On" will permanently run the pump until switched off.

1) Menu item only visible if a pump is connected to the corresponding appliance control unit connection.

Table 26 Function check Menu

7.3.6 Reset menu

Menu item	Settings/adjustment range	Remark/restriction
Default setting	Restore?	Restore factory settings. ▶ The system needs to be re-commissioned following this reset!
Service display ¹⁾	Reset?	Reset maintenance period.
Fault history	Delete?	▶ Reset the maintenance first. The fault history is deleted. Unresolved faults will re-appear after fault history reset

1) Service display sub-menu only available if maintenance options have been selected.

Table 27 Reset menu

7.3.7 Demo mode Menu

Demo mode enables users to navigate through the appliance menus without gas or water supplied to the appliance. Demo mode is designed to increase product familiarity in a pre-sales environment.

Menu item	Settings/adjustment range	Remark/restriction
Demo mode	<ul style="list-style-type: none"> • Yes • No 	▶ To exit Demo mode: switch the appliance power off and back on.

Table 28 Menu Demo mode

7.4 Thermal disinfection

To prevent hot water from becoming contaminated by bacteria such as legionella, we recommend thermal disinfection after long downtimes.



CAUTION

Risk of scalding:

During thermal disinfection, discharging unmixed hot water can cause serious scalding.

- ▶ Run thermal disinfection at the factory default temperature of 70 °C for a minimum of 3 minutes.
- ▶ Inform occupants of the premises of the risk of scalding.
- ▶ Perform thermal disinfection outside of the normal operating times.
- ▶ Do not discharge DHW unmixed.



To prevent the risk of scalding and to ensure mixed hot water, it is advisable to fit a thermostatic mixing valve (TMV) at the point of use (e.g. before the bath hot tap or shower).

Proper thermal disinfection involves the DHW system including the draw-off points.

- ▶ Set the thermal disinfection in the service menu or hot water program of the heating controller (→ heating controller operating instructions).
- ▶ Close DHW draw-off points.
- ▶ Set any DHW circulation pump to continuous operation.
- ▶ Wait until the maximum temperature is reached.
- ▶ Open all DHW draw-off points, from the nearest to the one furthest away, and draw off hot water until hot water at a minimum of 70 °C has flown from all draw-off points for at least 3 minutes.
- ▶ Restore the original settings.

8 Decommissioning

8.1 Safety instructions

Switching off the appliance - Anti-seizing function

The anti-seizing function prevents the heating pump and the 3-way valve from seizing up following long periods of inactivity. The anti-seizing function is not active when the appliance is switched off.

- ▶ Switch off the appliance.
- ▶ During longer shut-down periods: observe the frost protection.

Damage caused by frost

The system can freeze if it is switched off:

- ▶ Observe the notices regarding frost protection.
- ▶ Due to the additional functions, e.g. DHW heating or pump anti-seizure protection, the system should always be left on.
- ▶ Have faults rectified immediately.

8.2 Temporary Decommissioning

8.2.1 Setting frost protection

Appliance frost protection:

The appliance frost protection function switches the burner and heating pump on when the appliance temperature falls below 5 °C. This prevents the appliance from freezing.

Frost protection for the heating system

Frost protection with the appliance switched on.

Frost protection for the heating system is only ensured if the heating pump is operational and is pumping heating water through the entire system.

- ▶ Leave the heating switched on.
- ▶ Set the room thermostat to 12 °C.
 - This limits the appliance to only fire if the property is below 12 °C but still maintains a safe temperature level, protecting the property and appliance from frost damage.



For further information, see the heating controller operating instructions.



Frost protection can also be achieved for systems with Bosch weather compensating controls installed.

- ▶ Refer to controller instructions for more details.

If installed in an internal unheated area, such as a basement or garage, additional protection is recommended to protect the pipework. The appliance internal frost protection only monitors the system water temperature within the appliance to provide protection for the appliance.

- ▶ Install a frost thermostat and pipe thermostat connected in series, to protect the system pipework.
 - It is recommend that the frost thermostat is sited in the coldest unheated area in which pipework is located and that it is set to call for heat at 5 °C. The Pipe thermostat should be located on whichever pipe is furthest from the heated area where warmer water will be drawn from considering the direction of flow, and set to end the demand at 15 °C.
- ▶ The system pipework in the internal unheated area should be insulated.

Frost protection when the appliance is switched off.

- ▶ Mix Bosch approved anti-freeze into the heating water (→ Chapter Cleaning primary systems, page 28) and drain the DHW circuit.

-or-

- ▶ Drain the heating system and DHW pipework at the lowest point.

8.3 Recommissioning after Standstill

Recommission the appliance.

- ▶ Following temporary decommissioning an approved contractor must recommission the appliance following the details covered in section 6 "Commissioning".

8.4 Final Decommissioning

Decommission the appliance.



WARNING

Risk of scalding

Hot water can cause severe burns.

- ▶ Ensure the water content of the primary system, appliance and/or hot water cylinder has cooled before draining water content.

- ▶ Switch off the appliance.
- ▶ Isolate from the power supply (230V AV) and secure against unintentional reconnection.
 - Disconnect the appliance from the power supply.
- ▶ Isolate the main gas supply.
- ▶ Isolate from the gas supply via the appliance gas isolator.
 - Disconnect the appliance from gas supply.

Primary system side

- ▶ Drain the primary system and appliance.
 - Drain from the lowest point.
 - This includes the primary system side of the hot water cylinder if fitted.

Domestic hot water side

- ▶ Close shut-off valve for cold water inlet.
- ▶ Drain the domestic hot water side.
 - Drain from the lowest point.
- ▶ Close shut-off valves.

With the appliance disconnected, the system and appliance drained:

- ▶ Remove the old appliance in preparation for the replacement appliance.

9 Inspection and maintenance

9.1 Safety instructions

Notes for the target group

Only approved contractors may carry out inspection, cleaning and maintenance in compliance with the system-relevant instructions. Improper execution may result in personal injury, including danger to life or material damage.

- ▶ Inform the user of the possible consequences of non-existent or improper inspection, cleaning and maintenance.
- ▶ Inspect the heating system at least once a year.
- ▶ Carry out any required cleaning or maintenance work according to the checklist (→ page 86).
- ▶ Remedy all defects immediately.
- ▶ Check the heat exchanger assembly once a year, and if necessary clean it.
- ▶ Use only original spare parts.
- ▶ Observe the service life of gaskets.
- ▶ Replace removed gaskets and O-rings with new ones.
- ▶ Record any work carried out.

Annual maintenance checks

Annual maintenance checks have to be conducted to ensure the continued safe and reliable operation of the appliance.

- ▶ During each maintenance check, the gas valve, all gas joints and test points should be checked for leakage using an analyser/sniffer.
- ▶ If a leak is found on the gas valve then it needs replacing as a gas valve is a non-repairable component.

Danger to life through electric shock!

Touching live parts can result in an electric shock.

- ▶ Before carrying out work on electrical components, isolate them from the power supply (230 V AC) and secure against unintentional reconnection.

Risk of death from escaping flue gas!

Escaping flue gas can cause poisoning.

- ▶ Check for leaks after working on flue gas-carrying components.

Risk of explosion from escaping gas!

Escaping gas can cause an explosion.

- ▶ Close the gas isolator prior to working on gas-carrying components.
- ▶ Carry out tightness test.



WARNING

Mains supplies - Isolate the appliance

- ▶ Turn off the gas supply and isolate the mains electrical supply before starting any work and observe all relevant safety precautions.
- ▶ Drain the appliance/system where necessary and protect any electrical equipment from water ingress during component replacement.

Risk of injury from Hot surfaces!

If the appliance has been operating components may be hot.

- ▶ Ensure precautions are taken when working on the appliance.

Risk of scalding from hot water!

Hot water can lead to severe scalding.

- ▶ Make residents aware of the risk of scalding prior to activating the chimney sweep mode or a thermal disinfection.
- ▶ Carry out thermal disinfection outside the normal hours of use.
- ▶ Do not change the maximum domestic hot water temperature set.

Escaping water can damage the device.

The control device can be damaged by escaping water.

- ▶ Cover the control device prior to work on parts routing water.

Resources for inspection and maintenance

- The following measuring devices are required:
 - Electronic flue gas analyser for CO₂, O₂, CO and flue gas temperature
 - Pressure gauge 0 - 30 mbar (minimum resolution 0.1 mbar)
- ▶ Use heat conducting paste 8 719 918 658 0.
- ▶ Use approved greases.

Gaskets and seals - gas related components!

Hot flue gas can leak through defective gaskets, damage the appliance and endanger safe operation.

- ▶ Burner/electrode assembly gasket must be replaced if disturbed.
- ▶ Other gaskets/seals must be checked and replaced where necessary.
- ▶ Do not attempt the cleaning procedure unless new gaskets and seals are available.
- ▶ Ensure that the gaskets are positioned correctly.

Material damage due to chemicals!

Using chemicals during the cleaning of the heat exchanger assembly and associated parts or carrying out maintenance can damage the sealing components. This can cause exhaust gas to escape during operation.

- ▶ Do not use chemicals to flush the heat exchanger assembly and associated gas carrying components.

Prior to inspection/maintenance

- ▶ Depressurise the appliance on the heating and DHW side before working on water routing components.

⚠ After the inspection/maintenance

- ▶ Re-tighten all the threaded connections that have been released.
- ▶ Restart the appliance (→ chapter 6, page 39).
- ▶ Check all joints for leaks.
- ▶ Check the gas/air ratio.

⚠ Maintenance of gas components

Maintenance should be performed by a qualified professional.

- ▶ When carrying out any work on the gas components, make sure that the appliance is no longer supplied with gas. The gas valve does not require any particular maintenance.
- ▶ When performing any operation near gas components, make sure that they are in good visual condition.

If a gas component is dismantled, the seals must be replaced with new seals supplied by Bosch.

- ▶ Do not repair, manipulate or deactivate the elements necessary for safety.
- ▶ Use only original spare parts.
- ▶ After any intervention on gas components, check for leaks.

⚠ Component replacement

- ▶ After replacement of a gas carrying component, where a gasket or seal has been disturbed or replaced, check for gas tightness using a gas sniffer/leak detection fluid.
- ▶ On re-assembly check all affected seals for cracks, hardness and deterioration.
 - If damaged or in any doubt the seal must be replaced.
- ▶ Also after re-assembly, carry out the following checks:
 - Fan pressure.
 - Flue gas analysis.

9.1.1 Safety-relevant components

Safety-relevant components (e.g. air/gas ratio control valves) have a limited service life, which depends on their operating time in switching cycles or years.



If the operating time is exceeded or due to increased wear, the affected component may fail and the system safety may be lost.

- ▶ Do not repair, manipulate or disable safety-relevant components.
- ▶ Check safety-relevant components during every inspection and maintenance to determine the continued safety of the system.
- ▶ Replace safety-relevant components in the event of increased wear or at the latest when they have reached the end of their service life.
- ▶ Only use new and undamaged original spare parts for replacement.

Component	Check
Air/gas ratio control valve	<ul style="list-style-type: none"> ▶ Check the air/gas ratio control valve housing for external gas tightness using an analyser certified for gas testing. ▶ Confirm the external gas tightness of the air/gas ratio control valve separately in the inspection and maintenance log.

Table 29 Checking safety-relevant components

9.2 Roof space installations



A risk assessment should be carried out before undertaking work in such areas.

You must ensure:

- The ladder is of the correct type and adequately secured to the building structure.

- Floor boarding must be fit for purpose and properly installed.
 - Floorboards should not be overlapped as this can cause a trip hazard.
- Fixed lighting must be provided in the access and work areas.
- There must be a means of preventing operatives from accidentally stepping into the loft hatch.
- Minimum clearances are maintained around the product.

9.3 Inspection and maintenance considerations

- To ensure continued efficient operation the appliance must be checked at regular intervals.
- The frequency of servicing will depend upon the particular installation conditions and usage, however, at least an annual service is recommended.
- The extent of the service work required on the appliance is determined by the operating condition of the appliance when tested by qualified engineers.
- After each service, the service interval record sheet at the rear of this manual, must be completed.

See the following instructions for detail of some of the service requirements:

- ▶ Check all joints and connections in the system and remake any that show signs of leakage. Refill and re-pressurise if applicable as described in the commissioning section.
- ▶ When it is frequently necessary to add water to maintain pressure in the installation, even though no leaks have been discovered, perform an expansion vessel check.
- ▶ Check that the condensate system is not obstructed, clean and refill the condensate siphon.
- ▶ If the appliance is in a compartment or cupboard check that the specified clearances around the appliance is clear.
- ▶ Check that the flue system is unobstructed and undamaged, clean/replace as necessary.
 - If fitted ensure the flue terminal guard is also unobstructed and undamaged.
- ▶ Operate the appliance and take note of any irregularities.
 - Refer to the fault finding pages for rectification procedure.

Maintenance reminder options

Accessing the maintenance reminder options.

- ▶ **Service menu > Settings > Special function > Maintenance.**

Options available.

- **Without (off)**
 - No reminder.
- **Burner run time**
 - Service reminder based on the number of hours the burner has been active, (1000 hours up to 6000 hours, default 6000 hours).
- **Boiler run time**
 - Service reminder based on the number of months the boiler has been operating, (1 month up to 72 months (6 years), default 12 months).
- **Service date** (Only available with installed Key Timer (accessory))
 - Service reminder where a specific calendar date can be selected.
- **Landlord function** (only available with installed Key Timer (accessory)).
 - Operates in the same way as service date with the additional option of reducing CH and DHW comfort.

Maximum system pressure

- ▶ 2.5 bar must not be exceeded when the heating system water is at maximum temperature. If this pressure is exceeded then an additional expansion vessel must be fitted into the system return as close as possible to the appliance.
- ▶ If the system does not retain the pressure, the pressure relief valve (PRV) and the heating system should be checked for leaks.

9.4 Component access

Removing the front casing



The front casing is secured with two screws which are critical to maintain the case seal and to prevent unauthorised removal (electrical safety).

- ▶ Always secure the casing with these screws.
- ▶ Loosen the two screws [1] and pull the bottom of the casing forward.
- ▶ Lift off the casing.



Fig. 69 Removing the front casing

9.5 Checking heat exchanger assembly

- ▶ Remove the front casing.
- ▶ Remove the cap from the test nipple, and connect a pressure gauge.

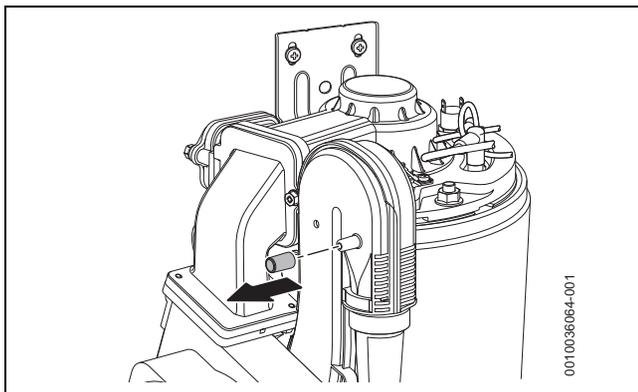


Fig. 70 Test nipple at the mixing device

9.6 Fan pressure test

NOTICE

Fan pressure test

- ▶ The appliance must be running at maximum output in chimney sweep mode for the fan pressure test, (→ Setting the appliance to maximum).



This test is to determine if the heat exchanger requires cleaning or additional actions.



Fan pressure test reading.

- ▶ The pressure reading will be in negative values.

Appliance fan pressure test values

Natural Gas appliances

Appliance output	Cleaning required		No cleaning required	
	Value			
24kW	0 mbar	↔ -3.4 mbar	-3.5 mbar	⇒ -12 mbar
21kW	0 mbar	↔ -2.7 mbar	-2.8 mbar	⇒ -12 mbar
18kW	0 mbar	↔ -2.0 mbar	-2.1 mbar	⇒ -12 mbar
15kW	0 mbar	↔ -4.2 mbar	-4.3 mbar	⇒ -12 mbar
12kW	0 mbar	↔ -2.8 mbar	-2.9 mbar	⇒ -12 mbar

Table 30 Natural Gas values

LPG appliances

Appliance output	Cleaning required		No cleaning required	
	Value			
24kW	0 mbar	↔ -4.2 mbar	-4.3 mbar	⇒ -12 mbar
21kW	0 mbar	↔ -3.3 mbar	-3.4 mbar	⇒ -12 mbar
18kW	0 mbar	↔ -2.5 mbar	-2.6 mbar	⇒ -12 mbar
15kW	0 mbar	↔ -5.0 mbar	-5.1 mbar	⇒ -12 mbar
12kW	0 mbar	↔ -3.4 mbar	-3.5 mbar	⇒ -12 mbar

Table 31 LPG values

If the manometer reading is within tolerance, in the white area of the table values.

- ▶ The heat exchanger/exhaust path/siphon does not require attention.

If the manometer reading is out of tolerance, in the shaded area of the table values then carry out the following checks.

- ▶ Check that the siphon is not restricted or blocked.
- ▶ Check the exhaust paths for restrictions.
- ▶ Clean the heat exchanger with a suitable cleaning tool, refer to cleaning section.
- ▶ Re-check the fan pressure readings.

If the appliance, after completing the above checks, fails the fan pressure test then contact Worcester, Bosch Group for advice.

- ▶ Switch the appliance off after completing pressure check.
- ▶ Disconnect the digital manometer and replace the test point cover.

9.7 Check working gas inlet pressure

NOTICE

Gas inlet pressure

- ▶ Do not continue with the other checks if the correct gas inlet pressure can not be achieved at maximum output.

- ▶ Check the gas supply working pressures in the system conform to the readings shown in the table shown in chapter 6.6 "Checking gas inlet pressure".

9.8 Flue gas analysis

NOTICE

Combustion testing

- ▶ Combustion testing must be carried out by a competent person. Testing must not be attempted unless the person carrying out the combustion check is equipped with a calibrated flue gas analyser conforming to BS 7967 and is competent in its use.



Flue gas analysis

- ▶ Ensure that the gas inlet pressure has been checked and is satisfactory.
- ▶ Refit the test point plugs after the test has been completed.
- ▶ Set the appliance to maximum and minimum output in chimney sweep mode (→ 6.5 "Chimney sweep mode") for the flue gas analysis checks.
- ▶ Check that the readings conform to those given in the following tables. In addition to CO and CO/CO₂ ratio checks also check the maximum and minimum CO₂ percentage reading.

CO/CO₂ settings

CO ₂ Reading	CO Reading
Natural Gas appliances	
Maximum rated Output ¹⁾	
Between 8.4 and 10.4%	<250ppm
Minimum rated Output ¹⁾	
A minimum of 0.2 lower than the maximum reading taken and between 8.0 and 10.2%	<250ppm
LPG appliances	
Maximum rated Output ¹⁾	
Between 10.4 and 11.0%	<250ppm
Minimum rated Output ¹⁾	
A minimum of 0.2 lower than the maximum reading taken and between 10.0 and 10.4%	<250ppm

1) Should be measured 10 minutes after firing the appliance

Table 32 CO₂ settings

If the CO₂ is out of tolerance then please check:

- ▶ The gas inlet pressure.
- ▶ The gas rate.
- ▶ The fan test pressure.
- ▶ The flue and air intake, plus any possible blockages in the condensate disposal.
- ▶ The condition of burner.
- ▶ For leaks or obstructions in the exhaust paths.
- ▶ That the injector is clean.

After all checks have been completed and the CO₂ is still out of tolerance then contact Worcester, Bosch Group helpline 0330 123 3366 before making any adjustment to the gas valve.

9.9 Cleaning the siphon and heat exchanger

9.9.1 Checking the electrodes and cleaning the heat exchanger



CAUTION

Risk of burns due to hot surfaces!

Individual components of the appliance can become very hot even after being shut down for a long time.

- ▶ Allow the appliance to cool down before carrying out any work.
- ▶ If necessary, wear protective gloves.



WARNING

Material damage due to hot flue gas! - Gaskets and seals - gas related components

Hot flue gas can leak through defective gaskets, damage the appliance and endanger safe operation.

- ▶ Burner/electrode assembly gasket must be replaced if disturbed.
- ▶ Other gaskets/seals must be checked and replaced where necessary.
- ▶ Do not attempt the cleaning procedure unless new gaskets and seals are available.
- ▶ Ensure that the gaskets are positioned correctly.

NOTICE

Material damage due to chemicals

Using chemicals during the cleaning of the heat exchanger assembly and associated parts or carrying out maintenance can damage the sealing components. This can cause exhaust gas to escape during operation.

- ▶ Do not use chemicals to flush the heat exchanger assembly and associated gas carrying components.



It is recommended to use the cleaning tool accessory, comprising of brush and lifting tool to assist in cleaning the heat exchanger assembly. Part number 7 733 600 091.

Refer to figure 71.

- ▶ Disconnect the electrical connection [3] from the fan.
- ▶ Remove the gas hose [2] from the venturi nozzle.
- ▶ Remove the screw [1] on the mixing device.
- ▶ Remove the fan with mixing device [4].

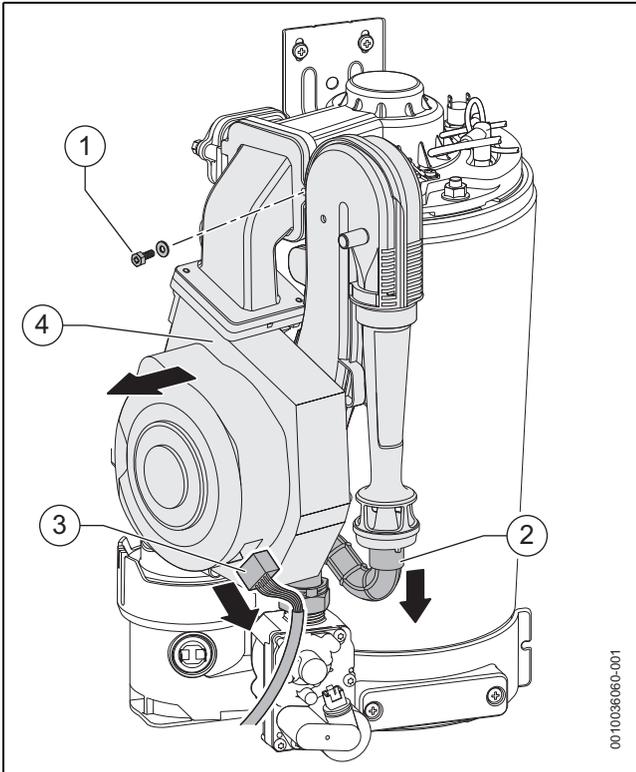


Fig. 71 Removing the fan with mixing unit

Refer to figure 72.

- ▶ Disconnect cables from the electrode set [2].
- ▶ Disconnect cable [1].
- ▶ Remove M8 nut [3].
- ▶ Remove the burner cover [4].



On re-assembly, to ensure a full gas tight seal, tighten the M8 nut down firmly, without over tightening.

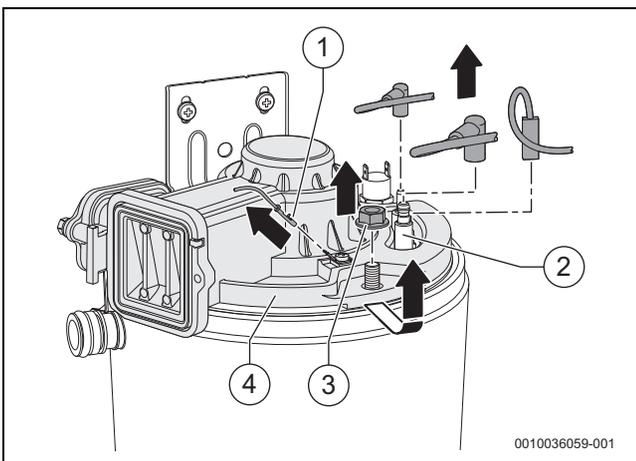


Fig. 72 Remove the burner cover

Refer to figure 73.

- ▶ Remove the non-return valve (bearing plate) [1].
 - Check for damage/cracks or deformation and for contamination, replace if required.
 - Ensure non-return valve moves freely.

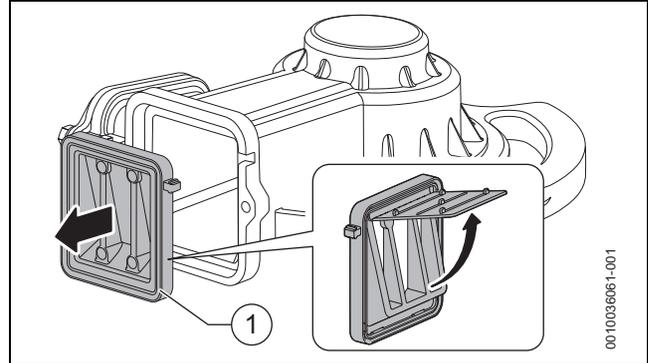


Fig. 73 Non-return valve (bearing plate) in the mixing unit

Refer to figure 74.

- ▶ Remove the gasket.
- ▶ Remove electrode set [2].
 - Check for damage or deformation, replace if required.
 - Check electrodes for contamination, clean or replace, if required.
- ▶ Remove the burner [3].

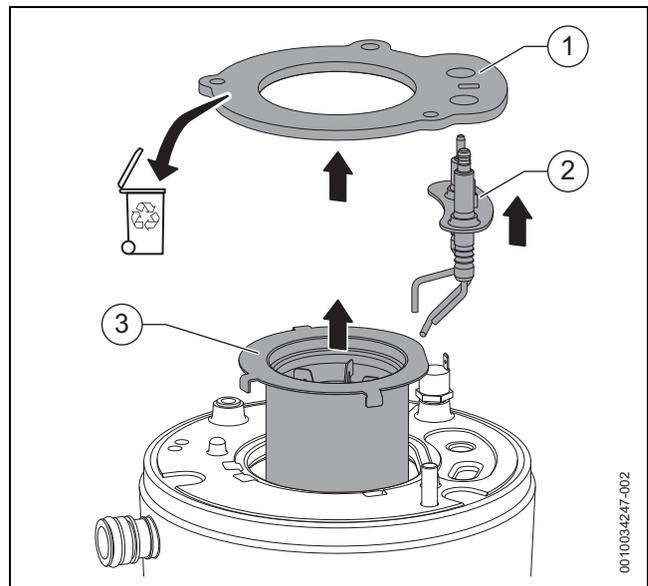


Fig. 74 Removing the burner

Refer to figure 75.

- ▶ Remove the top baffle using the lifting device.
- ▶ Remove the bottom baffle using the lifting device.

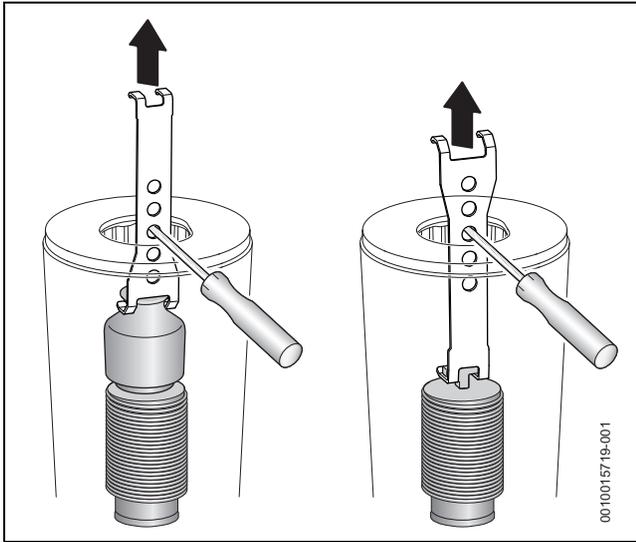


Fig. 75 Remove the top and bottom baffles

- ▶ Check for damage or deformation and then clean both baffles.

Refer to figure 76.



To gain better access from above, remove inspection aperture from the top panel of the appliance.

- ▶ Clean the heating exchanger with the brush:
 - by rotating in both directions
 - from top to bottom
- ▶ Remove the screws from the inspection aperture cover and remove with the seal.

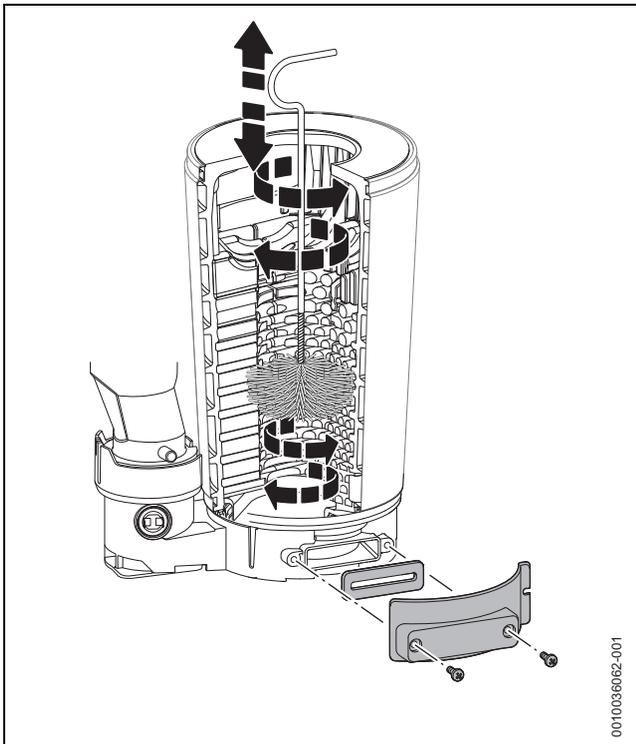


Fig. 76 Cleaning the heat exchanger

- ▶ Clean out residue and re-fit the inspection aperture again.

Refer to figure 77.

- ▶ Rinse the heat exchanger with water from the top.

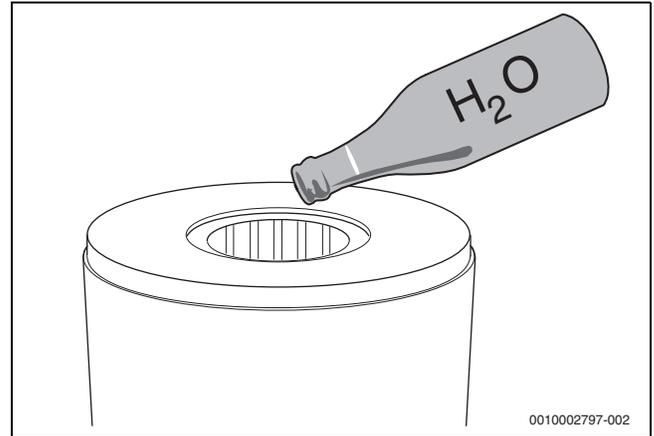


Fig. 77 Rinse the heat exchanger with water

Refer to figure 78.

- ▶ Re-open inspection aperture and ensure no residue remains.
 - Close the inspection aperture once checked.

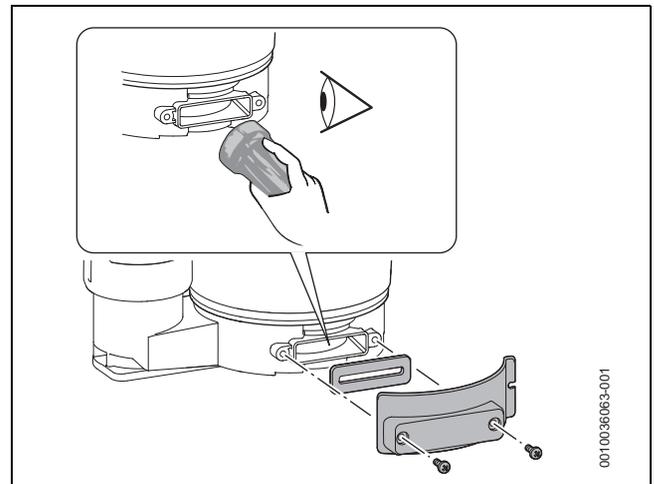


Fig. 78 Checking the heat exchanger for residue

- ▶ Refit the cleaned baffles.
- ▶ Clean the condensate trap before carrying out the following checks (→ section 9.9.2).
- ▶ Check that pathways are clear by carrying out Checking heat exchanger assembly, (→ section 9.5).
- ▶ Check and adjust if required the gas/air ratio.

9.9.2 Cleaning the condensate trap

 **WARNING**

Danger to life due to poisoning!

If the condensate trap is not filled, poisonous flue gas can escape.

- ▶ Fill the condensate trap with approximately 250 ml water before refitting.
- ▶ Make sure that the condensate discharge drains off properly.

 **i**

Damage resulting from an insufficiently cleaned trap is excluded from the warranty.

- ▶ Check and clean the siphon during regular maintenance.

Removing the siphon.

Refer to figure 79.

- ▶ Disconnect the discharge elbow [3] from the siphon.
- ▶ Place a suitable container below the siphon outlet to catch any water.
- ▶ Whilst supporting the siphon [2], press the locking lever [1] to the unlock position.
- ▶ Release the siphon [2] from the connection.
- ▶ Tip the siphon backwards to empty any condensate which will be discharged whilst removing the siphon from the appliance.
- ▶ Remove the siphon.

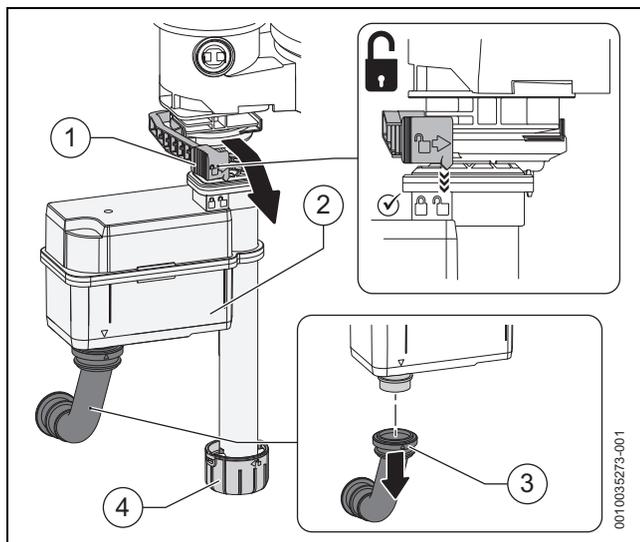


Fig. 79 Removing the siphon

- ▶ Clean the condensate siphon.
- ▶ Remove the dirt trap [4] (→ figure 79) at the bottom and clean it.
 - Check dirt trap gasket for cracks, deformation or breakage, replace if required.
- ▶ Refit the dirt trap and check that it is correctly seated.
- ▶ Check that the opening to the heat exchanger is clear.

Replacing siphon gasket.

Refer to figure 80.

- ▶ Remove the gasket on the top of the siphon.
- ▶ Check the gasket for cracks, deformation or breakage and replace if required.
- ▶ Align the gasket [1] correctly with the siphon.

- ▶ Push the gasket [1] into the recess and ensure it is correctly inserted.

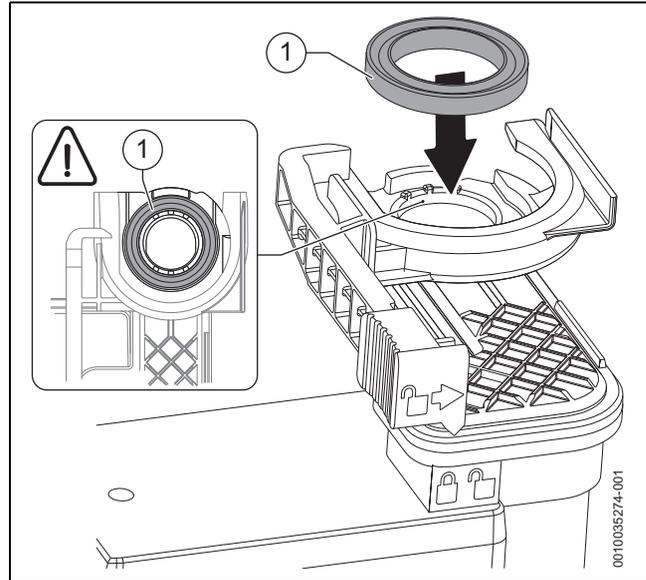


Fig. 80 Replacing the gasket

Refitting the siphon.

Refer to figure 81.

- ▶ Check the condition of the discharge elbow.
 - Check for cracks, deformation or breakage, replace if required.
 - Clean discharge elbow if required.
- ▶ Fit the discharge elbow to the 25mm condensate pipework protrusion on the wall frame.
- ▶ Fill the condensate siphon with approx. 250 ml water.
- ▶ Fit the condensate siphon [1]. Ensure the alignment arrow on the locking arm is in the locked position.
 - Ensure the condensate siphon is secured correctly.
- ▶ Fit the discharge elbow [2] onto the outlet, ensuring the locating arrows are aligned.

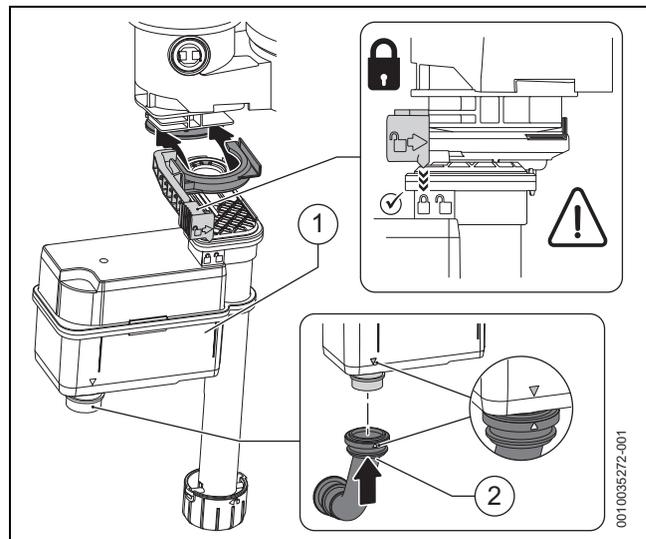


Fig. 81 Refitting the siphon

9.10 Setting the air/gas ratio

Adjusting the minimum rated output settings

With the appliance in minimum rated output.

- ▶ Remove the seal from the adjusting screw of the gas valve (only gas valve is shown in the below Figure 82) and set the CO₂ content for minimum rated output.

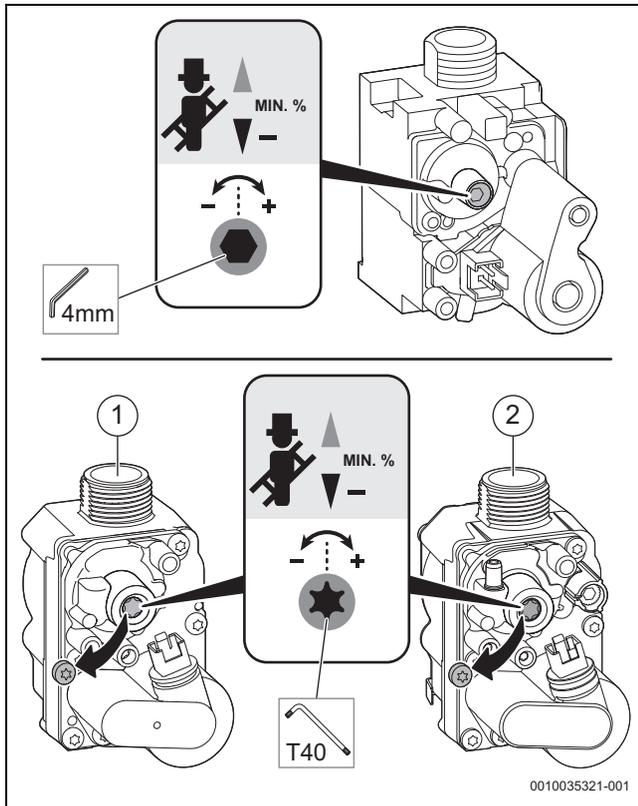


Fig. 82 Setting the CO₂ content (above: SIT valve, below: Honeywell valves)

- [1] Gas valve - NG
- [2] Gas valve - LPG

- ▶ Re-check settings at maximum and minimum rated output and re-adjust if required.
- ▶ Seal the gas valve minimum adjustment.
- ▶ Exit the chimney sweep mode.
- ▶ Enter the CO₂ contents in the servicing record.

Adjusting the maximum rated output settings (LPG appliances)

With the appliance in maximum rated output.

- ▶ Insert the hex tool into the adjusting screw of the gas valve (as shown in the below Figure 83) and set the CO₂ content for maximum rated output.

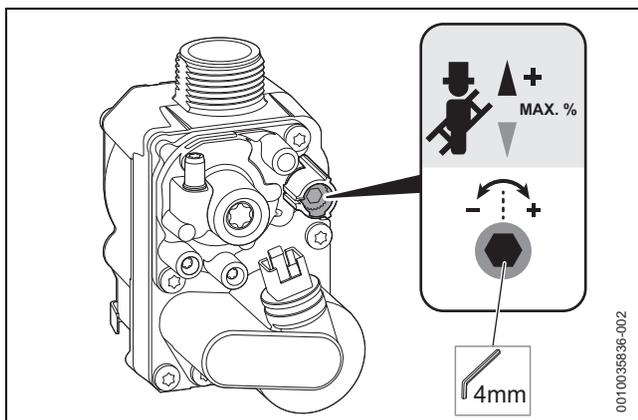


Fig. 83 Setting the CO₂ content

- ▶ Re-check settings at minimum and maximum rated output and re-adjust if required.
- ▶ Exit the chimney sweep mode.
- ▶ Enter the CO₂ contents in the servicing record.

! WARNING

Mains supplies - Isolate the appliance

- ▶ Turn off the gas supply and isolate the mains electrical supply before starting any work and observe all relevant safety precautions.
- ▶ Drain the appliance/system where necessary and protect any electrical equipment from water ingress during component replacement.

! WARNING

Component replacement:

- ▶ After replacement of a gas carrying component, where a gasket or seal has been disturbed or replaced, check for gas tightness using a gas sniffer/leak detection fluid.
- ▶ On re-assembly check all affected seals for cracks, hardness and deterioration.
 - If damaged or in any doubt the seal must be replaced.
- ▶ Also after re-assembly, carry out the following checks:
 - Fan pressure.
 - Flue gas analysis.



Only use Bosch original spare parts with this appliance. Non Bosch original spare parts will invalidate the guarantee (if applicable) and any warranty.

- ▶ A comprehensive list of appliance spares can be found on the website www.worcester-bosch.ie

9.11 Component access

Removing the front casing



The front casing is secured with two screws which are critical to maintain the case seal and to prevent unauthorised removal (electrical safety).

- ▶ Always secure the casing with these screws.
- ▶ Loosen the two screws [1] and pull the bottom of the casing forward.
- ▶ Lift off the casing.



Fig. 84 Removing the front casing

9.12 Draining the appliance

NOTICE

Risk of water damage to appliance or property!

Damage from disconnecting water pathways which may have retained some water.

- ▶ Take care after draining the appliance to protect equipment/property from residual water content within components.



Many of the tasks in this section require that the appliance be isolated and drained.

- ▶ Before working on any water carrying pipework and components drain the appliance.
- ▶ Connect a suitable hose firmly to the drain point and run the hose outside to a suitable point or container.
- ▶ Turn the drain valve a ¼ turn anti-clockwise to open the drain. Turn the valve firmly clockwise to close.

9.13 Removing the heat exchanger assembly

- ▶ Remove the fan, gas hose, mixing device and burner cover as described in Chapter 9.9.1 "Checking the electrodes and cleaning the heat exchanger", page 55.

Separating components from the heat exchanger assembly. Refer to figure 85.

- ▶ Separate components from the heat exchanger assembly in the sequence shown.
 - Release the clip.
 - Detach the flow connection.
 - Disconnect the cable from the heat exchanger temperature limiter.
 - Disconnect the in-line connector from the flow temperature sensor on the heat exchanger.
 - Disconnect the cable from the flue gas temperature limiter.
 - Remove the nut.

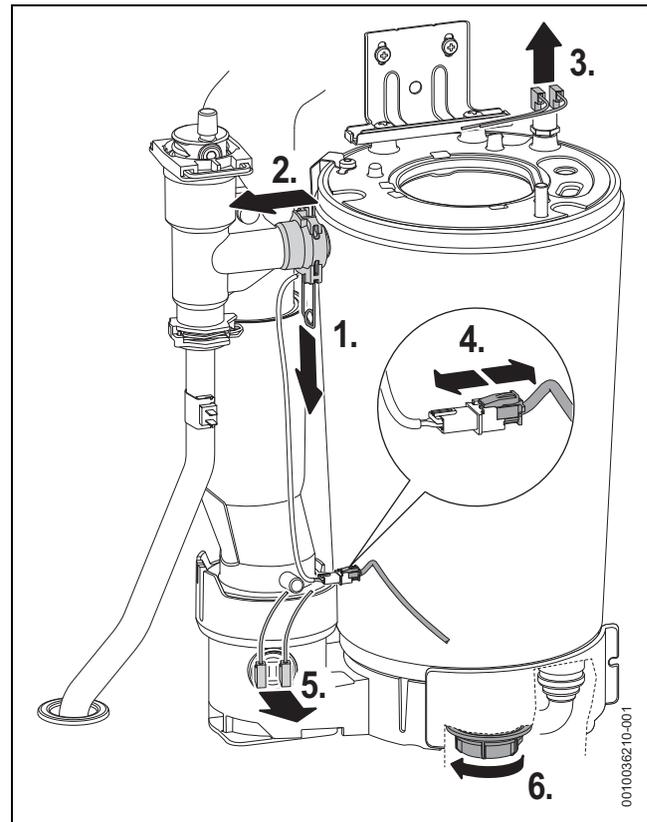


Fig. 85 Separating components from the heat exchanger assembly

Removing the heat exchanger assembly

Refer to figure 86.

- ▶ Release the flue pipe clip.
- ▶ Push the flue pipe up.
- ▶ Remove the bracket screws.
- ▶ Remove the heat exchanger assembly.

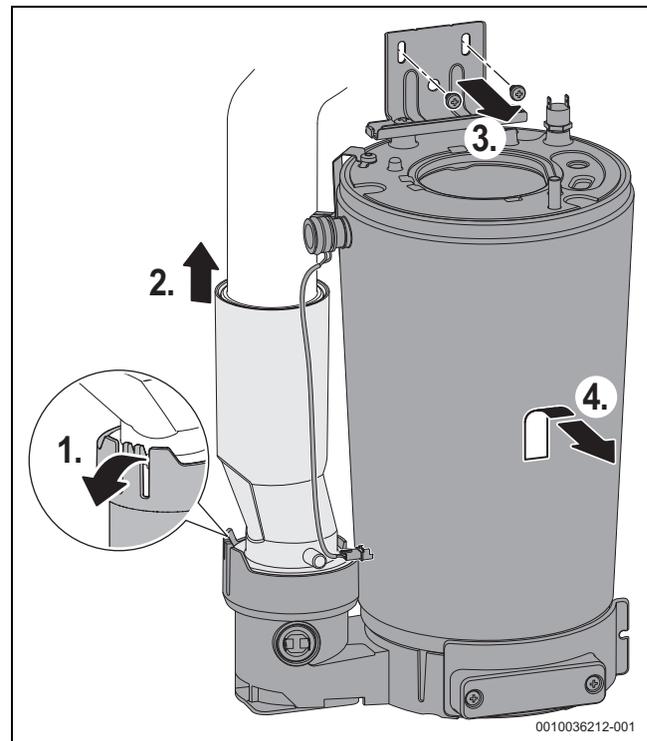


Fig. 86 Removing the heat exchanger assembly

9.14 Checking/replacing the motor of the 3-way valve (appliances fitted with diverter valve accessory)

Variant without screws

Checking 3-way valve motor.

- ▶ Carry out function check of 3-way valve motor in **Function check** menu.
 - **Service menu > Function check > Activate test** ¹⁾ > **3-way valve > Hot water.**

Detaching the motor.

- ▶ Set the 3-way valve to mid position.
 - **Service menu > Settings > Special function > 3-WV mid. pos. > Yes.**



The 3-way valve remains at the middle position for approx. 15 minutes.

- ▶ Detach the motor in the sequence shown.
 - Disconnect the plug.
 - Remove the locking clip.
 - Turn the motor anti-clockwise and pull it up and out.
 - Pull the motor up to disengage from ball head and remove.

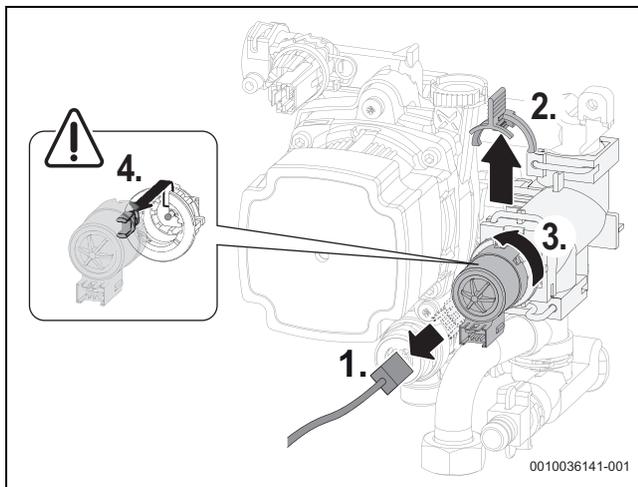


Fig. 87 Detaching the motor from the 3-way valve (variant without screws)

Installing the motor.

- ▶ Install the motor in the sequence shown.
 - Insert the motor and align above the ball head. Push down to engage.
 - Pull gently on the motor to ensure it has properly engaged onto the ball.
 - Turn the motor clockwise as far as it will go.
 - Refit the lock clip.
 - Connect the plug.

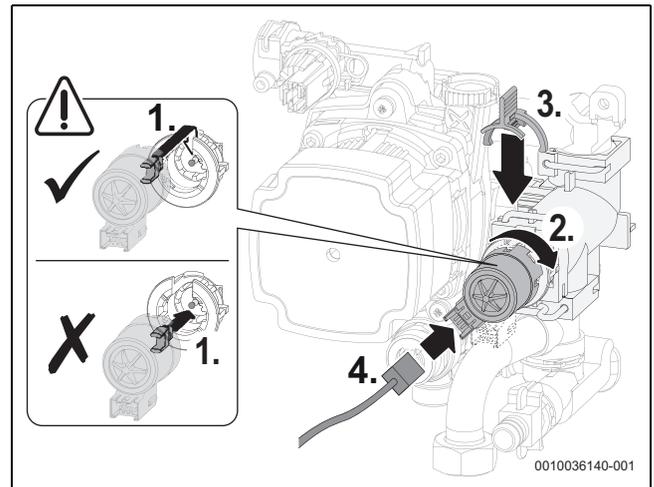


Fig. 88 Installing the motor in the 3-way valve (variant without screws)

9.15 Replacing the gas valve

- ▶ Close the gas isolator.
- ▶ Unscrew the union nut [1].
- ▶ Remove the connector [2].
- ▶ Unscrew the union nut [3].
- ▶ Remove the union nut and hose connection [4] from gas valve.
- ▶ Remove the 2 screws [6].
- ▶ Remove the gas valve [5].

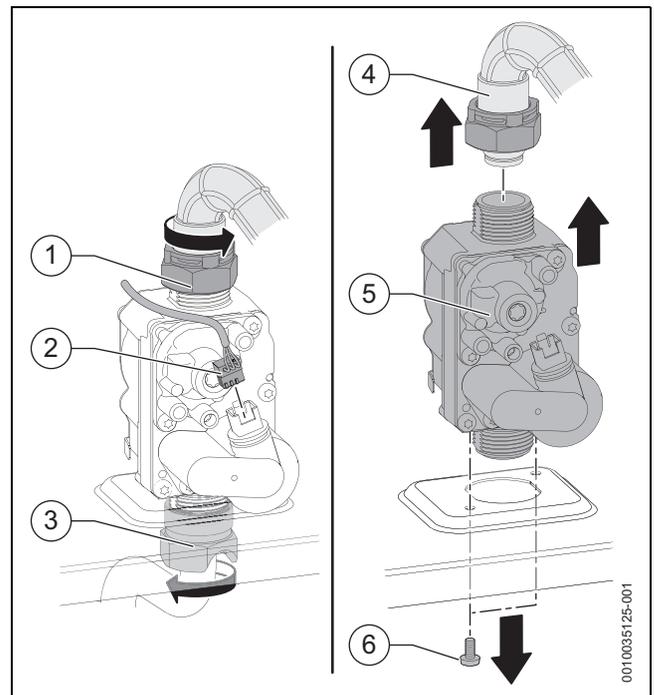


Fig. 89 Removing the gas valve

- ▶ Install the gas valve in reverse order, and check the gas/air ratio.

1) When the Function Check menu is entered only **Burner** will be visible for the first 10 seconds, after this period of time the other components that can be tested will appear in the menu. Components such as HC1 pump, DHW circulation pump and Solar pump will show if connected to the control board.

9.16 Removing the pump

- ▶ Unplug the electrical connections [4].
- ▶ Release the ratchet connection [1] between pump and heat exchanger assembly.
- ▶ Loosen the securing screws [3].
- ▶ Remove pump assembly [2].

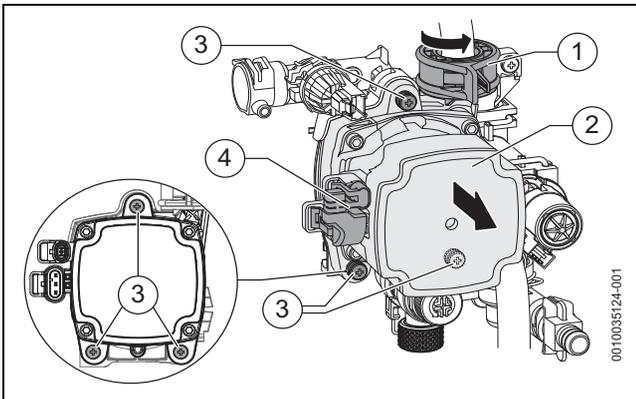


Fig. 90 Removing the pump

- ▶ Install the pump in reverse order.

9.17 Replacing the expansion vessel

- ▶ Disconnect the pipe union nut [3].
- ▶ Slacken the screws on the clamps, top [1] and bottom [2] of the expansion vessel.
- ▶ Slide the expansion vessel [4] towards you to remove.

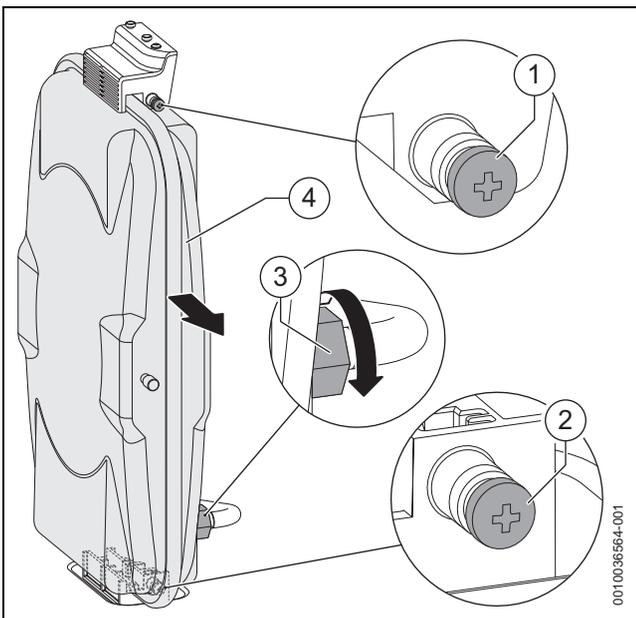


Fig. 91

- ▶ Replace the expansion vessel in the reverse order

9.18 Replacing the PRV

- ▶ Unscrew the knurled nut of the PRV discharge pipe.
- ▶ Disconnect the PRV discharge pipe prior to removing the PRV.
- ▶ Remove the PRV in the sequence shown.
 - Release the clip.
 - Pull the PRV forward to release.

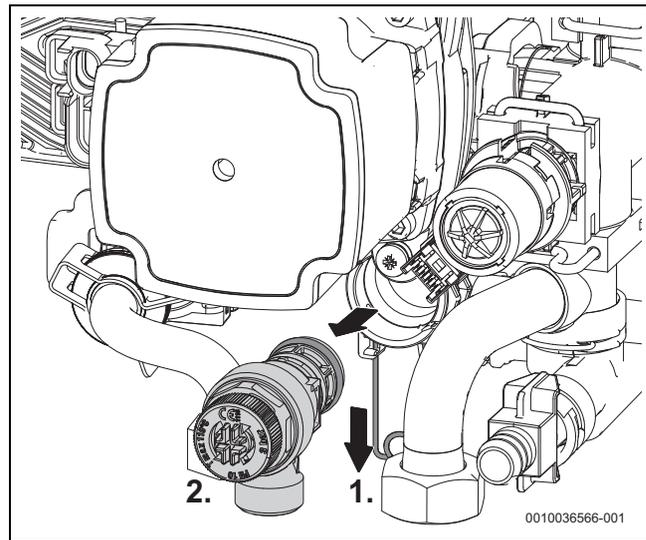


Fig. 92 PRV removal

- ▶ Replace the PRV in the reverse order

9.19 Replacing the pressure sensor



Pressure sensor is a wet pocket sensor, therefore the appliance must be drained down.

- ▶ Remove the pressure sensor in the sequence shown.
 - Release the electrical connection clip [1].
 - Disconnect the electrical connection [2].
 - Release the clip [3].
 - Pull the pressure sensor forward to release [4].

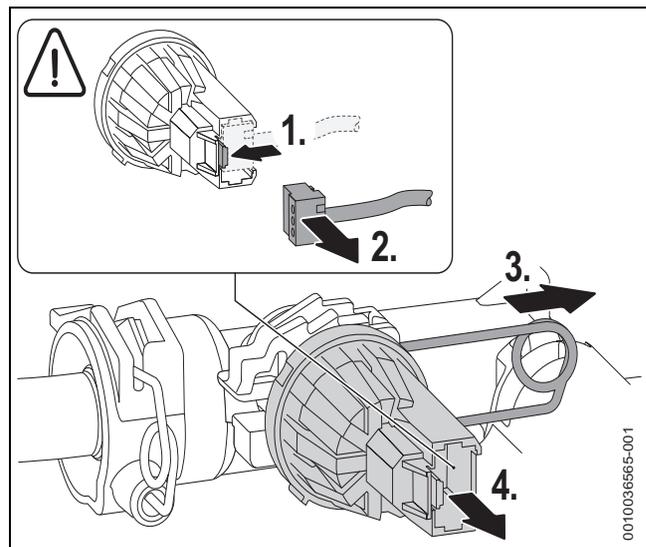


Fig. 93 Pressure sensor removal

- ▶ Replace the pressure sensor in the reverse order

9.20 Heat shield removal

The heat shield [1] is designed to protect components from heat produced when soldering boiler pipework connections. The heat shield will need to be removed to facilitate the removal of the return manifold, drain cock and pressure gauge capillary tube. The heat shield is secured with one hexagon head screw [2], a spanner will be required when removing the securing screw due to the confined space around the heat shield.

i Once the installation of the boiler and pipework is complete the heat shield is no longer required and does not need to be replaced when removing and replacing components from the area.

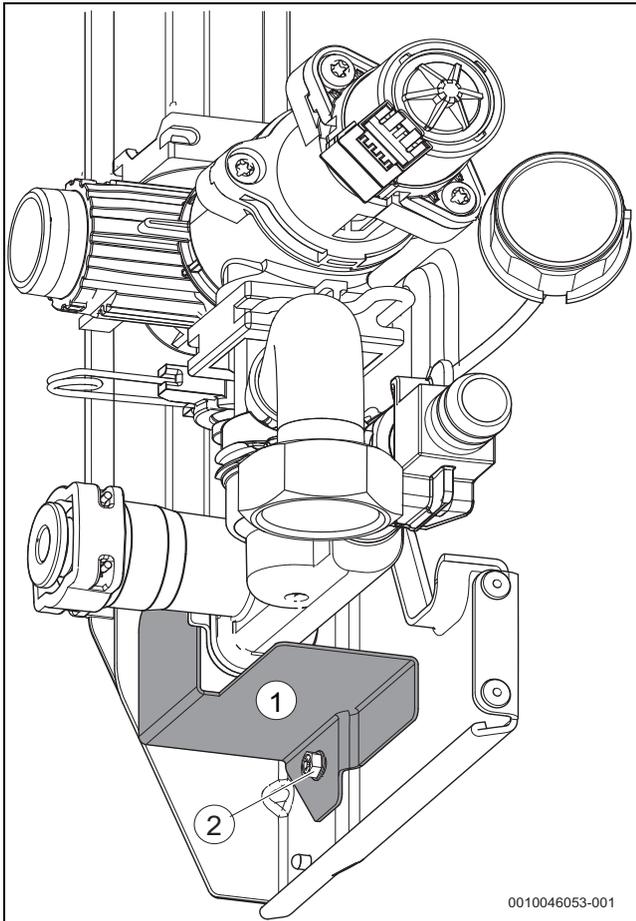


Fig. 94 Heat shield

9.21 Pressure gauge removal

At the rear of the boiler:

1. Release the clip securing the pressure gauge connection [1].
2. Remove the capillary from the support clip [2].
3. Pull the connection down to remove [3].

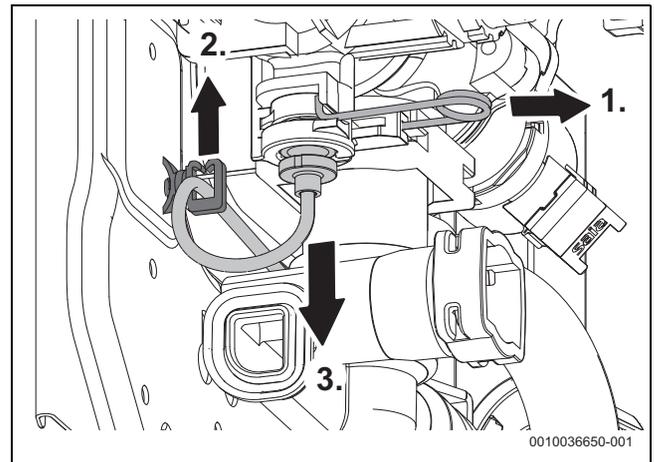


Fig. 95 Rear view of pressure gauge connection

From the front of the boiler:

1. Release at least two of the retaining clips on the pressure gauge mount.
2. Pull the pressure gauge forward and down to remove.

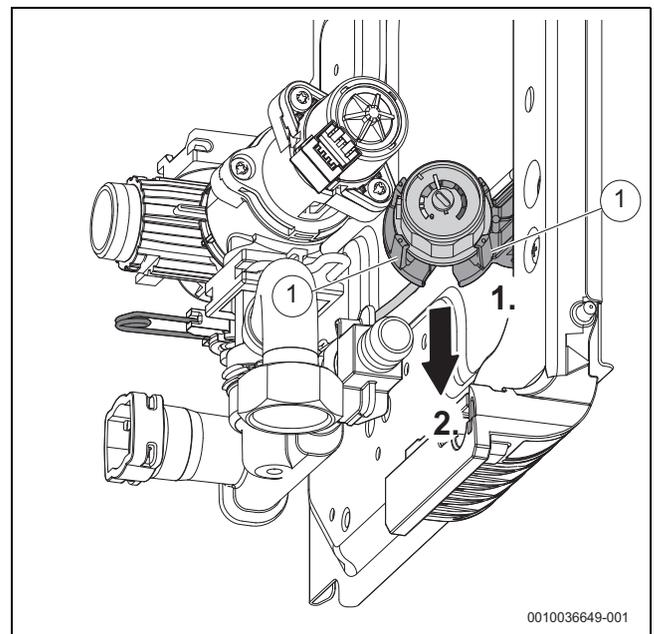


Fig. 96 Front view of pressure gauge

9.22 Replacing the control unit



Replacement control unit.

- ▶ The replacement control unit is not supplied with code plug or display cover panel. These must be removed and refitted to the replacement control unit.

Preparation before control unit removal.

- ▶ Loosen the retaining screw and open the cover.
- ▶ Remove connectors from the PCB on the both terminal strip sides.
 - Power supply (power cables) terminal strip (2).
 - Low voltage (signal cables) terminal strip (3).
- ▶ Remove connector for the Key accessory slot [4].
- ▶ Remove code plug [5].

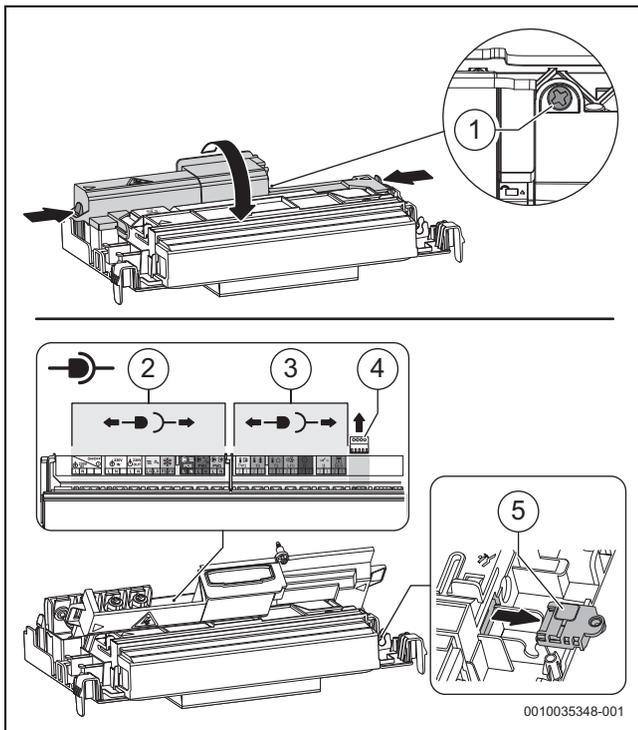


Fig. 97 Control unit removal preparations

Control unit removal.

- ▶ Release the locking latches [1] and pull the control unit [2] out of the cradle.
- ▶ Remove the display cover panel [3] from the control unit [2].
 - Lift up and forwards to release the display cover panel [3].

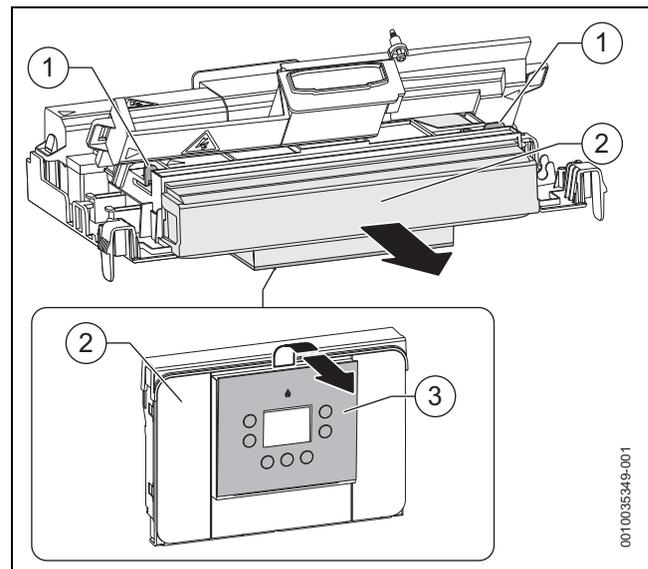


Fig. 98 Control unit removal

- ▶ Install the control panel in the reverse order.
 - Ensure all parts and connectors are fitted securely in position.

10 Fault finding and diagnosis



This fault finding information is for guidance only. Worcester cannot be held responsible for costs incurred by persons not deemed to be competent.



This fault finding system assumes that the appliance has been operating normally until the time of failure (i.e. not a first time installation error).

Basic checks

- Ensure that there is 230V power supply and the polarity is correct to the appliance.
- Ensure that the appliance settings and functionality is correct.
- Ensure the CH/DHW programmer/timer is functioning.
- Ensure the room thermostat is functioning.
- Ensure the cylinder thermostat (if fitted) is functioning.
- Ensure the cold water mains is turned on.
- Ensure the primary system has adequate pressure/system content for the system type.
- Ensure there is gas to the appliance.
 - Are other gas appliances working, gas cooker/hob for example?
 - Has the credit run out on the gas pre-payment meter?

NOTICE

On completion of the Service/Fault-Finding task which has required the breaking and remaking of electrical connections, check:

- ▶ Earth continuity,
- ▶ Short circuit check,
- ▶ Polarity,
- ▶ Resistance to earth.

10.1 Fault and event history

Fault history

To view the last 10 faults in chronological order.

- ▶ Enter the service menu.
 - Press the  key and the  key simultaneously until the service menu appears.
- ▶ Navigate to **Info** menu item.
 - Keep pressing the  key, until **Info** is displayed and press **ok** key to confirm selection.
- ▶ Navigate to **Fault history** menu item.
 - Keep pressing the  key, until **Fault history** is displayed and press **ok** key to confirm selection.

10.2 Operating and fault displays

10.2.1 General information

- **Fault code:** indicates which fault is present.
- **Fault category:** indicates what kind of fault is present and its effects.

Fault category O (operating code)

Operating codes indicate the operating conditions in normal operation.

Fault category B (blocking faults)

Blocking faults result in the heating system being shut down temporarily. The heating system restarts automatically as soon as the blocking fault is removed.

Fault category V (locking faults)

Locking faults result in the heating system being shut down, and the system can only be restarted after a reset.

- ▶ Press the  and  keys, until **Reset** is displayed. The appliance resumes operation.

If a fault persists:

- ▶ Rectify the fault according to 10.1.2 Fault code table

Fault category W (maintenance codes)

10.2.2 Operating/Fault code table

Fault code	Fault category	Fault text on the display/description	Remedy
200	O	Boiler in heating mode	Operating message, is not a fault. • Heating circuit is being heated.
201	O	Boiler in hot water mode	Operating message, is not a fault. • Hot water circuit is being heated.
202	O	Boiler in anti-cycle mode	Operating message, is not a fault. • Anti-cycle mode - this is the standby time between heating demands - default 5 minutes. – For example, if there is heating demand for 1 minute, the boiler will wait for 4 minutes after the heating demand before firing for a subsequent heating demand. Fault code 202 will be present during anti-cycle mode.
203	O	Boiler in standby, no heat energy demand	Operating message, is not a fault. • Appliance in standby, awaiting a demand request.
204	O	Current prim. water temp. higher than set val.	Operating message, is not a fault. • System waiting. The actual boiler water temperature is higher than the target boiler water temperature. The boiler heat demand is switched off.
208	O	Chimney sweep demand	Operating message, is not a fault. • Chimney sweep mode active.
214	V	Fan shut down during safety time	▶ Check the plug on the fan. ▶ Check the connecting lead to the fan.
224 224	B V	Maximal flue gas thermostat or heat exchanger maximal thermostat has activated Maximal flue gas thermostat or heat exchanger maximal thermostat has activated	If the blocking fault persists for a prolonged period, it becomes a locking fault. ▶ Check if the lead is disconnected from the safety temperature limiter/thermostat or the flue thermostat. ▶ Check the high limit of the safety temperature limiter/thermostat or the flue thermostat and the harness for continuity. ▶ Check the flow temperature to confirm actual temperature (may have tripped out at lower temperature, leading to a safety temperature limiter/thermostat or the flue thermostat fault). ▶ Check the system pressure and top up as required. ▶ Check if air is trapped in the system and in the boiler. ▶ Pump seized/not running: check the pump for failure or blockage. ▶ Check if a blockage/restriction within boiler/pipework is restricting the flow.
227	V	No flame signal after ignition	Tip: Check the ceramic insulator is not damaged, this can cause the spark to earth, twist and pull the ceramic insulator to ensure it is not broken. ▶ Check the gas supply to the property and the inlet on the gas valve. ▶ Check for low pressure when the gas valve opens. ▶ Gas valve failing to open: check for voltage to the valve and for possible blockage on inlet filter of the gas valve. ▶ Obstruction in the air intake to the fan leading to incorrect CO ₂ ratio. ▶ Condensate siphon is blocked or restricted. Condensate pipe is frozen. ▶ Flue is blocked or restricted. ▶ Heat exchanger is blocked or restricted. ▶ Check the burner for damage. ▶ Check the spark electrode/lead for failure. ▶ Check the flame sense/lead for failure. ▶ Check the rectification ground (black wire to heat exchanger).
228	V	Flame signal without flame present	Tip: Check the ceramic insulator is not damaged, this can cause the spark to earth, twist and pull the ceramic insulator to ensure it is not broken. ▶ Check the flame sense and the lead and replace if required. ▶ Check the earth tags on the boiler and on the electrodes. ▶ Check the operation of the siphon and that no water is collecting in the sump. ▶ Replace the gas valve. ▶ Replace the control unit and/or burner control unit.
232	B	Boiler locked by external switching contact	External cut off switch not used in UK: ▶ Ensure nothing is plugged into red I3 connection.
233	V	Boiler identification module or device electronics faulty	▶ Wrong code plug is inserted. ▶ Check the code plug is not damaged. ▶ Replace the code plug if required.

Fault code	Fault category	Fault text on the display/description	Remedy
234	V	Gas valve electrical fault	<ul style="list-style-type: none"> ▶ Check the gas supply to the property and the inlet on the gas valve (check drop on inlet). ▶ Check the connections on the gas valve and the board (loose connection). ▶ Check the continuity down harness and replace if required. ▶ Check the voltage to the gas valve (19–24 V DC approx. when demand). ▶ Check for water on the gas valve connections. ▶ Check the resistance on the gas valve (pins 1–2 approx. 69.5 Ohms). <ul style="list-style-type: none"> – Replace the gas valve if resistances are incorrect. ▶ If all tests are correct: replace the control unit.
235	V	Conflicting versions of boiler electr. and boiler identification	<ul style="list-style-type: none"> ▶ Replace the code plug or the burner control.
237	V	System fault	<ul style="list-style-type: none"> ▶ Check the code plug is not damaged. ▶ Replace the code plug if required. ▶ Replace the control unit (control unit).
238	V	Boiler electronics faulty	<ul style="list-style-type: none"> ▶ Check the gas supply to the property and the inlet on the gas valve (check drop on inlet). ▶ Check the connections on the gas valve and the board (loose connection). ▶ Check the continuity down harness and replace if required. ▶ Check the voltage to the gas valve (19–24 V DC approx. when demand). ▶ Check for water on the gas valve connections. ▶ Check the resistance on the gas valve (pins 1–2 approx. 69.5 Ohms). <ul style="list-style-type: none"> – Replace the gas valve if resistances are incorrect. ▶ If all tests are correct: replace the control unit.
242	V	Boiler electr. system fault	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
245	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
249	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
250	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
251	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
252	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
253	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
254	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
258	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
259	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
262	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.

Fault code	Fault category	Fault text on the display/description	Remedy
263	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
265	B	Heat demand lower than energy supplied	<p>Operating message, is not a fault.</p> <ul style="list-style-type: none"> • The boiler's ignition sequence alone is sufficient enough to maintain room temperature. • The modulating heat demand is higher than the minimum modulation factor of the unit. The unit switches to proportional control.
268	O	Relay test was activated	<p>Operating message, is not a fault.</p> <ul style="list-style-type: none"> • Appliance in component test mode.
269	V	Flame monitoring	<ul style="list-style-type: none"> ▶ Restart the appliance to see if the problem re-occurs. ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit (control unit).
273	B	Operation of burner and fan interrupted	<p>Operating message, is not a fault.</p> <ul style="list-style-type: none"> • The burner and fan have been running continuously for 24 hours and have been shut down briefly for an appliance electronic inspection
281	B	Operation of burner and fan interrupted	<ul style="list-style-type: none"> ▶ Check primary system water pressure. ▶ Check for air in the system and vent the pump. ▶ Check for circulation within heating system. ▶ Check hydraulic connections to the pump. ▶ Check wiring and operation of the pump, replace if necessary.
283	O	Burner starting	<p>Operating message, is not a fault.</p> <ul style="list-style-type: none"> • Burner is starting.
284	O	Opening air/gas ratio control valve/oil solenoid valves	<p>Operating message, is not a fault.</p> <ul style="list-style-type: none"> • Gas valve is opening.
305	O	Boiler in hot water anti-cycle mode	<p>Operating message, is not a fault.</p> <ul style="list-style-type: none"> • Anti-cycle mode, domestic hot water post-heat function. Following a domestic hot water demand the boiler runs for 30 seconds or until the target temperature is met. <ul style="list-style-type: none"> – Diverter valve is held in the hot water position for a period of time. – If no domestic hot water demand is requested then check for false demands on the cold water inlet.
306	V	Flame signal after closing the fuel supply	<ul style="list-style-type: none"> ▶ Check the gas valve, replace if required. ▶ Check electrodes and connecting leads, replace if required. ▶ Replace the appliance electronics.
353	O		<p>Test non-volatile lockout</p> <p>Operating message, is not a fault.</p> <ul style="list-style-type: none"> • If the boiler has been operating for 24 hours without a 20-minute off period, the boiler will not respond for a period of time whilst it undertakes diagnostics checks on the fan.
357	O	Flame signal after closing the fuel supply	<p>Operating message, is not a fault.</p> <ul style="list-style-type: none"> • Venting/air purge program has been automatically activated.
358	O	Anti-seizing functn. active	<p>Operating message, is not a fault.</p> <ul style="list-style-type: none"> • Blocking protection for the heating pump and diverter valve active. <ul style="list-style-type: none"> – The purpose of component kick is to ensure that hydraulic components such as pumps will not get stuck by giving these functional components a “kick”, i.e. they are briefly turned on after a period of inactivity. – After power up every 24 hours the appliance will do a component kick, where the pump will run for 10 seconds. – If the appliance is already in a CH or DHW heat request, these heat demands will be prioritised over component kick. But once the heat demand has ended the component kick will take place. – If this causes nuisance then please power the appliance off and on again at a more suitable time; the daily kick will then occur at the time the appliance is turned on again.
360	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Wrong code plug is inserted. ▶ Check the code plug is not damaged. ▶ Replace the code plug if required.
362	–	Boiler identification module or boiler electronics faulty	<p>Is not a fault.</p> <ul style="list-style-type: none"> • Service plug detected.

Fault code	Fault category	Fault text on the display/description	Remedy
363	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Check and replace the ionisation cable. ▶ Check and replace the electrodes if required. ▶ Check and replace the control unit and/or burner control unit.
810		Hot water remains cold	<ul style="list-style-type: none"> ▶ Reset the appliance and wait 24 hours ▶ Check the DHW valves, ▶ Check the 3-way valve, replace if necessary, ▶ Check that the tank is properly connected.
811	A	Hot water heating: thermal disinfection failed	<ul style="list-style-type: none"> ▶ If water is being drawn constantly, take action to stop this. ▶ Position the DHW temperature sensor correctly. ▶ Check that there is contact between the DHW cylinder temperature sensor and the cylinder. ▶ Vent the cylinder circuit. ▶ Set DHW heating to "priority". ▶ Check plate heat exchanger for calcification. ▶ Check sizing of DHW circulation line and heat loss.
1010	-	No communication via EMS BUS connection	<ul style="list-style-type: none"> ▶ Check the grey ribbon on far right of the control unit control unit (low voltage connection). ▶ If using a Key control product check the Key connections (black, white, red, green) are plugged into the correct position on the control unit (under installer cover on the far right hand side, leaving one space to the BUS connection). ▶ Check that the Key is pushed fully home. ▶ Check the batteries of the room control. ▶ Check the bridging links are fitted at LR & 230 V out. ▶ For wired room controls check the EMS BUS Voltage to the remote control is 12 - 15V DC. ▶ Check the 230 V external wiring does not run alongside the BUS connections, thus causing interference. ▶ Replace the control unit
1013	W	Max. combustion point reached	<p>The service reminder message is present due to the maximum burner hours service threshold being reached.</p> <ul style="list-style-type: none"> ▶ Carry out maintenance. ▶ Reset the maintenance code via the reset menu.
1017	W	System pressure too low	<ul style="list-style-type: none"> ▶ Top up system water and vent the system. ▶ Check the voltage to the pressure sensor and the signal back from the pressure sensor. ▶ Replace the pressure sensor.
1018	W	Maintenance interval expired	<ul style="list-style-type: none"> ▶ Carry out maintenance. ▶ Reset the maintenance code via the reset menu.
1019	W	Incorrect pump type detected	<ul style="list-style-type: none"> ▶ Pump communication failure or wrong pump is fitted (i.e. non-ErP). ▶ Check the pump communication wire is connected and has continuity. ▶ Replace the pump for correct modulating pump.
1021	B	Cylinder charging or hot water temperature sensor faulty	<p>A 1021 error can only be cleared by powering the appliance off and back on again after the hot water sensor has been changed if open or short circuit, or refitted to the pipe if it has fallen off.</p> <ul style="list-style-type: none"> ▶ Check the domestic hot water temperature sensor is connected and the harness is fitted securely to the sensor. ▶ Check the resistance of the temperature sensor and replace if required. ▶ Check the continuity of harness and replace if required.
1022	W	Cylinder temp. sensor faulty or contact problems	<ul style="list-style-type: none"> ▶ Connect the plug to the temperature sensor correctly. ▶ Connect the plug to the control device correctly. ▶ Check the temperature sensor, replace if necessary. ▶ Check temperature sensor connecting lead, replace if necessary.
1023	W	Maximum run time including standby time reached	<p>The service reminder message is present due to the maximum run time (boiler hours) being reached.</p> <ul style="list-style-type: none"> ▶ Carry out maintenance. ▶ Reset the maintenance code via the reset menu.

Fault code	Fault category	Fault text on the display/description	Remedy
1037	W	Outside temp. sensor faulty - heating back-up operation active	<p>Tip: Check the weather compensation is applicable and the menu has not been accidentally switched on in the menu.</p> <ul style="list-style-type: none"> ▶ Check the positioning of the outside weather sensor. ▶ Check the weather sensor connections on the control board.
1065	W	System pressure sensor faulty or not connected	<ul style="list-style-type: none"> ▶ Check the plug is connected correctly to the pressure sensor. ▶ Check pressure sensor connecting leads for breaks or short circuits, replace if necessary. ▶ Check the pressure sensor, replace if necessary.
1068	W	Outside temp. sensor or lambda probe faulty.	<ul style="list-style-type: none"> ▶ Check the plug to the temperature sensor, connect correctly. ▶ Check connecting lead for break or short circuit, replace if required. ▶ Check temperature sensor, replace if necessary. ▶ Check appliance electronics, replace control unit if necessary.
1070	W	Maintenance is due on <dd.mm.yyyy> please call your service engineer	<p>Advanced service reminder warning.</p> <ul style="list-style-type: none"> ▶ Check the maintenance menu. ▶ Reset the maintenance code via the reset menu.
1071	W	Maintenance is now due please call your service engineer	<ul style="list-style-type: none"> ▶ Check the maintenance menu. ▶ Reset the maintenance code via the reset menu.
1072	W	Maintenance is overdue please call your service engineer	<ul style="list-style-type: none"> ▶ Check the maintenance menu. ▶ Reset the maintenance code via the reset menu.
1073	W	Short-circuit at flow temp. sensor	<ul style="list-style-type: none"> ▶ Check the flow temperature sensor plug is connected. ▶ Check the resistance of the flow temperature sensor and replace if required. ▶ Check the continuity of harness and replace if required. ▶ Replace the flow temperature sensor.
1074	W	No signal from flow temperature sensor	<ul style="list-style-type: none"> ▶ Check the flow temperature sensor plug is connected. ▶ Check the resistance of the flow temperature sensor and replace if required. ▶ Check the continuity of harness and replace if required. ▶ Replace the flow temperature sensor. ▶ Replace the control unit.
1075	W	Heat exchanger temp sensor short circuit	<ul style="list-style-type: none"> ▶ Check the flow temperature sensor plug is connected. ▶ Check the resistance of the flow temperature sensor and replace if required. ▶ Check the continuity of harness and replace if required. ▶ Replace the flow temperature sensor. ▶ Replace the control unit.
1076	W	Heat exchanger temp sensor disconnected	<ul style="list-style-type: none"> ▶ Check the flow temperature sensor plug is connected. ▶ Check the resistance of the flow temperature sensor and replace if required. ▶ Check the continuity of harness and replace if required. ▶ Replace the flow temperature sensor. ▶ Replace the control unit.
2085	V	Internal fault	<ul style="list-style-type: none"> ▶ Reset the appliance. ▶ Switch off the appliance for 30 seconds and then turn back on. ▶ Check the incoming mains voltage. ▶ Check the polarity. ▶ Replace the control unit.
2908	V	System fault boiler electronics / basic controller	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
2910	V	Fault in flue system	<ul style="list-style-type: none"> ▶ Check the flue for obstructions and remove any found. ▶ Check the flue integrity test. ▶ Check for water in the sump and check the siphon operation, clean if required.
2914	-	Boiler electr. system fault	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.

Fault code	Fault category	Fault text on the display/description	Remedy
2915	V	Boiler electr. system fault	The fan keeps running after the post purge. <ul style="list-style-type: none"> ▶ Reset the appliance. ▶ Create a heat demand to test the boiler's ignition sequence. ▶ Check the voltage to the fan and the continuity of the fan harness. ▶ Check the power modulation on the fan. ▶ control unit may be defective.
2916	V	Boiler electr. system fault	Gas valve was detected as open during post-purge. <ul style="list-style-type: none"> ▶ Carry out a gas tightness test on the gas valve and replace if required. ▶ Check the voltage to gas valve. ▶ The gas valve or the control unit may be defective
2920	V	Fault in flame monitoring	<ul style="list-style-type: none"> ▶ Check electrodes and connecting leads, replace if required. ▶ Check protective earth conductor connections (PE). ▶ Check appliance electronics, replace control unit if necessary.
2923	V	Boiler electr. system fault	Unexpected feedback from the modulating/current controlled gas valve. <ul style="list-style-type: none"> ▶ Check the voltage to the gas valve. ▶ Check the continuity of harness and replace if required. ▶ Check the resistance of the gas valve coils. ▶ The gas valve or the appliance electronics (control unit) may have a fault.
2927	B	Boiler electr. system fault	No ionisation detected after ignition. <ul style="list-style-type: none"> ▶ Check the main shut-off valve, open if necessary. ▶ Check the appliance isolation valve, open if necessary. ▶ Measure the gas supply pressure at the rated heat input. If necessary, shut down the appliance and check the gas line. ▶ Check flame sense electrode and connecting lead, replace if required. ▶ Check venturi/injector for potential blockage. ▶ Measure the ionisation current. ▶ Check the protective earth conductor connection (PE) in the control unit. ▶ Check the ignition cable for damage, replace if necessary. ▶ Check functionality of gas valve and replace if necessary. ▶ Check CO₂ settings at min and max output ▶ Check flue system. ▶ Check combustion air supply. ▶ Check the heat exchanger on the flue gas side for deposits, clean if necessary.
2928	V	Internal fault	<ul style="list-style-type: none"> ▶ Restart appliance. ▶ If the fault persists following a reset, the burner control unit is faulty and must be replaced, (replace control unit).
2931	V	System fault boiler electronics / basic controller	Illegal instruction. <ul style="list-style-type: none"> ▶ Restart appliance. ▶ If the fault persists following a reset, the burner control unit is faulty and must be replaced, (replace control unit).
2940	V	System fault burner control unit	Low voltage. <ul style="list-style-type: none"> ▶ Restart appliance. ▶ If the fault persists following a reset, the burner control unit is faulty and must be replaced, (replace control unit).
2946	V	Incorrect code plug detected	<ul style="list-style-type: none"> ▶ Check code plug, replace if necessary.
2948	B	No flame signal with low output	Burner starts automatically after purging. This can be caused by strong winds. <p>If this fault occurs frequently:</p> <ul style="list-style-type: none"> ▶ Check CO₂ settings. ▶ Check flue outlet position for effects of excessive wind pressure. ▶ Check flue integrity.
2949	B	No flame signal with high output	May be caused by strong winds or flue gas recirculation. The burner starts automatically after purging. <ul style="list-style-type: none"> ▶ Check the flue integrity. ▶ Check the flue terminal position. ▶ Check the CO₂ settings and adjust if necessary. ▶ Check the burner and the heat exchanger gaskets and the inner flue gaskets. ▶ Check the gas pressure during burning at full load (working pressure, dropping low).

Fault code	Fault category	Fault text on the display/description	Remedy
2950	B	No flame signal following starting procedure	<p>Burner starts automatically after purging.</p> <ul style="list-style-type: none"> ▶ Check gas pressure whilst burning at full load. ▶ Check CO₂ settings, adjust if necessary. ▶ Check Burner and heat exchanger gaskets.
2951	V	Loss of flame too many times	<p>Maximum unexpected flame losses exceeded.</p> <ul style="list-style-type: none"> ▶ Refer to the blocking error(s) that lead to this locking error. Check the fault history on appliance. ▶ Possible incomplete purging of gas pipe. ▶ Could also indicate a wide variety of issues such as undersized pipework or gas pressure dropping off, incorrectly routed condensate discharge, incorrectly sited flues, incorrectly wired etc.
2952	V	Internal fault when testing the ionisation signal	<ul style="list-style-type: none"> ▶ Perform reset. ▶ If fault persists, replace control unit.
2957	V	Boiler electr. system fault	<ul style="list-style-type: none"> ▶ Reset appliance electronics (factory reset). ▶ Check the electrical connections on the board (check for loose wires etc.). ▶ Replace the control unit.
2961	V	No fan signal available	<ul style="list-style-type: none"> ▶ Check the mains voltage to the fan. ▶ Check the fan harness for continuity and replace if required. ▶ Check the pulse width modulation (PWM). ▶ Replace the fan. ▶ Replace the control unit.
2962	V	No fan signal available	<ul style="list-style-type: none"> ▶ Check the mains voltage to the fan. ▶ Check the fan harness for continuity and replace if required. ▶ Check the pulse width modulation (PWM). ▶ Replace the fan. ▶ Replace the control unit.
2963	B	The heat exchanger sensor or both supply and heat exchanger sensors are defect	<ul style="list-style-type: none"> ▶ Check the flow through the appliance and the system is filled. ▶ Check for air locks in the system and purge if required. ▶ Check the heat exchanger sensor (primary thermistor) and the plug connected to temperature sensor. ▶ Check the resistance of the temperature sensor and replace if required. ▶ Check the continuity of the temperature sensor harness and replace if required.
2964	B	Flow rate in heat exchanger too low	<ul style="list-style-type: none"> ▶ Check the flow through the appliance and that the system is filled. ▶ Check for air locks in the system and purge if required. ▶ Check the heat exchanger sensor (primary thermistor) and the plug connected to the temperature sensor. ▶ Check the resistance of the temperature sensor and replace if required. ▶ Check the continuity of the harness and replace if required.
2965	B	Flow temperature too high	<ul style="list-style-type: none"> ▶ System is not filled with water or low system pressure. ▶ No water flow, because CH system is closed. ▶ No water flow, because pump is not operating correctly. ▶ Check flow through appliance and system. ▶ Check for air locks in the system. Purge if required. ▶ Check isolation valves.
2966	B	Flow temperature rise in heat exchanger too rapid	<ul style="list-style-type: none"> ▶ System is not filled with water or low system pressure. ▶ No water flow, because CH system is closed. ▶ No water flow, because pump is not operating correctly. ▶ Check pump is operating freely check voltage to pump. ▶ Check the isolation valves. ▶ Check for air locks in the system, purge if required. ▶ Check flow through appliance and system pressure.

Fault code	Fault category	Fault text on the display/description	Remedy
2967	B	The temperature difference between supply temperature sensor and temperature sensor at heat exchanger is too large	<ul style="list-style-type: none"> ▶ Check the flow through the appliance and that the system is filled. ▶ Check for air locks in the system and purge if required. ▶ Check the isolation valves, ensure they are open. ▶ Check the pump is operating freely and check the voltage to the pump. ▶ Check the heat exchanger sensor and the flow sensor are making correct contact with the heat exchanger assembly/pipework. ▶ Check the heat exchanger sensor for break or short circuit, replace if required. ▶ Check the resistance of the supply sensor for break or short circuit, replace if required. ▶ Check the continuity of harness, replace if required.
2970	B	Pressure drop in heating system too rapid	Too many unexpected pressure drops within a short time period. Cause code can appear if system is pressurised and the system then vented. <ul style="list-style-type: none"> ▶ Re-pressurise manually and vent the system. ▶ Ensure the correct pressure. If cause code does not clear, power off appliance.
2971	B	System pressure too low	System pressure is very or extremely low. This is triggered when the pressure falls to between 0.6 and 0.3 bar. Top up water until the target pressure is reached. Filling loop <ul style="list-style-type: none"> ▶ Vent the heating system and top up water until the pre-set pressure reached. Pressure sensor <ul style="list-style-type: none"> ▶ Check the continuity down harness for the pressure sensor and replace if required. ▶ Check the voltage at the pressure sensor and replace if required.
2972	V	Mains voltage too low	<ul style="list-style-type: none"> ▶ Establish supply voltage of at least 196 V AC. ▶ Replace control unit.
2980	V	Locking fault: To unlock Hold up and down arrow keys pressed simultaneously for 3 s. For more information see operating instr. (Boiler locked. Contact a qualified heating engineer)	Boiler is in the super lock-out condition. Super lock-out (2980) occurs when a potential safety-critical condition is detected and 5 locking faults are reset within a 15-minute period. If the fault is not remedied and the complete system is not checked, there is a risk of personal injury: <ul style="list-style-type: none"> ▶ Follow remedy actions for fault code 2981.
2981	V	Locking fault: To unlock Hold up and down arrow keys pressed simultaneously for 3 s. For more information see operating instr. (Boiler locked. Contact a qualified heating engineer) The appliance power was switched off and on again with an existing super lock-out (fault code 2980).	<ul style="list-style-type: none"> ▶ Diagnose and remedy the locking fault. Check the complete system, including sensors and harnesses. ▶ When remedied and system checked, turn the boiler power off and on again. ▶ Fault condition 2981 will appear, the boiler is still in super lock-out ▶ Press the up and down arrows simultaneously for 3 seconds. ▶ Immediately after 22 seconds have elapsed, perform an additional reset by pressing the up and down arrows simultaneously for 3 seconds. ▶ Super lock-out is remedied, boiler returns to normal operating condition. ▶ Fault history is now available, double check the last 10 faults to confirm the fault has been remedied
3071	-		Comfort + II RF <ul style="list-style-type: none"> ▶ Check the configuration (address setting). The selected setting requires a hard-wired room control. ▶ Check the EMS connection cable of the room control for damage. The BUS voltage on the room control must be between 12 and 15 V DC. ▶ Disconnect the EMS-BUS connection to the control unit and power the boiler off and back on again. Reconnect the EMS-BUS connection. ▶ If the problem persists the room control may be defective.

Table 33 Indicators and fault displays

10.2.3 Faults that are not displayed

Appliance faults	Remedy
Combustion noises too loud; rumbling noises	<ul style="list-style-type: none"> ▶ Check the gas type. ▶ Check the gas supply pressure. ▶ Check the flue system; clean or repair if required. ▶ Check the gas/air ratio. ▶ Check the gas valve; replace if required. ▶ Check condense discharge pipework and drain is clear. ▶ Check fan pressure at test point.
Flow noises	<ul style="list-style-type: none"> ▶ Set the pump rate or pump characteristic map correctly and match to the maximum output.

Appliance faults	Remedy
Heat-up takes too long.	<ul style="list-style-type: none"> ▶ Set the pump rate or pump characteristic map correctly and match to the maximum output.
Flue gas values incorrect; CO content too high.	<ul style="list-style-type: none"> ▶ Check the gas type. ▶ Check the gas supply pressure. ▶ Check the flue system; clean, repair or replace if required. ▶ Check the gas/air ratio. ▶ Check the gas valve; replace if required.
Delayed ignition, poor ignition.	<ul style="list-style-type: none"> ▶ Check the ignition transformer function for misfiring in the Function check menu Ignition test, replace if required. ▶ Check the gas type. ▶ Check the gas supply pressure. ▶ Check the power supply. ▶ Check the electrodes with cable; replace if required. ▶ Check the flue system; clean or repair if required. ▶ Check the gas/air ratio. ▶ For natural gas: check the external gas flow monitor, replace if required. ▶ Check the burner, replace if required. ▶ Check the air/gas ratio control valve; replace if required.
Condensate in air box	<ul style="list-style-type: none"> ▶ Check the non-return valve in the burner hood assembly, replace if required.
System boilers: hot water outlet temperature is too low.	<ul style="list-style-type: none"> ▶ Check the cylinder temperature setpoint.
System boilers: no hot water.	<ul style="list-style-type: none"> ▶ Check the external controls function; replace if required.
No function, the display remains dark.	<ul style="list-style-type: none"> ▶ Check the electrical wiring for damage. ▶ Replace defective cables. ▶ Check the fuse, replace if required. One spare fuse is supplied.

Table 34 Faults that are not shown on the display

System gassing

WARNING

If you suspect the heating system is gassing, you must exercise caution when carrying out testing or remedial work as the gasses produced can be flammable. Do not vent air from radiators whilst the central heating is switched on. Allow 30mins after venting the radiators before using the central heating or hot water.

- ▶ Whilst venting radiators, do not allow the pressure on the boiler to drop below the point at which it is normally set.
- ▶ If the system is to be drained, the boiler must be electrically isolated.

CAUTION

If system pressure is repeatedly increasing, even when the appliance is not operating, you should first check that the filling link is fully closed and confirm that it is not passing. If radiators are also not heating to the top of the panels and repeatedly need venting, the heating system may be suffering from gassing. This is an indication that corrosion is taking place and requires the system being cleaned and treated to BS7593.

- ▶ This should be confirmed by taking water samples to check pH levels and turbidity.
- ▶ Failure to properly maintain the heating system may result in damage to the system and appliance, and may affect the boiler warranty.

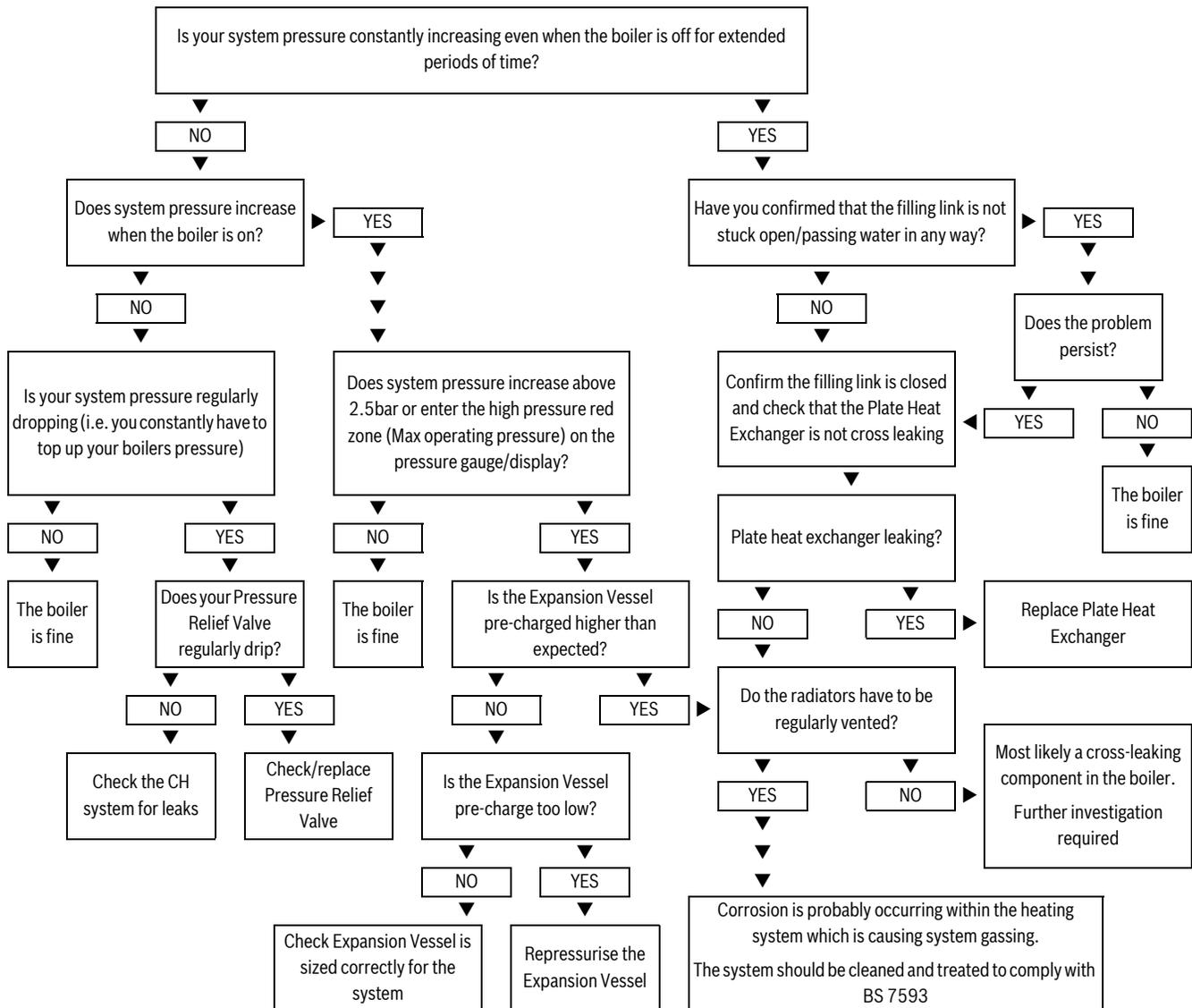


Table 35 System gassing flow chart

11 Environmental protection and disposal

Environmental protection is a fundamental corporate strategy of the Bosch Group.

The quality of our products, their economy and environmental safety are all of equal importance to us and all environmental protection legislation and regulations are strictly observed.

We use the best possible technology and materials for protecting the environment taking account of economic considerations.

Packaging

Where packaging is concerned, we participate in country-specific recycling processes that ensure optimum recycling.

Compostable packaging

Compostable packaging is used wherever possible in an effort to reduce the product's impact on the environment and the overall demand for plastic packaging. Where the following symbol is shown the material is compostable:



Compostable packaging can be disposed of in a number of ways:

- Home compost heap
- Local Authority garden waste collection
- Local Authority food waste collection, ideally as a food waste bin bag
- Local Authority household waste

Please note that compostable materials **cannot be recycled**.



Used appliances

Used appliances contain valuable materials that can be recycled.

The various assemblies can be easily dismantled. Synthetic materials are marked accordingly. Assemblies can therefore be sorted by composition and passed on for recycling or disposal.

Old electrical and electronic appliances



This symbol means that the product must not be disposed of with other waste, and instead must be taken to the waste collection points for treatment, collection, recycling and disposal.

The symbol is valid in countries where waste electrical and electronic equipment regulations apply, e.g. "(UK) Waste Electrical and Electronic Equipment Regulations 2013 (as amended)". These regulations define the framework for the return and recycling of old electronic appliances that apply in each country.

As electronic devices may contain hazardous substances, it needs to be recycled responsibly in order to minimize any potential harm to the environment and human health. Furthermore, recycling of electronic scrap helps preserve natural resources.

For additional information on the environmentally compatible disposal of old electrical and electronic appliances, please contact the relevant local authorities, your household waste disposal service or the retailer where you purchased the product.

You can find more information here:

www.bosch-homecomfortgroup.com/en/company/legal-topics/weee/

Batteries

Batteries must not be disposed together with your household waste.

Used batteries must be disposed of in local collection systems.

12 Data Protection Notice



We, **Bosch Thermotechnology Ltd., Cotswold Way, Warndon, Worcester WR4 9SW, United Kingdom**

process product and installation information, technical and connection data, communication data, product registration and client history data to provide product functionality (art. 6 (1) sentence 1 (b) GDPR / UK GDPR), to fulfil our duty of product surveillance and for product safety and security reasons (art. 6 (1) sentence 1 (f) GDPR / UK GDPR), to safeguard our rights in connection with warranty and product registration questions (art. 6 (1) sentence 1 (f) GDPR / UK GDPR) and to analyze the distribution of our products and to provide individualized information and offers related to the product (art. 6 (1) sentence 1 (f) GDPR / UK GDPR). To provide services such as sales and marketing services, contract management, payment handling, programming, data hosting and hotline services we can commission and transfer data to external service providers and/or Bosch affiliated enterprises. In some cases, but only if appropriate data protection is ensured, personal data might be transferred to recipients located outside of the European Economic Area and the United Kingdom. Further information are provided on request. You can contact our Data Protection Officer under: Data Protection Officer, Information Security and Privacy (C/ISP), Robert Bosch GmbH, Postfach 30 02 20, 70442 Stuttgart, GERMANY.

You have the right to object, on grounds relating to your particular situation or where personal data are processed for direct marketing purposes, at any time to processing of your personal data which is based on art. 6 (1) sentence 1 (f) GDPR / UK GDPR. To exercise your rights, please contact us via privacy.ttgb@bosch.com To find further information, please follow the QR-Code.

13 Technical information and reports

13.1 Technical data

Technical data table - Condens 4700iW

Condens 4700iW Description	Unit	GC4700iW 24 S		GC4700iW 21 S	
		NG	LPG	NG	LPG
Gas flow maximum rate - 10 minutes from lighting					
Gas inlet pressure (nominal) ¹⁾	mbar	20.0	37.0	20.0	37.0
Natural gas ²⁾	m ³ /h	2.61	-	2.28	-
Propane Gas (LPG) ³⁾	kg/h	-	1.91	-	1.68
Heat output/load					
Modulation range, heat input Q	kW	3.2 - 24.6	3.2 - 24.6	3.2 - 21.4	3.2 - 21.4
Rated heat input, DHW (net) (Q _{nW})	kW	24.6	24.6	21.4	21.4
Adjustment range, rated heat input of heating Q _n	kW	3.2 - 24.6	3.2 - 24.6	3.2 - 21.4	3.2 - 21.4
Adjustment range, rated heat output (80/60 °C) P _n	kW	3.0 - 24.0	3.0 - 24.0	3.0 - 21.0	3.0 - 21.0
Adjustment range, rated heat output (50/30 °C) P _{cond}	kW	3.3 - 24.8	3.3 - 24.8	3.3 - 21.9	3.3 - 21.9
Adjustment range, rated heat output (40/30 °C)	kW	3.3 - 24.8	3.3 - 24.8	3.3 - 21.9	3.3 - 21.9
Maximum flow temperature	°C	82	82	82	82
Maximum flow temperature possible	°C	86	86	86	86
Maximum permissible operating pressure (PMS)	bar (MPa)	2.5 (0.25)	2.5 (0.25)	2.5 (0.25)	2.5 (0.25)
Available pump head at 20 °C system temperature rise	m	2	2	2	2
Flue					
Flue gas temperature 80/60 °C, rated/min. load	°C	71/57	71/57	68/57	68/57
Flue gas temperature 40/30 °C, rated/min. load	°C	50/30	50/30	47/30	47/30
CO ₂ level at max. rated heat output (after 10 minutes)	%	9.4	10.8	9.4	10.8
CO ₂ level at min. rated heat output (after 10 minutes)	%	8.6	10.2	8.6	10.2
NOx rating (EN 15502-1)	mg/kWh	40	49	35	47
NOx Class	-	6	6	6	6
Condensate					
Maximum condensate rate	l/h	2	2	1.8	1.8
pH value, approx.	-	4.8	4.8	4.8	4.8
Electrical					
Electrical power supply voltage	a.c. V	230	230	230	230
Frequency	Hz	50	50	50	50
Maximum power consumption (stand-by)	W	2	2	2	2
Maximum power consumption (heating)	W	94	94	83	83
Maximum power consumption (Domestic Hot Water)	W	94	94	83	83
Energy efficiency index (EEI) heating pump	-	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.20
Approval data					
Gas group classification (gas type) IE				CATII _{2H/3P}	
Installation type				C ₁₃ , C ₃₃ , C ₅₃	
General data					
Expansion vessel capacity	l	6	6	6	6
Expansion vessel pre-charge pressure	bar	0.75	0.75	0.75	0.75
Appliance protection rating	IP	X4D	X4D	X4D	X4D
Permissible ambient temperature	°C	0-50	0-50	0-50	0-50
Nominal capacity of the appliance	l	3.9	3.9	3.9	3.9
Total packaged weight	kg	39.3	39.3	39.3	39.3
Total appliance weight (excluding packaging)	kg	33.2	33.2	33.2	33.2
Lift weight (front panel removed)	kg	30.6	30.6	30.6	30.6
Lift weight (front panel and expansion vessel removed)	kg	26.7	26.7	26.7	26.7
SEDBUK 2009/12	%	89.4	90.5	89.6	90.6
SEDBUK 2005	%	90.2	91.9	90.2	92.0

1) For minimum and maximum permissible pressure refer to "Gas pressure within the system", section 6.6.

2) The Gas Rate provided assumes the accepted NG averaged calorific value of 34.9 MJ/m³ net.

3) Propane/butane mixture for fixed containers with capacity up to 15 000 litres.

Table 36 Technical data Condens 4700iW

Condens 4700iW Description	Unit	GC4700iW 18 S		GC4700iW 15 S	
		NG	LPG	NG	LPG
Gas flow maximum rate - 10 minutes from lighting					
Gas inlet pressure (nominal) ¹⁾	mbar	20.0	37.0	20.0	37.0
Natural gas ²⁾	m ³ /h	1.95	-	1.63	-
Propane Gas (LPG) ³⁾	kg/h	-	1.43	-	1.19
Heat output/load					
Modulation range, heat input Q	kW	3.2 - 18.4	3.2 - 18.4	2.0 - 15.3	2.0 - 15.3
Rated heat input, DHW (net) (Q _{nW})	kW	18.4	18.4	15.3	15.3
Adjustment range, rated heat input of heating Q _n	kW	3.2 - 18.4	3.2 - 18.4	2.0 - 15.3	2.0 - 15.3
Adjustment range, rated heat output (80/60 °C) P _n	kW	3.0 - 18.0	3.0 - 18.0	1.9 - 15.0	1.9 - 15.0
Adjustment range, rated heat output (50/30 °C) P _{cond}	kW	3.3 - 18.8	3.3 - 18.8	2.1 - 15.8	2.1 - 15.8
Adjustment range, rated heat output (40/30 °C)	kW	3.3 - 18.9	3.3 - 18.9	2.1 - 15.9	2.1 - 15.9
Maximum flow temperature	°C	82	82	82	82
Maximum flow temperature possible	°C	86	86	86	86
Maximum permissible operating pressure (PMS)	bar (MPa)	2.5 (0.25)	2.5 (0.25)	2.5 (0.25)	2.5 (0.25)
Available pump head at 20 °C system temperature rise	m	2	2	2	2
Flue					
Flue gas temperature 80/60 °C, rated/min. load	°C	65/57	65/57	63/57	63/57
Flue gas temperature 40/30 °C, rated/min. load	°C	45/30	45/30	41/30	41/30
CO ₂ level at max. rated heat output (after 10 minutes)	%	9.4	10.8	9.4	10.8
CO ₂ level at min. rated heat output (after 10 minutes)	%	8.6	10.2	8.6	10.2
NOx rating (EN 15502-1)	mg/kWh	37	54	34	47
NOx Class	-	6	6	6	6
Condensate					
Maximum condensate rate	l/h	1.5	1.5	1.2	1.2
pH value, approx.	-	4.8	4.8	4.8	4.8
Electrical					
Electrical power supply voltage	a.c. V	230	230	230	230
Frequency	Hz	50	50	50	50
Maximum power consumption (stand-by)	W	2	2	2	2
Maximum power consumption (heating)	W	73	73	75	75
Maximum power consumption (Domestic Hot Water)	W	73	73	75	75
Energy efficiency index (EEI) heating pump	-	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.20
Approval data					
Gas group classification (gas type) IE				CATII _{2H/3P}	
Installation type				C ₁₃ , C ₃₃ , C ₅₃	
General data					
Expansion vessel capacity	l	6	6	6	6
Expansion vessel pre-charge pressure	bar	0.75	0.75	0.75	0.75
Appliance protection rating	IP	X4D	X4D	X4D	X4D
Permissible ambient temperature	°C	0-50	0-50	0-50	0-50
Nominal capacity of the appliance	l	3.9	3.9	3.9	3.9
Total packaged weight	kg	39.3	39.3	39.3	39.3
Total appliance weight (excluding packaging)	kg	33.2	33.2	33.2	33.2
Lift weight (front panel removed)	kg	30.6	30.6	30.6	30.6
Lift weight (front panel and expansion vessel removed)	kg	26.7	26.7	26.7	26.7
SEDBUK 2009/12	%	89.5	90.6	89.8	90.7
SEDBUK 2005	%	90.3	92.0	90.4	92.1

1) For minimum and maximum permissible pressure refer to "Gas pressure within the system", section 6.6.

2) The Gas Rate provided assumes the accepted NG averaged calorific value of 34.9 MJ/m³ net.

3) Propane/butane mixture for fixed containers with capacity up to 15 000 litres.

Table 37 Technical data Condens 4700iW

13.2 Energy consumption

13.2.1 Product data on energy consumption

Natural Gas appliance

The following product data comply with the requirements of the EU Regulations No. 811/2013, No. 812/2013, No. 813/2013 and No. 814/2013 supplementing the Regulation (EU) 2017/1369.

Product data	Symbol	Unit	7 733 601 635	7 733 601 634	7 733 601 633	7 733 601 632
Product type	–	–	GC4700iW 24 S NG	GC4700iW 21 S NG	GC4700iW 18 S NG	GC4700iW 15 S NG
Condensing boiler	–	–	✓	✓	✓	✓
Low temperature boiler	–	–	✗	✗	✗	✗
B1 boiler	–	–	✗	✗	✗	✗
Co-generation space heater	–	–	✗	✗	✗	✗
Equipped with a supplementary heater?	–	–	–	–	–	–
Combination heater	–	–	✗	✗	✗	✗
Rated heat output	P_{rated}	kW	24	21	18	15
Seasonal space heating energy efficiency	η_s	%	94	94	94	94
Energy Efficiency Class	–	–	A	A	A	A
Useful heat output						
At rated heat output and high temperature regime ¹⁾	P_4	kW	24	21	18	15
At 30 % of rated heat output and low temperature regime ²⁾	P_1	kW	8.1	7.1	6.1	5.1
Useful efficiency						
At rated heat output and high temperature regime ¹⁾	η_4	%	87.9	88.2	88.1	88.4
At 30 % of rated heat output and low temperature regime ²⁾	η_1	%	98.9	99	99.1	99.2
Auxiliary electricity consumption						
At full load	e_{max}	kW	0.038	0.030	0.027	0.031
At part load	e_{min}	kW	0.012	0.011	0.011	0.011
In standby mode	P_{SB}	kW	0.002	0.002	0.002	0.002
Other items						
Standby heat loss	P_{stby}	kW	0.059	0.059	0.059	0.059
Ignition burner power consumption	P_{ign}	kW	–	–	–	–
Emissions of nitrogen oxides (only gas- or oil fired)	NO_x	mg/kWh	40	35	37	34
Annual energy consumption	Q_{HE}	kWh	20556	18056	15287	12778
Annual energy consumption	Q_{HE}	GJ	74	65	55	46
Sound power level, indoors	L_{WA}	dB	45	44	45	43

1) High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.

2) Low temperature means for condensing boilers 30 °C, for low-temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet).

Table 38 Product data on energy consumption Condens 4700iW

LPG appliances

The following product data comply with the requirements of the EU Regulations No. 811/2013, No. 812/2013, No. 813/2013 and No. 814/2013 supplementing the Regulation (EU) 2017/1369.

Product data	Symbol	Unit	7 733 601 639	7 733 601 638	7 733 601 637	7 733 601 636
Product type	–	–	GC4700iW 24 S LPG	GC4700iW 21 S LPG	GC4700iW 18 S LPG	GC4700iW 15 S LPG
Condensing boiler	–	–	✓	✓	✓	✓
Low temperature boiler	–	–	✗	✗	✗	✗
B1 boiler	–	–	✗	✗	✗	✗
Co-generation space heater	–	–	✗	✗	✗	✗
Equipped with a supplementary heater?	–	–	–	–	–	–
Combination heater	–	–	✗	✗	✗	✗
Rated heat output	P_{rated}	kW	24	21	18	15
Seasonal space heating energy efficiency	η_s	%	94	94	94	94
Energy Efficiency Class	–	–	A	A	A	A
Useful heat output						
At rated heat output and high temperature regime ¹⁾	P_4	kW	24	21	18	15
At 30 % of rated heat output and low temperature regime ²⁾	P_1	kW	8.1	7.1	6.1	5.1
Useful efficiency						
At rated heat output and high temperature regime ¹⁾	η_4	%	87.9	88.2	88.1	88.4
At 30 % of rated heat output and low temperature regime ²⁾	η_1	%	98.9	99	99.1	99.2
Auxiliary electricity consumption						
At full load	e_{max}	kW	0.038	0.030	0.027	0.031
At part load	e_{min}	kW	0.012	0.011	0.011	0.011
In standby mode	P_{SB}	kW	0.002	0.002	0.002	0.002
Other items						
Standby heat loss	P_{stby}	kW	0.059	0.059	0.059	0.059
Ignition burner power consumption	P_{ign}	kW	–	–	–	–
Emissions of nitrogen oxides (only gas- or oil fired)	NO_x	mg/kWh	40	35	37	34
Annual energy consumption	Q_{HE}	kWh	20556	18056	15287	12778
Annual energy consumption	Q_{HE}	GJ	74	65	55	46
Sound power level, indoors	L_{WA}	dB	45	44	45	43

1) High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.

2) Low temperature means for condensing boilers 30 °C, for low-temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet).

Table 39 Product data on energy consumption Condens 4700iW

13.3 Component resistance characteristics



The supply sensors (flow temperature sensor at heat exchanger assembly and flow temperature sensor at flow pipe) share the same resistance values.

► Refer to table 40.

13.3.1 Sensor values - Flow temperature sensor

Temperature [°C ± 10 %]	Resistance [Ω]
0	33 404
5	25 902
10	20 247
15	15 950
20	12 657
25	10 115
30	8 138
35	6 589
40	5 367
45	4 398
50	3 624
55	3 002
60	2 500
65	2 092
70	1 759
75	1 486
80	1 260
85	1 074
90	918.3
95	788.5

Table 40 Flow temperature sensor

13.3.2 Sensor values - Cylinder temperature sensor

Temperature [°C ± 10 %]	Resistance [kΩ]
0	35 964
5	28 507
10	22 756
15	18 273
20	14 768
25	11 977
30	9 783
35	8 045
40	6 650
45	5 521
50	4 606
55	3 855
60	3 242
65	2 744
70	2 332
75	1 989
80	1 703
85	1 463
90	1 262
95	1 093

Table 41 Cylinder temperature sensor

13.3.3 Sensor values - Flue gas temperature limiter

Normally closed thermostat	Temperature (°C)	Resistance (Ω)
Opening temperature	≥ 112	3 500
Close temperature	≤ 82	6 500

Table 42 Flue gas temperature limiter

13.3.4 Sensor values - Heat exchanger assembly temperate limiter

Normally closed thermostat	Temperature (°C)
Opening temperature	≥ 120
Close temperature	≤ 80

Table 43 Heat exchanger assembly temperate limiter

13.3.5 Sensor values - Outside temperature sensor

Temperature [°C ± 10 %]	Resistance [Ω]
-20	2 392
-16	2 088
-12	1 811
-8	1 562
-4	1 342
0	1 149
4	984
8	842
12	720
16	616
20	528
24	454

Table 44 Outside temperature sensor (for weather-compensated control units, accessory)

13.4 HCM (Code plugs)

- Sealed system code plugs are for systems operating at 0.6 bar and above.
- Semi-sealed system code plugs are for gravity-fed systems or low pressure systems (below 0.6 bar).

Appliance	Gas type	Sealed system	Semi-Sealed system
GC4700iW 15 S 23	Natural gas	20541	20548
GC4700iW 18 S 23	Natural gas	20540	20547
GC4700iW 21 S 23	Natural gas	20539	20546
GC4700iW 24 S 23	Natural gas	20538	20545
GC4700iW 15 S 31	LPG	20555	20562
GC4700iW 18 S 31	LPG	20554	20561
GC4700iW 21 S 31	LPG	20553	20560
GC4700iW 24 S 31	LPG	20552	20559

Table 45 Code plugs - System appliances

13.5 Pump characteristic map of the heating pump

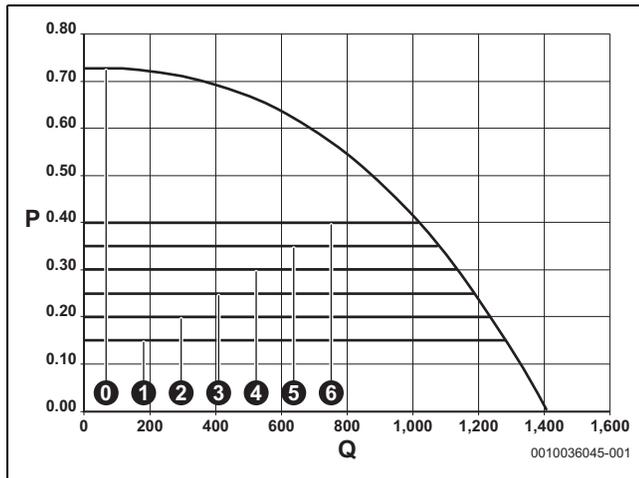


Fig. 99 Pump characteristic maps and pump curves

- [0] Pump curve at maximum pump rate
- [1] Pump characteristic map, constant pressure 150 mbar
- [2] Pump characteristic map, constant pressure 200 mbar
- [3] Pump characteristic map, constant pressure 250 mbar
- [4] Pump characteristic map, constant pressure 300 mbar
- [5] Pump characteristic map, constant pressure 350 mbar
- [6] Pump characteristic map, constant pressure 400 mbar

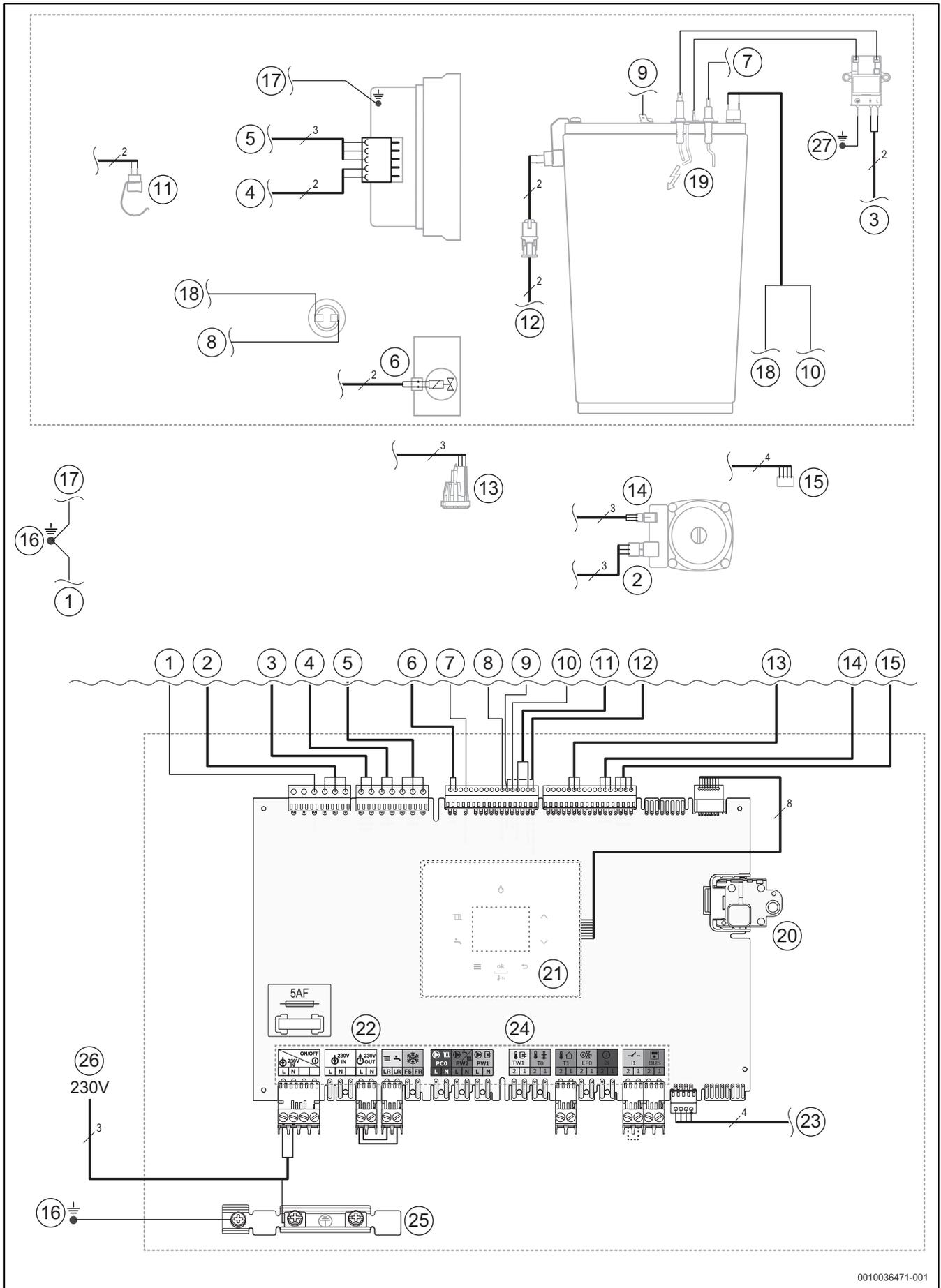
P Pressure (bar)
 Q Volumetric flow rate (l/hr)

Constant pressure

If the constant pressure **Pump range map** (1 - 6) is chosen, the differential pressure between the CH flow and return will be kept at the corresponding value. When the CH system is cold and the radiator TRVs are fully open, the pump will be running faster to try and maintain the pressure differential. When the TRVs start to close and the resistance of the CH system increases, the pump speed reduces to maintain the pressure.

The setting (1 - 6) to be selected is dependent upon the resistance and heat load of the CH system. The higher these are, the higher the pressure constant.

13.6 Internal wiring of the appliance



0010036471-001

Fig. 100 Electrical wiring

Legend to figure 100:

- [1] PCB earth
- [2] Pump power cable (230V)
- [3] Ignition transformer
- [4] Fan power Cable (230V)
- [5] Fan control cable
- [6] Gas valve
- [7] Flame sense electrode
- [8] Flue gas temperature limiter
- [9] Ground
- [10] Heat exchanger assembly temperature limiter
- [11] Flow temperature sensor at flow pipe
- [12] Flow temperature sensor at the heat exchanger assembly
- [13] Pressure sensor
- [14] Pump control cable
- [15] Connecting lead for 3-way valve from the diverter valve kit accessory ¹⁾
- [16] Chassis earth
- [17] Fan earth
- [18] Cable between flue gas temperature limiter and heat exchanger assembly temperature limiter
- [19] Electrode set
- [20] Code plug
- [21] Display
- [22] Terminals for Installer connections
- [23] Connecting lead for Key accessory slot
- [24] Connection for the cylinder sensor from the diverter valve kit accessory ²⁾
- [25] Earth rail
- [26] Boiler mains cable (230V)
- [27] Ignition transformer earth

1) Only applicable when fitting the optional integral diverter valve kit.

2) Supplied with optional integral diverter valve kit.

GAS BOILER SYSTEM COMMISSIONING CHECKLIST & WARRANTY VALIDATION RECORD

Address:													
Boiler make and model:													
Boiler serial number:													
Commissioned by (PRINT NAME):						Gas Safe registration number:							
Company name:						Telephone number:							
Company email:						Company address:							
										Commissioning date:			
Heating and hot water system complies with the appropriate Building Regulations?											Yes		
Optional: Building Regulations Notification Number (if applicable):													
Time, temperature control and boiler interlock provided for central heating and hot water											Yes		
Boiler Plus requirements (tick the appropriate box(s))													
Boiler Plus option chosen for combination boiler in ENGLAND						Weather compensation			Smart thermostat with automation and optimisation				
						Load compensation			Flue Gas Heat Recovery				
Time and temperature control to hot water			Cylinder thermostat and programmer/timer						Combination boiler				
Zone valves			pre-existing			Fitted			Not required				
Thermostatic radiator valves			pre-existing			Fitted			Not required				
Automatic bypass to system			pre-existing			Fitted			Not required				
Underfloor heating			pre-existing			Fitted			Not required				
Water quality													
The system has been flushed, cleaned and a suitable inhibitor applied upon final fill, in accordance with BS7593 and boiler manufacturers' instructions											Yes		
What system cleaner was used?						Brand:			Product:				
What inhibitor was used?						Brand:			Product:				
Primary water system filter			pre-existing			Fitted			Not required				
CENTRAL HEATING MODE measure and record (as appropriate)													
Gas rate (for combination boilers complete DHW mode gas rate)						m ³ /hr			or			ft ³ /hr	
Central heating output left at factory settings?											Yes	No	
If no, what is the maximum central heating output selected?											kW		
Dynamic gas inlet pressure											mbar		
Central heating flow temperature											°C		
Central heating return temperature											°C		
System correctly balanced/rebalanced?											Yes		
COMBINATION BOILERS ONLY													
Is the installation in a hard water area (above 200ppm)?											Yes	No	
Water scale reducer/softener			pre-existing			Fitted			Not required				
What type of scale reducer/softener has been fitted?						Brand:			Product:				
Water meter fitted?											Yes	No	
If yes- DHW expansion vessel			pre-existing			Fitted			Not required				
Pressure reducing valve			pre-existing			Fitted			Not required				
DOMESTIC HOT WATER MODE Measure and record													
Gas rate						m ³ /hr			or			ft ³ /hr	
Dynamic gas inlet pressure at maximum rate											mbar		
Cold water inlet temperature											°C		
Hot water has been checked at all outlets											Yes	Temperature	°C
CONDENSATE DISPOSAL													
The condensate drain has been installed in accordance with the manufacturers' instructions and/or BS5546/BS6798											Yes		
Point of termination						Internal			External (only where internal termination impractical)				
Method of disposal						Gravity			Pumped				
ALL INSTALLATIONS													
Record the following		At max rate:		CO ppm		CO ₂ %		CO/CO ₂ Ratio					
		At min rate (where possible)		CO ppm		CO ₂ %		CO/CO ₂ Ratio					
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?											Yes		
The operation of the boiler and system controls have been demonstrated to and understood by the customer											Yes		
The manufacturers' 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 manufacturers' 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.

13.8 Inspection and maintenance checklist

Inspection and maintenance checklist		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Date:																
1	Check appliance operation (CH & DHW) and fault history	Yes <input type="checkbox"/>														
2	Visual inspection:- Check compliance of appliance, system and components	Yes <input type="checkbox"/>														
3	Internal visual inspection Check for signs of leaking, corrosion and distress	Yes <input type="checkbox"/>														
4	Appliance performance checks:															
4.1	Check Fan pressure test was cleaning required?	Yes <input type="checkbox"/>														
		No <input type="checkbox"/>														
		Yes <input type="checkbox"/>														
4.2	Check and clean syphon	Yes <input type="checkbox"/>														
4.3	Correct working gas inlet pressure	Yes <input type="checkbox"/>														
4.4	Flue gas analysis															
	Check combustion settings: Min/Max test modes	Yes <input type="checkbox"/>														
4.5	Gas rate appliance at maximum output in test mode	Yes <input type="checkbox"/>														
4.6	Check flame failure appliance	Yes <input type="checkbox"/>														
4.7	Fit casing	Yes <input type="checkbox"/>														
4.8	Check flue integrity	Yes <input type="checkbox"/>														
6	Gas Safe/Benchmark documentation updated	Yes <input type="checkbox"/>														
8	Appliance left to customer settings	Yes <input type="checkbox"/>														
9	Gas Safe registration number	Yes <input type="checkbox"/>														
Gas Safe Engineers Signature																

Table 46 Inspection and maintenance checklist

SERVICE & INTERIM BOILER WORK RECORD

It is recommended that your boiler and heating system are regularly serviced and maintained, in line with manufacturers' instructions, and that the appropriate service / interim work record is completed.

Service provider

When completing a service record (as below), please ensure you have carried out the service as described in the manufacturers' instructions. Always use the manufacturers' specified spare parts.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:
Engineer name:		Company name:			
Telephone N°:		Gas Safe registration N°:			
Max rate	CO	ppm	CO ₂	%	CO/CO ₂
Min rate	CO	ppm	CO ₂	%	CO/CO ₂
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes
Gas rate:	m ³ /h	OR	ft ³ /h		
Were parts fitted? <small>delete as appropriate</small>		Yes	No		
Parts fitted:					
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes
					n/a
Comments:					
Signature:					

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:
Engineer name:		Company name:			
Telephone N°:		Gas Safe registration N°:			
Max rate	CO	ppm	CO ₂	%	CO/CO ₂
Min rate	CO	ppm	CO ₂	%	CO/CO ₂
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes
Gas rate:	m ³ /h	OR	ft ³ /h		
Were parts fitted? <small>delete as appropriate</small>		Yes	No		
Parts fitted:					
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes
					n/a
Comments:					
Signature:					

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:
Engineer name:		Company name:			
Telephone N°:		Gas Safe registration N°:			
Max rate	CO	ppm	CO ₂	%	CO/CO ₂
Min rate	CO	ppm	CO ₂	%	CO/CO ₂
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes
Gas rate:	m ³ /h	OR	ft ³ /h		
Were parts fitted? <small>delete as appropriate</small>		Yes	No		
Parts fitted:					
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes
					n/a
Comments:					
Signature:					

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:
Engineer name:		Company name:			
Telephone N°:		Gas Safe registration N°:			
Max rate	CO	ppm	CO ₂	%	CO/CO ₂
Min rate	CO	ppm	CO ₂	%	CO/CO ₂
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes
Gas rate:	m ³ /h	OR	ft ³ /h		
Were parts fitted? <small>delete as appropriate</small>		Yes	No		
Parts fitted:					
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes
					n/a
Comments:					
Signature:					

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:
Engineer name:		Company name:			
Telephone N°:		Gas Safe registration N°:			
Max rate	CO	ppm	CO ₂	%	CO/CO ₂
Min rate	CO	ppm	CO ₂	%	CO/CO ₂
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes
Gas rate:	m ³ /h	OR	ft ³ /h		
Were parts fitted? <small>delete as appropriate</small>		Yes	No		
Parts fitted:					
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes
					n/a
Comments:					
Signature:					

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:
Engineer name:		Company name:			
Telephone N°:		Gas Safe registration N°:			
Max rate	CO	ppm	CO ₂	%	CO/CO ₂
Min rate	CO	ppm	CO ₂	%	CO/CO ₂
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes
Gas rate:	m ³ /h	OR	ft ³ /h		
Were parts fitted? <small>delete as appropriate</small>		Yes	No		
Parts fitted:					
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes
					n/a
Comments:					
Signature:					

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

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SERVICE & INTERIM BOILER WORK RECORD

It is recommended that your boiler and heating system are regularly serviced and maintained, in line with manufacturers' instructions, and that the appropriate service / interim work record is completed.

Service provider

When completing a service record (as below), please ensure you have carried out the service as described in the manufacturers' instructions. Always use the manufacturers' specified spare parts.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:	
Engineer name:		Company name:				
Telephone N°:		Gas Safe registration N°:				
Max rate	CO	ppm	CO ₂	%	CO/CO ₂	
Min rate	CO	ppm	CO ₂	%	CO/CO ₂	
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes	
Gas rate:	m ³ /h	OR	ft ³ /h			
Were parts fitted? <small>delete as appropriate</small>		Yes	No			
Parts fitted:						
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes	n/a
Comments:						
Signature:						

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:	
Engineer name:		Company name:				
Telephone N°:		Gas Safe registration N°:				
Max rate	CO	ppm	CO ₂	%	CO/CO ₂	
Min rate	CO	ppm	CO ₂	%	CO/CO ₂	
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes	
Gas rate:	m ³ /h	OR	ft ³ /h			
Were parts fitted? <small>delete as appropriate</small>		Yes	No			
Parts fitted:						
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes	n/a
Comments:						
Signature:						

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:	
Engineer name:		Company name:				
Telephone N°:		Gas Safe registration N°:				
Max rate	CO	ppm	CO ₂	%	CO/CO ₂	
Min rate	CO	ppm	CO ₂	%	CO/CO ₂	
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes	
Gas rate:	m ³ /h	OR	ft ³ /h			
Were parts fitted? <small>delete as appropriate</small>		Yes	No			
Parts fitted:						
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes	n/a
Comments:						
Signature:						

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:	
Engineer name:		Company name:				
Telephone N°:		Gas Safe registration N°:				
Max rate	CO	ppm	CO ₂	%	CO/CO ₂	
Min rate	CO	ppm	CO ₂	%	CO/CO ₂	
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes	
Gas rate:	m ³ /h	OR	ft ³ /h			
Were parts fitted? <small>delete as appropriate</small>		Yes	No			
Parts fitted:						
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes	n/a
Comments:						
Signature:						

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:	
Engineer name:		Company name:				
Telephone N°:		Gas Safe registration N°:				
Max rate	CO	ppm	CO ₂	%	CO/CO ₂	
Min rate	CO	ppm	CO ₂	%	CO/CO ₂	
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes	
Gas rate:	m ³ /h	OR	ft ³ /h			
Were parts fitted? <small>delete as appropriate</small>		Yes	No			
Parts fitted:						
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes	n/a
Comments:						
Signature:						

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE/INTERIM WORK ON BOILER <small>delete as appropriate</small>					Date:	
Engineer name:		Company name:				
Telephone N°:		Gas Safe registration N°:				
Max rate	CO	ppm	CO ₂	%	CO/CO ₂	
Min rate	CO	ppm	CO ₂	%	CO/CO ₂	
Where possible, has a flue integrity check been undertaken in accordance with manufacturers' instructions, and readings are correct?"					yes	
Gas rate:	m ³ /h	OR	ft ³ /h			
Were parts fitted? <small>delete as appropriate</small>		Yes	No			
Parts fitted:						
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and boiler manufacturers' instructions. *					yes	n/a
Comments:						
Signature:						

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

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