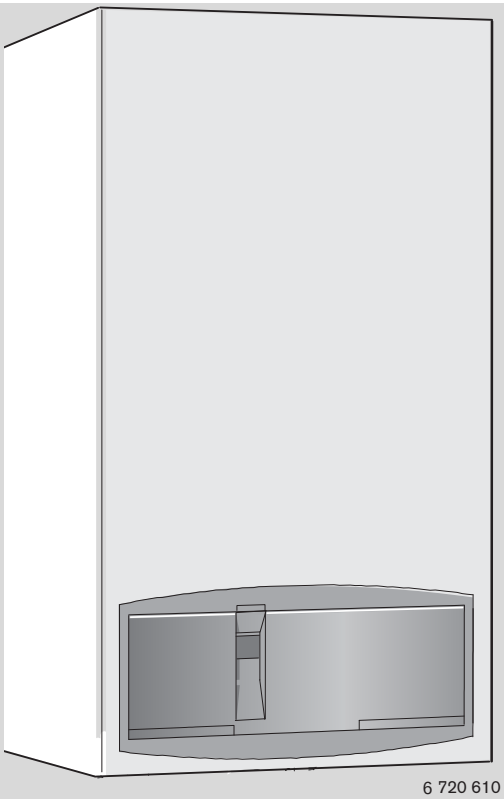
Installation and Servicing Instructions

RD 532 combi

Wall mounted condensing boiler for central heating and mains fed domestic hot water



6 720 610 577-01.10

ZWB 7-32 RD 532 GC-Number: 41 108 13

benchmark

6 720 611 451GB (03.11) TD

British Gas

Scottish Gas

Contents

Safety precautions

If you smell gas

- Turn off gas service cock at the meter.
- Open windows and doors.
- Do not operate any electrical switches.
- Extinguish any naked flames.
- Telephone your gas company.

If you smell fumes from the appliance

- Switch off appliance (see page 24).
- Open windows and doors.

Fitting and modifications

- Fitting of the appliance or any controls to the appliance may only be carried out by a competent engineer in accordance with the Gas Safety (Installation and Use) Regulations 1998.
- Flue systems must not be modified in any ways other than as described in the fitting instructions.
- This appliance is for use on sealed primary systems only.

Maintenance

- **The user is recommended:** to have the system regularly serviced in order to ensure that it functions reliably and safely.
- Use only original spare parts!

Combustible materials

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

Health and safety

- This appliance contains no asbestos products.
- There is no potential hazard due to the appliance being electrically unsafe.
- There are no substances used in the construction that are a potential hazard in relation to the COSHH Regulations (Control of Substances Hazardous to Health Regulations 1988).

Combustion air/Ambient atmosphere

- The combustion air/ambient atmosphere should be kept free of chemically aggressive substances (e.g. halogenated hydrocarbons which contain chlorine or fluorine compounds). This will prevent corrosion.

Instructions to the customer

- Explain to the customer how the appliance works and how to operate it.
- Advise the user that he/she must not make any modifications to the appliance or carry out any repairs on it.
- These instructions are to be left with the user or at the Gas meter.
- Important: These instructions apply in the UK only.

Unpacking

IMPORTANT HANDLING INSTRUCTIONS

- Two people should transfer the packaged appliance from the van to the point of installation
- Open the top of the carton, remove and place the component tray and both side bars of the wall mounting frame to one side
- Lie the packaged appliance on its back. (The back has “TRUCK HERE” printed on the carton)
- One person firmly holds the packaging while the other straddles the boiler and slides it from the packaging
- Two persons are then required to lift one end and stand the appliance upright with the flue at the top

Additional requirements for roof space installation

- Two people should use two step ladders and share lifting the unpacked boiler up to the loft hatch
- Where the boiler enters the loft space, tilt and slide the boiler on its back to the point of installation

Check the contents against the packing list.

Symbols

Safety instructions in this document are identified by a warning-triangle symbol and are printed on a grey background.

Notes containing important information are identified by the symbol shown on the left. They are bordered by horizontal lines above and below the text.

1 Details of the appliance

1.1 EC Declaration of Conformity

This appliance is in accordance with the applicable requirements of the Gas Appliance Directive, Boiler Efficiency Directive, Electromagnetic Compatibility Directive and the Low Voltage Directive.

PIN	CE-0085 BL 0507
Category UK	$II_{2H\ 3P}$
Appliance Type	C_{13}, C_{33}

Table 1

1.2 Standard package

- Gas condensing combination boiler for central heating and domestic hot water
- Wall mounting frame
- Fixings (screws etc.)
- Set of documentation for appliance
- Pre-plumbing manifold
- Condensate drain pipe.

1.3 Description of appliance

- Wall-mounted appliance, siting not dependent on room size
- Natural gas models are low-emission appliances
- Multi function display
- Bosch Heatronic control system
- Automatic ignition
- Modulating control
- Full safety systems incorporating Bosch Heatronic with flame ionisation monitoring, solenoid valves and temperature sensors
- Concentric flue/air duct with testing point for CO_2/CO
- Regulated speed fan
- Pre-mix burner
- Temperature control for central heating
- Temperature sensor in domestic hot water
- Safety temperature limiter in 24 V electrical circuit
- Three-speed central heating pump with automatic vent
- Relief valve, pressure gauge, expansion vessel
- Flue gas temperature limiter (105 °C)
- Hot water priority circuit
- Motorised 3-way valve
- Plate-type heat exchange
- Condensate Trap.

1.4 Accessories

- Standard horizontal flue kit at 100 mm outside diameter for flues up to 4 m in length.
- Flue duct kits for horizontal (125 mm outside diameter) for flue lengths up to 13 m and vertical flue systems for flue lengths up to 13.7 m. Fitting instructions are sent with these kits.
- Heating programmers
- Single or Twin channel digital timer
- Single channel mechanical timer
- RF controlled Digistat
- Night Set Back module
- TR2 room controllers.

NOTE: Where a timer, other than the Twin Channel Digital, is used, the Hot Water Pre-Heat facility can only be isolated with the ECO button on the fascia.

1.5 Casing dimensions

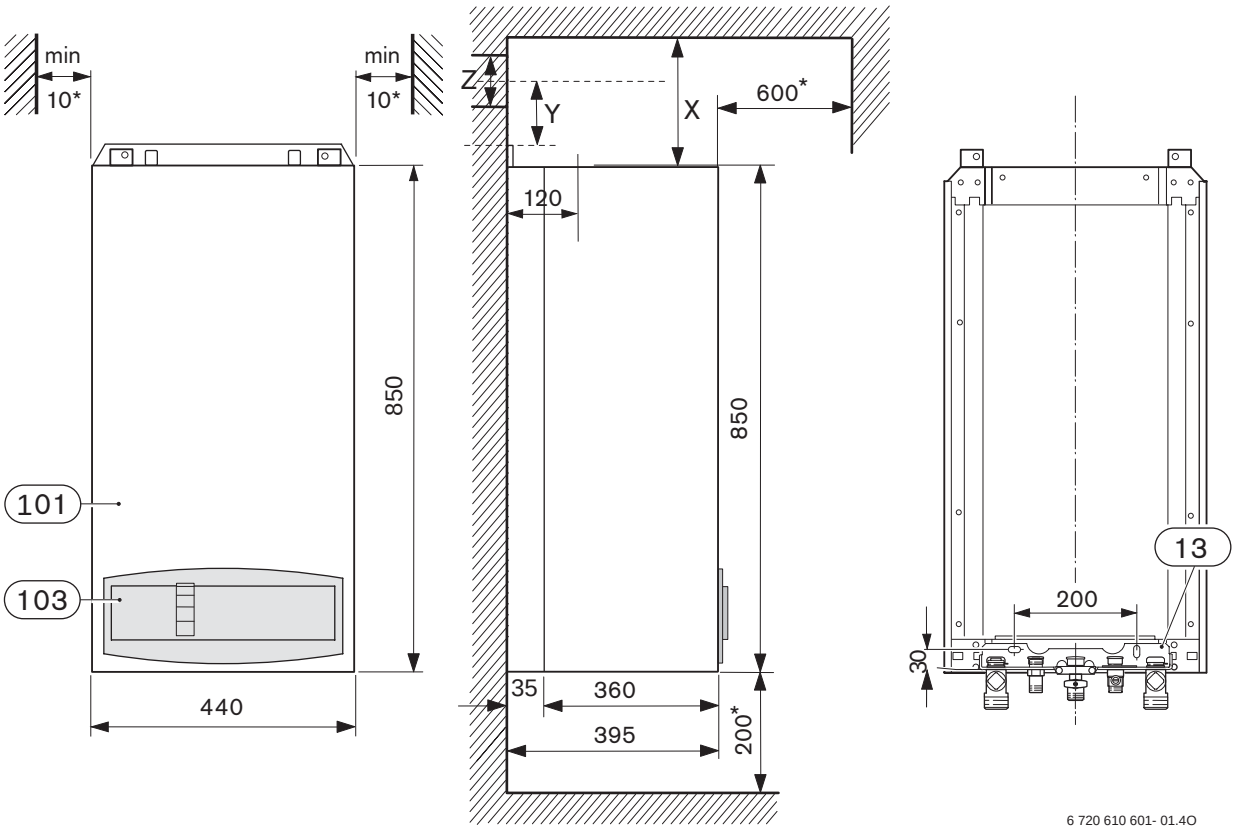


Fig. 1

13 Manifold assembly
101 Outer case
103 Facia cover
X Standard Concentric Horizontal Flue System: min. 160 mm
Alternative Concentric Flue System: min. 220 mm
Y Standard Concentric Horizontal Flue System: 40mm
Alternative Concentric Flue System: 70 mm
Z Standard Concentric Horizontal Flue System: 105 mm
Alternative Concentric Flue System: 130 mm
***** For servicing the appliance
Note: Horizontal flue only: dimension X may need to increase due to the incline of the flue.

1.6 Layout of appliance

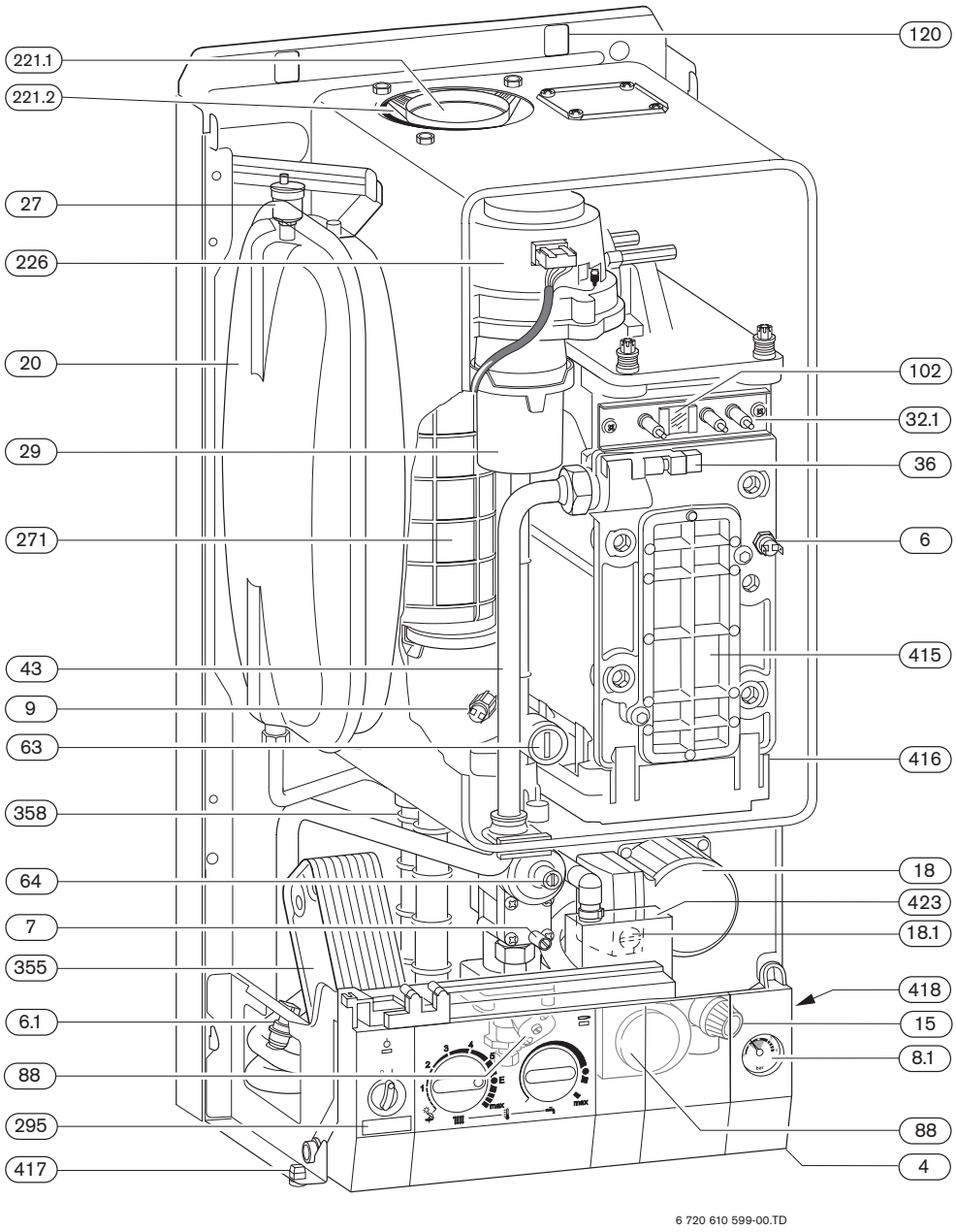


Fig. 2

4 Heatronic control
6 Heat exchanger safety temperature limiter
6.1 Hot water NTC sensor
7 Testing point for gas supply pressure
8.1 Pressure gauge
9 Flue gas temperature limiter
15 Relief valve
18 Pump
18.1 Pump speed selector switch
20 Expansion vessel
27 Automatic air vent
29 Air gas Mixer unit
32.1 Electrode assembly
36 Temperature sensor in CH flow
43 CH flow
63 Adjustable gas flow restrictor
64 Adjusting screw for min. gas flow volume
88 3-way valve (combi)
98 DHW flow switch (combi)
102 Inspection window
120 Fixing points
221.1 Flue duct
221.2 Combustion air intake
226 Fan assembly
295 Appliance type sticker
271 Flue duct
355 Plate-type domestic hot water heat exchanger
358 Condensate trap
415 Cover plate for cleaning access
416 Condensate collector
417 Clip for fixing outer case
418 Data plate
423 Siphon

1.7 Function

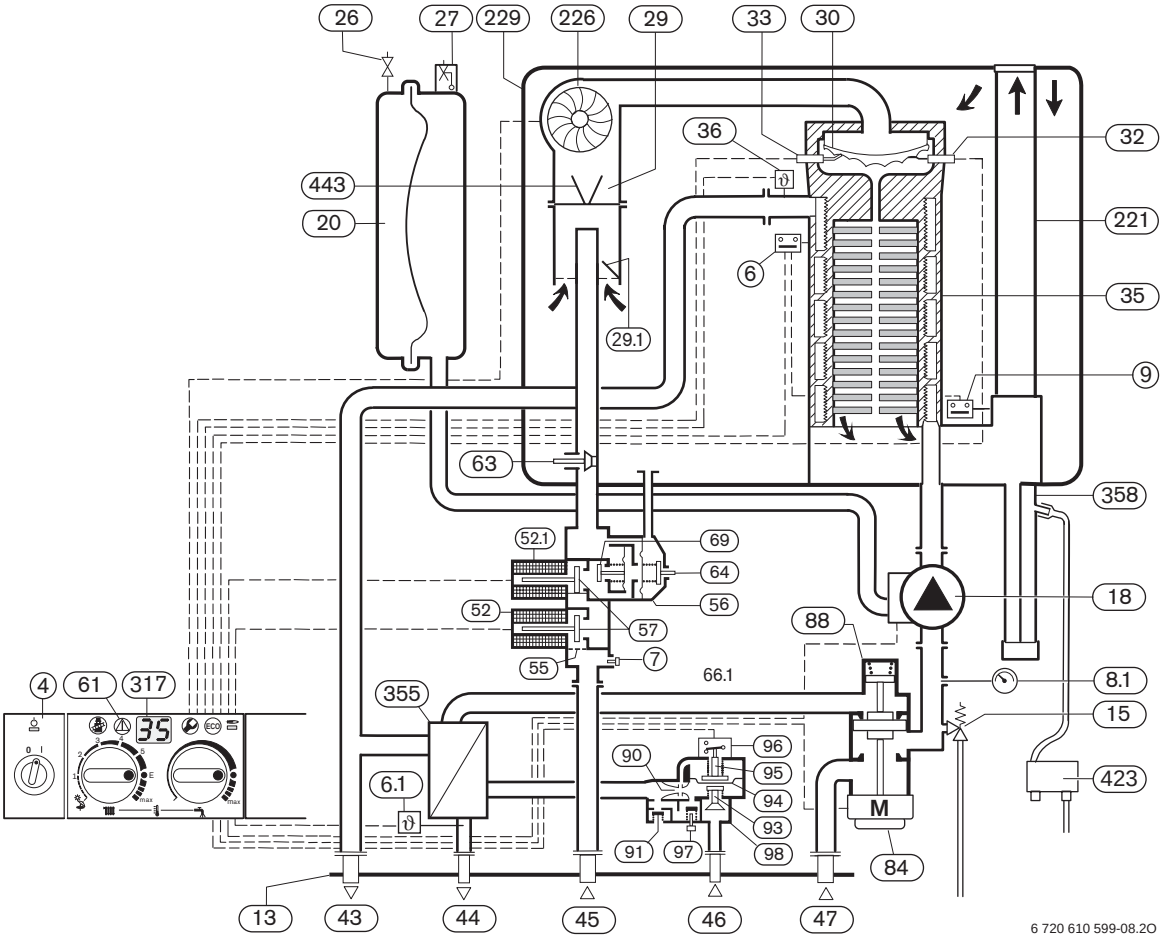


Fig. 3

4 Bosch Heatronic control
6 Temperature limiter, heat exchanger
6.1 Hot water NTC sensor
7 Testing point for gas supply pressure
8.1 Pressure gauge
9 Flue gas temperature limiter
13 Manifold
15 Safety valve
18 Central heating pump
20 Expansion vessel
26 Charging Valve
27 Automatic vent
29 Mixer unit
29.1 Bi-metallic thermostat for combustion air compensation
30 Burner
32 Flame sensing electrode
33 Igniter electrode
35 Heat exchanger with cooled combustion chamber
36 Temperature sensor in CH flow
43 CH flow
44 Hot water flow
45 Gas inlet
46 Cold water inlet
47 CH return
52 Solenoid valve 1
52.1 Solenoid valve 2
55 Filter
56 Gas valve CE 427
57 Main valve disc
61 Reset button
63 Adjustable gas flow restrictor
64 Adjusting screw for min. gas inlet flow volume
69 Control valve
84 Motor
88 3-way valve
90 Venturi
91 Pressure relief valve
93 Water flow regulator
94 Diaphragm
95 Pushrod with switch cam
96 Microswitch
97 Valve for hot water flow volume
98 Water valve
221 Flue duct
226 Fan
229 Inner casing
317 Display
355 Plate-type heat exchanger
358 Condensate trap
422 Digital timer
423 Siphon
443 Diaphragm

1.8 Electrical wiring diagram

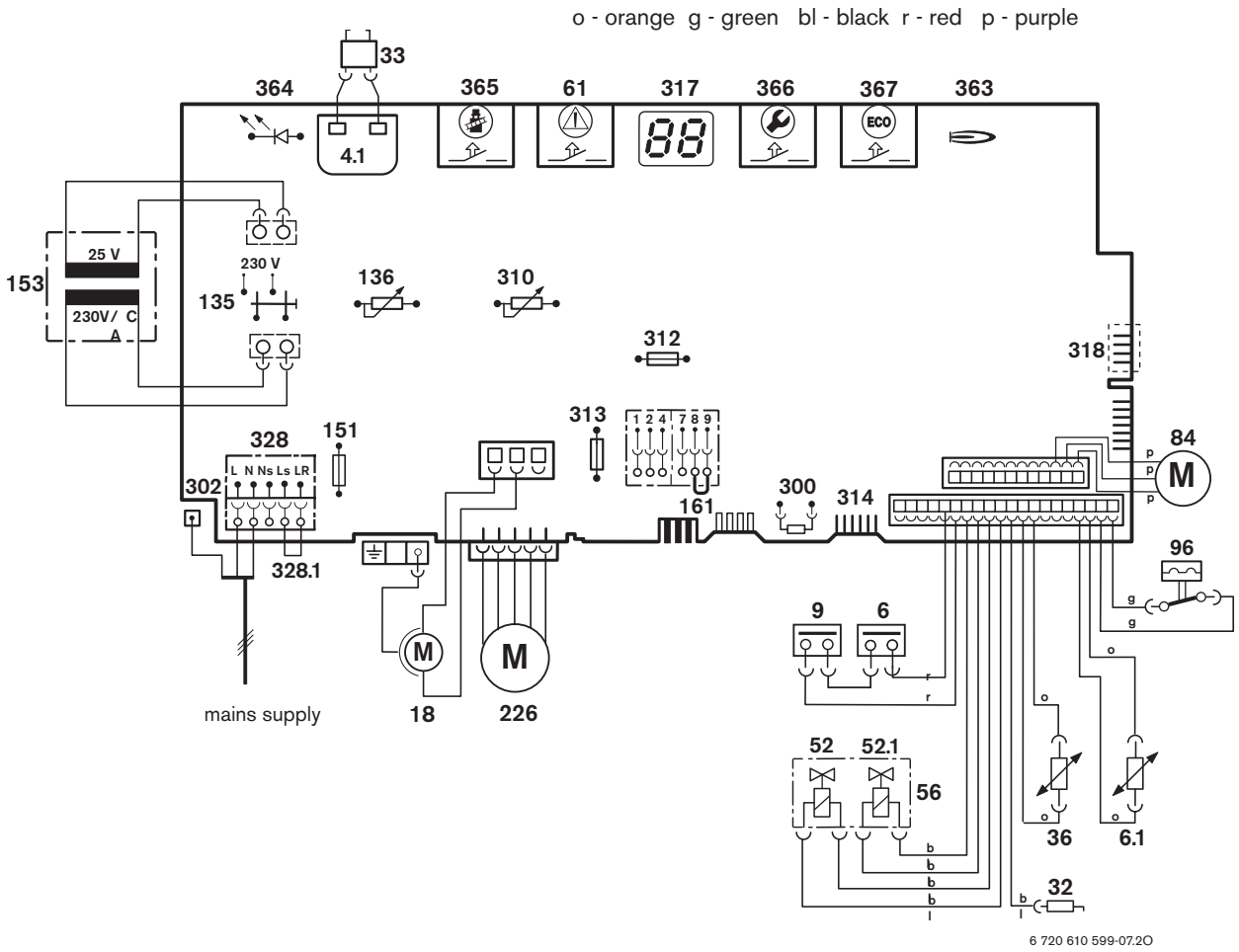


Fig. 4

4.1 Ignition transformer
6 Temperature limiter, heat exchanger
6.1 Hot water NTC sensor
9 Flue gas temperature limiter
18 Pump
32 Flame sensing electrode
33 Ignition electrode
36 Temperature sensor in CH flow
52 Solenoid valve 1
52.1 Solenoid valve 2
56 Gas valve CE 427
61 Reset button
84 Motor, 3-way valve
96 Microswitch, hydraulic switch
135 Master switch
136 Temperature control for CH flow
151 Fuse, slow 2.5 A, AC 230 V
153 Transformer
161 Link
226 Fan
300 Code plug
302 Earth connection
310 Temperature control for hot water
312 Fuse, slow T 1,6 A
313 Fuse, slow T 0,5 A
314 Connector for programmer
317 Digital display
328 Terminal block for AC 230 V Mains supply
328.1 Link
363 Indicator lamp for burner
364 Indicator lamp for power supply
365 “Chimney sweep” button
366 Service button
367 ECO button

1.9 Technical data

	Units	Natural gas	Propane
Max. rated heat output net 40/30°C central heating	kW	34.3	34.3
Max. rated heat output net 50/30°C central heating	kW	34.0	34.0
Max. rated heat output net 80/60°C central heating	kW	32.2	32.3
Max. rated heat input net	kW	32.5	32.5
Min. rated heat output net 40/30°C	kW	8.4	11.6
Min. rated heat output net 50/30°C	kW	8.3	11.4
Min. rated heat output net 80/60°C	kW	7.4	10.5
Min. rated heat input net	kW	7.6	10.8
Max. rated heat output net, domestic hot water	kW	32.2	32.2
Max. rated heat input net, domestic hot water	kW	32.5	32.5
Maximum gas flow rate – After 10 minutes from lighting			
Natural gas G20 (CVnet 34.02 MJ/m^3)	m^3/h	3.4	-
LPG (CVnet 88 MJ/m^3)	kg/h	-	2.3
Gas supply pressure			
Natural gas G20 (CVnet 34.02 MJ/m^3)	mbar	20	-
LPG (CVnet 88 MJ/m^3)	mbar	-	37
Expansion vessel			
Charge pressure	bar	0.75	0.75
Total capacity	l	10	10
Hot water specifications			
Hot water flow rate @ 35°C	l/min	13.3	13.3
Max. hot water flow rate	l/min	14	14
Outlet temperature range	°C	40 - 60	40 - 60
Max. permissible water supply pressure	bar	10	10
Min. inlet pressure for max flow rate	bar	1.2	1.2
Specific flow rate	l/min	14.6	14.6
Flue			
Flue gas temp. 80/60°C, rated/min. load	°C	67/55	67/55
Flue gas temp. 40/30°C, rated/min. load	°C	43/32	43/32
Residual delivery pressure (inc. pressure drop in air intake duct)	Pa	80	80
CO_2 level at max. rated heat output	%	9.2	10.8
CO_2 level at min. rated heat output	%	8.8	10.5
NO_x-class		5	5
SEDBUK figure	Band	A	A
Condensate			
Max. condensation rate (t_R = 30°C)	l/h	2.8	2.8
pH-value, approx.		4.8	4.8
General Data			
Electrical power supply voltage	AC ... V	230	230
Frequency	Hz	50	50
Max. power consumption	W	130	130
Noise output level	dB(A)	37	37
Appliance protection rating with blanking plate fitted	IP	X4D	X4D
Max. CH flow temperature	°C	nom. 90	nom. 90
Max. permissible operating pressure (CH)	bar	2.5	2.5
Permissible ambient temperatures	°C	0 - 50	0 - 50
Nominal capacity of appliance	l	3.75	3.75
Weight (excluding packaging)	kg	46	46

Table 2

Condensate analysis, mg/l

Ammonium	1.2	Nickel	0.15
Lead	≤ 0.01	Mercury	≤ 0.0001
Cadmium	≤ 0.001	Sulphate	1
Chromium	≤ 0.005	Zinc	≤ 0.015
Halogenated hydrocarbons	≤ 0.002	Tin	≤ 0.01
Hydrocarbons	0.015	Vanadium	≤ 0.001
Copper	0.028	pH-value	4.8

Table 3

Flue system

HORIZONTAL 100 mm – Standard FLUE SYSTEM			
Overall Diameter of Duct	mm	100	Max. 4 m
Flue Terminal / Duct Assembly Length	mm	600	
Extension Duct Length	mm	1000	

Table 4

HORIZONTAL 125 mm FLUE SYSTEM			
Overall Diameter of Duct	mm	125	Max. 13 m (including turret)
Flue Terminal / Duct Assembly	mm	1030	

Table 5

VERTICAL 100 mm FLUE SYSTEM			
Overall Diameter of Duct	mm	100	Max. 13.7m (Excl. Terminal)
Flue Terminal / Duct Assembly	mm	1140	

Table 6

VERTICAL 125 mm FLUE SYSTEM			
Overall Diameter of Duct	mm	125	Max. 5m (Excl. Terminal)
Flue Terminal / Duct Assembly	mm	1365	

Table 7

Elbow - 90 ° Equivalent length 2 m
Bend - 45 ° Equivalent length 1m

Gas supply

Total length of gas supply pipe (metres)			Pipe diameter (mm)
3	6	9	
Gas discharge rate (m^3/h)			
8.7	5.8	4.6	22
18.0	12.0	9.4	28

Table 8

Domestic water performance

Domestic Water Flow Rate l/min	Temperature Rise	30 °C	15.6
	Temperature Rise	35 °C	13.3
	Temperature Rise	40 °C	11.7
Maximum Mains pressure		bar	10.0
Minimum Mains pressure		bar	0.2

Table 9

2 Installation regulations

Gas Safety (Installation & Use) Regulations 1998: All gas appliances must be installed by a competent person. Failure to install correctly could lead to prosecution.
The manufacturers notes must not be taken, in any way, as overriding statutory obligations.
The appliance must be installed in accordance with the current IEE Wiring Regulations, local Building Regulations, Building Standards (Scotland) (Consolidation), bye-laws of the local Water Company, Health and Safety Document 635 (Electricity at Work Regulations 1989) and any other local requirements.
Product Liability regulations indicate that, in certain circumstances, the installer can be held responsible, not only for mistakes on his part but also for damage resulting from the use of faulty materials. We advise the installer to avoid any risk by using only quality approved branded fittings.
The relevant British Standards should be followed i.e.

- BS 6798: Specification for the installation of gas fired hot water boilers of rated input not exceeding 60kW
- BS 5449: Central Heating for Domestic Premises
- BS 5546: Installation of gas hot water supplies for domestic purposes
- BS 5440:1: Flues and ventilation for gas appliances of rated input not exceeding 70 kW (net): Flues
- BS 5440:2: Flues and ventilation for gas appliances of rated input not exceeding 70 kW (net): Air Supply
- BS 6891: Installation of low pressure gas pipework installations up to 28mm (R1).
- BS 7074:1: Code of practice for domestic heating and hot water supply
- BS 7671: Requirements for Electrical Installation.

These instructions must be followed.

3 Installation

- Always turn off the gas cock before carrying out any work on components which carry gas.

Fixing of the appliance, gas and flue connections, commissioning of the system and electrical connections may only be carried out by competent persons authorised by CORGI.

3.1 Important remarks

- Appliance should only be installed in sealed central heating systems.
- To avoid gas formation in the system, galvanised radiators or pipes must not be used.
- If a room thermostat is used: do not fit a thermostatic radiator valve on the radiator in the primary room.
- Add a suitable anti-freeze fluid compatible with aluminium to the water in the central heating system. Suitable products are available from Betz-Dearborn Tel.: 0151 4209563, Fernox Tel.: 01799 550811 and Salamander Tel: 0121-378 0952..
- In our experience, the addition of sealing agents to the water in the central heating system can cause problems (deposits in the heat exchanger). For that reason we advise against their use.

3.2 Domestic hot water

Any regulations specified by the local water company must be observed.

The final 600 mm of the mains cold water connection to the appliance should be made in copper tube only.

The appliance is suitable for a mains supply having a maximum pressure of 10 bar. A pressure reducing valve must be fitted, if necessary.

The hot water outlet temperature is set to be capable of achieving a maximum of 60°C. The maximum temperature and the frequency of the recharge of the heat store may be reset.

A water flow rate of 11.7 l/min will give a temperature rise of 40°C. If a higher rise is required then the flow must be reduced at the tap and the discharge temperature will rise up to the maximum set figure.

The temperature rise, up to the maximum set by the user, is automatically maintained by the modulation of the heat input. In winter, when the mains temperature is very low, the water flow, adjusted at the tap or shower, should be reduced to maintain the required delivery temperature.

It is suggested that long pipe runs to taps or showers be insulated to prevent the rapid cooling of the water.

All types of single lever mixer taps and thermostatic mixer units suitable for a mains pressure of up to 10 bar can be used.

The head of a loose-head shower must not be allowed to fall within 25 mm of the top the bath to prevent the risk of water being drawn back into the mains. Alternatively the shower must be fitted with an anti-syphonage device at the point of the flexible hose connections.

Over-rim bidets may be connected to the appliance provided that it is in accordance with the requirements of the local water company. The outlet(s) should be shrouded and unable to have any temporary hand held spray attached. No anti-syphonage arrangements are necessary.

In exceptionally hard water areas a device to prevent scale formation may be fitted or, alternatively, the maximum temperature reset to about 45°C which may reduce the risk of scale formation. The installation of a scale inhibitor assembly should be in accordance with the requirements of the local water company. Artificially softened water must not be used to fill the central heating system. An isolating valve should be fitted to allow for servicing.

Devices, such as water meters or back-flow prevention valves, capable of preventing the flow of expansion water must not be fitted unless separate arrangements have been made.

A Zilmet Z160 expansion vessel is the preferred type. A thread sealant compatible with potable water must be used. The vessel should be connected into the cold water mains inlet pipe as close as possible to the appliance.

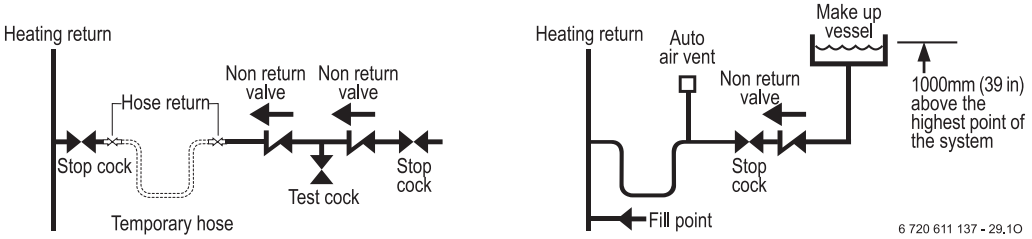


Fig. 5

3.3 Sealed systems

The appliance must not be operated without the system being full of water, properly vented and pressurised.

The expansion vessel has a volume of 10 litres and is charged to a pressure of 0.75 bar.

The water capacity of the system is shown in table 12, page 28. If a greater capacity is required then an additional expansion vessel must be fitted into the system return as close to the appliance as possible. The system pressure can be set up to a maximum of 1.5 bar with 1 bar being the normal setting.

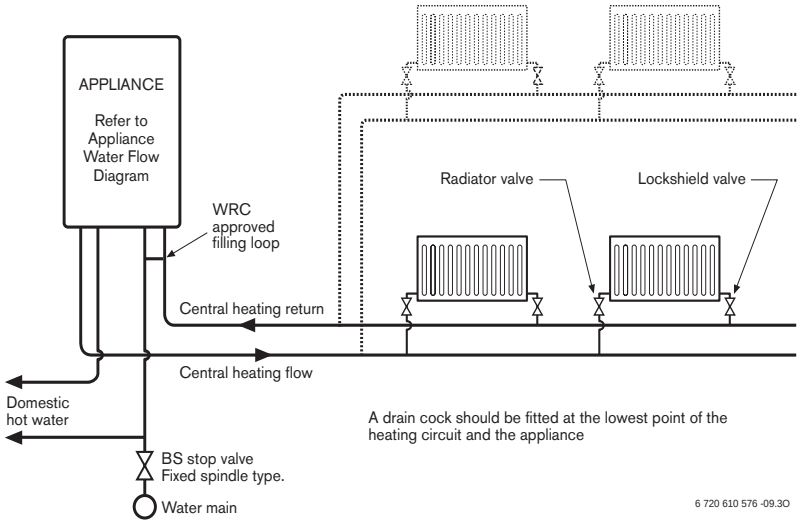


Fig. 6 Sealed primary water system

If the system pressure is greater than 2.65 bar when the appliance is operating at maximum temperature then an additional expansion vessel must be fitted into the system return as close to the appliance as possible.

The filling point must be at low level and arranged as shown in figs. 6 and 5.

The pressure relief valve is set to operate at 3 bar.

There must be no connection to the mains without the approval of the local water company. All connections in the system must be capable of withstanding a pressure of up to 3 bar and the radiator valves conform to the requirements of BS 2767:10.

Fit Thermostatic Radiator Valves to radiators in the sleeping accommodation and not to the radiator where the room thermostat is sited, this must be left open.

Repeated venting probably indicates a leak and this must be rectified to ensure the proper operation of the appliance.

No galvanised radiators or pipes must be used.

If any system water treatment is required then use only products suitable for use with Aluminium shall be used i.e Fernox- Copal or Supercon-centrate or Sentinal X100, in accordance with the manufacturers instructions. The use of any other substances will invalidate the guarantee. The pH value of the system water must be less than 8 or the appliance guarantee will be invalidated.

Suitable products are available from Betz-Dearborn Tel.: 0151 4209563, Fernox Tel.: 01799 550811 and Salamander Tel: 0121-378 0952.

A drain cock to BS2879 must be fitted to the lowest point of the system.

IMPORTANT: Check that no dirt is left in the water pipework as this could damage the appliance. Thoroughly flush the heating system and the mains water supply before fitting the appliance to the wall in accordance with the recommendations of BS7593:1992.

3.4 Siting the appliance

Regulations concerning the Installation Site

- Relevant national regulations must be complied with section 3.9.1.
- Consult the installation instructions for details of minimum clearances required.

Combustion air

In order to prevent corrosion, the combustion air must not contain any corrosive substances.

Substances classed as corrosion-promoting include halogenated hydrocarbons which contain chlorine and fluorine compounds and are contained in some solvents, paints, adhesives, aerosol propellants and household cleaners, for example.

Surface temperature

The max. surface temperature of the casing and the flue is less than 85 °C.
This means that, no special safety precautions are required with regard to flammable building materials and fitted furniture. The specified clearances must be maintained.

Cupboard/Compartment

The appliance can be installed in a cupboard/compartment need for airing clothes providing that the requirements of BS6798 and BS5440:2 are followed. The low casing losses from the appliance eliminate the need for ventilation openings in the compartment.

3.5 Wall mounting frame assembly

- Take the wall mounting frame out of the package and screw together with 6 screws as shown in fig. 7. Use the inner lugs on the top and bottom horizontal sections.

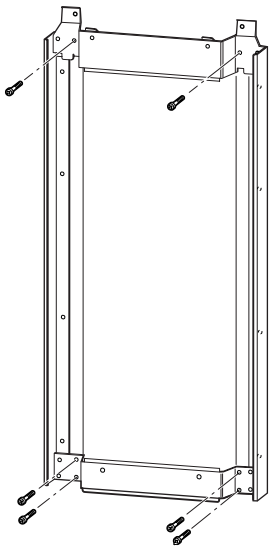


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Fig. 7

- Hold the wall-mounting frame against the wall ensuring that it is vertical.
- Mark the holes for the wall mounting frame onto the wall, drill and plug the holes and fix the wall mounting frame to the wall with the screws provided.
- Mark the position of the flue duct hole if a rear flue is to be used. Refer to fig. 1 and 16.

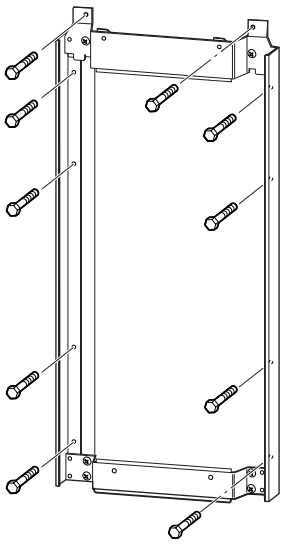

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Fig. 8

- Screw the pre-plumbing manifold with two screws to the wall mounting frame.

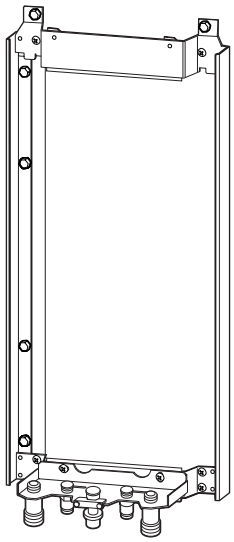

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Fig. 9

3.6 Pre-piping the system

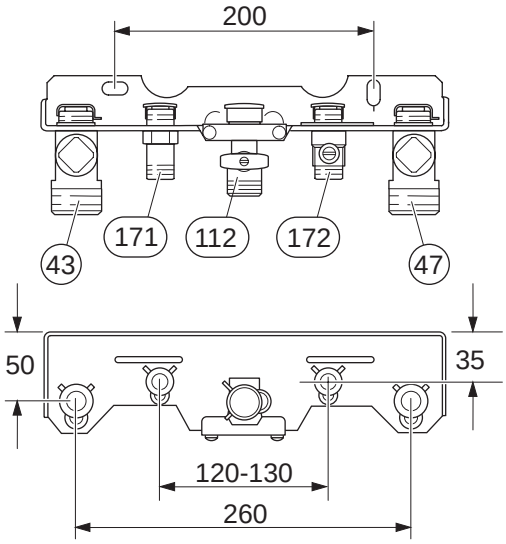

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Fig. 10 Manifold

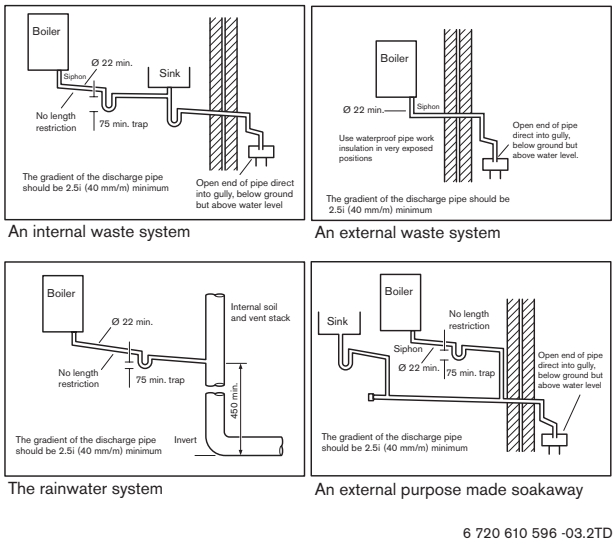
43 CH flow
47 CH return
112 Gas cock
171 Domestic hot water
172 Cold water inlet

- A drain tap should be fitted at the lowest point of the central heating system.
- WRAS approved filling loop must be fitted.

Condensate Termination and Route

The appliance has a built-in syphonic condensate trap eliminating the need for external traps. Connect to the 22mm plastic drain pipe and extend the pipe run away from the control panel and appliance with a constant fall of 2.5 ° or 25 mm in every metre. See Fig. 12

The condensate pipe can terminate into any of four areas:



An internal waste system

An external waste system

The rainwater system

An external purpose made soakaway

6 720 610 596 -03.2TD

Fig. 11

Whilst all of the above methods are acceptable it is always the best practice to terminate the condense pipe via an internal waste system.This will eliminate the need for any external condensate pipe runs which can be susceptible to freezing in extreme weather.

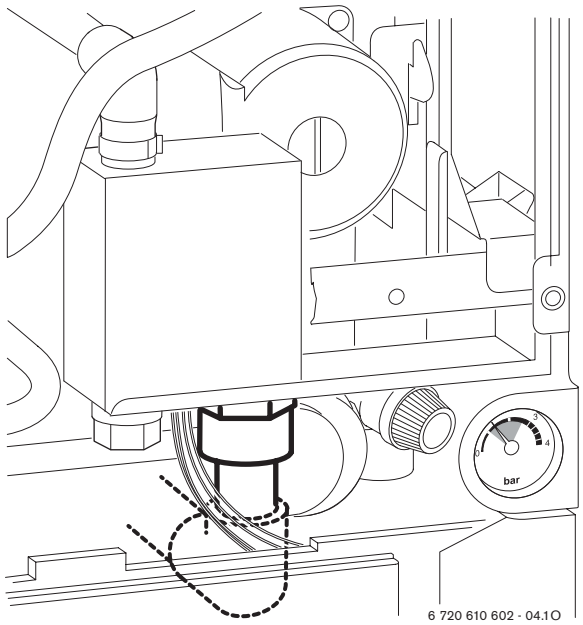


Fig. 12 Recommended route of the condensate drain

External condensate pipework

The syphonic condensate trap collects condensate into a trap which releases it in 100 ml quantities. This helps to prevent the discharge from freezing.

If there is no alternative and the condensate pipe has to be externally run, the following should be considered:

- The pipe run should take the shortest practical route.
- The pipework should be insulated with weather resistant insulation.
- The pipe should terminate as close as possible to the ground or drain, whilst still allowing the condensate to safely disperse. This would prevent wind blowing up the pipe.
- The pipework should be installed with the minimum of horizontal runs and with a downward slope of at least 2.5 °.

3.7 Fitting the appliance

Benchmark: For optimum performance after installation, this boiler and its associated central heating system must be flushed in accordance with the guidelines given in BS5793:1992 “Treatment of water in domestic hot water central heating systems”.

Removing the outer case

The outer case is secured against unauthorised removal by two screws (electrical safety).Always secure the outer case with those screws again after refitting.

- ▶ Remove retaining screws (1).
- ▶ Slide the outer case upwards and then forwards to remove (2).
- ▶ Remove the wall mounting frame manifold kit and the flue duct connector from the boiler
- ▶ Remove the plastic caps from the boiler connections.

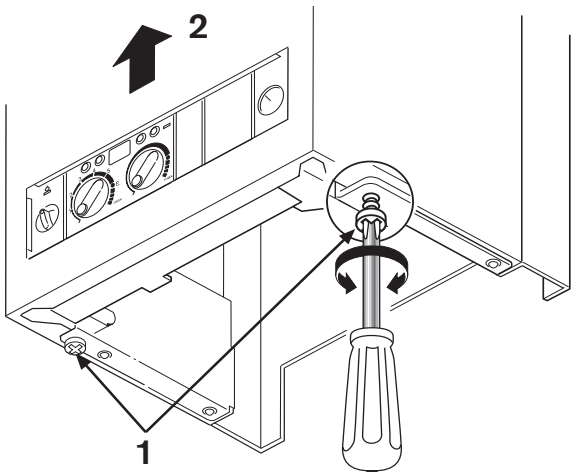


Fig. 13

Fixing the appliance

- Fit the washers onto the gas and water connections.
- Lift the boiler onto the wall-mounting frame. The lugs pass through the rectangular holes in the boiler back panel.
- Take care not to disturb the washers on the connections.

Connecting the flue duct

- Fit flue duct connector onto appliance flue spigot.
- Secure with screws supplied.

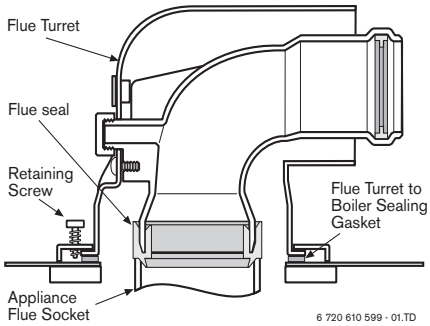


Fig. 14

- For remaining installation of flue assembly, refer to the relevant installation instructions.

3.8 Checking the connections

Water connections

- Check that the O-rings or seals are in place before tightening the connection.
- Turn on the service valves for central heating flow and return and fill the heating system through a WRAS approved filling loop.
- Check all seals and unions for leaks (testing pressure max. 3.0 bar as indicated by pressure gauge).
- Turn on cold water service cock and fill hot water system (testing pressure max. 10 bar).
- Check all connections for leaks.

Gas supply pipe

- Check that the seal is in place before tightening the connection.
- Turn off gas cock to protect gas valve against damage from excessive pressure.
- Check gas supply pipe.
- Release the pressure on the gas supply pipe.

3.9 Flue Systems

The only flue systems that may be used are those supplied with the boiler.
The flue system must be installed in accordance with the requirements of BS5440:1.

Standard 100 mm flue system

The standard concentric flue system provides for a horizontal length of up to 4 m. Full instructions for fitting this flue are in Subsection 3.9.2 “Installation of the flue”.

Alternative 125 mm diameter flue systems

Installation instructions for the alternative flue systems are sent with the appropriate flue kit.

Systems are available to give a maximum horizontal length of 13 m.

A vertical flue system up to a height of 13.7 metres is available.

45° and 90° flue bends can be used with a corresponding reduction in flue length of 2m for each 90° bend and 1 m for each 45° bend used.

IMPORTANT: Any horizontal flue system fitted to a condensing boiler must incline from the appliance at an angle of 3° (30 mm per metre length) to prevent condensate dripping from the flue terminal.

Note, the standard 100mm horizontal flue requires only a 0.5° incline from the boiler as the inner exhaust pipe is inclined at 2.5° inside the outer pipe.

This means that the clearance above the appliance must be increased to match the duct length. Refer to fig. 1 on page 5.

3.9.1 Siting the Flue Terminal

The flue must be installed in accordance with BS 5440:1 and the Building Regulations. Flue terminals in carports and under balconies are to be avoided.
The terminal must be positioned so that it does not cause an obstruction nor the combustion products a nuisance. See fig. 15 and table 10.
The terminal will, at times, give out a plume of water vapour and consideration must be given to this when choosing a terminal position. Keep clear of security lighting, activated by passive infra-red sensing heads.
If the terminal is less than 2 m above a surface to which people have access then a guard must be fitted. The guard must be evenly spaced about the terminal with a space of 50 mm in each direction and fixed with plated screws.
A guard Type K6 for the standard horizontal flue, can be obtained from Tower Flue Components, Vale Rise, Tonbridge TN9 1TB.

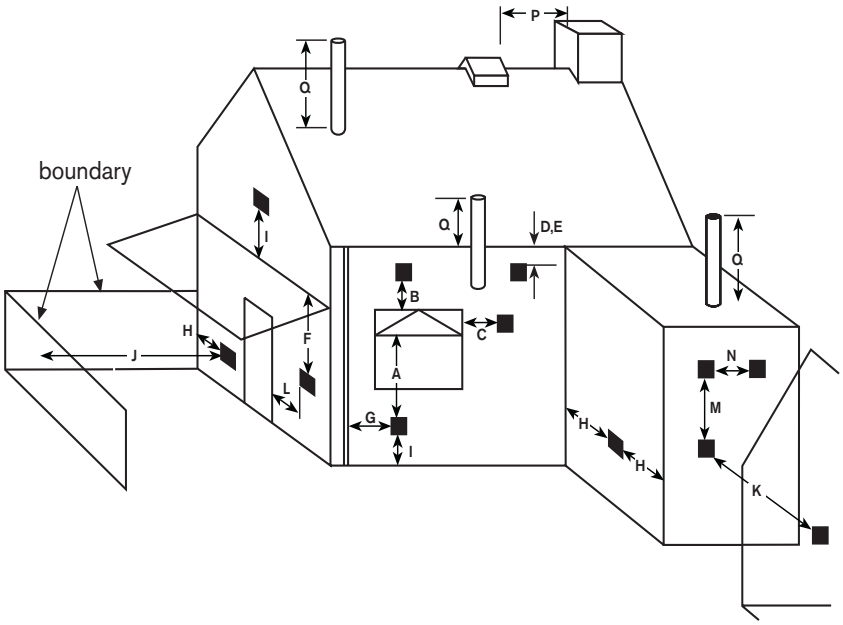


Fig. 15

Minimum dimensions of flue terminal positions (all types) (see fig 15. 15)

Dimension	Terminal position (kW input expressed in net)	Balanced flues room sealed: Fanned draught
A[1)]	Directly below an opening, air brick, opening windows, etc.	300 mm
B[1)]	Above an opening, air brick, opening window, etc.	300 mm
C[1)]	Horizontally to an opening, air brick, opening window, etc.	300 mm
D	Below gutters, soil pipes or drain pipes	75 mm
E	Below eaves	200 mm
F	Below balconies or car port roof (lowest point)	Not recommended
G	From a vertical drain pipe or soil pipe	75 mm
H	From an internal or external corner or to a boundary alongside the terminal	300 mm
I	Above ground roof or balcony level	300 mm
J	From a surface or boundary facing the terminal	1200 mm
K	From a terminal facing the terminal	2000 mm
L	From an opening in the car port (e. g. door, window) into the dwelling	Not recommended
M	Vertically from a terminal on the same wall	1500mm
N	Horizontally from a terminal on the same wall	300 mm
P	From a vertical structure on the roof	500 mm
Q	Above intersection with roof	300 mm

Table 10

1) In addition, the terminal should not be nearer than 150 mm (fanned draught) to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a window frame.

3.9.2 Installation of the flue

The standard 100 mm diameter horizontal flue system is suitable for lengths up to 4 m.
Flues up to 650 mm do not require an extension duct assembly.
Flues between 1600 mm and 4000 mm require extension duct assemblies.
NOTE: Flue lengths between 650 mm and 730 mm cannot be accommodated. Refer to Fig. 17, 18, 19.

Standard 100mm system comprise:

- Flue turret
- Flue turret clamp
- Terminal assembly
- Wall sealing gasket and cover plate.

Refer to Fig. 20.

Instructions for fitting other flue systems are packed with the relevant flue kit.
Check that the position chosen for the appliance is satisfactory Refer to Fig. 16.

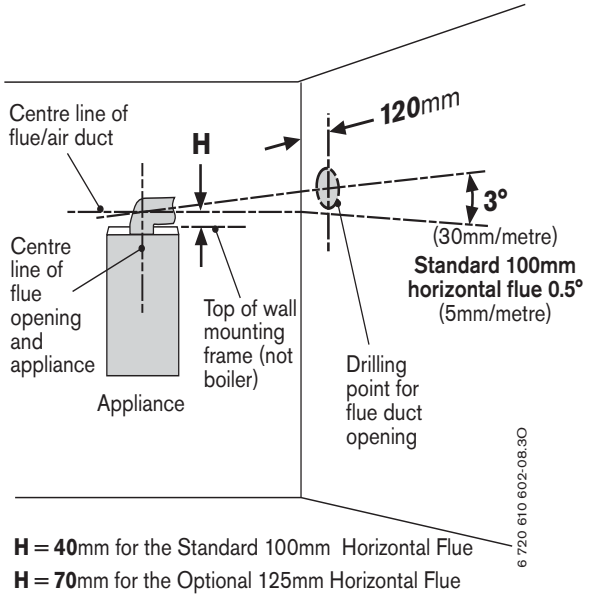


Fig. 16 Marking the position of a side flue opening. Note: ensure there is adequate access to the air/flue sampling points in the flue turret.

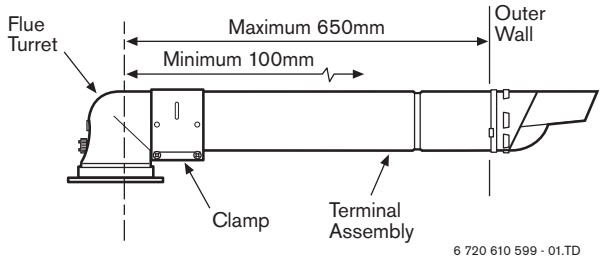


Fig. 17 Standard Flue

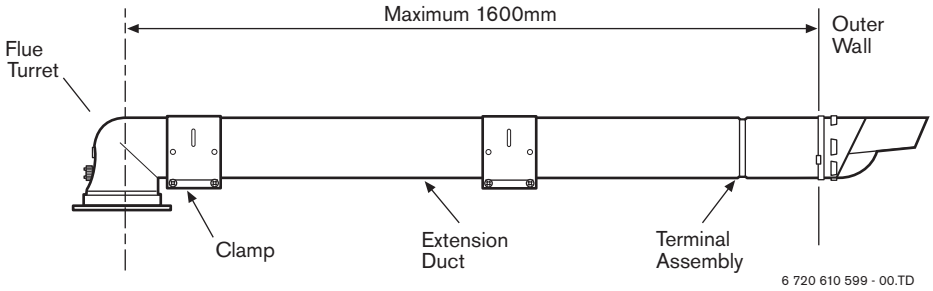


Fig. 18 Flue with one extension

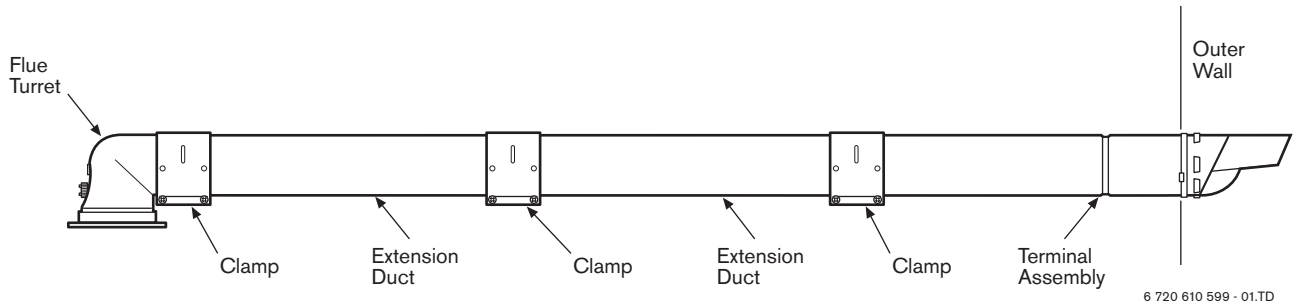


Fig. 19 Flue with extensions

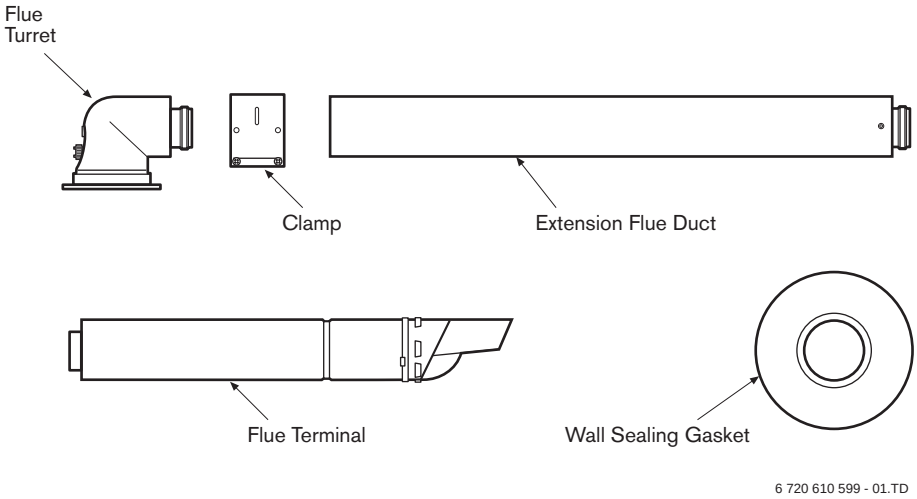


Fig. 20 Flue components

3.9.3 Flue duct preparation and assembly

Measure the flue length L. Refer to fig. 21, 22.

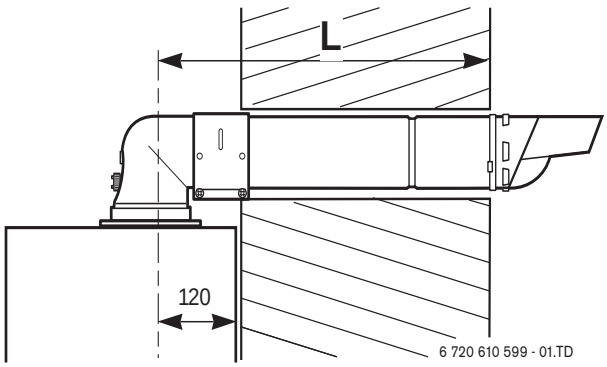


Fig. 21 Flue length - rear

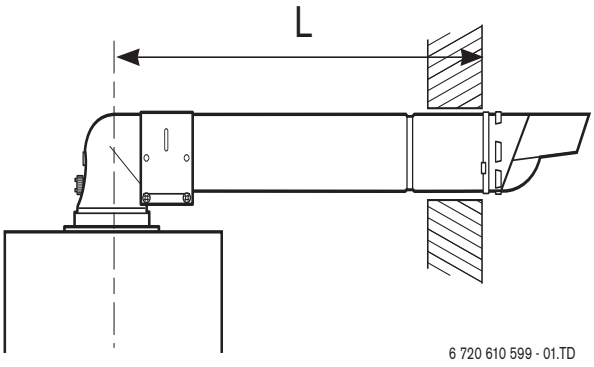


Fig. 22 Flue length - side

Measure 'L' from the end of the metal section of the flue terminal to the centre of the flue outlet on the boiler as shown in Fig. 21 & Fig. 22 and deduct 90mm from that measurement.

Cut both inner and outer flue pipe square at the opposite end to the terminal without creasing the tubes.

Remove any burrs before fitting the terminal to the turret.

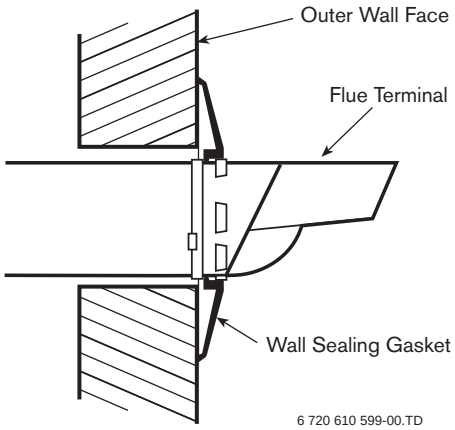


Fig. 23 Flue terminal position

Assemble flue system completely. Push the ducts fully together and clamp in the positions. The slope of the terminal outlet must face downwards.

The assembly will be made easier if a solvent free grease is lightly applied i.e Silicone lubricant, to the male end of the ducts.

NOTE: An inner wall sealing plate is provided which should be fitted to the ducts before assembly.

Push the assembly through the wall and fix the turret to the appliance with the screws provided. Refer to fig. 24.

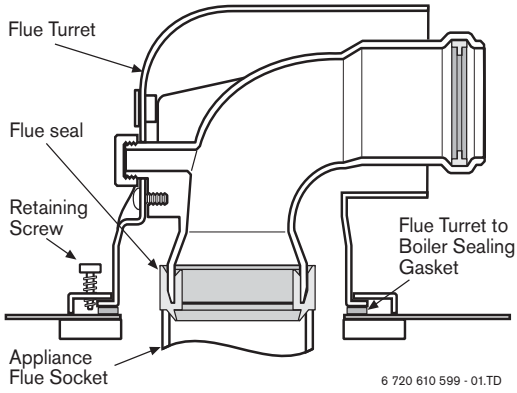


Fig. 24 Flue turret

Ensure that the turret is fully secured to the socket on the boiler.

If the terminal is within 2 m of the ground where there is access then an approved terminal guard must be fitted. The guard must give a clearance of at least 50 mm around the terminal and fixed with corrosion resistant screws.

4 Electrical connections

- ▶ Always disconnect the power supply to the appliance at the mains before carrying out any work on the electrical systems and components.

- ▶ Allow mains cable to protrude at least 50 cm from wall.
- ▶ To maintain the splash-proof (IP) design: cut the cable grommet hole size to match the diameter of the cable, see fig. 27.
- ▶ The appliance must be earthed.
- ▶ It must be possible to completely isolate the appliance with at least 3mm contact separation in both poles.

The wiring between the appliance and the electrical supply shall comply with current IEE Wiring Regulations (and any local regulations which apply) for fixed wiring to a stationary appliance.

- Supply: 230 V ~ 50 Hz, 150 Watts
- External fuse 3 A
- The system connected to the boiler must NOT have a separate electrical supply
- Water Protection IPX4D (with fascia blanking plate fitted or IP20 without blanking plate).

4.1 Connecting the appliance

To gain access to the mains connection remove the drop down facia cover. The drop down cover is removed by lowering it to the horizontal position and pushing firmly upwards at the rear of the supports to release the cover. Lift cover from the appliance.

After installation (or in the event of an electrical fault) the electrical system shall be checked for short circuits, fuse failure, incorrect polarity of connections, earth continuity and resistance to earth.

- ▶ Pull out cover panel at the bottom and remove. Refer to fig. 25.

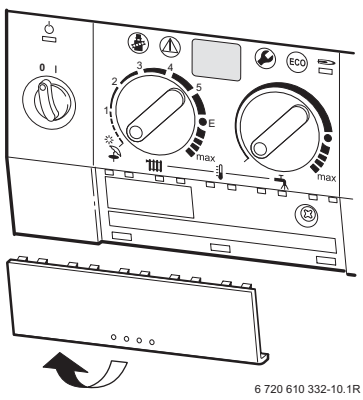


Fig. 25

- ▶ Remove screw and slide terminal cover forwards to remove. Refer to fig. 26.

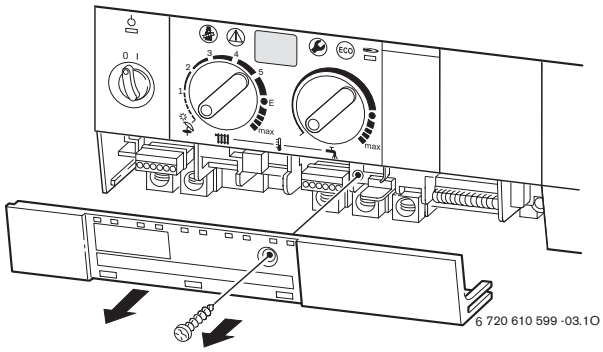


Fig. 26

- ▶ Cut cable grommet to diameter of cable.

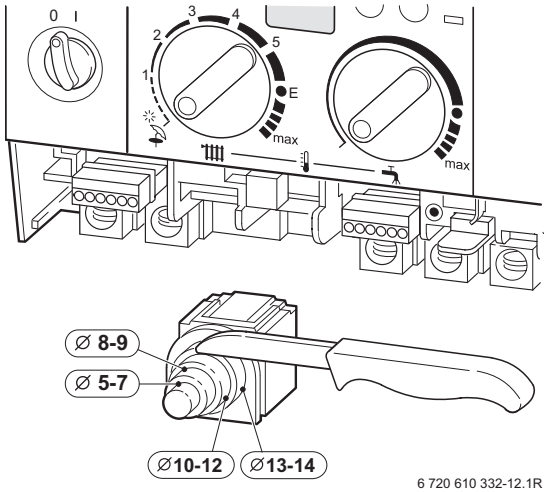


Fig. 27

- ▶ Feed cable through cable grommet and connect the mains supply cable, see fig. 28.
- ▶ Secure cable in cable grommet by means of cable grip.

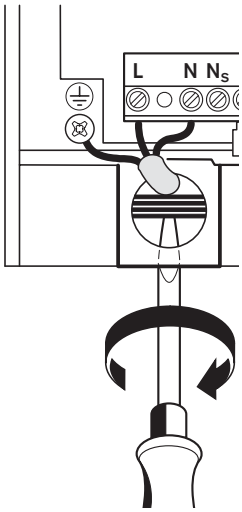


Fig. 28

4.2 Mains Voltage external controls connections

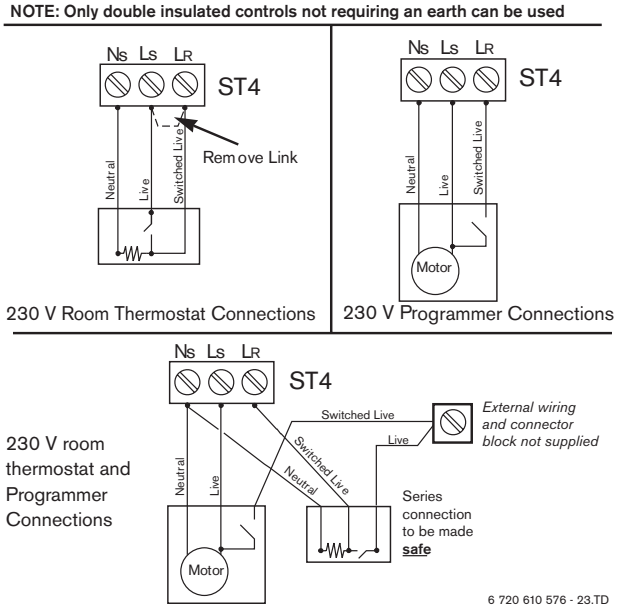


Fig. 29

Note: If an external timer is used then the domestic hot water pre-heat facility can only be reduced in temperature (approx. 25°C) by using the 'ECO' button on the fascia.

5 Commissioning

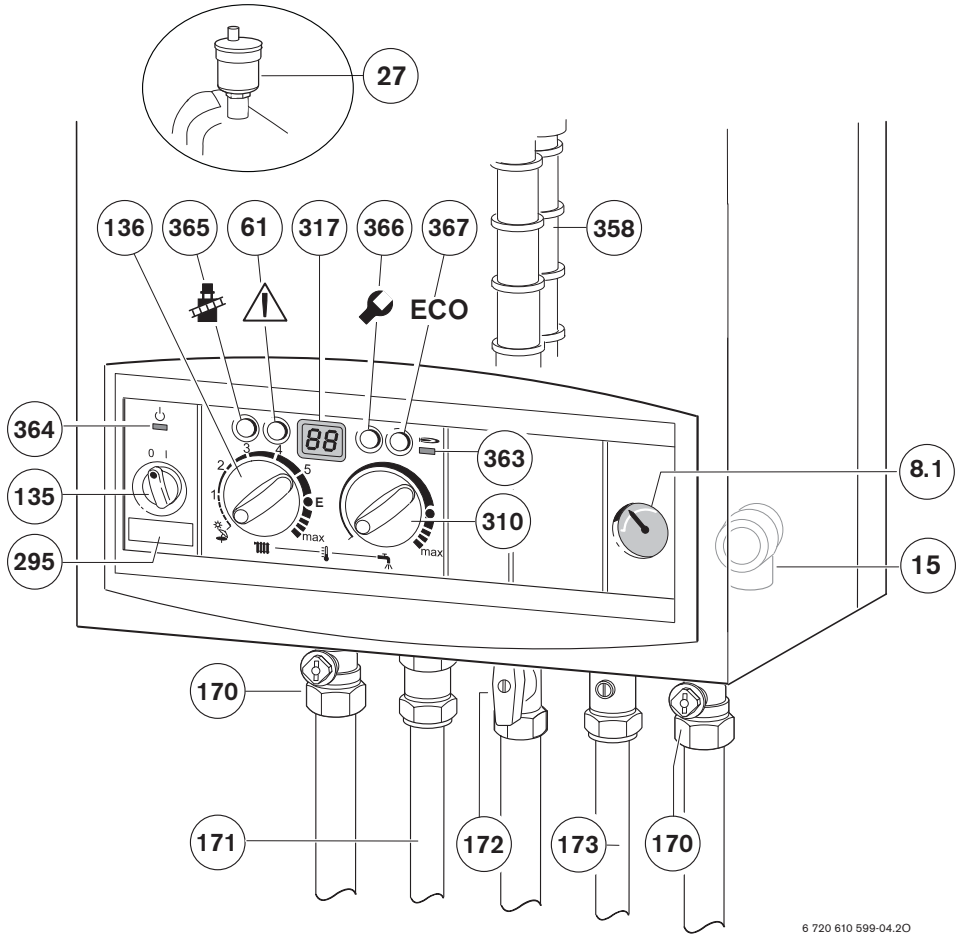


Fig. 30

8.1 Pressure gauge
15 Safety valve
27 Automatic vent
61 Reset button
135 Master switch
136 Temperature control for central heating
170 Service cocks on CH flow and return
171 Hot water
172 Gas cock (shown in on position)
173 Cold water service cock
295 Appliance type sticker
310 Temperature control for hot water
317 Multi function display
358 Condensate trap
363 Indicator lamp for burner
364 Indicator lamp for power supply
365 “Chimney sweep” button
366 Service button
367 ECO button

5.1 Commissioning

Never run the appliance when empty or unpressurised.

The operational CO_2 level is set at the factory and no adjustment is necessary when installing a natural gas fired appliance.

Benchmark Water Treatment: For optimum performance after installation, this boiler and its associated central heating system should be flushed in accordance with the guidelines given in BS7593:1992 - Treatment of water in domestic hot water systems. Full instructions are supplied with proprietary cleansers sold for this purpose. If an inhibitor is to be used after flushing, it should be used in accordance with the inhibitor manufacturers instructions.

To drain the appliance shut the system valves and open the system drain point.

Suitable flushing agents and inhibitors are available from Betz/Dearborn Tel.: 0151 4209563, Fernox Tel.: 01799 550811 and Salamander Tel.: 0121 378 0952.

Instructions for use are supplied with the these products.

- **Before commissioning, the gas supply pressure must be checked at the gas supply pressure test point (see page 6, fig. 2, item 7). Natural gas appliances must not be operated if the gas supply pressure is below 18 mbar or above 24 mbar. LPG appliances must not be operated if the supply pressure is not 37 mbar at the inlet to the appliance**.
- Unscrew the condensation trap (358) and pull out, fill with approx. 1/4 l of water and refit. Refer to fig. 30.
- Adjust charge pressure of expansion vessel to static head of the central heating system (see page 28).
- Open all system radiator valves.
- Check automatic air vent is open, item 27, see fig 30
- Turn on service valves (170), fill central heating system to pressure of 1 - 2 bar through the WRAS approved filling loop. Refer to fig. 30.
- Vent radiators.
- Refill heating system and set the pressure to 1 bar.
- Turn on cold water service cock (173). Refer to fig. 30.
- Check that the gas type specified on the identification plate matches that of the gas supply.
- Turn on gas cock (172). Refer to fig. 30.

5.2 Switching the appliance on/off

Switching on

- Switch on the appliance at the master switch (**I**). The indicator lamp shows green and the display will show the central heating flow temperature, when the appliance is operating in the central heating mode.

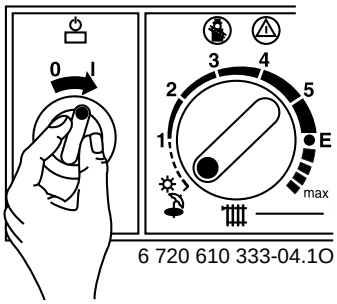


Fig. 31

If the display alternates between **-II-** and the central heating flow temperature, the trap filling programme is active.

The trap filling programme ensures that the condensation trap is filled after the appliance has been installed or after the appliance has been out of use for a long period or the mains supply has been interrupted. For that reason, the appliance remains at minimum heating output for 15 minutes.

Switching off the appliance

- Set the master switch to (**0**). The green indicator lamp goes out.

- Always disconnect the appliance from the power supply (fuse, circuit breaker) before carrying out any work on the electrical systems or components.

5.3 Switching on the central heating

The central heating flow temperature is adjustable between 35°C and 88°C. Refer to table 13, page 28.

- Turn the temperature control to set the flow temperature to a level appropriate to the type of central heating system:
  - Underfloor heating: e.g. setting **“3”** (approx. 50°C)
  - Low-temperature heating: setting **“E**” (approx. 75°C)
  - Central heating systems for flow temperatures up to 88 °C: limited “max” setting for low-temperature operation (see page 28).

  When the burner is alight, the **red** indicator lamp lights up.

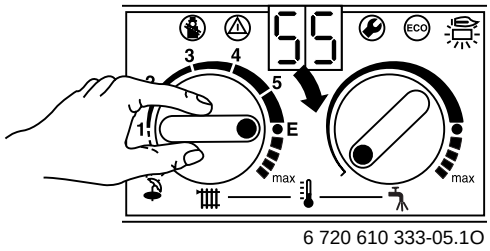


Fig. 32

5.4 System controls

- Set room thermostat to the desired room temperature.
- Set internal room temperature control unit (TR2), if fitted. Refer to the instructions with the control.
- Set the thermostatic radiator valves to the desired settings.

5.5 Setting the domestic hot water temperature and flow rate

5.5.1 Domestic hot water temperature

The hot water temperature can be set to between approx. 40 °C and 60 °C.

This temperature is not shown on the display.

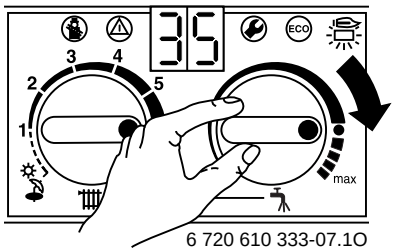


Fig. 33

Setting	Hot Water temperature
Turn fully anti-clockwise	approx. 40°C
•	approx. 55°C
Turn fully clockwise	approx. 60°C

Table 11

"ECO" button

By pressing and holding the "ECO" button (ECO), until the display lights, you can switch between **Comfort mode** and **Economy mode**.

Comfort mode: button is not lit (factory setting)

The appliance is held constantly at the set temperature. This means that hot water is available almost instantaneously at the tap. Consequently the appliance will switch on at intervals, even if no hot water is being drawn.

ECO mode with demand detection, button is lit

The demand detection function enables maximum gas and water economy.
Briefly turning a hot water tap on and then off again signals demand to the appliance which then heats up the water to the set temperature.
Hot water is thus available in about 1 minute.

ECO mode, button is lit

Water is not heated up until hot water is drawn. This means that there is a longer waiting period before hot water is available.

5.5.2 Hot water flow rate

Adjust the flow rate according to model.

Under standard conditions (2 bar) supply pressure, one full turn is equivalent to approximately 2 l/min.

- **To increase the flow rate (max. 14 l/min):**
  turn screw on flow switch anti-clockwise (+).
  The outlet temperature will decrease relative to the increase in the flow rate.
- **To reduce the flow rate (min. 8 l/min):**
  turn screw on flow switch clockwise (–).
  The outlet temperature will increase relative to the decrease in the flow rate.

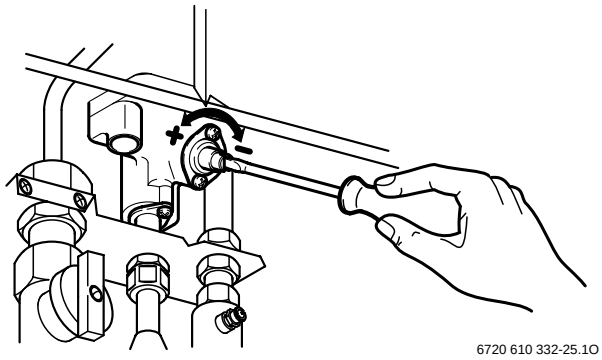


Fig. 34

5.6 Summer mode (hot water only)

With room thermostat

- Turn temperature control on the appliance anti-clockwise as far as the stop.
  The central heating is now turned off. The hot water function and the mains power supply for the heating programmer and timer remain switched on.

5.7 Frost protection

- Leave master switch switched on.

If the appliance is to be left for long periods switch the central heating on and set the room thermostat to 6°.

- Add a suitable anti-freeze fluid to the water in the central heating system.
  Suitable products are available from Betz/Dearborn Tel.: 0151 4209563, Fernox Tel.: 01799 550811 and Salamander Tel.: 0121 378 0952.

5.8 Pump anti-seize function

This function prevents the central heating pump seizing after long periods of inactivity.

Every time the pump is switched off, a timer is started. If after 24 hours the pump has not run again, it is switched on for a period of 5 minutes.

5.9 Fault Condition

A list of faults that may occur is given on page 44.

In the unlikely event of a fault occurring while the appliance is in operation:

The display then shows a fault code and the button ⚠ may also flash.

If the button ⚠ flashes:

- Press and hold the button ⚠ until the display shows "– –".
  The appliance will then start up again and the display will show the central heating flow temperature.

If the button ⚠ does not flash:

- Switch the appliance off and then on again at the master switch.
  The appliance will start up again and the central heating flow temperature will be displayed.

5.10 Appliance Data Monitoring

If an external Gateway module is fitted then the operating system must be commissioned at this stage.

Commissioning of ADM and Gateway

Check if Gateway is plugged into the telephone line and mains.

1. Remove the cover from the gateway.
2. Unplug the power connector from the side of the gateway.
3. Reconnect the power to the gateway. Press and hold **SW1** and **SW2** within **5** seconds of powering up, see Fig. 35.
4. Observe **2** distinct clicks from the relays on the gateway.

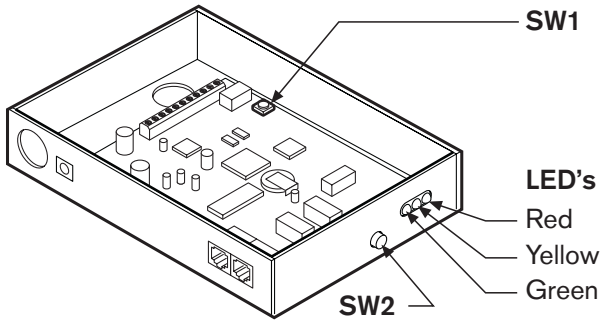


Fig. 35 Gateway Module - switches and LED's

5. Release the switches. Note only the **RED LED** is **ON**. The Gateway is now reset.
6. Press **SW1**. Observe 0.5 Hz flashing of **GREEN LED**. The gateway is now in "House Address Creation mode". This lasts for approx. 1 minute.
7. Wait until **GREEN LED** flashes **3** seconds **ON** and **1** second **OFF**. The gateway has now Created the *House Address*.
8. Make the jumper **JP1** on the **ADM** while powering up the appliance, see Fig. 36.
   Observe **LED** on ADM flashing. The flashing rate is 0.5 Hz, the ADM is now in *"House Address Acquisition mode"*.

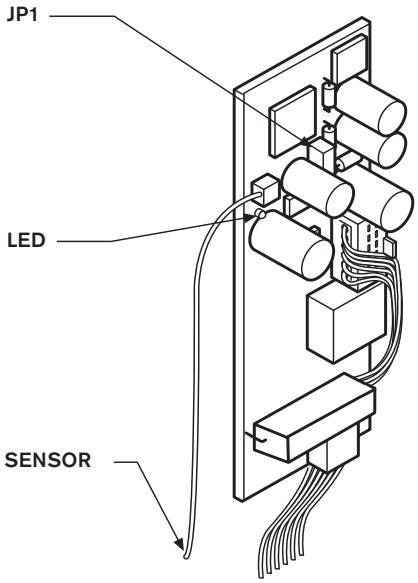


Fig. 36 ADM - switches and LED's

9. Return to the gateway and press **SW1**. Observe **GREEN LED** through the side of the box "*House Address Distribution mode"*

"House Address Acquisition mode" on the ADM and "House Address Distribution mode" on the gateway must overlap. Note the times are as follows, the ADM will stay in "House Address Acquisition mode" for 100 seconds and the gateway will stay in and "House Address Distribution mode" for 60 seconds.

10. After 100 seconds from step 8 observe **ADM LED** flashing at 2 Hz.
11. After 60 seconds from step 9 observe **GREEN LED** on gateway is **ON**.
12. The ADM will now cause the gateway to dial into BG. A click of the relay will be heard from the gateway at each end of the dialling in.
13. Now power down the Heatronic, remove **JP1**, replace all covers and power up again. The system is now set up.

6 Individual settings

6.1 Mechanical settings

6.1.1 Checking the size of the expansion vessel

Maximum pressure at maximum CH flow temperature is 2.5 bar. If the pressure is greater than this then fit an extra expansion vessel. Refer to table 12.

System Capacity – BS7074:1

Expansion Vessel Pressure and System Capacity			
Expansion Vessel		litres	10
Expansion Vessel Charge Pressure		bar	0.75
System pressure and capacity	1 bar	litres	82
	1.5 bar	litres	46

Table 12

6.1.2 Setting the central heating flow temperature

The central heating flow temperature can be set to between 35°C and 88°C.

With underfloor heating systems, observe the maximum permissible flow temperatures.

Limited maximum setting for low-temperature operation

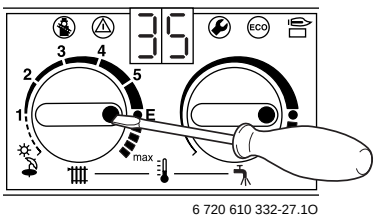
The temperature control is factory limited to setting **E**, giving a maximum flow temperature of 75°C.

Adjustment of the heating output to the calculated heat demand is not required by the heating systems regulations.

Removing the maximum setting limit

For heating systems which require higher flow temperatures, the maximum setting limit can be removed.

▶ Lift off the yellow button on the temperature control with a screwdriver.



6 720 610 332-27.1O

Fig. 37

▶ Rotate yellow button through 180° and replace (dot facing inwards).
The CH flow temperature is no longer limited.

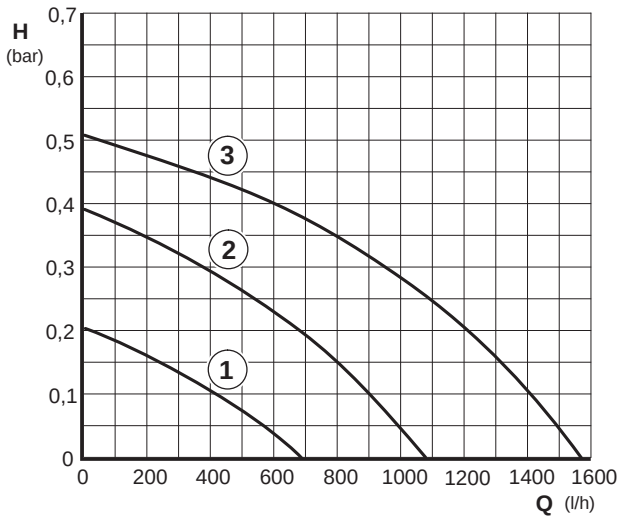
Control setting	CH flow temperature
1	approx. 35°C
2	approx. 43°C
3	approx. 51°C
4	approx. 59°C
5	approx. 67°C
E	**approx. 75°C**
max	approx. 88°C

Table 13

6.1.3 Changing the heating pump characteristic

The speed of the central heating pump can be altered on the pump terminal box.

At switch position 1, maximum output is not delivered if hot water mode is active. Position 1 must not be used on combi appliances.



6 720 610 576-23.2O

Fig. 38

1 Pump characteristic for switch position 1
2 Pump characteristic for switch position 2
3 Pump characteristic for switch position 3
H Residual delivery pressure
Q Water circulation rate

6.2 Settings on the Bosch Heatronic

6.2.1 Operating the Bosch Heatronic

The Bosch Heatronic enables easy setting and checking of a large number of appliance functions.

This description is limited to those functions required for commissioning.

For a full description of all available functions, please refer to the Service booklet for the Engineer, order no. 7-181-465-348.

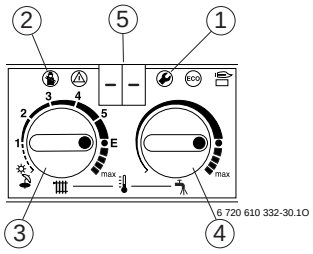


Fig. 39 Appliance controls

1 Service button
2 "Chimney sweep" button
3 Temperature control for central heating
4 Temperature control for hot water
5 Display

Selecting service function:

Note the positions of the temperature controls and . After completing the settings, return the temperature controls to their original positions.

The service functions are subdivided into two levels: **Level 1** comprises service functions up to function **4.9**, while **Level 2** consists of the service functions from **5.0** upwards.

- To select a service function on Level 1: press and hold the button until the display shows **– –**.
- To select a service function on Level 2: press and hold the buttons and simultaneously until the display shows **= =**.
- Then turn the temperature control to select the required function.

Service function	Code no.	See page
Anti-cycle time	**2.4**	29
Max. CH flow temperature	**2.5**	29
Switching difference	**2.6**	29
Max. heating output	**5.0**	29
Constant hot water cycle time	**6.8**	30

Table 14

The service function **5.0** may be reset.

Entering a setting

- To enter the setting for a function, turn the temperature control .

Storing a setting

- Level 1: press and hold the button until the display shows **[ ]**.
- Level 2: press and hold the and buttons simultaneously until the display shows **[ ]**.

After completing the settings

- Reset the temperature controls and to their original positions.

6.2.2 Setting the anti-cycle time (Service Function 2.4)

This service function is only active if Service Function 2.7, automatic anti-cycle time, is deactivated.

The anti-cycle time can be set to between 0 and 15 minutes (**factory setting** is 3 minutes).

If the setting 0 is entered, the anti-cycle time is inactive.

The shortest possible anti-cycle time is 1 minute (recommended for single-pipe and hot-air heating systems).

If the appliance is connected to an outside temperature controlled heating programmer, the anti-cycle time does not need to be set on the appliance and is optimised by the programmer instead.

6.2.3 Setting the maximum CH flow temperature (Service Function 2.5)

The maximum CH flow temperature can be set to between 35°C and 88°C (**factory setting**).

6.2.4 Setting the switching difference (Service Function 2.6)

If the appliance is connected to an outside temperature controlled programmer, the programmer sets the switching difference. It does not need to be set on the appliance.

The switching difference is the permissible divergence from the specified CH flow temperature. It can be set in increments of 1°C. The adjustment range is 1 to 30°C (is **factory set** to 0°C). The minimum CH flow temperature is 30°C.

6.2.5 Setting the heating output (Service Function 5.0)

The heating output can be set to any level between min. rated heat output and max rated heat output to limit it to the specific heat requirements.

The factory setting is the max. rated heat output.

- Press and hold the and buttons simultaneously until the display shows = =.
  The and buttons will light up.

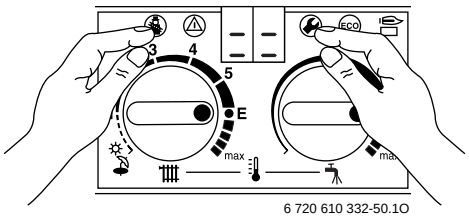


Fig. 40

- Turn the temperature control until the display shows **5.0**.
  After a short delay, the display then shows the set heating output in percent.

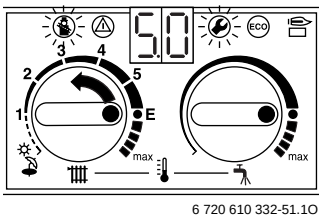


Fig. 41

- Refer to the settings tables for heating and cylinder charging output to obtain the relevant code for the desired heating output in kW (see page 46).
- Turn the temperature control until the display shows the desired code number.
  The display and the and buttons will flash.
- Measure the gas flow rate and compare with the figures specified for the code number displayed. If figures do not match, adjust the code number!
- Press and hold the and buttons simultaneously until the display shows **[ ]**.
  The heating output is now stored.

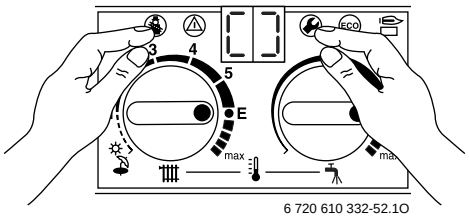


Fig. 42

- Return the temperature controls and to their original positions.
  The display will revert to the CH flow temperate.

6.2.6 Constant hot water cycle time (Service Function 6.8)

In Comfort mode “ECO light off” , the hot water inside the appliance is held constantly at the set temperature. For that reason, the appliance switches on if the water temperature falls below a certain temperature. In order to prevent it switching on and off too frequently, the constant hot water cycle time service function allows you to set the minimum period between switching off and on again. This function has no effect on normal demand for hot water and relates only to the constant hot water function in Comfort mode.

The cycle time can be set to any period between 20 and 60 minutes (is **factory set** to 20 minutes).

6.3 Setting the gas/air ratio

The appliance is set at the factory and adjustment to the CO_2 settings (gas/air ratio) is only required where the appliance has been stripped down and assembled or if the fan, burner or gas valve are replaced or the appliance has been converted to a different gas type, see section 7.

7 Converting the appliance to different gas types

The setting is factory sealed at maximum. Adjustment to the rated heat input and min. heat input is not necessary.

Checking the gas supply pressure

▶ Check the gas supply pressure at the gas supply pressure testing point.

Natural gas appliances must not be operated if the gas supply pressure is below 18 mbar or above 24 mbar.
LPG appliances must not be operated if the supply pressure is below or above 37 mbar.

Natural gas

- Appliances for **natural gas type G20** are factory set to Wobbe-Index 15 kWh/m^3 and 20 mbar supply pressure and sealed.

7.1 Setting the gas/air ratio

The gas/air ratio may only be adjusted on the basis of a CO_2 measurement at max. heat output and min. heat output using an electronic tester.

▶ Switch off the appliance at the master switch (**O**).

▶ Remove the outer case (see page 15, refer to fig. 13).

▶ Switch on the appliance at the master switch (**I**).

▶ Unscrew sealing plug from flue gas testing point (234). Refer to fig. 43.

▶ Insert testing probe about 135 mm into the flue gas testing point and seal testing point.

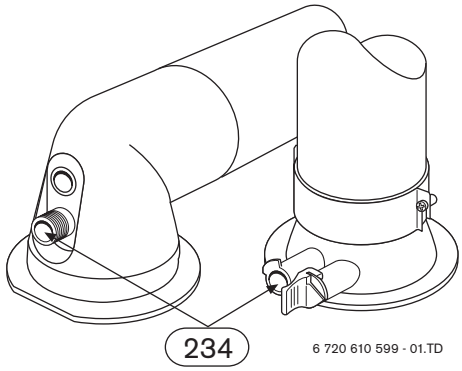


Fig. 43

▶ Press and hold button until the display shows **– –**. The button will light up.

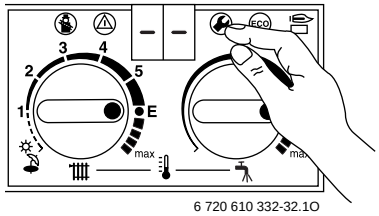


Fig. 44

▶ Turn the temperature control until the display shows **2.0** .
After a short delay, the current operating mode setting will be displayed (**0.** = Normal mode).

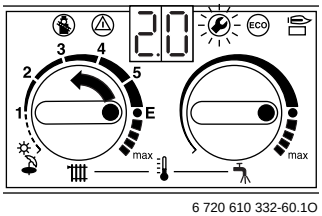
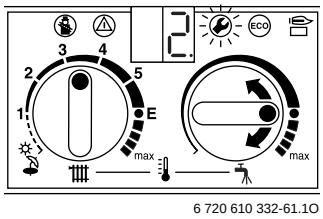


Fig. 45

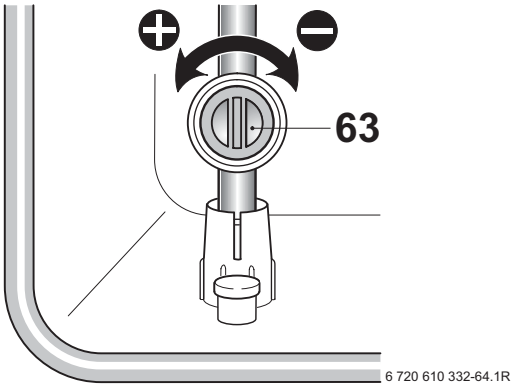
- Turn the temperature control until the display shows **2.** (= max. rated heat output).
  The display and the button will flash.



6 720 610 332-61.1O

Fig. 46

- Measure the CO_2 level.
- Prise off the seal on the gas flow restrictor.
- Adjust the gas flow restrictor (63) to obtain the CO_2 level given in Table 15. Refer to fig. 47.



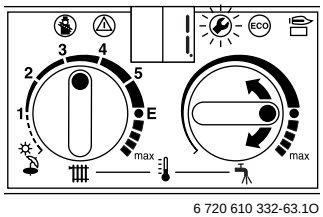
6 720 610 332-64.1R

Fig. 47

Gas Type	CO_2 reading at max. rated heat output	CO_2 reading at min. rated heat output
Natural gas type G20	9.2 %	8.8 %
LPG G31 (propane)	10.8 %	10.5 %

Table 15

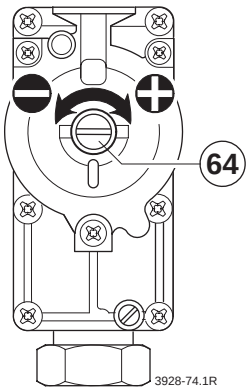
- Turn the temperature control anti-clockwise until the display shows **1.** (= min. rated heat output).
  The display and the button will flash.



6 720 610 332-63.1O

Fig. 48

- Measure the CO_2 level.
- Remove the seal from the gas valve adjusting screw (64) and adjust the CO_2 level to the figure given in Table 15 for min. rated heat output.



3928-74.1R

Fig. 49

- Recheck the levels at min. and max. rated heat output and re-adjust if necessary.
- Turn the temperature control anti-clockwise as far as the stop so that the display shows **0.**
  (= Normal operating mode).
  The display and the button will flash.
- Press and hold the button until the display shows **[ ]**.
- Reset the temperature controls and to their original positions.
  The display will revert to the CH flow temperature.
- Remove testing probe from the flue gas testing point (234) and refit sealing plug.
- Re-seal gas valve adjusting screw and gas flow restrictor.
- Replace outer case and secure.

7.2 Testing combustion air/flue gas at set heat output

7.2.1 Testing the O_2 or CO_2 level in the combustion air

By testing the O_2 or CO_2 level in the combustion air the gas tightness of a type C_{13} or C_{33} **flue system** can be checked. The O_2 level must not be less than 20,6 %. The CO_2 level must not exceed 0,2 %.

- Press and hold the button until the display shows **– –**.
  "Chimney sweep" mode is now active.
  The button will light up and the display shows the CH flow temperature.

In "chimney sweep" mode, the appliance switches to max. rated heat output or the set heating output. You then have 15 minutes in which to measure the levels. After that, the appliance switches back from "chimney sweep" mode to normal mode.

- Remove sealing plug from combustion air testing point (234.1, fig. 50).
- Insert testing probe about 80 mm into the testing point and seal testing point.

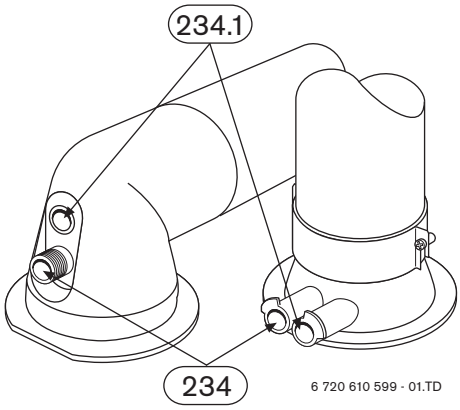


Fig. 50

- Measure O_2 and CO_2 levels.
- Refit sealing plug.
- Press and hold button until the display shows **– –**.
  The button will stop flashing and the display shows the CH flow temperature.

7.2.2 Testing CO and CO_2

- Press and hold the button until the display shows **– –**.
  "Chimney sweep" mode is now active.
  The button will light up and the display shows the CH flow temperature.

You have 15 minutes in which to measure the levels. After that, the appliance switches back from "chimney sweep" mode to normal mode.

- Remove sealing plug from flue gas testing point (234, Fig. 50).
- Insert testing probe about 135 mm into the testing point and seal testing point.
- CO- and CO_2 levels.
- Refit sealing plug.
- Press and hold button until the display shows **– –**.
  The button will stop flashing and the display shows the CH flow temperature.

8 Maintenance

- Always disconnect the appliance from the electrical power supply (fuse, circuit breaker) before carrying out any work on the electrical systems or components.

- Always turn off the gas cock before carrying out any work on components which carry gas.

There is a special Service booklet for the Engineer, order no. 7-181-465-348, available to competent persons.

All safety and control systems are monitored by the Bosch Heatronic. In the event of a component fault, the display shows a fault code.

- The User should be recommended to have the appliance serviced regularly by a competent person (see Maintenance Contract).
- Use only genuine spare parts
- Refer to the Spare Parts List when ordering spare parts.
- Always renew seals and O-rings removed during servicing or repair work.
- Use only the following types of grease:
  - Water valve: WRAS approved silicon based grease
  - Unions: approved sealant.
- To drain the appliance shut the system valves and open the pressure relief valve.
- Upon completion of any electrical work check for earth continuity, correct polarisation and resistance to earth.

8.1 Pre-Service Check List

			Date								
1	Call up the last fault stored by the Bosch Heatronic, Service Function **.0,** (see page 36).										
2	Check ionisation current, Service Function **3.3**, (see page 36).										
3	Perform visual check of air/flue duct. Visual check of diaphragm for soiling and splits (see page 38).										
4	Check gas supply pressure (see page 31).	mbar									
5	Test combustion air/flue gas (see page 33).										
6	Check CO_2 setting for min./ max. (gas/air ratio) (see page 31).	min. % max. %									
7	Check gas and water systems for leaks (see page 16).										
8	On combi models, check hot water outlet temperature (see page 36).										
9	Check heat exchanger (see page 36).	mbar									
10	Check burner (see page 37).										
11	Clean condensation trap (see page 38).										
12	Check charge pressure of expansion vessel matches static head of heating system.	mbar									
13	Check central heating system pressure.	mbar									
14	Check electrical wiring for damage.										
15	Check heating programmer settings.										
16	Check appliances that are part of the heating system										

Table 16

8.2 Description of servicing operations

The combustion performance must be checked before and after any servicing work on the combustion and burner components. Refer to section 7.1.

Check “Last fault stored”:

- Select Service Function **.0** (See page 29 “Selecting Service Function”).

There is a list of the fault codes in the Appendix (see page 44.

To delete “Last fault stored”:

- Turn temperature control anti-clockwise as far as the stop.
- Press and hold the button until the display shows **[ ]**.
  The last fault stored has now been deleted.

Checking the ionisation current, Service Function 3.3

- Select Service Function **3.3** (See page 29 “Selecting Service Function”).

If the display shows 2 or 3, the ionisation current is OK. If the display shows 0 or 1, the electrode assembly (32.1, page 6) must be cleaned or replaced.

Domestic hot water

If the flow rate is too slow:

- remove the domestic hot water heat exchanger and replace,
- Before removing the heat exchanger shut the inlet valve and drain the hot water circuit.
- Use new seals when replacing the heat exchanger.

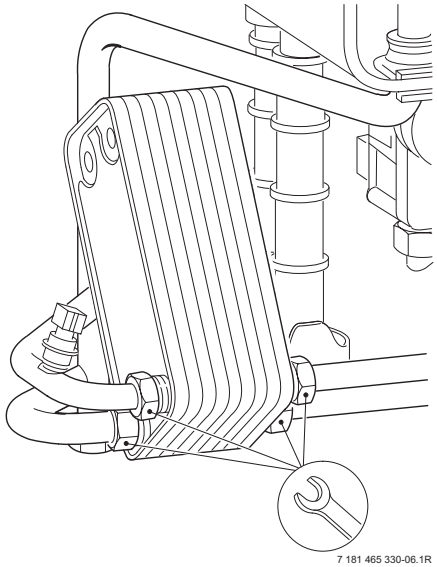


Fig. 51

Primary Heat exchanger

There is a special accessory kit (no. 840) for cleaning the heat exchanger, order no. 7 719 001 996.

- Check control pressure on the air - gas mixer unit at max. rated heat output using an electronic manometer.

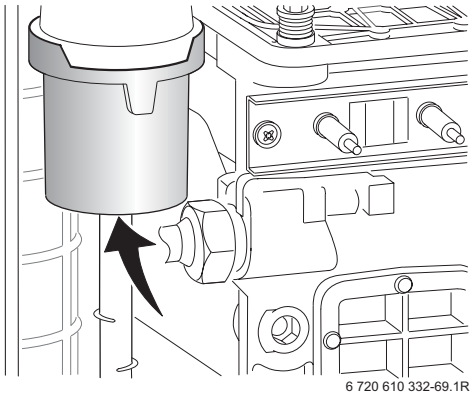


Fig. 52

The heat exchanger should only be cleaned if the control pressure is **5.2 mbar** (depression) or less.

- Remove cleaning access cover (415, page 6) and the metal plate below it, if present. Refer to fig. 2.
- Unscrew condensation trap and place suitable container underneath. Refer to fig. 53.
- Remove the fan and the burner as described in the text headed “Burner” (see page 37).

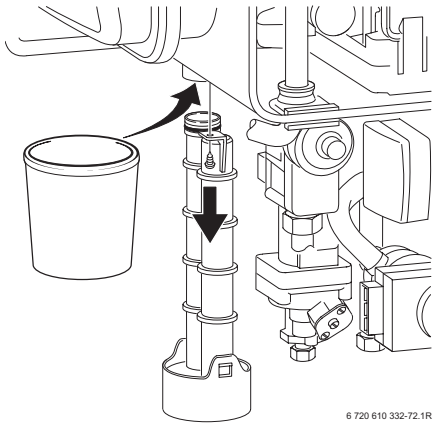


Fig. 53

- Loosen any deposits in the heat exchanger from top to bottom using the cleaning blade. Refer to fig. 54.

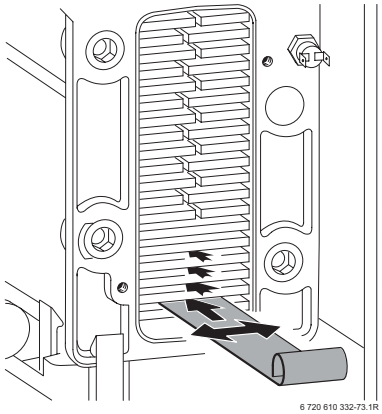


Fig. 54

- Clean the heat exchanger from top to bottom using the brush. Refer to fig. 55.

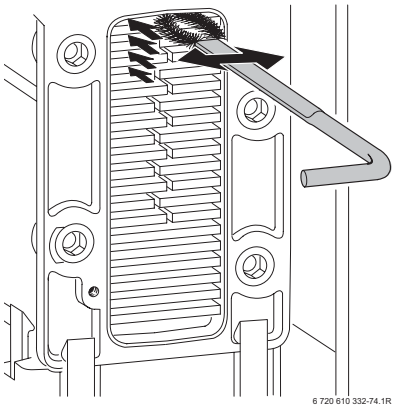


Fig. 55

- Flush the heat exchanger from the top. Refer to fig. 56.
- Clean out the condensate collector and trap connection (with other end of brush).

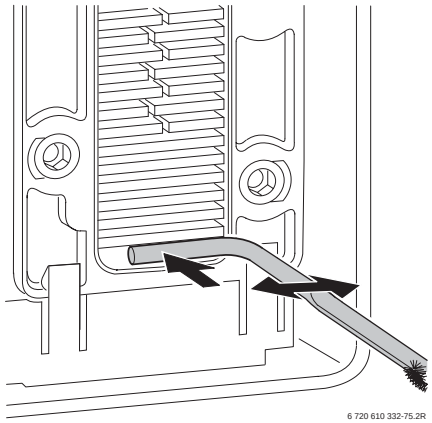


Fig. 56

- Refit the clean-out cover using a new seal and tighten screws to torque of approx. 5 Nm.

Burner

- Check that the gas cock is turned off and the master switch is in the OFF position
- Remove the clips (1) and unscrew the two bolts (2). Refer to fig. 57.
- Unscrew and remove the two hexagon screws securing the fan (3).
- Slacken fully the rear securing bolt (4).
- Remove the burner coverplate.

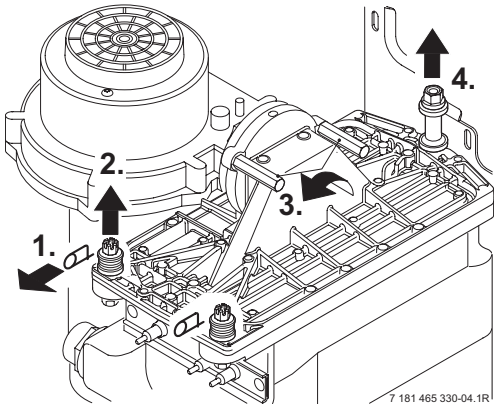


Fig. 57

- Remove the burner skin and clean components. Do not use a wire brush. Refer to fig. 58.

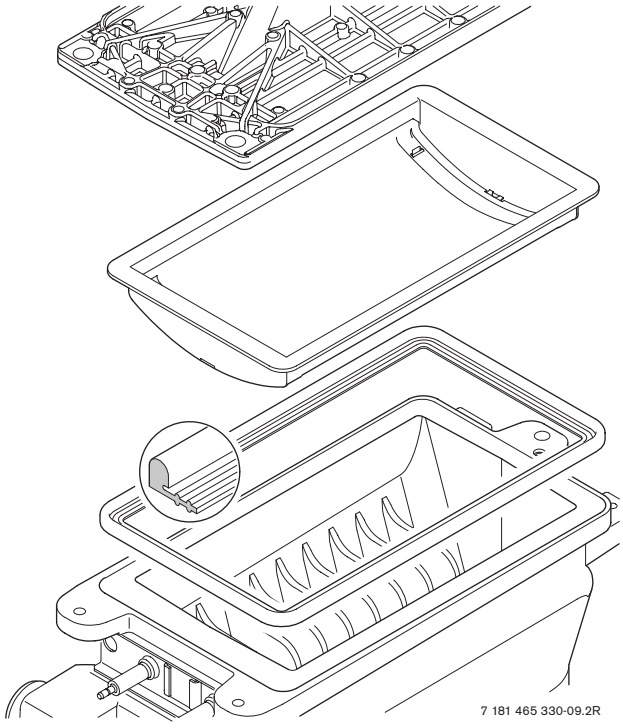


Fig. 58

- Re-assemble burner in reverse order inspect seal for damage and replace if necessary.
- Adjust gas/air ratio. Refer to section 7.2.

Diaphragm in mixer unit

▶ Take care not to damage diaphragm (443) when removing and refitting it.

- ▶ Open mixer unit (29).
- ▶ Carefully withdraw diaphragm (443) from fan intake tube and check for soiling and splits.

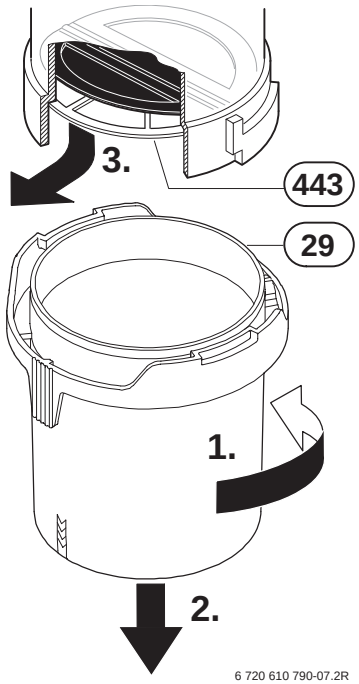


Fig. 59

- ▶ Carefully refit diaphragm (443) the correct way round into the fan intake tube.

The flaps of the diaphragm (443) must open upwards.

- ▶ Seal the mixer unit (29).

Condensation trap

In order to prevent spillage of condensate, the condensation trap should be completely removed, (see page 36, fig. 53).

- ▶ Unscrew condensation trap and check connection to heat exchanger is clear.
- ▶ Remove condensation trap cover and clean.
- ▶ Fill condensation trap with approx. 1/4 l of water and refit.

Electrode assembly

- ▶ Switch off the master switch.
- ▶ Pull off the leads from the electrodes. Refer to fig. 2.
- ▶ Unscrew the two fixing screws and carefully remove the electrode assembly . Refer to fig. 52.
- ▶ Clean the electrodes with a non-metallic brush. (The spark gap should be 4,5 mm ± 0,5 mm.)
- ▶ Replace and re-connect the assembly taking care not to mislay the inspection window.

Siphon

- ▶ Unscrew the clip and disconnect the pipe to the siphon.
- ▶ Remove the drain plug to drain the siphon.
- ▶ Unscrew the securing nut from beneath the side facia and remove the siphon. Refer to figure below.
- ▶ Refit and prime the siphon.

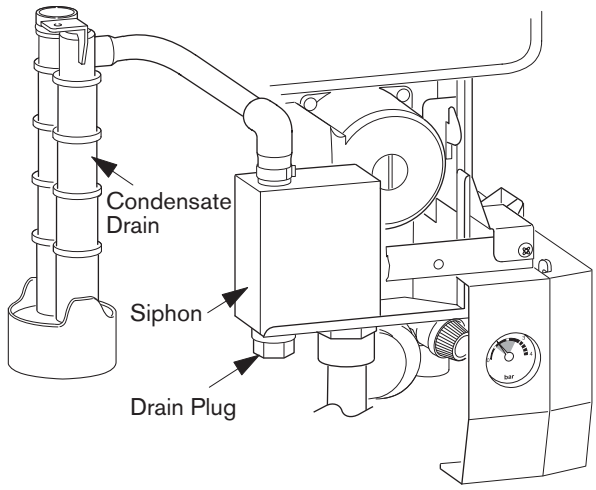


Fig. 60

Expansion vessel

The expansion vessel should be checked once a year.

- ▶ Depressurise appliance.
- ▶ If necessary, adjust expansion vessel charge pressure to static head of the heating system.

Heating system pressure

Fill the system using the WRAS approved filling loop.

- ▶ The pointer on the pressure gauge should be 1 bar.
- ▶ If the pointer is below 1 bar (when the system is cold), water should be added until the pointer is 1 bar again.
- ▶ **Max. pressure** of 2.5 bar when the heating system water is at maximum temperature must not be exceeded. If this pressure is exceeded then an extra expansion vessel must be fitted in the system return as close to the appliance as possible.
- ▶ If the system does not retain the pressure, the expansion vessel and the heating system should be checked for leaks.

Electrical wiring

- Check the electrical wiring for physical damage and replace any damaged wires.

8.3 Replacement of Parts

Before changing any components check that the gas is turned off and that the appliance is electrically isolated. When necessary close the system valves and drain the appliance.

Refitting is a reverse of the procedure for removal using new seals or o-rings as appropriate.

8.3.1 PCB control board and transformer

- Switch off the appliance.
- Disconnect appliance from the power supply.
- Unplug all connectors from the control box (inc. keyed plug). Access is gained by removing the covers. Refer to fig. 25, 26.
- Remove screw holding power connector earth lead and remove earth lead.
- Remove two fixing screws from the control box. Refer to fig. 61.

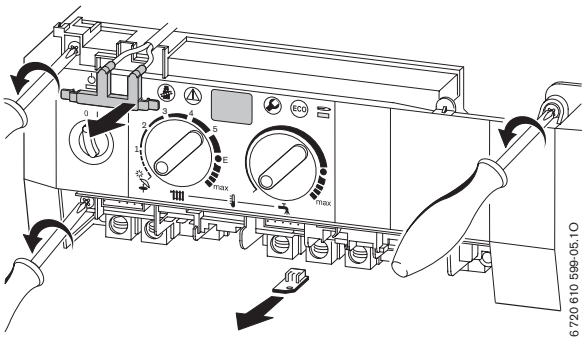


Fig. 61

- Lower the control box.
- Unscrew earth lead.
- Unscrew four fixing screws from cover plate. Refer to fig. 62.
- Prise off cover plate.
- Pull off transformer.
- Remove pcb holder.
- Remove the pcb control board.

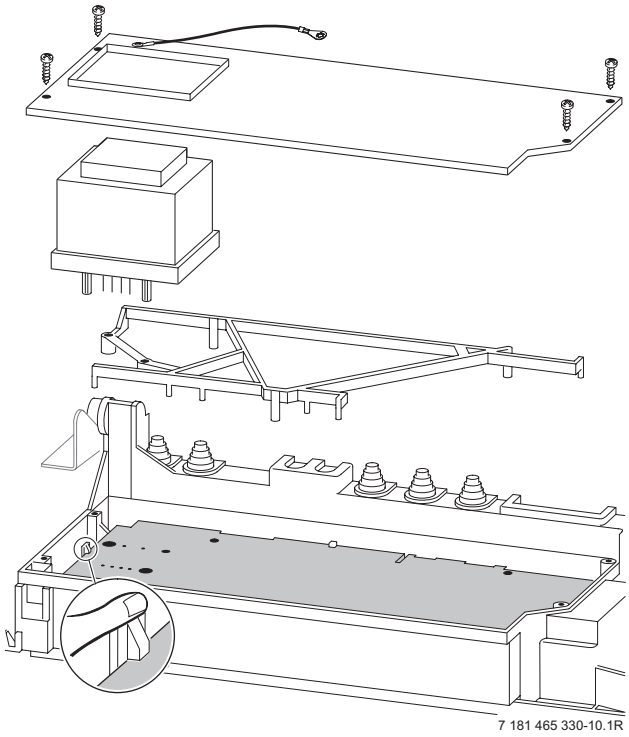


Fig. 62

Fuses

- Remove the connections covers. Refer to fig. 25, 26.

The fuses are located adjacent to the mains connector block and connector ST18. Refer to fig. 4.

Fuse, item 312, is only replaceable by removing the pcb.

Spare fuses are fixed to the connections cover.

A fuse pack is available: Part number 8 744 503 010 0.

8.3.2 Fan Assembly

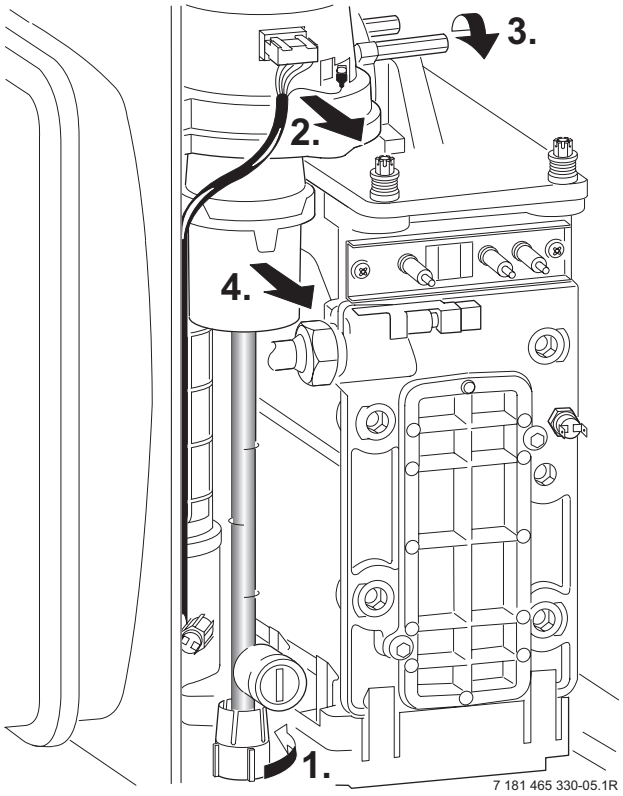


Fig. 63

- Switch off the appliance.
- Disconnect the appliance from the power supply.
- Undo lower pipe union on gas pipe (1.). Refer to fig. 63.
- Remove fan lead and earth connector (2.). The earth connector has a positive clip fixing.
- Remove fixing screws attaching fan to the burner cover (3.).
- Remove fan together with gas pipe and mixer unit.
- Separate the fan from the pipe and mixer unit by twisting the mixer unit to release it (4.).

8.3.3 Pump

- Switch off the appliance.
- Disconnect the appliance from the power supply.
- Remove two switchbox fixing screws (1.). Refer to fig. 64.
- Lower switchbox (2.).
- Unscrew and remove the the siphon by releasing the jubilee clip. Refer to fig. 60.
- Unscrew the pump union nuts (5.). Refer to fig. 64.
- Carefully remove the pump and disconnect the leads.

Alternatively

- After removing the siphon release the four Allen screws and remove and replace the pump head.

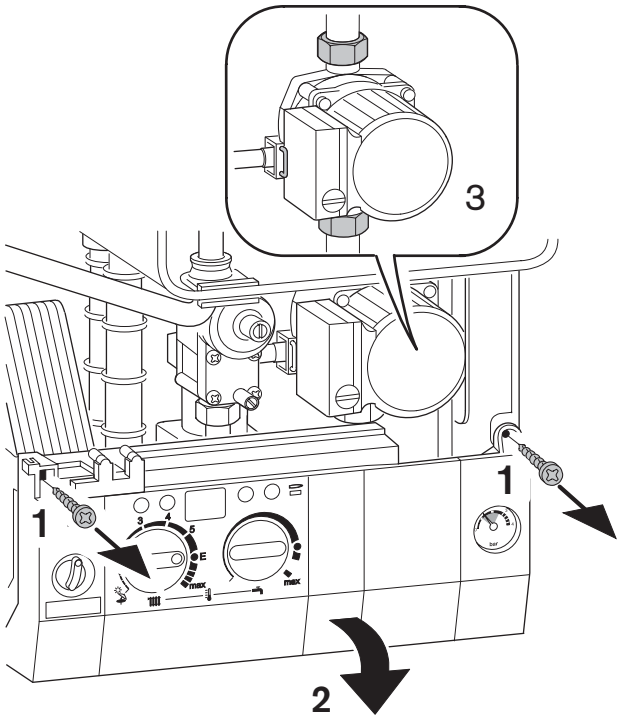


Fig. 64

8.3.4 Diverter valve

- ▶ Switch off the appliance.
- ▶ Disconnect appliance from the power supply.
- ▶ Turn off service cocks.
- ▶ Unplug connector from 3-way valve motor. Refer to fig. 65.
- ▶ Pull out retaining clip.
- ▶ Remove motor.
- ▶ Disconnect the relief valve drain.
- ▶ Disconnect the pressure gauge by withdrawing the clip and pulling out the capillary head.
- ▶ Undo pipe unions by withdrawing the clips.
- ▶ Remove 3-way valve.

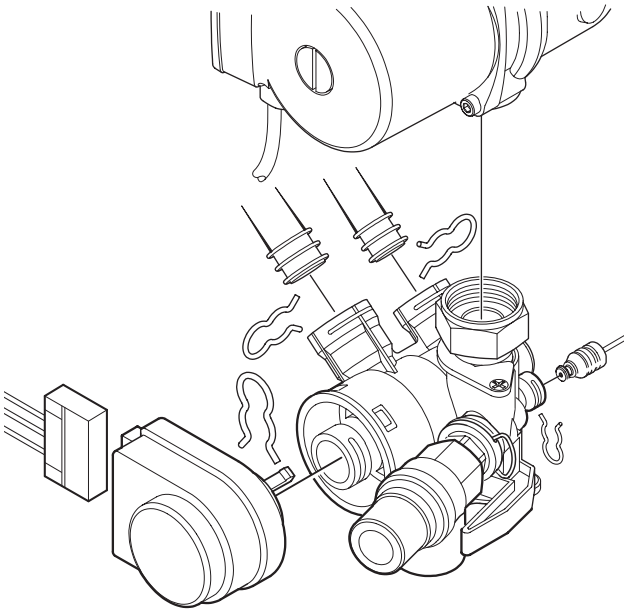


Fig. 65

After refitting:

- ▶ Fill system, bleed and re-pressurise (see Installation Instructions).

8.3.5 Diverter valve motor

- ▶ Switch off the appliance.
- ▶ Turn off the service cocks.
- ▶ Unplug connector from 3-way valve motor. Refer to fig. 65.
- ▶ Pull out retaining clip.
- ▶ Remove motor.

8.3.6 Sensors

- ▶ Check that the appliance is electrically isolated.

Central Heating Flow Temperature Sensor – Item 36, fig. 2, 61

- ▶ Pull-off the connector.
- ▶ Release the sensor clip and withdraw the sensor.
- ▶ Apply heat transfer paste to the replacement sensor.

Safety Temperature Limiter – Item 6, fig. 2, 61

- ▶ Pull-off the connectors.
- ▶ Unscrew the sensor.

Flue Temperature Limiter – Item 9, fig. 2, 61

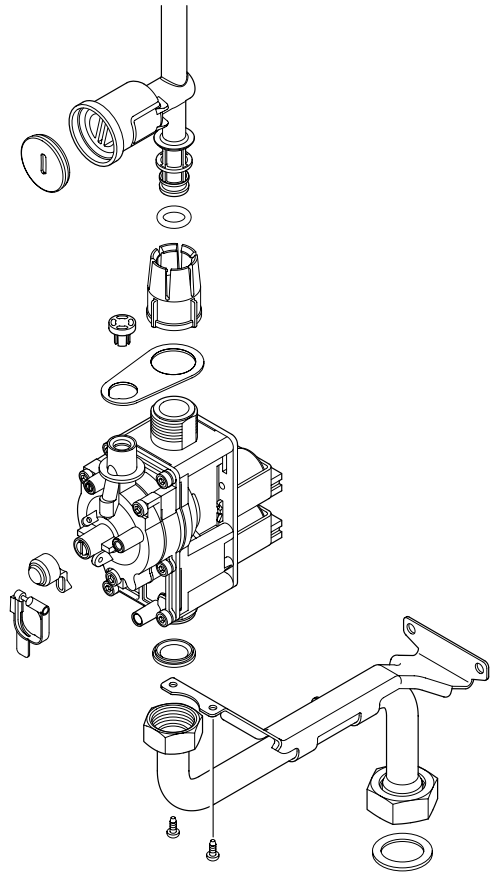
- ▶ Pull-off the connectors.
- ▶ Unscrew the sensor.

Domestic Hot Water Temperature Sensor – Item 6.1, fig. 2

- ▶ Check that the inlet water valve is closed and the domestic hot water circuit is drained.
- ▶ Release and pull-off the connector.
- ▶ Unscrew the sensor.

8.3.7 Gas Valve

- Check that the gas cock is turned off.
- Lower the control panel. Refer to fig. 64.
- Pull off the solenoid connections at the rear of the valve.
- Undo the union, within the inner casing, securing the valve to the gas/air tube. Refer to fig. 63.
- Remove the white plastic cap from the gas valve.
- Release the gas inlet union at the manifold assembly.
- Unscrew the two screws securing the gas valve assembly bracket to the back panel and withdraw the assembly.
- Transfer the bracket and inlet pipe assembly to the new gas valve.
- Check for gas soundness when the new gas valve has been fitted.
- Recheck the combustion performance as described in section 7.1.



6 720 610 602 - 04.1O

Fig. 66

8.3.8 Domestic Hot Water Heat Exchanger

- Refer to section 8.2.
- Use new seals when fitting the new heat exchanger.

8.3.9 Electrode assembly

- Refer to section 8.2.
- Use a new seal if the existing seal is damaged.

8.3.10 Pressure gauge

- Drain the appliance.
- Lower the facia. Refer to fig. 64.
- Twist the pressure gauge head anti-clockwise to release it from the casing. Refer to fig. 2.
- Disconnect the capillary head from the rear of the diverter valve by withdrawing the clip and pulling out the head. Refer to fig. 65.

8.3.11 Expansion vessel

- Drain the appliance.
- Undo the union connection at the base of the vessel. Refer to fig. 2.
- Unscrew the top and bottom fixing screws and remove the vessel.
- Set the pressure of the new vessel to that required by the system.

8.3.12 Pressure Relief Valve

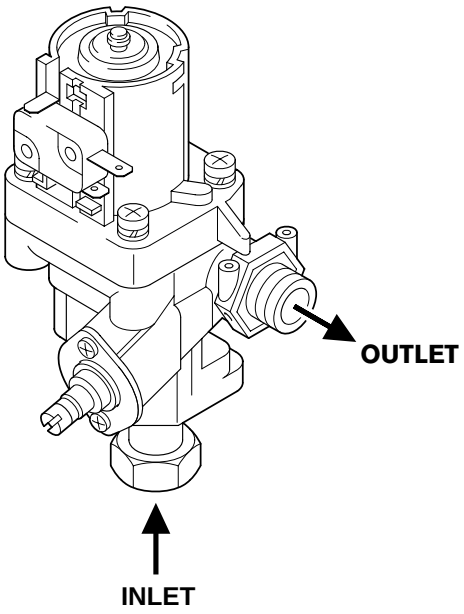
- Drain the appliance.
- Disconnect the drain pipe from the valve. Refer to fig. 30.
- Pull-out the clip securing the valve.
- Pull-out the valve.
- Ensure that the replacement valve is fully entered before fitting the clip.

8.3.13 Burner

- Refer to section 8.2.

8.3.14 Flow switch

- Shut the mains water inlet valve and drain the domestic hot water circuit.
- Pull-off the connectors from the micro-switch.
- Unscrew the inlet and union connection and remove the assembly.
- Reset the domestic hot water flow rate on the new assembly.



6 720 610 602 - 05.10

Fig. 67

8.3.15 Primary Heat Exchanger

- Drain the appliance.
- Check that the gas supply is turned off.
- Check that the appliance is electrically isolated.
- Remove the fan assembly complete with the gas/air tube and mixer assembly. Refer to section 8.3.2.
- Remove the burner. Refer to section 8.2.
- Disconnect the sensors. Refer to section 8.3.6.
- Undo the central heating flow union.
- Undo the top connection of the pump. Refer to fig. 64.
- Undo the grey plastic cap, next to the top pump connection at the base of the heat exchanger.
- Unscrew and remove the condensate trap. Refer to section 8.2.
- Unscrew and remove the two screws securing the heat exchanger top bracket to the rear panel.
- Lift up the flue duct, item 271, refer to fig. 2.
- Pull forward from the top and lift the heat exchanger from the casing.
- Transfer components, as necessary, to the new heat exchanger.
- Ensure that all the seals are in place and all of the connections are tight before re-commissioning the appliance.

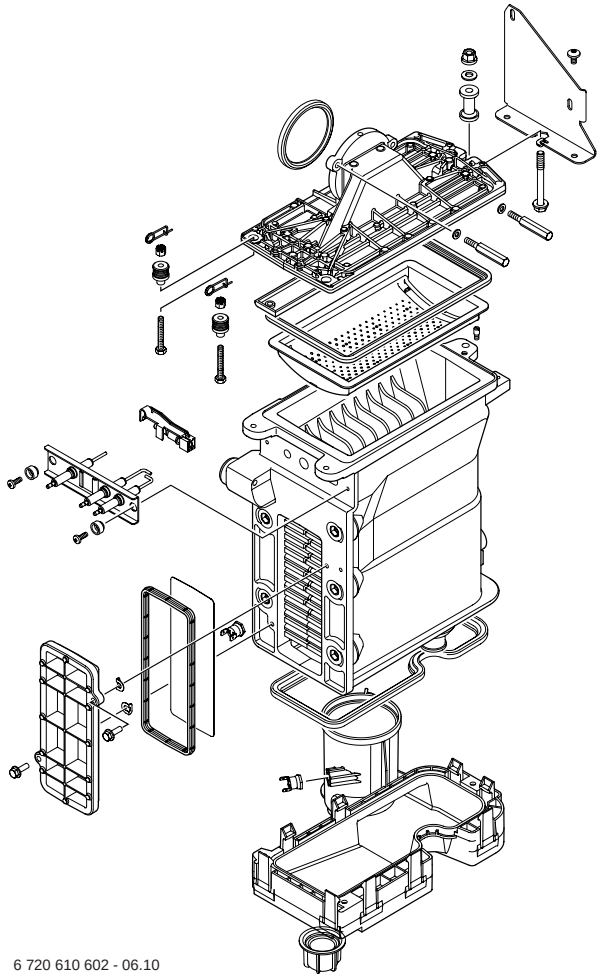


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Fig. 68

9 Appendix

9.1 Fault Codes

More detailed fault finding procedures are described in the Service booklet for the Engineer number 7 181 465 346.

Display code	Description	Remedy
A7	Hot water NTC sensor defective.	Check hot water NTC sensor and connecting lead for circuit breaks/short circuits.
A8	Break in communication	Check connecting lead to programmer
AC	Module not detected.	Check connecting lead between TA211E/TR212E and Heatronic
b1	Code plug not detected.	Insert code plug correctly, test and replace if necessary.
C1	Fan speed too low.	Check fan lead and connector, and fan; replace as necessary.
d3	Jumper 8-9 not detected.	Connector not connected, link missing, underfloor heating limiter tripped.
E2	CH flow NTC sensor defective	Check CH flow NTC sensor and connecting lead.
E9	Safety temp. limiter in CH flow has tripped.	Check system pressure, check safety temp. limiters, check pump operation, check fuse on pcb, bleed appliance.
EA	Flame not detected.	Is gas cock turned on? Check gas supply pressure, power supply, igniter electrode and lead, ionisation sensing electrode and lead, flue duct and CO2 level.
F0	Internal error.	Check electrical connector contacts, programmer interface module ignition leads are not loose; replace pcb if necessary.
F7	Flame detected even though appliance switched off.	Check electrode assembly, dry pcb. Flue clear?
FA	Flame detected after gas shut off.	Check gas valve and wiring to gas valve. Clean condensation trap and check electrode assembly. Flue clear?
Fd	Reset button pressed by mistake.	Press reset button again
P1, P2, P3, P1...	Please wait, initialisation in progress.	24 V fuse blown. Replace fuse.

Table 17

9.2 Short parts list

Key	Description	Qty GC	Spare part number
1	Sensor - Flue gas temp.	1	8 722 963 858 0
2	Sensor - CH flow temp.	1	8 714 500 087 0
3	Sensor - DHW flow temp.	1	8 714 500 054 0
4	Control board	1	8 748 300 495 0
5	Gas valve	1	8 747 003 508 0
6	Fan assembly	1	8 717 204 373 0
7	Fan washer	1	8 729 000 183 0
8	Expansion vessel	1	8 715 407 236 0
9	Relief valve	1	8 717 401 012 0
10	Electrode assembly	1	8 718 107 077 0
11	Electrode lead	1	8 714 401 999 0
12	Pump	1	8 717 204 384 0
13	Pressure gauge	1	8 717 208 079 0
14	Burner skin seal	1	8 711 004 168 0
15	Transformer - facia	1	8 747 201 358 0
16	Flow switch	1	8 717 002 110 0
17	3-way diverter valve	1	8 717 010 062 0
18	Heat exchanger washer	1	8 710 103 153 0
19	Washer set Condensation Trap	1	8 710 103 154 0
20	Fuse set	1	8 744 503 010 0
21	Service set Water Valve	1	8 710 503 031 0
22	Domestic Hot Water Heat Exchanger	1	8 715 406 659 0
23	Primary heat exchanger	1	8 715 406 615 0

Table 18

9.3 Heating/hot water output settings (N.G)

Display code	Natural gas G20		
	Heat output kW	Heat input kW	Gas vol. flow rate (l/min at t_V/t_R = 80/60°C)
30	8.8	8.9	15.5
40	11.7	11.8	20.7
50	14.6	14.8	25.8
60	17.5	17.7	31.0
70	20.4	20.7	36.1
80	23.4	23.6	41.3
90	26.3	26.6	46.5
100	29.2	29.5	51.6

Table 19

9.4 Heating/hot water output settings (L.P.G)

Display code	Propane	
	Heat output kW	Heat input kW
40	11.7	11.8
50	14.6	14.8
60	17.5	17.7
70	20.4	20.7
80	23.4	23.6
90	26.3	26.6
100	29.2	29.5

Table 20

9.5 Operational Flow diagrams

9.5.1 Domestic hot water function

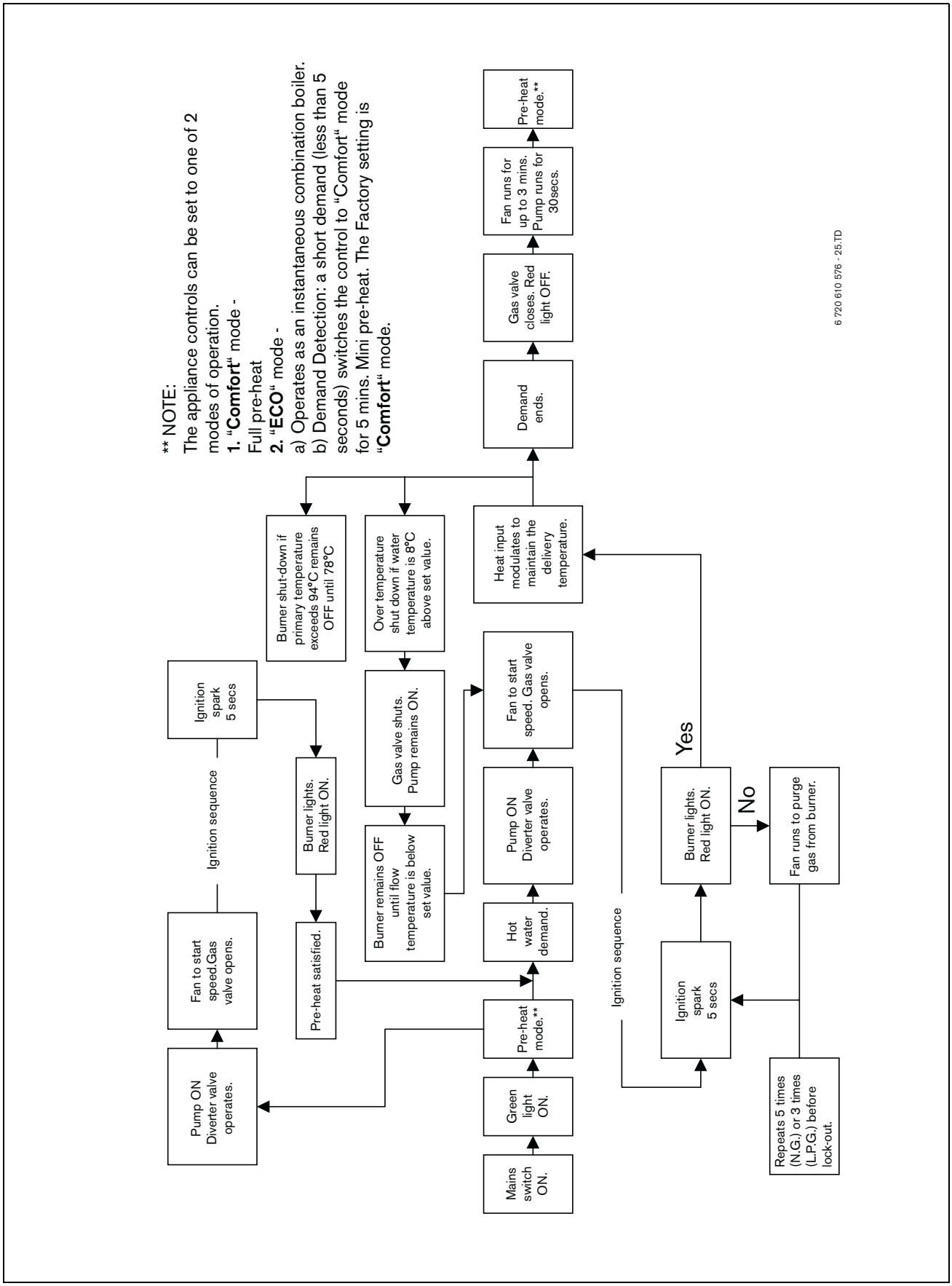


Fig. 69

9.5.2 Central heating function

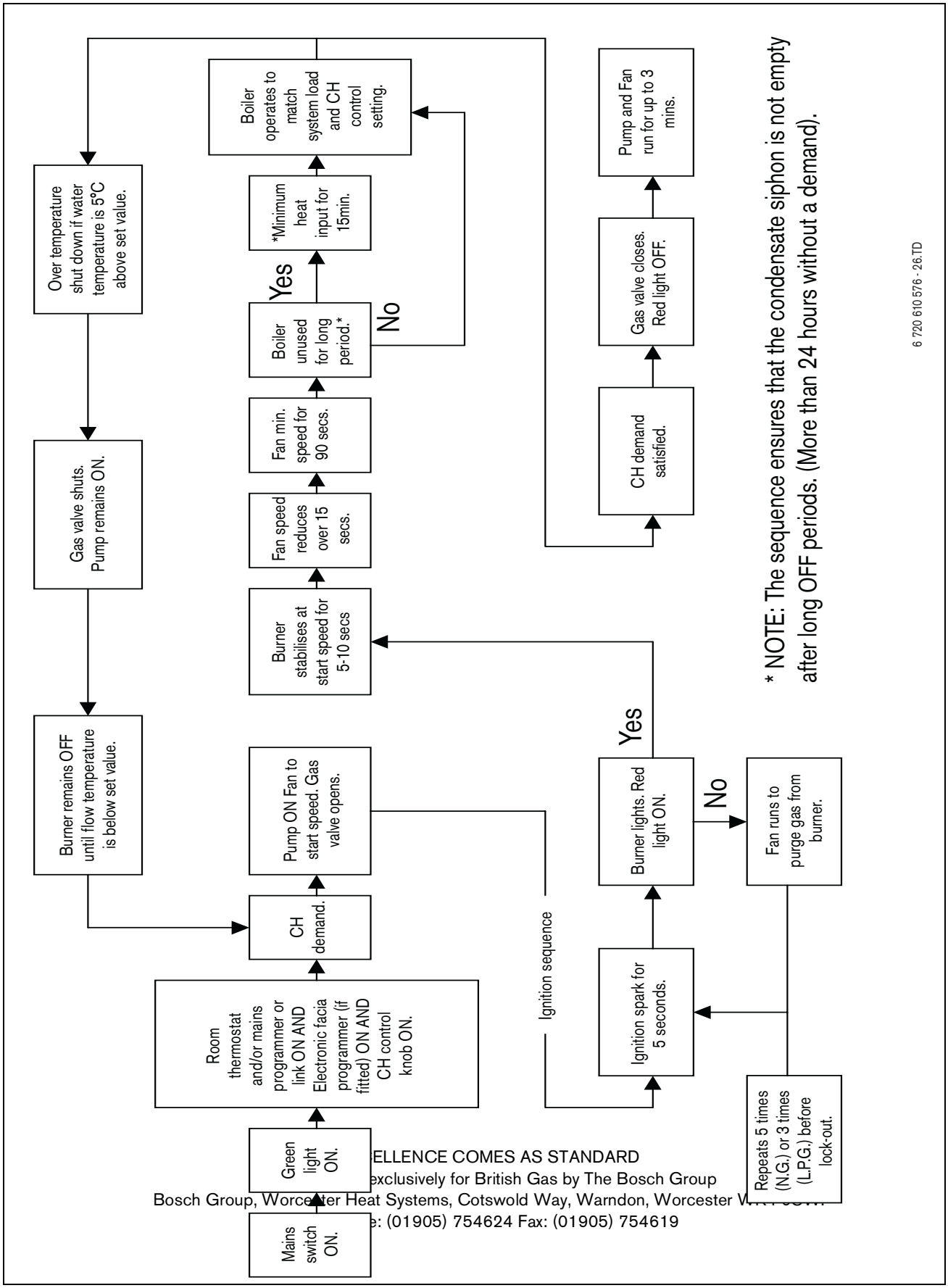


Fig. 70

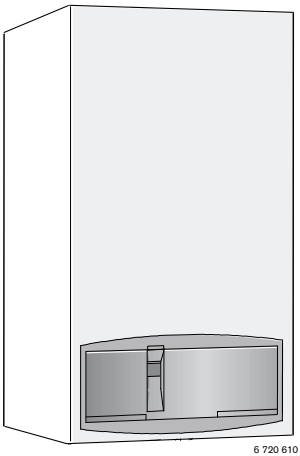
EXCELLENCE COMES AS STANDARD

Manufactured exclusively for British Gas by The Bosch Group
Bosch Group, Worcester Heat Systems, Cotswold Way, Warndon, Worcester WR4 9SW.
Telephone: (01905) 754624 Fax: (01905) 754619

Users Instructions and Customer Care Guide

RD 532 Condensing boiler

RD 428 Condensing boiler



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ZWB 7-32 RD 532 GC-Number: 41 108 13
ZB 7-28 RD 428 GC-Number: 41 108 07

benchmark

6 720 610 600 GB (03.06) OSW

British Gas

Scottish Gas

Contents

Excellence comes as standard

Thank you for purchasing an RD 532/RD 428 condensing appliance.
The RD 532/RD 428 Series has been developed by the Bosch Group and the strictest quality control standards are demanded throughout every stage of production.
Indeed, the Bosch Group have led the field in innovative appliance design and performance for many years.
The result is that your new RD 532/RD 428 appliance offers you the very best of everything – quality, efficiency, economical running costs, proven reliability and value for money.
What's more, you also have the assurance of our no nonsense 2 year parts and labour guarantee.
And it's backed up by British Gas - Offering a complete maintenance scheme to keep your boiler operating at peak condition and efficiency.
No wonder that more and more people are agreeing that when it is gas, it has to be a British Gas/Scottish Gas Condensing appliance.

Benchmark

The "Benchmark" initiative is the new code of practice to encourage the correct installation, commissioning and servicing of domestic central heating boilers and system equipment.

The "log-book" is a vital document that must be completed by the installer at the time of installation. It confirms that the boiler has been installed and commissioned according to the manufacturers instructions.

Without the completion of the "log-book", manufacturers may refuse to respond to a call–out from a householder, who will be advised that he or she must call back the installer, who has not fulfilled his obligations to record the information required by the initiative.

Safety precautions

Gas Safety (Installation and Use) Regulations 1998

It is the law that all gas appliances are installed by a competent person in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your interest, and that of safety, to ensure compliance with the law.

If you smell gas:

- Turn off gas service cock at the meter.
- Open all doors and windows.
- Do not operate any electrical switches.
- Do not smoke.
- Extinguish any naked flames.
- Call your gas company.

If you smell fumes from the appliance:

- Switch off appliance.
- Open windows and doors.
- Inform your heating engineer.

Fitting and modifications

- Fitting of the appliance or any modifications to the appliance may only be carried out by a competent person.
- Flue systems must not be modified in any way.

Maintenance

- We **recommend that you** take out a maintenance contract with a competent installer and have the appliance serviced at regular intervals.
- Ensure that your Service Engineer uses only genuine spare parts!

Combustible materials

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

Health and safety

- This appliance contains no asbestos products.
- There is no potential hazard due to the appliance being electrically unsafe.
- There are no substances used in the construction that are a potential hazard in relation to the COSHH Regulations (Control of Substances Hazardous to Health Regulations 1988).

Combustion Air/Ambient Air

- Keep combustion air/ambient air free of corrosive substances (e.g. halogenated hydrocarbons which contain chlorine or fluorine compounds). In this way corrosion can be prevented.

1 General notes

To get the best from your appliance please read these instructions carefully.

Sealed heating systems

The appliance is fitted to a sealed heating system which is prepressurised. Your installer will tell you of the minimum and maximum pressure which must be indicated on the pressure gauge.

Check regularly that the pressure is maintained and contact your installer or maintenance engineer if there is a permanent significant drop in the pressure. If the system loses pressure it should be repressurised and the cause of the fall investigated.

Central heating systems

During the first few hours of operation of the central heating system, check that all radiators are being heated at an even rate. If the top of a radiator is at a lower temperature than the bottom then it should be vented by releasing air through the venting screw at the top of the radiator. Ask your installer to show you how this is done.

Repeated venting will reduce the quantity of water in the system and this must be replenished for safe and satisfactory operation of the appliance.

Should water leaks be found in the system or excessive venting is required then a service engineer must be contacted to inspect the installation and rectify any fault.

Only additives that are compatible with aluminium may be used in the system. Any incompatible additive used will invalidate the guarantee.

Condensate drain

This is a condensing appliance and the terminal will, at times, give out a plume of water vapour. This is quite normal.

The appliance produces quantities of condense which is discharged regularly through the siphon.

Clearances

Your installer will have provided adequate space around the appliance for safety and servicing access. Do not restrict this space with the addition of cupboards, shelves etc. next to the appliance.

Left-hand side	5 mm
Right-hand side	5 mm
In Front	600 mm
Above Casing (Vert. Flue)	75 mm
Above Flue Turret	30 mm
Below	200 mm

Table 1

Room thermostat

A room thermostat may be fitted to control the central heating. Refer to the instructions supplied with the thermostat for information on siting and setting. A programmable thermostat may also be used with this appliance to provide additional timed control of the central heating.

Thermostatic radiator valves

It is recommended that this type of valve is fitted to all the radiators except one, usually radiator where the room thermostat is fitted. They should conform to the requirements of BS2767:10.

Showers, bidets, taps and mixing valves – RD 532 Boilers

Standard hot and cold taps and mixing valves must be suitable for operating at mains pressure. Thermostatically controlled or pressure equalising shower valves will guard against the flow of water at too high a temperature.

Hot and cold mains fed water can be supplied directly to an over-rim flushing bidet subject to local water company requirements.

With all mains fed systems the flow of water from individual taps will vary with the number of outlets operated simultaneously and the cold water mains supply pressure to the property.
Flow balancing using “ball-o-fix” type valves is recommended to avoid an excessive reduction in flow to individual outlets.

For further information contact British Gas Technical Services Department.

Hot and cold flow – RD 532 Boilers

The flow of water demanded from both hot and cold service outlets is dependent upon the mains supply, it may not be possible in some installations to operate all outlets simultaneously.

Water mains failure – RD 532 Boilers

If there is a failure of the mains water supply then no water will be available at a tap or shower until the mains supply is restored. The appliance will still operate in the central heating mode.

Use in hard water areas – RD 532 Boilers

In exceptionally hard water areas a device to prevent scale formation may be fitted. Installation of a scale inhibitor assembly should be in accordance with the requirements of the local water company. An isolating valve should be fitted to allow for servicing.

Alternatively the maximum temperature of the domestic hot water may be reset to about 45 °C which will reduce the risk of scale formation in these hard water areas.

Ventilation

This is a room sealed appliance and does not require any air for combustion from inside the house. If the appliance is fitted into a cupboard or a compartment is built around the appliance after installation then the compartment must be separated from the boiler space by a perforated non-combustible partition as described in BS6798.

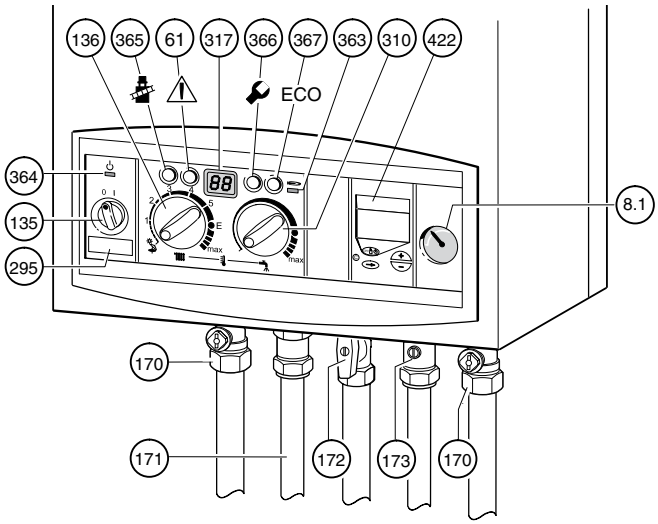
Notwithstanding the requirements of BS6798, there is no need for ventilation openings to be provided in the compartment because of the low heat loss from the casing.

Do not allow the flue terminal fitted on the outside wall to become obstructed or damaged.

Pump

The pump will have been set by the manufacturer and must not be manually re-adjusted.

2 Controls



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8.1 System Pressure gauge
61 Reset button
135 Master switch
136 Central heating temperature control
170 Service valves in CH flow and return
171 Hot water
172 Gas isolation valve (open)
173 Cold water inlet
295 Identification sticker
310 Hot water temperature control (RD 532)
317 Display
363 Indicator lamp for “burner on”
364 Indicator lamp for “off/on”
365 “Chimney sweep” button
366 Service button
367 “ECO” button
422 Optional timer

3 Operating the Appliance

3.1 Preparation

Turn on the gas cock (172).

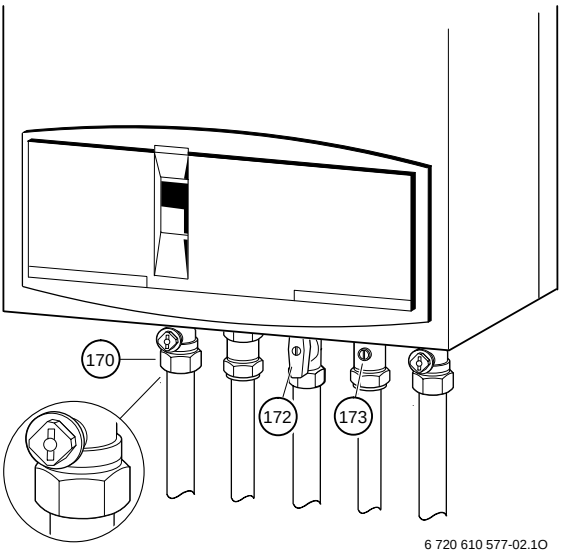
- Press in the handle and turn it anti-clockwise as far as the stop (when handle is in line with direction of flow, the cock is open).

Central heating system valves (170)

- Using a spanner, turn square nut until groove is in line with direction of flow (see detail).
  Groove at right angles to direction of flow = off.

Cold water inlet valve (173)

- Turn handle so that it is in line with direction of flow.
  When handle is at right angles to direction of flow, the valve is closed.



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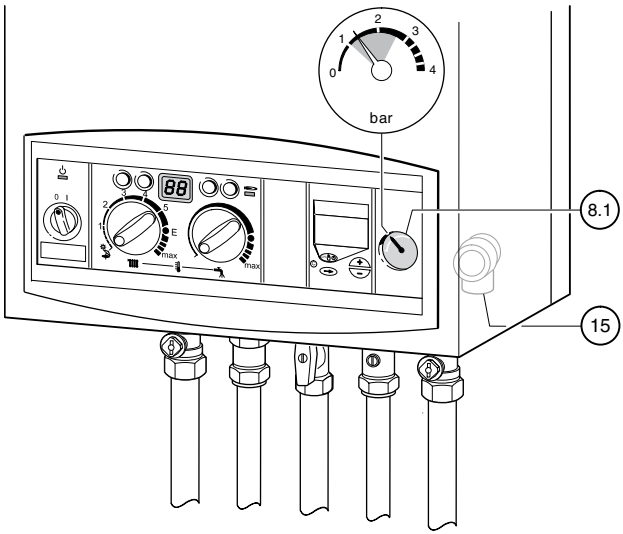
Check the central heating system pressure

- The pointer on the pressure gauge (8.1) should be about 1 bar.
- If the pointer is below 1 bar (when the system is cold), top up the system with water until the pointer is 1 bar. Your installer will have shown you how to do this.

- The **maximum operating pressure** of 2.5 bar at maximum central heating flow temperature must not be exceeded. If the pressure increases to 3 bar then the relief valve (15) opens.



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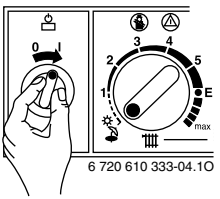
3.2 Switching the Appliance On/Off

Switching on

- Switch on the appliance at the master switch (**I**).
  The indicator lamp shows green and the display will show the central heating flow temperature, when the appliance is operating in the central heating mode.



If the display alternates between

-II-

and the central heating flow temperature, the trap filling programme is active.

The trap filling programme ensures that the condensation trap is filled after the appliance has been installed or after the appliance has been out of use for a long period. For that reason, the appliance remains at minimum heating output for 15 minutes.

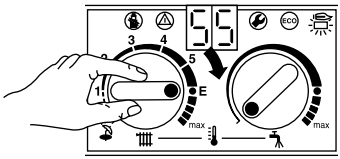
Switching off

- Switch off the appliance at the master switch (**0**).
  The green indicator lamp goes out. The optional timer will continue running until the emergency supply is exhausted.

3.3 Switching on the Central Heating

- Turn the central heating temperature control to the desired level:
  - "**Min**" setting: 35°C
  - Low-temperature heating: setting **"E"** (approx. 75°C)
  - "**Max**" setting: 88°C

  When the burner is lit, the **red** indicator lamp is illuminated.



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3.4 Controlling Central Heating

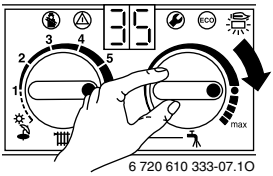
- Set room thermostat to the desired room temperature.
- Set room temperature controller unit, if fitted. Refer to the instructions with the control.
- Set the thermostatic radiator valves to the desired settings.

3.5 RD 532 Boilers: Setting the Hot Water Temperature

Hot water temperature

On RD 532 models, the hot water temperature can be set to between approx. 40°C and 60°C using the temperature control .

The domestic hot water temperature is not shown on the display.



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Control Setting	Water Temperature
Anti-clockwise limit	approx. 40°C
●	approx. 55°C
Clockwise limit	approx. 60°C

Table 2

“ECO” button

By pressing and holding the “ECO” button (ECO), until the display lights, you can switch between **Comfort mode** and **Economy mode**.

Comfort mode: button is not lit (factory setting)

The appliance is held constantly at the set temperature. This means that hot water is available almost instantaneously at the tap. Consequently the appliance will switch on at intervals, even if no hot water is being drawn.

ECO mode with demand detection, button is lit

The demand detection function enables maximum gas and water economy.
Briefly turning a hot water tap on and then off again signals demand to the appliance which then heats up the water to the set temperature.
Hot water is thus available in about 1 minute.

ECO mode, button is lit

Water is not heated up until hot water is drawn. This means that there is a longer waiting period before hot water is available.

3.6 Summer Mode, Hot Water Only (RD 532 Appliances)

With room thermostat

- Turn temperature control on the appliance anti-clockwise as far as the stop.
  The central heating is now turned off. The hot water function and the mains power supply for the heating programmer and timer remain switched on.

3.7 Frost protection (RD 532 Appliances)

▶ Leave master switch switched on.

If the appliance is to be left for long periods switch the central heating off:

▶ Add a suitable anti-freeze fluid to the water in the central heating system.
Suitable products are available from Betz-Dearborn Tel.: 0151 4209563, Fernox Tel.: 01799 550811 and Salamander on 0121 378 0952.

3.8 Fault Condition

In the unlikely event of a fault occuring while the appliance is in operation:

The display then shows a fault code and the button ⚠ may also flash.

If the button ⚠ flashes:

▶ Press and hold the button ⚠ until the display shows "– –". The appliance will then start up again and the display will show the central heating flow temperature.

If the button ⚠ does not flash:

▶ Switch the appliance off and then on again at the master switch.
The appliance will start up again and the central heating flow temperature will be displayed.

If the fault remains and can not be cleared:

▶ Call British Gas for assistance, giving a description of the fault and, if possible, the fault code from the facia display.

4 Tips on saving energy

Heating economically

The boiler is designed to provide a high level of comfort while keeping gas consumption and the resulting environmental effect as low as possible. The gas supply to the burner is con-trolled according to the level of demand for heat. The boiler con-tinues to operate with a low flame if the demand for heat reduces. The technical term for this process is modulating control. Modulating control keeps temperature fluctuations small and provides even distribution of heat throughout the home. This means that the boiler may stay on for relatively long periods but will use less gas than an appliance that continually switches on and off.

Central heating systems with room thermostats/thermostatic radiator valves

The central heating control on the boiler should be set to the maximum rated temperature of the central heating system or to position "**E**", when the maximum central heating water temperature obtained is 75°C.
The temperature can be set individually in each room (except primary room with the room thermostat) using the thermostatic radiator valves. If you wish to have a lower temperature in the primary room than in the other rooms, leave the room thermostat at the set temperature and turn down the radiator using the radiator valve.

Reduced-output operation

Considerable fuel savings can be made by slightly reducing the room temperature. Lowering the temperature by 1 °C can bring about energy savings of up to 5 %. However, it is not advisable to allow the room temperature to fall below +15 °C. The room temperature for reduced-output mode can be set separately on the room thermostat. Instructions are given in the control unit operating instructions.

Hot water

A lower setting on the hot water temperature control can result in considerable energy savings.

For RD 532 appliances:
The **on-demand activation** using the ECO-button makes possible the maximum savings of gas and water.

Now you know how to heat your home economically with the RD 532/RD 428 gas condensing boiler. If you have any other questions, please contact your installer – or write to us.

5 General Information

Cleaning the Outer Case

Wipe down the outer case with a damp cloth. Do not use abrasive or caustic cleaning agents.

Appliance details

If you ever need to call Customer Service it helps us a great deal if you can provide precise details of your appliance.

The information is printed on the appliance identification plate/ sticker (see page 10, item 295).

Your installer will have completed the Benchmark “log-book” giving details of the boiler together with name, address and registration number. Have the “log-book” to hand when calling a Service Engineer.

6 Maintaining your appliance

Your new RD 532/RD 428 gas-fired appliance represents a long-term investment in a reliable, high quality product.

In order to realise its maximum working life, and to ensure it continues to operate at peak efficiency and performance, it is essential that your boiler receives regular, competent servicing and maintenance checks beyond the initial 2 year guarantee period.

To arrange for a British Gas three star cover agreement please call 0845 9 60 50 40.

7 Service

If your RD 532/RD 428 appliance should fail to operate correctly or requires servicing please call British Gas on:
0845 9 60 50 40.

8 Fault or breakdown

This product is supported in the UK by Worcester Heat Systems Ltd. – part of the Bosch Group.

A specialist factory trained field SERVICE ENGINEER is available to attend a breakdown or manufacturing fault occuring on this appliance.

No charge will be made for parts and/or labour providing:

- An appliance fault is found and the appliance has been installed within the past 24 months. Reasonable evidence of this must be supplied on request.

A call-out charge will be made where:

- The appliance has been installed for over 24 months.
  OR
- Our Field Service Engineer finds no fault with the appliance (see **NOTE**).
  OR
- The cause of breakdown is misuse or with other parts of your plumbing/heating system, or with equipment not supplied by Worcester.

NOTE: No appliance fault is found on over 30 % of all service call outs.

If in doubt contact our British Gas on 0845 9 60 50 40.

IN THE EVENT OF AN APPLIANCE FAULT OR BREAK-DOWN please contact your Service Centre (see over). Your service administrator will arrange for an engineer to call with the minimum of delay; under normal circumstances this will be within the period 1-3 working days (excluding weekends) for priority breakdown situations (no hot water and/or heating service).

INVOICES FOR ATTENDANCE AND REPAIR WORK CARRIED OUT ON THIS APPLIANCE BY ANY THIRD PARTY WILL NOT BE ACCEPTED.

9 Your guarantee

This appliance is guaranteed against faulty material or workmanship for a period of 24 calendar months from the date of installation subject to the following conditions and exceptions.

- That during the currency of this guarantee any components of the unit which are proved to be faulty or defective in manufacture will be exchanged or repaired free of material charges and free of labour charges by Worcester Heat Systems Limited.
- That the householder may be asked to prove the date of installation, that the appliance was correctly commissioned and, where appropriate, the first 2 year service has been carried out to the satisfaction of Worcester Heat Systems Limited when requested.
- That any product or part thereof returned for servicing under the guarantee any components of the unit which are proved to be faulty guarantee must be accompanied by a claim stating the Model, Serial Number, Date of Installation.
- That Worcester Heat Systems Limited will not accept responsibility for damage caused by faulty installation, neglect, misuse or accidental damage, the non observance of the instructions contained in the Installation and Users Instructions Leaflets.
- That the appliance has been used only for normal domestic purposes for which it was designed.
- That this guarantee applies only to equipment purchased and used in Great Britain.

This guarantee is given in addition to all your normal statutory rights.

10 Guarantee registration

You should complete and return the postpaid Guarantee Registration Card within 14 days of purchase.

The card will register you as the owner of your new RD 532/RD 428 appliance and will assist us in maintaining an effective and efficient customer service by establishing a reference and permanent record for your boiler.

This will not affect your statutory rights in any way.

Important:

For your own record:

Model

.....

Serial number:.....

(See identity label inside appliance casing)

Type/size:.....

Date of installation:.....

Check that the Benchmark "log-book" has been completed by your installer or service engineer.

EXCELLENCE COMES AS STANDARD

Manufactured exclusively for British Gas by The Bosch Group

Bosch Group, Worcester Heat Systems, Cotswold Way, Warndon, Worcester WR4 9SW.

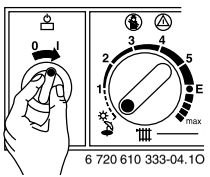
Telephone: (01905) 754624 Fax: (01905) 754619

SERIAL NUMBER. Copy the number off the Guarantee Card.

Notice

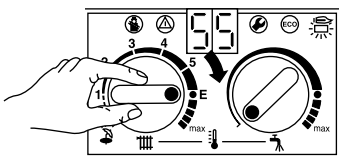
11 Operating Instructions Quick Reference

Switching on



6 720 610 333-04.1O

Switching the central heating on

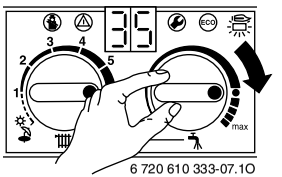


6 720 610 333-05.1O

Controlling the central heating

Set room thermostat to desired temperature or the outside-temperature control unit to the appropriate setting.

Hot water temperature

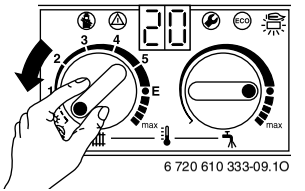


6 720 610 333-07.1O

"**ECO**"-button **lit** –
Economy mode.

"**ECO**"-button **not lit** –
Comfort mode

Hot water only

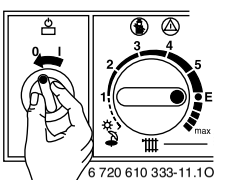


6 720 610 333-09.1O

Fault Condition

If the ⚠ button flashes, press and hold-in to reset the appliance. Refer to page 18.

Switching off



6 720 610 333-11.1O

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