

For the heating engineer

Instructions and maintenance instructions
ecoTEC plus 937



Gas fired wall hung high efficiency boiler
with layered storage tank

VUI

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1 Introduction

1.1 Notes on the documentation

The following information is intended to help you throughout the entire documentation. Further documents apply in combination with this installation and maintenance manual. We accept no liability for any damage caused by failure to observe these instructions.

1.1.1 Documents also having validity

The following additional documents form part of the scope of supply of the unit:

For the owner of the system:

Operating manual	No. 0020031573
Short-form instructions	No. 0020040000
Guarantee card with return envelope	No. 802922

For the heating engineer:

Installation manual for flue accessories	No. 834449
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The manuals for any accessories and controllers used also apply.


1.1.2 Storage of the documents

Please pass this installation manual on to the owner of the system. The owner of the installation must store the manuals in such a way that they are available if required.

1.1.3 Safety instructions and symbols


Observe the safety instructions in this installation instruction manual!

The symbols used in the manual are explained below:

 **Danger!**
Immediate risk of serious injury or death!

 **Danger!**
Danger of death by electric shock!

 **Danger!**
Danger of burning and scalding!

 **Caution!**
Potentially dangerous situation for the product and environment!

 **Note**
Useful information and instructions.

- Symbol for a necessary task
- Is located in front of a list of function descriptions or a general list.



Note

Installation and maintenance of the unit may only be undertaken by a heating engineer in accordance with "Gas Safety (Installation and Use) Regulations 1998".
In the UK this work is carried out by a "CORGI" registered installation company in accordance with the Safety and Quality Standards.

1.2 Validity of the manual

This installation manual applies exclusively to the unit with the following part number:
- 0010003809

The part number of the unit can be obtained from the identification plate.

1.3 General notes

The ecoTEC plus 937 is designed for use in a closed central heating system and is comprehensively tested in the factory. The ecoTEC plus 937 is supplied fitted with a circulation pump, an expansion vessel, a diverter valve and a 15 l layered storage tank. The shift load storage tank and combination boiler can be easily mounted on an internal wall and installed with a vertical or horizontal RSF (room sealed fan assisted flue).

The combination boilers operate with a standard flue gas system (outside diameter 100 or 125 mm). To increase the flexibility of the system, extensions and additional right-angle and leg extensions are available. If required, an inhibitor can be used in the system. Instructions for the use of these inhibitors can be found in their instructions.

All combination boilers are equipped with an internal diagnostic system which provides information concerning the operating status of the combination boiler. This diagnostic system provides important information to support commissioning and troubleshooting.

1.4 Intended use

The ecoTEC plus 937 is a state-of-the-art appliance which has been constructed in accordance with recognised safety regulations. Nevertheless, there is still a risk of injury or death to the user or others or of damage to the equipment and other property in the event of improper use or use for which they are not intended. The appliance is designed to generate heat for closed hot water central heating systems and for instantaneous hot water supply. Any other use or extended use is considered to be improper.

The manufacturer or supplier is not liable for any resulting damage. The user alone bears the risk.

The unit is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and/or knowledge, unless they have been given supervision or instruction concerning use of the unit by a person responsible for their safety. Children must be watched to ensure that they do not play with the unit.

Intended use includes the observance of the operating and installation manual and the adherence to the inspection and maintenance conditions.



Danger!
Danger to persons and/or material damage!
Any improper use is forbidden.

The appliances must be installed by a competent person, who is responsible for adhering to the existing regulations, rules and guidelines.

1.5 CE label

CE labelling shows that the appliances comply with the basic requirements of the following directives:

- Directive **90/396/EEC** of the Commission with revisions
 "Directive for Harmonisation of Legal Regulations of the Member States for Gas Consumer UNits" (Gas equipment directive)
- Directive **92/42 EEC** of the Commission with revisions
 "Directive Concerning the Efficiency of New Hot Water Heating Boilers Fired by Liquid or Gaseous Fuels" (Efficiency directive)
- Directive **73/23/EEC** of the Commission with revisions
 "Directive Concerning Electrical Operating Equipment for Use Within Specific Voltage Limits" (Low voltage directive)
- Directive **89/336/EEC** of the Commission with revisions
 "Directive Concerning Electromagnetic Compatibility"

The units comply with the prototype described in the EU Prototype Test Approval:

PIN-No. CE-0085BP0464

The units comply with the following standards:

- EN 483
- EN 625
- EN 677
- EN 50165
- EN 55014
- EN 60335-1
- EN 60529
- EN 61000-3-2
- EN 61000-3-3

1.6 Benchmark



Note

Vaillant Ltd. supports the Benchmark Initiative. You will find the Benchmark Logbook on the last page of this instruction manual. It is very important that this document be filled out properly when installing, commissioning and handing-over to the owner of the installation.

1.7 Gas Council Number

Appliance	Gas council Number
ecoTEC plus 937	47-044-39

Table 1.1 Gas Council Number

2 Unit description, data and dimensions

2 Unit description, data and dimensions

2.1 Technical data

Name	ecoTEC plus 937	
	Combination unit	Unit
Nominal heat output range of central heating 80 °C Feed/60 °C Return 60 °C Feed/40 °C Return 50 °C Feed/30 °C Return 40 °C Feed/30 °C Return	12.0 - 28.0 12.3 - 28.9 12.7 - 29.7 12.9 - 30.3	kW kW kW kW
Maximum output DHW	37	kW
Maximum heating output	28	kW
Minimum output	12	kW
Category	I12H3P	
SEDBUK Band	A	
SAP Seasonal Efficiency	91.5	%
Required gas flow pressure (G20, Natural Gas)	20	mbar
Required gas flow pressure (G31, Propane)	37	mbar
Connection value (if necessary referred to storage tank charging/hot water preparation) at 15 °C and 1013 mbar	G20: 4.0 G31 : 2.94	G20 :m³/h G31 : kg/h
Exhaust mass flow at minimum thermal load (40 °C Feed/30 °C Return) at maximum thermal load (80 °C Feed/60 °C Return)	5.7 17.1	g/s g/s
Exhaust temperature at minimum thermal load (40 °C Feed/30 °C Return) at maximum thermal load (80 °C Feed/60 °C Return)	40 70	°C °C
NOx class	5	
Protection class	IP X4D	
Max. flow temperature	85	°C
Adjustable flow temperature (default setting: max. 75 °C)	30 - 85	°C
Permissible total excess pressure central heating	3.0	bar
Volume of water circulating (ΔT =20 K)	1204	l/h
Approximating condensation water volume at 50 °C Feed/30 °C Return	2.9	l/hr
Pump head	250	mbar
Minimum water flow	< 0.1	l/min
Specific throughflow in 10 min (ΔT = 30 K)	204	l/10min
Permissible excess pressure water side	10	bar
Required connection pressure for max. throughflow quantity	1.3	bar
Required connection pressure for min. throughflow quantity	0.1	bar
Hot water temperature discharge	35 - 65	°C
Flue size (concentric)	60/100	mm
Flue approval category	C _{13'} C _{33'} C _{43'} C _{53'} C _{63'} B _{23'} B _{33'}	
Pre-pressure 10 l expansion vessel	0.75	bar
Connections for heating flow and return	22	mm
Gas connection	22	mm
Diameter of the drain line for the safety valve heating (min.)	15	mm
Diameter of the drain line for the safety valve hot water (min.)	15	mm
Condensate drain (min. internal diameter drain)	19	mm
Dimensions (H x W x D)	720 x 440 x 597	mm
Primary water quantity	2.5	l
Supply voltage	230/50	V ~/Hz
Main PCB fuse (slow-blow) for main power supply	2	A
Electr. Power consumption	175	W
Standby power consumption	6.5	W
Layered storage tank capacity	15	l
Installation weight, just storage tank	17	kg
Installation weight, just combi unit	38	kg
Operating weight (with water)	62	kg

Table 2.1 Technical Data ecoTEC plus 937

2.2 Dimensions

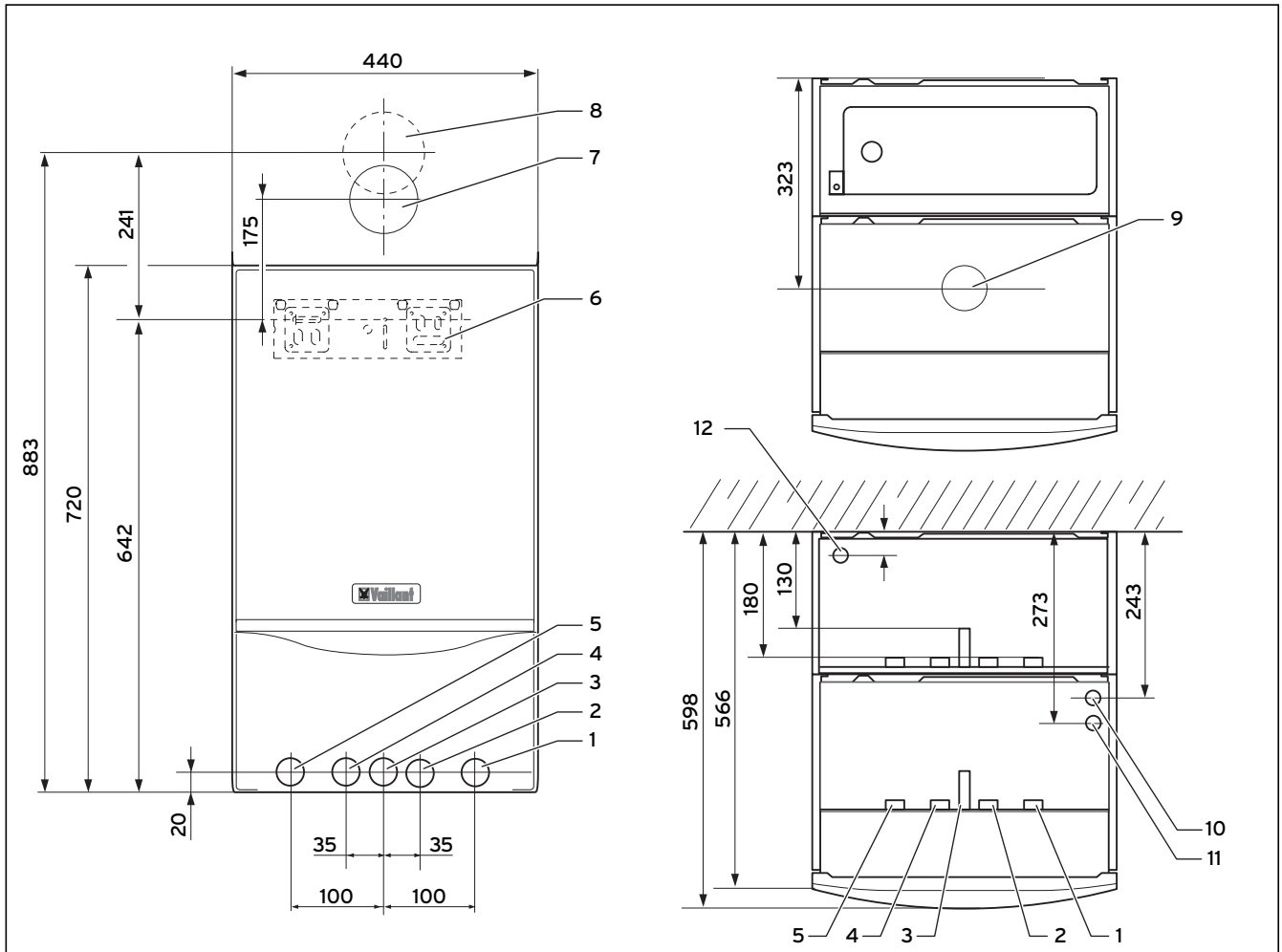


Fig. 2.1 Dimensions ecoTEC plus 937

- 1 Heating return pipe, \varnothing 22 mm
- 2 Cold water connection, \varnothing 15 mm
- 3 Gas connection \varnothing 22 mm
- 4 Hot water connection, \varnothing 15 mm
- 5 Heating flow pipe, \varnothing 22 mm
- 6 Hanging bracket
- 7 Flue hole - flue system 60/100
- 8 Flue hole - flue system 80/125
- 9 Flue duct connection
- 10 Condensate drain connection, \varnothing 19 mm
- 11 Heating system pressure relief valve connection, 15 mm
- 12 Layered storage tank pressure relief connection (flexible hose supplied)

2 Unit description, data and dimensions

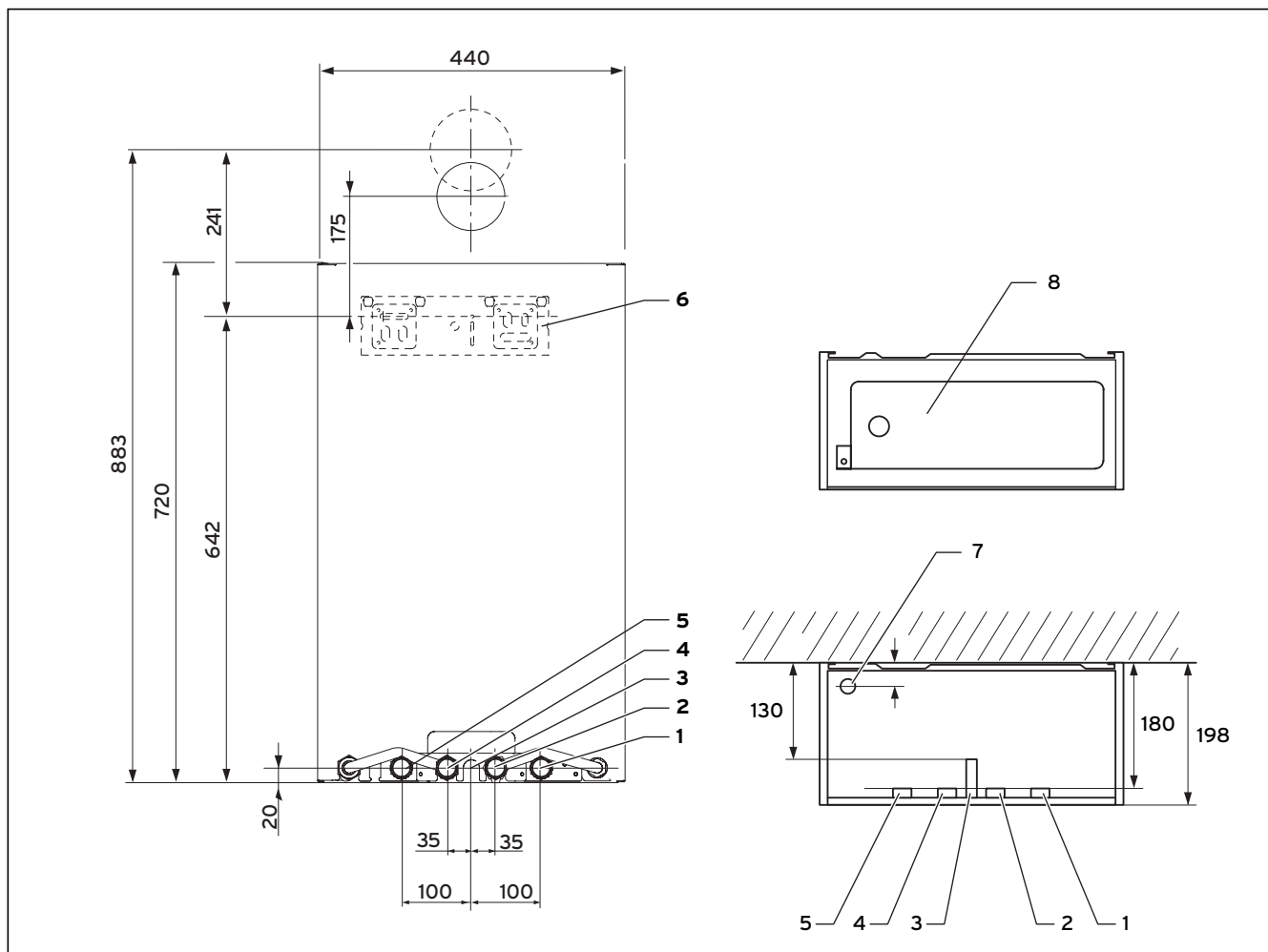


Fig. 2.2 Dimensions shift load storage tank

- 1 Heating return pipe, \varnothing 22 mm
- 2 Cold water connection, \varnothing 15 mm
- 3 Gas connection \varnothing 22 mm
- 4 Hot water connection, \varnothing 15 mm
- 5 Heating flow pipe, \varnothing 22 mm
- 6 Hanging bracket
- 7 Shift load storage tank pressure relief connection (flexible hose supplied)
- 8 Cover

2.3 Structure and functional elements

The ecoTEC plus 937 consists of
 - a modified combination boiler and
 - a 15 litre shift load storage tank.

Mains cold water heated by the combi unit is fed to the heat insulated storage tank by means of a modulating storage tank charging pump.

The combi unit supplies the shift load storage tank with electrical energy for the storage tank charging pump.

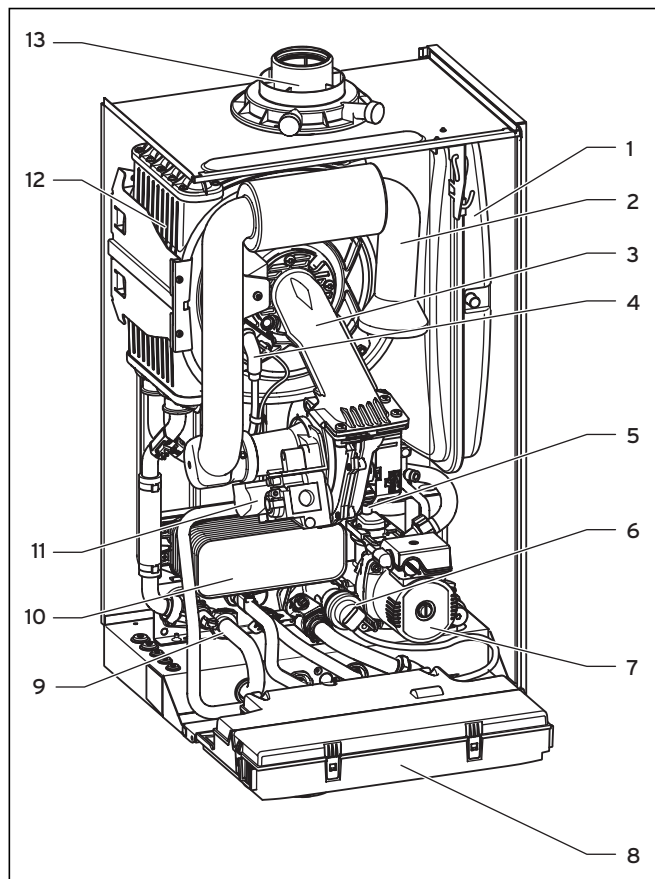


Fig. 2.3 Function elements combi unit

- 1 Expansion vessel combi boiler
- 2 Air intake pipe
- 3 Compact thermal module
- 4 Ignition electrode
- 5 Fan
- 6 Diverter valve with built in automatic adjustable bypass
- 7 pump
- 8 Electronics box
- 9 Pressure sensor
- 10 Hot water heat exchanger
- 11 Gas valve
- 12 Heat exchanger
- 13 Connection flue duct

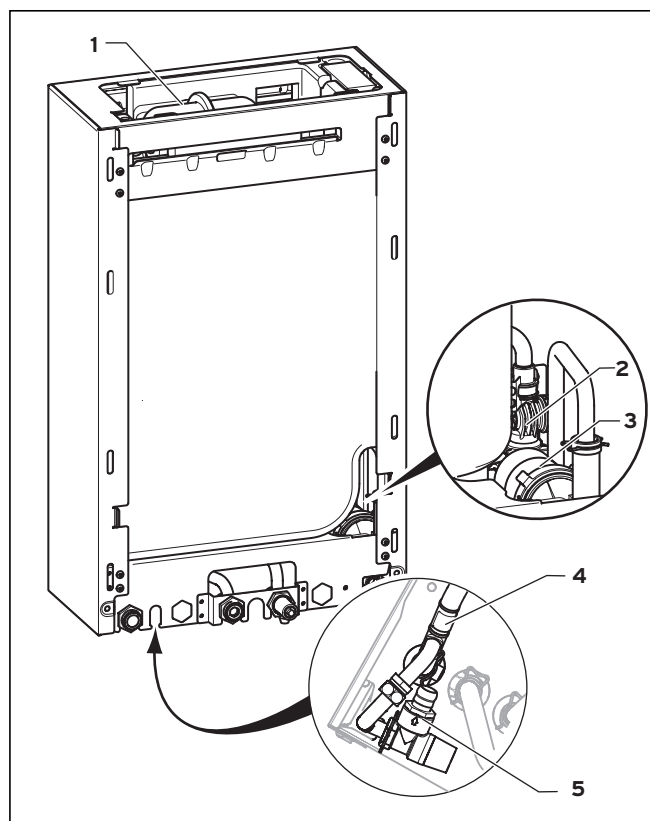


Fig. 2.4 Function elements shift load storage tank

- 1 Shift load storage tank expansion vessel
- 2 Aqua-Sensor
- 3 storage charging pump
- 4 NTC temperature sensor - hot water outlet
- 5 Storage tank pressure relief valve

2.4 Identification plates

The identification plate of the ecoTEC plus 937 is located on the underside of the unit.

2 Unit description, data and dimensions

2.5 Functional description

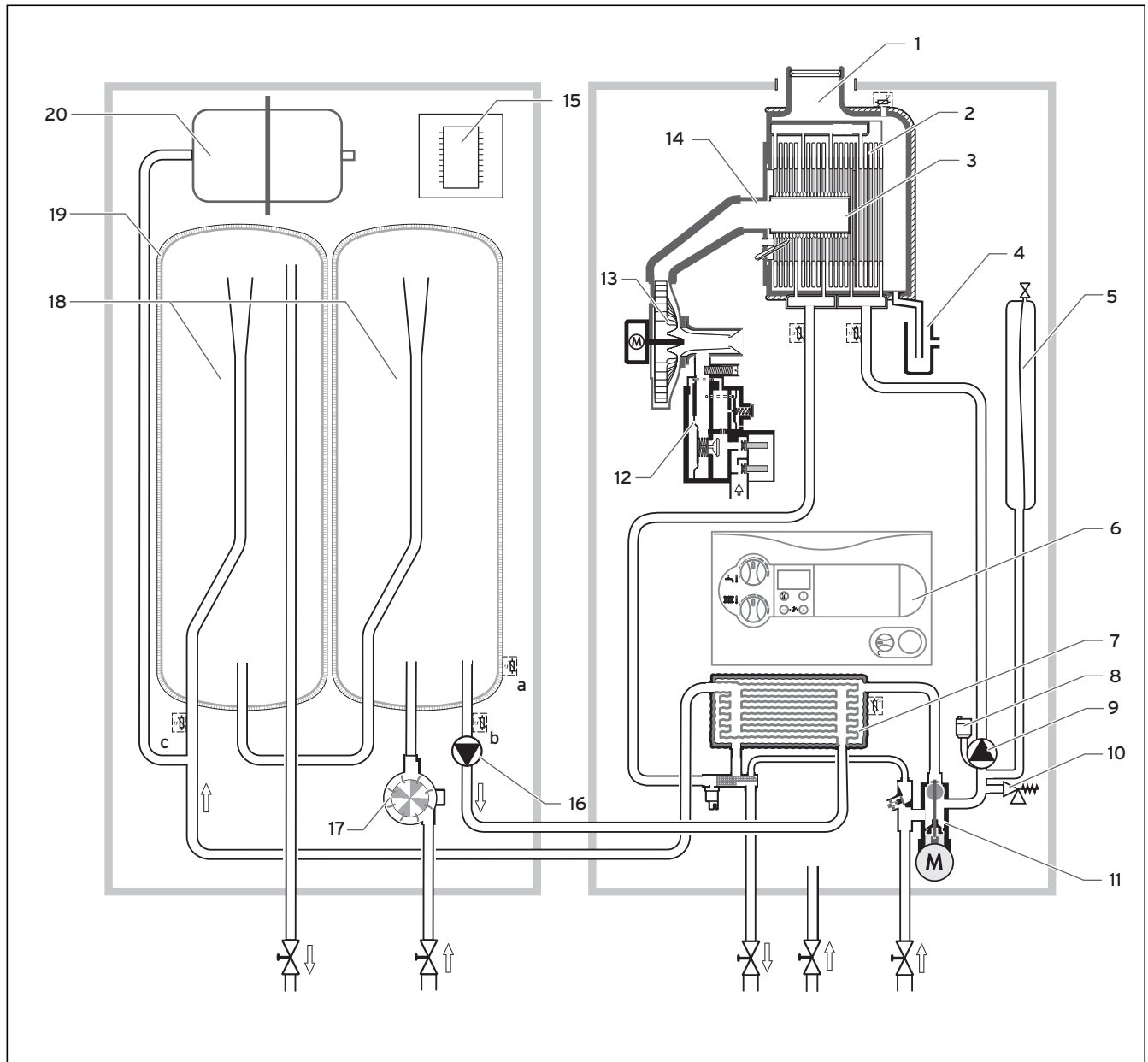


Fig. 2.5 Sequence diagram

- 1 Exhaust gas
- 2 Heat exchanger
- 3 Combustion chamber
- 4 Water condensate siphon
- 5 Expansion vessel
- 6 Operating display
- 7 Secondary heat exchanger
- 8 Automatic air vent
- 9 Pump
- 10 Pressure relief valve
- 11 Diverter valve
- 12 Gas valve
- 13 Fan

- 14 Compact thermal module
- 15 Shift load storage tank electronics
- 16 storage charging pump
- 17 Aqua-Sensor
- 18 Stainless steel storage tank
- 19 Storage tank insulation
- 20 Expansion vessel

NTC sensors shift load storage tank

- a Storage tank sensor
- b Infeed sensor SWT
- c Storage tank charging sensor

The ecoTEC plus 937 is a fully-automatic wall-mounted unit with condensing technology for central heating and hot water preparation and with a shift load storage tank for the storage of hot water.

Mains cold water heated by the combi boiler is fed to the heat insulated storage tank by means of a modulating storage tank charging pump.

The provision of hot water takes place directly from the combi boiler without the need for a copper cylinder, a cold water tank or a supply and expansion vessel with the corresponding pipework. The provision of hot water has priority over the central heating.

The combi unit supplies the shift load storage tank with electrical energy for the storage tank charging pump.

The combi unit is equipped with a warm start function which keeps the heat exchanger hot so that hot water is immediately available.

The temperature in the hot water heat exchanger is limited by the control system.

Fitting a water softener on the mains cold water inlet of the combi boiler is not necessary. In regions with extremely hard water (greater than 300 mg/l of CaCO₃) however a water softener may still be fitted in order to prevent the formation of scale build up in the water pipes. The heating system can be filled using the filling devices fitted to the ecoTEC plus combination boilers.

The ecoTEC plus 937 is supplied for natural gas and can be converted for propane gas with a conversion kit.

3 General requirements

3.1 Preliminary remarks for room sealed appliances

This appliance should only be installed in conjunction with either a Vaillant flue system or an alternative approved system (details of flue approval categories can be found in the technical section of the installation manual). Install the flue system as detailed in the separate flue installation instructions supplied with this boiler.

3.2 Related documents

The installation of the boiler must be in accordance with the relevant requirements of Gas Safety (Installation and Use) Regulations 1998, Health and Safety Document No. 635 (The Electricity at Work Regulations 1989), BS 7671 (IEE Wiring Regulations) and the Water Supply (Water Fitting) Regulations 1999, or The Water Bylaws 2000 (Scotland). It should also be in accordance with the relevant requirements of the Local Authority, Building Regulations, The Building Regulations (Scotland), The Building Regulations (Northern Ireland) and the relevant recommendations of the following British Standards:

BS 6700: Services supplying water for domestic use within buildings and their curtilages.

BS 6798: Specification for installation of gas fired boilers not exceeding 60 kW input.

BS 6891: Specification for installation of low pressure gas pipework up to 28 mm (R1) in domestic premises (2nd family gas).

BS 7593: Treatment of water in domestic hot water central heating systems. - Institute of Gas Engineers Publication IGE/UP7 Edition 2

BS 5482: Pt. 1 Domestic butane and propane gas burning installations.

IGE/UP1: Soundness testing and purging of industrial and commercial gas installation.

IGE/UP2: Gas installation pipework, boosters and compressors on industrial and commercial premises.

IG/UP/7 Edition 2 „Gas installations in timber framed and light steel framed buildings“

IGE/UP10. Installation of gas appliances in industrial and commercial premises.

BS 6644: Installation of gas fired hot water boilers of rated inputs between 60 kW and 2 MW (2nd and 3rd family gases).

BS 5449: Forced circulation hot water central heating systems for domestic premises. Note: only up to 45 kW.

BS 6880: Low temperature hot water heating systems of output greater than 45 kW.

Part 1 Fundamental and design considerations.

Part 2 Selection of equipment.

Part 3 Installation, commissioning and maintenance.

BS 4814: Specification for: Expansion vessels using an internal diaphragm, for sealed hot water heating systems.

BS 5440: Installation and maintenance of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases).

Part 1 Specification for installation of flues.

Part 2 Specification for installation and maintenance of ventilation for gas appliances.

European installation directive



Caution!

Installation and maintenance of the unit may only be undertaken by a competent person in accordance with the "Gas Safety (Installation and Use) Regulations 1998".

In IE the installation must comply with the current Version of I.S.813 'Domestic Gas Installations' and the current Building Regulations. The current ETCl Regulations for the installation of electrical equipment must also be observed.

Caution!

To tighten or loosen bolts, only use suitable open-ended spanners (do not use wrenches or extensions etc.).

Improper use or unsuitable tools can cause damage, (such as gas or water leaks.)

3 General requirements

3.3 Scope of supply and accessories

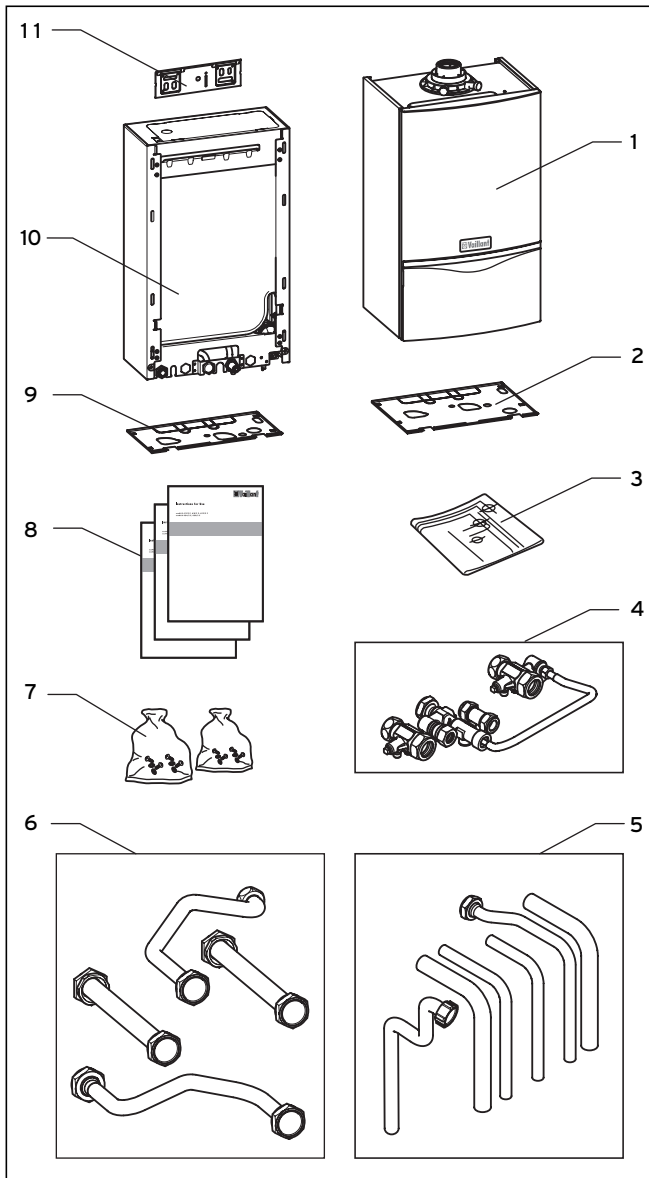


Fig. 3.1 Scope of supply and accessories

The shift load storage tank and the combi boiler are delivered pre-assembled in one packaging unit. Check that all parts have been delivered undamaged (see Fig. 3.1 and Table 3.1).

Note

At this stage do not yet remove the combi boiler and the shift load storage tank from the expanded polystyrene base to prevent any damage.

Pos.	Quantity	Name
1	1	Combi boiler ecoTEC plus
2	1	Bottom cover ecoTEC plus
3	1	Installation template
4	4	Isolating valves and filling loop
5	6	Connecting pipes (gas, heating, water, safety valve)
6	5	Adapter set, consisting of connecting pipes between the shift load storage tank and the combi boiler for gas, heating flow and return and water flow and return
7	2	Installation and connection accessories:
8	3	User, installation and service, flue installation manuals
9	1	Bottom cover for shift load storage tank
10	1	Shift load storage tank
11	1	Hanging bracket

Table 3.1 Scope of supply and accessories

3.4 Installation location



Note

When selecting the installation location observe the regulations and recommendations for combi boilers!

The installation location for the combi boiler and shift load storage tank must permit proper connection of the flue gas system to the combi boiler. In addition there must be sufficient space for maintenance work and air circulation around the combi boiler and the shift load storage tank.

The Combi boiler and shift load storage tank can be mounted together in any room you wish to choose. In rooms with a bath or a shower, the special requirements of BS 7671 (IEE Regulations), the electro-technical stipulations of the Building Standards (Scotland) Regulations and, in IE, the current issue of IS 813 and the current ETCI Stipulations must especially be observed.



Danger!

Danger of death by electric shock!

If a room-sealed combi boiler is installed in a room with a bath or a shower, the electrical switches and the boiler controller, which operate at mains voltage, must be mounted in locations where any person in the bath or in the shower cannot reach them.

In the event of installation in unusual locations, special provisions may have to be made. Detailed instructions for this can be found in BS 5546 and in BS 6798.

The ecoTEC plus 937 must be mounted on a flat, vertical wall which is sufficiently strong to hold the weight of the shift load storage tank and the combi boiler.

It is possible to mount onto a wall made of flammable material if the regulations of the Local Authority and the legal building regulations are fulfilled. In this case

however, the unit would have to be mounted in a specially made enclosure. (You can also use an existing cabinet or existing enclosure as long as it can be modified accordingly to suit the new application.) Further details concerning the fundamental characteristics when modifying existing cabinets or enclosures, including the requirements for ventilation, are described in BS 6798.

Note
If the boiler is to be installed in a half-timbered house, the installation must be undertaken in accordance with the Institute of Gas Engineers Publication IG/UP/7 Edition 2 „Gas installations in timber framed and light steel framed buildings“

Note
If the boiler is to be installed in an airing cupboard it is not required to separate the boiler with a non-combustible partition. However installation and servicing clearances must be maintained, and the appliance kept clear of any clothing.

Please note the following instructions before choosing where to install the boiler:

Caution!
Danger of damage to the unit from the effects of frost!
Do not install the shift load storage tank and combi boiler in rooms with a danger of frost.

Caution!
In rooms with aggressive vapours or dust the combi boiler must be operated independent of the ambient air.

Make sure that, when selecting the installation location and when operating the unit, the combustion air is free from chemical substances which contain fluorine, chlorine, sulphur etc. Sprays, solvents and cleaning agents, paints, adhesives etc. can contain substances of this type which can cause corrosion in the flue gas system, in the worst case even if the unit is operated as an open vent appliance. Particularly in hairdressing salons, lacquering and finishing, cleaning facilities, the appliance must be operated independent of the ambient air! Otherwise, a separate installation room is required to guarantee that the combustion air supply is free from the aforementioned substances.

3.5 Gas supply

The gas provider must guarantee the availability of an adequate gas supply. The connection of a gas meter in the supply line is only permitted when carried out by the gas provider and a company appointed by him. If there

is an existing gas meter you must check that it is suitable for the required gas rate. Installation pipes should be fitted in accordance with BS 6891. In IE in accordance with the current issue of IS 813. The pipework between the gas meter and the combi boiler must be of an appropriate size. Do not use any pipes that are smaller than the connection to the combi boiler (22 mm). The entire installation must be checked for leaks and purged in accordance with BS 6891.

3.6 Flue pipe

Danger!
Vaillant appliances are only system-certified if genuine Vaillant flue pipes are used. Only use genuine Vaillant flue pipes. Malfunctions can occur if you use other accessories. These may result in damage and injury. You will find a list of genuine flue pipes in the Vaillant installation manual for flue pipes.
The CE mark is valid only if the appliance is operated with Vaillant flue pipes.

3.6.1 100 mm standard flue duct

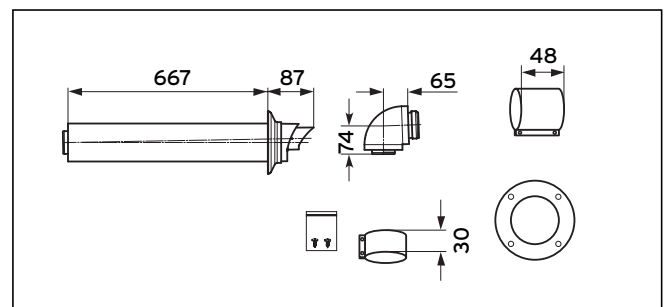


Fig. 3.2 Item No. 303 933

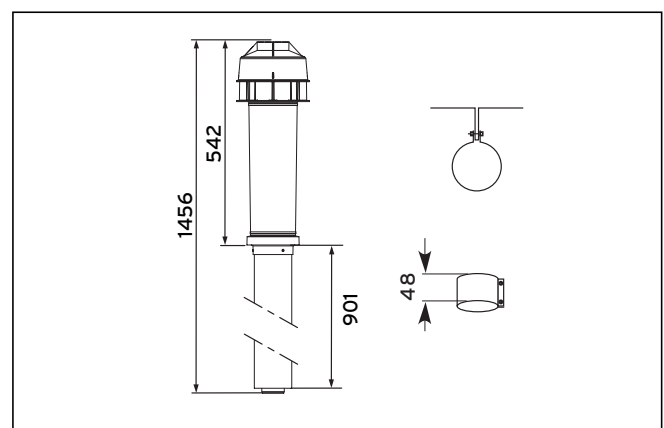


Fig. 3.3 Item No. 0020060570, 0020060571 and 0020065937 (60/100)

3 General requirements

A 100 mm standard flue duct (Item No. 303 933) is available. Further information can be obtained from the installation instructions for the flue duct.

Extensions are available to increase this length to a maximum of 5.5 m. 87° elbows and 45° bends are also available to increase the flexibility during installation.

3.6.2 Optional 125 mm flue pipe

A concentric flue pipe having an outside diameter of 125 mm is available, which can be extended to a length of up to 21 m.

You can also get a vertical system. Further information can be obtained from the installation instructions for the flue pipe.

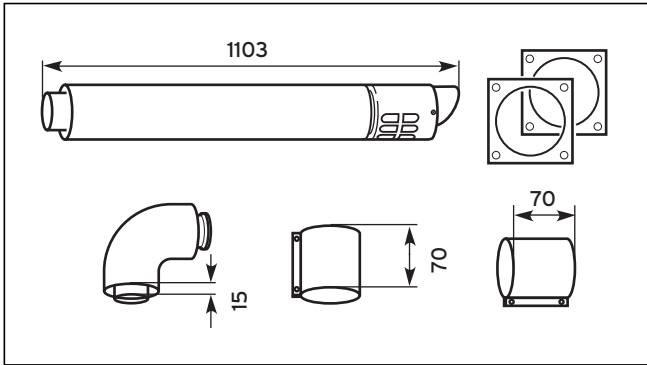


Fig. 3.4 Item No. 303 209

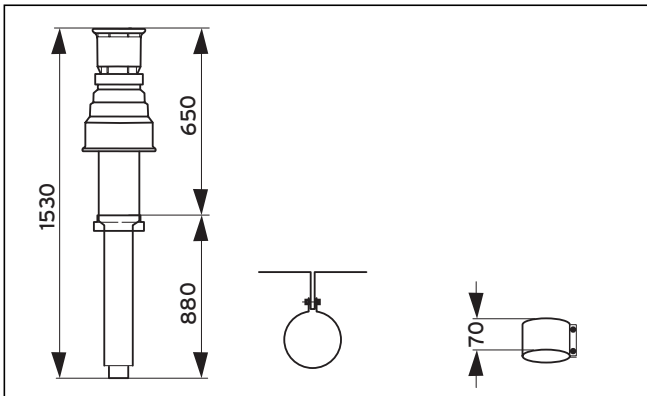


Fig. 3.5 Item No. 303 200 (80/125)

3.7 Flue termination

The following information applies to both flue pipe systems.

- The terminal position must be located in such a position that any flammable gases can be freely dissipated.
- A plume of water vapour will sometimes be visible from the flue terminal. Positions where this could be a nuisance should be avoided.
- If the terminal is less than 2 m above a balcony, the ground or a flat roof that is accessible by persons, a suitable terminal guard should be fitted (manufactured by Tower Flue Components, Tonbridge, TN9 1TB, Model K3, plastic-coated).

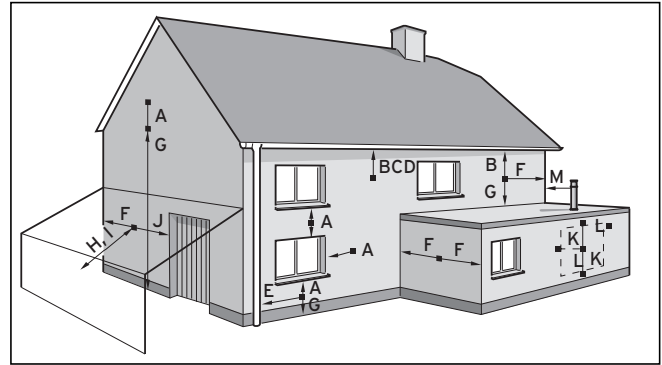


Fig. 3.6: Flue termination



Note

Vertical flue pipes must not terminate within 600 mm of an opening window, air vent or any other ventilation opening.

The flue pipe must be fitted, or shielded, in such a way that ignition or damage to sections of the building are avoided.

	Location of the junction	mm
A	Directly under or above an opening or the horizontal to an opening, a hollow ventilation tile, an opening window etc.	300
B	Under gutters, soil pipes or drainpipes	75
C	Under eaves	200
D	Under balconies	200
E	From vertical drainpipes and down-pipes	25
F	From external and internal corners	300
G	Above the ground, a roof or a balcony	300
H	Opposite another surface	600
I	Opposite another termination	1200
J	Next to an opening (e.g. a door, window) within a carport	1200
K	Vertically away from a junction on the same wall	1500
L	Horizontally away from a junction on the same wall	300
M	Distance away from an adjoining vertical flue pipe	500

Table 3.2 Position of the terminal in a fan-assisted concentric flue



Note

In addition, the terminal should not be located closer than 150 mm from an opening in the fabric of the building formed for the purpose of accommodating a built-in element such as a window.

BS 5440-1: We recommend that the terminal of a fan-assisted flue system be positioned as follows:

- At least 2 m from an opening in the building directly opposite, and

- b) so that products of combustion are not directed to discharge across a boundary.
- 1) Dimensions B, C and D:
These dimensions can be reduced to 25 mm without having a negative effect on the performance of the boiler. In order to ensure that condensate plume does not affect adjacent surfaces the terminal should be extended as shown in Fig. 3.7.
- 2) Dimension F:
These dimensions can be reduced to 25 mm without having a negative effect on the output of the combi boiler. However in order to ensure that the condensate plume do not affect adjacent surfaces a clearance of 300mm is preferred. For IE, recommendations are given in the current edition of IS813.

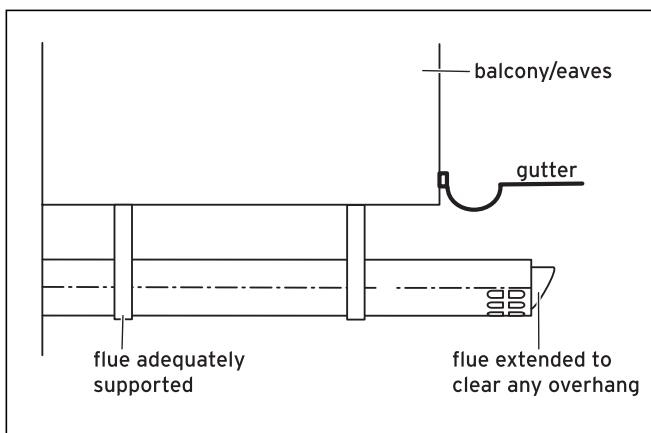


Fig. 3.7 Flue termination under balcony/eaves

3.8 Air supply

Detailed recommendations for air supply are given in BS 5440, Part 2.

It is not necessary to have an air vent in the room or internal space in which the boiler is installed.

Ventilating a cabinet or enclosure

This appliance is highly efficient. As a consequence the heat loss from the casing is very small. For cupboard or compartment installations it is not necessary to provide any high or low permanent air vents for cooling or ventilation purposes.

3.9 Electrical connection

In accordance with BS 7671 (IEE Wiring Regulations) and any other local regulations which may apply, a 3 A fused single phase AC supply (230 V, 50 Hz) must be provided. In IE the current issue of the ETCI regulations must be observed. The method of connection to the mains electricity supply must provide a means of completely isolating the boiler and ancillary controls. Isolation is preferably by the use of a fused three pin plug and unswitched shuttered socket outlet, both complying with the requirements of BS 1363. Alternatively, a 3 A fused double pole switch with 3 mm contact separation on both poles may be used.



Danger!
Danger of death by electric shock!
The unit must be earthed.

3.10 System requirements

3.10.1 Water circulation system

Detailed recommendations concerning the water circulation system can be taken from BS 6798 and BS 5449, Part 1 (for "Small Bore" and "Micro Bore" central heating systems). Pipework which does not form part of the usable heating surface should be insulated to prevent heat losses and possible freezing up, especially where the pipes run through roof spaces and ventilated under-floor spaces. The drain connections must be located in easily-accessible locations, so that draining the entire system including the combi boiler and the hot water system is possible. The drain connections should be at least 1/2" (BSP nominal size) and must be in accordance with BS 2879.

The combi boiler is suitable for Minibore and Microbore Systems. Copper tubing in accordance with BS 2871 should be used for all water carrying pipework. All capillary joints in all Domestic Hot Water (DHW) pipework must be made with lead free solder. When a new boiler is to be fitted to an existing system, it is good practise that the system is thoroughly flushed before the boiler is installed in the system. See BS 7593 for full details.



Caution!
To prevent the formation of deposits and prevent serious damage to the appliance and system, cleansers must be used carefully following the cleanser manufacturers instructions and must be removed by thoroughly flushing the system. Cleansers should only be left in systems for a maximum of 24 hours. Failure to thoroughly remove cleanser from a system could result in damage to the appliance.

The cleaning must take place before fitting a new boiler and in accordance with BS 7593. Recommendations for use of system cleaning agents can be obtained from Sentinel, Betz Dearborn Ltd. Widnes, Cheshire, WA8 8UD, Tel. 0151 420 9595, or Fernox, Alpha Fry Technologies, Tandem House, Marlow Way, Croydon, CR0 4XS, Tel. 0870 8700362.

3.11.2 Filling and preparation of the heating system

The system can be filled using the incorporated filling device. This connection must be removed again after the filling process is complete. If the local Water Authority regulations do not allow temporary connection a sealed system filler pump with break tank must be used. The heating system will not be filled automatically from the domestic hot water side. (Alternative methods of filling sealed systems are given in BS 5449)

3 General requirements

3.10.3 Pressure relief valve

The boiler is equipped with a pressure relief valve. This safety device is required for all sealed central heating systems, is preset to 3 bar and is fitted with a 15 mm compression connection for the discharge pipe, whose diameter must not be less than 15 mm. The pressure relief valve must not be used for draining purposes.

3.10.4 Pressure gauge

The pressure gauge is fitted to the boiler in the factory and indicates the pressure of the primary circuit, to make filling and testing easier.

3.10.5 Heating circuit expansion vessel

The boiler of the ecoTEC series are equipped with a 10 litre expansion vessel which is suitable for a sealed heating system with a maximum water volume of 100 litres. If the nominal capacity of the boiler expansion vessel is not adequate for the heating system (e.g. when modernising old open systems) an additional expansion vessel can be fitted outside the boiler. The pressure gauge must be fitted in the return pipe, in accordance with BS 5449: Part 1, as close as possible to the boiler. In Table 3.5 you will find an overview of the required size of an additional expansion vessel.

	Vessel volume (in l)	
	1.0	1.5
Initial system pressure (in bar)	1.0	1.5
Setting of the excess pressure valve (in bar)	3.0	
Total water volume of the system (in l)		
25	2.7	3.9
50	5.4	7.8
100	10.9	15.6
125	13.6	19.5
150	16.3	23.4
175	19.1	27.3
200	21.8	31.2
225	24.5	35.1
250	27.2	39.0
275	30.0	42.9
300	32.7	46.8
325	35.7	50.7
350	38.1	54.6
375	40.9	58.5
400	43.6	62.4
425	46.3	66.3
450	49.0	70.2
475	51.8	74.1
500	54.5	78.0
With other system volumes than shown above, multiply the volume by the adjacent factors	0.109	0.156

Table 3.3 Size of an additional expansion vessel

3.10.6 Shift load storage tank expansion vessel

The shift load storage tank is fitted with a 1 litre expansion vessel.

3.11 Details for the pumps

3.11.1 Circulation pump

The circulation pump is integrated in the combi boiler. The remaining head of the pump with respect to the bypass valve is shown in Fig. 3.8. The operating mode of the 2-speed pump can be adjusted using diagnostic number d.19, see Section 8.1.2.

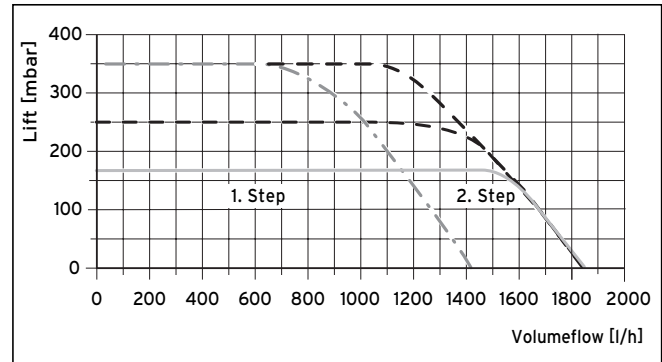


Fig. 3.8 Technical data of the pump in the combi boiler

3.11.2 Shift load storage tank circulation pump

The shift load storage tank is equipped with a maintenance-free charging pump.

3.12 System-Bypass

The boiler is fitted with an automatic system by-pass. The installation can be used in systems with thermostatic radiator valves without the need for an additional by-pass. The by-pass valve is adjustable, see Section 5.8.

3.13 Venting

The boiler is fitted with an automatic air vent. Other measures need to be taken to allow the heating system to be either automatically or manually vented during filling and during commissioning.

3.14 Condensate siphonic trap

The boiler is fitted with a siphonic condensate trap incorporating a water seal of 145 mm.

4 Sequence of operations during installation

4.1 Transporting the appliance



Important:

With regards to the Manual Handling Operations, 1992 Regulations, the following lift operation exceeds the recommended weight for a one man lift.

General recommendations when handling

- Clear the route before attempting the lift.
- Ensure safe lifting techniques are used - keep back straight - bend using legs.
- Keep load as close to body as possible. Do not twist - reposition feet instead.
- If 2 persons performing lift, ensure co-ordinated movements during lift.
- Avoid upper body/top heavy bending - do not lean forward/sideways.
- Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip.
- Always use assistance if required.

Removal of carton from delivery van

- Recommend 2 person lift or 1 person with use of sack truck.
- If 1 person is performing lift, straddle the load, tilt and place carton into position on truck.
- Recommend secure appliance onto truck with suitable straps.
- Ensure safe lifting techniques are used - keep back straight - bend using legs.
- Keep load as close to body as possible.
- If 2 persons performing lift, ensure co-ordinated movements during lift.
- Always use assistance if required.

Carriage of carton from point of delivery to point of installation - ground floor.

- Recommend 2 person lift or 1 person with use of sack truck.
- If 1 person is performing lift, straddle the load, tilt and place carton into position on truck.
- Recommend secure appliance onto truck with suitable straps.
- Ensure safe lifting techniques are used - keep back straight - bend using legs.
- Keep load as close to body as possible.
- If 2 persons performing lift, ensure co-ordinated movements during lift.
- Clear the route before attempting the lift.
- If removing boiler from truck straddle the load and tilt forwards to facilitate secure grip.
- Ensure safe lifting techniques are used - keep back straight - bend using legs.
- Do not twist - reposition feet instead.

- Take care to avoid trip hazards, slippery or wet surfaces and climbing steps and stairs.
- Always use assistance if required.

Carriage of carton from point of delivery to point of installation - first or higher floor, cellar.

- Recommend 2-person lift or 1 person with use of sack truck.
- If 1 person is performing lift, straddle the load, tilt and place carton into position on truck.
- Recommend secure appliance onto truck with suitable straps.
- Ensure safe lifting techniques are used - keep back straight - bend using legs.
- Keep load as close to body as possible.
- If 2 persons performing lift, ensure co-ordinated movements during lift.
- Avoid upper body/top heavy bending - do not lean forward/sideways.
- Clear the route before attempting the lift.
- If removing boiler from truck straddle the load and tilt forwards to facilitate secure grip.
- Ensure safe lifting techniques are used - keep back straight - bend using legs.
- Do not twist - reposition feet instead.
- Take care to avoid trip hazards, slippery or wet surfaces and climbing steps and stairs.
- Always use assistance if required.

Carriage of carton from point of delivery to point of installation - roofspace.

- Recommend 2-person lift.
- Ensure co-ordinated movements during lift.
- Avoid upper body/top heavy bending - do not lean forward/sideways.
- Clear the route before attempting the lift.
- Take care to avoid trip hazards, slippery or wet surfaces and climbing steps and stairs.
- When transferring appliance into roofspace, recommend 1 person to be in roofspace to receive the appliance and other person to be below to pass up and support appliance.
- Ensure safe lifting techniques are used - keep back straight - bend using legs.
- Keep load as close to body as possible.
- Always use assistance if required.
- It is assumed safe access, flooring and adequate lighting are provided in the roof space.
- It is recommended a risk assessment of the roof space area be carried out before moving the appliance into the area to take into account access, stability of flooring, lighting and other factors, and appropriate measures taken.

Unpacking of appliance from carton.

- Recommend 2 persons unpack appliance from carton.
- Always keep working area clear.
- Recommend straps and open carton flaps, then remove items from the top including the polystyrene packing and remove carton by sliding up over the boiler.

4 Sequence of operations during installation

- Ensure safe lifting techniques are used - keep back straight - bend using legs.
- Keep load as close to body as possible.
- Always use assistance if required.
- Dispose of packaging in a responsible manner.
- Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance outside packaging.

Positioning of Appliance for Final Installation - no obstructions.

- If appliance weight is over 25 kg always use 2 persons to move where practical.
- Fit bracket securely onto wall before lifting appliance into position.
- Obtain firm grip on front and sides of appliance, lift upwards, ensure stable balance achieved and lift upwards to position in place on bracket.
- Ensure safe lifting techniques are used - keep back straight - bend using legs - when lifting load from floor level.
- Do not twist - reposition feet instead.
- Keep boiler as close as possible to body throughout lift to minimise strain on back.
- Ensure co-ordinated movements to ensure equal spread of weight of load.
- Always use assistance if required.
- Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance.

Positioning of Appliance for Final Installation - above worktop, foreseeable obstructions etc.

- If appliance weight is over 25 kg always use 2 persons to move where practical.
- Fit bracket securely onto wall before lifting appliance into position.
- Obtain firm grip on front and sides of appliance, lift upwards, onto worktop if practicable.
- Ensure stable balance achieved and lift upwards to position in place on bracket.
- If 2 persons positioning onto bracket obtain firm grip at front and sides/base of boiler.
- Ensure coordinated movements during 2 person lifts to ensure equal spread of weight of load.
- Ensure safe lifting techniques are used - keep back straight - bend using legs - when lifting load from floor level.
- Do not twist - reposition feet instead.
- Keep boiler as close as possible to body throughout lift to minimise strain on back.
- Avoid upper body/top heavy bending - do not lean forward/sideways.
- Always use assistance if required.
- Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance.

Positioning of Appliance for Final Installation - within compartment etc. restricting installation.

- If appliance weight is over 25 kg always use 2 persons to move where practical.
- Fit bracket securely onto wall before lifting appliance into position.
- Obtain firm grip on front and sides of appliance, lift upwards, onto worktop if practicable.
- Ensure stable balance achieved and lift upwards to drop into place onto bracket.
- If 2 persons positioning onto bracket obtain firm grip at front and sides/base of boiler.
- Ensure coordinated movements during 2 person lifts to ensure equal spread of weight of load.
- If 1 person positioning onto bracket recommend obtain firm grip supporting base of boiler.
- Ensure safe lifting techniques are used - keep back straight - bend using legs - when lifting load from floor level.
- Do not twist - reposition feet instead.
- Keep boiler as close as possible to body throughout lift to minimise strain on back.
- Always use assistance if required.
- Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance.

Positioning of Appliance for Final Installation - in roof space restricting installation.

- If appliance weight is over 25 kg always use 2 persons to move where practical.
- Obtain firm grip on front and sides of appliance, lift upwards, ensure stable balance achieved and lift upwards to drop into place onto bracket.
- If 2 persons positioning onto bracket obtain firm grip at front and sides/base of boiler.
- Ensure co-ordinated movements during 2 person lifts to ensure equal spread of weight of load.
- If 1 person positioning onto bracket recommend obtain firm grip supporting base of boiler.
- Ensure safe lifting techniques are used - keep back straight - bend using legs - when lifting load from floor level.
- Do not twist - reposition feet instead.
- Keep boiler as close as possible to body throughout lift to minimise strain on back.
- Always use assistance if required.
- Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance.
- It is recommended a risk assessment of the roof space area be carried out before moving the appliance into the area to take into account access, stability of flooring, lighting and other factors, and appropriate measures taken.

4.2 Required minimum gaps/assembly clearances

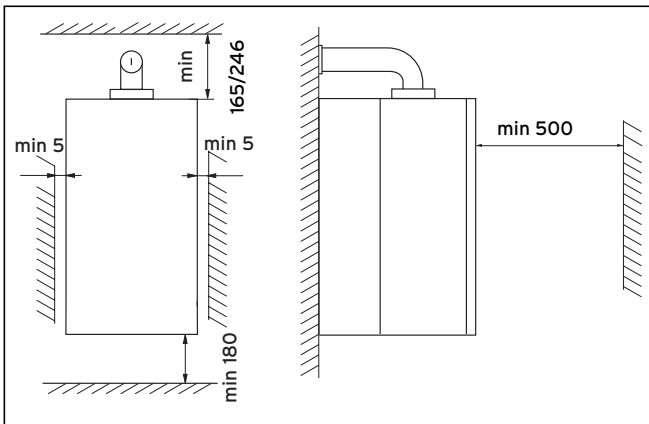


Fig. 4.1 Distances during installation (dimensions in mm)

The combination of units must be installed on a flat vertical wall which is large enough for the shift load storage tank with mounted combi boiler, including the required minimum clearances and space allowances for installation. The required minimum clearances during installation can be taken from Fig. 4.1.

The minimum clearances and installation clearances are shown on the installation template. They are:

- 5 mm on each side of the unit combination
- 180 mm underneath the unit combination
- 165 mm above the boiler if using a flue pipe of 100 mm outside diameter
- 246 mm above the boiler if using a flue pipe of 125 mm outside diameter
- 500 mm in front of the unit combination to permit easy access for service work.

Please note that, under the unit combination, there should be adequate space to position the drain pipes via a drain funnel. The drain must be visible!



Note

If the boiler is to be installed in a timber framed building, it should be fitted in accordance with IG/UP/7 Edition 2 „Gas installations in timber framed and light steel framed buildings“.

4.2.1 Selecting the location for the shift load storage tank and combination boiler

The installation location for the shift load storage tank and the combi boiler should be selected so that:

- there is adequate room around the boiler for service and maintenance work
- the flue pipe of the combi boiler can operate properly i.e. the location of the terminal of the flue pipe is located in accordance with these instructions and the flue pipe is installed in accordance with the installation instructions for the flue pipe provided
- all the required pipework including the pressure relief valve and the condensate drain can be fitted.

Further information concerning the installation location of the combi boiler can be found in the Section "Installation Location".

4.3 Unpacking the equipment

First cut through the two plastic straps when unpacking the units. Then open the box and lift the top section of the polystyrene off. Lift the box upwards.



Note

Please take care that the white surface of the units is not damaged.

4.4 Using the installation template

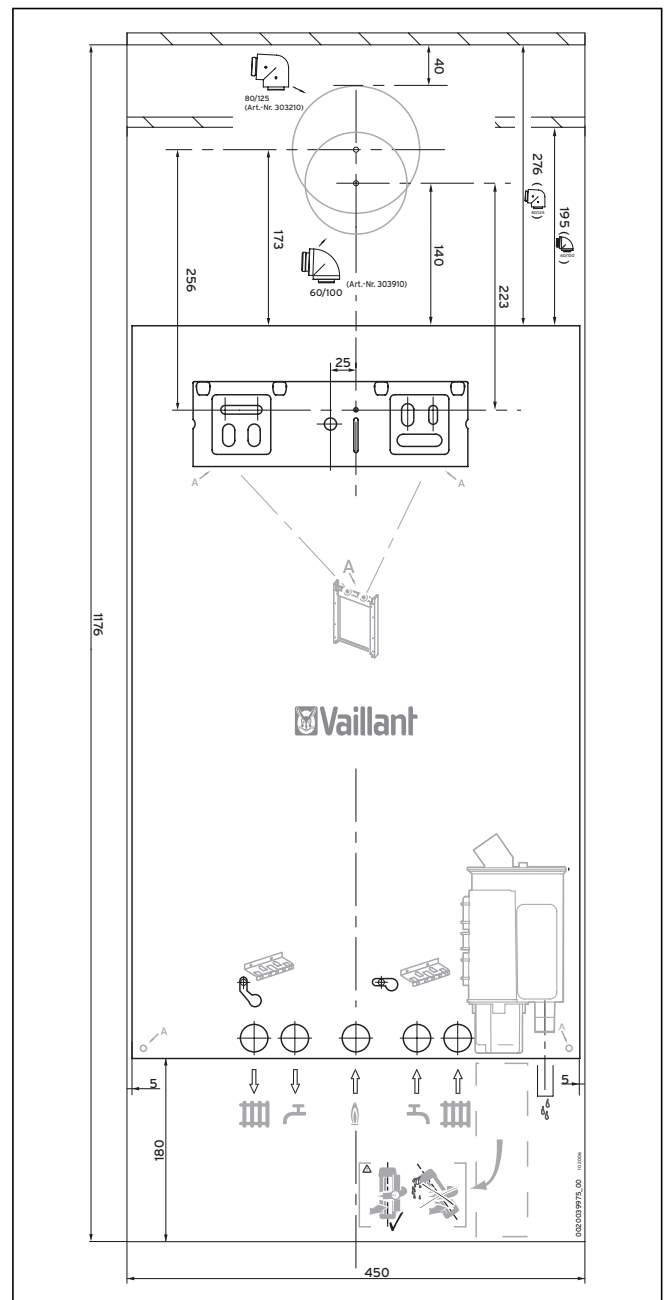


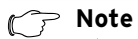
Fig. 4.2 Assembly template

4 Sequence of operations during installation

Use the template provided for the installation (see Fig. 4.2).

The template shows the following:

- the position of the fixing holes for the hanging bracket,
- the position of the connections.
- the position of the hole in the wall for the flue pipe.
- line the installation template up vertically and fix the template to the wall.
- mark the position of the fixing holes for the hanging bracket,
- drill 2 holes \varnothing 10 mm in the wall for the hanging bracket.



Note

Please take the total weight of the unit combination and the load capacity of the wall into account.

If necessary drill alternative fixing holes. If necessary use alternative fixing materials.

4.5 Flue exit

- If using rear flue mark the position of the air/flue duct and its circumference.
- Remove the assembly template from the wall.
- If necessary cut the aperture in the wall for the flue pipe.

Other flue options

Instructions concerning other flue pipe systems, for example, vertical flues, flue pipes to the side of the boiler and the use of additional elbows etc. are listed in the installation instructions for the flue pipe included with the combi boiler.

4.6 Installation of the flue gas system

- Install the flue gas system (observe the separate installation instructions for the flue pipe).

4.7 Fitting the appliance hanging bracket

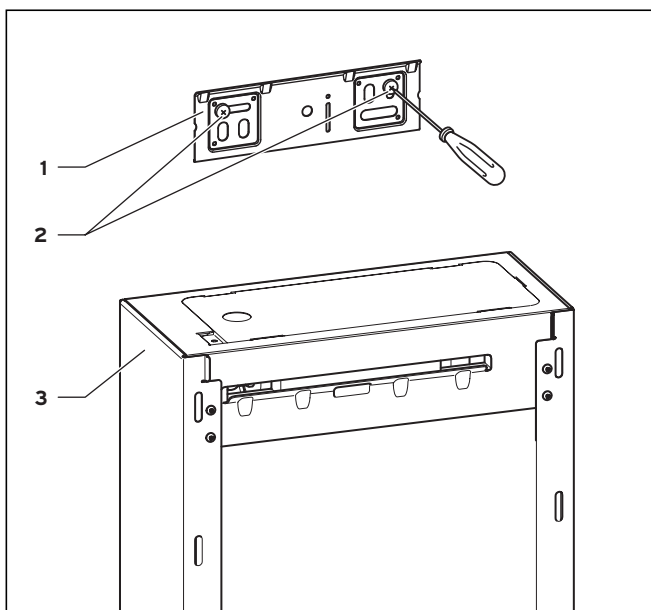


Fig. 4.3 Shift load storage tank with hanging bracket

- Fix the hanging bracket (1) to the wall using the plugs and screws (2) provided with the appliance.
- Lift the shift load storage tank out of the packaging (see Section 3.4).
- Lift the shift load storage tank (3) onto the wall so that it is located slightly above the hanging bracket (1).
- Slowly lower the shift load storage tank onto the hanging bracket so that the installation carrier on the rear of the unit fully engages in the hanging bracket.



Note

If the appliance is to be fitted in a timber framed building ensure that the hanging bracket is secured to a substantial part of the timber frame capable of taking the full weight of the appliance.

4.8 Mounting the combination boiler

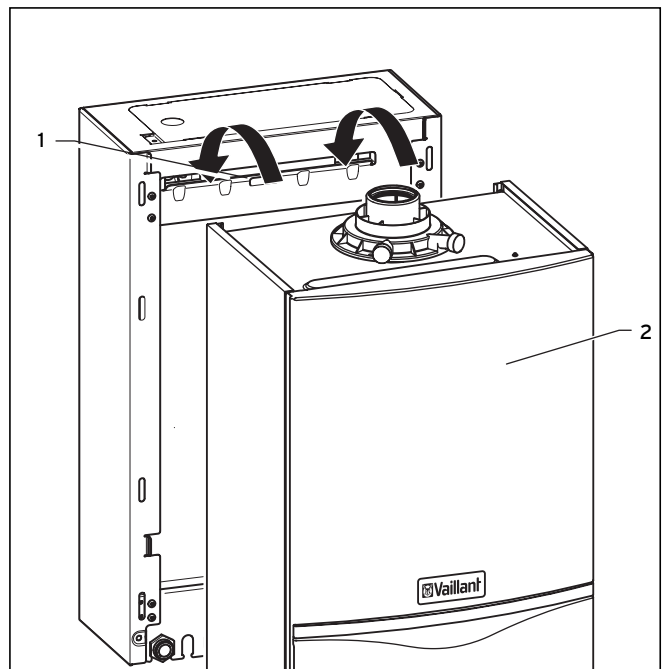


Fig. 4.4 Mounting the combi boiler on the shift load storage tank

- Lift the combi boiler out of the packaging (see Section 3.4).
- Lift the combi boiler (2) onto the shift load storage tank so that it is located slightly above the shift load storage tank (1).



Note

Lift the combi boiler at both sides of the base.

- Lower the combi boiler slowly onto the hanging bracket on the shift load storage tank so that the installation carrier on the rear of the combi boiler fully engages in the hanging bracket on the shift load storage tank.

4.9 Removing the front case

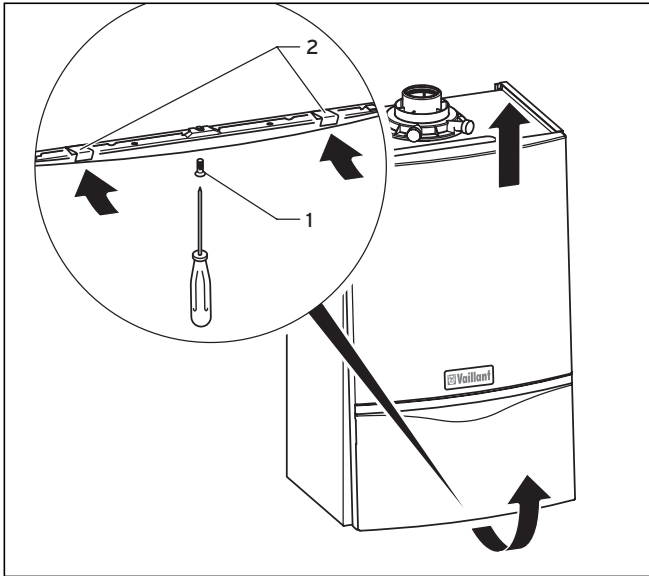


Fig. 4.5 Removing/fixing the front case

Proceed as follows to remove the front cladding:

- Release the screw (1) on the base of the unit.
- Push the two retaining clips (2) on the base of the unit inwards until the front case releases.
- Hold the front case by the bottom edge, pull forwards and remove the front case from the unit.

4.10 General instructions concerning the heating system



Caution!

Clean the heating system thoroughly before connecting the appliance!
This will remove small particles such as solder residues, ash, hemp, putty, rust, dirt particles and similar substances from the pipework. Otherwise there is a danger that these particles can deposit in the appliance and cause damage.



Note

The heating system is fitted with an expansion tank (10 l/0.75 bar).

- Before connecting the unit, make sure that this volume is adequate. Otherwise the installation must be fitted with an additional expansion vessel (see Section 3.11.6).

4.11 Gas connection



Danger!

Danger of death by gas escapes if the installation is not properly carried out!
The gas connection must only be made by a competent person (e.g. CORGI registered). The legal directives and local regulations for the gas supply companies must be observed.



Caution!

Danger of leaks by improper installation!
Ensure a stress-relief assembly of the gas pipes.



Caution!

Danger of damage to units and system!
The electronic gas valve may be tested for leakage only with a maximum pressure of 150 mbar!
At higher testing pressures there is a danger that the gas fitting could be damaged.



Caution!

Danger of damage to the gas isolator valves by heat transmission!

If the final connections to the combi boiler are made using soldered pipe connections, you must be particularly careful not to damage the gas isolator valves by heat transfer.

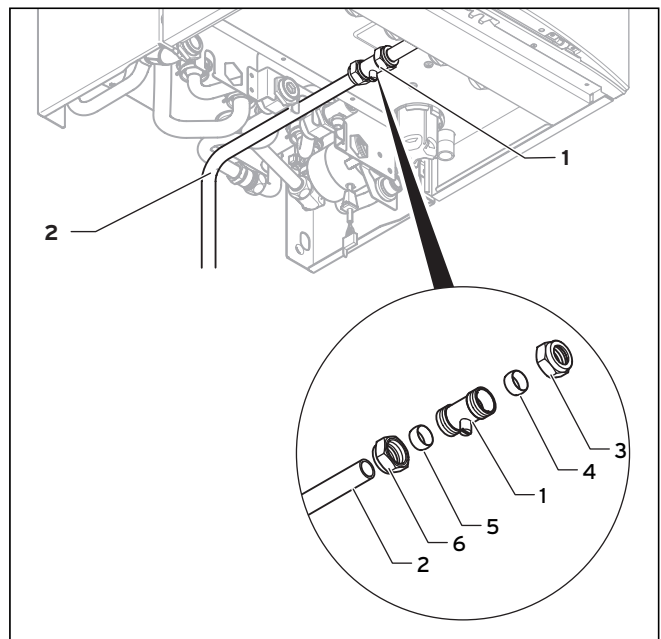


Fig. 4.6 Gas connection

Proceed as follows for gas connection:

- Remove the gas connection pipe elbow (2) and gas isolator valve (1) from the packaging.
- Push the union nut (3) and the olive (4) onto the gas pipe which protrudes from the combi boiler.
- Push the gas isolator valve (1) onto the gas pipe which protrudes from the combi boiler up to the stop.
- Pull the union nut (3) with the olive (4) towards the gas isolator valve. Tighten the union nut hand tight.
- Push the union nut (6) and the olive (5) onto the gas connection pipe elbow (2).
- Push the gas connection pipe elbow (2) into the gas isolator valve (1) up to the stop.

4 Sequence of operations during installation

- Pull the union nut (6) with the olive (5) towards the gas isolator valve. Tighten the union nut hand tight.
- The diameter of the pre-formed copper pipe (2) is 22 mm. Connect this pipe to a gas supply pipe having a diameter of not less than 22 mm.



Note

The gas supply pipework must be of sufficient size so that, at maximum output, a gas pressure of 20 mbar is available at the input to the combi boiler.

- Tighten all connections.
- Purge the gas pipe before commissioning.
- Check the gas connection for leaks using leak-detecting spray.

4.12 Cold water supply and hot water outlet



Caution!

Ensure stress-free assembly of the connection pipework to avoid leakages!

Caution!

Danger of damage to the gas isolator valves by heat transfer!

If the final connections to the combi boiler are made using soldered pipe connections, you must be particularly careful not to damage the gas isolator valves by heat transfer.

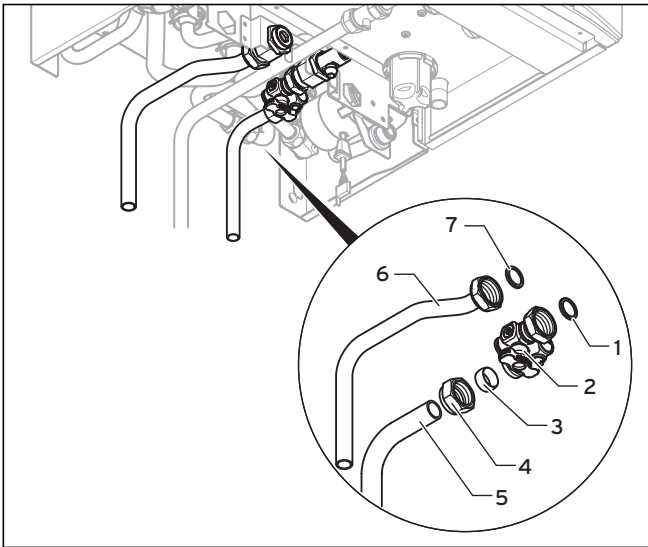


Fig. 4.7 Installing the cold water and hot water connections



Note

Flush all foreign matter from the mains supply before connecting to the appliance.

- Remove the two copper tails (5, 6) for water connection, the cold water isolating valve (2) and the union nut (4), olive (3) and fibre seals (1, 7) from the packaging.

- Insert the fibre seal (1) and screw the cold water isolating valve (2) to the cold water connection of the shift load storage tank.
- Push the union nut (4) with the inserted olive (3) onto the copper tail (5) included with the combi boiler. The diameter of this pipe is 15 mm.
- Insert the copper tail into the cold water isolating valve up to the stop. Tighten the union nuts in this position.
- Insert the fibre seal (7) and screw the copper tail (6) which is included with the storage tank module, to the hot water connection on the unit. The diameter of this pipe is 15 mm.
- Fit the handle for the filling loop to the cold water stop valve (2) with a countersunk screw.

4.13 Piping between shift load storage tank and combination boiler

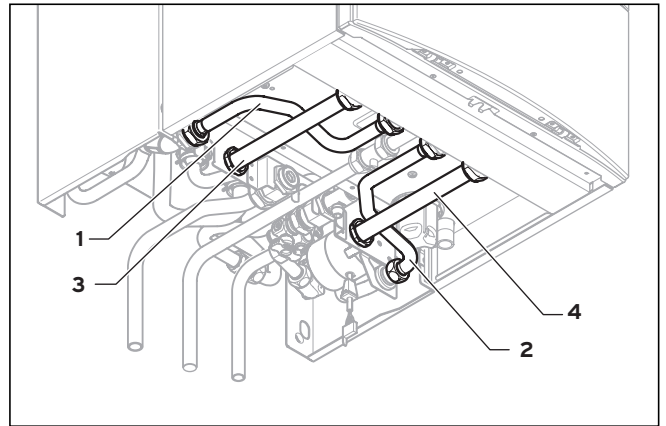


Fig 4.8 Piping between shift load storage tank and combination boiler

- Remove the pipe sections (1), (2), (3) and (4) with the associated fibre seals from the box of accessories of the shift load storage tank.
- Fit the formed pipe and straight pipe sections in the correct sequence.



Note

The formed pipes (1) and (2) must be fitted first.

4.14 Flow and return heating connections



Caution!

Ensure stress-free assembly of the connection pipework to avoid leakages!



Caution!

Danger of damage to the stop valves by heat transfer!

If the final connections to the combi boiler are made using soldered pipe connections, you must be particularly careful not to damage the stop valves by heat transfer.

Note
 Before connecting the heating circuit to the combi boiler all pipework and radiators must be thoroughly flushed out to remove all contaminants.

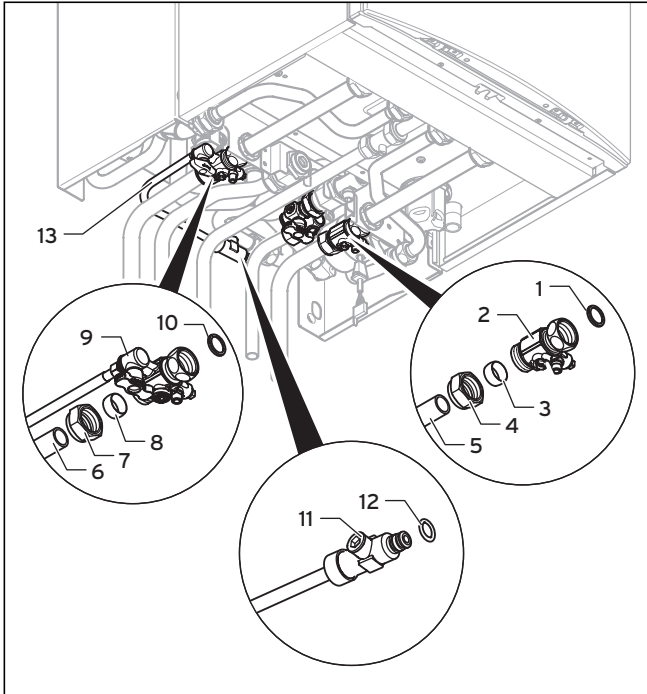


Fig. 4.9 Flow and return heating connections

- Remove the stop valves with union nuts, olives and fibre seals from the box of accessories for the combi boiler.
- Insert the fibre seal (1) and screw the stop valve (2) onto the return pipe connection on the combi boiler.
- Insert the fibre seal (10) and screw the stop valve (9) with the fitted flexible hose (13) onto the flow connection of the combi boiler.
- Fit the O-ring seal (12) to the non-return valve (11).

Note
 Lay the filling loop hose (13) above the pipe-work elbows.

- Push the union nuts (4) and (7) with olives (3) and (8) onto the pre-shaped 22 mm pipes (5) and (6).
- Push the pipes (5) and (6) into the stop valves up to the stop. Tighten the union nuts in this position.
- Fit the handle for the filling loop to the cold water stop valve (9) with a countersunk screw.

Caution!
 Please note that, when fitting a low loss header the diameter of the connection lines between the unit and the diverter must not be greater than 22 mm.

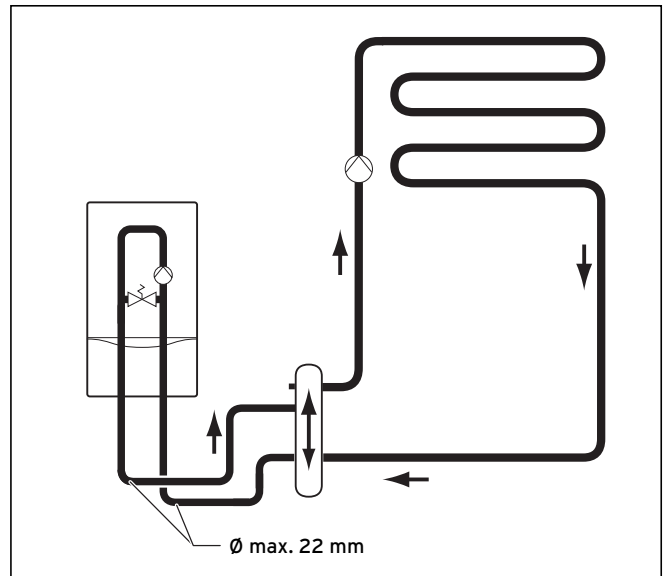


Fig. 4.10 Diameter of the connection lines when using a low loss header

4.15 Condensate drain

The combi boiler is equipped with a condensate siphon. (The filling height is 145 mm.) The siphon collects the condensate in a vessel with a capacity of approx. 200 ml and feeds the entire contents to the drain pipe. This minimises the risk of the drain pipe freezing up.

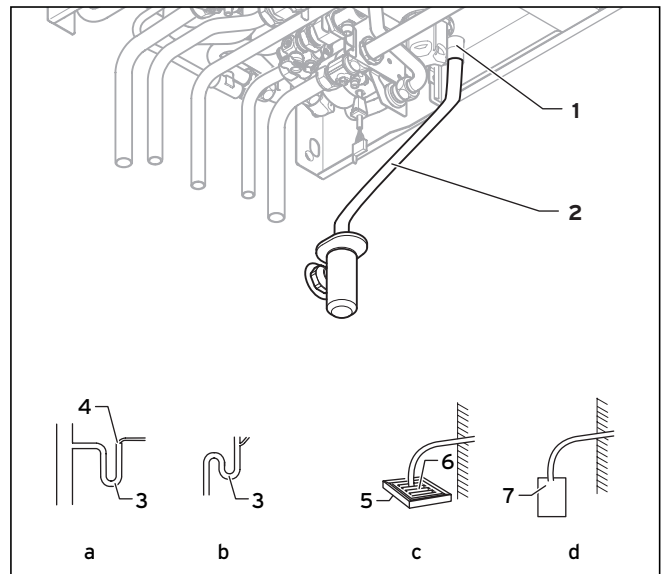


Fig. 4.11 Installing the condensate drain

- Connect the condensate drain (1) of the boiler to a condensate drain pipe (2) which has a minimum internal diameter of 19 mm (22 mm outside diameter for all external pipes) and which is made from an acid-resistant material (e.g. plastic overflow pipe).

Note
 The accessories for the storage tank include a corrugated hose for draining the condensate.

4 Sequence of operations during installation



Note

The drain pipe connected to the condensate drain of the combi boiler must have a constant gradient (45 mm per metre) and should be installed and terminate within the building to prevent the possibility of freezing up.

The condensate drain pipe must terminate in a suitable location, e.g.:

- a) preferably the discharge pipe should run and terminate internally to the house soil and vent stack (at least 450 mm above the invert of the stack). A trap giving a water seal of at least 75 mm (3) (built into the boiler) should be incorporated into the pipe run, and there must be an air break (4) in the discharge pipe upstream of the trap. The connection to the stack should not be made in a way that could cause cross flow into any other branch pipe, or from that branch pipe into the condensate drainpipe. This can be achieved by maintaining an offset between branch pipes of at least 110 mm on a 100 mm diameter stack and 250 mm on a 150 mm diameter stack.
- b) connecting into the internal discharge branch (e.g. sink waste or washing machine) with an external termination, the condensate discharge pipe should have a minimum diameter of 22 mm with no length restriction and should incorporate a trap with a 75 mm (3) (built into the boiler) seal. The connection should preferably be made down stream of the sink waste trap. If the connection is only possible upstream, then an air break is needed between the two traps. This is normally provided by the sink waste.
- c) terminating in a gully (5) below grid level (6) and above the water level. The external pipe length should be kept as short as possible to minimise the risk of freezing and should not be more than 3 m.
- d) at a condensate absorption point (soakaway) (7). The external pipe length should not be more than 3 m.

Further information can be obtained from "BS 6798 Specification for installation of gas-fired boilers of rated input not exceeding 70 kW net". The condensate siphon must be filled with water as described in Section 5.6 before the combi boiler is commissioned.

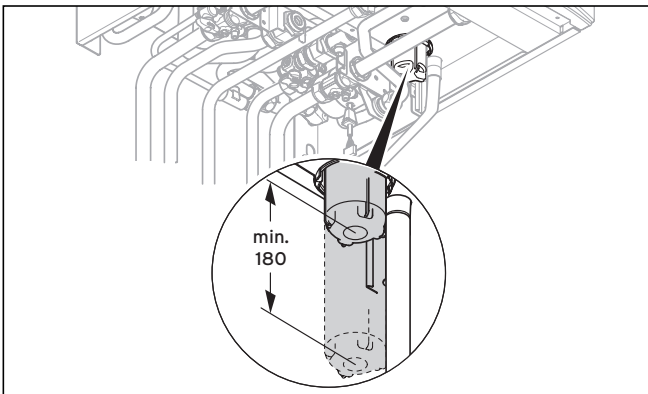


Fig. 4.12 Installation space condensate siphon



Danger!

Danger of poisoning!

In order to prevent exhaust gases from escaping from the combi boiler via the siphon, the siphon must be filled with water before the unit is switched on.

The discharge pipes must therefore be installed in such a way that they do not cause an obstruction and sufficient clearance exists to allow access to the condensate siphon.

There must be a minimum clearance of 180mm below the siphon for access.

4.16 Installing the pressure relief discharge pipework

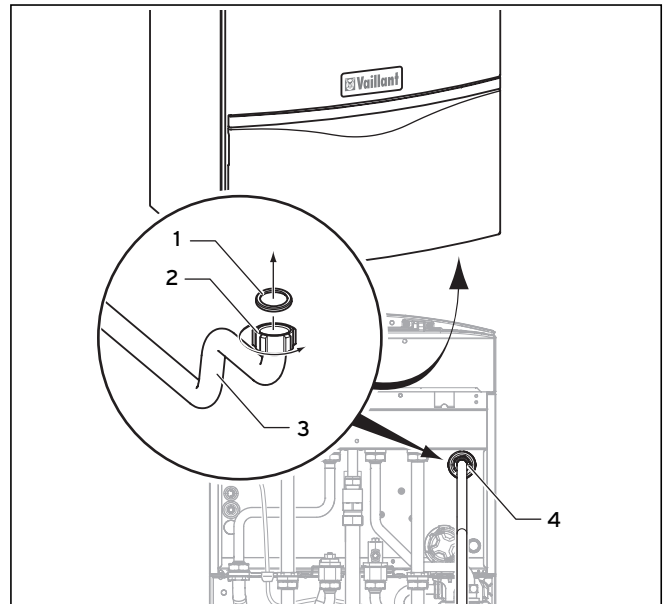


Fig. 4.13 Installing the discharge pipe

The pressure relief for the heating system is integrated into the boiler.

- Remove the discharge pipe with union nut and rubber seal from the box of accessories for the shift load storage tank.
- Insert the rubber seal (1) into the union nut (2) and screw the discharge (3) onto the pressure relief valve (4).
- The discharge pipework should be as short as possible with a continuous fall from the appliance.
- The discharge pipe should terminate in such a way that nobody can be injured and no cable or other electrical components can be damaged if water or steam is discharged. Please note that the end of the discharge pipe must be visible.



Note

We recommend that the discharge pipe for the pressure relief valve is not shortened.

4.17 Storage tank pressure relief discharge pipe-work

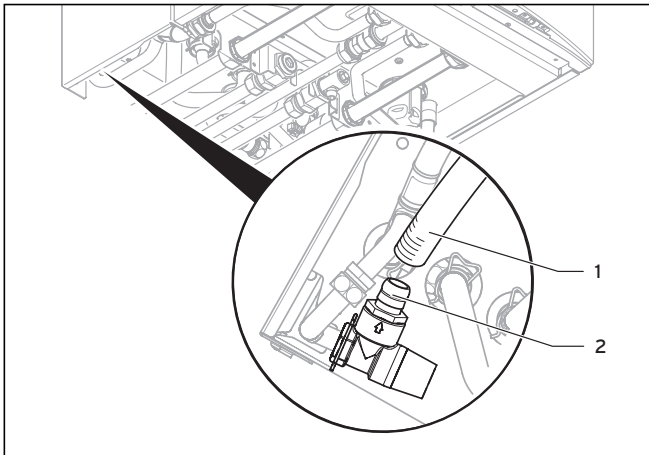


Fig. 4.14 Storage tank pressure relief discharge pipe connection

The safety valve for the hot water system is integrated in the shift load storage tank.

- Remove the flexible drain hose from the box of accessories for the shift load storage tank.
- Push the drain hose (1) onto the safety valve (2). The end of the drain hose can be directed via an open connection to a tundish and terminated in a similar manner to the boiler pressure relief discharge pipe.

4.18 Connecting the flue system to the combination boiler

- Refer to the separate air/flue duct installation instructions included with the appliance.

4.19 Electrical connection

4.19.1 General requirements



Danger!
Risk of fatal electric shock from touching live connections!
Before working on the appliance, turn off the power supply and secure against restart! All work on the electrical system should be carried out by a competent person and must be in accordance with BS 7671 (IEE Regulations). In the Irish Republic the current issue of the ETCI Regulations (Electro-Technical Council for Ireland) must be observed.



Caution!
For the electrical connection observe the relevant installation instructions for the ecoTEC combi boilers and the country-specific regulations.

The appliance is designed for connection to 230 V, ~ 50 Hz supply with a 3 A rating. Connection to the mains supply shall be made via a fused 3 pin plug to an unswitched shuttered, and should comply with BS 1363. (Alternatively the connection can also be carried out with a 3 A fused two-pole isolator, whose contact separation

at all poles is at least 3 mm and which supplies only the appliance and controls). The connection must permit complete isolation of the appliance and its connected controller from the mains supply. It should be easily accessible and be located in the proximity of the combi boiler. Use a three core flexible cable in accordance with BS 6500, Tables 6, 8 or 16 (3 x 0.75 to 3 x 1.5 mm²).



Danger!
Danger of death by electric shock!
The unit must be earthed.



Danger!
Danger of death by electric shock!
The power connections L and N continue to be under power when the main switch of the combi boiler is switched off.



Caution!
Danger of damage to the equipment!
Do not connect mains 230 V power to the terminals 7-8-9 or eBUS (+, -).



Note
Ensure that all wiring passes through the cable clamps in the rear of the control box and are securely fixed.

- Check that when connecting the mains wiring that the current carrying conductors become taut before the earth conductor should the supply cable slip from the cable clamp.

4.19.2 Connecting shift load storage tank

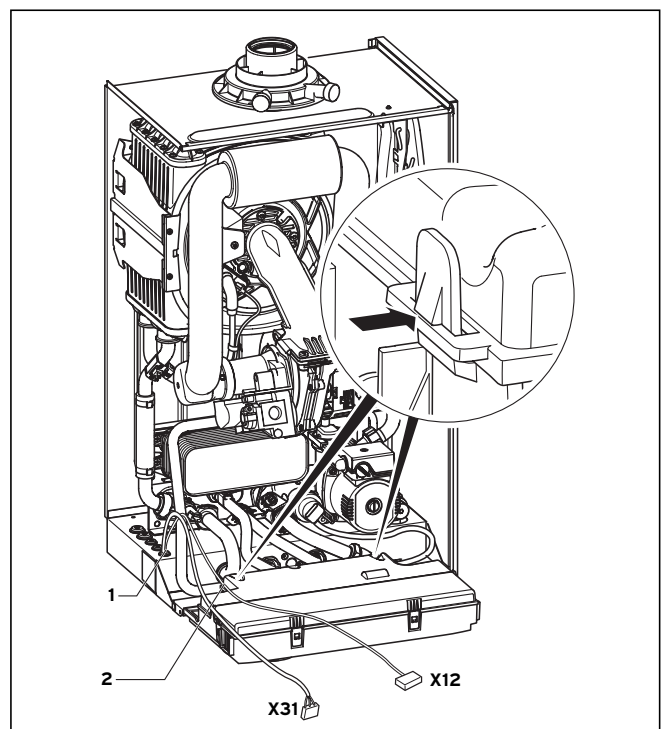


Fig. 4.15 Opening the electronics box

4 Sequence of operations during installation

- Pull the electronics box forward and lower.
- Unclip the back cover of the electronics box and lift the cover upwards to reveal the connections.

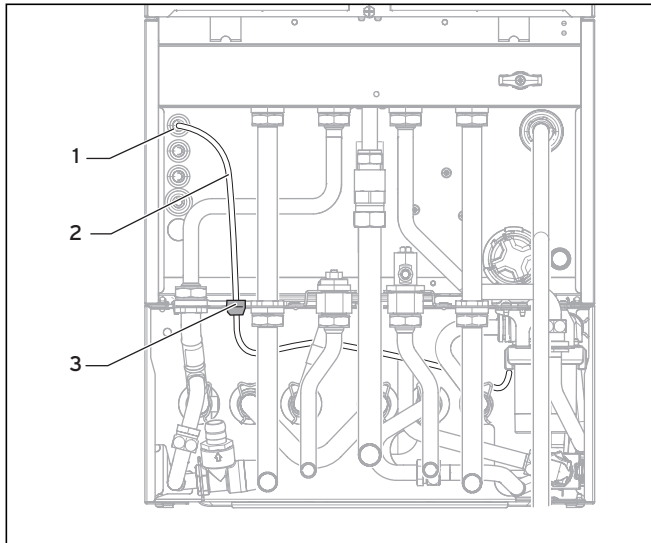


Fig. 4.16 Cable run on the underside of the unit

- Feed the wiring harness (2) of the shift load storage tank with the grommets (3) through the cable entries provided on the shift load storage tank and on the combi boiler. On the combi boiler use the cable entry at the very front (1).
- Fix the grommets to the cable entries using the spring clamps provided.



Caution!
Danger of cable damage!
Observe the routing of the cable!
The cables must not touch hot unit components!

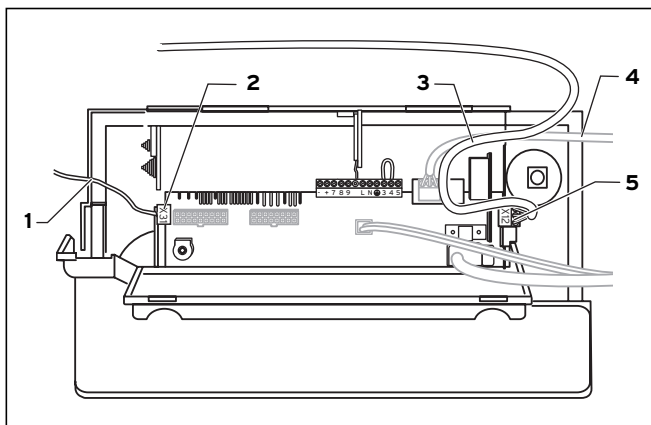


Fig. 4.17 Cable routing in the electronics box

- Run the pump cable X12 (3) outside the electronics box.
- Push the plug X12 of the pump cable onto the plug socket X12 (5) on the printed circuit board.

- Run the sensor cable (1) with plug X31 to the printed circuit board.
- Push the flat connector X31 onto the plug socket X31 (2) (left-hand side of the printed circuit board).
- Fix the cable (4) in the electronics box via the cable clamps.

4.19.3 Connection the power supply

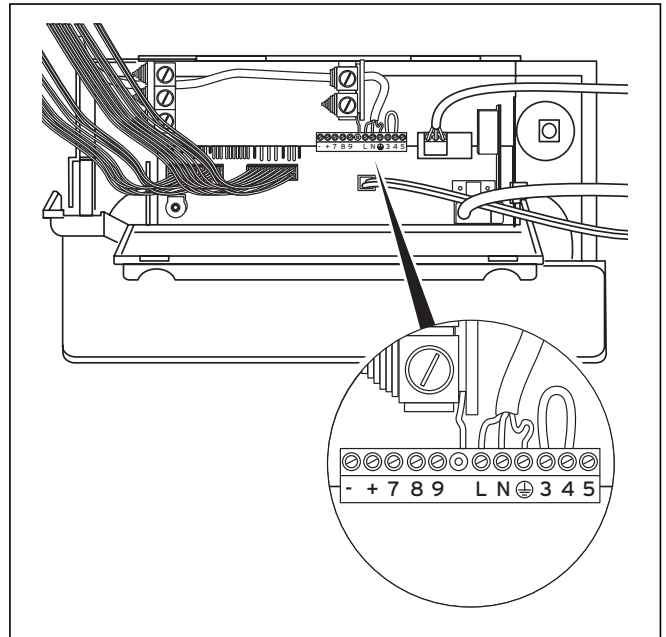


Fig. 4.18 Connecting the power supply

- Run the flex through the cable entries provided in the combi boiler and in the electronics box and tighten the cable clamps.
- Connect the flex to terminals L and N and the earth connection of the terminal block.

Green-yellow wire (earth)	Boiler connection earth symbol
Blue wire (neutral)	Boiler connection N
Brown wire (live)	Boiler connection L



Note
Do not connect power to the terminals 7-8-9 or eBUS (+, -).

Note
Make sure that the cables are securely fixed in the terminal blocks.

- Refit the electronics box cover by pushing into place until it clips back into position ensuring all wires are not trapped or pinched.
- Lift the electronics box up and secure.

4.19.4 Wiring diagrams

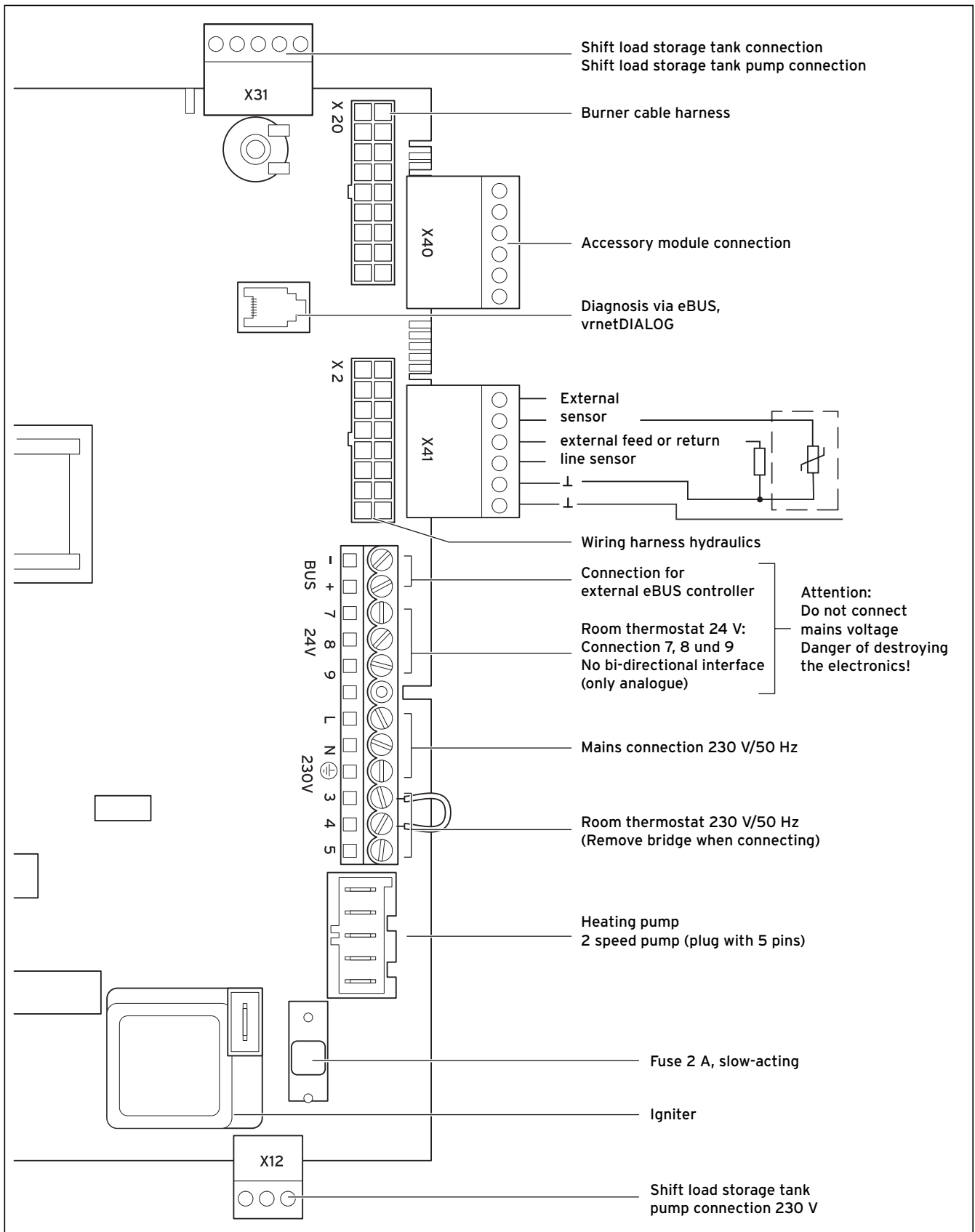


Fig. 4.19 Wiring diagram electronics box

4 Sequence of operations during installation

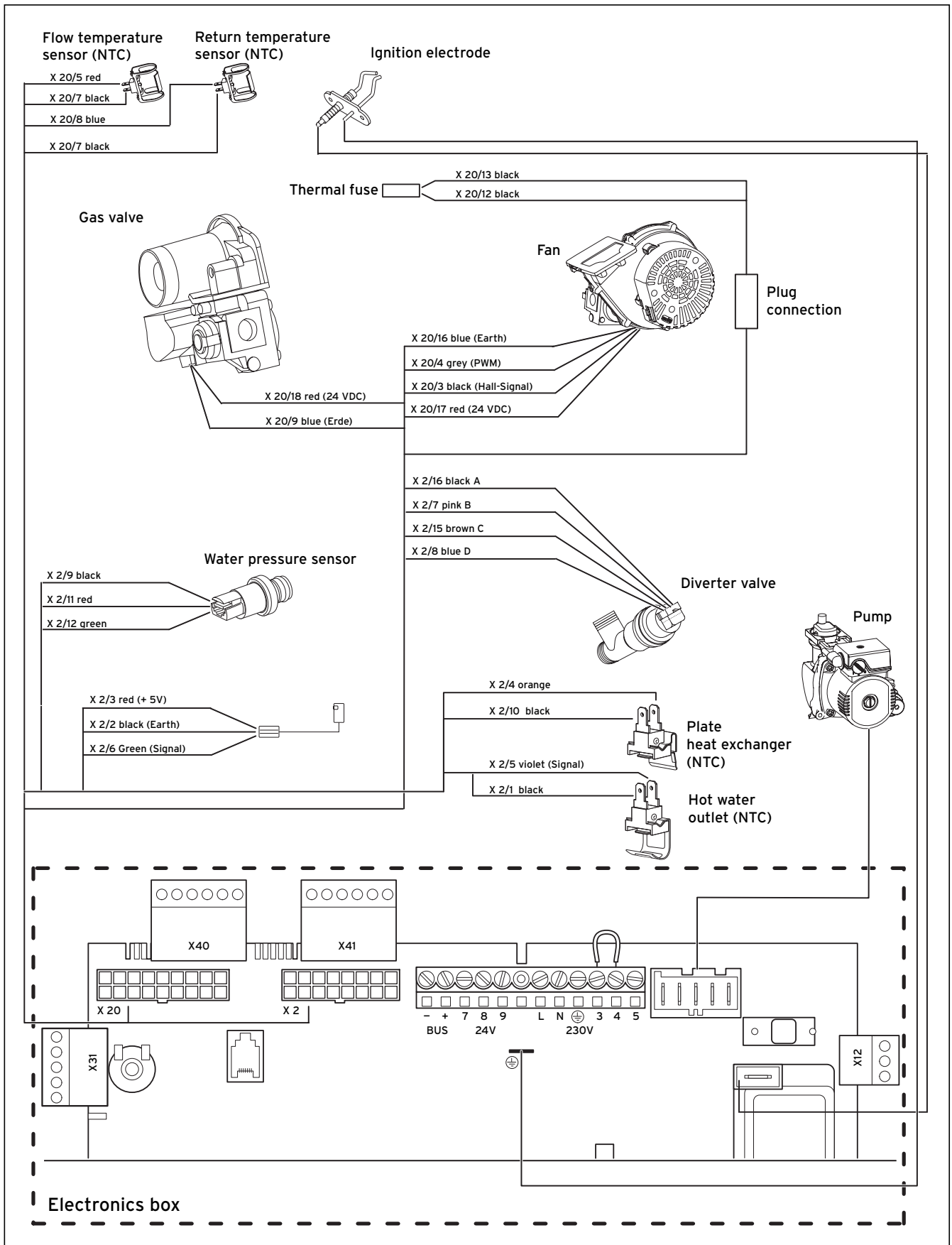


Fig. 4.20 Wiring diagram combi boiler

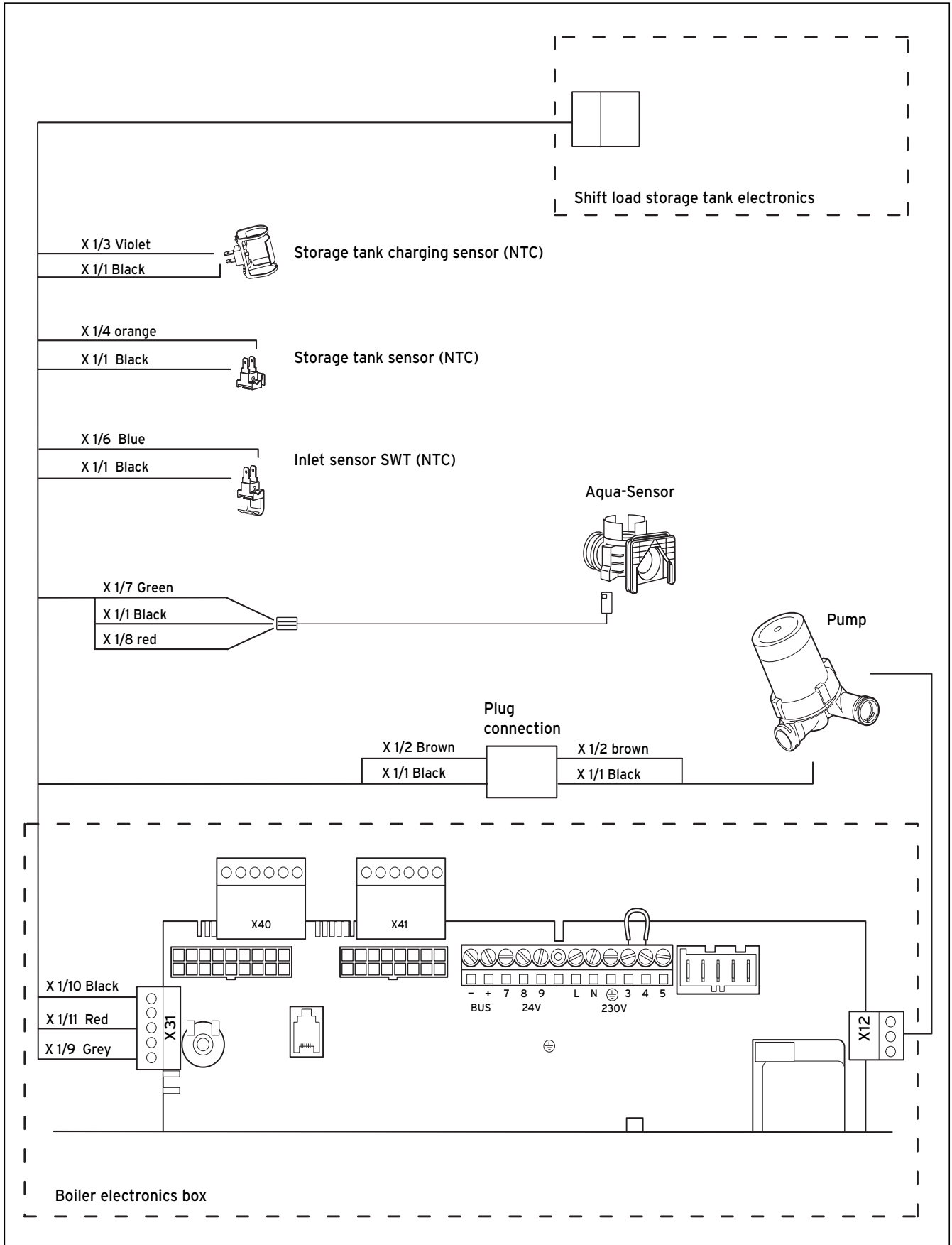


Fig. 4.21 Wiring diagram shift load storage tank

4 Sequence of operations during installation

4.20 Control units

4.20.1 Vaillant control units and accessories

Controller	Item no.	Connection
VRC 400 (1-circuit controller, weather-controlled)	0020010843	Installation in electronics box (plug-and-play)
VRT 360 (room temperature controller)	0020010842	Wall-mounted, 2-wire bus
VRT 360f (room temperature controller)	0020018258	Wireless controller, receiver wall-mounted
VRT 230 (room temperature controller)	0020010841	Wall-mounted, 3-wire connection to terminals 3-4-5
timeSWITCH 140 (timer)	306 760	Installation in electronics box (plug-and-play)
timeSWITCH 130 (timer)	306 759	Installation in electronics box (plug-and-play)
VRT 30 (room thermostat)	300 637	Wall-mounted, 3-wire connection to terminals 3-4-5
VRT 30 (room thermostat)	0020018265	Wall-mounted, 2-wire bus
Telecommunication	Item no.	Connection
vrnetDIALOG 830 (Int)	0020003988	GSM/GPRS, installation in electronics box (plug-and-play)
vrnetDIALOG 860/2 (Int)	0020003984	Wall-mounted, GSM/GPRS, up to 16 appliances
Accessories	Item no.	Connection
VR 65 control centre for UK cylinder installation (eBUS)	307 215	System solution for UK cylinder connection
vrDIALOG 810/2	0020023370	Diagnostic software

Table 4.1 Vaillant control units and accessories

4.20.2 External electrical controllers

The boiler terminals 3, 4 and 5 on the combi boiler are for the connection of external controllers, for example a timer and/or a room thermostat. Terminals 3 and 4 are linked together from the factory. If external controllers are used, this link must be removed and the controllers must be connected to terminals 3 and 4.

Terminal 5 is an additional neutral line for example for the anticipator of a room thermostat.

4.20.3 Details for the connection of an external timer to the terminal strip

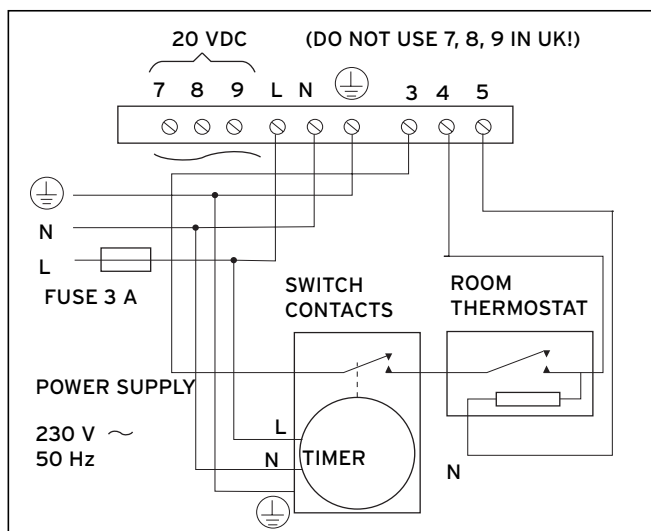


Fig. 4.22 Details for the connection of timers

If it is intended to connect a room thermostat in addition to a timer, the connection between the ON connec

tion of the timer and terminal 4 on the combi boiler must be broken by the contacts of the room thermostat (see circuit diagram Fig. 4.22).

4.20.4 Optional plug-in timers by Vaillant

Further details for the connection can be found in the relevant instructions of the accessories. The cover on the electronics box should be replaced after all the electrical connections have been made. The cover is secured with two clips.

4.21 Thermostatic radiator valves

The combi boiler is equipped with an automatic adjustable by-pass valve which makes it ideal for use in systems with thermostatic radiator valves (an additional by-pass valve is not required). In the interests of optimum fuel economy, if thermostatic radiator valves are fitted they must be used in conjunction with an interlock block on the combi boiler. A programmable room thermostat or separate timer and room thermostat will ensure complete boiler shutdown when the heating demand is satisfied. (The radiator in the room containing the room thermostat should not be fitted with a TRV.)

4.22 Frost prevention

The combi boiler is equipped with an integrated frost protection thermostat for protecting the combi boiler. Additional protection measures must be taken to prevent external or exposed parts of the heating system and the house, for example the fitting of an external frost protection thermostat. This frost protection thermostat should be connected to the terminals 3 and 4 on the combi boiler, in parallel to all the other external heating controllers.



Note

External frost protection devices cannot be used if plug-in timers are used.

4.23 Heating pump

The combi boiler is fitted with a heating pump which is fully wired (additional cabling is not necessary). The pump has automatic overrun time after the combi boiler has switched off.

4.24 Anti-cyclic "Economiser" control system

The combi boiler is fitted with an anti-cyclic controller which ensures that energy wasting short term running of the combi boiler cannot occur. The controller prevents the combi boiler from switching on again within a preset time period after the last switch-off of the central heating. (Hot water preparation is not affected by this function. Hot water can be drawn off at any time.)



Note

For temporary cancellation of this switch-on protection system, turn the main switch ON/OFF of the combi boiler to position "0" and then a few seconds later switch to position "I".

4.25 Automatic pump spin control

The combi boiler is fitted with an internal controller which causes the fitted heating pump to switch on once in a 23 hour period and also operates the diverter valve. This controller prevents the jamming up of these components if the combi boiler is inactive for long periods. This controller is inactive if the power supply to the unit is switched off

5 Commissioning, Part I

5.1 Preparatory checks of the electrical system

- Check the electrical installation for short circuits, proper earthing and earth resistance and for correct polarity.

5.2 Gas supply

The entire gas installation including the gas meter must be inspected, checked for leaks and purged in accordance with BS 6891. In the Irish Republic (IE) in accordance with the current version of IS 813.

- Purge the gas supply by opening the gas isolator valve under the unit.



Danger!

Danger of explosions!

Provide adequate ventilation whilst doing the work.

Extinguish all open flames and do not smoke during purging.

- After purging re-tighten the gas isolator valve and check for leaks. (The combi boiler itself does not need to be purged.) This takes place through the automatic burner ignition monitoring system.)

5.3 Cold water supply

- Open all the domestic hot water taps supplied by the appliance.
- Open the mains water isolating valve supplying the appliance.
- Open the cold water isolating valve under the appliance. The water then flows through the combi boiler and the shift load storage tank to the hot water taps.
- Close all the hot water taps one after the other starting with the lowest one until the hot water pipework is vented.
- Check all hot and cold water pipes for leaks.

5.4 Filling the heating system



Note

Use the following test programmes for filling and venting the heating system:

Filling the heating system

- Use the test programme P6 for filling the heating system:

The diverter valve moves to the central position, the heating pump is not running and the unit does not go into heating mode.

- Use the test programme as described in Section 8.2.

Vent the heating system

- Use the test programme P.0 to vent the combi boiler, the heating system and the hot water circuit:

5 Commissioning, Part I

The unit does not go to heating mode, the heating pump runs intermittently and alternately vents the heating circuit and the hot water circuit. • Use the test programme as described in Section 8.2.

5.4.1 Checking the filling pressure of the heating system

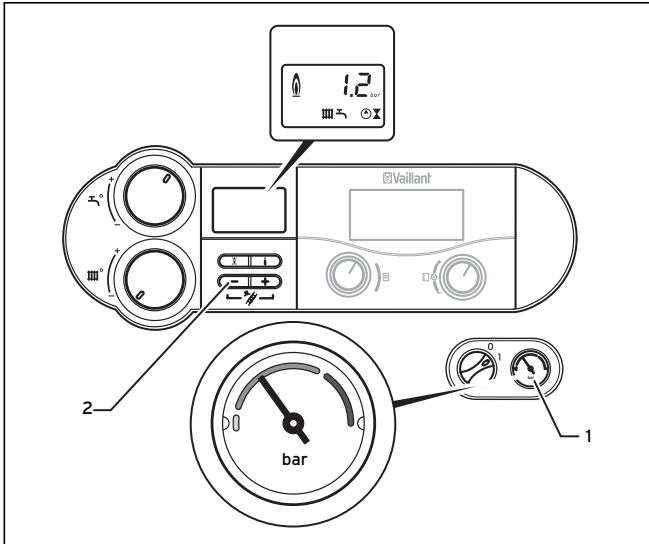


Fig. 5.1 Checking the filling pressure of the heating system

Note

The ecoTEC plus 937 is supplied fitted with a pressure gauge and a digital pressure display. Using the pressure gauge you can perform a quick check whether the filling pressure is within the prescribed range or not, even when the unit is switched off. With the unit switched on, you can read off the exact pressure by pushing the button "-" (2).

For proper operation of the heating system, when the installation is cold, the pointer on the pressure gauge (1) should be in the dark-grey area. This corresponds to a filling pressure between 1.0 and 2.0 bar. If the pointer is in the light grey area, top up with water. If the heating system extends over several storeys, the system may require a higher filling pressure.

5.4.2 Filling device for ecoTEC plus 937

The ecoTEC plus 937 is fitted with a filling loop.

- Push the double check (1) of the filling loop into the cold water stop valve (2) and secure the double check valve (1) with the spring clip (4).
- First open the stop valve to perform the filling (3).
- Open the cold water stop valve (2) so that the water flows into the heating system. Fill the heating system as described in Section 5.4.3.
- After filling close both stop valves and remove the filling loop by pulling the double check valve (1) off the cold water stop valve (2) (see Fig. 5.2).

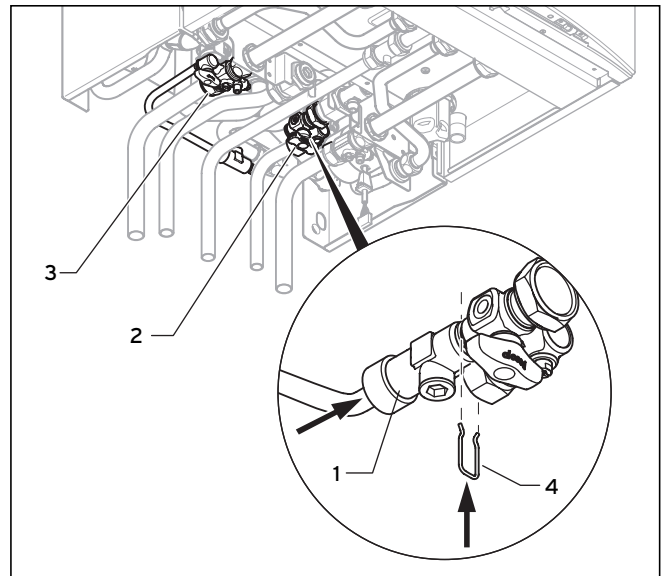


Fig. 5.2 Filling device



Note

Both stop valves must be closed during the operation of the heating system and the filling loop must be removed from the double check valve again.

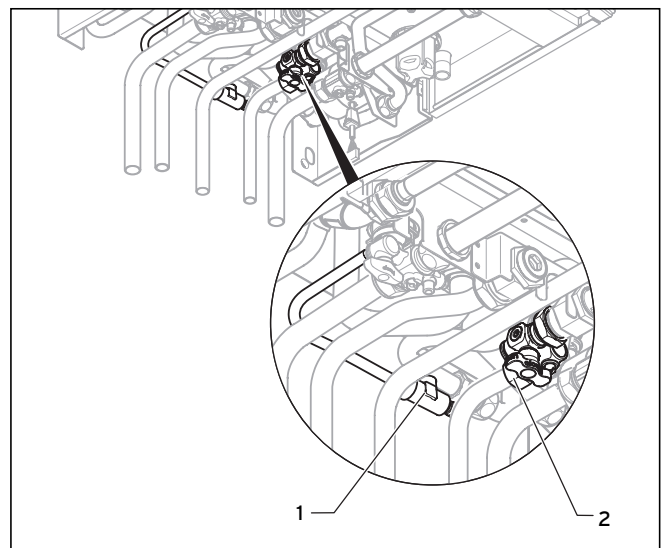


Fig. 5.3 Double check valve separated from the system during the heating process

5.4.3 Initial filling of the heating system



Note

If the water pressure in the heating system is too low the display switches between error message F.22 and the display of the actual pressure when the unit is switched on.

Fill the heating system as follows:

- Open all thermostatic radiator valves.

- Check that both stop valves on the combi boiler are open.
- Connect the filling loop as described in Section 5.4.2.
- Open the water stop valve.
- Slowly open the isolator valve in the filling loop so that water can flow into the heating system. Bleed the radiator at the lowest point until water flows out of the bleed valve without bubbles.
- Bleed all other radiators until the heating system is completely filled with water, all bleed valves have been shut and the manometer pointer is in the centre of the dark grey area. Bleed the heating pump by loosening the central screw. Close the filling loop valve and the cold water stop valve.
- Loosen the cap on the automatic air vent by a couple of turns. (In continuous mode the unit is vented independently by the automatic air vent system.)
- Check all connections and the entire system for leaks.

5.5 Initial flushing of the system ("cold")

Note

The entire heating system must be flushed through completely at least twice: once cold and once hot, in accordance with the following instructions.

- Check if all radiator thermostat valves and both stop valves on the combi boiler are open.
- Connect a hose to the drain valve which is located at the lowest position in the heating system.
- Open the 1/2" drain valves and all the bleed valves on the radiators so that the water flows quickly and completely out of the heating system and the combi boiler, in order to remove the contamination caused during the installation out of the heating system before the combi boiler is started up.
- Close the 1/2" drain valves and radiator bleed valves.
- Re-fill the heating system with water as described in Section 5.4.3.
- Check that the pressure relief valve in the heating system is functioning correctly by turning the handle on the valve.
- Check the pressure in the heating system and top up with water if necessary.
- Close the filling loop valve and the cold water stop valve.

5.6 Filling the condensate siphon



Danger!

If the condensate siphon is empty during operation of the combi boiler there is a danger that exhaust gases can flow into the room and cause poisoning. For this reason you must make sure that the siphon is filled up every time the unit is cleaned.

- Remove the lower section (1) of the condensate siphon by turning the bayonet connection in a counterclockwise direction a quarter of a turn.
- Fill the lower section with water until about 10 mm below the upper edge.
- Replace the lower section of the condensate siphon.

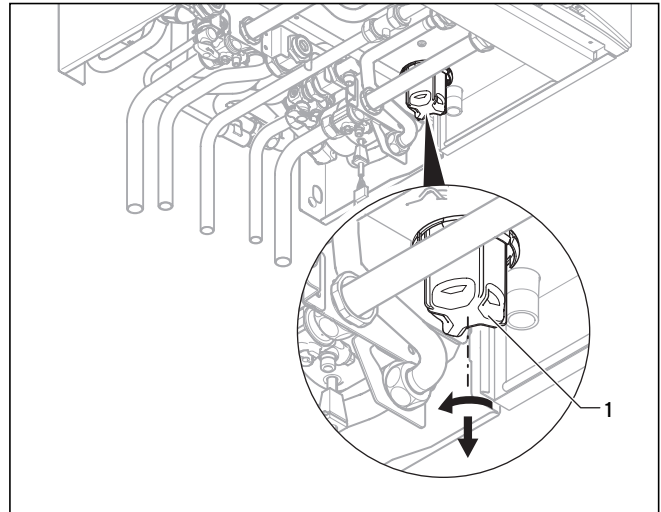


Fig. 5.4 Filling the condensate siphon

5.7 Setting the pump output

Only in ecoTEC plus appliances:

The output of the two-speed pump can be matched to the requirements of the heating system. If required, change the pump output, depending upon the setting of the operating mode, under diagnostic number "d.19" (see Section 8.1.2).

5.8 Adjusting the bypass

The appliance is equipped with an adjustable bypass valve. The pressure can be set between 170 and 350 mbar. The valve is pre-set to approx. 250 mbar (mid-position). Each turn of the setting screw changes the pressure by approx. 10 mbar. The pressure is increased by turning to the right and reduced by turning to the left.

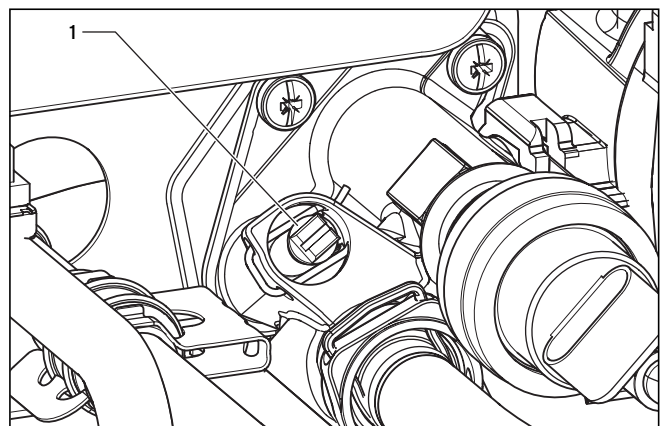


Fig. 5.5 Setting the bypass valve

- Setting the by-pass valve using the setting screw (1).

5 Commissioning, Part I

5.9 Checking the gas supply

5.9.1 Factory settings

Caution!
Before operating the boiler check the type-plate (data badge) underneath the appliance and ensure that the correct gas type appliance has been installed.

The combi boiler is supplied ready for operation and additional settings are not required; the gas inlet working pressure and the maximum gas rates should be checked, however, in accordance with the information in 5.9.2 and 5.9.3.

5.9.2 Gas inlet working pressure

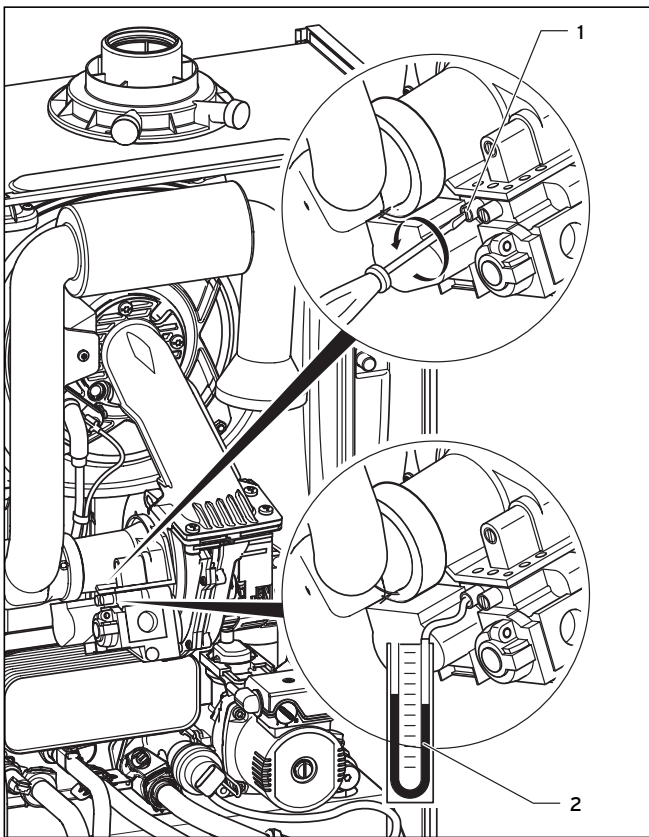


Fig. 5.6 Checking the gas inlet working pressure

Check the gas inlet working pressure as follows:
 Remove the front cover from the combi boiler.

- Close the gas isolator valve on the combi boiler.
- Loosen the sealing screw on the gas valve marked with (1) in the illustration.
- Connect a digital pressure gauge or U-tube manometer (2).
- Open the gas isolator valve on the combi boiler.
- Start up the combi boiler (see the operating instruction manual for the combi boiler).
- Read off the value from the U-tube manometer and make sure that the gas pressure is between the following values.

Caution!
Natural gas:
DO NOT continue with the settings or start up the unit if the supply pressure is not within the range 17-25 mbar.

Caution!
Liquid gas:
DO NOT continue with the settings or start up the unit if the supply pressure is less than 37 mbar.

- Turn the unit off and remove the U-tube manometer.
- Tighten the test point screw and check for leaks.
- Record the inlet working pressure (mbar) in the Benchmark gas boiler commissioning checklist.

5.9.3 Checking the gas rate

The combi boiler is equipped with a fully modulating automatic gas valve which ensures that the correct air-gas mixture is provided under all operating conditions. The gas rate is set in the factory and need not be adjusted subsequently.

With the front cover fitted, the gas rate of the combi boiler is checked as follows:

- Activate the operating mode full load operation by simultaneously pushing the buttons "+" and "-" on the display (alternatively fully open the hot water tap).
- Wait at least 5 minutes or until the combi boiler has reached its operating temperature.
- With all other gas appliances are switched off, measure the gas rate on the gas meter. The gas rate must correspond to the values given in Table 5.1.

Caution!
If the measured gas rate lies outside the tolerance limits specified in Table 5.1, do not operate the appliance and inform the Vaillant Customer Service.

Appliance	Maximum heat supply in kW	Gas rate					
		Natural gas in m ³ /h			Propane in kg/h		
		nominal	+ 5 %	- 10 %	nominal	+ 5 %	- 10 %
ecoTEC plus 937	37.8	4.00	4.20	3.60	2.94	3.09	2.65

Table 5.1 Gas rate

5.10 Fitting the front casing

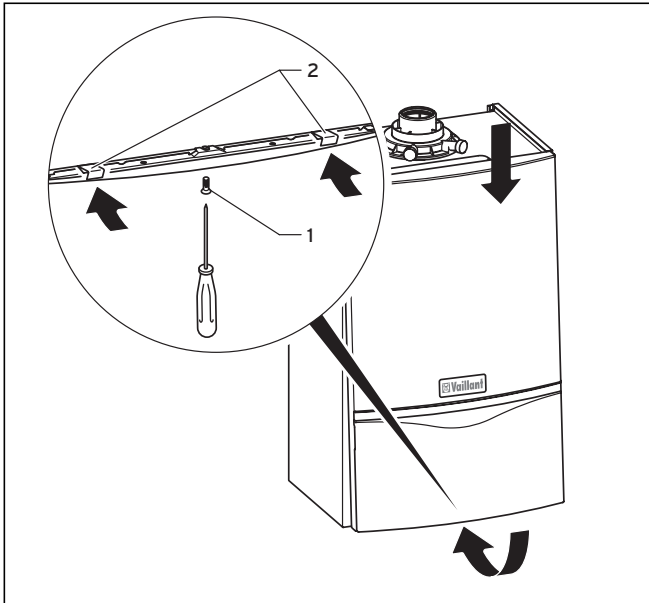


Fig. 5.7 Fitting the front casing

- Hook the front casing section into the tabs at the top of the frame of the combi boiler and slide the lower section of the casing into the position provided.
- Make sure that the spring clips (2) engage properly.
- Tighten the securing screw of the enclosure (1).

5.11 Setting the output of the central heating (range rating)

The appliance is fully modulating for central heating and it is therefore not necessary to range rate the appliance. However if desired it is possible to range rate the boiler as follows:

- Press the "i" and "+" buttons simultaneously.
- Hold the button "+" down until "d.0" is displayed.

Note

The display runs from "d.0" to "d.99" and then starts again at "d.0".

- Press the "i" button. The symbol "=" is displayed. Then the part load setting is shown in kW.
- Use the buttons "+" and "-", to increase or decrease the displayed value in steps of 1 kW. The displayed value flashes during the setting process. The available setting ranges are shown in Table 5.2.
- Push the button "i" for about five seconds or until the display stops flashing. This stores the value in the memory. The display reverts back to the normal status (display of current feed temperature, for example 45 °C).
- To de-activate the setting mode, simultaneously push the buttons "i" and "+". The setting mode is also de-activated if a button is not pushed within a period of 4 minutes.

Appliance	Heating output in kW
ecoTEC plus 937	12 - 28

Table 5.2 Setting the part load ranges of the heating system

5.12 Gas conversion



Note

To convert the appliance from natural gas to liquid gas you will need the Vaillant modification kit Part No. 00 20010641. To convert the appliance from liquid gas to natural gas you will need the Vaillant modification kit Part No. 00 20010642. Perform the conversion of the appliance in accordance with the description in the modification set.

6 Commissioning Part II: Functional checks

6.1 Functional checks

6.1.1 Method of procedure

After installing and setting the gas, perform a function check before commissioning the appliance and handing over to the user.

- Commission the appliance in accordance with the instructions in the relevant operating manual.
- Check the gas supply pipework, the flue system, the heating system and the hot water pipework for leaks.
- Check that the flue system is properly fitted in accordance with the installation instructions for the flue system.
- Check the ignition and whether the burner is showing a consistent flame picture.
- Carry out a function check of the heating system (see Section 6.1.2) and the hot water preparation (see Section 6.1.3).
- Hand over the appliance to the user (see Section 6.2).

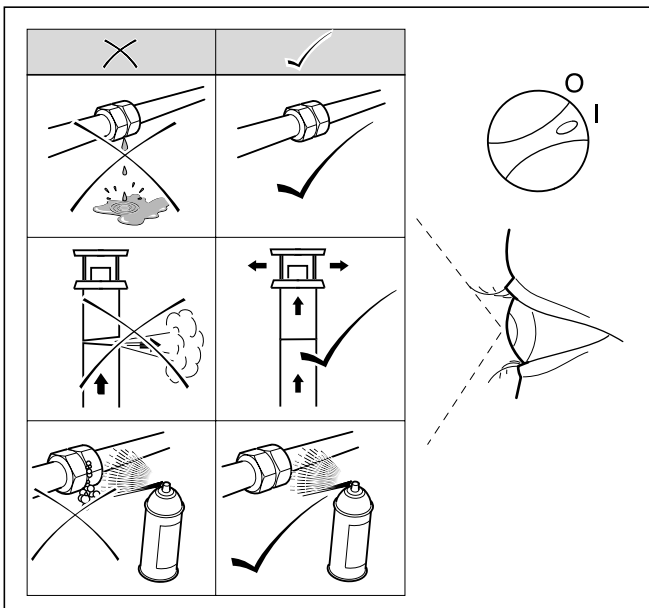


Fig. 6.1 Function check

6.1.2 Heating

- Switch on the appliance.
- Make sure that there is a heat demand.
- Press "i" to activate the status indicator.

As soon as there is a heat demand the display runs through status indications "S. 1" to "S. 3", until the appliance is running properly in normal operation and the display shows "S. 4".

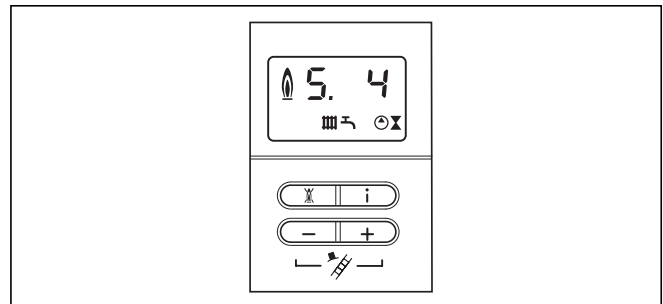


Fig. 6.2 Display in heating mode

6.1.3 Hot water operation

- Switch on the appliance.
- Open the hot water tap fully.
- Press "i" to activate the status indicator.

If the hot water operation is operating properly, the display shows "S.14".

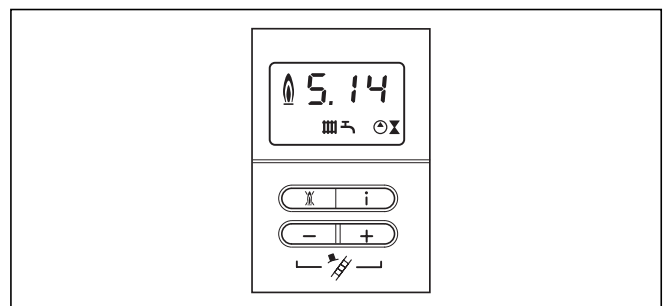


Fig. 6.3 Display during hot water preparation

6.1.4 Storage tank charging



Note

The storage tank charging is delivered de-activated and must be activated during commissioning.

The storage tank charging of the shift load storage tank is only active if the warm start function is switched on. This is shown by the symbol **C** in the display.

With the storage tank charging function switched on you can set the following temperatures using the knob for hot water draw-off temperature:

- Knob setting "b" 50 °C
- Knob setting "a" 65 °C

With the storage tank charging function switched off you can set the following temperatures using the knob for hot water draw-off temperature:

- Knob setting "c" 35 °C
- Knob setting "a" 65 °C

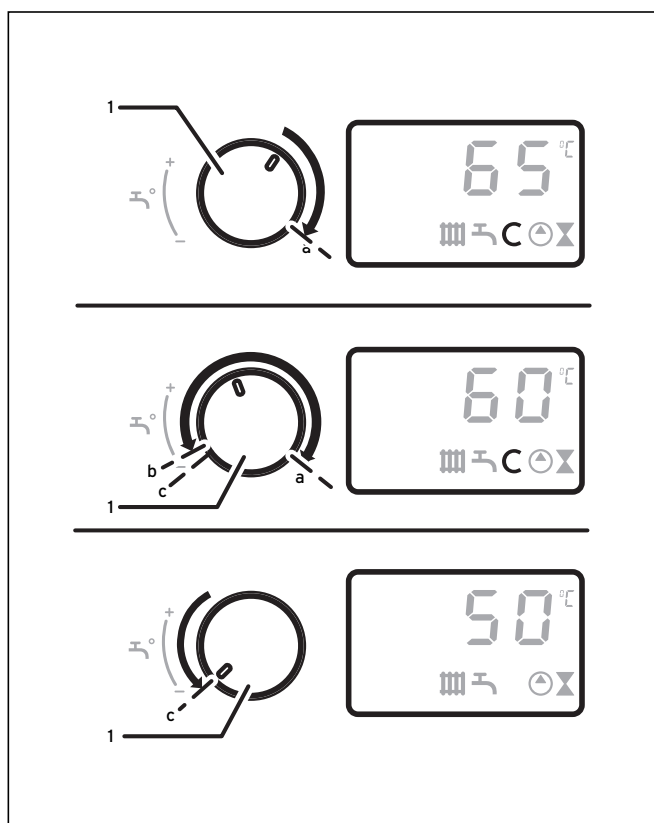


Fig. 6.4 Setting range for the storage tank temperature

If the storage tank charging function is switched off the storage tank is not held at temperature. In this case the unit switches on when water is drawn off and operates on a through-flow principle.



Danger!

Danger of scalding!

The units are fitted with automatic Legionella protection control:

If the temperature falls below 50 °C in the hot water storage tank the storage tank is heated up to 70 °C once every 24 hours. In such a case there is a danger of scalding when drawing the water off.

The Legionella protection control can be de-activated in the diagnosis level "d.74".

Activating the storage tank charging

- Switch on the appliance.
- Activate the storage tank charging by turning the hot water temperature control knob fully clockwise.

The symbol "C" is displayed.

- Turn the hot water temperature control knob to the temperature you require.
- Press "i" to activate the status indicator.

During the storage tank charging the display shows "S.24".

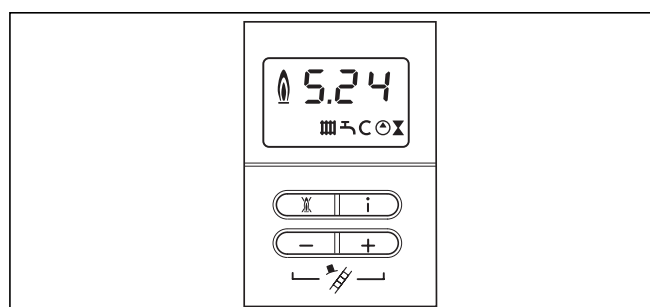


Fig. 6.5 Display during storage tank charging

De-activating the storage tank charging

- De-activate the storage tank charging by turning the hot water temperature control knob fully anti-clockwise.

The symbol "C" disappears.

- Then set the desired hot water temperature. The unit now operates in the through-flow principle, the storage tank is not held at temperature.

6.1.5 Subsequent flushing through of the heating system ("hot")

- Allow the appliance to run until both the appliance and the heating system have reached their operating temperature.
- Check the heating system for leaks.
- Connect a hose to the drain valve which is located at the lowest position in the heating system.
- Shut off the appliance, open the drain valve and all vent valves on the radiators and allow the water to flow out of the heating system and the combi boiler quickly and fully.
- Close the drain valve.
- Re-fill the heating system with water as described in Section 5.4.3.
- Drain water out of the system until a system pressure of 1.0 bar is reached. (The ideal measured value on the pressure gauge is 0.5 bar plus an extra amount corresponding to the highest point of the system above the combi boiler. A height of 10 m corresponds to a pressure increase on the pressure gauge of around 1 bar. The pressure must not be less than 1 bar on any installation.)

If the system is to be protected by an inhibitor, it should be added at this stage in accordance with the manufacturer's instructions.

Further information can be obtained from Sentinel, Betz Dearborn Ltd., Tel.: 0151 420 9595, or from Fernox, Alpha-Fry technologies, Tel.: 0870 8700362.

- Re-fit the enclosure of the combi boiler (see Section 5.10).
- Fit the base cover to the combi boiler and shift load storage tank by pushing the front edge of the cover into the retaining tag on the front lower edge of the unit framework.
- Carefully push the base cover upwards until the spring clips on the side of the unit engage. It may be neces-

6 Commissioning, Part II: Functional checks

sary to modify the base cover by removing the easily removable breakaway sections.

6.2 Handing over the boiler to the owner



Note

When you have finished the installation, attach the sticker supplied (835 593) to the appliance in the user's language.

- Set the controller for the maximum radiator temperature to the required temperature.
- Set the controller for the maximum hot water temperature to the required temperature.
- Instruct the operator in the safe and efficient operation of the combi boiler, paying particular attention to the functions of:
 - the ON/OFF switch of the combi boiler,
 - the controller for the maximum radiator temperature,
 - the controller for the maximum hot water temperature (only on combination boilers),
 - the pressure gauge.
- Make the operator acquainted with the operation of any external controllers.
- Explain to the operator the importance of regular maintenance by a competent heating engineer. It is strongly recommended that a maintenance contract be taken out to ensure regular maintenance. Further information can be obtained from Vaillant Service Solutions (0870 6060 777).
- Enter the operating pressure of the central heating system, the heat input (in kW) and the temperature difference between the flow and return in the Benchmark gas boiler commissioning checklist. If the appliance is not installed and commissioned in accordance with manufacturer's instructions this can lead to invalidation of the guarantee (Note: Your legal rights remain unaffected by this.)
- Leave the operating and installation instructions with the operator of the appliance.

6.3 Vaillant warranty

6.3.1 Two years warranty

Vaillant is obliged to resolve manufacturing faults which arise during the first 24 months after installation. A prerequisite for the effectivity of the guarantee in the second year is that an annual service is carried out one year after commissioning by a CORGI registered installer. The costs for this annual service is not included in the guarantee. The appliance must be installed by a suitably competent person in accordance with the Gas Safety (Installation and Use) Regulations 1998, and the manufacturer's instructions. Failure to install and commission this appliance in accordance with the manufacturer's instructions may invalidate the warranty (this does not affect statutory rights).

6.3.2 Registering with us

Registration with us is simple. Just fill in the card for guarantee registration and return it to Vaillant within 30 days from the date of installation. Your details are automatically entered in the Vaillant guarantee scheme.



Note

A receipt is not issued.

6.3.3 First aid

In the event of a fault on your Vaillant boiler firstly consult your installer since his services must be obtained as a condition of the guarantee.

If you cannot contact your installer contact Vaillant Service Solutions on phone number 0870 6060 777.

7 Inspection and maintenance

7.1 First inspection

Regular maintenance and service is recommended to ensure continued safe and efficient operation of the appliance. The frequency of maintenance and service depends upon the individual installation conditions and upon the use the appliance is put to. An inspection must be performed once a year.



Danger!

It is a legal requirement that all maintenance work be performed by competent personnel (CORGI registered).

Inspection and maintenance work which is not carried out by a competent person can result in injury and property damage.

In order to ensure all the functions of the Vaillant appliance over a long period, only genuine Vaillant spare parts may be used when undertaking maintenance, service and repair work. Any spare parts which might be required are contained in the current Vaillant spare parts catalogues. Further information can be obtained from Vaillant Customer Service Centres.

7.1.1 Safety instructions

Important:

Observe the following instructions before starting the maintenance work:

- Isolate the appliance from the electrical mains by pulling the mains plug out of the socket. (If there is only an isolator, the fuse must be removed from the switch).
- Turn OFF the gas supply at the gas isolator valve on the appliance.
- Take care when removing water-carrying components that all electrical components are kept away from the water.
- Always fit new seals and O-rings when replacing components.
- Always carry out a gas tightness test and always carry out a function check after completion of maintenance work or after replacing gas-carrying components.
- After all maintenance work and after replacing electrical components check the earth continuity, polarity and earth resistance using a multi-meter.



Danger!

Electric shock by touching current-conducting parts can be fatal!

The electrical mains supply terminals in the electronics box remain live even when the main switch ON/OFF is switched off.

Protect the electronics box from water splashes. Before working on the appliance, turn off the power supply and secure against restart!

Always perform the following steps after performing any maintenance work:

- Open the stop valves in the heating flow and return lines and the cold water stop valve.
- If required, fill the unit with cold water up to a pressure of approx. 1.5 bar and bleed the heating system.
- Open the stop valve of the gas supply pipe.
- Turn on the power supply and the main switch.
- Check the appliance for gas and water leaks.
- If necessary, refill and re-bleed the heating system.



Note

If it is necessary to keep the main ON/OFF switch on for certain inspection and maintenance activities this is indicated in the description of the maintenance task.

Note

The appliance is fitted with a combustion analysis test point. A suitable flue gas analyser can be connected to determine the combustion efficiency of the boiler. This check is required during an annual service (alternative methods are described if no flue gas analyser is available). A combustion analyser must be used for the following circumstances:

Replacing the gas valve, converting to or from natural gas/LPG or if poor combustion is suspected. (see section 9.7).

7.1.2 Maintenance

Carry out a first inspection of the system before starting maintenance or repair work as follows:

- Check the flue system, the pipework and the electrical connections for signs of damage or wear.
- Check the air supply and ventilation of the installation.
- Check the heating and water system, especially the condition of the radiator valves, evidence of leaks in the heating system and dripping hot water taps.

7 Inspection and maintenance

7.1.3 Overview of inspection and maintenance tasks

No.	Step	Column 1 An inspection must be performed once a year.	Column 2 Maintenance
1	Check flue system and make sure that it is not blocked, not damaged and fixed correctly.	x	
2	Measure the gas rate in operation (see Table 5.1 in Section Commissioning, Part I). If the gas rate is less than the minimum value, carry out maintenance work (Column 2).	x	
3	Check combustion by measuring the CO and CO ₂ values, compare with values in Table 9.2. Carry out the maintenance if the measured values are outside the tolerances (Column 2). If flue gas analyser is not available, check the ignition process and the flame picture on the burner through the sight glass; if incomplete combustion is evident carry out maintenance (Column 2)	x	
4	Isolate the unit from the electrical mains, close the gas and the water service valves.		x
5	Inspect the entire primary heat exchanger area for visible signs of corrosion, sooting up or other damage. If damage is detected, carry out maintenance work (Column 2).	x	
6	Remove compact thermo-module (as described in Section 7.2.1), if maintenance is required as a result of steps 2, 3 or 5. Clean the primary heat exchanger. Fit seal kit for burner door (observe the fitting instructions included with the seal kit). Re-fit the compact thermo-module and tighten the nuts.		x
7	Check whether the electrical plug connections and other connections are fitted tightly and make adjustments, if necessary.	x	x
8	Check expansion vessel of the combi boiler. If required, correct the pressure.	x	x
9	Check combi boiler in general, check combi boiler for dirt/dust and clean if required.	x	x
10	Check and clean the condensate trap and discharge pipes.	x	x
11	Open gas inlet and stop valves, connect unit to the electrical mains and switch on.	x	x
12	Test the unit and the heating system including the hot water operation. Bleed if required.	x	x
13	Check the expansion vessel of the shift load storage tank. If required, correct the pressure.	x	x
14	Fill the pressure in the combi boiler or in the heating system to approx. 1.0 - 2.0 bar (dependent upon the static height of the plant).	x	x
15	Measure the gas rate during operation and check that it is within tolerances (see Table 5.1 in Section Commissioning, Part I).		x
16	Check combustion by measuring the CO and CO ₂ values, compare with values in Table 9.2. The measured values must be in tolerance. If there is no combustion analyser is available, check the ignition process and the flame picture on the burner visually through the sight glass;		x
17	Check the boiler for any leaks and seal if necessary.	x	x
18	Fill out gas commissioning checklist (Benchmark).	x	x

Table 7.1 Inspection and maintenance steps

7.1.4 Function check of the combination boiler

- Carry out a function check of the combi boiler as described earlier.
- Remove the front panel in accordance with the instructions and switch the combi boiler on.
- Check the function of the burner through the sight glass.
- Check that the flames consistently cover the surface of the burner.
- Take particular notice if the height of the flame is excessive and the production of soot.

7.2 Maintenance of the thermo-compact module

7.2.1 Removing the thermo-compact module

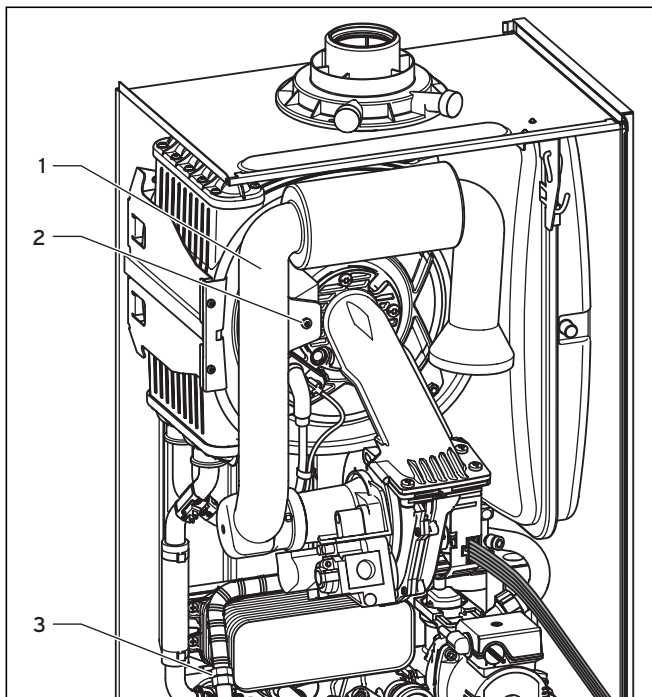


Fig. 7.1 Removing the air inlet pipe

The thermo-compact module consists of the burner, the fan, the gas valve and the gas supply (mixture pipe).



Danger!

There is danger of being burned or injured by the compact thermal module and at all components carrying water. Only carry out work on these components once they have cooled down.

Proceed as follows to remove it:

- Switch the combi boiler off.
- Isolate the power supply from the combi boiler.
- Remove the bottom cover (if fitted) of the combi boiler by releasing both the spring clips and lowering the back of the bottom cover downwards.
- Pull the bottom cover slightly towards the back
- Remove the bottom cover from the unit.
- Turn the stop valve off.
- Turn the stop valves of the central heating off.

- Release the screw and the spring clips on the front panel located under the front of the unit.
- Remove the front of the of the unit by pulling the bottom edge forwards and lifting slightly.
- Lower the electronic box.
- Unscrew the screw (2) and remove the air inlet pipe (1).
- Separate the gas supply line (3) from the gas valve. Make sure that the corrugated gas pipe does not twist by holding the flattened end of the pipe with an open-ended spanner whilst you release the cap nut.



Caution!

Danger of damage to the corrugated gas pipe! Under no circumstance may the compact thermal module be suspended from the flexible corrugated gas pipe.

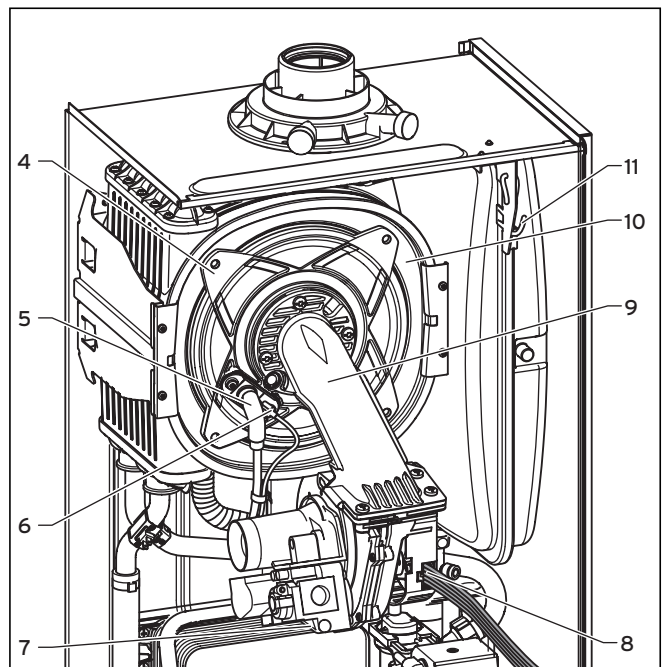


Fig. 7.2 Removal of the thermo-compact module

- Pull the ignition cable (5) and the earth wire (6) off the ignition electrode.
- Unscrew the four nuts (4) from the burner door.
- Pull the two electrical connections (7 and 8) off the fan and the gas valve.
- Pull the burner, gas valve and fan assembly (9) forwards off the integral condensation heat-exchanger (10).



Note

You can hang the thermo-compact module on the hook (11) whilst you perform the maintenance work.

- After removing the thermo-compact module clean the components in accordance with the following description.

7 Inspection and maintenance 7

7.2.2 Cleaning the integral condensation heat-exchanger



Caution!
Protect the electronics box from water splashes.

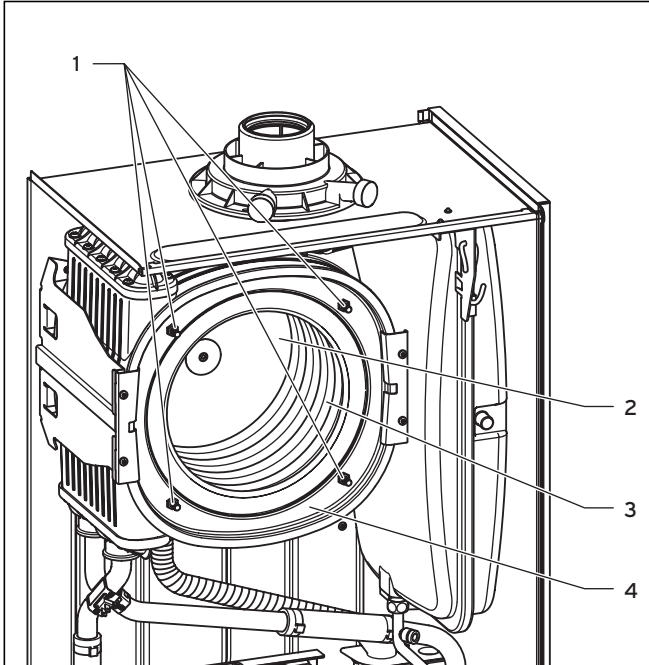


Fig. 7.3 Cleaning the heat-exchanger

- Dismantle the compact thermo module as described under 7.2.1.



Caution!
Danger of damage to the primary heat-exchanger!
Do not attempt to release or tighten the four screws (1).

After removal of the burner and fan assembly you can check the primary heat-exchanger (4).

- Remove the loose deposits from the heating coils (3) with a soft brush and a jet of water. Make sure that water is kept away from all electrical components. The water used to clean the primary heat-exchanger runs away through the condensate siphon. Avoid pointing the water jet directly at the insulating surface (2) on the back of the heat exchanger.

If necessary, the heat-exchanger can be cleaned using ordinary vinegar.

7.2.3 Checking the burner

The burner (1) is maintenance-free and needs no cleaning.

- Check the surface of the burner for damage. If necessary, replace the burner.
- After checking or replacing the burner re-fit the thermo-compact module as described in Section 7.2.4.

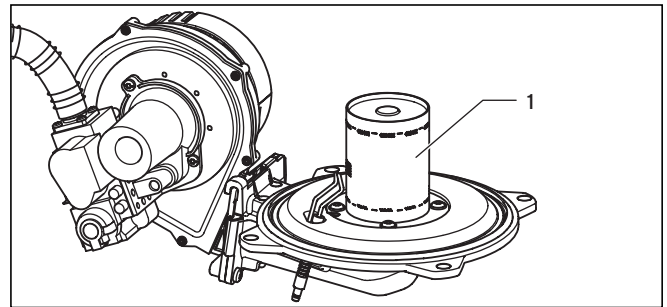


Fig. 7.4 Checking the burner

7.2.4 Fitting the thermo-compact module

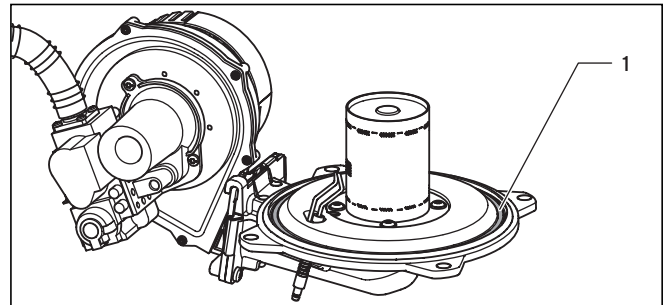


Fig. 7.5 Replacing the burner door gasket

- Insert a new gasket (1) in the burner door.



Caution!
The burner door gasket (1) and the self-locking nuts on the thermo-compact module must be replaced every time the module is removed (e.g. during maintenance, see Table 7.1). If the burner flange insulation on the thermo-compact module shows any signs of damage or is showing small cracks it must also be replaced.

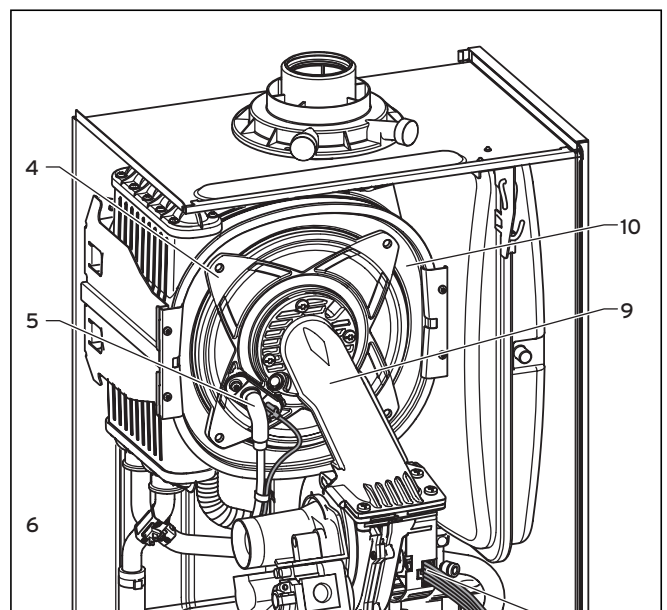


Fig. 7.6 Fitting the thermo-compact module

- Insert the compact thermo module (9) in the integral condensation heat exchanger (10).
- Tighten the four nuts (4) alternately on the left and right until the burner door closes securely and evenly over the surface of the heat exchanger.
- Re-connect the ignition cable (5) and the earth wire (6) to the ignition electrode.
- Connect the cable (8) to the fan motor and the cable (7) to the gas fitting.

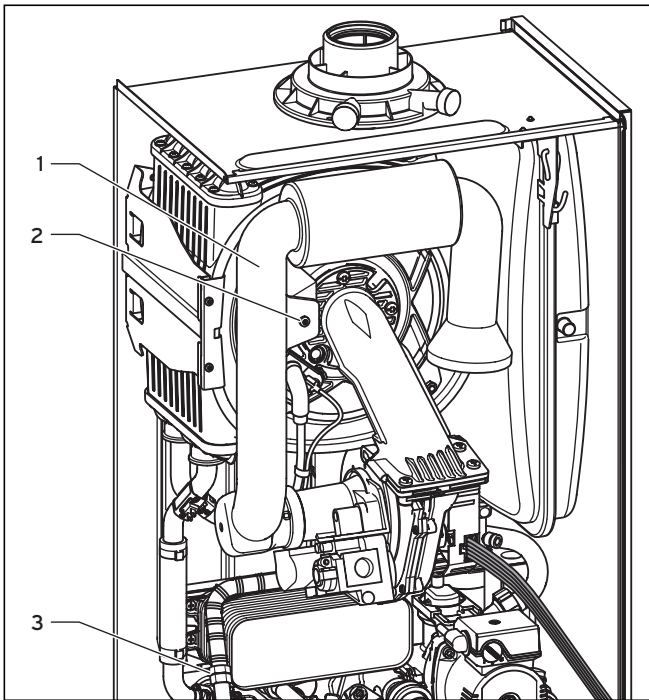


Fig. 7.7 Connecting the gas supply

- Re-connect the gas supply (3) to the gas valve. Use a new seal and ensure it is correctly located. Use the flats of the spanner on the flexible gas pipe to hold the gas fittings in position.

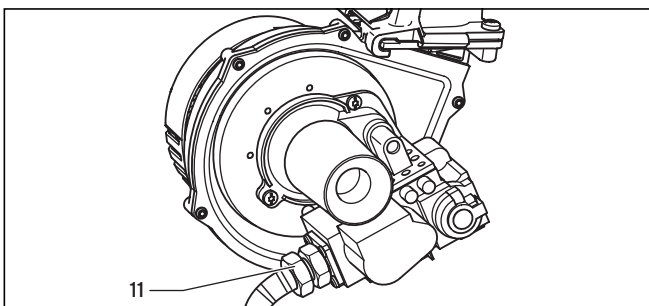


Fig. 7.8 Checking the gas supply for leaks

- Turn on the gas supply and check for leaks. Pay particular attention to fittings (3) and (11).
- Re-connect the air inlet pipe (1) and make sure that the blue seal is correctly located in the air inlet pipe.

7.3 Cleaning the condensate siphon

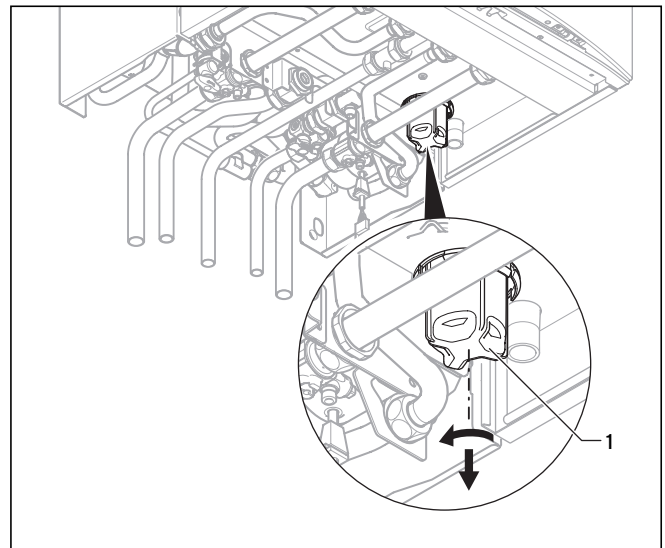


Fig.7.9 Cleaning the condensate siphon



Danger!

If the combi boiler is operated with an empty water condensate trap there is a danger that poisonous exhaust gases can escape and cause poisoning. For this reason it is important that the trap is refilled after each cleaning.

- Remove the lower section (1) of the water condensate siphon by turning the bayonet connection in a counterclockwise direction.
- Clean the siphon part by flushing it out with water.
- Fill the lower section with water until about 10 mm below the upper edge.
- Re-fit the lower section to the condensate siphon.

7.4 Cleaning strainer in cold water supply

There is a strainer in the cold water supply to the combi boiler which must be cleaned during maintenance.

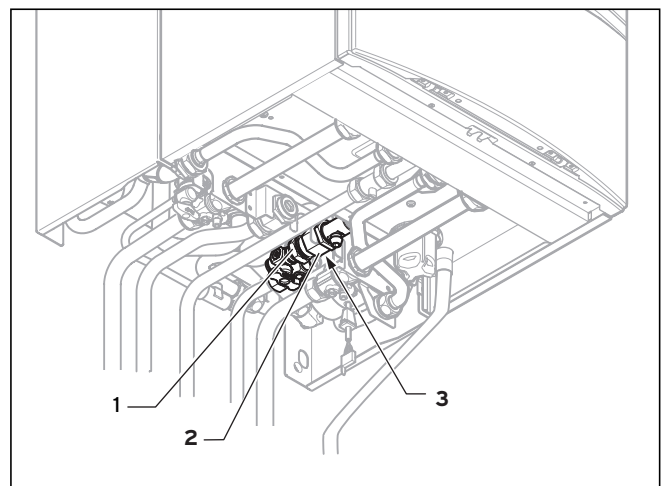


Fig.7.10 Cleaning strainer in cold water supply

7 Inspection and maintenance

- Isolate the unit from the electric mains in the apartment as described in 8.2.
- Close the cold water stop valve on the inlet combination (see Fig. 7.10) and drain the unit from the hot water side.
- Release the fitting (1) of the cold water inlet.
- Release the fitting (3) on the connector (2).

Note
The fitting (3) is located above the elbow (2) and is not shown in Fig. 7.10.

- Remove the connector (2) from the chassis.
- Flush the connector out under flowing water in the opposite direction to normal flow.
- Re-fit the connector with the cleaned strainer.
- Fit the pipe elbows of the shift load storage tank and the cold water feed back in position.
- Always use new seals.

7.5 Checking filling pressure of the expansion vessel of the combination boiler

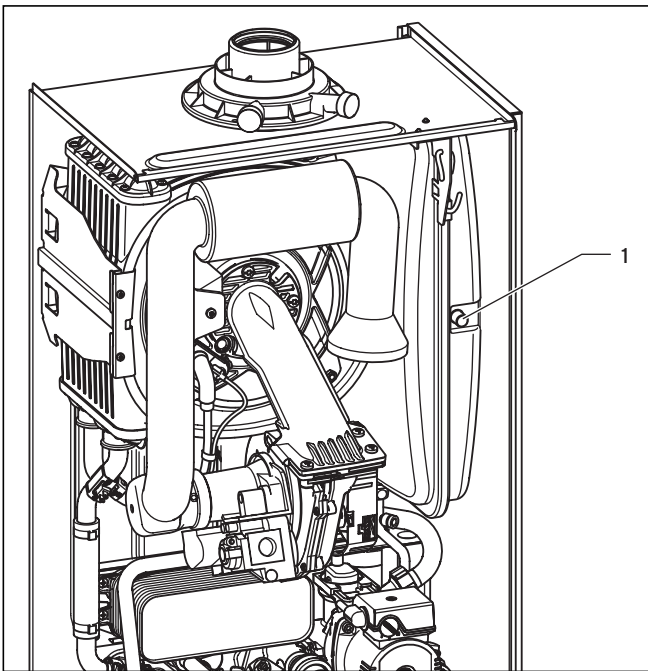


Fig. 7.11 Checking filling pressure of the expansion vessel of the combination boiler

Note
This check need not be performed every year - a check every three years is sufficient.

- Turn the stop valves of the central heating off.
- Release the pressure from the appliance.
- Remove the valve cover from the expansion vessel.
- Check that the internal pressure in the expansion vessel is between 0.75 and 0.9 bar.

- If the pressure is less than this, the vessel must be pumped up again using an air pump.
- Refit the valve cover.
- Re-pressurise the combi boiler and the heating system.

7.6 Checking filling pressure of the expansion vessel of the shift load storage tank

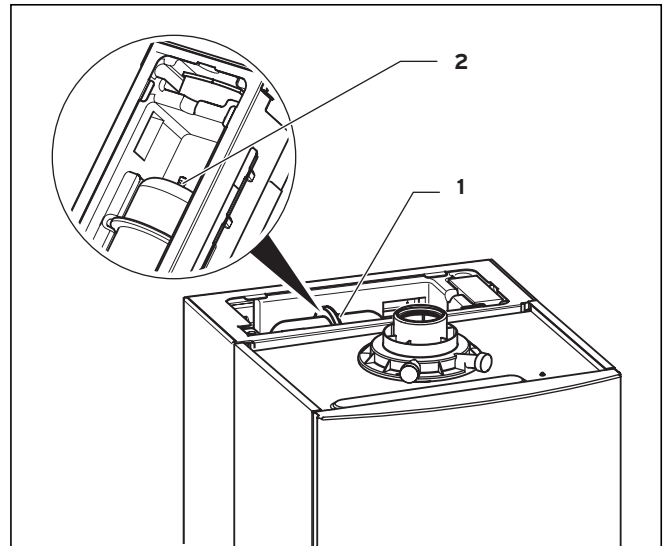


Fig. 7.12 Checking filling pressure of the expansion vessel of the shift load storage tank

Note
This check need not be performed every year - a check every three years is sufficient.

- Close the stop valves of the hot water system.
 - Release the pressure from the appliance.
 - Release the screw on the top cover of the shift load storage tank and remove the cover.
- The expansion vessel (1) is freely accessible
- Unscrew the seal cap (2) from the expansion vessel.
 - Check that the internal pressure of the expansion vessel is approx. 4 bar.
- If the pressure is less than this, the vessel must be pumped up again using an air pump.
- Screw the seal cap (2) back onto the expansion vessel.
 - Re-fit the cover.
 - Re-pressurise the combi boiler and the hot water system.

7.7 Re-commissioning the combination boiler

- Carry out the electrical safety tests.
- Switch on the electrical supply.
- Turn the stop valves of the central heating on.
- Carry out a function check of the combi boiler as described earlier.
- Check the gas rate as described earlier.
- Check for water leaks.
- Re-fit the front case. Make sure that the seal is good.

7.8 Test mode

Always perform the following steps after performing any maintenance work:

- Commission the appliance in accordance with the instructions in the relevant operating manual.
- Check the appliance for gas and water leaks.
- Check the entire air/flue gas system for leaks and securely fixed.
- Check ignition and even flame appearance of the burner.
- Check whether the heating system and the hot water preparation is functioning.
- Complete the Benchmark gas boiler commissioning checklist in the rear section of these instructions.

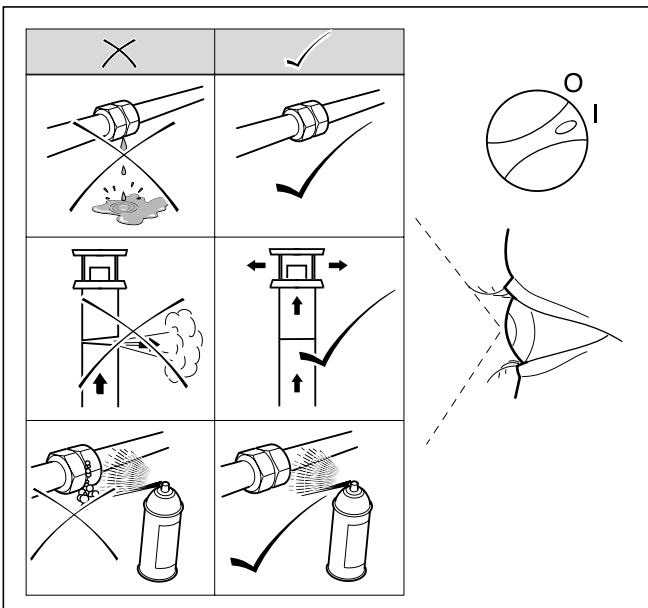


Fig. 7.13 Function check

8 Troubleshooting

8.1 Logical fault finding procedure

Carry out the following checks before the actual troubleshooting:

- Carry out the tests to check electrical safety (see Section "Preparatory Checks on the Electrical System").
- Check that the external power supply for the combi boiler is switched on and that there is a supply voltage of 230 V AC between the connections "L" and "N".
- Check that the gas supply to the combi boiler is switched on.
- Check that the combi boiler has been properly purged and that there is a supply pressure of 20 mbar the inlet to the boiler. (See Section "Gas Supply".)
- Check that the heating system is filled with water and that there is a pressure of between 1.0 and 1.5 mbar. Otherwise top up the system and bleed. (See Section "Filling the Heating System".)
- Check that the stop valves in the flow and return lines of the combi boiler are open.
- Check that the mains switch is set to "ON".
- Set the temperature of the central heating to "Maximum".
- Set the temperature of the hot water preparation to "Maximum".
- Check that all external controllers are switched on and are demanding heat (if no external controllers are fitted, the connections 3 and 4 on the combi boiler terminal must be connected together).
- Check that the burner anti-cycling time mode on the combi boiler is not active.

8.1.1 Status codes

The status codes which you can see in the display provide information concerning the current operating status of the unit.

Proceed as follows to display the status codes:

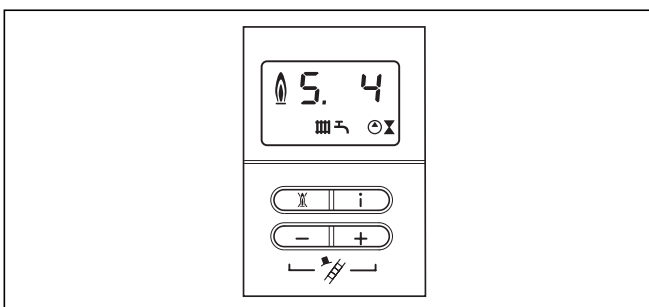


Fig. 8.1 Display of status codes

- Press the "i" button.
The display shows the status code e.g. **S.04** for the "Burner mode - heating".

The status code display can be de-activated as follows:

- Press the "i" button. or
- Do not press any button for about 4 minutes.
The current heating flow temperature appears in the display again.

Display	Meaning
Heating mode:	
S.0	No heat demand
S.1	Fan running
S.2	Pump running
S.3	Ignition
S.4	Burner ignited
S.5	Fan and pump running
S.6	Fan over run
S.7	Pump overrun time
S.8	Anti-cycling mode
Hot water mode (ecoTEC plus 800 models only):	
S.10	Hot water request
S.11	Fan running
S.13	Ignition
S.14	Burner ignited
S.15	Fan and pump running
S.16	Fan over-run
S.17	Pump over-run
Warm start mode/hot water storage tank charging:	
S.20	Pump running
S.21	Fan running
S.23	Ignition
S.24	Burner ignited
S.25	Fan and water pump running
S.26	Fan over-run
S.27	Pump over-run time
S.28	Anti-cycling mode
All boilers:	
S.30	No heat demand from external controllers (terminal 3-4 open)
S.31	Thermostat knob of central heating switched off or no heat demand from an eBUS controller
S.32	Heat exchanger antifreeze active, as fan speed variation is too high. Appliance is within the waiting time of the operation block function
S.34	Antifrost mode active
S.36	No heat demand from low voltage regulators (terminal 7-8-9)
S.41	Water pressure >2.9 bar
S.42	Feedback from accessories module or defective condensate pump blocks the burner operation
S.53	Appliance is within the waiting period of the modulation block/operation block function due to water shortage (flow-return spread too large)
S.54	Appliance is within the waiting period of the operation block function due to water shortage (temperature gradient)
S.96	Return flow sensor test, heat demands (hot water or heating) are blocked
S.97	Water pressure sensor test, heat demands (hot water or heating) are blocked
S.98	Flow/return flow sensor test, heat demands (hot water or heating) are blocked

Table 8.1 Status codes (continuation see next page)

8.1.2 Diagnostic codes

In the diagnostic mode, you can change certain parameters or display more information.

The diagnostic information is divided into two diagnostic levels. Access to the second diagnostic level can only be permitted after entering a password.



Caution!

Danger of incorrect operation and wrong unit parametrisation!

Access to the second diagnostic level must be used exclusively by a heating engineer.

First diagnostic level

- Press the "i" and "+" buttons simultaneously. The display shows "d.00".

- Use the buttons "+" or "-" to move to the desired diagnostic number of the first diagnostic level (see the Table 8.2).

- Press the "i" button.

The associated diagnostic information is shown in the display.

- If necessary you can change the value with the buttons "+" or "-" (display flashing).
- Save the new value by holding down the "i" button for approx. 5 seconds until the display no longer flashes.

You can end the diagnostic mode as follows:

- Press the "i" and "+" buttons simultaneously. or
- Do not press any button for about 4 minutes.

The current heating flow temperature appears in the display again.

Display	Meaning	Displayed value/settable value
d.0	Heating partial load	Adjustable heating partial load in kW (factory setting: max. output)
d.1	Water pump over run time for heating mode	2 - 60 minutes (factory setting: 5 minutes)
d.2	Max. anti cycle time heating at 20°C flow temperature	2 - 60 minutes (factory setting: 20 minutes)
d.3	Measured value of the domestic hot water temperature	in °C
d.4	Measured value for the warmstart sensor	in °C
d.5	Flow temperature target value or return temperature target value, if return flow regulation selected	in °C, max. of the value set in d.71 limited by an eBUS controller, if fitted)
d.6	Hot water target temperature	in °C, 35 to 65 °C
d.7	Warm start target temperature	in °C, 40 to 65 °C
d.8	Heat demand of external controllers (terminal 3-4)	1=closed (heating requirement); 0=opened (no heating requirement)
d.9	Flow target temperature from external analogue regulator to terminal 7-8-9/eBus	in °C, minimum from ext. eBus target value and target value terminal 7
d.10	Status internal heating pump	1, 2 = on, 0 = off
d.11	Status external heating pump (via accessory module)	1 to 100 = on, 0 = off
d.12	Cylinder charging pump (via accessories module)	1 to 100 = on, 0 = off
d.13	External hot water circulation pump (via accessory module)	1 to 100 = on, 0 = off
d.22	Hot water demand	1 = on, 0 = off
d.23	Summer /winter function	1 = Winter, 0 = Summer
d.25	Hot water activation via eBUS controller	1 = yes, 0 = no
d.30	Control signal for both gas valves	1 = on, 0 = off
d.33	Fan speed target value	in upm/10
d.34	Fan speed actual value	in upm/10
d.35	Internal diverter valve position	0 = heating; 100 = hot water; 40 = mid-position
d.36	Hot water flow sensor	in l/min
d.40	Flow temperature	actual value in °C
d.41	Return flow temperature	actual value in °C
d.44	digitalised ionisation voltage	Display range 0 to 102, >80 no flame, <40 good flame display
d.47	External temperature (only on weather-compensated Vaillant controllers)	actual value in °C
d.67	Remaining burner anti-cycling time	in minutes
d.76	Unit variants (device specific number)	00 to 99
d.90	Status of the digital controller	1 = identified, 0 = unidentified (eBUS Address <=10)
d.91	DCF status with connected external probe with DCF77 receiver (not available in the UK)	0 = no reception, 1 = reception, 2 = synchronised, 3 = valid
d.92	Module recognition shift load storage tank	Setting range: 0 = not recognised 1 = no communication via PE-BUS; Module recognised earlier 2 = Communication OK Setting = 0: Unregister shift load storage tank from combi boiler (if shift load storage tank is to be de-installed, set d.92 = 0)
d.97	Activation of the second diagnostic level	Password: 17

Table 8.2 Diagnostic codes of the first diagnosis level

8 Troubleshooting

Second diagnostic level

- As described above in the first diagnostic level, scroll through to the diagnosis number **d.97**.
- Change the displayed value to **17** (Password) and push the button "i".

You are now in the second diagnostic level where all information from the first diagnostic level (see Table 8.2) and the second diagnostic level (see Table 8.3) is displayed.

Scroll and change values and exit diagnosis mode as described in the first diagnosis level.



Note

If you push the buttons "i" and "+" again within 4 minutes after leaving the second diagnosis level you will go directly to the second diagnosis level without having to enter the password again.

Display	Meaning	Displayed value/settable value
d.17	Heating flow/return regulation changeover	0 = flow, 1 = return (factory setting: 0)
d.18	Pump mode (return flow)	0 = overrun, 1 = continuous, 2 = winter (Factory setting: 0)
d.19	Operating modes of the two-speed heating pump	0 = Pre-ignition speed 1, Hot water or heating speed 2, overrun speed 1 1 = Pre-ignition speed 1, hot water speed 2, heating speed 1, overrun speed 1 2 = Like 1 but speed in heating mode dependant on heating part load d.0 (if d.0 is below 60 % of full load, then pump speed 1, otherwise speed 2); Factory setting 2) 3 = Always speed 2
d.20	Maximum set value for external cylinder target temperature (system boilers only)	Setting range: 50 °C to 70 °C (Factory setting 65 °C)
d.27	Switching relay 1 on the accessories module	1 = Circulation pump (factory setting) 2 = Ext. Pump 3 = External cylinder charging pump 4 = Flue gas flap/extractor hood 5 = External gas valve 6 = External error message
d.28	Switching relay 2 on the accessories module	1 = Circulation pump 2 = Ext. pump (factory setting) 3 = External cylinder charging pump 4 = Flue gas flap/extractor hood 5 = External gas valve 6 = External error message
d.50	Offset for minimum fan speed	in upm/10, adjustment range: 0 to 300
d.51	Offset for maximum fan speed	in upm/10, adjustment range: -99 to 0
d.58	Activation solar pre-heat function	Setting range: 0 to 3 0 = solar post-heating deactivated (factory setting) 3 = Activation hot water target value min = 60 °C for solar pre-heat
d.60	Number of safety temperature limiting switch-offs	Quantity
d.61	Number of unsuccessful ignitions	Number of successful ignitions in the last attempt
d.64	Average ignition duration	in seconds
d.65	maximum ignition duration	in seconds
d.68	Successful ignitions at the first attempt	Quantity
d.69	Successful ignitions at the second attempt	Quantity
d.70	Setting the diverter valve position	0 = Normal mode (factory setting) 1 = mid-position 2 = Permanent heating position
d.71	Maximum flow temperature knob setting	Adjustment range in °C 40 to 85 (Factory setting: 75)

Table 8.3 Diagnostic codes in the second level

Display	Meaning	Displayed value/settable value
d.72	Pump overrun time after warm start or shift load storage tank charging	Setting range in seconds: 0, 10, 20 to 600 Factory setting: 80
d.73	Offset for warm start target temperature	Setting range: -15 K to +5 K (Factory setting: 0K)
d.74	Legionella protection shift load storage tank	Setting range: 0 = deactivated 1 = activated (Factory setting)
d.75	Maximum charging duration for an external cylinder without its own control (system boilers only)	Adjustment range in min: 20, 21, 22 to 90 (Factory setting: 45)
d.77	Part load of the external cylinder (limit for charging capacity of the external cylinder, system boilers only)	Adjustment range in kW: appliance specific Factory setting: max. output
d.78	Limit for charging temperature of the external cylinder (target flow temperature in storage tank mode, system boilers only)	Adjustment range in °C 55 to 85 (Factory setting: 80)
d.80	Operating hours heating	in h
d.81	Operating hours hot water generation	in h
d.82	Operating cycles in heating mode	number/100 ¹⁾ (3 equals 300)
d.83	Cycles in hot water operation	number/100 ¹⁾ (3 equals 300)
d.84	Maintenance indicator: Number of hours until the next maintenance	Setting range: 0 to 3000h and „-“ for deactivated Factory setting: „-“ (300 corresponds to 3000h)
d.88	switching on threshold for recognizing water tapping (only VCW)	0 = 1,5 l/min and no delay, 1 = 3,7 l/min and 2s delay
d.92	Module recognition shift load storage tank	Setting range: 0 = not recognised 1 = no communication via PE-BUS; Module recognised earlier 2 = Communication OK Setting = 0: Unregister shift load storage tank from combi boiler (if shift load storage tank is to be de-installed, set d.92 = 0)
d.93	DSN appliance variant setting	Setting range: 0 to 99
d.96	Factory reset	1 = Resetting adjustable parameters to factory setting

¹⁾ In the diagnostic codes 80 to 83 5 digit figure values are stored. When selecting e.g. d.80 only the first two digits of the figure value are displayed (e.g.10). By pressing the „i“ key, the display switches over to the last three figures (e.g. 947). The operating hours counter of the heating in this case would be 10947 h. Pressing the „i“ again causes the display to switch back to the diagnosis point that was called up.

Table 8.3 Diagnosis codes of the second diagnosis level

8.1.3 Error codes

Fault codes take priority over all other display functions in the event of a system fault occurring.

If many errors occur simultaneously, the relevant error codes are displayed alternately for approx. 2 seconds each.

8.1.4 Fault memory

The fault memory of the unit stores the information concerning the last ten errors.

- Press the "i" and „-“ buttons simultaneously.
- Scroll backwards with button "+“ through the list of stored errors.

You can exit the error memory display as follows:

- Push the button "i" under the display, or
- Do not press any button for about 4 minutes. The display then switches back to the display of current flow temperature.

8 Troubleshooting

Code	Meaning	Cause
F.0	Flow NTC open circuit	NTC faulty, NTC cable faulty, faulty plug connection on NTC, faulty plug connection on the electronics
F.01	Return NTC open circuit	NTC faulty, NTC cable faulty, faulty plug connection on NTC, faulty plug connection on the electronics
F.02	Shift load storage tank charging (NTC) open circuit, only in combination with F.91	NTC faulty, NTC cable faulty, faulty plug connection on NTC, faulty plug connection on the electronics
F.03	Shift load storage tank temperature (NTC) open circuit, only in combination with F.91	NTC faulty, NTC cable faulty, faulty plug connection on NTC, faulty plug connection on the electronics
F.10	Flow NTC short circuit	NTC faulty, NTC plug short-circuited to casing
F.11	Return NTC short circuit	NTC faulty, NTC plug short-circuited to casing
F.12	Short circuit in storage tank charging sensor (NTC) only in combination with F.91	Sensor plug has mass short to the casing, short-circuit in wiring loom, sensor faulty
F.13	Short circuit storage tank temperature sensor (NTC) only in combination with F.91	Sensor plug has mass short to the casing, short-circuit in wiring loom, sensor faulty
F.20	Safety temperature limiter by NTC activated	Flow probe not connected thermally correct or defective, appliance does not shut down
F.22	Dry fire	Too little water in the appliance, water pressure sensor defective, cable to pump or water pressure sensor defective, pump seized or defective, pump output too low
F.23	Water shortage, temperature spread between flow and return NTC too large	Pump seized or defective, pump output too low, flow and return sensor swapped over
F.24	Water shortage, temperature rise too quick	Pump seized, low output from the pump, air in appliance, system pressure too low
F.25	Compact thermal module wiring harness open circuit	Wiring harness thermo-compact module faulty
F.27	Incorrect sensing of flame	Flame monitor faulty
F.28	Unit will not start: Attempts to ignite during start failed	Faults in the gas supply such as: - Gas meter or gas pressure regulator - Air in gas - Gas flow pressure too low Faults in the gas valve, wrong gas setting, igniter (ignition transformer, ignition cable, ignition plug) defective, ionisation current stopped (cable, electrode), faulty earthing in appliance, electronics defective
F.29	Flame goes off during operation and subsequent ignition attempts failed	Gas supply temporarily interrupted, defective earthing of the unit
F.32	Speed deviation Fan	Fans seized, plug not inserted correctly on fan, hall sensor defective, fault in cable harness, electronics defective
F.49	eBUS undervoltage	Short-circuit on eBUS input, eBUS overload or two power supplies with different polarities on the eBUS
F.61	Gas valve control faulty	Short circuit/earth(ground) leak in cable harness to gas valve, gas valve assembly defective (earth/ground leak from solenoid), electronics fault.
F.62	Switch-off delay of the gas valve faulty	gas valve leaking, electronics defective
F.63	EEPROM error	Defective electronics
F.64	Electronics/NTC fault	Short-circuit in flow or return NTC or electronics defective/ air in gas
F.65	Electronics temperature too high	Electronics too hot due to external effect, electronics defective
F.67	Flame monitor input signal is outside the limits (0 or 5 V)	electronics defective
F.70	No valid appliance variant for display and/or electronics (DSN number invalid)	Spare parts error: Display and electronics changed at the same time appliance variant not re-set
F.71	Flow NTC reports constant value	Flow NTC is defective
F.72	Flow and/or return NTC fault	Feed and/or return NTC is faulty (tolerance too great)
F.73	Signal water pressure sensor in the wrong range (too low)	Line to water pressure sensor is interrupted or has a short-circuit to 0 V or water pressure sensor faulty
F.74	Signal water pressure sensor in the wrong range (too high)	Harness to water pressure sensor has a short-circuit at 5 V / 24 V or internal fault in water pressure sensor
F.75	No sudden change in pressure was detected on turning on the pump	Water pressure sensor and/or pump faulty (pump seized - check system water for contamination) Air in heating system, automatic air vent system faulty Too little water in the unit; check adjustable bypass; Connect expansion vessel in return;
F.76	Overheating protection on primary heat-exchanger activated	Cable or cable connection of fuse in the primary heat exchanger defective, replace primary heat exchanger
F.77	Condensate pump or return signal from accessory module blocks heating	Condensate pump faulty or return signal from the exhaust gas flap has activated
F.78	Incorrect configuration of accessories	Control Center VR 65 connected to combination boiler
F.80	Interruption or short-circuit of SWT inlet sensor only in conjunction with F.91	NTC defective, NTC cable defective, defective plug connection at NTC, defective plug connection at APC electronics Plug at sensor has short-circuited to housing, short-circuit in cable harness, sensor defective

Table 8.4 Error codes

Code	Meaning	Cause
F.81	APC loadpump fault connected to F.91	Storage tank is not fully charged after a specific period of time. -Check storage tank charge sensor and storage tank sensor -Air in the APC pump -Check pump wiring harness -Secondary heat exchanger blocked -Priority changeover valve defective -Pump defective
F.90	Communication with shift load storage tank module interrupted	Check wiring harness from combi boiler to shift load storage tank (PE Bus). If combi boiler is to be operated without shift load storage tank, set d.92 = 0
F.91	Sensor error on shift load storage tank module (NTC)	NTC faulty, NTC cable faulty, faulty plug connection on NTC, faulty plug connection on the electronics
con	No communication with the printed circuit board	Communication fault between the display and the printed circuit board in the electronics box

Table 8.4 Error codes

8.2 Test programmes

Special functions can be triggered in the appliance by activating various test programs.

These programmes are listed in detail in Table 8.5.

- The test programmes P.0 to P.6 will be started when "Power ON" is turned on and the "+" button is pressed for 5 seconds simultaneously.
The display shows "P.0".
- Press the "+" key to start counting the test programme number upwards.
- Press the "i" to operate the appliance now and to start the test programme.
- To de-activate the setting mode, simultaneously push the buttons "i" and "+". You can also end the test programmes by not pushing any button for a 15 minute period.

Display	Meaning
P.0	Bleeding test program The heating circuit and the hot water circuit (only on combination boilers) are bled via the automatic air vent (the cap of the automatic air vent must be released two turns).
P.1	Test programme where the appliance is operated in full load after successful ignition.
P.2	Test program where the appliance is operated with minimum gas volume (ignition gas volume) after successful ignition
P.3	not available
P.4	not available
P.5	Test programme for checking the safety temperature limitation: The unit is heated by avoidance of the regular switch-off by the feed regulator until a temperature of 97 °C is reached.
P.6	Filling programme: The diverter valve moves to the centre position.

Table 8.5 Test programmes

8.3 Resetting the parameters to factory settings

Besides the option to reset individual parameters manually to the factory settings specified in Tables 9.2 and 9.3, you can also reset all parameters simultaneously.

- In the second diagnostic level, under the diagnostic point "d.96" change the value to 1 (see Section 8.1.2).

The parameters of all adjustable diagnosis points now correspond to the factory settings.

9 Replacing components

9 Replacing components

The tasks listed below may only be undertaken by a qualified competent heating engineer.

- Only use genuine spare parts for repairs.
- Check that the parts are correctly fitted and that the original location and alignment is maintained.

9.1 Safety instructions



Danger!

Every time components are replaced observe the following safety instructions for your own safety and to prevent damage to the unit!

Take the appliance out of operation.



Danger!

**Danger of death by electric shock!
Before starting any maintenance work:
Isolate the unit from the electrical mains by
pulling the plug out of the plug socket (if only
an isolator switch is available, remove the fuse
from the switch.)**

- Close the stop valves in the gas supply and in the heating flow and return pipes.
- Close the cold water inlet stop valve (only on combi boilers).
- Drain the unit if you wish to replace water-conducting components in the unit.
- Make sure that no water drips on live electrical components (e.g. electronic box etc.)!
- Use only new gaskets and O-rings!
- Check the system for gas leaks after completion of the work. Carry out a function test (see Section 7.8).
- After all maintenance work and after replacing electrical components check the earthing, polarity and earth resistance using a multi-meter.

9.2 Replacing the burner



Danger!

Before replacing components ensure that the safety instructions from Section 9.1 are observed.

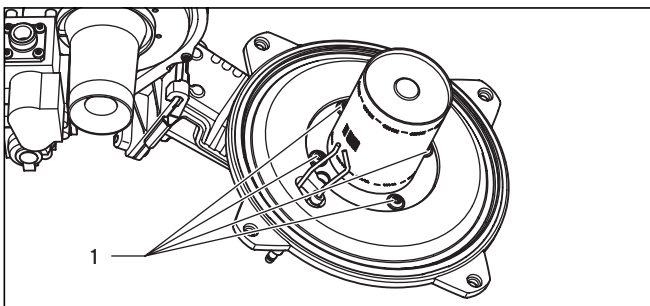


Fig. 9.1 Replacing the burner

- Dismantle the compact thermo module as described under 7.2.1.
- Release the 4 screws (1) on burner, and remove the burner.
- Mount the new burner with a new gasket. The notch in the burner must be aligned with the sight glass of the burner.
- Fit the compact thermo module as described under 7.2.4.
- Fit a new burner door seal kit.
- After completion of the work check the system for gas leaks and carry out a function test (see Section 7.8).



Note

A new burner door seal kit must be fitted every time the burner door is removed.

9.3 Replacing the fan or gas valve



Danger!

Before replacing components ensure that the safety instructions from Section 9.1 are observed.

- Switch the combi boiler off.
- Isolate the electrical supply from the combi boiler.
- Remove the air intake pipe (Fig. 7.1, Pos. 2).
- Loosen the gas supply pipe on the gas valve (Fig. 7.2, Pos. 3).

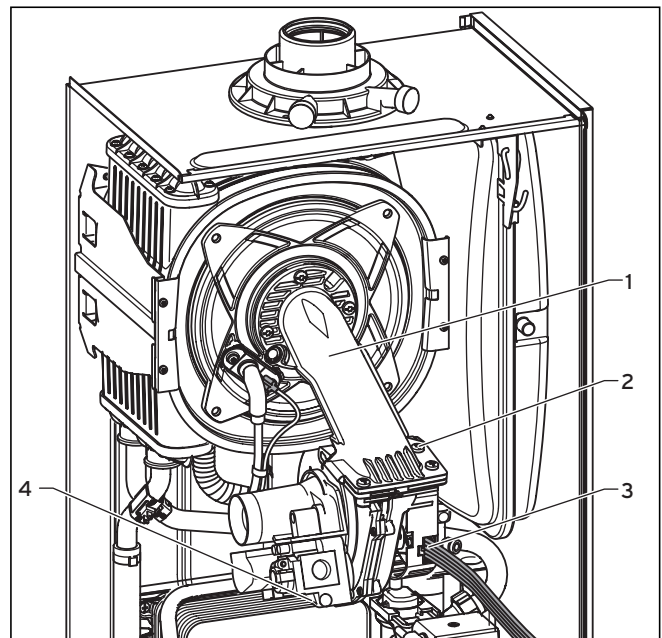


Fig. 9.2 Removing the fan with gas fitting

- Pull the plug (4) out of the gas valve.
- Pull the plug (3) out of the fan.
- Unscrew the three screws (2) out of the thermo-compact module (1).
- Remove the complete component group "gas valve/ fan".

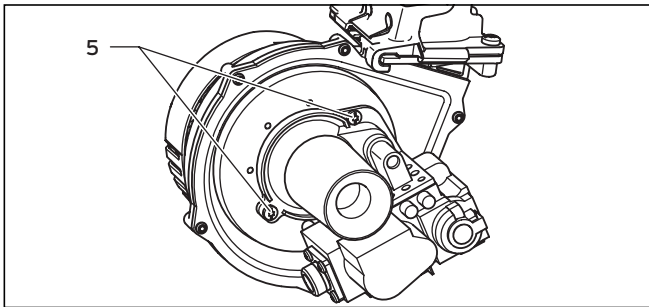


Fig. 9.3 Gas valve/fan screwed joint

- Release both fixing screws (5) on the gas valve and remove the fan from the gas valve.
- Replace the faulty component.



Caution!
Danger of damage to the equipment!
Fit the gas valve and fan in the same position as before.

- Screw the fan onto the gas valve. Use new seals.
- Re-install the complete "gas valve/fan" unit in reverse sequence.
- After completion of the work check the system for gas leaks and carry out a function test (see Section 7.8).

9.4 Replacing the expansion vessel



Danger!
Before replacing components ensure that the safety instructions from Section 9.1 are observed.

- Disconnect the appliance from the mains as described in Chapter 9.1, and close the gas isolator valve in the gas supply pipe.
- Close the stop valves in the flow and return pipes and drain the water out of the combi boiler.
- Unscrew the nuts (4) from the water pipe on the underside of the expansion vessel.
- Unscrew the two screws (1) in the retaining plate (2) and remove the retaining plate.
- Pull out the expansion tank (3) forwards.
- Guide the new expansion tank back into the appliance.
- Re-connect the new expansion tank using a new gasket.
- Re-fit the retaining plate.
- Check the pressure of the expansion tank (minimum pressure 0.75 bar). If required, match the pressure to the static head of the heating system.
- Fill and vent the combi boiler.
- After completion of the work check the system for gas leaks and carry out a function test (see Section 7.8).

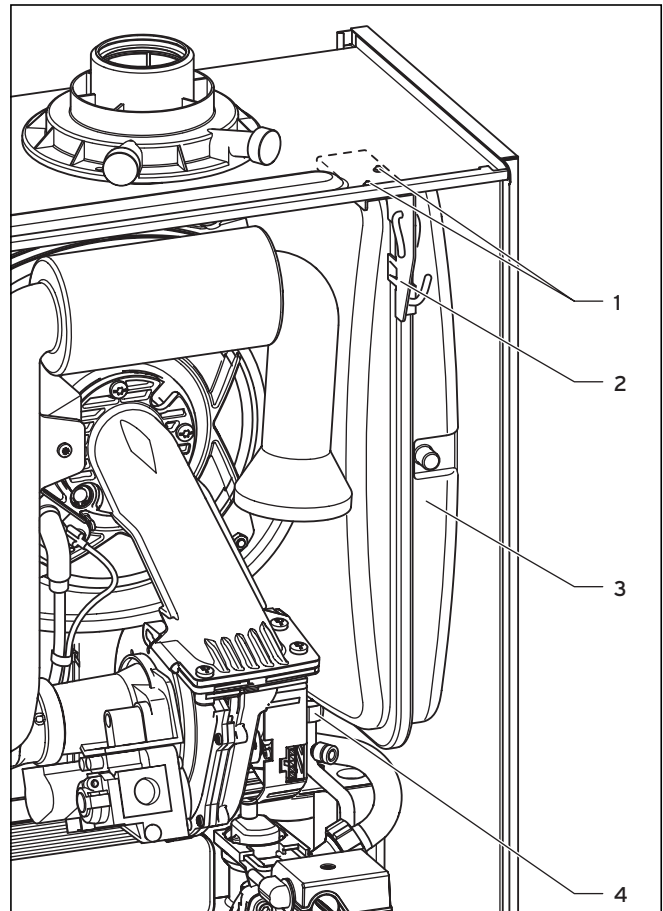


Fig. 9.4 Replacing the expansion vessel

9.5 Replacing the primary heat exchanger



Danger!
Before replacing components ensure that the safety instructions from Section 9.1 are observed.

- Disconnect the appliance from the mains as described in Chapter 9.1, and close the gas isolator valve in the gas supply pipe.
- Close the stop valves in the flow and return pipes and drain the water out of the combi boiler.
- Remove the compact thermo module as described under 7.2.1.
- Remove the expansion tank as described under 9.4.
- Pull off the condensate pipe which runs from the primary heat-exchanger to the siphon.
- Remove the clamps (1) and (2) and pull off the flow and return hoses from the primary heat-exchanger.
- Unscrew the four screws (3) on the holder of the primary heat-exchanger.

9 Replacing components

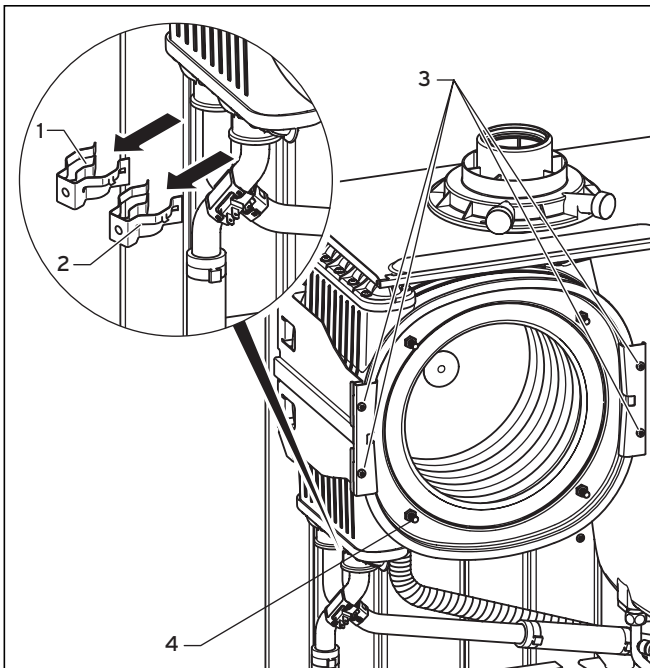


Fig. 9.5 Replacing the primary heat exchanger

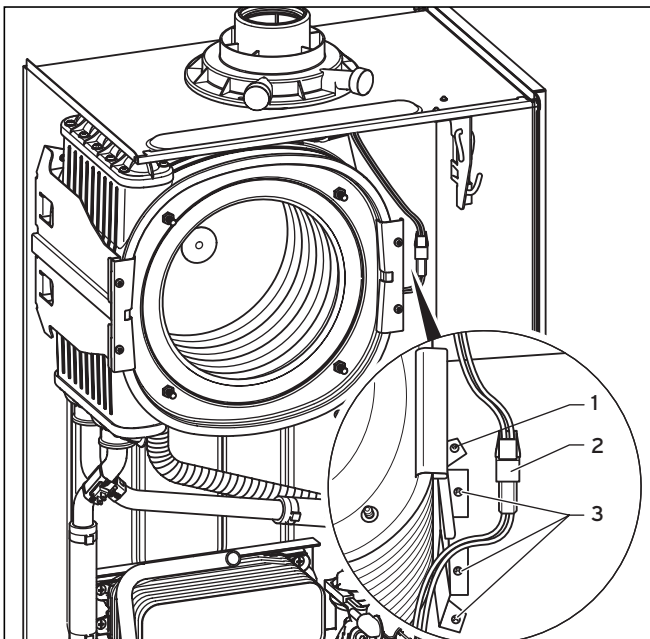


Fig. 9.6 Holder for the primary heat-exchanger

- Pull the plug connection (2) of the thermal fuse off the primary heat-exchanger.
- Unscrew the three screws (3) on the holder of the primary heat-exchanger.
- Turn the holder to the side around the rivet (1), pull the primary heat exchanger downwards to the right and remove it from the appliance.
- Mount the new primary heat exchanger
- Fit a new burner door seal kit.
- Fit the burner module.
- Continue to replace in the reverse order.



Note

A new burner door seal kit must be fitted every time the burner door is removed.



Caution!

Danger of damage to the primary heat-exchanger!
Do not release or tighten the four screws (Fig. 9.5, Item 4).

Caution!

Insert the „O“-rings for the flow and return hoses on the primary heat-exchanger using a suitable lubricant.
Push the flow and return connections up to the stop in the primary heat-exchanger and make sure that the seating of the clamps on the flow and return hoses are correct (see Fig. 9.5).

- Filling and vent the combi boiler as required.
- After completion of the work check the system for gas leaks and carry out a function test (see Section 7.8).

9.6 Replacing the expansion vessel of the shift load storage tank

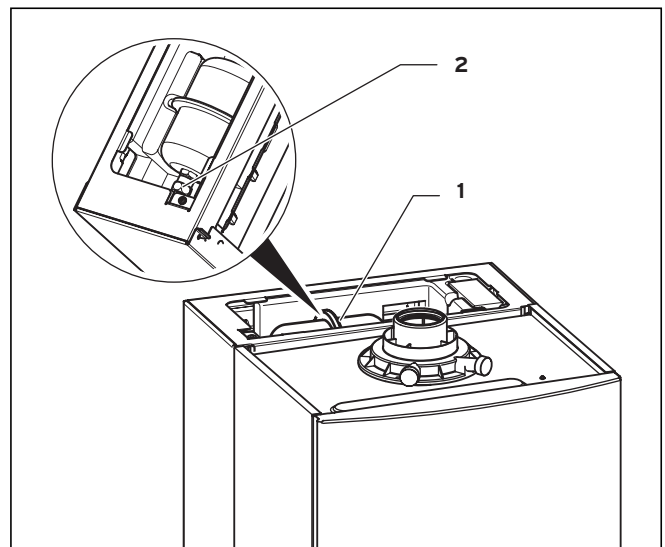


Fig. 9.7 Replacing the expansion vessel of the shift load storage tank



Danger!

Before replacing components ensure that the safety instructions from Section 9.1 are observed.

- Disconnect the appliance from the mains as described in Section 9.1, and close the gas isolator valve in the gas supply pipe.
- Close the cold water inlet stop valve.
- Open a hot water tap in order to release the pressure on the water circuit. Then close the tap again.

- Remove the screw on the cover of the shift load storage tank.
- Remove the cover.
- The expansion vessel (1) is freely accessible
- Release the nuts (2) on the expansion tank.
- Pull the expansion tank (1) off the pipe fitting and remove it from the EPS trough.
- Insert the new expansion tank in the EPS trough.
- Re-connect the new expansion tank. Use a new gasket:
- Check the pressure of the expansion tank (minimum pressure 4 bar).
- Filling and vent the combi boiler and the shift load storage tank.
- After completion of the work check the system for gas leaks and carry out a function test (see Section 7.8).

9.7 Replacing the storage tank pump of the shift load storage tank

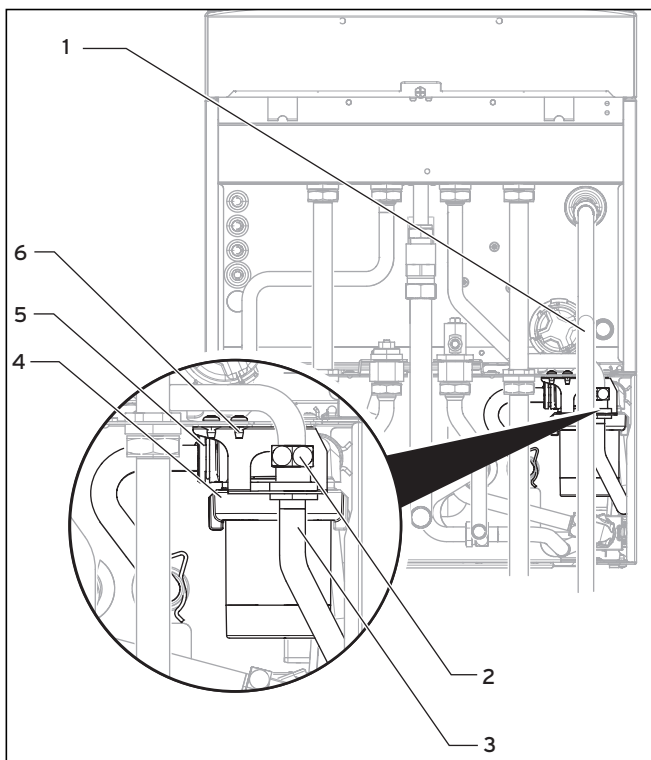


Fig. 9.8 Replacing storage tank pump



Danger!

Before replacing components ensure that the safety instructions from Section 9.1 are observed.

- Isolate the unit from the mains as described in Section 9.1.
- Close the gas isolator valve in the gas supply pipe.
- Close the stop valves in the hot water system and drain the water out of the combi boiler and the shift load storage tank.

- Remove the discharge pipe (1) of the heating pressure relief.
- Lower the electronics box as described in Section 4.19.2.
- Unclip the back cover of the electronics box and swing the cover upwards to reveal the connections.
- Pull the plug X12 off the electronic printed circuit board.
- Pull the free end of the line carefully through the entry grommets on the combi boiler and on the shift load storage tank.
- Release the sensor wire of the pump from the wiring harness by pulling the plug off the wiring harness.
- Unscrew the sheet metal bracket (6) from the chassis.
- Release the fitting (2) on the connector pipe (3).
- Release the spring clamp (5) on the storage tank charging pump casing (4). Support the storage tank charging pump with your other hand to prevent it from falling out of the chassis.
- Pull the storage tank charging pump out of the chassis downwards.
- Fit the pipe bracket to the new storage tank charging pump using new gaskets.
- Fit the new storage tank charging pump in reverse order and use new gaskets.
- Connect the electrical wires of the pump in reverse sequence. Check for correct routing of the lines.
- Re-fit the discharge pipe (1) and use new gaskets.
- Filling and vent the combi boiler and the shift load storage tank.
- After completion of the work check the system for gas leaks and carry out a function test (see Section 7.8).

9.8 Replacing the aqua sensor

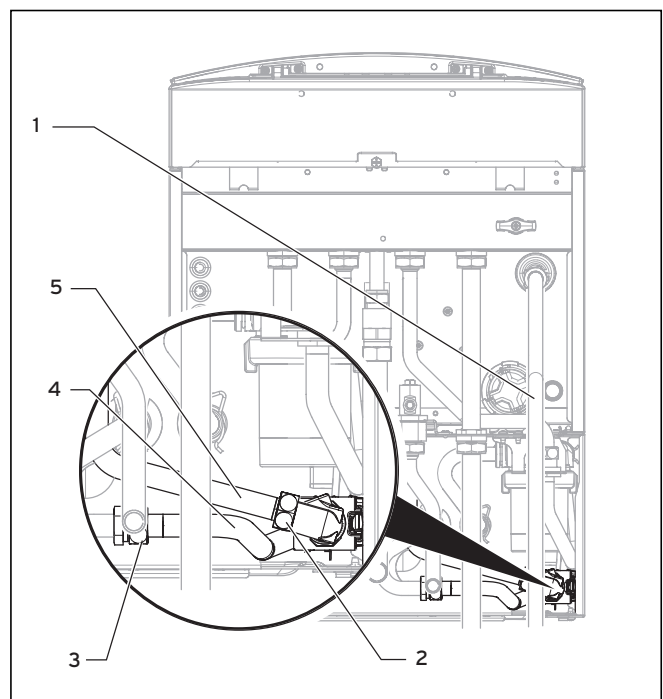


Fig. 9.9 Replacing the aqua sensor

9 Replacing components



Danger!
Before replacing components ensure that the safety instructions from Section 9.1 are observed.

- Isolate the unit from the mains as described in Section 9.1.
- Close the gas isolator valve in the gas supply pipe.
- Close the stop valves in the hot water system and drain the water out of the combi boiler and the shift load storage tank.
- Remove the discharge pipe (1) of the heating pressure relief.
- Separate the electrical wire of the aqua sensor from the wiring harness by pulling off the plug from the wiring harness.
- Release the fitting (2) and (3) on the elbows (4) and (5).
- Turn the Aqua-Sensor slightly to the side and pull the Aqua-Sensor downwards out of the chassis.
- Remove the pipe elbow from the Aqua-Sensor.
- Fit the pipe elbow onto the new Aqua-Sensor and use new gaskets.
- Mount the new Aqua-Sensor in reverse order and replace the seals.
- Connect the line plug of the Aqua-Sensors with the wiring harness.
- Re-fit the discharge pipe (1) and use new gaskets.
- Filling and vent the combi boiler and the shift load storage tank.
- After completion of the work check the system for water leaks and carry out a function test (see Section 7.8).

9.9 Replacing the electronics on the shift load storage tank

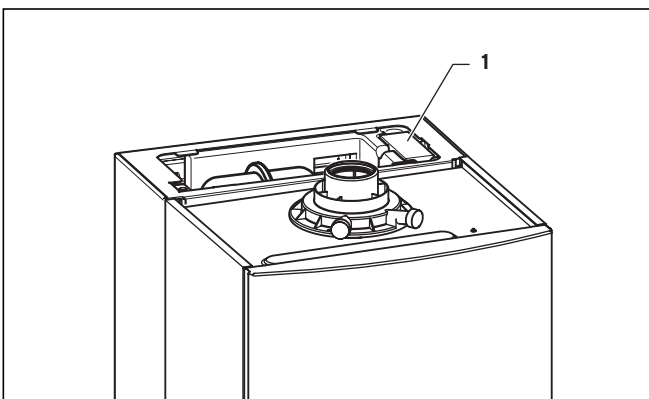


Fig. 9.10 Replacing electronics



Danger!
Before replacing components ensure that the safety instructions from Section 9.1 are observed.

- Isolate the unit from the mains as described in Section 9.1.
- Close the gas isolator valve in the gas supply pipe.
- Comply with the assembly and installation manuals provided with the spare parts.
- Remove the screw on the top cover of the shift load storage tank and remove the cover.
- Pull the electronics (1) out of the location slot.
- Pull off the plug connector from the wiring harness.
- Fit the new electronics in reverse order.
- Start up the appliance.

Check the correct setting of the unit variants (DSN) as follows:

- Enter the 2nd diagnostic level of the combi boiler .
- Set the equipment-specific DSN value (parameter "d.93") in accordance with Table 10.1.

Appliance type	DSN
ecoTEC plus 937	8

Table 9.1 DSN Setting Values

- Exit the diagnostic mode.

The combi boiler ecoTEC plus 937 is ready for operation.

9.10 Replacing the electronics and the display on the combination boiler



Danger!
Before replacing components ensure that the safety instructions from Section 9.1 are observed.

- Comply with the assembly and installation manuals provided with the spare parts.

Replacing the display or the electronics

If you are only replacing one of the two components the parameter settings take place automatically. When switching the unit on the new component automatically takes the pre-set parameters from the components which have not been changed.

Replacing the display or the electronics

When replacing both components, after being turned on, the appliance goes to fault and displays the error message **F.70**.

- In the second diagnostic level, under the diagnostic point "d.93" enter the number of appliance variant according to Table 9.1 (see Chapter 9.9).

The electronics is now set to the appliance type and the parameters of all adjustable diagnostic points correspond to the factory settings.

9.11 Checking and setting the CO₂ content, if required (air ratio adjustment)

Note
 Checking/adjusting this value is only required under the following circumstances: Replacing the gas valve, converting from or to natural gas/propane during an annual service (if a flue gas analyser is available) or under suspicion of faulty combustion!

- Remove the front cover.
- Press the "-" and "+" buttons simultaneously. The "full load mode" is activated.
- Wait at least 5 minutes until the appliance reaches its operating temperature.

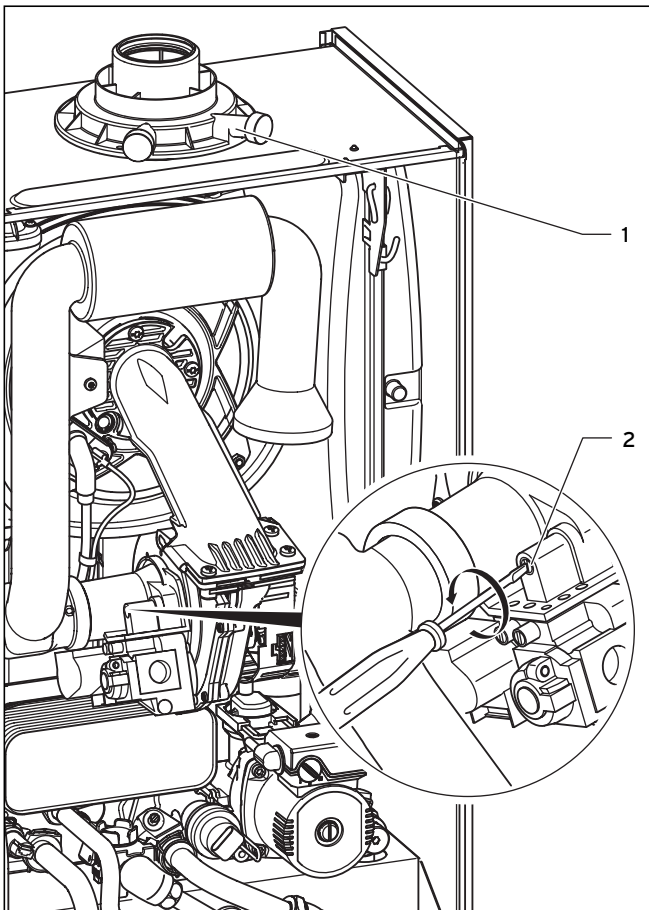


Fig. 9.11 Measurement of the CO₂ content; Preparation air figure setting

- Measure the CO₂ content at the flue gas analysis point (1) of the flue adapter.
- If required, remove the screw and swing the air inlet pipe downwards through 90° (do not remove!).
- If necessary, set the corresponding flue gas value (value with removed appliance front, see Table 9.2) by turning the screw (2).
 - > Turn to the left: Higher CO₂ content
 - > Turn to the right: Lower CO₂ content

Note
Only for natural gas:
 Carry out the setting only in steps of 1/8 turn. After each setting wait for approx. 1 Minute until the value has stabilised.

Only for liquid gas:
 Carry out the setting only in very small steps (approx. 1/16 turn.) After each setting wait for approx. 1 Minute until the value has stabilised.

- Swing the air inlet pipe upwards again.
- Check the CO₂ content again.
- If necessary repeat the setting procedure.
- Press the "i" and "+" buttons simultaneously. The "full load mode" is de-activated. Deactivation of the full load mode if no button is pushed within a period of 15 minutes.
- Secure the air inlet pipe.
- Re-fit the front cover.

Settings:	Natural gas (H) Tolerance	Propane Tolerance	Unit
CO ₂ content after 5 min. Full load mode with front cladding closed	9.2 ± 1.0	10.2 ± 0.5	Vol.-%
CO ₂ content after 5 min. Full load mode with front cladding removed	9.0 ± 1.0	10.0 ± 0.5	Vol.-%
Setting for the Wobbe-Index W0	15	22.5	kWh/m ³
CO content in full load mode	< 250	< 250	ppm

Table 9.2 Factory gas settings

10 Recycling and disposal

11 Vaillant service

10 Recycling and disposal

The product development of all Vaillant products takes into account later recycling and/or the secure scrapping of each component used. Vaillant factory standards stipulate strict requirements in this regard. The selection process for choosing the raw materials takes into account their recycling properties, the dismantlability and the separation facility of the component groups. We also take into account the environmental and health dangers associated with the recycling and disposal of non-reusable remnants.

10.1 Unit

The Vaillant ecoTEC consists to a large extent (up to 92 %) of metallic components designed for recycling by melting down in the steelworks. This gives these parts almost indefinite reusability. All plastic materials are marked properly which makes the separation and sorting more easy when the component group needs to be recycled.

10.2 Packaging

Vaillant strives to keep the scope of the transport packaging for its units to an absolute minimum. When selecting the packaging material its subsequent reusability is taken into account. High quality cardboard has been, for many years, a valuable raw material for the paper and cardboard industry. The EPS components (Styropor®) are used for protecting the unit during transport. EPS is 100 % recyclable and CFC-free. The foil packaging and securing straps are made from recyclable plastic.

11 Vaillant service

To ensure regular servicing, it is strongly recommended that arrangements are made for a Maintenance Agreement. Please contact Vaillant Service Solutions (0870 6060 777) for further details.

EC declaration of conformity



EC declaration of conformity

Name and Address of the manufacturer: **Vaillant GmbH
Berghäuser Str. 40
42859 Remscheid**

Identification of product: **Condensing wall-hung system / combination boiler with its flue ducts**

Identification of type: **VU GB 126/3-5, ...156/3-5, ...186/3-5, ...246/3-5,
...306/3-5, ... 376/3-5
VUW GB 246/3-5, ...316/3-5, ...376/3-5
VUW GB 246/3-3, ...286/3-3**

The appliance types as described satisfy the essential requirements of the directives which apply to them:

<p>90/396/EEC "Directive on the approximation of the law of the member states relating to appliances burning gaseous fuels"</p> <p>92/42/EEC "Directive of efficiency relating to boiler burning gaseous fuels"</p> <p>73/23/EEC "Directive on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits"</p> <p>89/336/EEC "Directive on the approximation of the law of the member states relating to electromagnetic compatibility "</p>	<p>Designed and built to CE-type examination certificate: PIN no: CE-0085PB0464</p> <p>Designed and built according to European Standards: EN 483 EN 677 EN 625 EN 60335-1 EN 60529 EN 50165 EN 55014 EN 61000-3-2 EN 61000-3-3</p>
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Any change on the appliance and/or any use not according to the instructions will lead to the invalidation of this Declaration of Conformity

<p>Remscheid, 19.12.2006 _____ (place, date)</p>	 _____ Group Programm Manager i. V. H.J. Brecker	 _____ Certification Department i. A. B. Zscheile
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Vaillant 0332006

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Directors: Dr. Michel Brosset, Claes Göransson ■ Chairman of the Supervisory Board: Gert Krüger
Commerzbank Remscheid (code 340 400 49) account no. 621 833 300 ■ USt-Ident-Nr. DE 81142240



BENCHMARK No. | | | | | | |

GAS BOILER COMMISSIONING CHECKLIST

BOILER SERIAL No. _____ NOTIFICATION No. _____

CONTROLS To comply with the Building Regulations, each section must have a tick in one or other of the boxes

TIME & TEMPERATURE CONTROL TO HEATING	ROOM T/STAT & PROGRAMMER/TIMER <input type="checkbox"/>	PROGRAMMABLE ROOMSTAT <input type="checkbox"/>
TIME & TEMPERATURE CONTROL TO HOT WATER	CYLINDER T/STAT & PROGRAMMER/TIMER <input type="checkbox"/>	COMBI BOILER <input type="checkbox"/>
HEATING ZONE VALVES	FITTED <input type="checkbox"/>	NOT REQUIRED <input type="checkbox"/>
HOT WATER ZONE VALVES	FITTED <input type="checkbox"/>	NOT REQUIRED <input type="checkbox"/>
THERMOSTATIC RADIATOR VALVES	FITTED <input type="checkbox"/>	
AUTOMATIC BYPASS TO SYSTEM	FITTED <input type="checkbox"/>	NOT REQUIRED <input type="checkbox"/>

FOR ALL BOILERS CONFIRM THE FOLLOWING

THE SYSTEM HAS BEEN FLUSHED IN ACCORDANCE WITH THE BOILER MANUFACTURER'S INSTRUCTIONS?

THE SYSTEM CLEANER USED _____

THE INHIBITOR USED _____

FOR THE CENTRAL HEATING MODE, MEASURE & RECORD

GAS RATE m³/hr ft³/hr

BURNER OPERATING PRESSURE (IF APPLICABLE) N/A mbar

CENTRAL HEATING FLOW TEMPERATURE °C

CENTRAL HEATING RETURN TEMPERATURE °C

FOR COMBINATION BOILERS ONLY

HAS A WATER SCALE REDUCER BEEN FITTED? YES NO

WHAT TYPE OF SCALE REDUCER HAS BEEN FITTED? _____

FOR THE DOMESTIC HOT WATER MODE, MEASURE & RECORD

GAS RATE m³/hr ft³/hr

MAXIMUM BURNER OPERATING PRESSURE (IF APPLICABLE) N/A mbar

COLD WATER INLET TEMPERATURE °C

HOT WATER OUTLET TEMPERATURE °C

WATER FLOW RATE lts/min

FOR CONDENSING BOILERS ONLY CONFIRM THE FOLLOWING

THE CONDENSATE DRAIN HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS? YES

FOR ALL INSTALLATIONS CONFIRM THE FOLLOWING

THE HEATING AND HOT WATER SYSTEM COMPLIES WITH CURRENT BUILDING REGULATIONS

THE APPLIANCE AND ASSOCIATED EQUIPMENT HAS BEEN INSTALLED AND COMMISSIONED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS

IF REQUIRED BY THE MANUFACTURER, HAVE YOU RECORDED A CO/CO₂ RATIO READING? N/A YES CO/CO₂ RATIO

THE OPERATION OF THE APPLIANCE AND SYSTEM CONTROLS HAVE BEEN DEMONSTRATED TO THE CUSTOMER

THE MANUFACTURER'S LITERATURE HAS BEEN LEFT WITH THE CUSTOMER

COMMISSIONING ENG'S NAME PRINT _____ CORGI ID No. _____

SIGN _____ DATE _____

SERVICE INTERVAL RECORD

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

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

SERVICE 1 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 2 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 3 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 4 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 5 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 6 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 7 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 8 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 9 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 10 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

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