

For the installer

## Instructions for installation and servicing ecoTEC plus



Wall hung open vent condensing boiler

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# 1 Introduction

## 1 Introduction

### 1.1 Notes on the documentation.

To ensure clarity of information in instructions a new European standard of advice and symbols is being introduced. To ensure compliance with this new standard the following details are included. The following information is intended to help you throughout the boilers entire instruction pack. **We assume no liability for any damage caused by non-observance of these instructions.**

#### 1.1.1 Other instructions supplied with this appliance.

##### For the owner:

Instructions for use no. 0020020829

Short operating instructions no. 838404

Warranty card with return envelope no. 802922

##### For the installer/service engineer:

Flue installation instructions no. 834449

The instructions for any accessories and controllers used also apply.

The Benchmark gas boiler commissioning checklist (in the installation manual) should be completed by the installer and/or the commissioning engineer.

If, after reading these instructions, you have any questions on the operation of the boiler, please contact either your installer or Vaillant Technical Department.

### 1.1.2 Retention of documents

Please retain this literature and all related documents so that they are available whenever they are required. If you move please pass on the documents to the buyer.

### 1.1.3 Safety instructions and symbols

Please observe the safety instructions in this literature for the operation of the appliance.



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



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



**Danger!**  
Risk of burns or scalding!



**Caution!**  
Potentially dangerous situations for the product and environment.



**Note!**  
Useful information and instructions.

•Symbol for a necessary task



**Note!**  
This boiler must be installed and serviced by a competent person in accordance with the Gas Safety (Installation and Use) Regulations 1998. In the UK 'CORGI' registered installers undertake the work in compliance with safe and satisfactory standard.

### 1.2 ecoTEC plus boilers

The ecoTEC plus boilers are designed to provide central heating from a fully pumped open-vented or sealed water system. The central heating water temperature can be adjusted on the boiler. The domestic hot water can only be adjusted on the boiler if it is installed with a Vaillant uniSTOR unvented cylinder and relevant controls. Once the controls are set the boiler operates automatically. A frost protection programme is also included. Please read these instructions and follow them carefully for the correct and economical use of your boiler.

These instructions are applicable to the following ecoTEC plus boilers, available in Natural Gas. All ecoTEC plus boilers can be converted to LPG.

APPLIANCE	MAXIMUM OUTPUT
ecoTEC plus 415	15kW
ecoTEC plus 418	18kW
ecoTEC plus 428	28kW
ecoTEC plus 438	38kW

### 1.3 General notes

The boiler has been designed for use with a open-vented central heating system, and comes fully tested and assembled. The boiler is easily mounted on any internal wall and can be installed with either a horizontal or vertical RSF (room sealed fan assisted) flue. The boiler uses a standard flue system (100 mm or 125 mm outside diameter). Flue extensions and additional bends and elbows are available for the flue system to increase the flexibility. If desired, an inhibitor may be used in the system. Guidance on the use of inhibitors is contained in these instructions. The boiler has a built in diagnostic system which indicates the operational status of the boiler. This feature provides key information to aid commissioning and fault finding. The data badge is fitted to the combustion chamber cover of the boiler. See text of General Requirements for installation requirements or notes.

The Vaillant ecoTEC plus boilers have been constructed in accordance with recognised safety regulations. Nevertheless, danger to the life and limb of the user or third parties can still occur or the appliance or other material assets be damaged in the event of improper use. The appliances are designed for central heating systems. Any other use or extended use is considered to be use other than intended. The manufacturer/supplier is not liable for any resulting damage. Intended use includes the observance of the operating and installation manual and the adherence to the inspection and maintenance conditions.



**Caution!**  
Any incorrect use is forbidden.

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



## 1.4 General information

Thank you for choosing a Vaillant boiler. The information given in this booklet will enable you to obtain the best performance from your boiler. The Benchmark logbook should be completed by the installer and/or commissioning engineer and handed to the user.

### 1.4.1 Gas category

The boiler is supplied factory set for use on Natural Gas (G20). The ecoTEC plus boilers can be field adjusted for use on LPG (propane G31), see section 7 for instructions or contact Vaillant Service, 0870 6060 777.

### 1.4.2 Gas safety (installation and use) regulations

In your own interests and that of safety, it is the Law that ALL gas appliances are installed by a competent person in accordance with the current issue of the above regulations.

### 1.4.3 Gas testing and certification

The boiler is tested and certificated for safety and performance. It is, therefore, important that no alteration is made to the boiler.

### 1.4.4 Control of substances hazardous to health

Under Section 6 of The Health and Safety at Work Act 1974, we are required to provide information on substances hazardous to health.

The adhesives and sealants used in this appliance are cured and give no known hazard in this state.

### 1.4.5 Insulation pads

These can cause irritation to skin, eyes and the respiratory tract.

If you have a history of skin complaint you may be susceptible to irritation. High dust levels are usual only if the material is broken.

Normal handling should not cause discomfort, but follow normal good hygiene and wash your hands before eating, drinking or going to the lavatory. If you do suffer irritation to the eyes or severe irritation to the skin seek medical attention.

### 1.4.6 Spare parts

Only original Vaillant spare parts may be used.

### 1.4.7 Manual handling guidance

During the appliance installation and the replacement of the heat exchanger it will be necessary to employ caution and assistance whilst lifting as the appliance or component exceeds the recommended weight for a one man lift.

In certain situations it may be required to use a mechanical handling aid.

Take care to avoid trip hazards, slippery or wet surfaces.



## Danger

**Smell of gas. Risk of poisoning and explosion due to a malfunction**

### 1.4.8 Gas leak or fault

If you smell gas or suspect a gas leak:

- Do not switch lights on or off.
- Do not use any other electrical switches.
- Do not use a telephone in the hazardous area.
- Do not use naked flames, such as matches or cigarette lighters.
- Do not smoke.
- Turn off the gas supply at the gas meter.
- Open the windows and doors.
- Warn other residents.
- Get out of the house.
- Consult your gas supplier, service agent or other competent person.

### 1.4.9 Clearances

If fixtures are positioned close to the boiler, space must be left as shown in fig 4.1. Enough space must also be left in front of the boiler to allow for servicing.

### 1.4.10 Sheet metal parts

This boiler contains metal parts (components) and care should be taken when handling and cleaning, with particular regard to edges.

### 1.4.11 Sealed components

Under no circumstances must the User interfere with any sealed component as this could result in a potentially dangerous situation arising.



## Danger

**This boiler must be earthed.**

### 1.4.12 Electrical supply failure

The boiler will not work without an electrical supply. Normal operation of the boiler should resume when the electrical supply is restored.

Reset any external controls to resume normal operation of the central heating.

If the boiler does not resume normal operation.

(The burner fails to ignite after five attempts).

The overheat thermostat may have operated.

Automatic ignition can only take place after you manually reset the fault, refer to section 5.1.3. to reset.

# 1 Introduction

## 1.4.13 Protection against freezing

The boiler has a built in frost protection programme as long as the electricity and gas are left switched on. This device operates the burner and system pump when the temperature inside the boiler falls to 3°C. Any other exposed areas of the system should be protected by a separate frost thermostat.

If the mains electricity and gas are to be turned off for any long periods during severe weather, it is recommended that the whole system, including the boiler, should be drained to avoid the risk of freezing. Make sure that, if fitted, the immersion heater in the cylinder is switched off.

If you have a sealed water system contact your installation/ servicing company as draining, refilling and pressurising MUST be carried out by a competent person.

As a safety feature the boiler will stop working if the condensate drain becomes blocked. During freezing conditions this may be due to the forming of ice in the condense drain external to the house. Release an ice blockage by the use of warm cloths on the pipe. The boiler should then restart. Contact your installation/ servicing company if the fault persists.

## 1.4.14 Boilers installed in a compartment or cupboard

If the boiler is fitted into a compartment or cupboard it does not require ventilation openings.

Do not use the compartment or cupboard for storage.

## 1.4.15 Boiler casing

Do not remove or adjust the casing in any way, as incorrect-fitting may result in incorrect operation or failure to operate at all.

## 1.4.16 Condensate drain

The condensate drain must not be modified or blocked.

## 1.4.17 Plumbing from flue terminal

All condensing boilers produce a plume of water vapour from the flue terminal. This is due to the high efficiency and hence low flue gas temperature. This may increase in wet, damp weather but this is completely normal and indicates that the boiler is operating correctly.

## 1.4.18 Cleaning

This appliance contains metal parts and care should be taken when handling and cleaning with particular regard to edges.

The boiler casing can be cleaned using a mild liquid detergent with a damp cloth, then a dry cloth to polish. Do not use any form of abrasive or solvent cleaner as you may damage the paint work.

## 1.4.19 Maintenance and servicing

For the continued efficient and safe operation of the boiler it is recommended that it is checked and serviced at regular intervals. The frequency of servicing will depend upon the installation conditions and usage, but in general, once a year should be enough.

If this appliance is installed in a rented property there is a duty of care imposed on the owner of the property by the current issue of the Gas Safety (Installation and Use) Regulations, Section 35.

Servicing/maintenance should be carried out by a competent person in accordance with the rules in force in the countries of destination.

To obtain service, please call your installer or Vaillant Service Solutions (0870 6060 777).

Please be advised that the installation engineer on completion of commissioning and servicing should complete the 'Benchmark' logbook.

All CORGI Registered Installers carry a CORGI ID card, and have a registration number. Both should be recorded in your boiler Logbook. You can check your installer is CORGI registered by calling CORGI direct on: - 01256 372300.

## 1.4.20 Technical data

All dimensions are given in millimetres (except as noted). The data label is positioned on the combustion chamber cover. The Seasonal Efficiency Domestic Boilers UK (SEDBUK) is:

All ecoTEC plus boilers : Class 'A'.

The value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated has been certified by B.S.I.

## 1.4.21 Guarantee

Vaillant provide a full two year parts and labour warranty for your appliance.

The appliance must be installed by a suitably competent person in accordance with the gas safety (installation and Use) Regulations 1998, and the manufacture's instructions. In the UK 'CORGI' registered installers undertake the work in compliance with safe and satisfactory standards.

Terms and conditions apply to the warranty, details of which can be found on the warranty registration card included with this appliance.

Failure to install and commission this appliance in compliance with the manufacture's instructions may invalidate the warranty (this does not affect your statutory rights).

### 1.5 Statutory requirements

The appliance is suitable only for installation in GB and IE and should be installed in accordance with the rules in force. In GB the installation of the boiler must be carried out by a competent person as described in the following regulations:

The manufacturer's instructions supplied.

The Gas Safety (Installation and Use) Regulations.

The appropriate Buildings Regulations either The Building Regulations, The Building Regulations (Scotland), The Building Regulations (Northern Ireland).

The Water Fittings Regulations or Water bye laws in Scotland. The Health and Safety at Work Act, Control of Substances Hazardous to Health (COSHH).

The Current I.E.E. Wiring Regulations.

Where no specific instructions are given, reference should be made to the relevant British Standard Code of Practice. In IE, the installation must be carried out by a competent person and installed in accordance with the current edition of I.S.813 "Domestic Gas Installations", the current Building Regulations and reference should be made to the current ETCI rules for Electrical Installation.

In GB the following Codes of Practice apply:

BS4814, BS6798, BS5440 Part 1 and 2, BS5546 Part 1, BS5449, BS6891, BS6700, BS7074 Part 1 and 2, BS7593, BS7671.

In IE: I.S.813, BS5546, BS 5449, BS 7074, BS 7593.

Manufacturer's instructions must not be taken as overriding statutory requirements.

Note: For further information, see the current issue of the

Building Regulations, approved document L1 (in the UK) and the current issue of the following:

1) Central heating system specification (CheSS)

2) Controls for domestic central heating system and hot water. BRECSU.

#### Certification

This boiler certificated to the current issue of EN 483 for performance and safety.

It is important that no alteration is made to the boiler, without permission, in writing, from Vaillant.

Any alteration that is not approved by Vaillant, could invalidate the warranty and could also infringe the current issue of the Statutory Requirements.

### 1.6 Regulations, rules and guidelines.

This boiler meets the requirements of Statutory Instrument, No. 3083 The Boiler (Efficiency) Regulations, and therefore is deemed to meet the requirements of Directive 92/42/EEC on the efficiency requirements for new hot water boilers fired with liquid or gaseous fuels.

Type test for purposes of Regulation 5 certified by: Notified body 0087.

Product/production certified by: Notified body 0086.



### 1.7 CE mark

The CE mark on this appliance shows compliance with:

- Directive 90/396/EEC on the approximation of the laws of the Member States relating to appliances burning gaseous fuels.
- Directive 73/23/EEC on the harmonisation of the Laws of the Member States relating to electrical equipment designed for use within certain voltage limits.
- Directive 89/336/EEC on the approximation of the Laws of the Member States relating to electromagnetic compatibility.

### 1.8 Benchmark



**Vaillant Ltd. support the Benchmark initiative.** At the rear of the installation manual, you will find a Benchmark gas boiler commissioning checklist. It is very important that this is completed correctly at the time of installation, commissioning and hand over to the user.



*The code of practice for the installation, commissioning & servicing of gas central heating*

### 1.9 Gas council numbers

Appliance	Gas council numbers
ecoTEC plus 415	41-044-53
ecoTEC plus 418	41-044-54
ecoTEC plus 428	41-044-55
ecoTEC plus 438	41-044-57

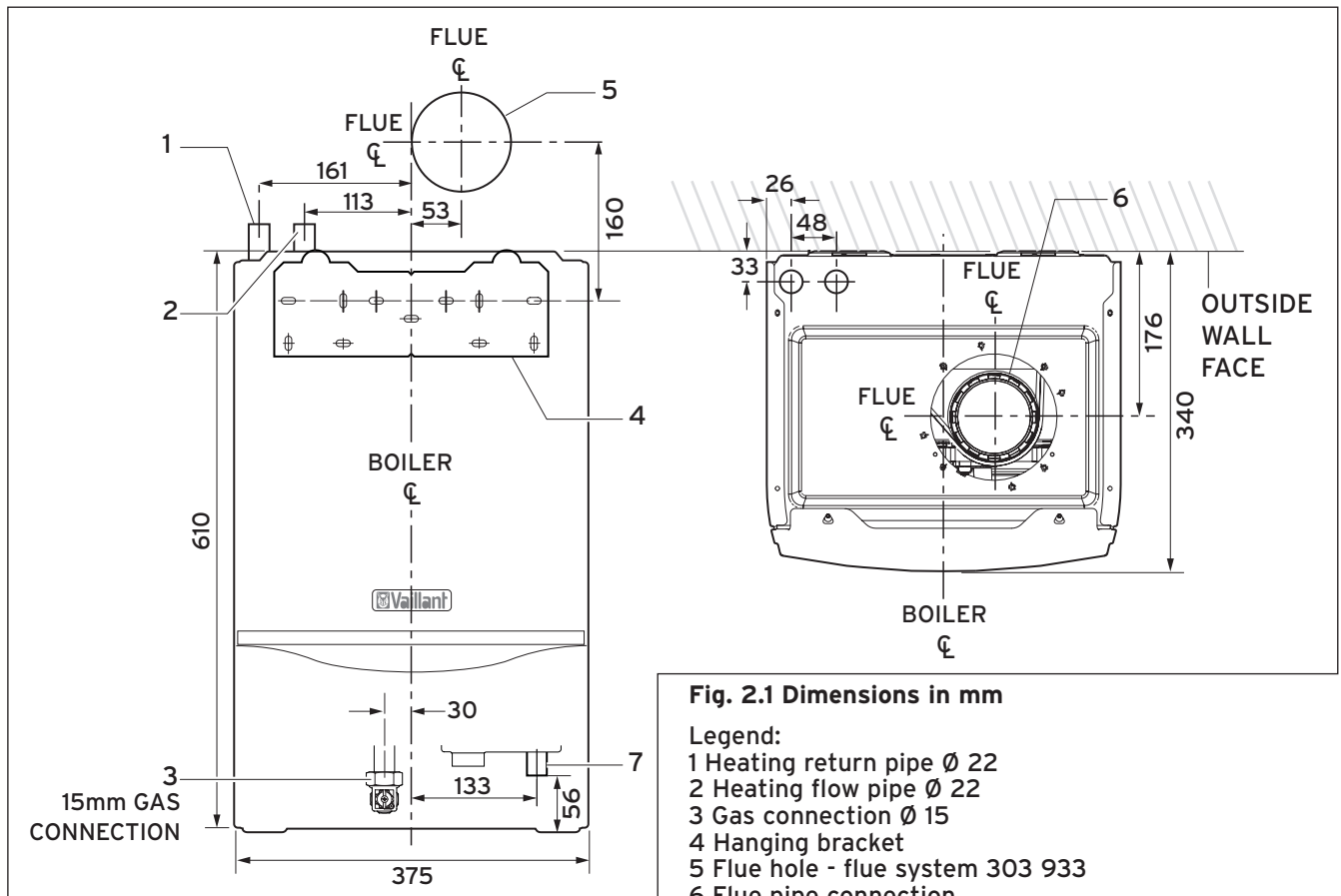
## 2 Boiler specifications

### 2 Boiler specifications

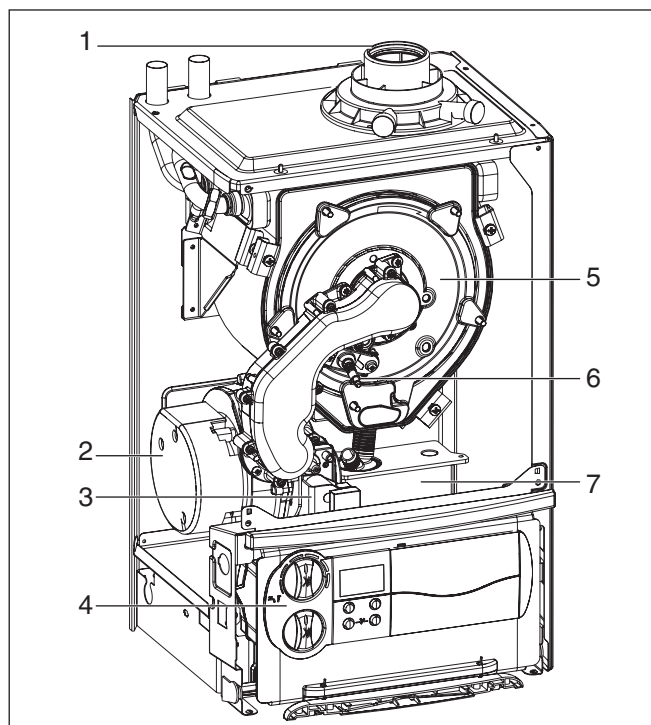
#### 2.1 Technical data

Description	Unit	ecoTEC plus 415	ecoTEC plus 418	ecoTEC plus 428	ecoTEC plus 438
Maximum CH heat input (net)	kW	15.3	18.9	28.6	38.4
CH heat output (80/60 °C)	kW	5.0 - 15.0	5.0 - 18.6	5.3 - 28.2	6.3 - 38.0
CH heat output (50/30 °C)	kW	5.3 - 16.2	5.3 - 20.0	5.7 - 30.6	6.8 - 41.0
SEDBUK Band		A	A	A	A
SAP Seasonal Efficiency	%	90.5	90.4	90.6	90.8
NOx Class		5	5	5	5
"IP rating"		IPX4D	IPX4D	IPX4D	IPX4D
Inlet gas working pressure required (natural gas)	mbar	20	20	20	20
Gas supply (G20) Gross CV (s.t.)	MJ/ m <sup>3</sup>	37.8	37.8	37.8	37.8
Maximum gas rate	M <sup>3</sup> /h	1.61	2.0	3.02	4.06
Minimum gas rate	M <sup>3</sup> /h	0.53	0.53	0.56	0.71
Burner % CO <sub>2</sub> (Case on)	%	9.3 + 0.2 - 0.5	9.3 + 0.2 - 0.5	9.3 + 0.2 - 0.5	9.0 + 0.2 - 0.5
Gas connection (compression)	mm	15	15	15	15
Water connections (compression)	mm	22	22	22	22
Condensate drain (internal diameter)	mm	19 min.	19 min.	19 min.	19 min.
Fuse ratings fan supply PCB	A	3.15 AT	3.15 AT	3.15 AT	3.15 AT
Main PCB	A	125 mAT	125 mAT	125 mAT	125 mAT
Minimum flow rate of water through the boiler	L/min.	10.8	12.9	20.3	27.2
Weight	kg	3.1	3.1	3.3	3.3
Electrical supply	V~/ HZ	230/~50	230/~50	230/~50	230/~50
External fuse	A	3	3	3	3
Power input	W	60	60	60	60
Case height	mm	600	600	600	600
Case width	mm	375	375	375	375
Case depth	mm	334	334	334	334

## 2.1.2 Dimensions



## 2.1.3 Installation



**Fig. 2.2 Function elements of boiler**

- Legend:**
- 1 Flue pipe connection
  - 2 Fan
  - 3 Gas valve
  - 4 Electronics box
  - 5 Burner module
  - 6 Ignition electrode
  - 7 Condensate trap



## 3 General requirements

### 3 General requirements

#### 3.1 Preliminary remarks for room sealed appliances

This appliance should only be installed with a Vaillant flue system.

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), BS7671 (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 pipe work 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/UP/7/1998: "Guide for gas installations in timber framed housing". IGE/UP1: Soundness testing and purging of industrial and commercial gas installation. IGE/UP2: Gas installation pipe work, boosters and compressors on industrial and commercial premises. 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!

**The appliance must be installed and serviced by a competent person as stated in the Gas Safety (Installation and Use) Regulations 1998. In IE, the installation must be in accordance with the current edition of I.S.813 'Domestic Gas Installations', the current Building Regulations and reference should be made to the current ETCI rules for electrical installation.**



#### Caution!

**When tightening or slackening screwed connections always use suitable open-ended spanners (not pipe wrench, or extensions, etc.). Incorrect use and/or unsuitable tools can lead to damage being caused (e.g. gas or water leakage)!**

#### 3.3 Installation site

The location chosen for the boiler must permit the provision of a satisfactory flue termination. The location must also provide adequate space for servicing and air circulation around the boiler. The boiler may be installed in any room, although particular attention is drawn to the requirements of BS 7671 (IEE Regulations), the electrical provisions of the Building Standards (Scotland) Regulations, and in IE the current edition of IS 813 and the current ETCI rules, in respect of the installation of a boiler in a room containing a bath or shower.



#### Note!

**If a room sealed boiler is installed in a room with a bath or shower, electrical switches or boiler controls using the mains power supply must be placed at locations that cannot be reached by the person in the bath or shower.**

If the boiler is installed in an unusual location, special procedures may be necessary and BS 5546 and BS 6798 give detailed guidance on this aspect. The boiler must be mounted on a flat, vertical wall, which must be sufficiently robust to take the weight of the boiler. The boiler may be installed on a combustible wall, subject to the requirements of the Local Authorities and Building Regulations.

A compartment used to enclose the boiler must be designed and constructed specifically for this purpose. (An existing cupboard or compartment may be used provided that it is modified for the purpose). Details of essential features of cupboard/compartment design including airing cupboard installations are given in BS 6798. If the boiler is to be fitted in a timber framed building, it should be fitted in accordance with Institute of Gas Engineers Publication IGE/UP/7/1998 "Guide for Gas Installation in Timber Framed Housing". Please note the safety instructions below before deciding where to install the boiler:



#### Caution

**Do not install the appliance in rooms prone to frost. In rooms with aggressive steam or dust, the appliance must be operated independent of the ambient air.**

When choosing the place of installation and while operating the appliance, make sure that the air supply is free of chemical substances containing fluorine, chlorine, sulphur etc. Sprays, solvents and cleaning agents, paints, adhesives etc. contain the kind of substances that can lead to corrosion even in the exhaust system when the appliance is operated depending on the ambient air in the worst case scenario. Particularly in hair-cutting 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 air supply is free of the above mentioned substances.

### 3.4 Gas supply

The gas supplier should ensure the availability of an adequate supply of gas. A gas meter may only be connected to the service pipe by the supplier of gas or their contractor. An existing meter should be checked to ensure that it is capable of passing the rate of gas supply required. Installation pipes should be fitted in accordance with BS 6891. In IE the current edition of IS 813. Pipe work from the meter to the boiler must be of an adequate size. Do not use pipes of a smaller size than the boiler gas connection (15 mm). The complete installation must be checked for leaks and purged as described in BS 6891.



#### **Danger!**

**Vaillant appliances are certified only for use with genuine Vaillant flue pipes. 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.**

### 3.5 Flue options

There are various flue systems to choose from, as follows:

- 60/100 standard horizontal air/flue duct, see fig 3.1.
  - 60/100 telescopic horizontal air/flue duct, see fig 3.2.
  - 60/100 Vertical air/flue duct and terminal, see fig 3.3.
  - 80/125 horizontal air/flue duct, see fig 3.4.
  - 80/125 Vertical air/flue duct and terminal, see fig 3.5.
- Flue extensions are available to extend the length, both 90° bends and 45° elbows are also available.

Refer to flue system installation instructions for full details.

When extension pipes are used the flue system must be designed to have a continuous fall to the boiler of at least 3° to allow condensate to run out via the drain.

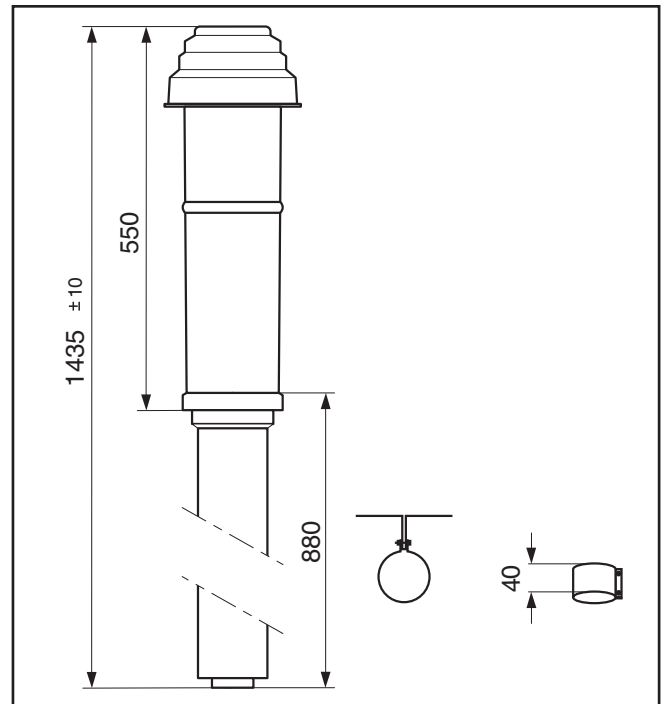


Fig. 3.3 Art. No. 303900

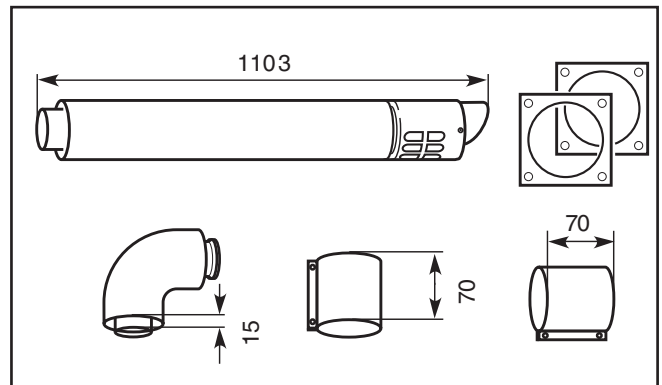


Fig. 3.4 Art. No. 303209

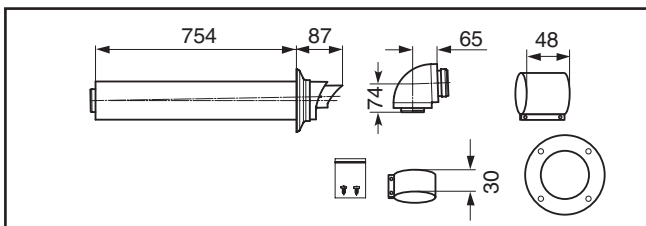


Fig. 3.1 Art. No. 303933

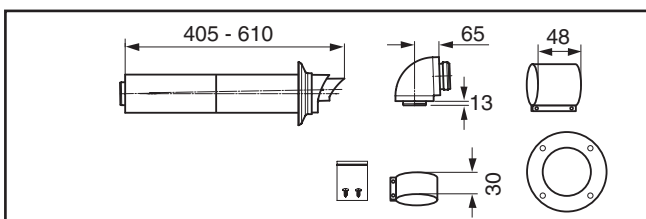


Fig. 3.2 Art. No. 303936

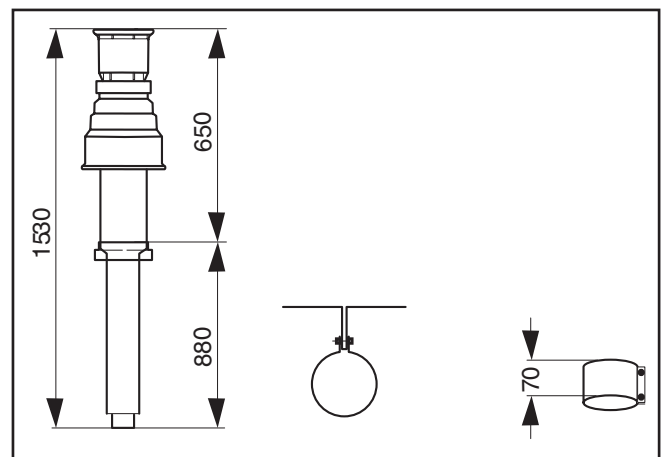


Fig. 3.5 Vertical Flue System Art. No. 303200

## 3 General requirements

### 3.5.1 Flue termination

The following details refer to both flue systems.

- The terminal must be located where the combustible substances can escape freely at all times.
- 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 fitted less than 2 m above a balcony, above ground or above a flat roof to which people have access then a suitable terminal guard must be provided and fitted (made by Tower Flue Components, Tonbridge, TN9 1TB, Model K3, plastic coated).

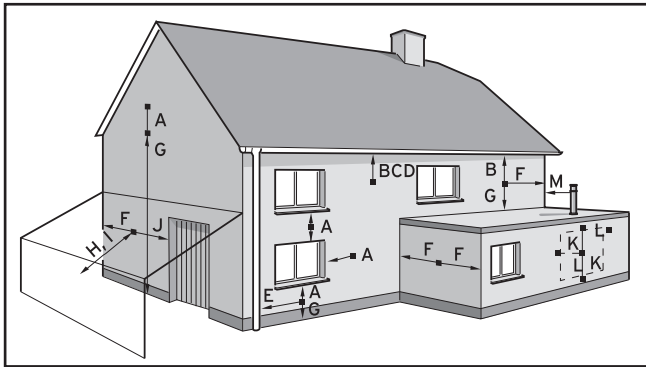


Fig. 3.6 Flue termination



#### Note!

**Vertical flues must not terminate within 600mm of an openable window, air vent or any other ventilation opening.**

The flue assembly shall be so placed or shielded as to prevent ignition or damage to any part of the building.

	Terminal position	mm
A	Directly below an opening, above an opening or horizontal to an opening, air brick, opening window, etc.	300
B	Below gutters, soil pipes or drain pipes	75
C	Below eaves	200
D	Below balconies	200
E	From vertical drain pipes and soil pipes	25
F	From internal or external corners	300
G	Above ground, roof or balcony	300
H	From a surface facing a terminal	600
I	From a terminal facing a terminal	1200
J	From an opening in the car port (e.g. door, window) into the dwelling	1200
K	Vertically from a terminal on the same wall	1500
L	Horizontally from a terminal on the same wall	300
M	Distance from adjacent wall for vertical Flue	500

Table 3.1 Flue terminal position for a fan assisted concentric flue



#### Note!

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

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

- at least 2 m from an opening in the building directly opposite, and
- so that the products of combustion are not directed to discharge across a boundary.

1) Dimensions B, C and D: These clearances may be reduced to 25 mm without affecting the performance of the boiler. In order to ensure that the condensate plume does not affect adjacent surfaces the terminal should be extended as shown in Fig. 3.7.

2) Dimension F:

This clearance may be reduced to 25 mm without affecting the performance of the boiler. However, in order to ensure that the condensate plume does not affect adjacent surfaces a clearance of 300 mm is preferred. For IE, recommendations are given in the current edition of IS 813.

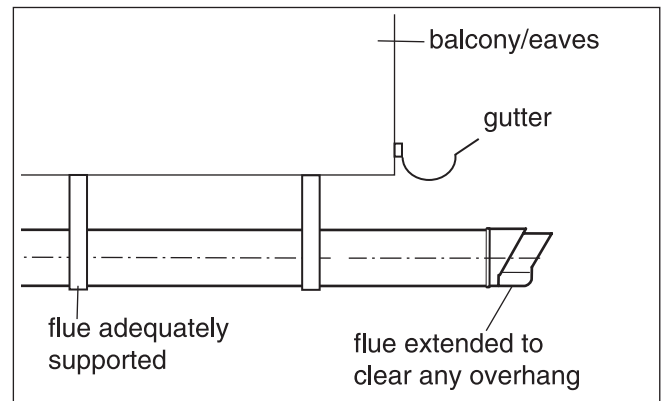


Fig. 3.7 Flue termination under balcony/eaves

### 3.5.2 Internal flue installation

The flue can be installed from inside the building when access to the outside wall face is not practicable.

### 3.6 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.

### 3.7 Cupboard or compartment ventilation

The boilers are very high efficiency appliances. As a consequence the heat loss from the appliance casing during operation is very low. For cupboard or compartment installations it is therefore not necessary to provide any high or low level permanent air vents for cooling purposes.

### 3.8 Domestic hot water cylinder



#### Caution!

**Single feed indirect cylinders are not suitable. The domestic hot water cylinder must be of the double feed fully indirect coil type. It must be suitable for working at a gauge pressure of 0.35 bar above the safety valve setting.**

#### 3.8.1 Unvented hot water cylinder

The ecoTEC plus can be connected to an unvented hot water cylinder. Vaillant offer a range of cylinders called uniSTOR with capacities from 125 litres to 310 litres. All unvented domestic hot water cylinders must be installed by a competent person to the current building regulations and water regulations at the time of installation.

For building regulations refer to G3 and for water regulations guidance G17 to G24 and recommendation R17 to R24.

For Ireland: The current issue of BS5546 and BS6700. If fitting to an existing system the local authority should be informed.

#### 3.9 Condensate drain

A plastic drain pipe must be fitted to allow discharge of condensate to a drain.

Condensate should, if possible, be discharged into the internal household draining system. If this is not practical, discharge can be made externally into the household drainage system or a purpose designed soak away, see Section 4.3.5 for more details.

#### 3.10 Heating system controls

It is recommended that a programmer and room thermostat control the boiler. Vaillant have a range of optional easy fit controls available.

Thermostatic radiator valves must be installed, however they must not be fitted in a room where the room thermostat is located.



#### Note!

**All systems must have at least one radiator not fitted with a thermostatic valve.**



#### Note!

**For further information, see the current issue of the Building Regulations, approved document L1, and the following current issues of:**

- 1) Central heating system specification (CheSS) and
- 2) Controls for domestic central heating system and hot water. BRECSU.

#### 3.11 Draining tap

A draining tap must be provided at all the lowest points of the system, which will allow the entire system and hot water system to be drained.

Draining taps shall be to the current issue of BS 2879.

#### 3.12 Safety valve

A safety valve need not be fitted to an open-vented system.

#### 3.13 Bypass

A system bypass will be required fitted at least 1.5 metres away from the boiler, refer to the current issue of central heating system specifications (CHeSS).

#### 3.14 Pump specification

The pump should be fitted on the flow pipe from the boiler and have isolating valves each side.

A variable duty pump should be set to give a temperature difference of no greater than 20°C

#### 3.15 Cleanser and inhibitor

In the case of an existing installation, it is ESSENTIAL that prior to installing the new boiler the system is thoroughly flushed. For optimum performance after installation of a new system, the boiler and its associated central heating system should also be flushed. Flushing should be carried out in accordance with BS7593: 1992 using a cleanser such as Sentinel X300 or X400, or Fernox Superfloc.

For long-term corrosion protection, after flushing, an inhibitor suitable for stainless steel heat exchangers should be used, refer to the current issue of BS 5449 and BS 7593 on the use of inhibitors in central heating systems. Examples are Sentinel X100 and Fernox.



#### Caution!

**It is ESSENTIAL that the cleanser is fully removed from the system after flushing and before adding inhibitor. Take care to ensure that all low points in the system are fully drained.**

For all systems follow the manufacture's instructions, but where new radiators are fitted do not leave the cleanser in the system for longer than 24 hours.

For optimum performance the boiler and its associated central heating system should be flushed in accordance with BS7593: 1992 using a cleanser.

For optimum performance the boiler and its associated central heating system should be flushed in accordance with BS7593: 1992 using a cleanser.

For advice on the application of system cleansers and inhibitors contact either;

Fernox, Alpha-Fry Technologies

Tandem House

Marlow Way

Beddington Farm Road

Croydon CR0 4XS

Tel: 0870 601 5000

Fernox technical help line

01799 550811

or:

Sentinel, GE Betz

Widnes

Cheshire, WA8 8UD

Tel: 0151 420 9595.

### 3 General requirements

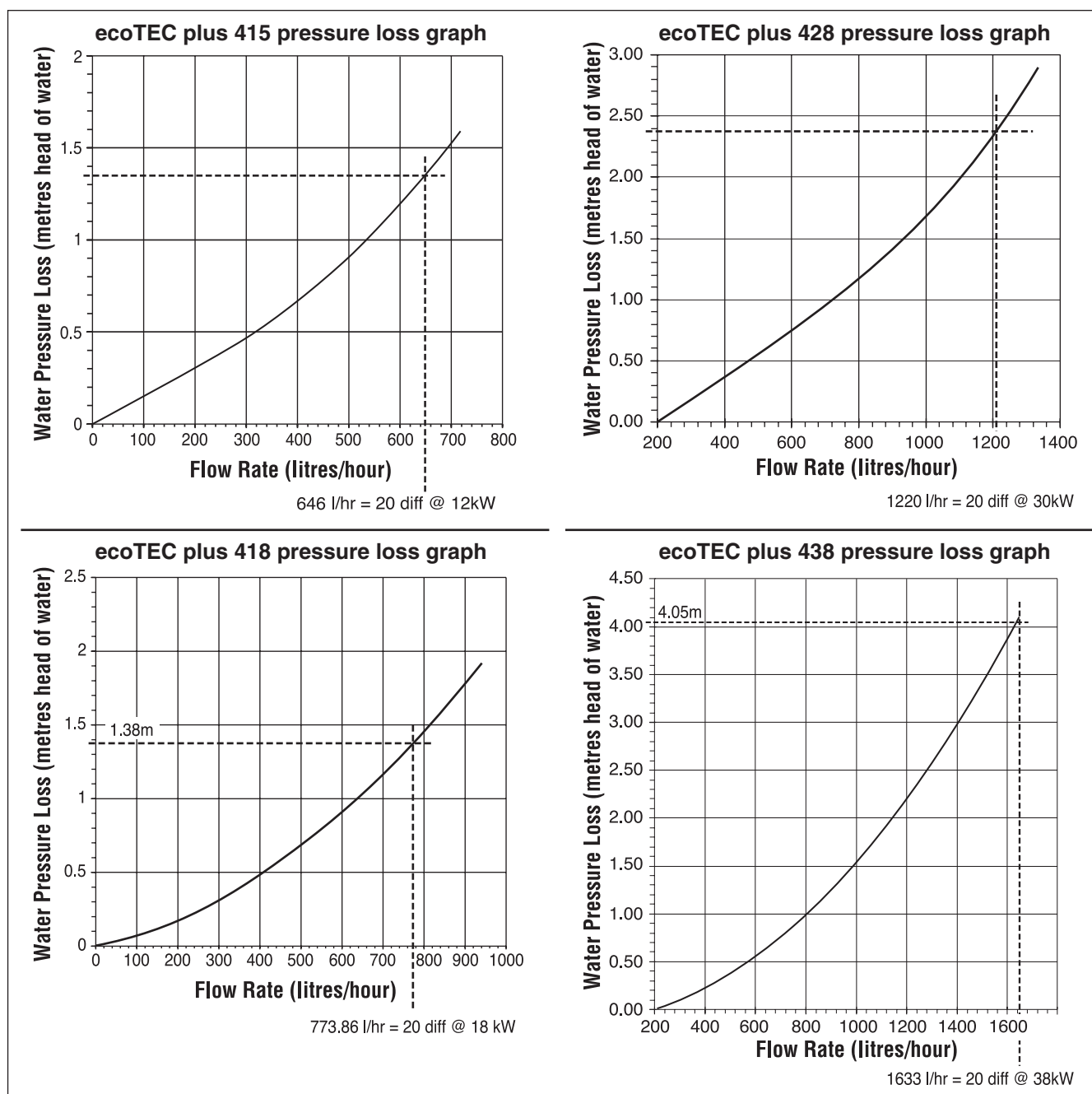


Fig. 3.8 Pressure loss

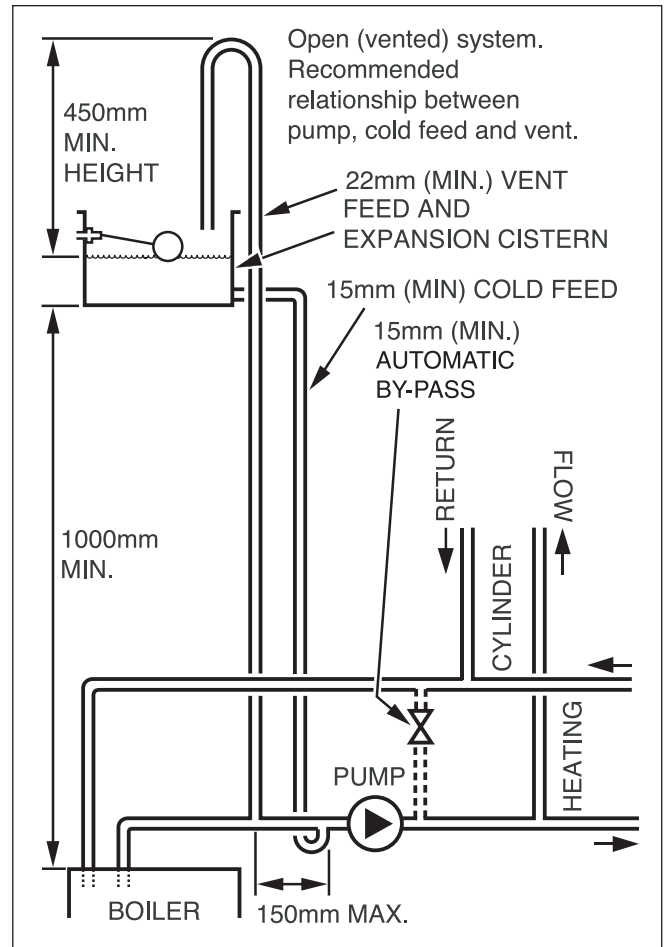


**3.16 Open vented heating system**

The boiler must be supplied from an unrestricted water supply taken from a feed and expansion cistern situated at a maximum height of 27 metres (90ft) above the boiler.

The cold feed must be 15mm minimum size.

The vent must rise continuously and be unrestricted. It is important that the relative positions of the pump, cold feed and open vent are as shown in fig 3.9.



**Fig. 3.9 Open vented system**

## 3 General requirements

### 3.17 Sealed water systems

The installation must comply with the appropriate requirements of the current issue of BS4814, BS5449, BS6759, BS6798 and BS7074 Part 1 and 2. For IE your attention is drawn to the current edition of IS 813. See fig 3.10 for a suggested layout.

#### 3.17.1 Safety valve

A safety valve must be fitted to a sealed system. It shall be preset, non-adjustable with a lift pressure of 3-bar, incorporating seating of a resilient material, a test device and a connection for drain. The safety valve discharge pipe must be routed to outside the building, must not discharge above an entrance or window or any type of public access area, be clear of any electrical fittings and positioned so that any discharge can be seen.

#### 3.17.2 Expansion vessel

A diaphragm type expansion vessel, conforming to the current issue of BS4814 (see also BS7074 Part 1 and 2). For IE the current edition of IS 813, must be connected at a point close to the inlet side of the circulating pump, see the Typical installation, Fig. 3.10. unless laid down differently by the manufacturer. The expansion vessel volume depends on the total water system volume and the initial system design pressure. For any system an accurate calculation of vessel size is given in the current issue of BS5449 and BS7074 Part 1.

Example: For an initial design pressure of 0.7 bar, the minimum total vessel volume required is  $0.063 \times \text{Total System Volume}$ .



#### Note!

**A higher initial design pressure requires a larger volume expansion vessel.**

The charge pressure must not be less than the static head of the system, that is, the height of the highest point of the system above the expansion vessel.

#### 3.17.3 Pressure gauge

A pressure gauge with a set pointer and covering at least 0 to 4 bar (0 to 60 lb/in<sup>2</sup>) shall be fitted permanently to the system in a position where it can be seen when filling the system.

#### 3.17.4 Water make up

Provision should be made for replacing water loss from the system using a make up bottle mounted in a position higher than the top point of the system, connected through a non-return valve to the return side of either the heating circuit or the hot water cylinder.

Alternatively, provision for make up water should be made using a proprietary filling loop.

#### 3.17.5 Filling a sealed water system

Provision for filling the system at low level must be made. This can be achieved by the use of a proprietary filling loop.

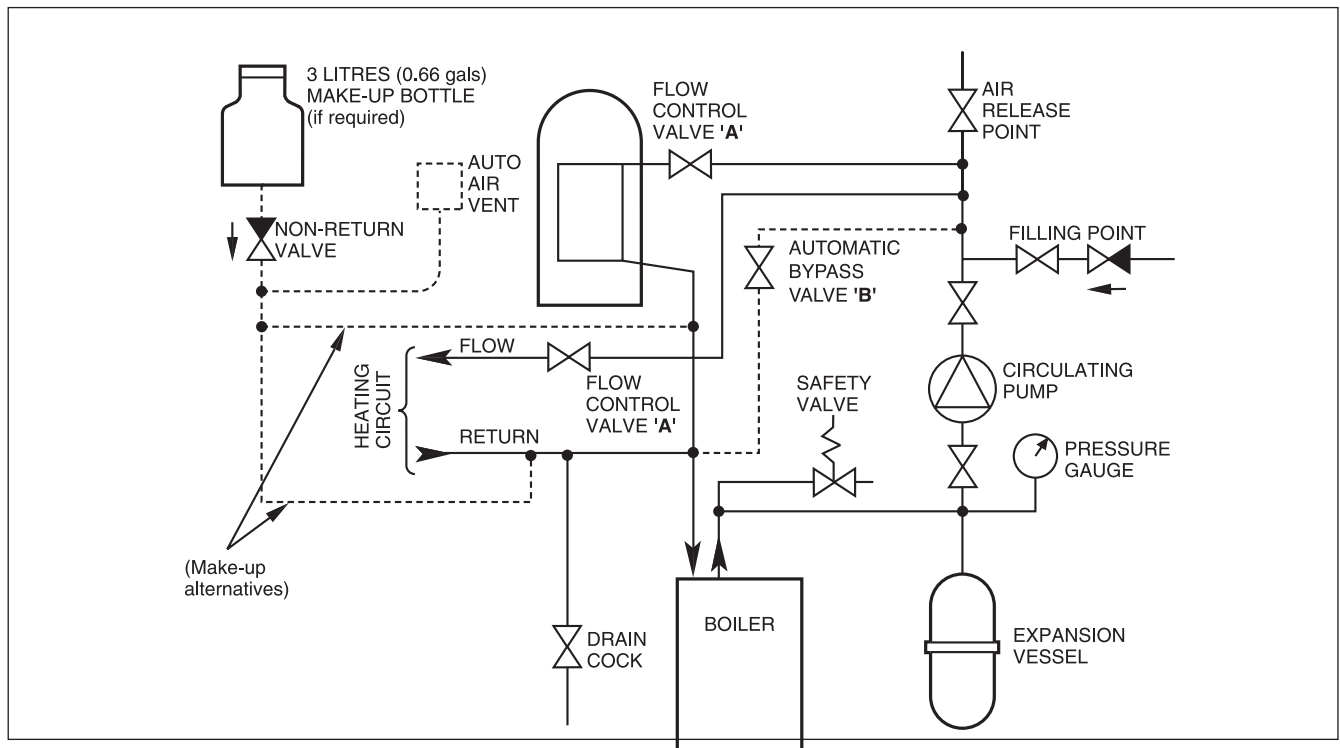


Fig. 3.10 Typical installation

## 4 Boiler installation sequence

### 4.1 Boiler location



#### Note!

This boiler is not suitable for outdoor installation.

This boiler may be installed in any room, although particular attention is drawn to the installation of a boiler in a room containing a bath or shower where reference must be made to the relevant requirements.

This boiler is suitable for installation in bathroom zones 2 and 3.

#### 4.1.1 Sheet metal parts



#### Caution!

When installing the appliance, care should be taken to avoid any possibility of personal injury when handling sheet metal parts.

In GB this is the current I.E.E. WIRING REGULATIONS and BUILDING REGULATIONS. In IE reference should be made to the current edition of I.S.813 "Domestic Gas Installations" and the current ETCI rules. The boiler must be mounted on a flat wall, which is sufficiently robust to take its total weight, see boiler specifications 2.1.

#### 4.1.2 Clearances

The boiler should be positioned so that at least the minimum operational and servicing clearances are provided, see fig 4.1.

Additional clearances may be beneficial around the boiler for installation and servicing.

For flue installations where external access is not practicable, consideration should be given for the space required to insert the flue internally, which may necessitate clearance larger than those specified in fig 4.1.

#### 4.1.3 Timber frame buildings

If the boiler is to be installed in a timber frame building it should be fitted in accordance with the Institute of Gas Engineers document IGE/UP/7/1998. If in doubt seek advice from the local gas undertaking or Vaillant.

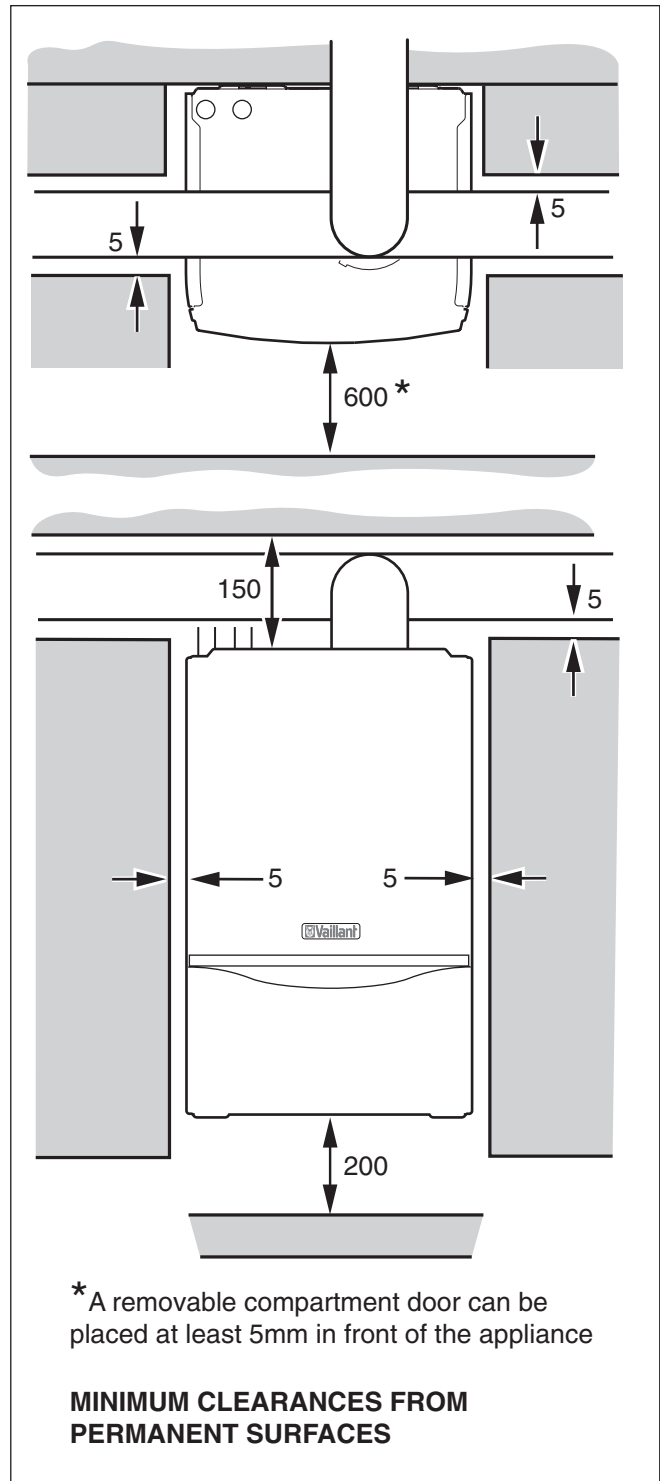


Fig. 4.1 Distance during installation

## 4 Boiler installation sequence

### 4.1.4 Contents included with delivery

The Vaillant ecoTEC plus is delivered pre-mounted in a package unit. Check that all the parts have been delivered intact (see fig. 4.2 and table 4.1).

DO NOT remove the boiler from the polystyrene base at this stage.

Place aside the flue adaptor and connections pack until required.



#### Note

Care should be taken not to scratch the white surface of the boiler casing.

### 4.2 Flue exit

Refer to flue system installation instructions for full details.



#### Danger!

Vaillant appliances are certified only for use with genuine Vaillant flue pipes. 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.

#### 4.2.1 Other flue options

Flue instructions for other flue systems such as vertical RSF flues, flues run to the side of the boiler and the use of additional bends etc. are detailed in the flue installation instructions.

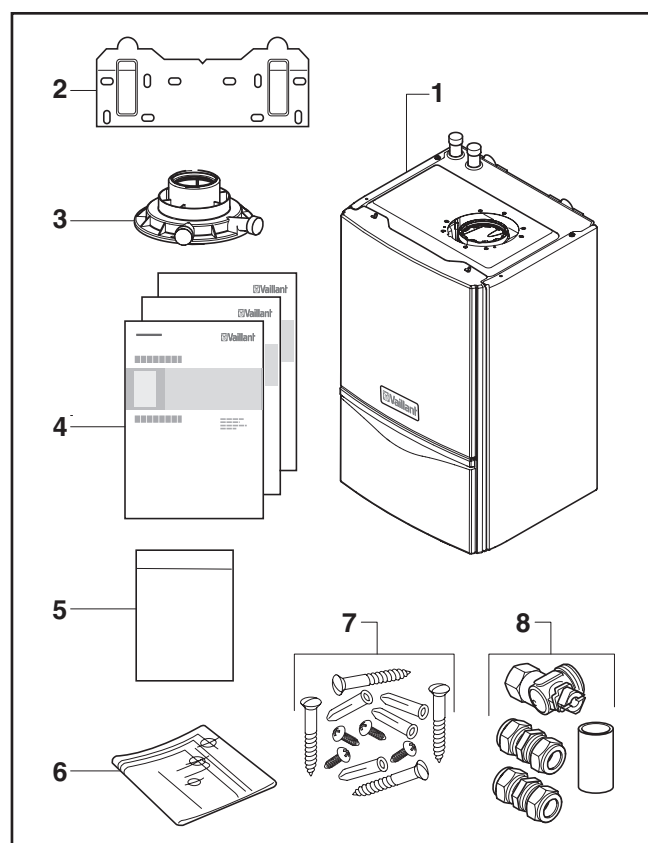


Fig. 4.2 Contents included with delivery

Item	Quantity	Description
1	1	Boiler
2	1	Hanging bracket
3	1	Flue connection adaptor
4	1	Instruction booklets
5	2	Guarantee card, envelope and log book
6	1	Template
7	1	Screws/wallplugs
8	1	Gas service valve, compression couplers and condense drain pipe coupler

Table 4.1 Contents included with delivery

## 4.3 Fitting the boiler hanging bracket

Reposition the wall template over the flue hole ensuring the template is vertical and mark the position of the fixing holes for the hanging bracket, see fig 4.3. Mark and drill the fixing holes and secure the hanging bracket. Fix the hanging bracket to the wall using the screws supplied. Ensure the uppermost set of screw positions are used (it may be necessary to use additional or alternative fixings to ensure adequate support).



### Note!

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

### 4.3.1 Boiler fixing

Lift the boiler into position in the following manner: Lean the top of the boiler slightly to the wall and position just above the hanging bracket. Allow the boiler to slowly move downwards until engaged in the hanging bracket.

### 4.3.2 Removing the front casing

Remove the front casing securing screws then lift the case upwards off the two top retaining dowels, see fig 4.4.



### Note!

Take care not to damage the front casing.

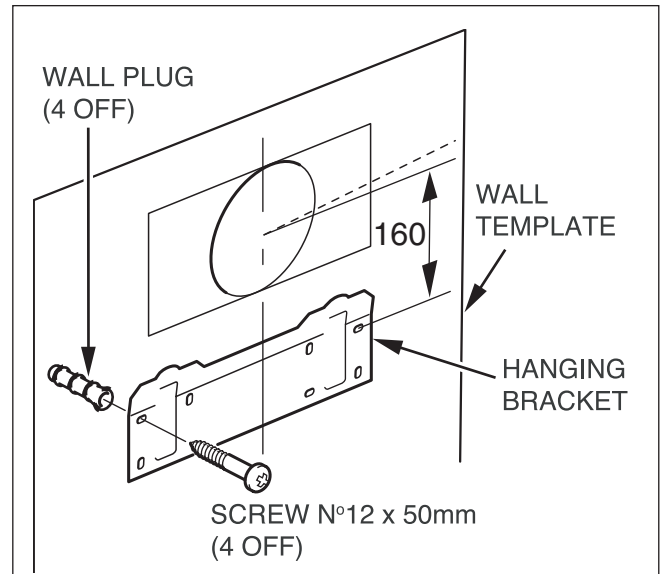


Fig. 4.3 Boiler hanging bracket

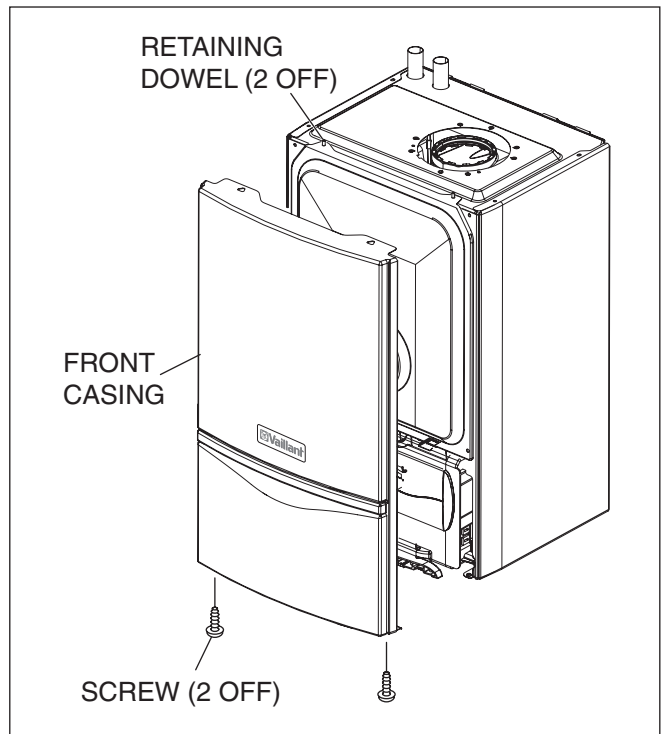


Fig. 4.4 Removing front casing



## 4 Boiler installation sequence

### 4.3.3 Gas connection



**Danger!**

The gas connection may only be made by a competent person.  
The legal directives and the local regulations for gas supply companies must be observed.



**Caution!**

Ensure a stress-relief assembly of the gas pipes to avoid leakages!



**Caution!**

The gas regulating block may be tested for leakage only with a maximum pressure of 150 mbar!  
Higher testing pressures can damage the gas fitting.



**Caution!**

When making final connection to the boiler, if using soldered fittings, extra care should be taken to avoid damage to isolation valves through heat transfer.  
Before connection check the supply of local gas.



**Note!**

Ensure the gas supply pipe work is adequately sized so that a 20 mbar gas pressure is available at the boiler inlet at full flow rate.

- Tighten all connections.
- Check the gas connection with leak indicator spray for leakage.

The gas supply can be connected from below, or through the wall at the rear of the boiler. See fig 4.5. and refer to section 3.4.

The whole of the gas installation, including the meter, should be inspected, tested for soundness and purged in accordance with the current issue of BS6891 and in IE the current edition of I.S.813 "Domestic Gas Installations".

### 4.3.4 Water connections



**Caution!**

When making final connection to the boiler, if using soldered fittings, extra care should be taken to avoid damage through heat transfer.

Provision is made for the water connections to be made from above the boiler, see fig 4.6 (using the two 22mm compression couplers supplied). The position is shown on the wall template.

Flush out the domestic hot water and the heating systems before connecting to the boiler.

### 4.3.5 Condensate trap and siphonic drain connection

Refer to fig 4.5.

The condensate drain connection is at the underside rear of the boiler.

The condensate drain is suitable for use with standard "Push fit" overflow pipe and couplings DO NOT use adhesive when connecting to the spigot (1) The condensate drain pipe (2) should be non corrosive plastic. The drain pipe should have a continuous fall

of at least (45mm per metre) away from the boiler.

Condensate should, if possible be discharged into the household internal drainage system.

The condensate is discharged periodically in 'slugs' by siphonic action.

It is not necessary to provide air breaks or extra traps in the discharge pipe as there is already a 75mm high trap inside the boiler. Fitting an extra trap may cause the boiler siphon to work incorrectly.

Refer to BS5546 or BS6798 for advice on disposal of boiler condensate.

(a) Preferably the drain pipe should run and terminate internally to the house soil and vent stack at least 450mm above the invert of the stack. There must be an air break in the discharge pipe upstream of the trap. This should be designed so that the condensate cannot be discharged into the house if the condensate drain pipe becomes blocked.

(b) Connecting into the internal discharge branch (e.g. sink waste or washing machine) with an external termination, the condensate drain pipe should have a minimum diameter of 22mm with no length restriction and should incorporate a trap with a 75mm (3) seal. The connection should preferably be made downstream 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) Termination 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 metres.

(d) At a condensate absorption point (soak away) (7). The external pipe length should not be more than 3 metres.

Refer to the latest issue of BS 6798 Specification for installation of gas fired boilers of rate input not exceeding 70kW net for further information.

Before operating the boiler the condensate trap must be filled with water.

### 4.3.6 Installing the flue system

- Install the flue system (refer to the separate air/flue duct installation instructions).

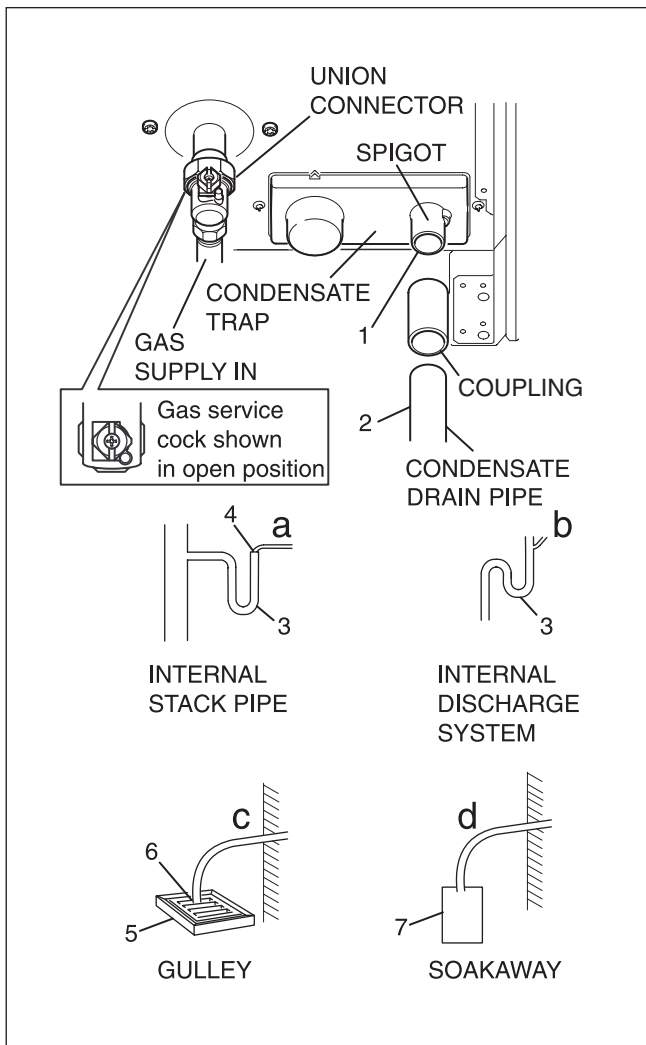


Fig. 4.5 Gas and condensate connections

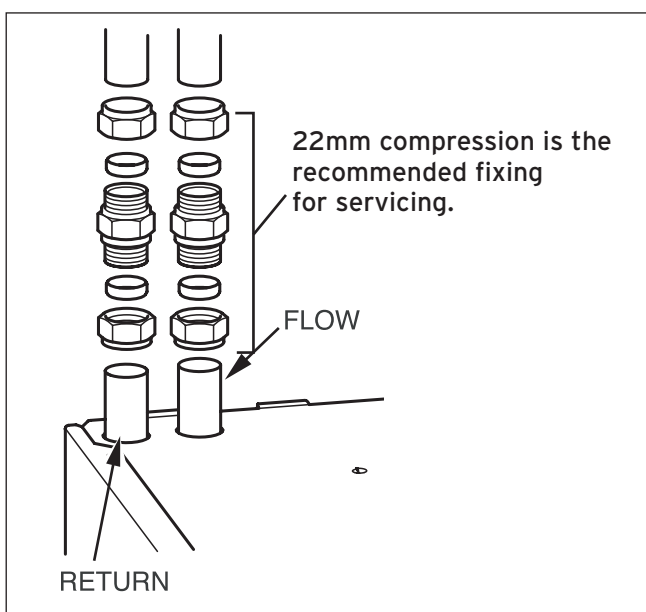


Fig. 4.6 Water connections

#### 4.4 Electrical connections



##### **Danger!**

**This appliance must be earthed. Electrocutation caused by touching live parts can be fatal. Before working on the appliance, turn off the power supply and secure against restart.**

The boiler must be earthed.

All system components shall be of an approved type and all wiring to current I.E.E. wiring regulations. External wiring must be correctly earthed, polarised and in accordance with the relevant standards.

In GB this is BS 7671.

In IE this is the current edition of I.S.813 "Domestic Gas Installations".

The boiler must be connected to a permanent 230V ac, 50Hz supply.

Connection of the whole electrical system of the boiler, including any heating controls, to the electrical supply must be through one common isolator and must be fused 3 Amp maximum.

Isolation should be by a double pole switched fused spur box, with a minimum gap of 3mm for both poles. The fused spur box should be readily accessible and preferably adjacent to the appliance. It should be identified as to its use.

Alternatively connection can be made through an unswitched shuttered socket and 3A fused 3-pin plug both to the current issue of BS 1363 may be used, provided they are not used in a room containing a bath or shower.

A 3 core flexible cord according to BS6500 tables 6, 8 or 16 (3 x 0.75 to 3 x 1.5mm<sup>2</sup>) should be used.



##### **Caution!**

**This appliance must be wired in accordance with these instructions. Any fault arising from incorrect wiring cannot be put right under the terms of the Vaillant guarantee.**



##### **Danger!**

**Mains connection terminals L and N remain live "unless isolated at the fused spur or electrical outlet supplying the boiler".**



##### **Caution!**

**Do not connect any mains 230V power to the connections 7-8-9 or BUS (+,-).**



##### **Note!**

**Ensure that all cables pass through grommets in the outer casing and are securely fixed by the cable clamps in the rear of the electronics box. Ensure that the power supply is connected such that the current carrying conductors become taut before the earth conductor should the supply cable slip from the cable clamp**

## 4 Boiler installation sequence

### 4.4.1 Connection to the main supply

- Lower the electronics box, see fig. 4.7.

### Opening the electronics box

- Unclip the bottom of the electronics box cover and hinge back to reveal the connection plugs.
- Feed the power supply flex into the appliance and the electronics box through the cable clamps provided.

### 4.4.2 Wiring system

- Connect the flex to the L, N and earth terminal block, see fig 4.8.

Green/yellow (earth) wire	- boiler terminal Earth
sign Blue (neutral) wire	- boiler terminal N
Brown (live) wire	- boiler terminal L



#### Caution!

Do not connect any mains 230V power to the connections 7-8-9 or BUS (+,-).



#### Note!

Ensure that the wires are securely fixed in the terminal block.

- Refit the electronics box cover by pushing into place until it clips back into position.
- Raise the electronics box.

- Check the electrical installation by carrying out short circuit, earth continuity and resistance to earth tests and a check for correct polarity.

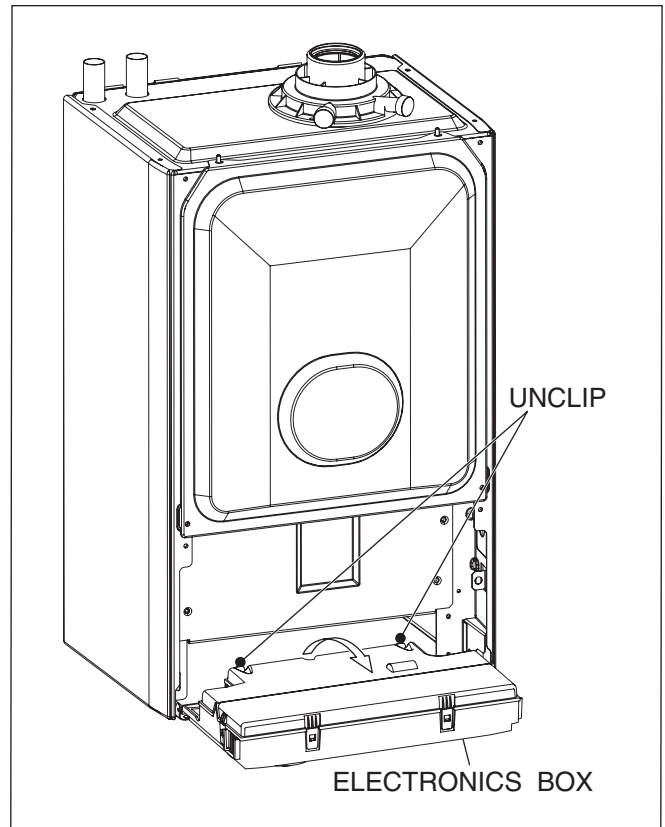


Fig. 4.7 Mains Supply Connection

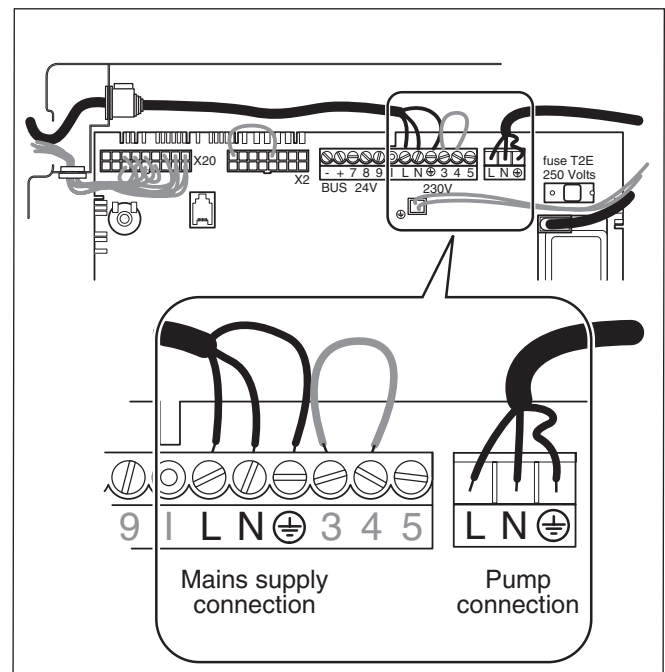
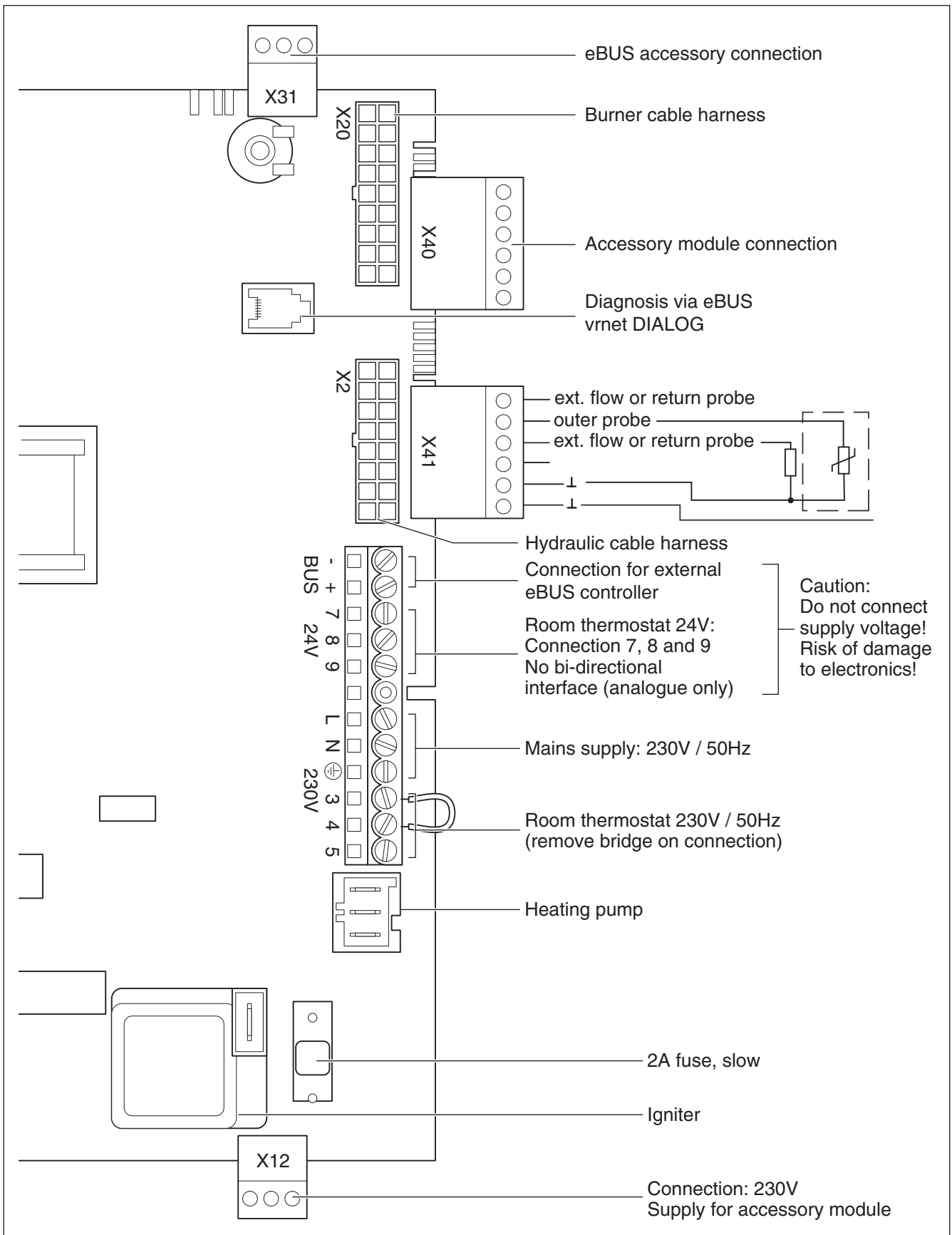


Fig. 4.8 Mains Supply Connection

## 4.4.3 Electrical board layout



**Fig. 4.9 Connection wiring**

## 4 Boiler installation sequence

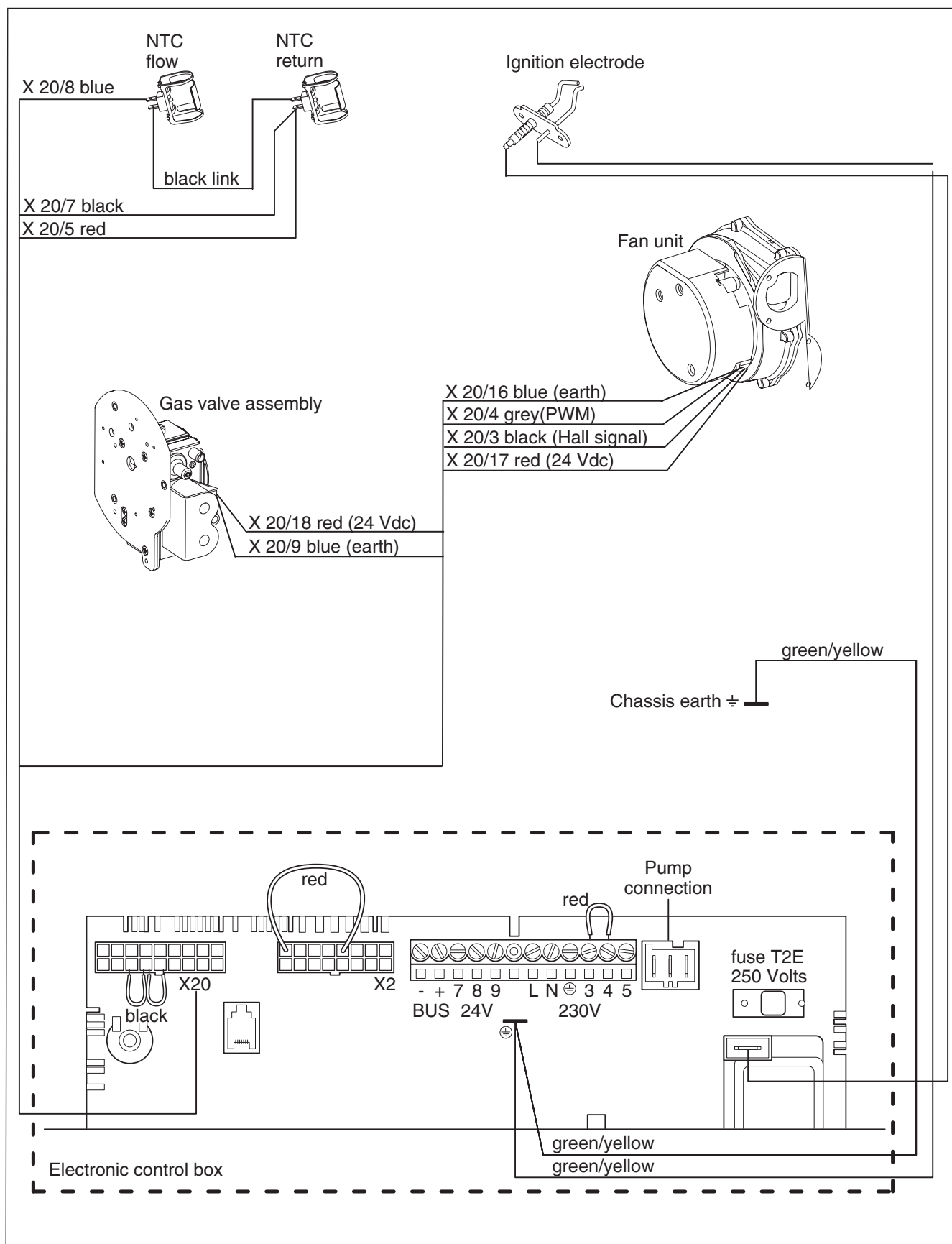


Fig. 4.10 Mains Supply Connection



#### 4.4.4 Controls

**Table 4.2 Vaillant controls (used in conjunction with the VR 65 accessory)**

Controls	Item no.	Connection
VRC 400 (1-circuit controller, weather-controlled)	00 2001 0843	Installation in electronics box or wall-mounted (plug-and-play)
VRT 360 (room temperature controlled)	00 2001 0842	Wall-mounted, 2-wire bus (plug-and-play)
timeSWITCH 140 (timer)	306 760	Installation in electronics box (plug-and-play)
Accessory	Item no.	Connection
VR 65 control centre for UK cylinder installation (eBUS)	307 215	System solution for UK cylinder connection

#### 4.4.5 External electrical controls

The boiler terminals 3, 4 and 5 are for connecting external electrical controls. Terminals 3 and 4 are linked together when the boiler is supplied. If external controls are used, this link must be removed, and the controls connected to terminal 4. Terminal 5 is an additional neutral connection for external neutrals such as from the anticipator of a room thermostat.

#### 4.4.6 Connection details for external switches and boiler terminal strip.

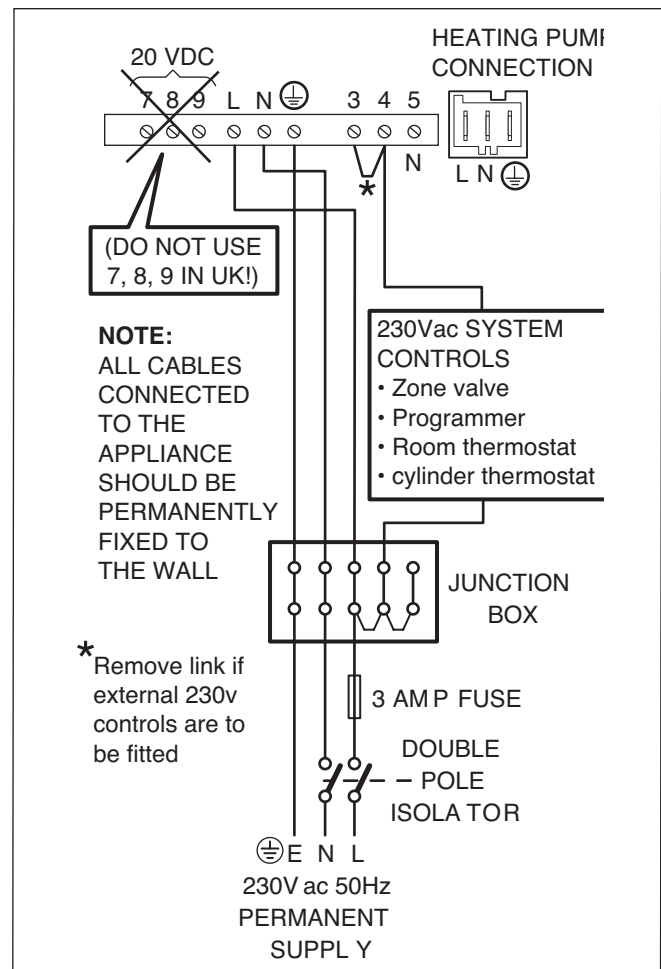
See schematic layout, fig. 4.11.

#### 4.4.7 Vaillant optional plug in timer accessories

Refer to the instructions supplied with the optional accessories for connection details. Upon completion of all electrical connections refit the terminal box cover by pushing into place. The cover is secured by two locking clips.

#### 4.4.8 Connection details using the VR 65 control centre

The Control Centre VR 65 is an eBUS system component. In a storage unit cylinder installation, it is responsible for the communication between the ecoTEC plus boiler and external 2- or 3-way-valves. Connect the VR 65 Control Centre as described in the enclosed manual.



**Fig. 4.11 Mains Supply and External Controls**

## 5 Commissioning (Part I)

### 5 Commissioning (Part I)

Please ensure the "Benchmark" commissioning check list is completed and left with the user.

#### 5.1 Preliminaries - all systems

A competent person should carry out commissioning, in accordance with the current issue of BS 6798.

Remove the two screws on the inner case then lift the case upwards off the two top retaining dowels. Drop down the electronics box into the service position.

Remove the four screws from the chassis panel. Remove the chassis panel by pulling it out at the top from its retaining slots, see fig 5.1.

**Note!**  
When replacing chassis panel ensure the bottom fits behind lip.

Make sure that the system has been thoroughly flushed out with cold water, prior to filling the system refer to section 3.15 inhibitor cleaning. Refill the system with water, making sure that all the air is properly vented from the system and pump.

#### 5.1.1 Gas supply

Isolate the boiler from the mains electrical supply. The complete gas installation including the gas meter must be isolated, tested for soundness and purged in accordance with BS 6891, in IE the current edition of IS 813.

The gas supply to the boiler can be purged by slackening the union connection on the gas service valve beneath the boiler, see fig 5.2. Ensure that there is adequate ventilation, extinguish all naked flames and do not smoke whilst purging.

After purging, the gas service union connection must be re tightened and tested for soundness. (The boiler itself does not require purging as this will be done by the automatic burner sequence control).

The gas valve is factory set for natural gas (G20) and should need no adjustment.

The supply pressure should be checked when the boiler is firing at full rate. Check the inlet pressure at the pressure test point on the gas valve shown in fig 5.3 the values should be between those shown below.

**! Natural gas:**  
**DO NOT** proceed with the adjustment or attempt to put the unit into service if the inlet working pressure lies outside the 17-25 mbar range.

**! LPG:**  
**DO NOT** proceed with the adjustment or attempt to put the unit into service if the inlet working pressure is lower than 34 mbar.

**! Caution!**  
Before operating the boiler check the type plate and ensure that the correct gas type

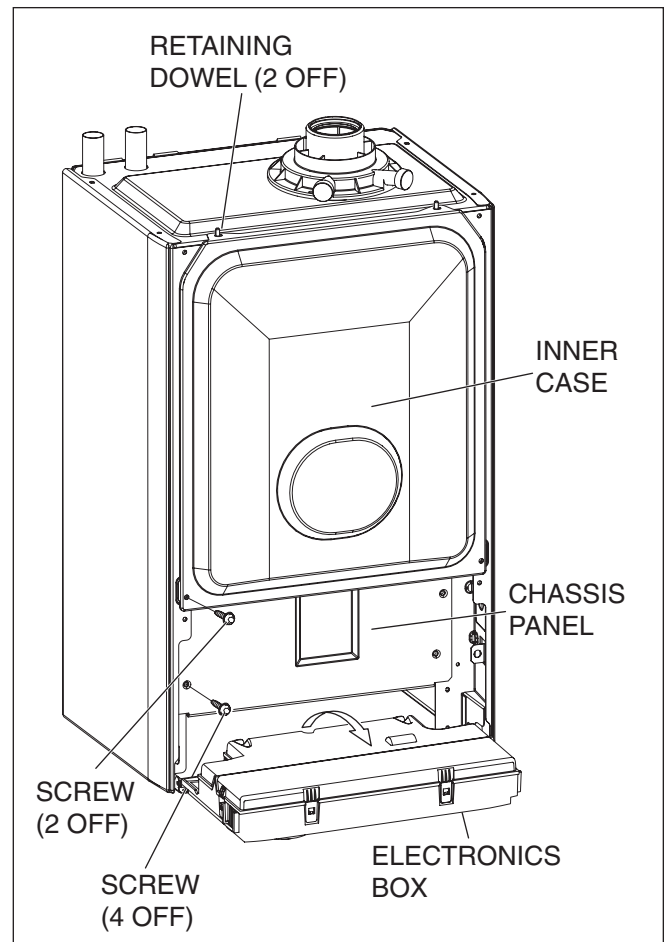


Fig. 5.1 Inner case and chassis removal

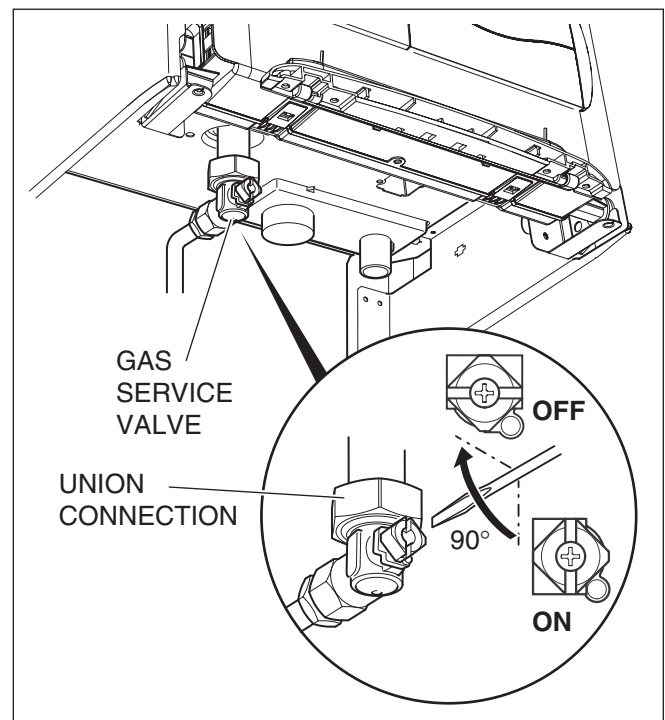
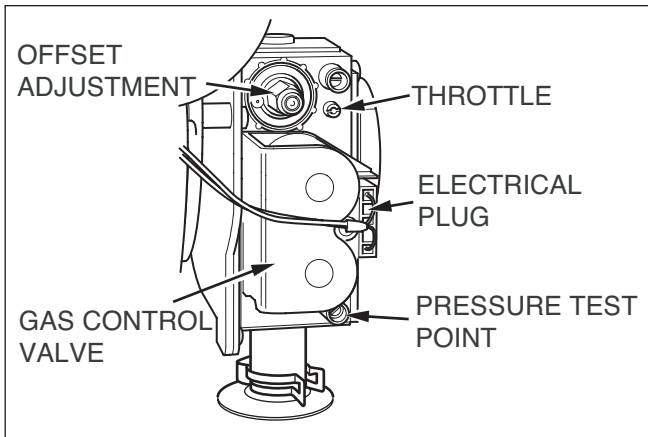


Fig. 5.2 Gas service valve



**Fig. 5.3 Gas control valve**

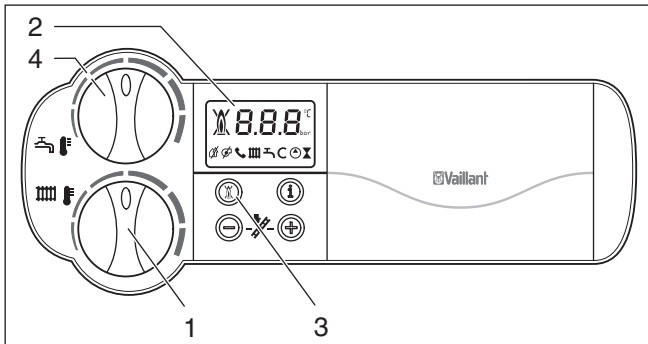
## 5.1.2 Initial Lighting

The lighting procedure of the boiler is fully automated. To prepare the boiler for initial lighting first ensure that all external controls are not calling for heat. For access open the front flap by pulling at the centre of the case strip.

Turn on the appliance at control (1), see fig 5.4. When you turn on the appliance, the current operating status appears in the display (2), see fig 5.4.

Adjust the control (1) anti-clockwise to its lowest setting (The indent position just before off). Turn on external heat demand to boiler. The fan should start and after a few seconds the ignition will commence.

Turn domestic hot water control knob (4) to max if accessory VR 65 is fitted.



**Fig. 5.4 Switching on the appliance**



### Note!

Allow the boiler to run on minimum until commissioning is complete.

In the unlikely event that a problem occurs with the operation of the ecoTEC boiler, the following points should be checked:

#### Boiler fails to operate:

- Is the gas supply turned on?
- Is there enough water in the heating system?
- Is the electrical supply switched on?
- Is the control knob (1, fig 5.4) in the operating position?
- Is there an ignition problem?



### Caution!

Inappropriate modifications can cause damage. If your boiler still does not operate then please consult the trouble shooting section of this literature.

## 5.1.3 Ignition problems

If the burner fails to ignite after five attempts, the device does not start up and switches to "Fault". This is indicated by the fault code "F.28" or "F.29" in the display.

The display also shows the flame symbol with a cross through it (2), see fig 5.4.

Automatic ignition can only take place after you manually reset the fault.

- To reset the fault, press the reset button (3), see fig 5.4. and hold it down for one second.



### Caution!

If the boiler still shuts off after three attempts of resetting, please consult the trouble shooting section of this literature.

## 5.1.4 Flue problems

This appliance is fitted with a fan. If the fan does not work properly, the appliance will switch itself off.

The display shows the symbols  $\phi$  and  $\phi$  and the fault message "F.32".



### Note!

If contacting Vaillant Service Solutions please remember to quote the fault code, as this will help to pinpoint the fault.

## 5.1.5 Testing - gas

The boiler is supplied ready adjusted and no further gas adjustments are necessary, however both the gas inlet working pressure and the maximum gas rate should be checked at least 10 minutes after the burner has lit, see table 5.1.

The gas inlet working pressure can be checked at the pressure test point on the gas valve (fig 5.3). The gas inlet working pressure should be between 17 mbar to 25 mbar when the boiler is firing at full rate, refer section 9. After testing the inlet pressure remove the U gauge, tighten the sealing screw and test for soundness



### Note!

The burner pressure cannot be measured at the gas valve due to the fan/burner design. Replace the inner and front casing panels. Record appliance working gas inlet pressure (mbar) in Benchmark Installation,

Model	Max. nett heat input (kW)	Gas Rate					
		Natural gas (m <sup>3</sup> /h)			Propane (kg/h)		
		nom.	+ 5%	- 5%	nom.	+ 5%	- 5%
415	15.26	1.62	1.70	1.54	1.19	1.25	1.13
418	18.9	2.00	2.10	1.90	1.47	1.54	1.40
428	28.6	3.03	3.18	2.88	2.22	2.33	2.11
438	38.35	4.06	4.26	3.86	2.98	3.13	2.83

**Table 5.1**

## 6 Natural gas to LPG conversion

### 6 Natural gas to LPG conversion

The ecoTEC plus is able to be field adjusted for use on LPG - propane G31 gas. To enable conversion the use of a combustion analyser is necessary.

**Caution!**  
After converting from natural gas to LPG, commission and check boiler function as described in commissioning section of the servicing and installation instructions.

**Caution!**  
This conversion must only be carried out by a competent person in accordance with the Gas Safety (Installation and Use) Regulation 1998. In the UK CORGI registered installers undertake the work to a safe and satisfactory standard.

Before starting any work.  
Isolate the electrical supply to the boiler.  
Turn off the gas supply at the gas service cock fitted to the appliance.  
Turn the gas valve "A" throttle screw (Ref fig.6.1) fully clockwise.  
Turn the "A" throttle screw back anti-clockwise the required number of turns as stated in Table 9.1 for the boiler installed.  
Ensure the gas analyser is set to the correct fuel setting propane.

To obtain conversion follow the procedure as listed below.  
Ensure that the gas supply pressure is = 34mbar.  
The gas inlet working pressure can be checked at the pressure test point on the gas valve (fig 5.3.).  
Turn gas supply on.  
Ensure there is an external heat demand.  
Enter the test programs by holding the "+" key, see fig 6.2. and turning power on.  
Press "+" until "P.1" is displayed for max rate.  
Press "i" to operate appliance in this mode.  
Allow appliance to stabilise.  
Measure the CO<sub>2</sub> at the combustion products test point, see fig 9.1.  
Check CO<sub>2</sub> value (for case off) as stated in table 6.1 for the boiler installed.  
If required, using a screwdriver, adjust the "A" throttle to obtain correct value. (rotating anti-clockwise to increase).  
Appliance will remain in this mode for 15 minutes or exit by pressing "i" and "+" simultaneously.

Repeat the process above and select "P.2" for min rate.  
Press "i" to operate appliance in this mode.  
Allow appliance to stabilise.  
Check CO<sub>2</sub> value (for case off) as stated in table 9.1 for the boiler installed.  
If required, using a 2mm allen key, adjust the "B" offset to obtain correct value. (rotating clockwise to increase)  
After checking the combustion, exit by pressing "i" and "+" simultaneously  
Refit the chassis panel and the inner case.  
(Note the CO<sub>2</sub> will increase slightly).

	NAT.GAS G20		PROPANE G31		
	CASE OFF CO <sub>2</sub> %	CASE ON CO <sub>2</sub> %	CASE OFF CO <sub>2</sub> %	CASE ON CO <sub>2</sub> %	THROTTLE ADJUSTMENT
ecoTEC plus 415	9.1+0.2-0.5	9.3+0.2-0.5	10.1+0.5-0.5	10.3+0.5-0.5	5 TURNS
ecoTEC plus 418	9.1+0.2-0.5	9.3+0.2-0.5	10.1+0.0-1.0	10.3+0.0-1.0	5 TURNS
ecoTEC plus 428	9.1+0.2-0.5	9.3+0.2-0.5	10.5+0.3-0.8	10.7+0.3-0.8	5 TURNS
ecoTEC plus 438	8.8+0.2-0.5	9.0+0.2-0.5	9.8+0.2-0.8	10.0+0.2-0.8	8 TURNS

Table 6.1

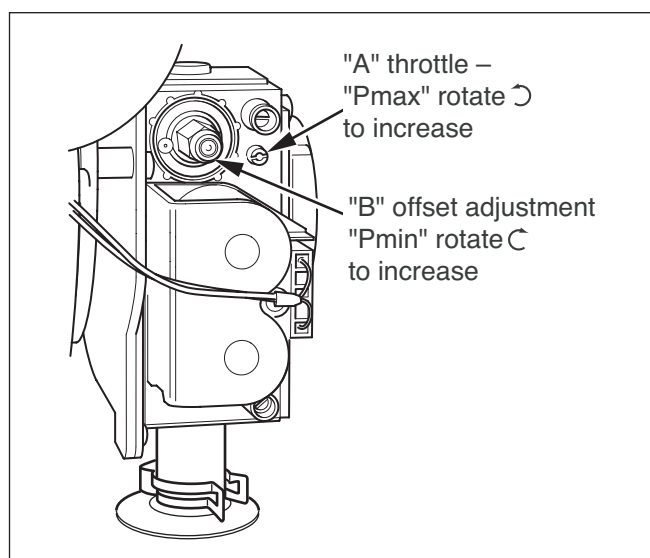


Fig. 6.1 Gas control valve

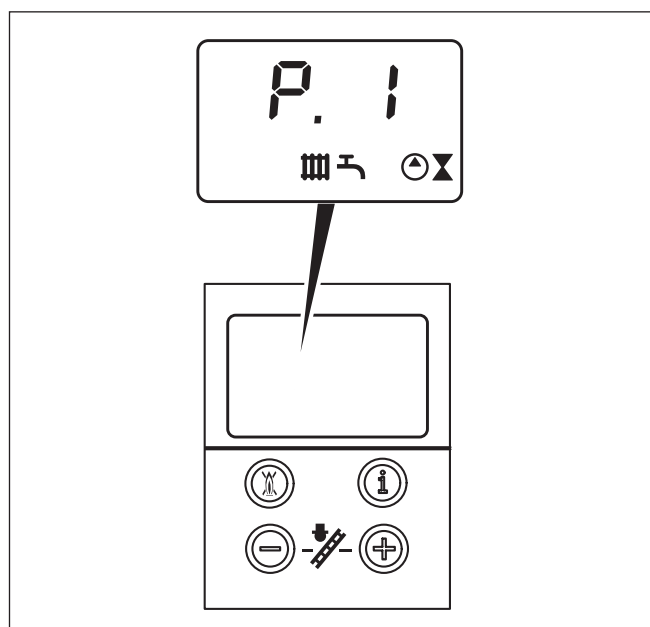


Fig. 6.2 ecoTEC plus controls

### Commissioning and Service log.

## 7 Functional checks commissioning (part II)

### Functional checks

#### Procedure:

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

- Commission the appliance according to the relevant operating manual.
- Check the gas supply pipe, flue system, heating system and the hot water pipes for leaks.
- Check that the flue system has been installed properly according to the flue system installation manual.
- Check for ignition and an even flame on the burner.
- Perform a function check on the heating system (see Section 7.1.).
- Perform a function check on the domestic hot water system (If applicable optional accessories are fitted) (see Section 7.1.1)

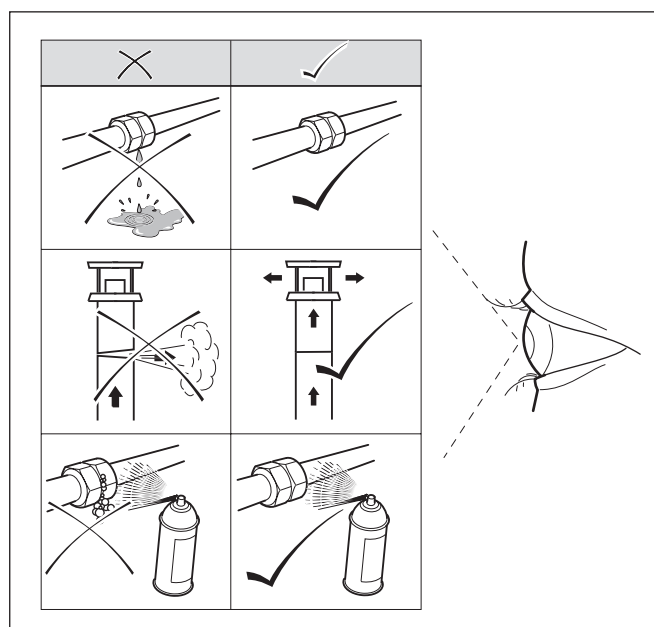


Fig. 7.1 Functional checks (appliance on)

### 7.1 Heating

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

As soon as a heat demand is received, the appliance runs through the status indicators "S. 1" to "S. 3", until the appliance is running correctly in normal mode and the display shows "S. 4".

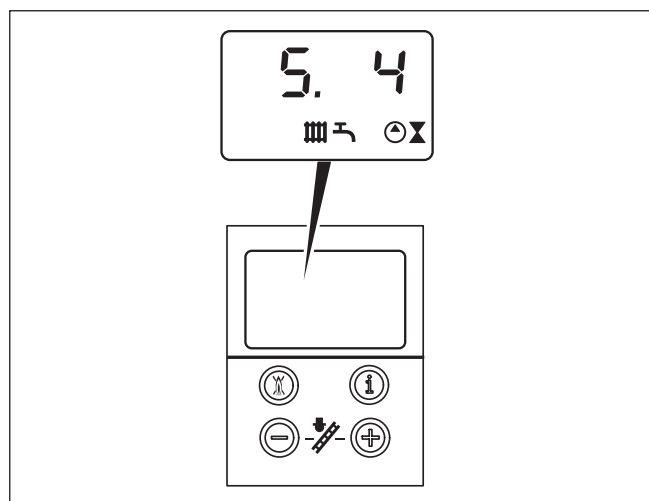


Fig. 7.2 Display indicator during heating mode

### 7.1.1 Domestic hot water (If optional VR65, uniSTOR cylinder & Vaillant control are installed)

- Switch on the appliance.
  - Fully open the hot water tap.
  - Press "i" to activate the status indicator.
- If the water heating is working correctly, the display shows the following: "S.24".

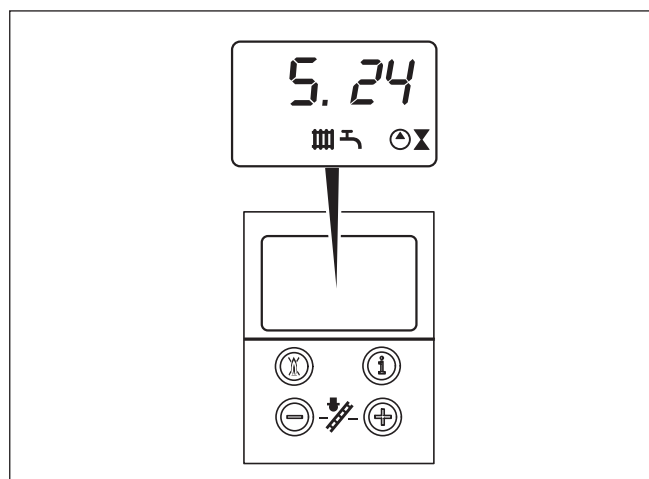


Fig. 7.3 Display indicator during water heating

### 7.1.2 Pump exercise programme

After a power cut or every 23 hours in frost protection mode the pump will run for one minute to prevent it from sticking. This will also occur during normal operating if there is no demand for more than 24 hours.

## 7 Functional checks commissioning (part II)

### 7.1.3 Final flush of the heating system (hot)

- Operate the appliance until the heating system is up to temperature.
- Check the heating system for leaks.
- Connect a hose to the drain valve located at the lowest position of the heating system.
- Shut off the appliance, open the drain valve and all bleed valves on the radiators and allow the water to flow out of the heating system and the boiler quickly and fully.
- Close the drain valve.
- Fill the heating system again with water.
- If fitted to a sealed system.  
Release water from the system until the system design pressure is attained. (The actual reading on the digital pressure gauge should ideally be 0.5 bar plus an additional pressure corresponding to the highest point of the system above the base of the boiler 10 m head equals an additional 1 bar reading on the pressure gauge. The minimum pressure should not be less than 1 bar in any installation.) If the system is to be treated with an inhibitor it should be applied at this stage in accordance with the manufacturer's instructions. Further information can be obtained from Sentinel, Betz Dearborn Ltd., Tel: 0151 420 9595, or Fernox, Alpha-Fry technologies. Tel: 0870 8700362.
- Refit the boiler casing (see section 5.10)

### 7.2 Handing over to the user



#### **Note!**

**If fitted to a sealed system.**

- Set the maximum radiator temperature control to the desired setting.
- Set the maximum hot water temperature control to the desired setting (If optional Vaillant accessories are fitted).
- Instruct the user in the safe and efficient operation of the boiler.
- Show the user how to operate any external controls.
- Explain to the user the importance of having the boiler regularly serviced by a competent servicing company.  
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.
- If applicable record central heating operating pressure in the Benchmark gas boiler commissioning checklist along with the heat input (kW) and temperature difference between flow and return.
- Leave the user instructions and the installation instructions with the user.

### 7.3 Vaillant warranty

Vaillant provide a full parts and labour warranty for this appliance.

The appliance must be installed by a competent person in accordance with the Gas Safety (Installation and Use) Regulations 1998, and the manufacturer's instructions. In the UK 'CORGI' registered installers undertake the work in compliance with safe and satisfactory standards.

All unvented domestic hot water cylinders must be installed by a competent person to the prevailing building regulations at the time of installation (G3).

Terms and conditions apply to the warranty, details of which can be found on the warranty registration card included with this appliance.

Failure to install and commission this appliance in compliance with the manufacturer's instructions may invalidate the warranty (this does not affect the customer's statutory rights).



## 8 Inspection and maintenance

### 8.1 Initial inspection

To ensure the continued safe and efficient operation of the boiler it is recommended that it is checked and serviced as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage, but in general once per year should be adequate.



#### **Danger!**

**It is law that all servicing work is carried out by a competent person (CORGI registered). Inspections/Maintenance work not carried out by a competent person can result in damage to property and personal injury.**

Only genuine Vaillant spare parts may be used for inspections, maintenance and repair work to ensure the long term working order of all functions of your Vaillant appliance. Any spare parts which might be required are contained in the current spare parts catalogues. Information can be obtained from Vaillant Customer Service Centres.

#### 8.1.1 Safety instructions

Important:

Before starting any maintenance work:

- Isolate the mains electricity supply by disconnecting the plug at the socket outlet (if there is only an isolating switch remove the fuse from the switch).
- Turn OFF the gas supply at the gas service valve fitted to the boiler.
- When removing any water carrying components ensure that water is kept away from all electrical components.
- Always use new seals and O rings when parts are replaced.
- Always test for gas soundness and always carry out functional checks after any service work and after replacing any gas carrying component.
- Always check earth continuity, polarity and resistance to earth with a multimeter after any service work and after replacing any electrical component.



#### **Danger!**

**Electrocution by touching live parts can be fatal! The supply terminals in the appliance are permanently live unless the appliance is isolated from the electrical supply either by removing the fuse from a fused spur or pulling the plug out if connected to a socket outlet. Protect the electronics box from spray water. Before working on the appliance, turn off the power supply and secure against restart!**

Always perform the following steps after completing any inspection tasks:

- Sealed system only. If necessary, refill the appliance with cold water up to a pressure of approx. 1.5 bar and bleed air from the entire heating system.
- Open the service valve of the gas supply pipe.
- Turn on the power supply and the main switch.
- Check the appliance for gas and water leaks.
- Fill and bleed air from the heating system again, if necessary.



#### **Note!**

**If it is necessary to keep the main switch on for certain inspection and maintenance, this is indicated in the description of the maintenance task.**



#### **Note!**

**The boiler is fitted with a combustion analysis test point. A suitable combustion analyser can be connected to this point to establish the combustion performance of the boiler. Checking/adjustment of this value is required in the following instances; replacement of gas valve, conversion to or from Natural Gas/ LPG as part of the service schedule or if incorrect combustion is suspected (see section 9).**

#### 8.1.2 Maintenance

Before commencing any servicing or maintenance work, carry out an initial inspection of the system as follows:

- Inspect the flue, pipe work and electrical connections for indications of damage or deterioration.
- Inspect the air supply and ventilation arrangements of the installation.
- Check the heating and water system, in particular the condition of radiator valves, evidence of leakage from the heating system and dripping hot water taps.

#### 8.1.3 Functional check of boiler operation

- Carry out a functional check of the boiler operation as previously detailed.
- Remove the appliance casing as detailed and operate the boiler.
- Inspect the burner operation through the viewing window.
- Check that the flames are evenly covering the surface of the burner.
- Inspect for signs of excessive flame lift or sooting.

## 8 Inspection and maintenance

### Overview of the inspection and maintenance tasks

No.	Activity	Column 1 Inspection must be carried out once a year	Column 2 Maintenance
1	Check the air/ gas flue system and ensure it is not blocked, damaged and is fitted correctly.	x	
2	Measure the gas rate during operation (see table 5.1. inside section 5 commissioning part I). If the gas rate is lower than the minimum gas rate, follow the maintenance schedule in column 2.	x	
3	Check combustion by measuring CO and CO <sub>2</sub> values, compare to table 9.1. If the measurement is outside the tolerances follow the maintenance schedule in column 2. If a flue gas analyser is not available check the ignition and burner flame picture through the viewing window if incomplete combustion is evident perform the maintenance schedule in column 2.	x	
4	Isolate the appliance from the electrical mains supply, close the gas service valve.		x
5	Visually inspect the general heat exchanger area for signs of corrosion, sooting or other forms of damage. If damage is evident perform the tasks in the maintenance schedule in column 2.	x	
6	Remove the burner module (as described in section 8.1.6.) if maintenance schedule is required from steps 2, 3 or 5 above. Clean the primary heat exchanger. Fit new burner door seal kit (observe the assembly instructions enclosed with the kit). Refit the burner module and tighten the nuts.		x
7	Check all appliance electrical connections and make adjustments, if necessary.	x	x
8	If applicable check/re-pressurise system expansion vessel as necessary.	x	x
9	Check the appliance generally, check for dirt/dust and clean if necessary.	x	x
10	Check and clean condensate trap and flexible condensate hose.	x	x
11	Perform a test operation of the appliance including the heating and hot water systems and bleed the system if necessary.	x	x
12	Measure the gas rate during operation and ensure it is inside the tolerances specified (see table 5.1 inside section 5 commissioning part I).		x
13	Re-check combustion by measuring CO and CO <sub>2</sub> values, compare to table 9.1. Ensure the measurement is within the tolerances. If a flue gas analyser is not available check the ignition and burner flame picture visually, through the viewing window.		x
14	Check boiler for leaks of any kind, rectify as necessary.	x	x
15	Complete gas boiler commissioning checklist (Benchmark).	x	x

**Table 8.1 Inspection and maintenance steps**

## 8.1.4 General

All routine servicing requirements can be achieved by the removal of the front casing, inner case and chassis panel only.

Remove the two screws on the underside of the front casing and lift off.

Remove the two screws on the front of inner case and lift off, see fig 8.1.

Drop down the electronics box into the service position.

Remove the four screws from the chassis panel, see fig 8.2. Remove the chassis panel by pulling it out at the top from its retaining slots.



### Note!

**When replacing chassis front panel ensure the bottom fits behind lip.**

Unless stated otherwise any part removed during servicing should be replaced in the reverse order to removal.

With the appliance operational carry out the following functional checks:

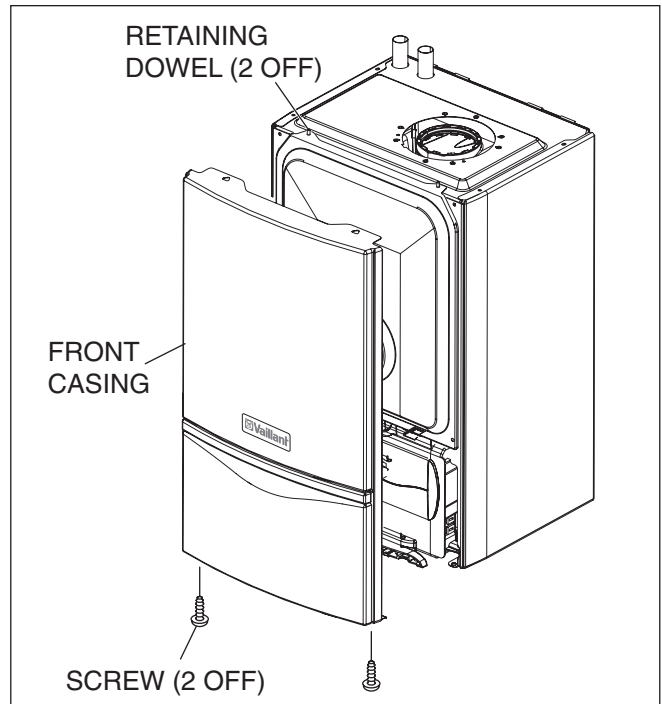
1. Check the combustion, preferably with a flue gas analyser, see section 9. If a flue gas analyser is not available remove the outer and inner case, see figs 8.1 and 8.2, and taking care not to touch any components, check the flame picture through the viewing window, fig 8.3.

Should the flame show signs of lift, sooting or appear yellow then it will be necessary to service the burner, if the servicing does not correct the condition, then proceed to the combustion test described in section 9.

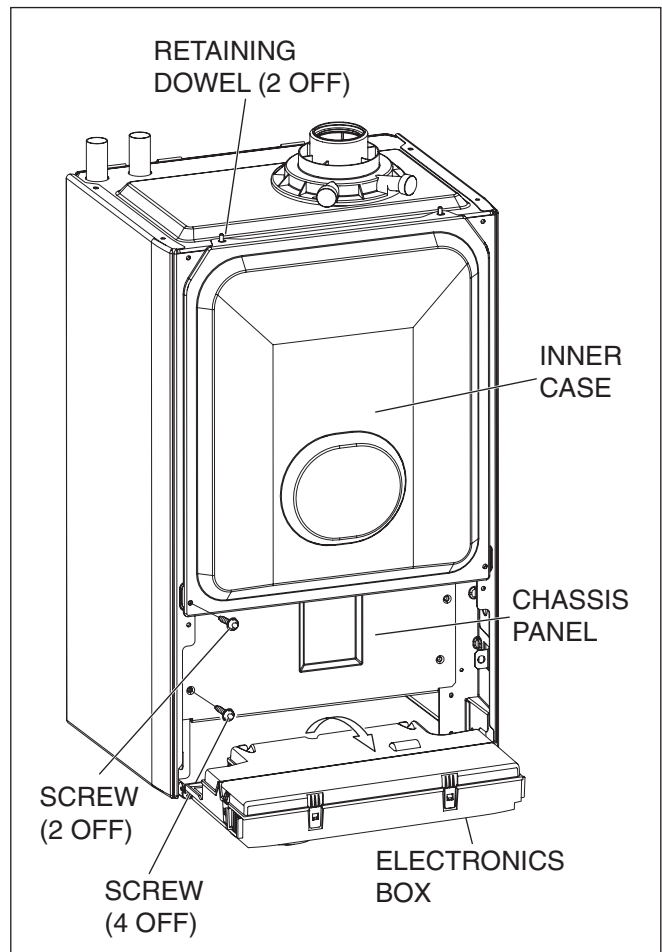
2. Measure the gas rate during operation. If the gas rate is lower than the minimum gas rate the burner will require servicing.

Should the combustion measurement or flame and gas valve be correct, then it is not necessary to remove the burner assembly for a service.

3. Check the operational performance of the central heating agrees with the technical specification.



**Fig. 8.1 Panels**



**Fig. 8.2 Control panel**

## 8 Inspection and maintenance

### 8.1.5 Spark electrode

Disconnect the ignition lead and earth lead from the igniter unit and two securing screws at the spark electrode. Withdraw the spark electrode carefully from the combustion chamber, see fig 8.4.

Inspect the tips for damage.

Clean away any debris and check the spark gap is 3.5 -4.5 mm.

Check the electrode gasket for signs of damage and replace if necessary.

### 8.1.6 Removing the burner



#### Note!

If the functional checks did not indicate poor combustion then it is not necessary to service the burner.



#### Caution!

The burner door seal and combustion chamber burner door securing nuts on the burner module, see figs 8.6 and 8.7 must be replaced each time the module is removed for example during maintenance if the burner flange insulation shows any signs of damage or small cracks it must also be replaced.

Isolate the gas supply at the gas service cock.

Disconnect the gas supply at the gas service cock.



#### Note!

Do not disconnect at the gas valve.  
Remove the two gas pipe bracket securing screws from underside of inner case, see fig 8.5.  
Drop down the electronics box into the service position.  
Remove the four screws from the chassis front, see fig 8.2.  
Remove the chassis front by pulling it out at the top from its retaining slots.



#### Note!

When replacing chassis front panel ensure the bottom fits behind lip.

Disconnect the gas valve electrical plug at the gas valve.

Disconnect the electrical leads from the fan.

Remove the five combustion chamber burner door securing nuts, these should be discarded and replaced with the new nyloc nuts supplied in the burner door seal kit.

Gently remove the fan, gas valve and burner assembly from the combustion chamber complete with the gas pipe bracket and seal, see fig 8.6.

Clean the burner with a soft brush taking great care not to damage the front insulation. DO NOT use wire or sharp instruments to clean the holes of the burner. Inspect the burner for any signs of damage.

Remove and discard the burner door seal and replace with new, see fig 8.7.

Removal of the burner is not necessary during a normal service.

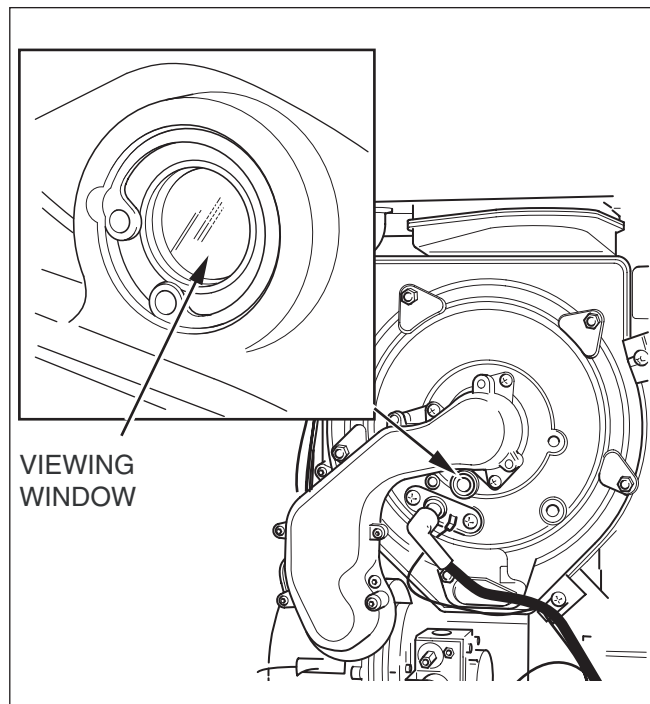


Fig. 8.3 Flame picture

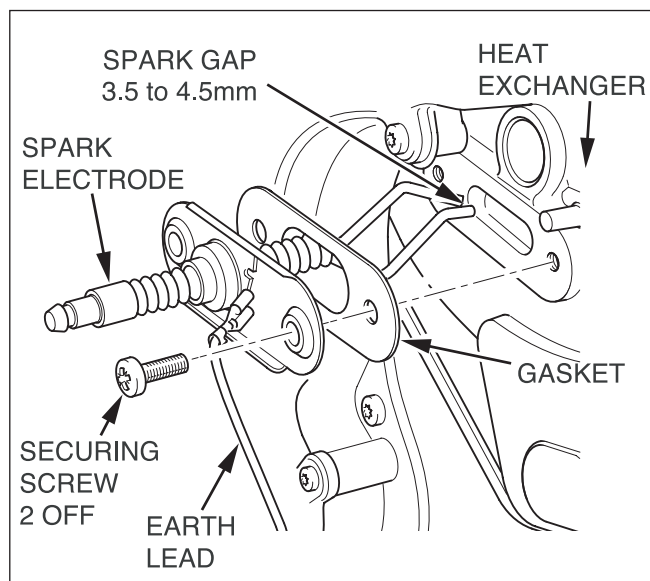


Fig. 8.4 Gas service cock

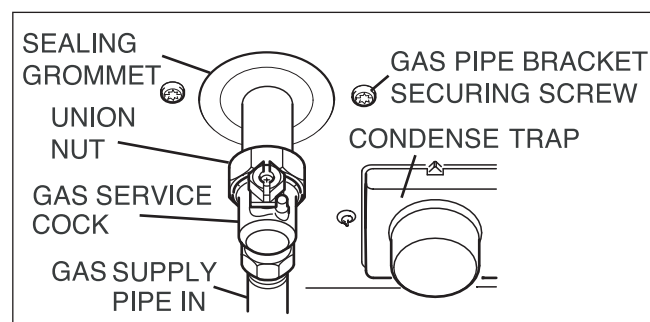


Fig. 8.5 Gas service cock



**Note!**

If the burner has to be removed it will require a new gasket when refitted.



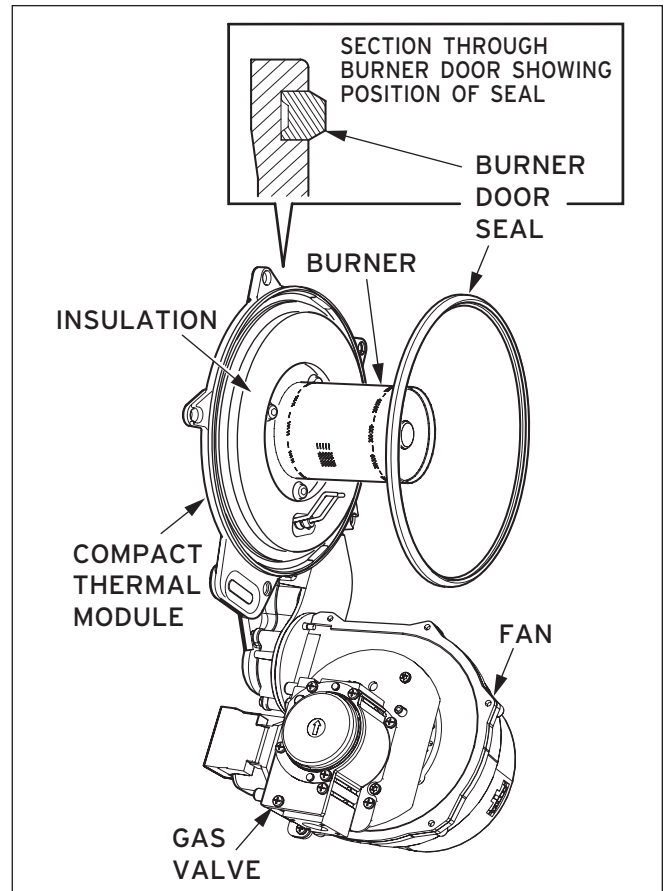
**Note!**

When replacing ensure that the sealing grommet, situated below the gas valve is correctly re-seated.

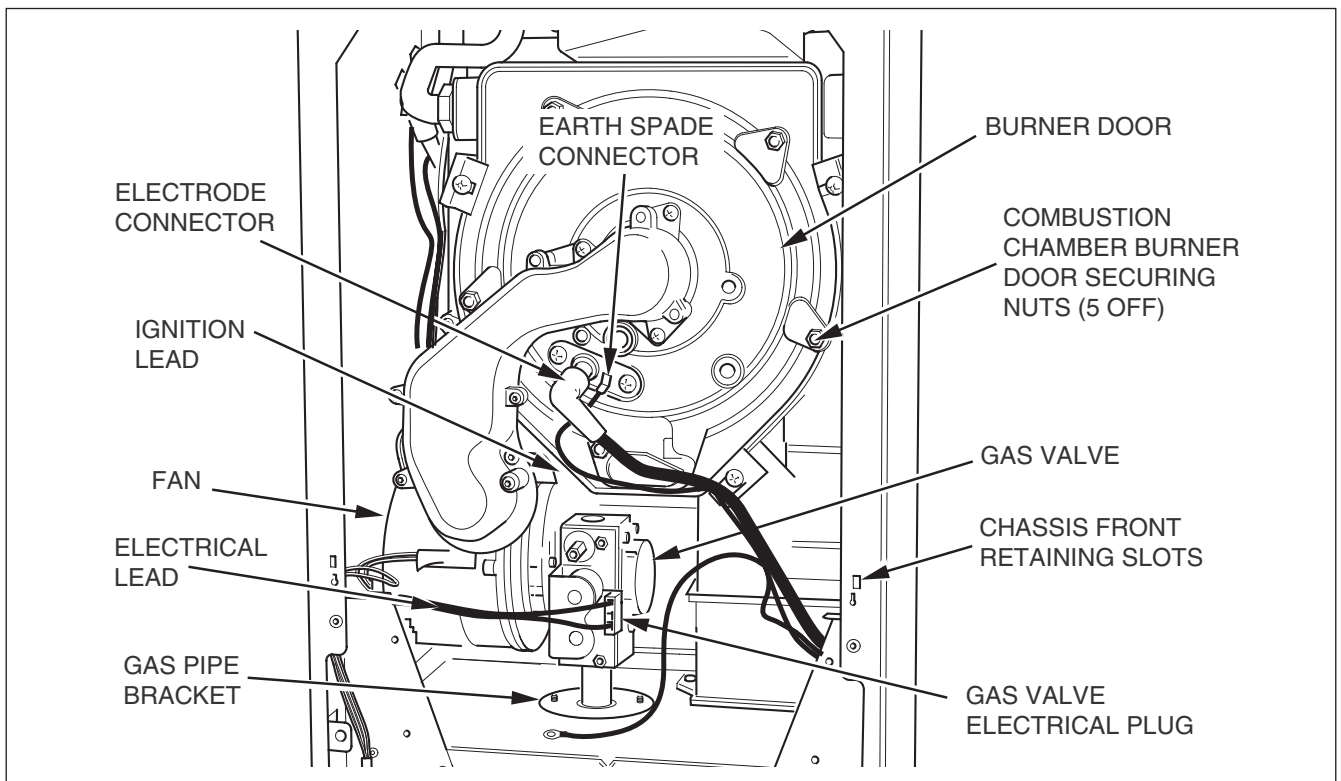
### 8.1.7 Combustion chamber and heat exchanger

Refer to fig 8.8.

Remove loose debris from combustion chamber using a soft brush and vacuum cleaner. Carefully flush any remaining debris through the condensate trap (ensure the water is kept away from electrical components).



**Fig. 8.7 Compact thermal module**



**Fig. 8.6 Fan, Gas valve and Burner**

## 8 Inspection and maintenance

### 8.1.8 Condensate drain

The condensate drain does not normally need removing during servicing.

To flush the condensate drain carefully pour water into the heat exchanger and check that water flows freely to drain. If the condensate drain is blocked, refer to parts replacement section 11 for removal.

### 8.1.9 Inner casing panel seal check

Refer to fig 8.9.

Check the condition of the seal, replace as required. To replace remove the old seal, thoroughly clean the casing surfaces. Fit the new seal, it is supplied to the correct length.

### 8.1.10 Checking the expansion vessel (If fitted).



#### Note!

It is not necessary to perform this check every year a check every three years is sufficient.

- Release the pressure from the boiler.
- Remove valve cap from expansion vessel charge point.
- Check that the internal charge pressure of the expansion vessel is to the correct design pressure. If the pressure is lower than this the vessel should be re pressurised using an air pump.
- Refit the valve cap.
- Re pressurise boiler and heating system.

### 8.1.11 Re commissioning the boiler

- Carry out electrical safety checks.
- Turn on the electrical supply.
- Open the boiler CH service valves.
- Carry out function checks of boiler operation as previously detailed.
- Check gas rate as previously detailed.
- Check for water leaks.
- Refit case, ensuring that a good seal is obtained.

### 8.1.12 Test operation

Always perform the following checks after completing any maintenance task:

- Commission the appliance according to the relevant operating manual.
- Check the appliance for gas and water leaks.
- Check the air/flue gas system for leaks, check its fastening
- Check for ignition and an even flame on the burner.
- Check that the heating system is working.
- Fill out the Benchmark gas boiler commissioning checklist at the rear of this guide.

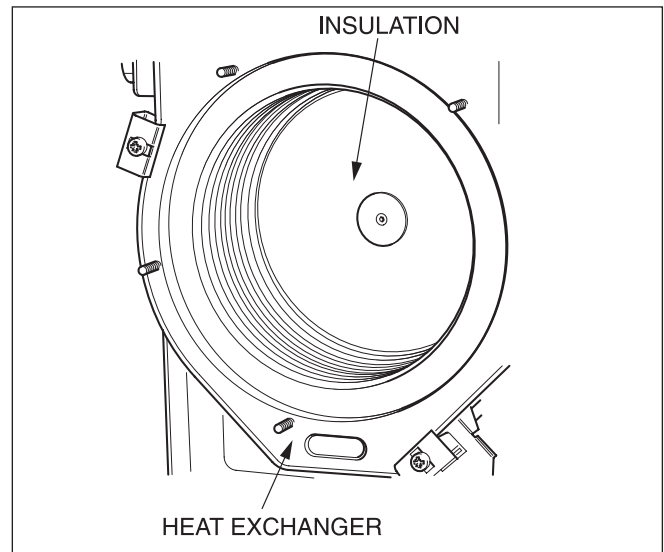


Fig. 8.8 Insulation

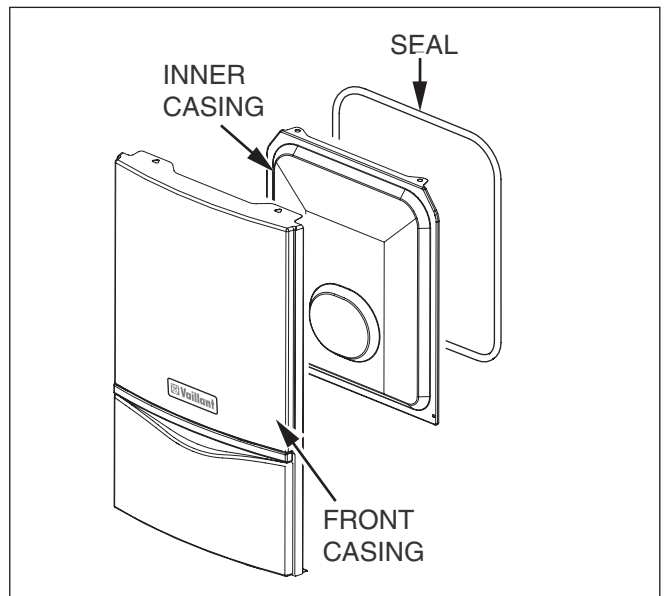


Fig. 8.9 Panels



## 9 Combustion analysis



### Note!

The boiler is fitted with a combustion analysis test point. A suitable combustion analyser can be connected to this point to establish the combustion performance of the boiler.

### 9.1 Check CO<sub>2</sub> content

Refer to table 9.1 and if necessary set (air-ratio adjustment).



### Note!

Combustion analysis must be carried out at annual service if a flue gas analyser is available, if no analyser is available then visual checks should be carried out as per service schedule. Checking/adjustment of this value is also required in the following instances: replacement of gas valve, conversion to or from natural gas/LPG or if incorrect combustion is suspected!

- Remove the front and inner cover.
- Press the "+" and "-" keys simultaneously. The "Full load mode" is activated.
- Wait at least 5 minutes until the appliance reaches its operating temperature.
- Measure the CO<sub>2</sub> content at the combustion products test point, see fig 9.1.
- If necessary, set the corresponding flue gas value (value with removed appliance front, see table 9.1) by turning "A" throttle, see fig 9.2.
  - > Turn to the left: higher CO<sub>2</sub> content,
  - > Turn to the right: lower CO<sub>2</sub> content,



### Note!

Only for natural gas:

Adjust only in increments of 1/8 turn and wait approx. 1 minute after each adjustment until the value stabilises.

Only for liquid gas: Adjust only in very small increments (approx. 1/16 turn), and wait approx. 1 minute after each adjustment until the value stabilises.

- Check the CO<sub>2</sub> content again.
- If necessary, repeat setting.
- Press the "+" and "-" keys simultaneously. The "Full load mode" is turned off. The full load mode is also turned off if no key is pressed for 15 minutes.
- Attach the inner and front cover.

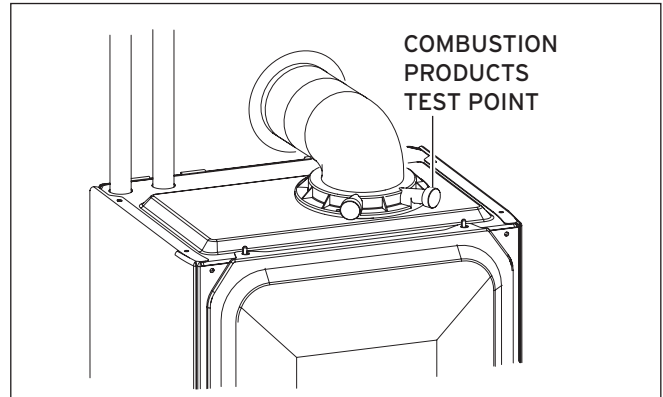


Fig. 9.1 Test point

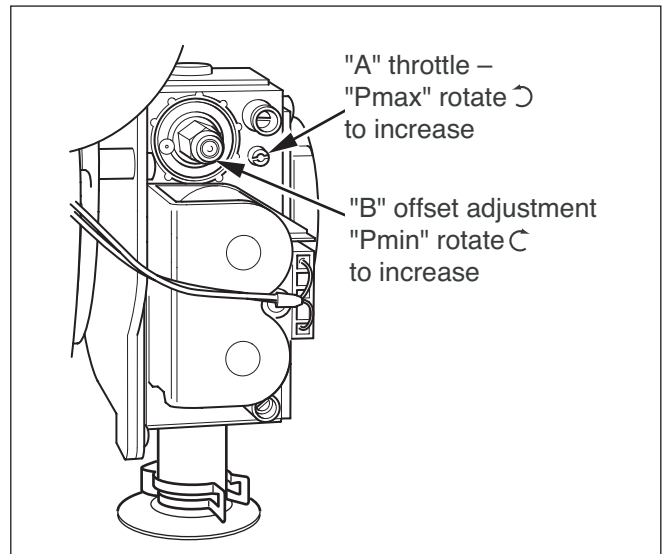


Fig. 9.2 Gas control valve

	NAT.GAS G20		PROPANE G31		THROTTLE ADJUSTMENT
	CASE OFF CO <sub>2</sub> %	CASE ON CO <sub>2</sub> %	CASE OFF CO <sub>2</sub> %	CASE ON CO <sub>2</sub> %	
ecoTEC plus 415	9.1+0.2-0.5	9.3+0.2-0.5	10.1+0.5-0.5	10.3+0.5-0.5	5 TURNS
ecoTEC plus 418	9.1+0.2-0.5	9.3+0.2-0.5	10.1+0.0-1.0	10.3+0.0-1.0	5 TURNS
ecoTEC plus 428	9.1+0.2-0.5	9.3+0.2-0.5	10.5+0.3-0.8	10.7+0.3-0.8	5 TURNS
ecoTEC plus 438	8.8+0.2-0.5	9.0+0.2-0.5	9.8+0.2-0.8	10.0+0.2-0.8	8 TURNS

Table 9.1



## 10 Troubleshooting

### 10.1 Logical fault finding procedure

These checks must be carried out before attempting to use the fault finding guide.

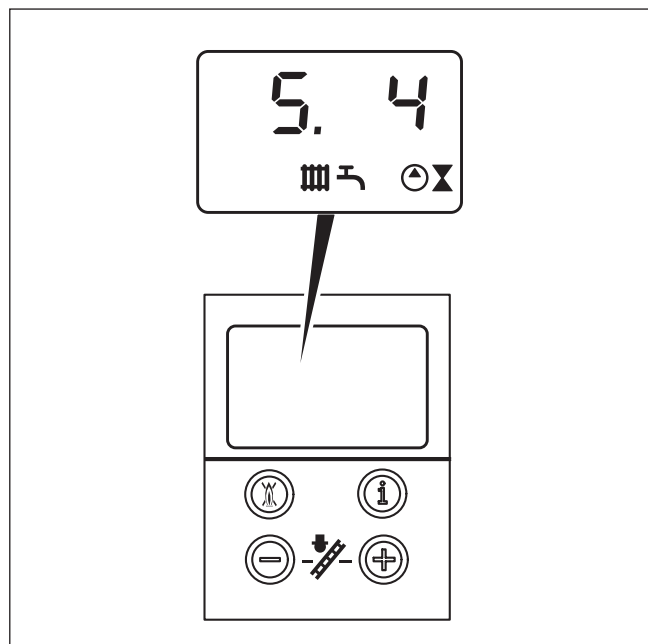
1. Carry out electrical safety checks (see section 4 'Wiring system').
2. Check that the external electricity supply to the boiler is on, and a supply of 230 V~ is present between boiler terminals 'L' and 'N'.
3. Check that the gas supply to the boiler is on, that it has been correctly purged and that an inlet pressure of 20 mbar is available at the gas valve. (See section 5 'Gas Supply').
4. Ensure the heating system is full of water and the system design pressure is attained. (sealed systems only). If not, refill and vent the system. Ensure any flow and return isolating valves (if fitted) are fully open.
5. Set the central heating temperature to maximum.
6. Set the domestic hot water temperature to maximum. (Only if additional Vaillant accessories are fitted).
7. Check that all external controls are on and calling for heat (if no external controls are fitted, boiler terminals 3 and 4 must be linked). Check that the boiler anti cycling economiser is not engaged.

#### 10.1.1 Status codes

The status codes that you can see on the display provides information about the current operating condition of the appliance.

The display of the status codes can be called as follows:

- Press the "i" key.  
The display shows the status code, e.g. S.4 for "Burner mode - Heating". The display of the status codes can be cancelled as follows:
- Press the "i" key.
- Do not press any key for approx. 4 minutes.  
The current heating flow temperature appears in the display again.



**Fig. 10.1 Display of status codes**

Display	Meaning
	Heating mode (all models):
S. 0	No heat demand
S. 1	Fan running
S. 2	Water pump running
S. 3	Ignition sequence
S. 4	Burner ignited
S. 5	Fan and pump running
S. 6	Fan over run
S. 7	Pump over run
S. 8	Anti cycling mode
	Domestic hot water mode (when accessories are fitted)
S.20	Warmstart demand
S.21	Fan running
S.22	Pump running
S.23	Ignition sequence
S.24	Burner ignited
S.25	Fan and water pump running
S.26	Fan over run
S.27	Pump over run
S.28	Anti cycling mode

**Table 10.1 Status codes**

Display	Meaning
	Charge hot water cylinder (when accessories are fitted):
S.20	Warmstart demand
S.21	Fan running
S.22	Pump running
S.23	Ignition sequence
S.24	Burner ignited
S.25	Fan and water pump running
S.26	Fan over run
S.27	Pump over run
S.28	Anti cycling mode
	All boilers:
S.30	No heating demand from external controls (clamp 3-4 open)
S.31	Central heating thermostat knob turned off or no heat demand by the eBUS control unit
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	Anti frost mode active
S.36	No heating demand from low voltage controls (clamp 7-8-9)
S.41	Water pressure > 2,9 bar
S.42	Response from accessory module or defective condensate pump is blocking burner operation
S.53	Appliance is within the waiting period of the operation block function due to water shortage (VL-RL spread too big)
S.54	Appliance is within the waiting period of the operation block function due to water shortage (temperature gradient)
S.96	Return-sensor check is running, demand (DHW or heating) is blocked
S.98	Flow-/Return-sensor check is running, demand (DHW or heating) is blocked

Table 10.1 Status codes (continued)

### 10.1.2 Diagnostic codes

In the diagnostic mode, you can change certain parameters or display more information. The diagnostic information is divided into two diagnostic levels. The second diagnostic level can be reached only after entering a password.



#### Caution!

Access to the second diagnostic level must be used exclusively by a qualified technician.

#### First Diagnostic level

- Press the "i" and "+" keys simultaneously. The display shows "d.0".
- Use the "+" or "-" keys to scroll through the desired diagnostic numbers of the first diagnostic level (see table 10.2).
- Press the "i" key. The display shows the relevant diagnostic information.
- If necessary, use the "+" or "-" keys to change the value (display flashes).
- Save the new value by holding down the "i" key for approx. 5 seconds until the display no longer flashes. You can end the diagnostic mode as follows:
  - Press the "i" and "+" keys simultaneously.
- Do not press any key for approx. 4 minutes. The current heating flow temperature appears in the display again.

#### Second diagnostic level

- As described above in the first diagnostic level, scroll through the diagnostic number d.97.
- Change the displayed value to 17 (password) and press the "i" button. You are now in the second diagnostic level where all information from the first diagnostic level (see table 10.2) and the second diagnostic level (see table 10.3) is displayed. Scrolling and changing values and exiting the diagnostic mode is done as described in the first diagnostic level.



#### Note!

After exiting the second diagnostic level, if you press "i" and "+" within 4 minutes, you will directly reach the second diagnostic level without having to enter the password again.

## 10 Troubleshooting

Display	Meaning	Display value/adjustable value
d. 0	Heating part load	Adjustable heating part load in kW (factory setting: max. output)
d. 1	Water pump over run time for heating mode	2 - 60 min (factory setting: 5 min)
d. 2	Max. burner anti cycling period at 20 °C Flow temperature	2 - 60 min (factory setting: 20 min)
d. 3	Hot water flow temperature reading (when accessories are fitted)	in °C
d. 4	Current temperature for warm start sensor (when accessories are fitted) Current storage tank sensor	in °C
d. 5	Flow temperature target value or return target value when return regulation is set.	in °C, max. the value set in d.71 Limited by the eBUS controller (if an eBUS controller is connected)
d. 6	Hot water temperature target value	in °C, 35 to 65 °C
d. 7	Warm start temperature target value (when accessories are fitted) Storage temperature target value (system boiler only)	in °C, 40 to 65 °C in °C, 15 °C for left stop, then 40 to 70 °C
d. 8	External controls heat demand (terminals 3-4)	0 = open (no heat request) 1 = closed (heat request)
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 = on, 0 = off
d.11	Status external heating pump	1 to 100 = on, 0 = off
d.12	Cylinder charging pump (via accessory module)	1 to 100 = on, 0 = off
d.13	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 Control	1 = yes, 0 = no
d.30	Control signal for both gas valves	1 = on, 0 = off
d.33	Fan speed target value	in rpm/10
d.34	Fan speed actual value	in rpm/10
d.35	Position of diverter valve (when accessories are fitted)	0 = Heating; 100 = Hot water; 40 = Centre position
d.36	Hot water flow sensor	in l/min
d.40	Flow temperature Actual value	in °C
d.41	Return temperature Actual value	in °C
d.44	Digitised ionisation potential	Display range of 0 to 102, > 80 no flame, < 40 even flame
d.47	Outside temperature (with weather compensating Vaillant controller only)	Actual value in °C
d.67	Remaining burner anti cycling time	in min
d.76	Appliance variant (device specific number)	00 to 99
d.90	Digital regulator status	1 = identified, 0 = unidentified (eBUS Address <=10)
d.91	DCF status with connected external probe with DCF77 receiver	0 = no reception, 1 = reception, 2 = synchronised, 3 = valid
d.97	Activation of the second diagnostic level	Password: 17

**Table 10.2 Diagnostics codes of the first diagnostic level**

Display	Meaning	Display value/adjustable value
d.17	Heating flow/return regulation change over	0 = flow, 1 = return (factory setting: 0)
d.18	Pump mode (return)	0 = return, 1 = nonstop, 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 dependent on heating part load d. 0 (if d.0 is below 60% of full load, then pump speed 1, other-wise speed 2) 3 = always speed 2 (factory setting: 2)
d.20	Maximum set value for target cylinder temperature (system boilers only)	Setting range: 50 to 70 °C (factory setting: 65 °C)
d.27	Switching accessory relay 1 in the accessory module	1 = Circulation pump (default) 2 = Ext. pump 3 = Storage charging pump 4 = Flue gas flap/extractor hood 5 = External gas valve 6 = External error message
d.28	Switching accessory relay 2 in the accessory module	1 = Circulation pump 2 = Ext. pump (default) 3 = Storage charging pump 4 = Flue gas flap/extractor hood 5 = External gas valve 6 = External error message
d.50	Offset for minimum speed	in rpm/10, adjustment range: 0 to 300
d.51	Offset for maximum speed	in rpm/10, adjustment range: -99 to 0
d.58	From the third quarter of 2006: Activation of solar reheating	Setting range: 0 to 30 = solar reheating disabled (factory setting) 3 = activation of min. hot water target value = 60 °C for solar reheating
d.60	Number of safety temperature limiter cut offs	Quantity
d.61	Number of lock outs	Number of unsuccessful ignitions in the last attempt
d.64	Average ignition time	in seconds
d.65	Maximum ignition time	in seconds
d.68	Unsuccessful ignitions in the first attempt	Quantity
d.69	Unsuccessful ignitions in the second attempt	Quantity
d.70	Set diverter valve position	0 = Normal mode (factory setting) 1 = Centre position 2 = permanent heating position
d.71	Maximum setting of heater control knob	Adjustment range in °C: 40 to 85 (Factory setting: 75)
d.72	Pump overrun time after warm start (combination boilers only) or charging an electronically controlled hot water storage through C1-C2 (system boilers only)	Adjustment range in sec: 0, 10, 20 to 600 Factory setting (when accessories are fitted): 80 Factory setting for system boilers: 300
d.73	Offset for warm start target value (when accessories are fitted)	Adjustment range: -15 K to +5 K (Factory setting: OK)
d.75	Maximum charging time for a storage without own controller (system boilers only)	Adjustment range in min: 20, 21, 22 to 90 (Factory setting: 45)
d.77	Storage partial load (storage charging capacity limit, system boilers only)	Adjustment range in kW: appliance specific Factory setting: max output

**Table 10.3 Diagnostics codes of the second diagnostic level**

## 10 Troubleshooting

Display	Meaning	Display value/adjustable value
d.78	Storage charging temperature limit (target flow temperature in storage mode, system boilers only)	Adjustment range in °C 55 to 90 (Factory setting: 80)
d.80	Heating operating hours	in h <sup>1)</sup>
d.81	Water heating operating hours (when accessories are fitted)	in h <sup>1)</sup>
d.82	Cycles in heating mode	Quantity/1001) (3 corresponds 300)
d.83	Cycles in hot water operation	Quantity/1001) (3 corresponds 300)
d.84	Maintenance indicator: Number of hours until the next maintenance	Adjustment range: 0 to 3000 h and "--" for disabled Factory setting: "--" (300 corresponds to 3000 h)
d.93	DSN appliance variant setting	Adjustment range: 0 to 99
d.96	Factory setting	1 = Resetting adjustable parameters to factory setting

1) Five-digit numbers are saved with the diagnostics codes 80 to 83. If d.80, for example, is selected, only the first two digits of the number are displayed (e. g. 10). The display switches to the last three digits (e. g. 947) by pressing "i". In this example the number of operating hours of the heating is 10947 h. The display returns to the selected diagnostics item by pressing "i" again.

**Table 10.3 Diagnostics codes of the second diagnostic level (continued)**

### 10.1.3 Fault codes

Fault codes take priority over all other display functions in the event of a system fault occurring. If multiple faults occur, the corresponding fault codes are displayed alternately for about two seconds each.

### 10.1.4 Fault memory

The fault memory stores details of the ten most recent faults.

- Press the "i" and "--" buttons simultaneously.
  - Use the "+" button to scroll back through the list of memorised errors.
- To cancel fault error memory display mode, proceed as follows:
- Press the "i" button below the display or
  - Do not touch any key for about four minutes.
- The display will now revert back to showing the current flow temperature.

Code	Meaning	Cause
F. 0	Flow-NTC open circuit	NTC broken, NTC cable broken, Defective connection at NTC, Defective connection at electronics
F. 1	Return-NTC open circuit	NTC broken, NTC cable broken, Defective connection at NTC, Defective connection at electronics
F.10	Flow NTC short circuit	NTC defective, short circuit in cable harness, cable/casing short cut
F.11	Return NTC short circuit	NTC defective, short circuit in cable harness, cable/casing short cut
F.13	Tank NTC short circuit	NTC defective, short circuit in cable harness, cable/casing short cut
F.20	Safety temperature limiter by NTC activated	Flow-NTC not correctly thermal-connected 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 sensor defective, pump blocked or defective, pump output too low
F.23	Water shortage, temperature difference between flow and return NTC too large	Pump blocked or defective, pump output too low, flow and return NTC interchanged
F.24	Water shortage, temperature rise too quick	Pump blocked, insufficient pump output, air in appliance, water pressure too low

**Table 10.4 Error codes**

Code	Meaning	Cause
F.27	Incorrect sensing of flame	Flame detector defective
F.28	Appliance does not start: Attempts to ignite during start failed	Faults in the gas supply such as:- - Gas meter or gas pressure detector defective - Air in gas- Gas flow pressure too low - Fire protection tap has disengaged 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 stopped, faulty earthing of appliance
F.32	Fan speed variation	Fan blocked, plug not inserted correctly on fan, hall sensor defective, fault in cable harness, electronics defective
F.49	eBUS under voltage	Short circuit on eBUS, overload on eBUS or two power sources on eBUS with different polarity
F.61	Gas-valve control defective	Short circuit/earth (ground) leak in cable harness to gas valves, gas valve assembly defective (earth/ground leak from coils), electronic control system defective
F.62	Gas valve shut off delay	Gas valve leaking, electronics defective
F.63	EEPROM error	Electronics defective
F.64	Electronics/NTC fault	Short-circuit in flow or return NTC or electronics defective
F.65	Electronics temperature too high	Electronics too hot due to external effect, electronics defective
F.67	Flame detector input signal is outside the limits (0 or 5 V)	Electronics defective
F.70	No valid DSN in display and/or main board	Spare part failure display and main board interchanged at same time and device specific number not adjusted
F.71	Flow NTC reports constant value (stuck at)	Flow NTC is defective
F.72	Flow and/or return NTC fault	Flow and/or return NTC is defective (tolerances too big)
F.75	No pressure rise was detected on turning on the pump	Water pressure sensor or/and pump defective Air in the heating system, quick bleeder defective Too little water in appliance; check adjustable by-pass; connect external expansion vessel to return
F.76	Overheating protection on primary heat exchanger triggered	Cable or cable connection of fuse in the primary heat exchanger defective, or primary heat exchanger defective
F.77	Condensate pump or feedback of accessories blocks heating	Condensate pump defective or flume flap feedback triggered
F.78	Wrong configuration with accessory	link box VR65 connected to combination boiler
con	No communication to main board	Connection error display main board

**Table 10.4 Error codes (continued)**

## 10 Troubleshooting

### 11 Parts Replacement

#### 10.2 Test programs

Special functions can be triggered on the appliances by activating various test programs.

These programs are given in detail in the Table 10.5.

- The test programs P.0 to P.6 will be started when "Power ON" is turned on and the "+" key is pressed for 5 s. The display shows "P.0".
- Press the "+" key to start counting the test number upwards.
- Press the "i" to operate the appliance now and to start the test program.
- Press "i" and "+" simultaneously to exit the test programs. You can also exit the test programs by not pressing any key for 15 minutes.

Display	Meaning
P.0	Bleeding test program. The heating circuit and hot water circuit (when accessories are fitted) is bled via the automatic air vent (the cap on the automatic air vent must be loosened).
P.1	Test program 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 program for the safety temperature limit check; appliance heats up by by-passing a regulating shut down through the flow regulator until the shut off temperature of 97 °C is achieved.
P.6	Filling test program. The diverter valve moves to the centre position

**Table 10.5 Test programs**

#### 10.3 Resetting parameter to factory settings

Besides the option to reset individual parameters manually to the factory settings specified in tables 10.2 and 10.3, you can also reset all parameters simultaneously.

- In the second diagnostic level, under the diagnostic number "d.96" change the value to 1 (see section 10.1.2).  
The parameters of all adjustable diagnostic numbers now correspond to the factory settings.

## 11 Parts replacement

The tasks listed below in this section may be carried out only by a qualified engineer.

- Only use genuine spare parts for repairs.
- Make sure the parts are correctly fitted and that their original position and alignment are retained.

### 11.1 Safety instructions



#### **Danger!**

**Each time the components are replaced, comply with the safety instructions below for your own safety and to avoid damage to the appliance!**

- Put the appliance out of operation.



#### **Note!**

**Before starting any maintenance work: Isolate the mains electricity supply by disconnecting the plug at the socket outlet (if there is only an isolating switch remove the fuse from the switch).**

Close the service valve in the gas supply.

Isolate the boiler flow and return if possible.

Empty the appliance if you want to replace water bearing components of the appliance!

Make sure that no water drops on live components (e.g. switch box etc.)!

Use only new seals and O-rings!

After completing the work, check for gas leaks and perform a function check (see section 7)!

Always check earth continuity, polarity and resistance to earth with a multimeter after any service work and after exchanging any electrical component.

### 11.2 Replacing the burner.

For access refer to section 8.1.4.

Remove the burner refer to section 8.1.6

### 11.3 Replacing the gas valve

For access refer to section 8.1.4.

Remove the gas valve, fan and burner refer to the relevant parts of section 8.1.6.

Before removing the gas valve note its position on the fan. Remove the three securing screws, which fix the gas valve, plastic swirl plate to the venturi on the fan.

Remove the gas valve.

Remove the gas supply pipe from the gas valve.

When refitting the gas valve take care as it can be fitted more than one way.

After assembly test for gas soundness and purge in accordance with the current issue of BS6891 or in IE, the current edition of I.S.813 "Domestic Gas Installations".

### 11.4 Replacing the fan

Remove the gas valve refer to section 11.3.

Remove the venturi plate secured with three screws and remove the two screws securing the fan to the gas manifold, see fig 11.1.

Check the gasket and replace if necessary.





**Note!**

The ecoTEC plus 428 and 438 fan is secured through an extension piece with two securing screws, check and replace any seals or gaskets if necessary.

## 11.5 Replacing the heat exchanger

For access refer to section 8.1.4.

Remove the gas valve, fan and burner refer to the relevant parts of section 8.1.6.

Drain the boiler.

Remove the clip securing the clear condensate pipe to heat exchanger.

Pull to remove clamps (two at the top and one at the bottom) to remove the heat exchanger, see fig 11.2.



**Note!**

There will be water in the heat exchanger.

Remove clear condensate pipe connector from bottom of heat exchanger.

## 11.6 Replacing the condensate trap and siphonic drain

Refer to fig 11.3.

Remove the clips securing the flexible tubes to the adapter by twisting the clips slightly to disengage the clip jaws from each other.

Remove flexible tubes from adapter.

Lift off the adapter.

Remove the drain connection downstream of the condensate trap.

Remove the two condensate trap securing screws.

Lift up and carefully remove the condensate trap taking care not to spill any water which may be left in the unit. As the unit is lifted remove the flexible pipe on the outlet.

Remove any solids found.

Before removing the float note it's orientation.

Remove the float to clean it.

Flush water through the trap to remove any remaining solids.

Check for any debris in the outlet pipe of the condensate drain and clean as necessary.

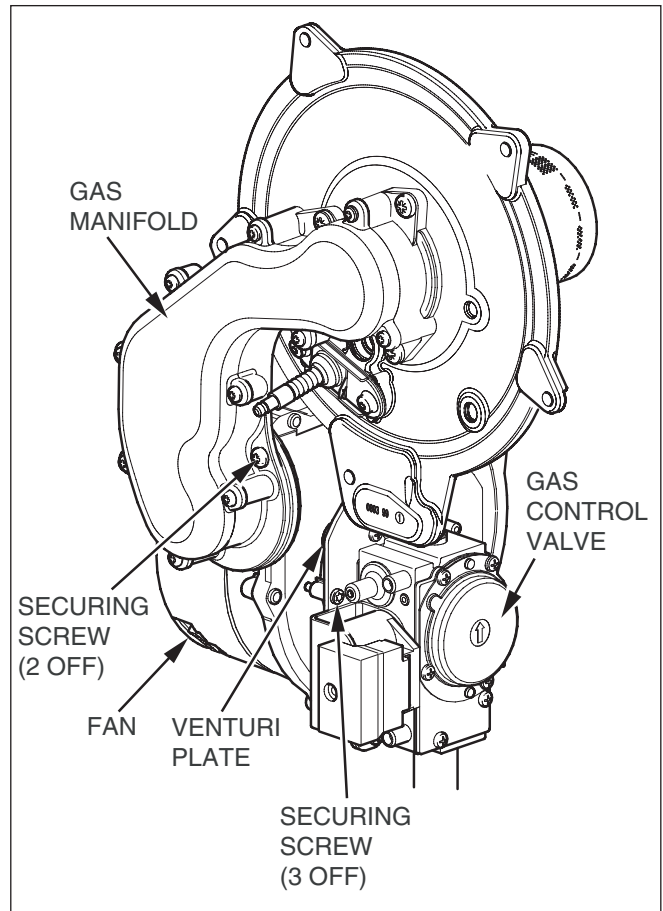
Reassemble and refit the condensate trap.



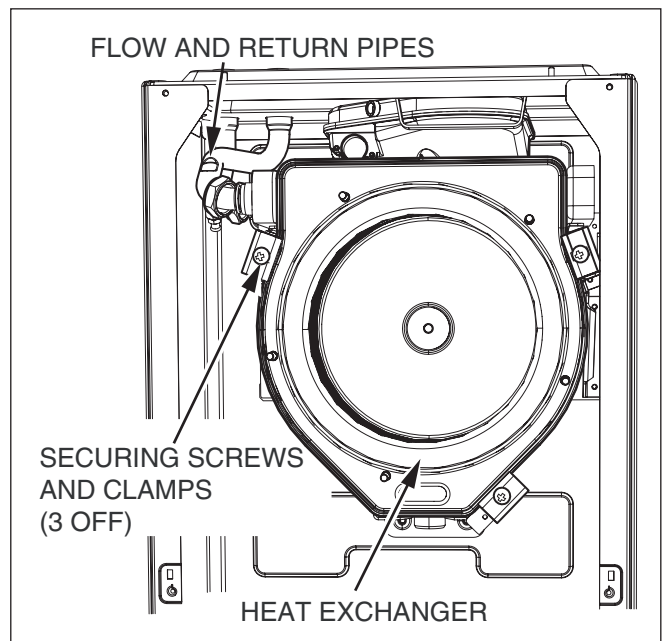
**Note!**

If a replacement trap is required remove spigot bung before fitting condensate drain connection.

Using a suitable container, flush the heat exchanger until the water appears clear in the container. Reassemble adapter.



**Fig. 11.1 Fan removal**



**Fig. 11.2 Heat exchanger removal**

## 11.7 Replacing electronics and display



**Danger!**  
Before replacing the component, comply with the safety instructions in Section 11.1.

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

### Replacing display or electronics

If you are replacing only one of the two components, the parameter adjustment functions automatically. On turning on the appliance, the new component takes over the previously set parameters from the components that are not replaced.

### Replacing display and electronics

When replacing both components, after being turned on, the appliance goes to fault and displays the error message "F70".

- In the second diagnostic level, under the diagnostic number "d.93" enter the number of appliance variant according to Table 11.1 (see section 10.1.2).

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

Appliance	Device specific number
ecoTEC plus 415	0
ecoTEC plus 418	1
ecoTEC plus 428	2
ecoTEC plus 438	3

Table 11.1 Device specific numbers

## 12 Recycling and disposal

The design of all Vaillant products takes into account the subsequent recycling and/or eventual safe scrapping of each component used. Vaillant's in-house rules set strict standards in this respect. The selection process used for choosing raw materials includes full consideration of their recycling characteristics, and of the breakdown and separation properties of sub assemblies. We also take fully into account the environmental and health hazards involved in recycling and in the disposal of non-reusable waste items.

### 12.1 Appliance

The Vaillant ecoTEC plus consists largely (92 %) of metal components designed for eventual recycling by incorporation into the smelting process of a steelworks. This gives these parts virtually unlimited scope for subsequent re-use. All plastic materials are duly identified to facilitate sorting and separation when the time comes to recycle the unit.

### 12.2 Packaging

Vaillant endeavours to keep the amount of transport packaging used for its equipment to the bare minimum necessary. Subsequent re-use is taken into account when selecting packaging materials. High-quality cardboard has long been a valuable secondary raw material for the card and paper industry. The sections of EPS (Styropor®) are required in order to protect equipment in transit. EPS is 100 % recyclable and CFC-free. The foil-wrapping and securing straps are likewise made of recyclable plastic.

## 13 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).

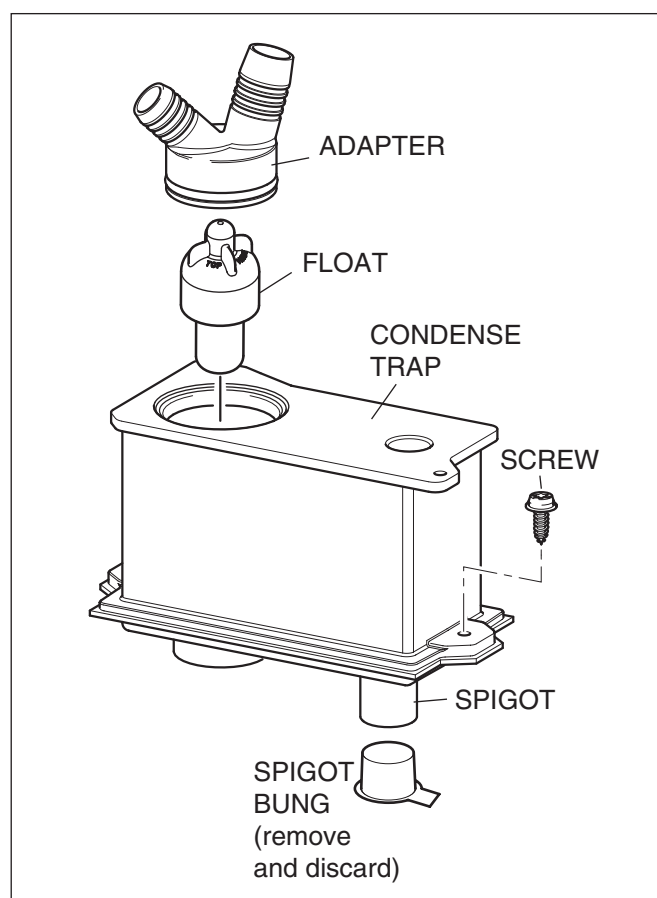


Fig. 11.3 Condense trap



## EC declaration of conformity

Name and Address of the manufacturer:

**Vaillant GmbH**  
**Berghauser Str. 40**  
**42859 Remscheid**

Identification of product:

Vaillant ecoTEC plus  
 Condensing - Open Vented Boilers

Appliance type:

ecoTEC plus 415  
 ecoTEC plus 418  
 ecoTEC plus 428  
 ecoTEC plus 438

The appliance types satisfy the essential requirements of the relevant directives and Standards:

**90/396/EEC** including amendments

"Directive on the approximation of the law of the member states relating to appliances burning gaseous fuels"

Designed and built to CE-type examination certificate:

PIN no: **87B042**

**92/42/EEC** including amendments

"Directive of efficiency relating to boiler burning gaseous fuels"

Designed and built according to European Standards:

**73/23/EEC** including amendments

"Directive on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits"

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

**89/336/EEC** including amendments

"Directive on the approximation of the law of the member states relating to electromagnetic compatibility"

Any change to the appliance and/or any use not according to the instructions will lead to the invalidation of this Declaration of Conformity

Belper, July 2006

(place, date)

Program Manager  
 S. Keeton

Certification Manager  
 A. Beardsley

**Vaillant GmbH**

Berghauser Str. 40 ■ D-42859 Remscheid ■ main phone no. +49 21 91/18-0 ■ Telefax +49 21 91/18-28 10

Ltd. company ■ Registered office: Remscheid ■ Registry court: Amtsgericht Wuppertal HRB 11775

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 811142240

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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 \_\_\_\_\_ m<sup>3</sup>/hr \_\_\_\_\_ ft<sup>3</sup>/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 \_\_\_\_\_ m<sup>3</sup>/hr \_\_\_\_\_ ft<sup>3</sup>/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/CO<sub>2</sub> RATIO READING? N/A ☐ YES ☐ CO/CO<sub>2</sub> 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 \_\_\_\_\_







**Vaillant Ltd**

Vaillant House ■ Medway City Estate ■ Trident Close ■ Rochester ■ Kent ME2 4EZ  
Telephone 01634 292300 ■ Fax 01634 290166 ■ [www.vaillant.co.uk](http://www.vaillant.co.uk) ■ [info@vaillant.co.uk](mailto:info@vaillant.co.uk)

For the installer



## Flue installation instructions



Air flue duct for use with ecoMAX  
and ecoTEC boilers

ecoMAX 613/2 E  
ecoMAX 618/2 E  
ecoMAX 622/2 E  
ecoMAX 635/ E  
ecoMAX 824/2 E  
ecoMAX 828/2 E  
ecoMAX 835/ E  
ecoMAX pro 18 E  
ecoMAX pro 28 E

ecoTEC plus 415  
ecoTEC plus 418  
ecoTEC plus 428  
ecoTEC plus 438  
ecoTEC plus 612  
ecoTEC plus 615  
ecoTEC plus 618  
ecoTEC plus 624  
ecoTEC plus 824  
ecoTEC plus 630  
ecoTEC plus 831  
ecoTEC plus 637  
ecoTEC plus 837  
ecoTEC pro 24  
ecoTEC pro 28



# **PART 1**

**Pages 4 - 36**

**Standard Concentric Systems Ø 60/100  
(Galvanized steel air duct/plastic flue duct)**

# **PART 2**

**Pages 37 - 59**

**Optional Concentric System Ø 80/125  
(Galvanized steel air duct/plastic flue duct)**

# CONTENTS: PART 1 CONCENTRIC 60/100



The air/flue duct must be installed by a suitably qualified service provider, which is responsible for observing the relevant specifications, regulations and standards.

		Page
	<b>Requirements</b>	Regulations and standards to be observed 5
	<b>Planning the air/flue duct layout</b>	Alternative termination accessories available 6 Maximum flue lengths for ecoMAX 11 Maximum flue lengths for ecoTEC 12
	<b>Installing the air/flue duct sliding sleeve</b>	14
	<b>Installation of the horizontal air/flue duct</b>	15
	<b>Installation of the black terminal kit</b>	21
	<b>Installation of the variable termination kit</b>	23
	<b>Installation of the vertical air/flue duct</b>	28
	<b>Fitting air/flue duct extensions</b>	How to add extensions 31 How to install elbows 32

## Regulations and standards to be observed

- Vaillant ecoMAX/ecoTEC boilers are certified as heating boilers with corresponding flue systems according to EC Directive 90/396/EEC on gas-fired devices. This installation manual is covered by this certification and is referred to in the design approval test certificate.
- These instructions should be read in conjunction with the instructions for installation and servicing supplied with the boiler.
- Ensure also that all legislation, rules, regulations and directives mentioned in the installation instructions are observed.
- The installation of the boiler and its flue must be carried out by a competent person who is registered with CORGI (The Council for Registered Gas Installers).
- The installation of the boiler and flue must be in accordance with the Gas Safety (Installation and Use) Regulations 1998 and the Building Regulations and BS 5440 Part 1.
- The requirements for flue termination detailed in the boiler installation instructions must be observed.
- Two types of flue system are available for ecoMAX/ecoTEC boilers. The standard concentric flue system (100 mm outside diameter) and a larger diameter concentric system (125 mm outside diameter) which allows longer air/flue duct lengths to be achieved.
- The air/flue duct operates at very low temperatures therefore no clearance is necessary between the air duct and adjacent services.
- Ensure while installation work is being carried out that no debris such as swarf, filings or fragments of mortar are allowed to remain in the air/flue duct.



















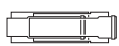







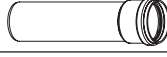




## PLANNING THE AIR/FLUE DUCT LAYOUT

### Alternative termination accessories available

 **303 900** = Vertical air/flue duct (black)

 **303 933** = Horizontal air/flue duct  
 **303 936** = Horizontal telescopic air/flue duct

Optional connection accessories	Accy. No.	303 900 	303 933 	303 936 
Air/flue duct extensions, concentric 470 mm - Ø 60/100 	303 902	x	x	x
Air/flue duct extensions, concentric 970 mm - Ø 60/100 	303 903	x	x	x
Air/flue duct extensions, concentric 1970 mm - Ø 60/100 	303 905	x	x	x
Bends (PP), concentric (pack of 2) 45° - Ø 60/100 	303 911	x	x	x
Elbow, concentric 87° - Ø 60/100 	303 910	x	x	x
Flue support clips (pack of 5), Ø 100 	303 821	x	x	x
Adjustable flue support clips (pack of 3); Ø 100 	303 935	x	x	x
Sliding sleeve (PP) Ø 60/100 	303 915	x	x	x
Adjustable roof tiles for pitched roof 	009076 black	x	x	x
Flexible pitched roof seal 	303 980	x		
Flat roof penetration collar 	009 056	x		
Telescopic extension 440 mm - 690 mm Ø 60/100 	303 906	x	x	x
Telescopic offset section 	303 919	x	x	x
Black terminal kit for horizontal air/flue duct 	303 934		x	x
Variable termination kit - black *) 	303 942		x	x
Extension pipe for variable termination kit VTK Ø 60 mm 1 m - black *) 	303 943		x	x
87° elbow for variable termination kit - black *) 	303 944		x	x
45° bend for variable termination kit - black (2 pieces) 	303 945		x	x
Variable termination kit - white *) 	303 946		x	x
Extension pipe for variable termination kit VTK Ø 60 mm 1 m - white *) 	303 947		x	x
87° elbow for variable termination kit - white *) 	303 949		x	x
45° bend for variable termination kit - white (2 pieces) 	303 948		x	x

\*) delivered with support clips

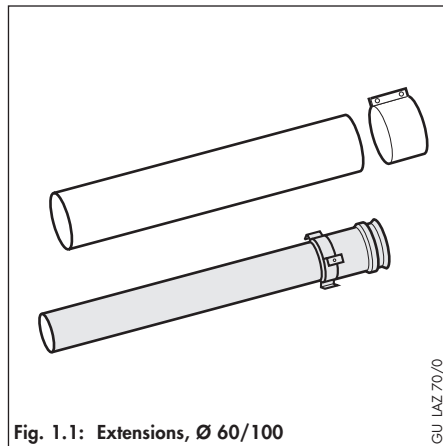


Fig. 1.1: Extensions, Ø 60/100

**Air/flue duct extension 470 mm  
Ø 60/100**

Vaillant Accy. No.: 303 902

**Air/flue duct extension 970 mm,  
Ø 60/100**

Vaillant Accy. No.: 303 903

**Air/flue duct extension 1970 mm,  
Ø 60/100**

Vaillant Accy. No.: 303 905

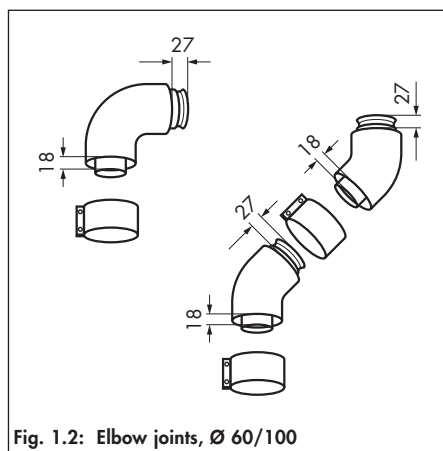


Fig. 1.2: Elbow joints, Ø 60/100

**Elbow, 87°, Ø 60/100**

Vaillant Accy. No.: 303 910

**Bends, 45° (pack of 2),  
Ø 60/100**

Vaillant Accy. No.: 303 911

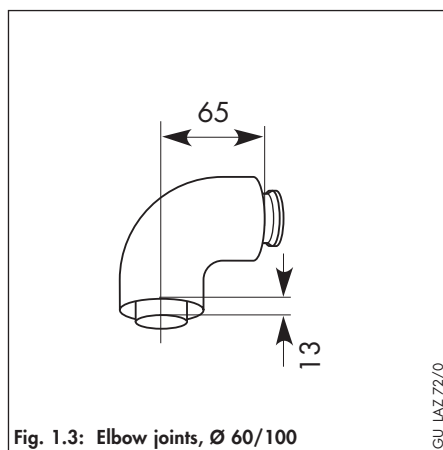


Fig. 1.3: Elbow joints, Ø 60/100

**Elbow, 87°, Ø 60/100**

Only Part of:

Vaillant Accy. No.: 303 933

Vaillant Accy. No.: 303 936

Use one clip per extension to support the air/flue duct.

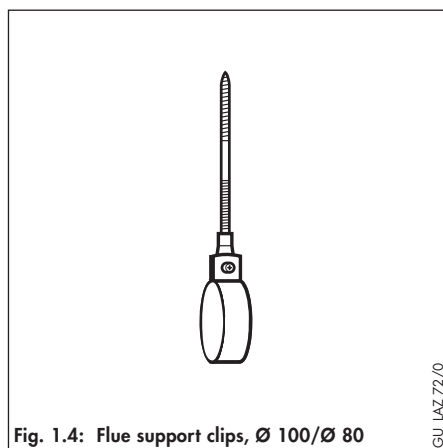


Fig. 1.4: Flue support clips, Ø 100/Ø 80

**Flue support clips, Ø 100 (pack of 5)**

Vaillant Accy. No.: 303 821



## PLANNING THE AIR/FLUE DUCT LAYOUT

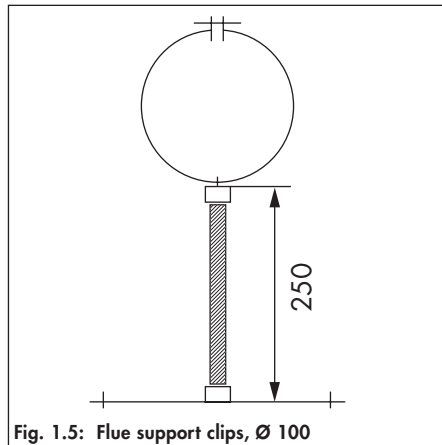


Fig. 1.5: Flue support clips, Ø 100

**Adjustable flue support clips, Ø 100  
(pack of 3)**

Vaillant Accy. No.: 303 935

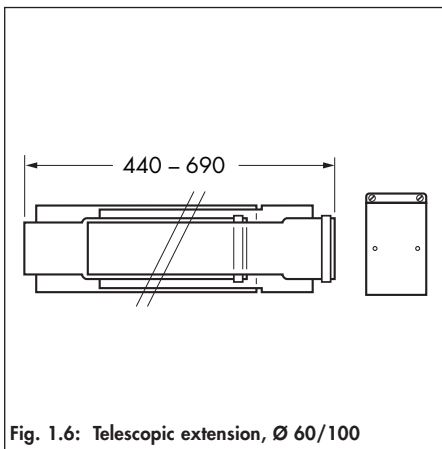


Fig. 1.6: Telescopic extension, Ø 60/100

**Telescopic extension (PP), Ø 60/100  
440 mm - 690 mm**

Vaillant Accy. No.: 303 906

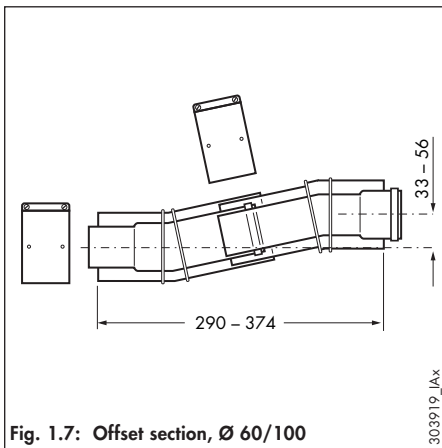


Fig. 1.7: Offset section, Ø 60/100

**Offset section, Ø 60/100**

Vaillant Accy. No.: 303 919

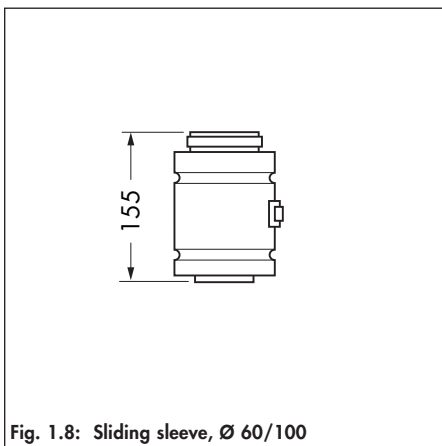


Fig. 1.8: Sliding sleeve, Ø 60/100

**Sliding sleeve (PP), Ø 60/100**

Vaillant Accy. No.: 303 915

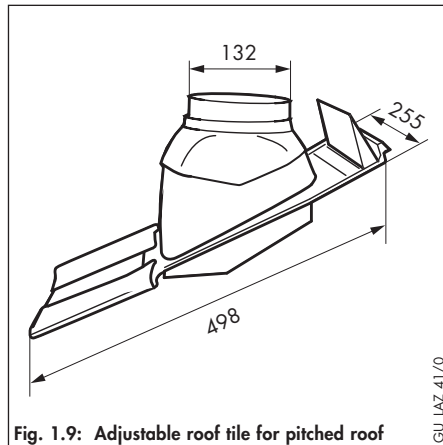


Fig. 1.9: Adjustable roof tile for pitched roof

**Adjustable roof tile for pitched roof**  
Vaillant Accy. No.: 009 076 (black)

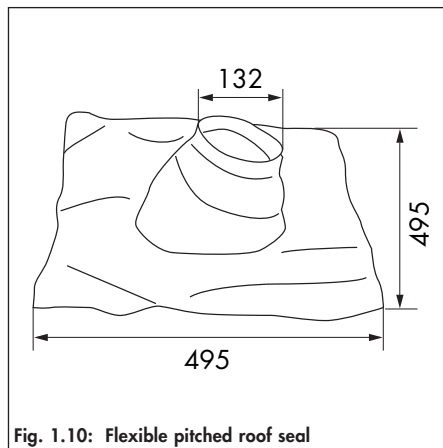


Fig. 1.10: Flexible pitched roof seal

**Flexible pitched roof seal (black)**  
Vaillant Accy. No.: 303 980

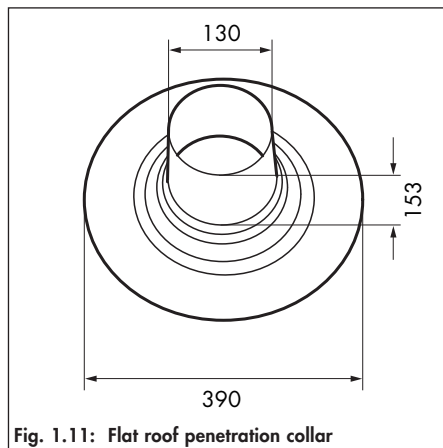


Fig. 1.11: Flat roof penetration collar

**Flat roof penetration collar**  
Vaillant Accy. No.: 009 056

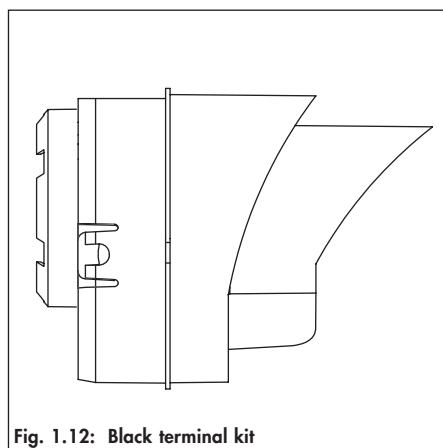


Fig. 1.12: Black terminal kit

**Black terminal kit for horizontal air/flue duct**  
Vaillant Accy. No.: 303 934  
For 303 933 and 303 936 only



## PLANNING THE AIR/FLUE DUCT LAYOUT

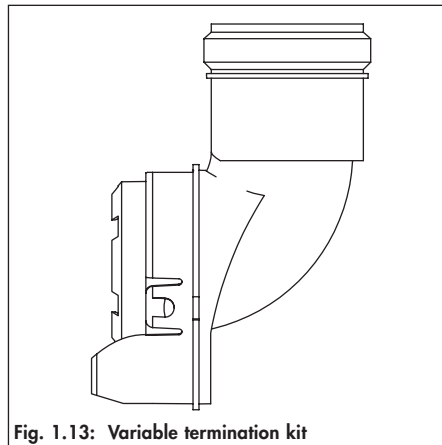


Fig. 1.13: Variable termination kit

### **Variable termination kit - black**

Vaillant Accy. No.: 303 942

For 303 933 and 303 936 only

### **Variable termination kit - white**

Vaillant Accy. No.: 303 946

For 303 933 and 303 936 only

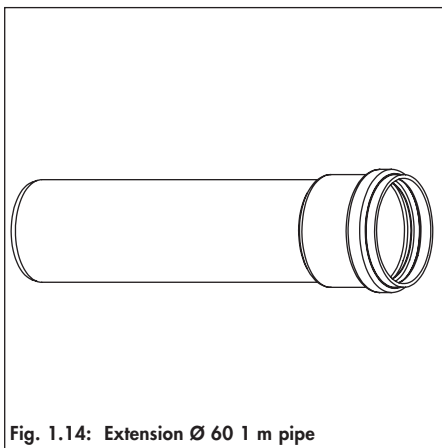


Fig. 1.14: Extension Ø 60 1 m pipe

### **Extension pipe for variable termination kit Ø 60 mm 1 m - black**

including 1 support clip

Vaillant Accy. No.: 303 943

### **Extension pipe for variable termination kit Ø 60 mm 1 m - white**

including 1 support clip

Vaillant Accy. No.: 303 947

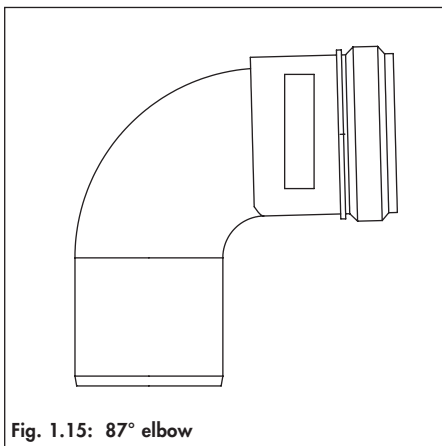


Fig. 1.15: 87° elbow

### **87° elbow for variable termination kit - black**

including 1 support clip

Vaillant Accy. No.: 303 944

### **87° elbow for variable termination kit - white**

including 1 support clip

Vaillant Accy. No.: 303 949

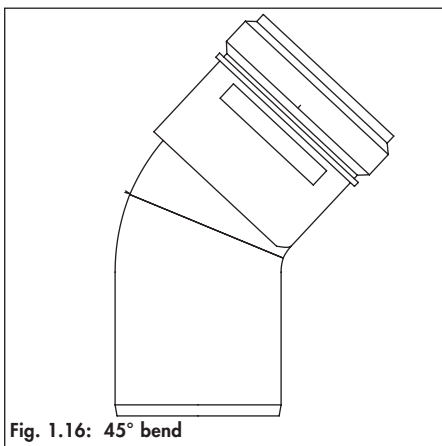


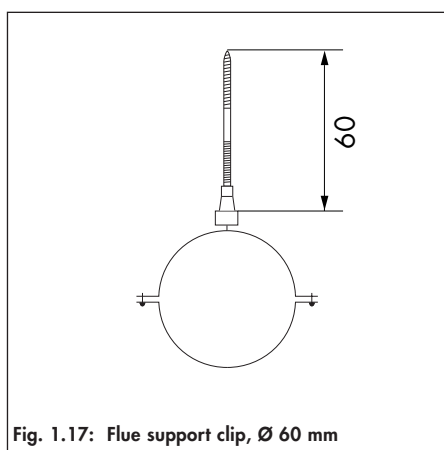
Fig. 1.16: 45° bend

### **45° bend for variable termination kit - black**

Vaillant Accy. No.: 303 945

### **45° bend for variable termination kit - white**

Vaillant Accy. No.: 303 948



**Flue support clip, Ø 60 mm**  
delivered with kits

**Fig. 1.17: Flue support clip, Ø 60 mm**

## Maximum flue lengths for use with ecoMAX

Accessories	Accy. No.		ecoMAX				
			613/2 E 618/2 E 622/2 E	824/2 E	828/2 E	635/ E 835/ E	pro 18 E pro 28 E
<b>Horizontal flue systems</b>	303 933	Max. permitted concentric flue length Fig. 1.17	8.0 m incl. 1 elbow 87°	7.0 m incl. 1 elbow 87°	8.0 m incl. 1 elbow 87°	4.0 m incl. 1 elbow 87°	10.0 m incl. 1 elbow 87°
			Maximum length of flue is reduced by 1.0 m for each additional 87° elbow				
			Maximum length of flue is reduced by 0.5 m for each additional 45° elbow				
<b>Variable termination kit</b>	303 942 303 946  only in combination with 303 933	Max. permitted concentric flue length Fig. 1.19	The maximum permitted concentric flue length given above is reduced as follows:  - Reduced by 0.5 m for the variable terminal - Reduced by 0.5 m for every 1 m VTK pipe - Reduced by 0.5 m for every 87° bend - Reduced by 0.5 m for 2 x 45° bend				
<b>Vertical flue systems</b>	303 900	Max. permitted concentric flue length Fig. 1.18	12.0 m	9.0 m	10.0 m	7.0 m	10.0 m
			Maximum length of flue is reduced by 1.0 m for each additional 87° elbow				
			Maximum length of flue is reduced by 0.5 m for each additional 45° elbow				



## PLANNING THE AIR/FLUE DUCT LAYOUT

### Maximum flue lengths for use with ecoTEC

Accessories	Accy. No.		ecoTEC					
			plus 612 plus 615 plus 618	plus 624 plus 824	plus 630 plus 831	plus 637 plus 837	pro 24 pro 28	plus 415 plus 418 plus 428 plus 438
<b>Horizontal flue systems</b>	303 933	Max. permitted concentric flue length Fig. 1.18	8.0 m incl. 1 elbow 87°	8.0 m incl. 1 elbow 87°	8.0 m incl. 1 elbow 87°	5.5 m incl. 1 elbow 87°	8.0 m incl. 1 elbow 87°	10.0 m incl. 1 elbow 87°
			Maximum length of flue is reduced by 1.0 m for each additional 87° elbow					
			Maximum length of flue is reduced by 0.5 m for each additional 45° elbow					
<b>Variable termination kit</b>	303 942 303 946  only in combina- tion with 303 933	Max. permitted concentric flue length Fig. 1.20	The maximum permitted concentric flue length given above is reduced as follows: <ul style="list-style-type: none"> <li>- Reduced by 0.5 m for the variable terminal</li> <li>- Reduced by 0.5 m for every 1 m VTK pipe</li> <li>- Reduced by 0.5 m for every 87° bend</li> <li>- Reduced by 0.5 m for 2 x 45° bend</li> </ul> The flue length outside shall not exceed 10 m.					
<b>Vertical flue systems</b>	303 900	Max. permitted concentric flue length Fig. 1.19	12.0 m	12.0 m	12.0 m	8.0 m	12.0 m	10.0 m
			Maximum length of flue is reduced by 1.0 m for each additional 87° elbow					
			Maximum length of flue is reduced by 0.5 m for each additional 45° elbow					



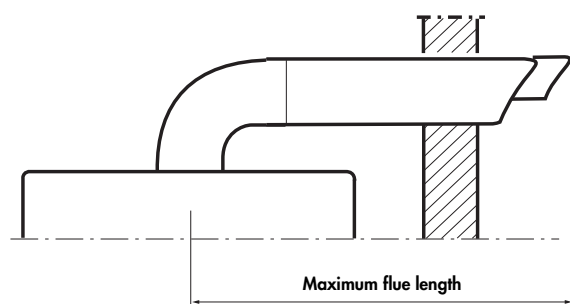


Fig. 1.18: Horizontal flue systems

LAS Euro B/S 074/0

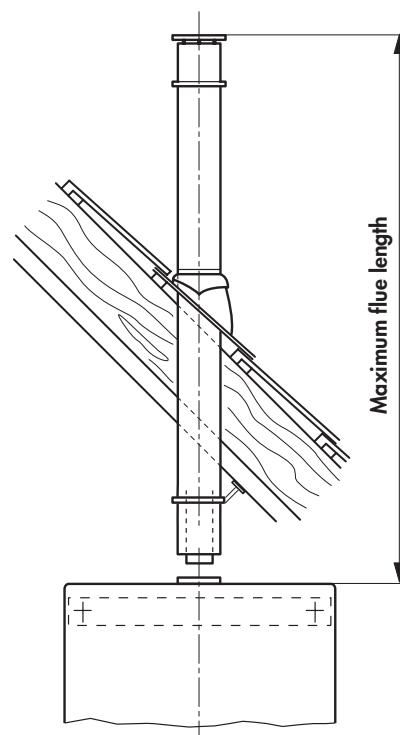


Fig. 1.19: Vertical flue systems

LAS Euro B/S 074/0

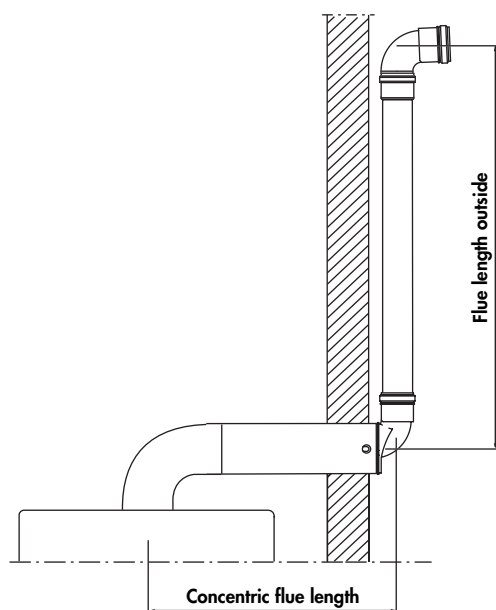
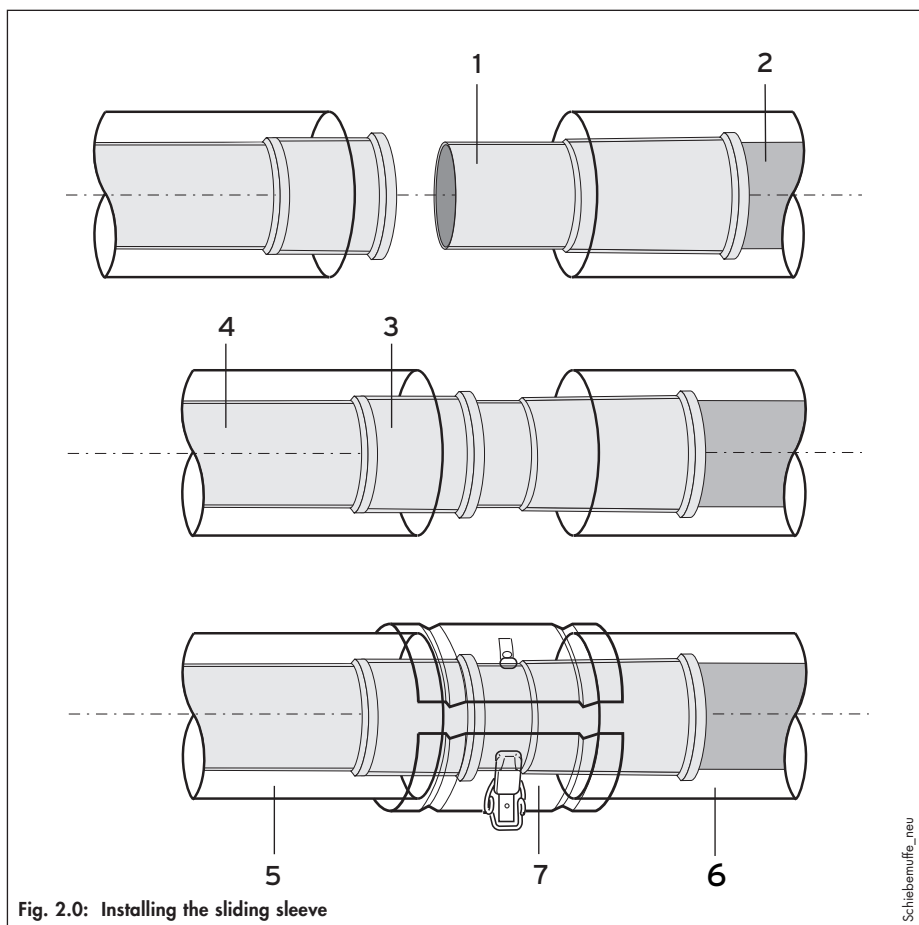


Fig. 1.20: Horizontal flue system installed with vertical termination kit



## INSTALLING THE AIR/FLUE DUCT SLIDING SLEEVE



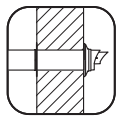
## INSTALLING THE AIR/FLUE DUCT SLIDING SLEEVE

### NOTE:

For installations where there is insufficient movement to allow fitting of the flue into flue outlet, a sliding sleeve (Accy. No. 303 915) is available. When using the sliding sleeve both the air and flue ducts of the last extension must be shortened by a further 95 mm.

- Push the sliding sleeve (1) over the cut end of the flue duct (2).
- Place the air duct clamp (7) over the air duct.
- Pull back the sliding sleeve so that it engages into the socket (3) of the boiler (4). Ensure that the sliding sleeve penetrates the socket such that there is at least 20 mm engagement at both ends of the sliding sleeve.
- Fit the air duct clamp over the air ducts (5 and 6) of the extension/terminal and boiler outlet. Close the snap clamp.
- Drill two holes 3 mm diameter through the air duct clamp (the centre of the holes should be 6 mm from the edge of the clamp). Ensure that the drill does not penetrate the inner flue duct. Screw the air duct clamp to the air duct of the sleeve using the screws provided.
- Complete the installation of the flue as detailed in these instructions.

# INSTALLATION OF THE HORIZONTAL AIR/FLUE DUCT



## IMPORTANT:

The air/flue duct is not concentric and the air duct has a slope of  $1.5^\circ$  (if the air flue duct is not cut). The hole through the wall can therefore be drilled horizontally with no slope.

Where extensions are used, these must be installed with a slope at  $3^\circ \pm 1^\circ$  (equivalent to  $50 \text{ mm} \pm 20 \text{ mm}$  rise per metre length) to ensure that condensate does not remain in the sleeve.

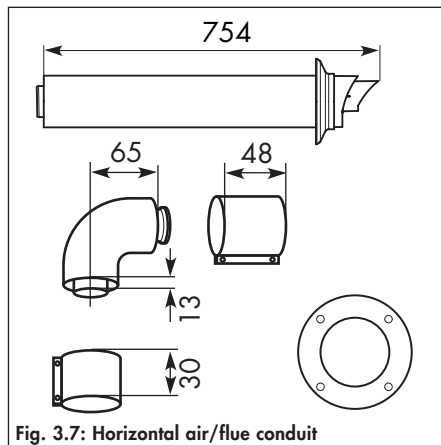


Fig. 3.7: Horizontal air/flue conduit

## Horizontal air/flue duct

Accy No.: 303 933

(Length 0.75 m)

Contents of the accessory:

- Horizontal air/flue duct
- $87^\circ$  elbow
- 1 x 48 mm air duct clamp
- 1 x 30 mm air duct clamp
- Internal trim ring  $\varnothing 100$
- External wall seal.

## Preparation

- Determine the installation site for the boiler with reference to the installation and servicing instructions supplied with the boiler.
- Ensure that all installation and service clearances are available and that the boiler flue can be installed as detailed in these instructions.
- Fix the paper template, supplied with the boiler, to the wall ensuring that the centreline of the template is vertical using a plumbline or spirit level.

## Top outlet flue exiting to rear

- For installations where the air/flue duct is to be installed directly to the rear of the boiler, the installation template details the position of the flue exit hole for horizontal top outlet installation.

## Top outlet flue exiting to side

- For installations where the air/flue duct is to be installed to the side, the position of the flue exit hole can be determined by carefully levelling across the wall from the centre line of the air/flue duct hole marked on the template (fig. 3.9).
- The position of the flue exit hole should allow the flue to be installed with a slight upward slope of about  $3^\circ \pm 1^\circ$  (equivalent to  $50 \text{ mm} \pm 20 \text{ mm}$  per metre of flue duct). Calculate the required rise according to the flue length and mark the position of the flue exit hole.

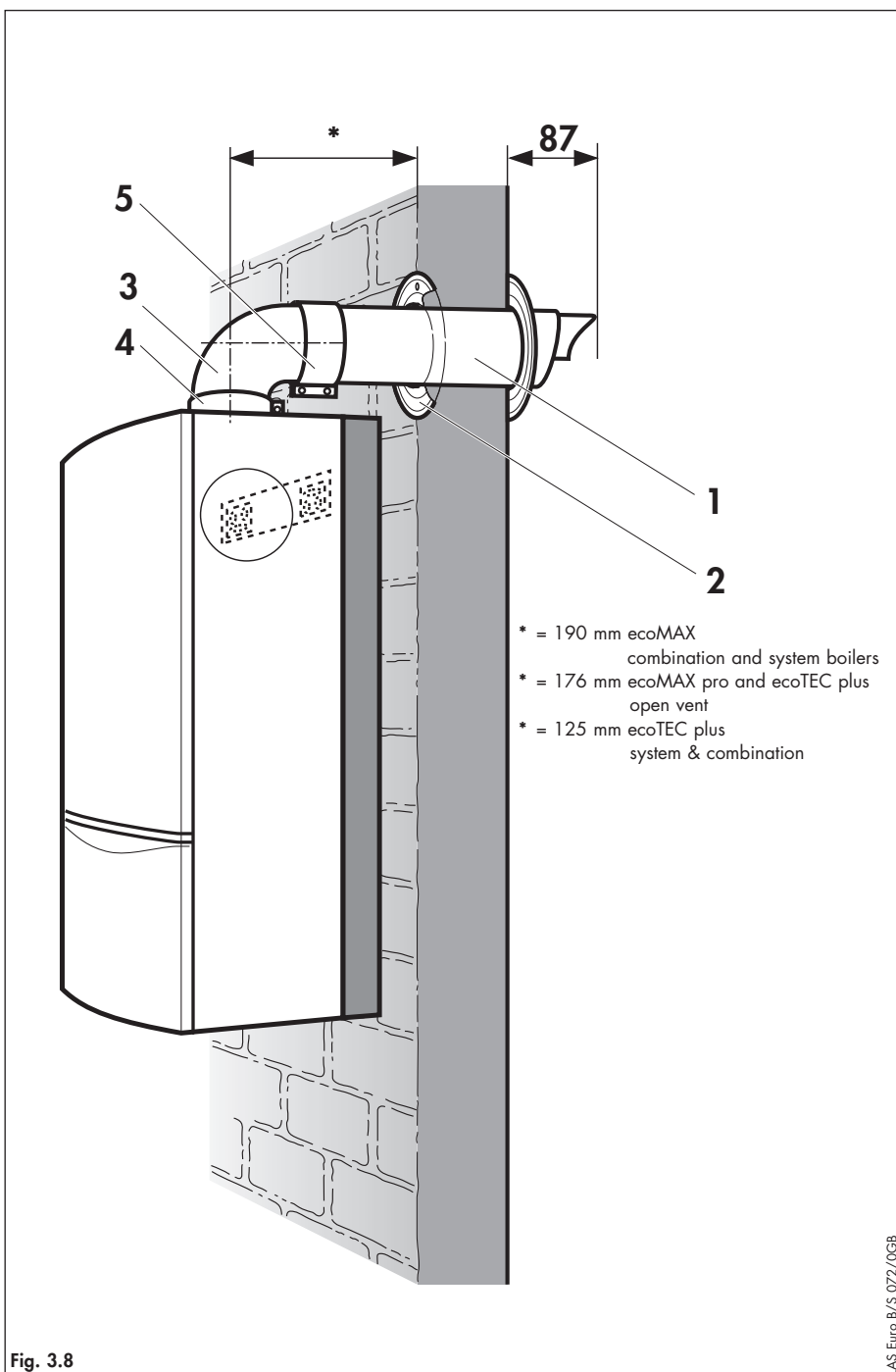
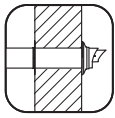
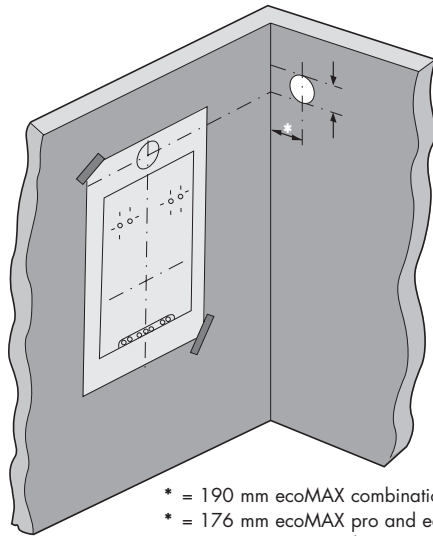


Fig. 3.8

LAS Euro B/S 072/0GB



## INSTALLATION OF THE HORIZONTAL AIR/FLUE DUCT (TOP OUTLET)

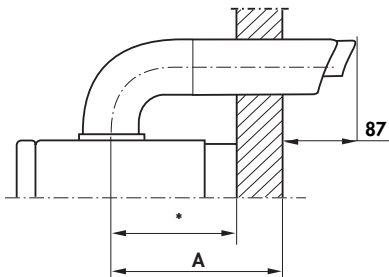


- \* = 190 mm ecoMAX combination and system boilers
- \* = 176 mm ecoMAX pro and ecoTEC plus open vent
- \* = 125 mm ecoTEC plus system & combination

Fig. 3.9

LAS Euro B/S 077/1

### Rear exit



- \* = 190 mm ecoMAX combination and system boilers
- \* = 176 mm ecoMAX pro and ecoTEC plus open vent
- \* = 125 mm ecoTEC plus system & combination

### Side exit

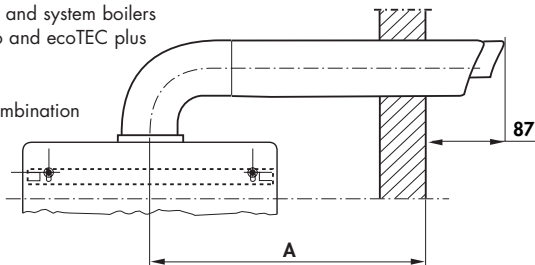


Fig. 3.10

LAS Euro B/S 078/0

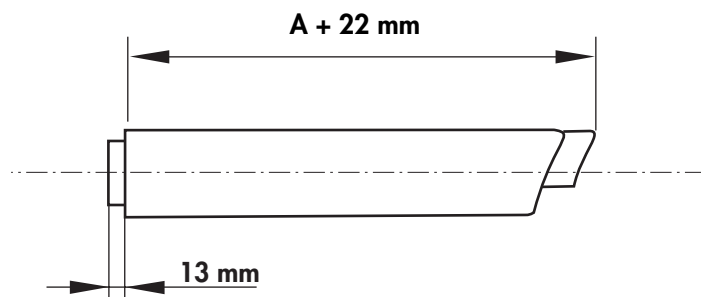


Fig. 3.11

LAS Euro B/S 076/0

- Once the position of the flue exit hole has been determined, the hole should be cut through the wall using a core drill of 125 mm diameter.

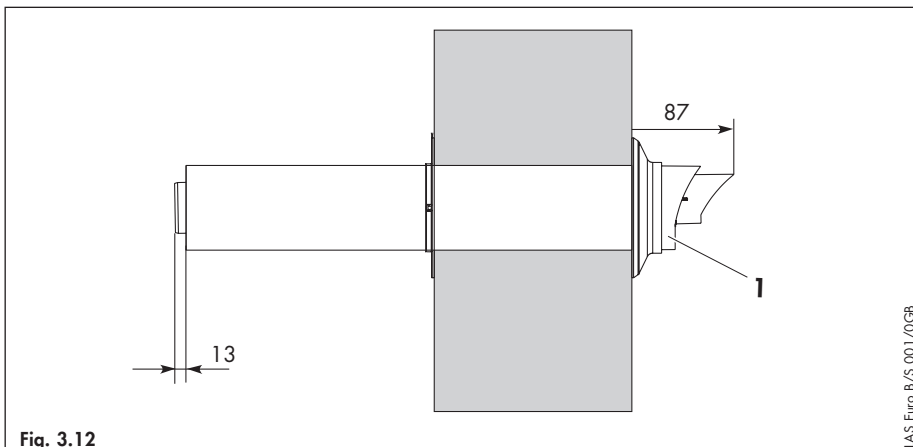
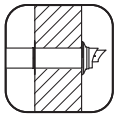
**Note:** If access can be gained to the proposed flue exit point from outside the dwelling, the hole can be cut with a 107 mm core drill and the flue external wall seal fitted from outside the dwelling.

- Measure the distance from the outside face of the wall to the centre of the fan outlet on the boiler (fig. 3.10).

**This is dimension A.**

- Cut the air duct and flue duct to the lengths shown in (fig. 3.11).
- All flue sockets should point towards the terminal.
- When cutting the air and flue ducts it is important to remove any burrs with a file, this ensures easy fitting of the ducts and prevents any rough edges from damaging the flue seals. Care should be taken not to scratch the white surface of the air duct.
- If the installation requires the use of air/flue duct extensions, additional bends or elbows refer to the sections on pages 31 - 35.
- Secure the air duct sections together by drilling a 3 mm diameter hole through the location hole in the end of the outer air duct. (Ensure that the drill does not pierce the inner flue duct). Secure the air ducts together using the screw provided.

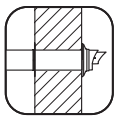
# INSTALLATION OF THE HORIZONTAL AIR/FLUE DUCT (TOP OUTLET)



- Push the air/flue duct assembly (1) including the flexible external seal through the wall until the seal clears the outside face of the wall and pull air/flue duct back towards the boiler until the external seal touches the outside wall (fig. 3.8 and fig 3.12).
- Ensure that the air/flue duct (1) is centred in the hole and the terminal is correctly positioned with the inlet grille at the bottom (fig 3.8 and fig 3.12).
- Slide the internal trim ring (2) over the air duct until it is flush with the wall (fig. 3.8).
- At this stage it is necessary to prepare and fit the boiler onto the hanging bracket – refer to the boiler installation instructions.
- Fit the elbow (3) to the boiler by inserting the spigot of the flue elbow into the flue socket on the boiler and secure using the 30 mm air duct clamp (4) provided (fig. 3.8).
- Pull the air/flue duct back through the wall such that the flue duct fully engages into the flue elbow socket.
- Fit the 48 mm air duct clamp (5) ensuring that it is positioned centrally (fig. 3.8).
- Drill two holes 3 mm Ø through the air duct of both the elbow/flue and elbow/boiler clamps at the most convenient holes on the air duct clamps. (Ensure that the drill does not penetrate the inner flue duct). Screw the clamps to the air ducts of the flue assembly, the elbow and boiler using the screws supplied.
- Slide the internal trim ring back to the wall, securing in position with a small amount of sealant if required.

## Caution!

If installed near a light, insects may fly into the opening. Tell the homeowner to clean the opening regularly.



## INSTALLATION OF THE TELESCOPIC HORIZONTAL AIR/FLUE DUCT

### IMPORTANT:

The air/flue duct is not concentric and the air duct has a slope of  $1.5^\circ$  (if the air flue duct is not cut). The hole through the wall can therefore be drilled horizontally with no slope.

Where extensions are used, these must be installed with a slope at  $3^\circ \pm 1^\circ$  (equivalent to  $50 \text{ mm} \pm 20 \text{ mm}$  rise per metre length) to ensure that condensate does not remain in the sleeve.

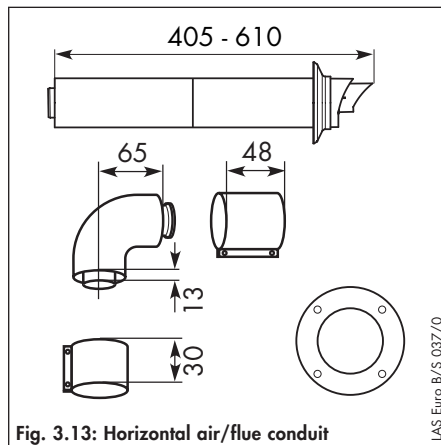


Fig. 3.13: Horizontal air/flue conduit

### Horizontal telescopic air/flue duct

Accy No.: 303 936

(Length 0.4 - 0.61 m)

Contents of the accessory:

- Horizontal telescopic air/flue duct
- $87^\circ$  elbow
- 1 x 48 mm air duct clamp
- 1 x 30 mm air duct clamp
- Internal trim ring  $\varnothing 100$
- External wall seal.

### Preparation

- Determine the installation site for the boiler with reference to the installation and servicing instructions supplied with the boiler.
- Ensure that all installation and service clearances are available and that the boiler flue can be installed as detailed in these instructions.
- Fix the paper template, supplied with the boiler, to the wall ensuring that the centreline of the template is vertical using a plumbline or spirit level.

### Top outlet flue exiting to rear

- For installations where the air/flue duct is to be installed directly to the rear of the boiler, the installation template details the position of the flue exit hole for horizontal top outlet installation.

### Top outlet flue exiting to side

- For installations where the air/flue duct is to be installed to the side, the position of the flue exit hole can be determined by carefully levelling across the wall from the centre line of the air/flue duct hole marked on the template (fig. 3.15).
- The position of the flue exit hole should allow the flue to be installed with a slight upward slope of about  $3^\circ \pm 1^\circ$  (equivalent to  $50 \text{ mm} \pm 20 \text{ mm}$  per metre of flue duct). Calculate the required rise according to the flue length and mark the position of the flue exit hole.

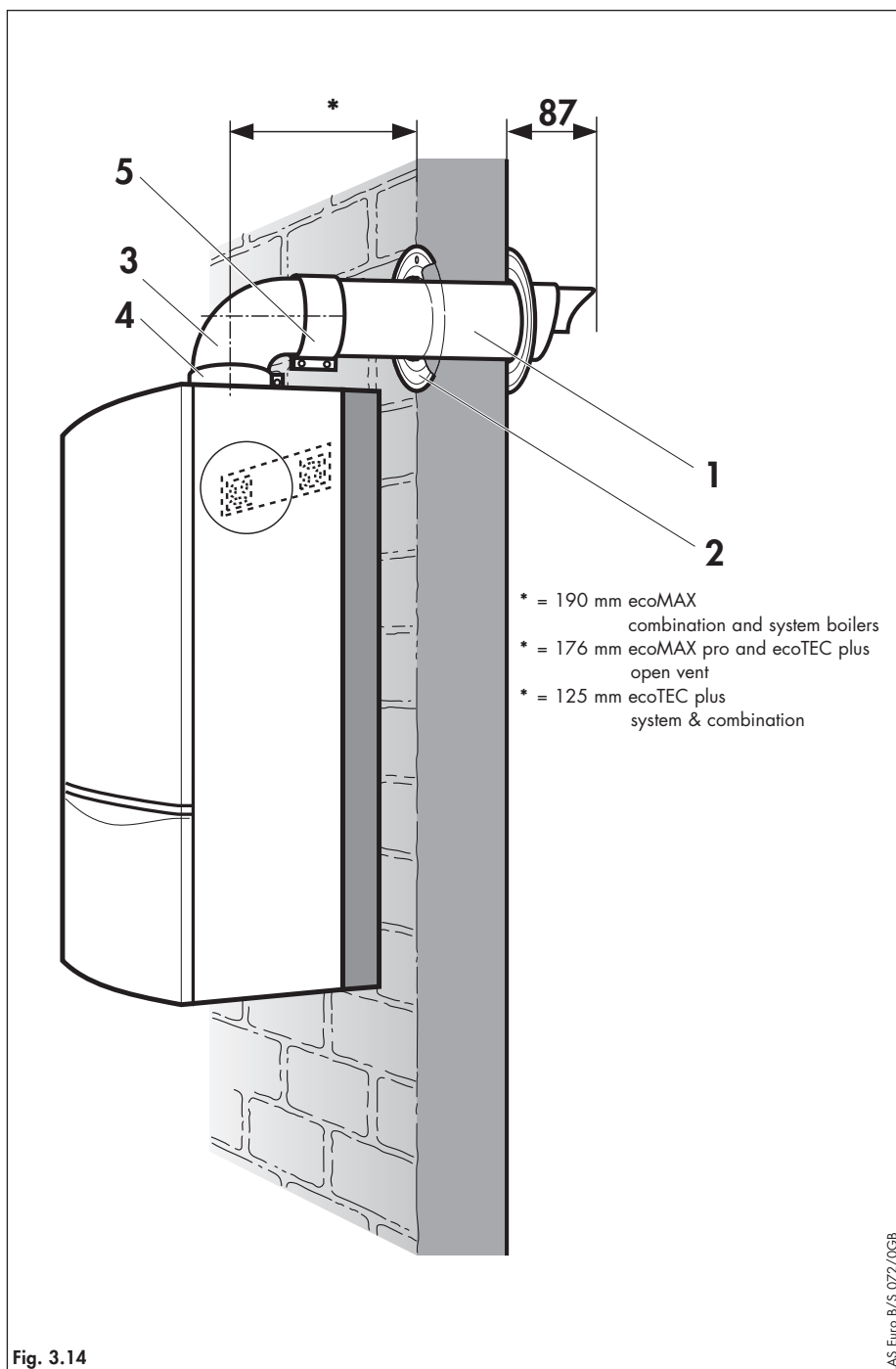


Fig. 3.14

# INSTALLATION OF THE TELESCOPIC HORIZONTAL AIR/FLUE DUCT (TOP OUTLET)

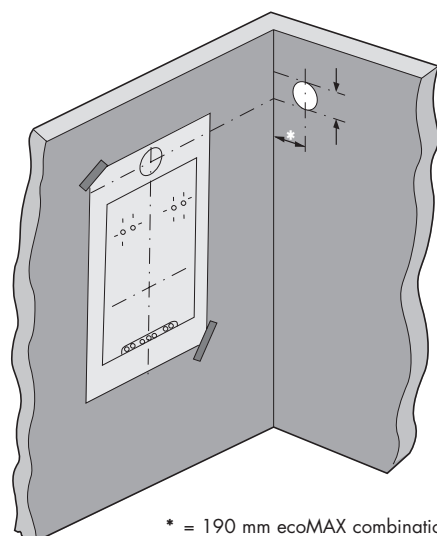
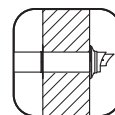


Fig. 3.15

- \* = 190 mm ecoMAX combination and system boilers
- \* = 176 mm ecoMAX pro and ecoTEC plus open vent
- \* = 125 mm ecoTEC plus system & combination

LAS Euro B/S 077/1

- Once the position of the flue exit hole has been determined, the hole should be cut through the wall using a core drill of 125 mm diameter.

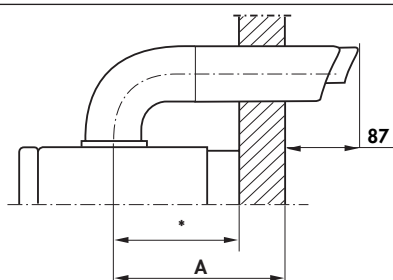
**Note:** If access can be gained to the proposed flue exit point from outside the dwelling, the hole can be cut with a 107 mm core drill and the flue external wall seal fitted from outside the dwelling.

- Measure the distance from the outside face of the wall to the centre of the fan outlet on the boiler (fig. 3.16).

**This is dimension A.**

- Adjust the air duct and flue duct to the lengths shown in (fig. 3.17).

## Rear exit



- \* = 190 mm ecoMAX combination and system boilers
- \* = 176 mm ecoMAX pro and ecoTEC plus open vent
- \* = 125 mm ecoTEC plus system & combination

## Side exit

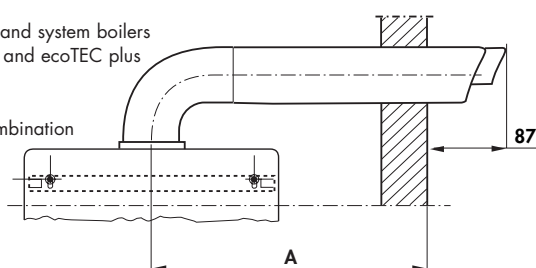


Fig. 3.16

LAS Euro B/S 078/0

- Secure the air duct sections together by drilling a 3 mm diameter hole through the location hole in the end of the outer air duct (1). (Ensure that the drill does not pierce the inner flue duct). Secure the air ducts together using the screw (1) provided. Place the adhesive tape (2) across the gap in the telescopic extensions. (fig. 3.17)
- All flue sockets should point towards the terminal.
- Care should be taken not to scratch the white surface of the air duct.
- If the installation requires the use of air/flue duct extensions, additional bends or elbows refer to the sections on pages 31 - 35.

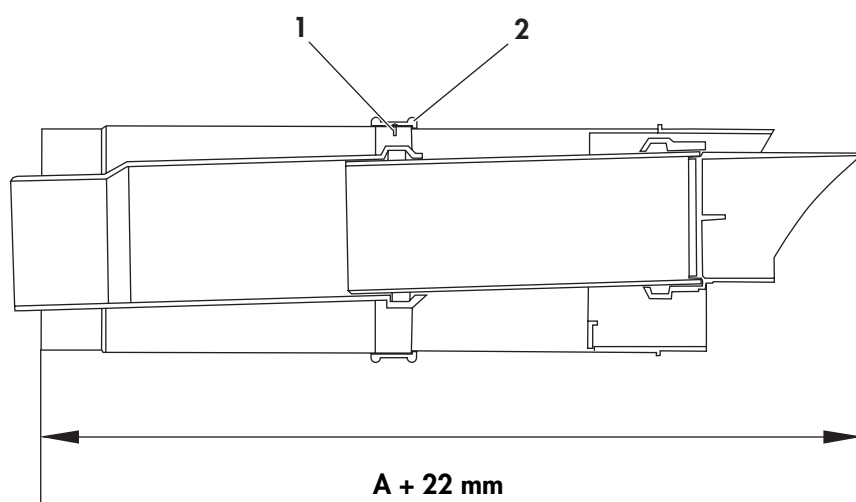
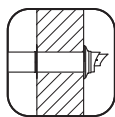
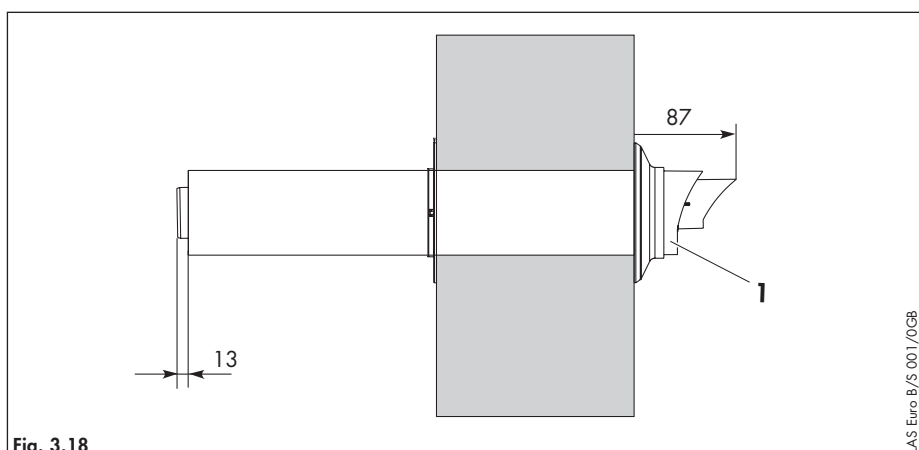


Fig. 3.17





## INSTALLATION OF THE TELESCOPIC HORIZONTAL AIR/FLUE DUCT (TOP OUTLET)



- Push the air/flue duct assembly (1) including the flexible external seal through the wall until the seal clears the outside face of the wall and pull air/flue duct back towards the boiler until the external seal touches the outside wall (fig. 3.14 and fig. 3.18).
- Ensure that the air/flue duct (1) is centred in the hole and the terminal is correctly positioned with the inlet grille at the bottom (fig. 3.14 and fig. 3.18).
- Slide the internal trim ring (2) over the air duct until it is flush with the wall (fig. 3.14).
- At this stage it is necessary to prepare and fit the boiler onto the hanging bracket – refer to the boiler installation instructions.
- Fit the elbow (3) to the boiler by inserting the spigot of the flue elbow into the flue socket on the boiler and secure using the 30 mm air duct clamp (4) provided (fig. 3.14).
- Pull the air/flue duct back through the wall such that the flue duct fully engages into the flue elbow socket.
- Fit the 48 mm air duct clamp (5) ensuring that it is positioned centrally (fig. 3.14).
- Drill two holes 3 mm Ø through the air duct of both the elbow/flue and elbow/boiler clamps at the most convenient holes on the air duct clamps. (Ensure that the drill does not penetrate the inner flue duct). Screw the clamps to the air ducts of the flue assembly, the elbow and boiler using the screws supplied.
- Slide the internal trim ring back to the wall, securing in position with a small amount of sealant if required.

### Caution!

If installed near a light, insects may fly into the opening. Tell the homeowner to clean the opening regularly.

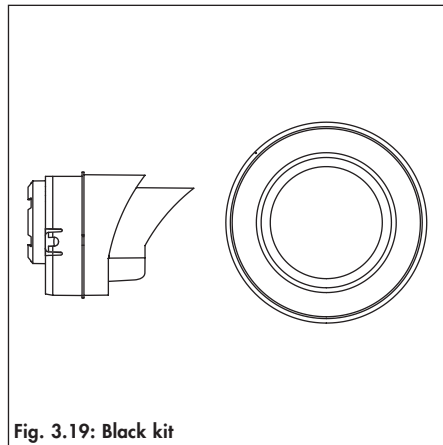
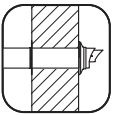


Fig. 3.19: Black kit

## Black terminal kit

Accy. No.: 303 934

Contents of the accessory:

- Black terminal
- External wall seal

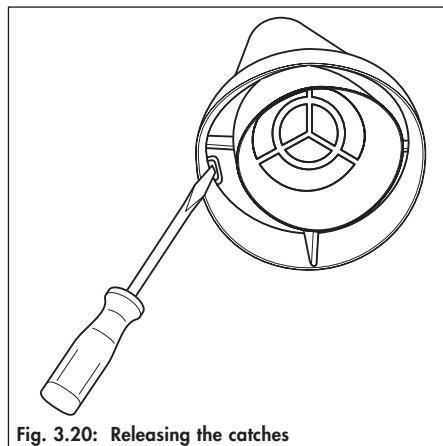


Fig. 3.20: Releasing the catches

## Assembly

### Before installing the flue duct

- Use an 8 mm screwdriver to bend the catches inwards (fig. 3.20).
- Pull the terminal together with the flue duct out of the air duct (fig. 3.21).
- Unlock the catch between the terminal and the flue duct by twisting them against each other (fig. 3.22).
- Pull the terminal off the flue duct.
- Push the new terminal into the flue duct and click to lock.

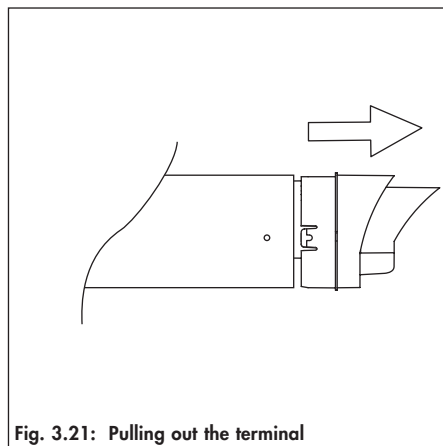


Fig. 3.21: Pulling out the terminal

⚠ Please note: The catch on the top of the terminal must lock firmly into the notch in the flue duct (fig. 3.23).

⚠ Please note: Make sure the seal fits tightly.

- Push the flue duct and the terminal back into the air duct and lock the two catches (fig. 3.24).

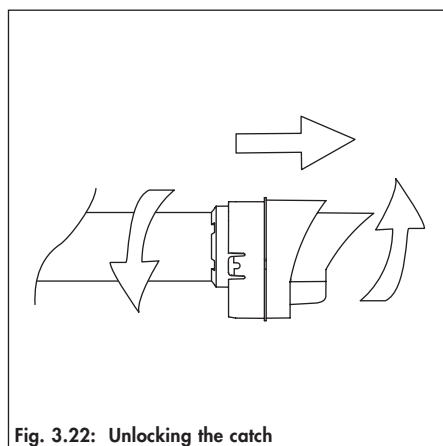
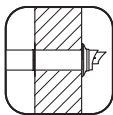


Fig. 3.22: Unlocking the catch

## Caution!

The seam of the air duct must be at the top.

- Fit the horizontal air/flue duct as described on pages 15 and 18.



## INSTALLATION OF THE BLACK TERMINAL KIT

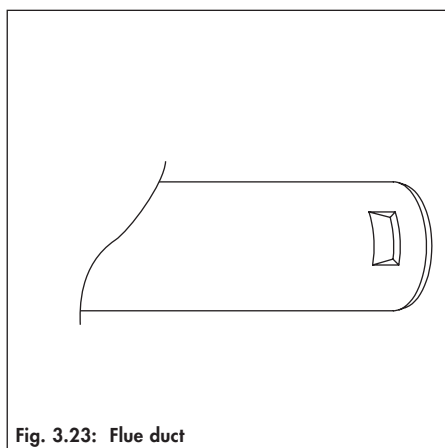


Fig. 3.23: Flue duct

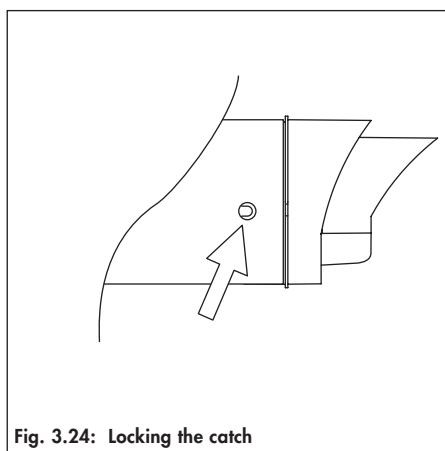


Fig. 3.24: Locking the catch

### Assembly

#### After installing the flue duct

##### **Danger!**

Before starting work, shut down the appliance and prevent it from being switched on unintentionally.

- Remove the wall seal from the terminal.
- Use an 8 mm screwdriver to bend the catches inwards (fig. 3.20).
- Pull the terminal together with the flue duct out of the air duct (fig. 3.21).

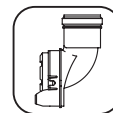
##### **Caution!**

Do not twist the flue duct, because this might detach the following flue duct behind the terminal from the spacer.

- Unlock the catch between the terminal and the flue duct by twisting them against each other (fig. 3.22).
  - Pull the terminal off the flue duct.
  - Push the new terminal into the flue duct and click to lock.
- ☞ Please note: The catch on the top of the terminal must lock firmly into the notch in the flue duct (fig. 3.23).
- ☞ Please note: Make sure the seal fits tightly.
- Push the flue duct with the terminal back in the air duct. Carefully push the flue duct back into the sleeve of the pipe or bend behind it. Lock the two catches (fig. 3.24).
  - Fit the wall seal.

##### **Danger!**

Before starting up the appliance, check that the entire flue pipe is firmly seated and sealed.



## Important:

The flue outlet of the variable termination must face directly upwards.

## Flue Terminal Clearances

Minimum flue terminal clearances are defined in BS5440, and these must apply unless the boiler manufacturer has received approval to quote smaller clearances that are not safety critical. Vaillant have reduced flue terminal clearances approved and these are given in the boiler installation instructions. These are the minimum clearances that must apply to all installations, except when a Variable Termination Kit (VTK) is fitted.

When a VTK is fitted to the horizontal flue, the terminal clearances for the air inlet are reduced. The terminal clearances for the 'new' flue outlet at the end of the VTK do not change.

The minimum terminal clearances A, B & C for the air inlet of the VTK are reduced to 50 mm from an opening such as a window, and 25mm from an opening such as an airbrick. This means that the terminal on the horizontal flue becomes the air inlet when a VTK is fitted, and hence can be located less than 300mm from an opening window or airbrick.

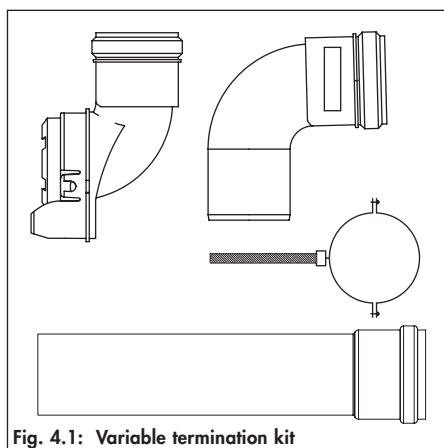


Fig. 4.1: Variable termination kit

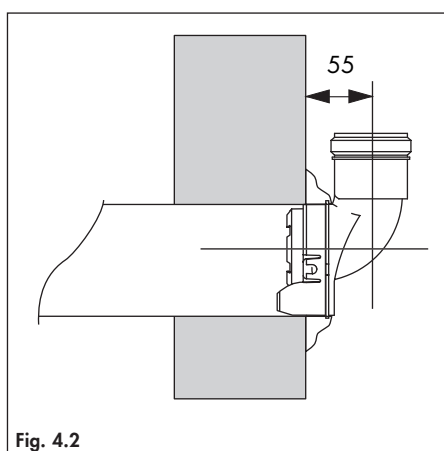


Fig. 4.2

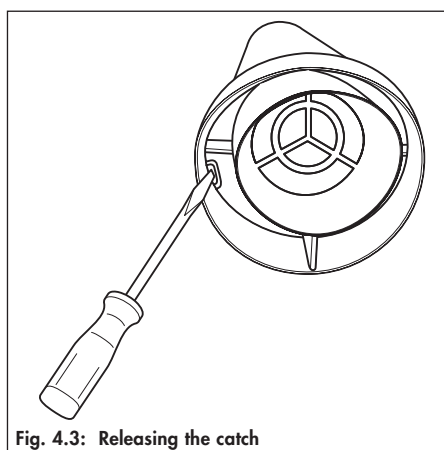


Fig. 4.3: Releasing the catch

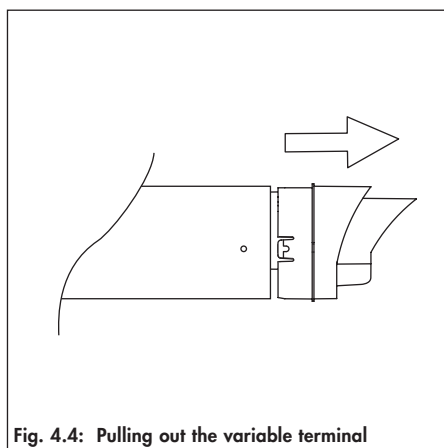


Fig. 4.4: Pulling out the variable terminal

## Variable termination kit

Accy. No.:

303 942 (black)

303 946 (white)

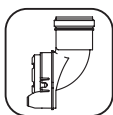
Contents of the kit:

- Variable terminal
- 2 x 1 m pipe
- 3 x pipe support clips
- 87° bend with bird protection grille

## Assembly

### Before installing the flue pipe

- Use an 8 mm screwdriver to bend the catches inwards (fig. 4.3).
- Pull the terminal with the flue duct out of the air duct (fig. 4.4).



## INSTALLATION OF THE VARIABLE TERMINATION KIT

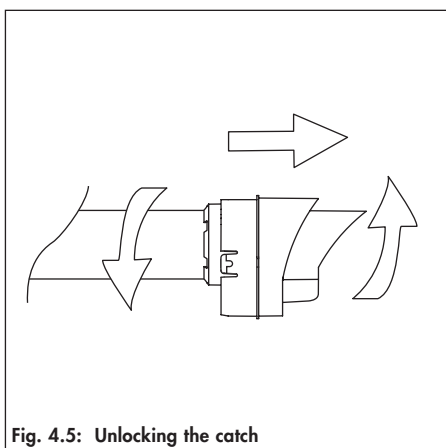


Fig. 4.5: Unlocking the catch

- Unlock the catch between the terminal and the flue duct by twisting them against each other (fig. 4.5).
  - Pull the terminal out of the flue duct.
  - Push the variable terminal onto the flue duct.
- ⓘ Please note: The catch on the top of the variable terminal must lock firmly into the notch in the flue duct (fig. 4.6).

### Caution!

Make sure the seal fits tightly.

- Push the flue duct and the variable terminal back into the air duct and lock the two catches (fig. 4.7).
- ⓘ Please note: The seam of the air duct must be at the top.
- Fit the horizontal air/flue duct as described on pages 15 and 18.

### Caution!

It cannot be fitted from inside.

- Fit the rest of the variable termination kit as described on page 25.

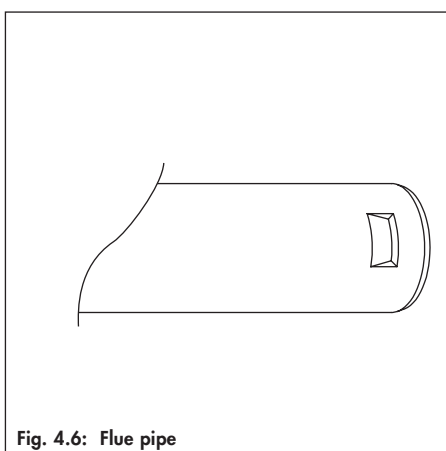


Fig. 4.6: Flue pipe

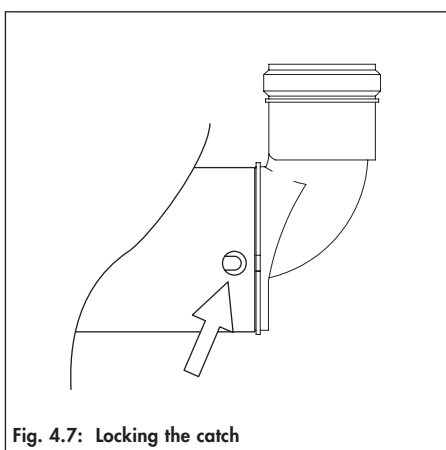


Fig. 4.7: Locking the catch

## Assembly

### After installing the flue duct

#### Danger!

Before starting work, shut down the appliance and prevent it from being switched on unintentionally.

- Remove the wall seal from the terminal.
- Use an 8 mm screwdriver to bend the catches inwards (fig. 4.3).
- Pull the terminal with the flue duct out of the air duct (fig. 4.4).

#### Caution!

Do not twist the flue duct, because this might detach the following flue duct behind the terminal from the spacer.

- Unlock the catch between the terminal and the flue duct by twisting them against each other (fig. 4.5).
  - Pull the terminal out of the flue duct.
  - Push the new variable terminal onto the flue duct.
- ⓘ Please note: The catch on the top of the variable terminal must lock firmly into the notch in the flue duct (fig. 4.6).
- ⓘ Please note: Make sure the seal fits tightly.
- Push the flue duct with the variable terminal back in the air duct. Carefully push the flue duct back into the sleeve of the duct or bend behind it. Lock the two catches (fig. 4.7).
  - Fit the wall seal on the variable terminal.
  - Fit the rest of the VTK as described on page 25.

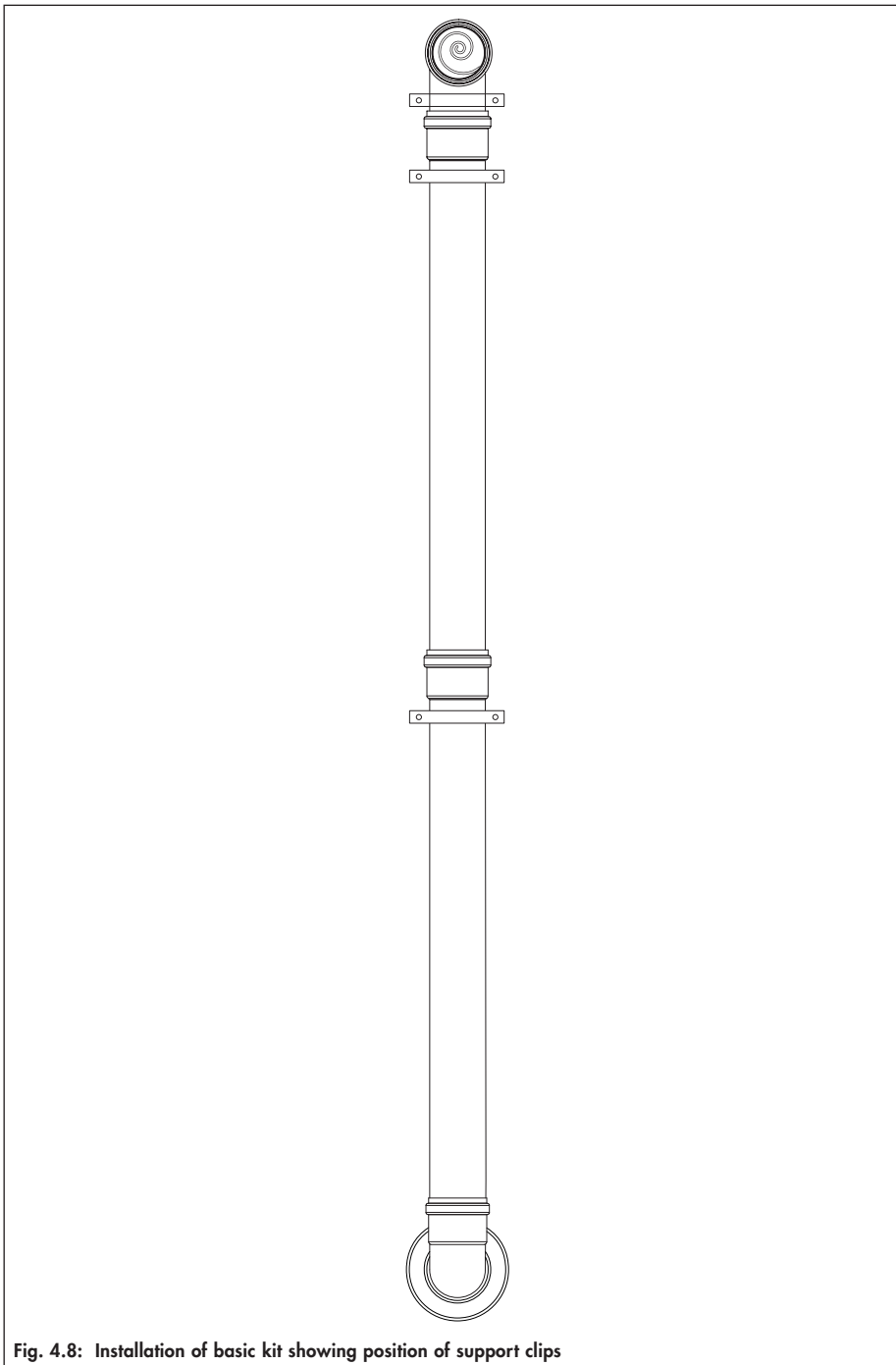


Fig. 4.8: Installation of basic kit showing position of support clips

- Fit the pipes and bends, working from the variable terminal to the selected location for the flue exit using support clips supplied fig 4.8, 4.9, 4.10 or 4.11.

### Caution!

Pipe extensions must be fixed to the wall using pipe clamps. Use one clamp for each extension directly beside the sleeve. Fit another clamp to the extension after each 87° bend (fig. 4.9).

### Caution!

The extension pipe expands when heated. Leave 1 cm expansion space in each sleeve.

- ☞ Please note: The maximum flue lengths where the variable termination kit is installed are shown in the tables on pages 11 and 12.
- ☞ Please note: The parts are simply pushed together (not bolted).

### Caution!

Fasten the 87° bend with bird protection grille using a separate pipe clamp (fig. 4.9).

### Caution!

If installed near a light, insects may fly into the opening. Tell the homeowner to clean the opening regularly.

### Danger!

Before starting up the appliance, check that the entire flue pipe is firmly seated and sealed.

### Caution!

During annual maintenance, check the flue system for

- visible defects, such as embrittlement or damage
- tight connection of the pipes
- dirt in the air intake and flue exits due to leaves, insects etc.

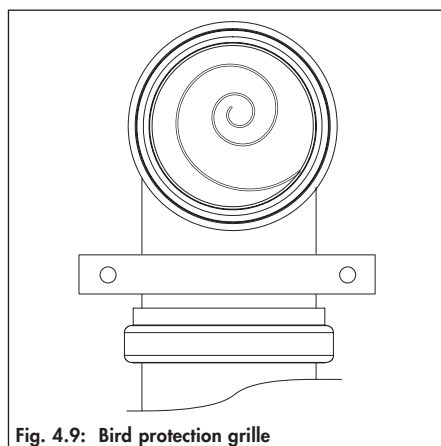


Fig. 4.9: Bird protection grille



## INSTALLATION OF THE VARIABLE TERMINATION KIT

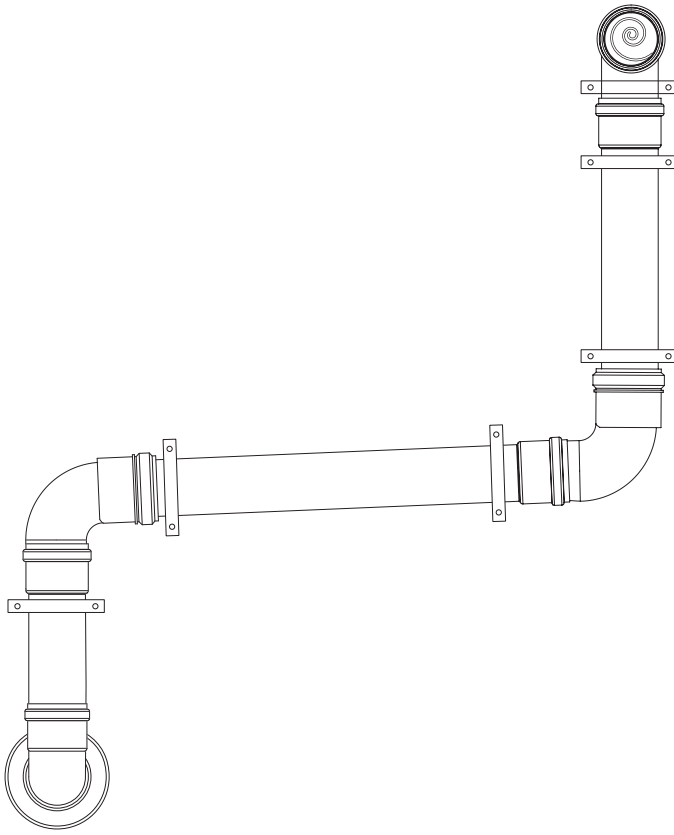


Fig. 4.10: Installation of basic kit with two additional 87° bends showing position of support clips

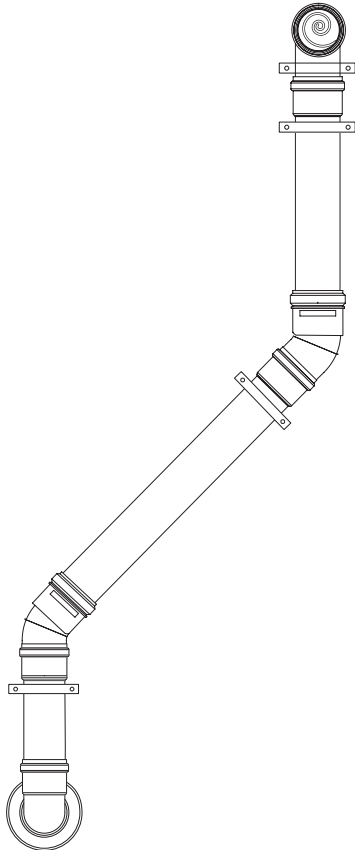


Fig. 4.11: Installation of basic kit with two additional 45° bends showing position of support clips



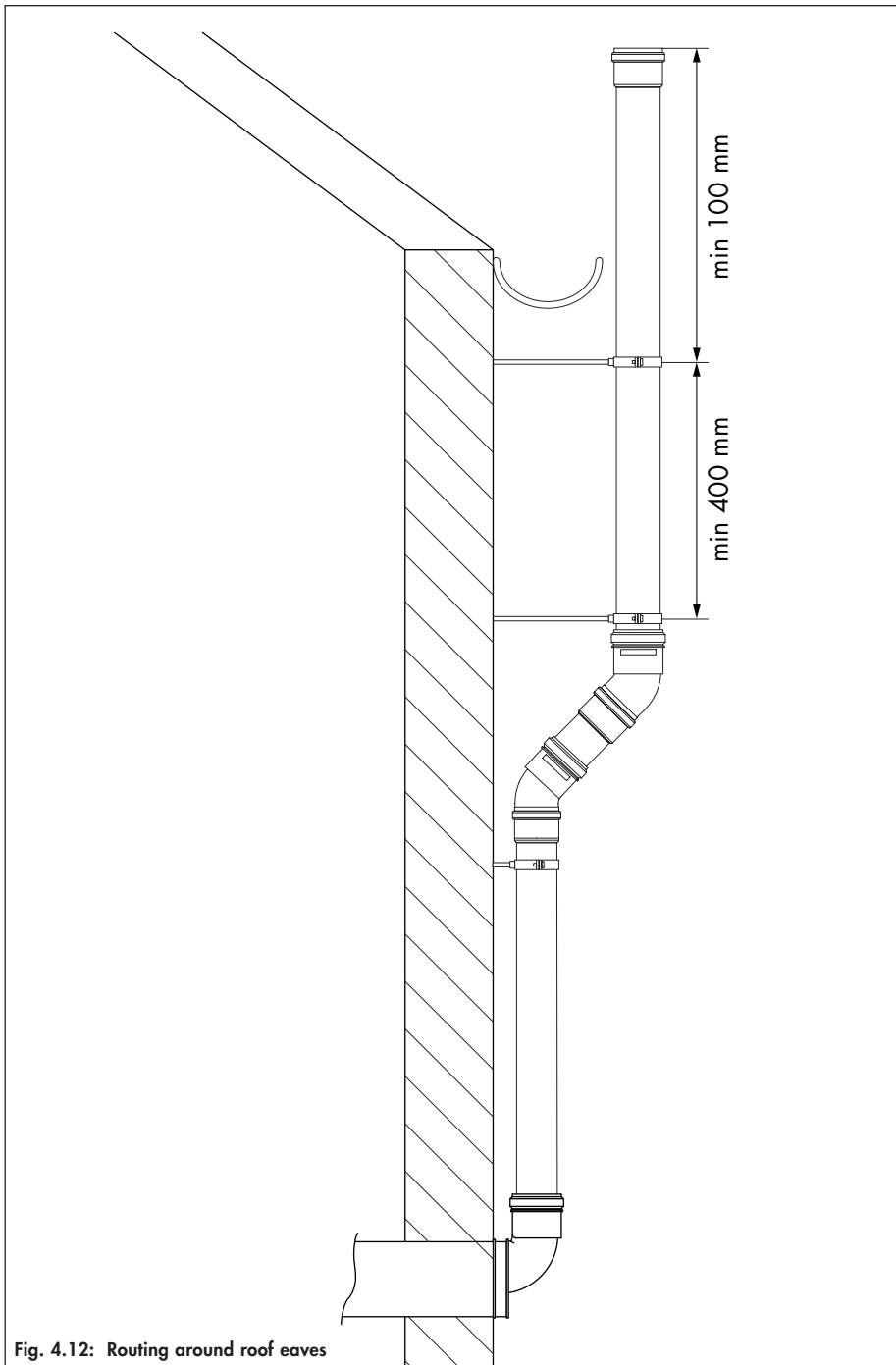
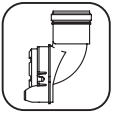
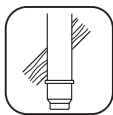


Fig. 4.12: Routing around roof eaves

## Routing around roof eaves

When routing the variable termination kit around the roof eaves, additional lengths of M8 threaded bar will be required for the support brackets. Threaded bar can be purchased from most local merchants.

- Change the bird protection grille from the 87° elbow to the extension installed at the end.
- If using the 87° elbow, use the seal from the pipe extension.
- The final pipe extension must be fixed to the wall using two support clips with a minimum distance of 400 mm.
- Additional 45° bends may be required.



## INSTALLATION OF THE VERTICAL AIR/FLUE DUCT

ⓘ Observe the maximum flue lengths as detailed in table on page 11.

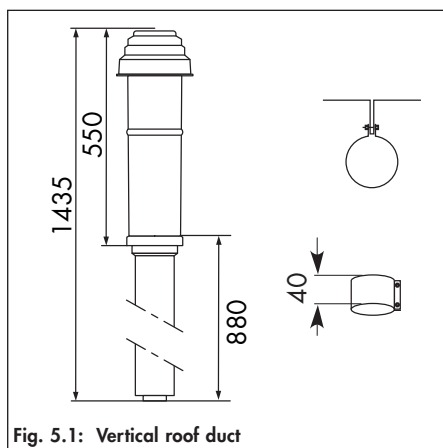


Fig. 5.1: Vertical roof duct

### Vertical air/flue duct

Accy. No.: 303 900 (black)

Contents of the accessory:

- Vertical air/flue duct and terminal assembly
- 40 mm air duct clamp
- Fixing bracket

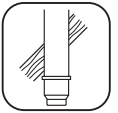
ⓘ See page 6 et seq. for details of air/flue duct elements.

The air/flue duct assembly may be connected directly to the flue outlet on top of the boiler.

In addition to the vertical air/flue duct and terminal accessory, air/flue duct extensions can be added to increase the length of the flue.

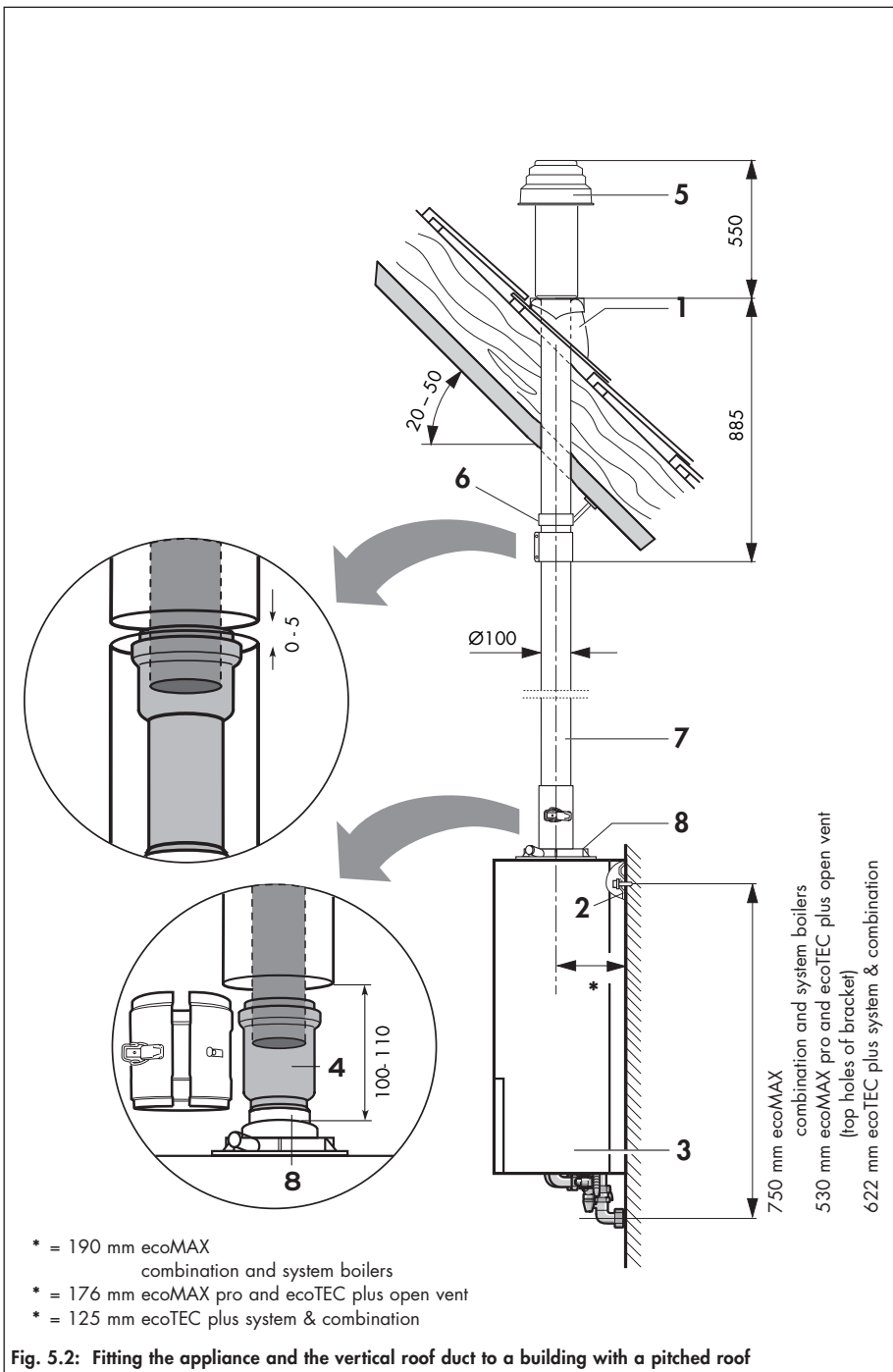
### Preparation

- Determine the installation site for the boiler with reference to the installation and servicing instructions supplied with the boiler.
  - Ensure that all installation and service clearances are available and that the boiler flue can be installed as detailed in these instructions.
  - Determine the point where the vertical air/flue duct and terminal assembly will penetrate the roof.
- ⓘ Please note: The vertical air/flue duct and terminal accessory (Accy. No. 303 900) may be shortened. The outer 'white' duct should be shortened first, then the inner flue duct cut so that it protrudes 13 mm out of the air duct. In case of installation directly to the boiler without elbows or bends, it is essential that the roof tile/collar is vertically aligned with the air/flue duct of the boiler.
- ⓘ Please note: If a 87° elbow is connected directly to the boiler, use the 40 mm air duct clamp supplied with the vertical air flue duct at this position.



## Pitched roof installation

- Determine the point where the vertical air/flue duct and terminal assembly will penetrate the roof.
  - Fit the flexible pitched roof (Accy. No. 303 980) tile (1).
  - Working from above, insert the vertical roof duct (5) through the roofing tile and push it firmly into place.
  - Vertically align the roof duct and attach it to the roof structure with the fixing bracket (6) supplied.
  - Fit the boiler hanging bracket (2).
  - Install the appliance (3) with reference to the installation and servicing instructions supplied with the boiler.
- See pages 33 et seq. for further details on the installation of extensions and elbows.**
- Push the sliding sleeve (4) firmly into place on the extension.
  - Join the vertical roof duct (5) to the extension (7).
  - Join the sliding sleeve (4) to the appliance's connection piece (8).
- Using the sliding sleeve allows the appliance to be easily removed and replaced without dismantling the flue.**
- Drill two holes 3 mm Ø through the air duct of the flue/boiler clamp at the most convenient holes on the air duct clamp. (Ensure that the drill does not penetrate the inner flue duct). Screw the clamp to the air ducts of the flue assembly and the boiler using the screws supplied.
  - Ensure that any air duct clamps used are positioned centrally and fixed to the air duct using the self tapping screws supplied.
  - **Note:** The air/duct clamp must not be screwed to the bottom of the vertical air/flue duct and terminal accessory to allow for any slight movement in the roof structure.
  - Ensure that at least one pipe clamp supports the air/flue duct at each extension fitted.





## INSTALLATION OF THE VERTICAL AIR/FLUE DUCT

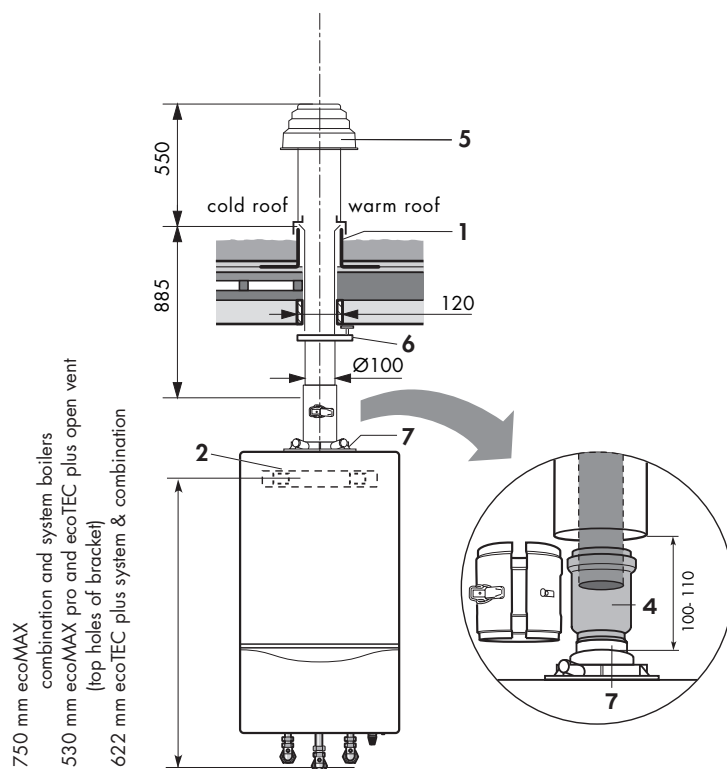


Fig. 5.3: Fitting the appliance and vertical flue duct to a building with a flat roof

### Flat-roof installation

- Determine the point where the vertical air/flue duct and terminal assembly will penetrate the roof.
  - Fit the flat roof penetration collar (1).
  - Stick the flat roof penetration collar firmly into place with adhesive in accordance with the codes of practice for flat roofs (CP 144) to ensure a watertight seal.
  - Working from above, insert the vertical roof duct (5) through the flat roof collar and push it firmly into place.
  - Vertically align the roof duct and attach it to the roof structure with the fixing bracket (6) supplied.
  - Fit the boiler hanging bracket (2).
  - Install the appliance (3) with reference to the installation and servicing instructions supplied with the boiler.
- See pages 31 et seq. for further details on the installation of extensions and elbows.
- Push the sliding sleeve (4) firmly into place on the extension.
  - Join the vertical roof duct (5) to the extension (7).
  - Join the sliding sleeve (4) to the appliance's connection piece (8). This permits easy separation between the air/flue duct and the appliance.
  - Drill two holes 3 mm Ø through the air duct of the flue/boiler clamp at the most convenient holes on the air duct clamp. (Ensure that the drill does not penetrate the inner flue duct). Screw the clamp to the air ducts of the flue assembly and the boiler using the screws supplied.
  - Ensure that any air duct clamps used are positioned centrally and fixed to the air duct using the self tapping screws supplied.
  - **Note:** The air/duct clamp must not be screwed to the bottom of the vertical air/flue duct and terminal accessory to allow for any slight movement in the roof structure.
  - Ensure that at least one pipe clamp supports the air/flue duct at each extension fitted.



## How to add extensions

Use a saw, tin-snips, etc. to cut tubes to size.

- ✎ No tools are required when separating extensions for cutting to size air and flue tubes separately. When doing so, the flue conduit should be twisted into a position where the shoulders on the plastic tube can be pushed through the spacer-piece. After cutting to size, refit the flue conduit and secure it to the air conduit.

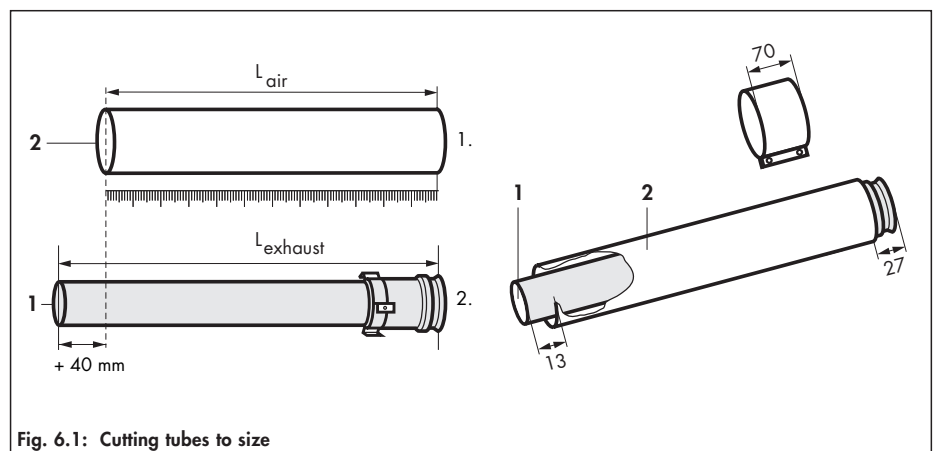


Fig. 6.1: Cutting tubes to size

### Tip:

Start by measuring the required length of air conduit\* ( $L_{air}$ ), and then calculate the corresponding length of flue conduit ( $L_{exhaust}$ ) as follows:

$$L_{exhaust} = L_{air} + 40 \text{ mm}$$

$$L_{exhaust} = \text{length of flue conduit}$$

$$L_{air} = \text{length of air conduit}$$

\* Minimum length of air-conduit extension: 80 mm.

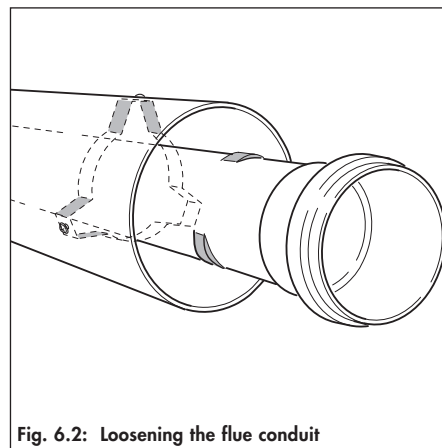


Fig. 6.2: Loosening the flue conduit

### Important:

You must fasten extensions to the ceiling or wall using pipe clamps. Use one clamp for each extension.

### Important:

Where extensions are used, these must be installed with a slope of  $3^\circ \pm 1^\circ$  to ensure that condensate does not remain in the sleeve (equivalent to  $50 \text{ mm} \pm 20 \text{ mm}$  rise per metre length).

- ✎ The seals are sensitive to mineral oil-based grease products. For this reason, the seals must not be greased. If the seals need wetting to aid in installation, use water only.
- ✎ De-burr and file down any rough edges on the tubes before fitting in order to prevent damage to the seals. Remove all metal filings and other debris.
- ✎ Do not use damaged or dented tubes, as they will not form an adequate seal.
- ✎ Ensure that the seals remain correctly aligned when installing the tubes. Do not fit damaged seals.
- ✎ Secure the exhaust conduit with the fixing device in order to ensure that it is correctly centred relative to the air conduit.



## FITTING AIR/FLUE DUCT EXTENSIONS

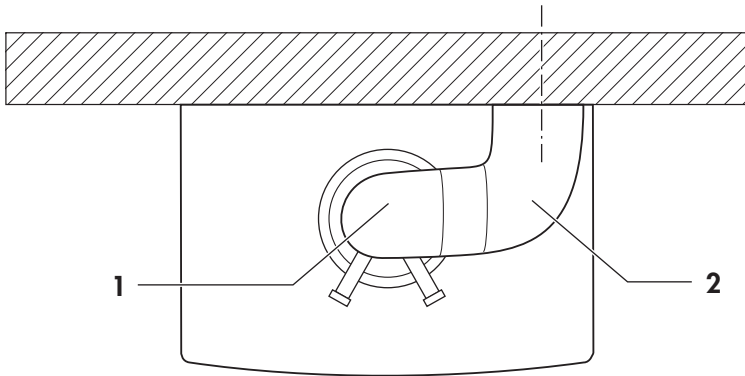


Fig. 6.1: Arrangement of 2 x 87° elbows – View from above

### How to install 2x 87° elbows

- When using 2 x 87° elbows follow fig. 6.1 to fig. 6.3 to avoid obstructions on outer wall.

**Note:** The elbows must be correctly aligned to avoid undue stress on the joints and risk of leakage.

The elbow fitted to the top of the boiler (1) should be twisted by 3° to ensure that the second 87° elbow (2) exits the wall perpendicular.

- When using elbows for long flue runs in a corner follow fig. 6.4 and fig. 6.5 to avoid obstructions.

**Note:** The elbows must be correctly aligned to avoid undue stress on the joints and risk of leakage.

The elbow fitted to the top of the boiler (1) should be twisted by 3° to ensure that the second 87° elbow (2) exits the wall perpendicular.

When using 87° elbow install with a slope of 3° between wall and air-flue pipe (fig. 6.4) or use 2 x 45° elbows (fig. 6.5).

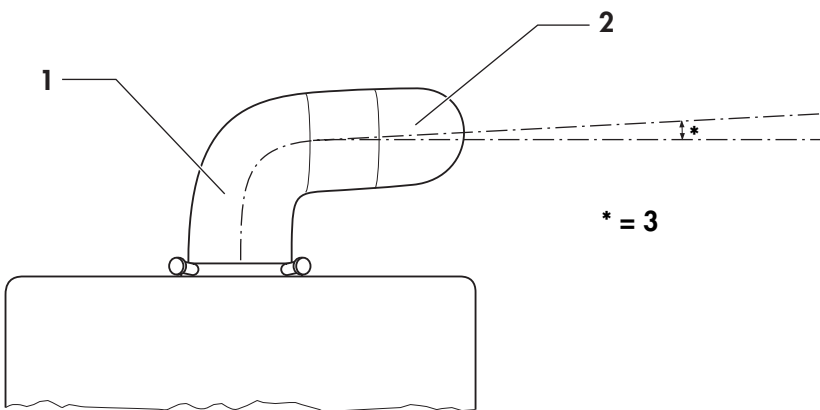


Fig. 6.2: Arrangement of 2 x 87° elbows – View from front

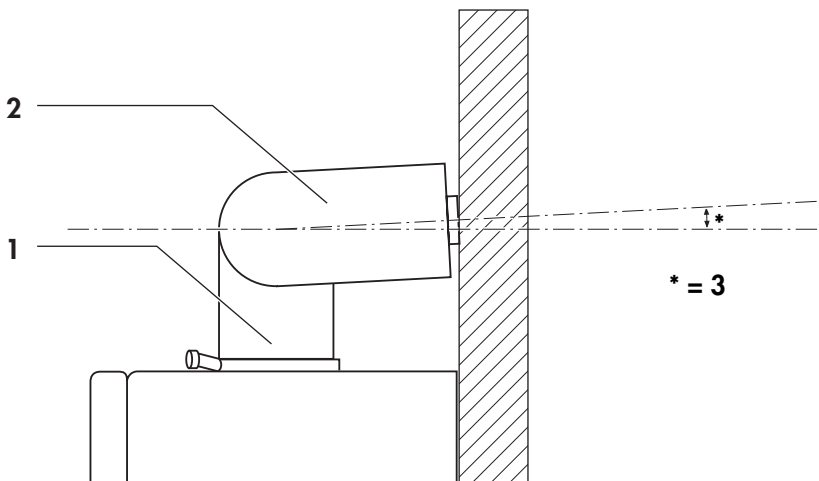
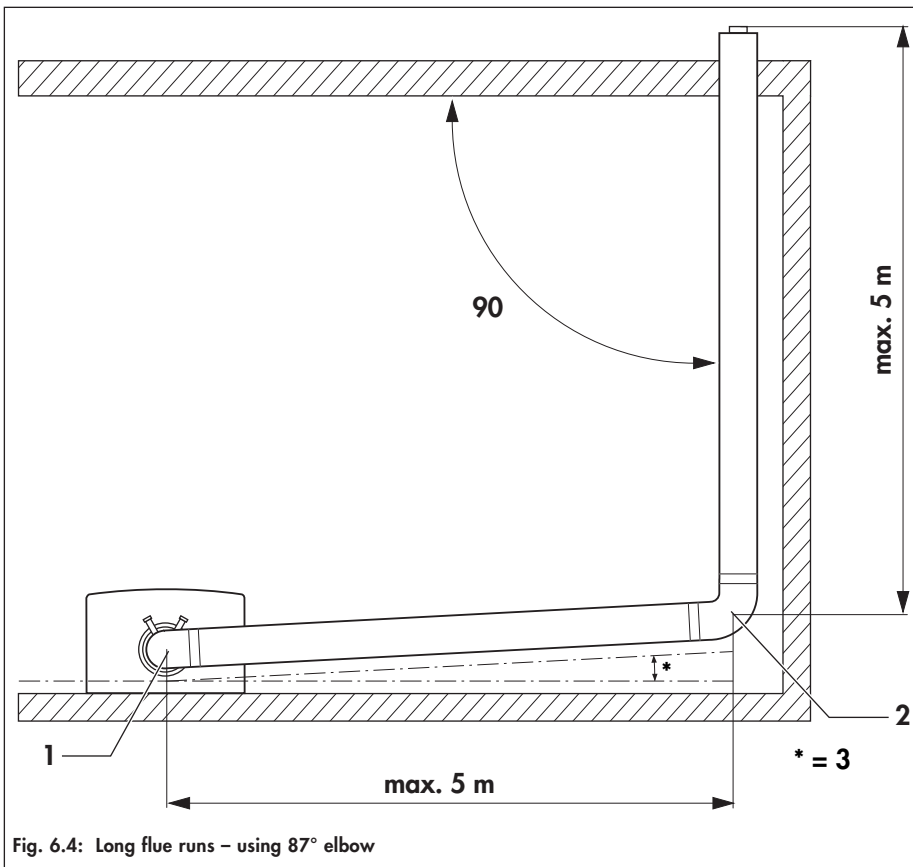


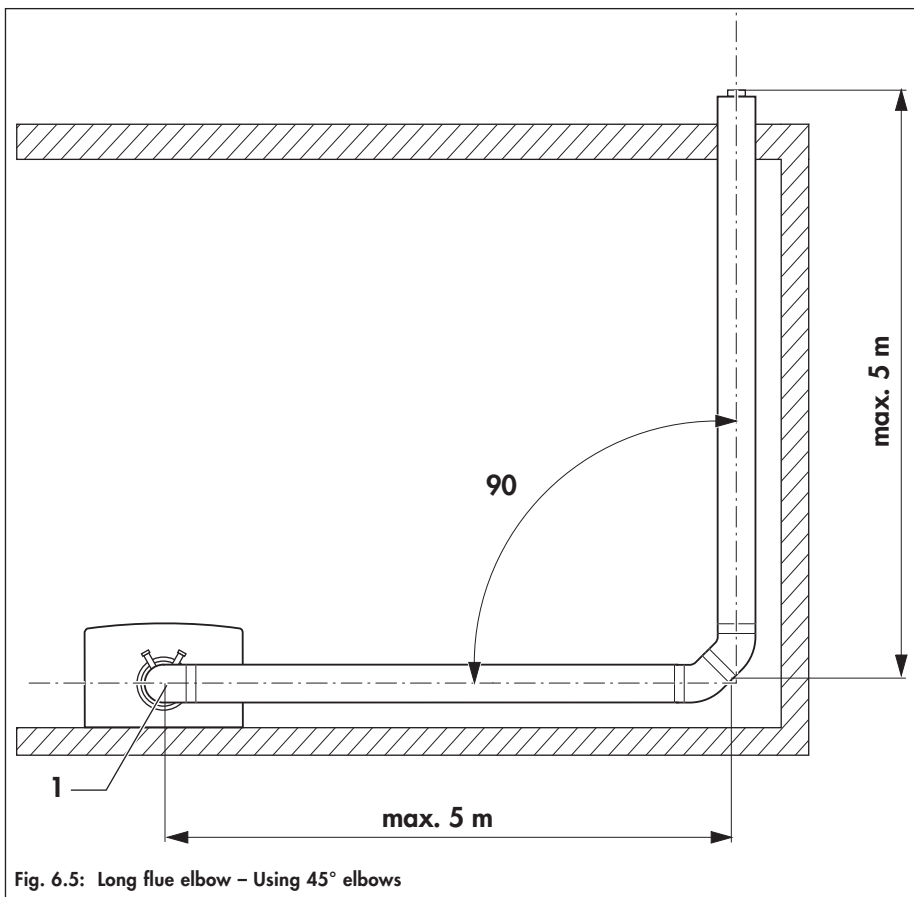
Fig. 6.3: Arrangement of 2 x 87° elbows – View from side

## FITTING AIR/FLUE DUCT EXTENSIONS



- When using elbows for long flue runs in a corner follow fig. 6.4 and fig. 6.5 to avoid obstructions.

**Note:** The elbows must be correctly aligned to avoid undue stress on the joints and risk of leakage. The elbow fitted to the top of the boiler (1) should be twisted by 3° to ensure that the second 87° elbow (2) exits the wall perpendicular. When using 87° elbow install with a slope of 3° between wall and air-flue pipe (fig. 6.4) or use 2 x 45° elbows (fig. 6.5).







## FITTING AIR/FLUE DUCT EXTENSIONS

### How to install 87° elbows

Accy. No.: 303 910

**Note:** The elbow delivered with the flue kits 303 933 and 303 936 is not the same dimension as shown here.

#### Example:

An offset of 400 mm is measured. This value is then used, along with the table below, to determine the length of the air conduit (= 190 mm in this case).



#### Important:

This gives a corresponding exhaust-conduit length of  $190 + 40 = 230$  mm.

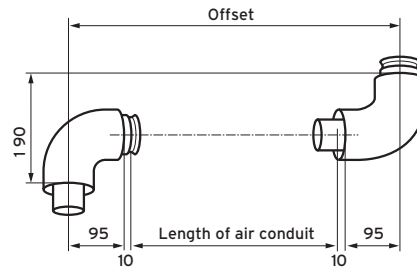


Fig. 6.3: Installation of 87° elbows

Table 6.1: Length of surplus with 87° elbows

Offset [in mm]	Length of air conduit [in mm]	Offset [in mm]	Length of air conduit [in mm]	Offset [in mm]	Length of air conduit [in mm]
> 190 to < 210 mm	0	440	230	630	420
		445	235	635	425
		450	240	640	430
> 215 to < 265 mm	<b>not possible</b>	455	245	645	435
		460	250	650	440
		465	255	655	445
> 270 to < 290 mm	80	470	260	660	450
		475	265	665	455
		480	270	670	460
295	85	485	275	675	465
300	90	490	280	680	470
305	95	495	285	685	475
310	100	500	290	690	480
315	105	505	295	695	485
320	110	510	300	700	490
325	115	515	305	705	495
330	120	520	310	710	500
335	125	525	315	715	505
340	130	530	320	720	510
345	135	535	325	725	515
350	140	540	330	730	520
355	145	545	335	735	525
360	150	550	340	740	530
365	155	555	345	745	535
370	160	560	350	750	540
375	165	565	355	755	545
380	170	570	360	760	550
385	175	575	365	765	555
390	180	580	370	770	560
395	185	585	375	775	565
400	190	590	380	780	570
405	195	595	385	785	575
410	200	600	390	790	580
415	205	605	395	795	585
420	210	610	400	800	590
425	215	615	405		
430	220	620	410		
435	225	625	415		



## How to install 45° elbows

Accy. No.: 303 911

Example:

An offset of 400 mm is measured.  
This value is then used, along with the table below, to determine the length of the air conduit (= 284 mm) and the height (= 420 mm).



### Important:

This gives a corresponding exhaust-conduit length of  $284 + 40 = 324$  mm.

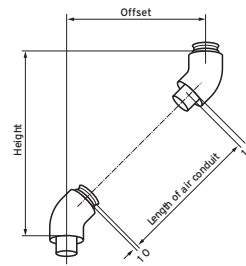


Fig. 6.4: Installation of 45° bends

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PART 1 CONCENTRIC 60/100

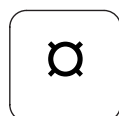
Table 6.2: Length of surplus with 45° bends

Offset [in mm]	Length of air conduit [in mm]	Height [in mm]	Offset [in mm]	Length of air conduit [in mm]	Height [in mm]	Offset [in mm]	Length of air conduit [in mm]	Height [in mm]
90	0	210	325	320	445	525	602	645
95	0	215	330	327	450	530	610	650
100	0	220	335	334	455	535	617	655
			340	341	460	540	624	660
			345	348	465	545	631	665
			350	355	470	550	638	670
			355	362	475	555	645	675
			360	369	480	560	652	680
			365	376	485	565	659	685
			370	383	490	570	666	690
			375	390	495	575	673	695
			380	397	500	580	680	700
			385	404	505	585	687	705
			390	412	510	590	694	710
			395	419	515	595	701	715
			400	426	520	600	709	720
			405	433	525	605	716	725
			410	440	530	610	723	730
			415	447	535	615	730	735
			420	454	540	620	737	740
			425	461	545	625	744	745
			430	468	550	630	751	750
			435	475	555	635	758	755
			440	482	560	640	765	760
			445	489	565	645	772	765
			450	496	570	650	779	770
			455	503	575	655	786	775
			460	511	580	660	793	780
			465	518	585	665	800	785
			470	525	590	670	808	790
			475	532	595	675	815	795
			480	539	600	680	822	800
			485	546	605			
			490	553	610			
			495	560	615			
			500	567	620			
			505	574	625			
			510	581	630			
			515	588	635			
			520	595	640			





The air/flue duct must be installed by a suitably qualified service provider, which is responsible for observing the relevant specifications, regulations and standards.



## Requirements

Regulations and standards to be observed

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## Planning the air/flue duct layout

Alternative termination accessories available

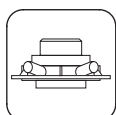
39

Maximum flue lengths for ecoMAX

42

Maximum flue lengths for ecoTEC

43



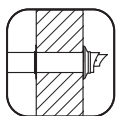
## Changing the appliance connection piece

45



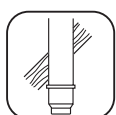
## Installation of the sliding sleeve

46



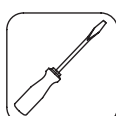
## Installation of the horizontal air/flue duct

47



## Installation of the vertical air/flue duct

52



## Fitting air/flue duct extensions

How to add extensions

55

How to install elbows

56



## REQUIREMENTS

### Regulations and standards to be observed

- ☞ Vaillant ecoMAX/ecoTEC boilers are certified as heating boilers with corresponding flue systems according to EC Directive 90/396/EEC on gas-fired devices. This installation manual is covered by this certification and is referred to in the design approval test certificate.
- ☞ These instructions should be read in conjunction with the instructions for installation and servicing supplied with the boiler.
- ☞ Ensure also that all legislation, rules, regulations and directives mentioned in the installation instructions are observed.
- ☞ The installation of the boiler and its flue must be carried out by a competent person who is registered with CORGI (The Council for Registered Gas Installers).
- ☞ The installation of the boiler and flue must be in accordance with the Gas Safety (Installation and Use) Regulations 1998 and the Building Regulations and BS 5440 Part 1.
- ☞ The requirements for flue termination detailed in the boiler installation instructions must be observed.
- ☞ The air/flue duct operates at very low temperatures therefore no clearance is necessary between the air duct and adjacent services.
- ☞ Ensure while installation work is being carried out that no debris such as swarf, filings or fragments of mortar are allowed to remain in the air/flue duct.



## Alternative termination accessories available















**303 200** = Vertical air/flue duct (black)



**303 209** = Horizontal air/flue duct



**303 926** = Appliance connection piece

Optional connection accessories		Accy. No.	303 200 	303 209 
Air/flue duct extensions (PPs), concentric 470 mm - Ø 80/125		303 202	x	x
Air/flue duct extensions (PPs), concentric 970 mm - Ø 80/125		303 203	x	x
Air/flue duct extensions (PPs), concentric 1970 mm - Ø 80/125		303 205	x	x
Bends (PPs), concentric (pack of 2) 45° - Ø 80/125		303 211	x	x
Elbow (PPs), concentric 87° - Ø 80/125		303 210	x	x
Flue support clips (pack of 5), Ø 125		303 616	x	x
Sliding sleeve (PPs) Ø 80/125		303 215	x	x
Adjustable roof tiles for pitched roof		009076 black	x	x
Flat roof penetration collar		009 056	x	x
Flexible pitched roof seal		303 980	x	



## PLANNING THE AIR/FLUE DUCT LAYOUT

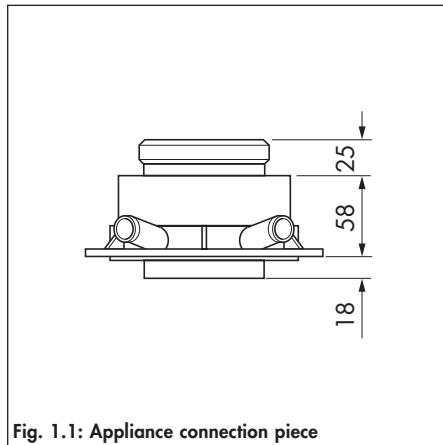


Fig. 1.1: Appliance connection piece

### Appliance connection piece Ø 80/125

Vaillant Accy. No.: 303 926  
(with 2 measuring apertures)

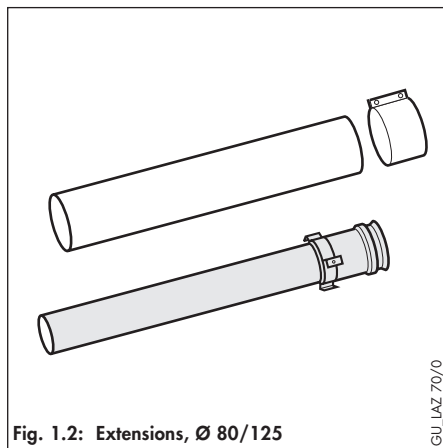


Fig. 1.2: Extensions, Ø 80/125

### Air/flue duct extension (PPs) 470 mm, Ø 80/125

Vaillant Accy. No.: 303 202

### Air/flue duct extension (PPs) 970 mm, Ø 80/125

Vaillant Accy. No.: 303 203

### Air/flue duct extension (PPs) 1970 mm, Ø 80/125

Vaillant Accy. No.: 303 205

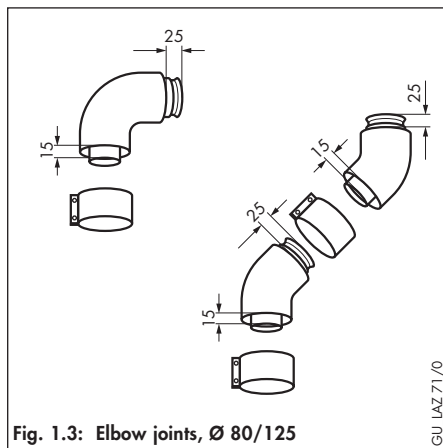


Fig. 1.3: Elbow joints, Ø 80/125

### Elbow (PPs), 87°, Ø 80/125

Vaillant Accy. No.: 303 210

### Bends (PPs), 45° (pack of 2), Ø 80/125

Vaillant Accy. No.: 303 211

Use one clip per extension to support the air/flue duct.

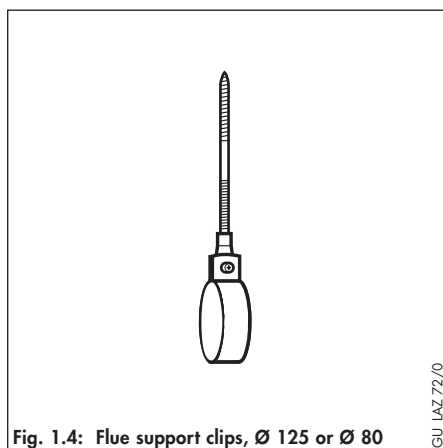


Fig. 1.4: Flue support clips, Ø 125 or Ø 80

### Flue support clips, Ø 125 (pack of 5)

Vaillant Accy. No.: 303 616

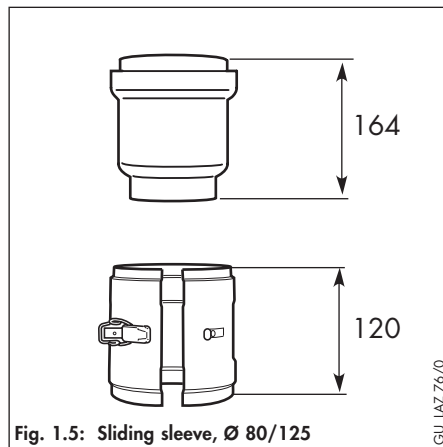


Fig. 1.5: Sliding sleeve, Ø 80/125

**Sliding sleeve (PPs), Ø 80/125**  
Vaillant Accy. No.: 303 215

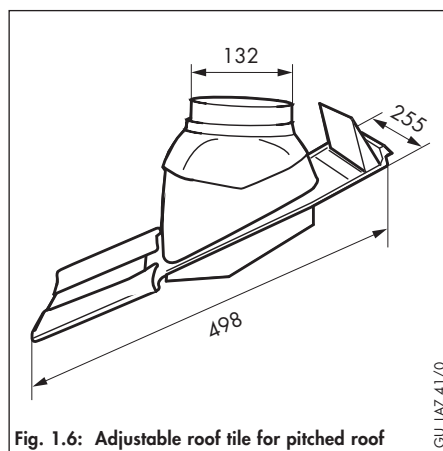


Fig. 1.6: Adjustable roof tile for pitched roof

**Adjustable roof tiles for pitched roof**  
Vaillant Accy. No.: 009 076 (black)

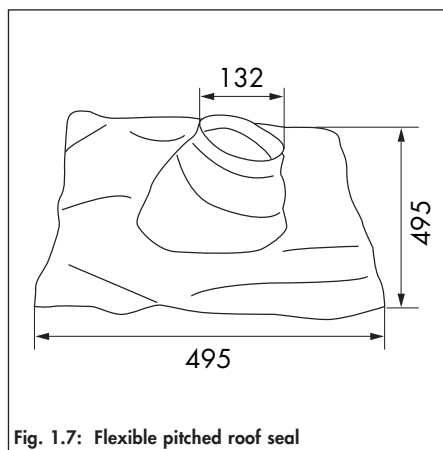


Fig. 1.7: Flexible pitched roof seal

**Flexible pitched roof seal (black)**  
Vaillant Accy. No.: 303 980

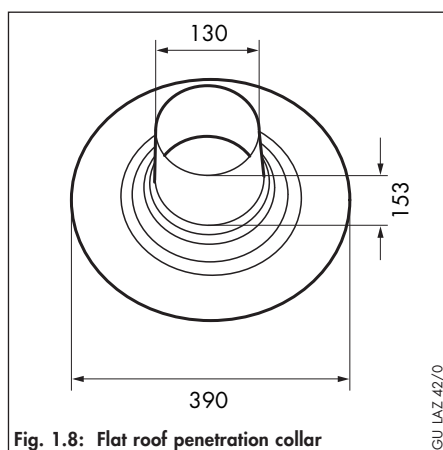


Fig. 1.8: Flat roof penetration collar

**Flat roof penetration collar**  
Vaillant Accy. No.: 009 056





## PLANNING THE AIR/FLUE DUCT LAYOUT

### Maximum flue lengths for use with ecoMAX

Accessories	Accy. No.		ecoMAX			
			613/2 E	618/2 E	622/2 E	pro 18 E pro 28 E
Horizontal flue systems	303 209	Max. permitted concentric flue length	13.0 m incl. 1 elbow 87°	25.0 m incl. 1 elbow 87°	30.0 m incl. 1 elbow 87°	20.0 m incl. 1 elbow 87°
			Maximum length of flue is reduced by 2.5 m for each additional 90° elbow. Maximum length of flue is reduced by 1.0 m for each additional 45° elbow.			
Vertical flue systems	303 200	Max. permitted concentric flue length	14.0 m	27.0 m	31.0 m	20.0 m
			Maximum length of flue is reduced by 2.5 m for each additional 90° elbow Maximum length of flue is reduced by 1.0 m for each additional 45° elbow			

Accessories	Accy. No.		ecoMAX		
			824/2 E	828/2 E	635/ E 835/ E
Horizontal flue systems	303 209	Max. permitted concentric flue length	25.0 m incl. 1 elbow 87°	30.0 m incl. 1 elbow 87°	21.0 m incl. 1 elbow 87°
			Maximum length of flue is reduced by 2.5 m for each additional 87° elbow. Maximum length of flue is reduced by 1.0 m for each additional 45° elbow.		
Vertical flue systems	303 200	Max. permitted concentric flue length	26.0 m	29.0 m	22.0 m
			Maximum length of flue is reduced by 2.5 m for each additional 90° elbow Maximum length of flue is reduced by 1.0 m for each additional 45° elbow		



## Maximum flue lengths for use with ecoTEC

Accessories	Accy. No.		ecoTEC	
			plus 612 plus 615	plus 618 plus 624 plus 630 plus 824 plus 831
Horizontal flue systems	303 209	Max. permitted concentric flue length	13.0 m incl. 1 elbow 87°	25.0 m incl. 1 elbow 87°
			Maximum length of flue is reduced by 2.5 m for each additional 90° elbow. Maximum length of flue is reduced by 1.0 m for each additional 45° elbow.	
Vertical flue systems	303 200	Max. permitted concentric flue length	14.0 m	27.0 m
			Maximum length of flue is reduced by 2.5 m for each additional 90° elbow Maximum length of flue is reduced by 1.0 m for each additional 45° elbow	

Accessories	Accy. No.		ecoTEC		
			plus 637 plus 837	pro 24 pro 28	plus 415 plus 418 plus 428 plus 438
Horizontal flue systems	303 209	Max. permitted concentric flue length	21.0 m incl. 1 elbow 87°	25.0 m incl. 1 elbow 87°	20.0 m incl. 1 elbow 87°
			Maximum length of flue is reduced by 2.5 m for each additional 87° elbow. Maximum length of flue is reduced by 1.0 m for each additional 45° elbow.		
Vertical flue systems	303 200	Max. permitted concentric flue length	23.0 m	27.0 m	20.0 m
			Maximum length of flue is reduced by 2.5 m for each additional 90° elbow Maximum length of flue is reduced by 1.0 m for each additional 45° elbow		



## PLANNING THE AIR/FLUE DUCT LAYOUT

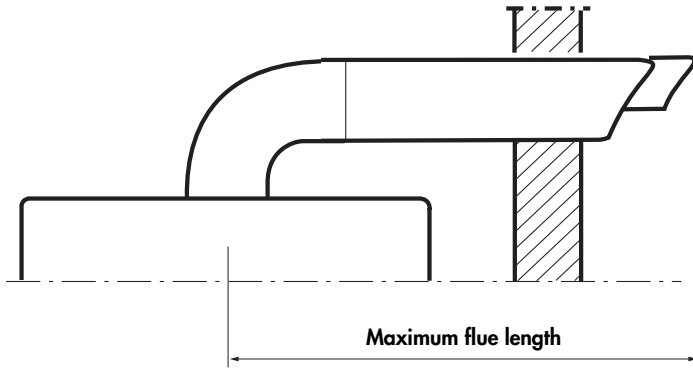


Fig. 1.9

LAS Euro B/S 074/O

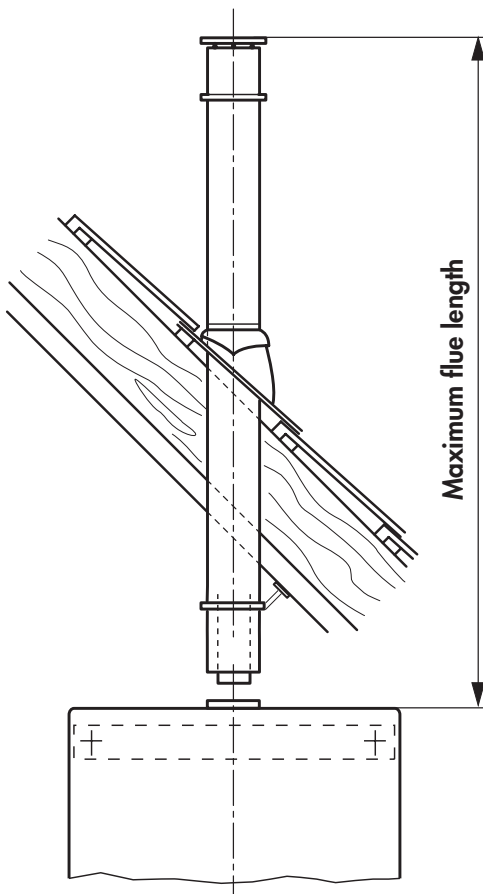


Fig. 1.10

LAS Euro B/S 074/O

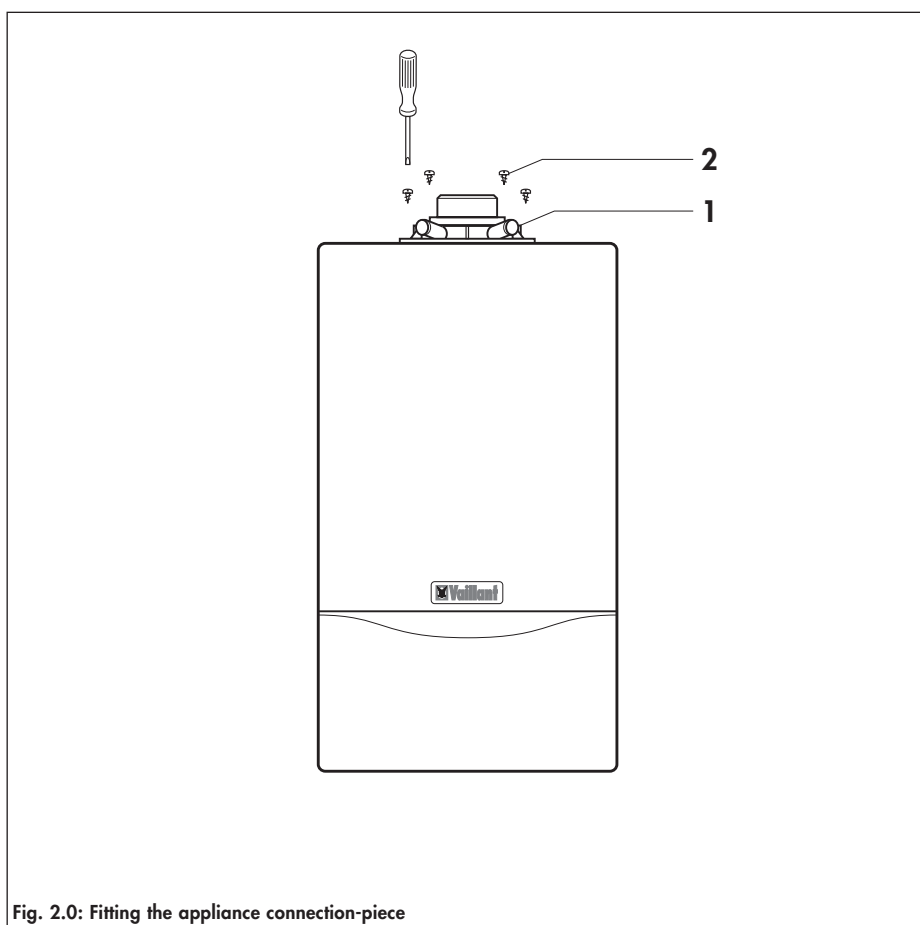
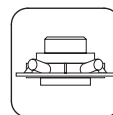


Fig. 2.0: Fitting the appliance connection-piece

## Installation

Accy No.: 303 926

The appliance is supplied ready-fitted with the connection-piece for the 60/100 air/flue duct system.

- Loosen the four screws (2) and pull the appliance connection-piece (1) upwards to remove it.
- Push the appliance connection-piece with the selected connection diameter down from above, inserting the push-in end onto the sleeve of the flue collecting chamber. Now push the appliance connection-piece downwards until the flange comes into contact with the low-pressure chamber.
- Refit the fixing screws (2).

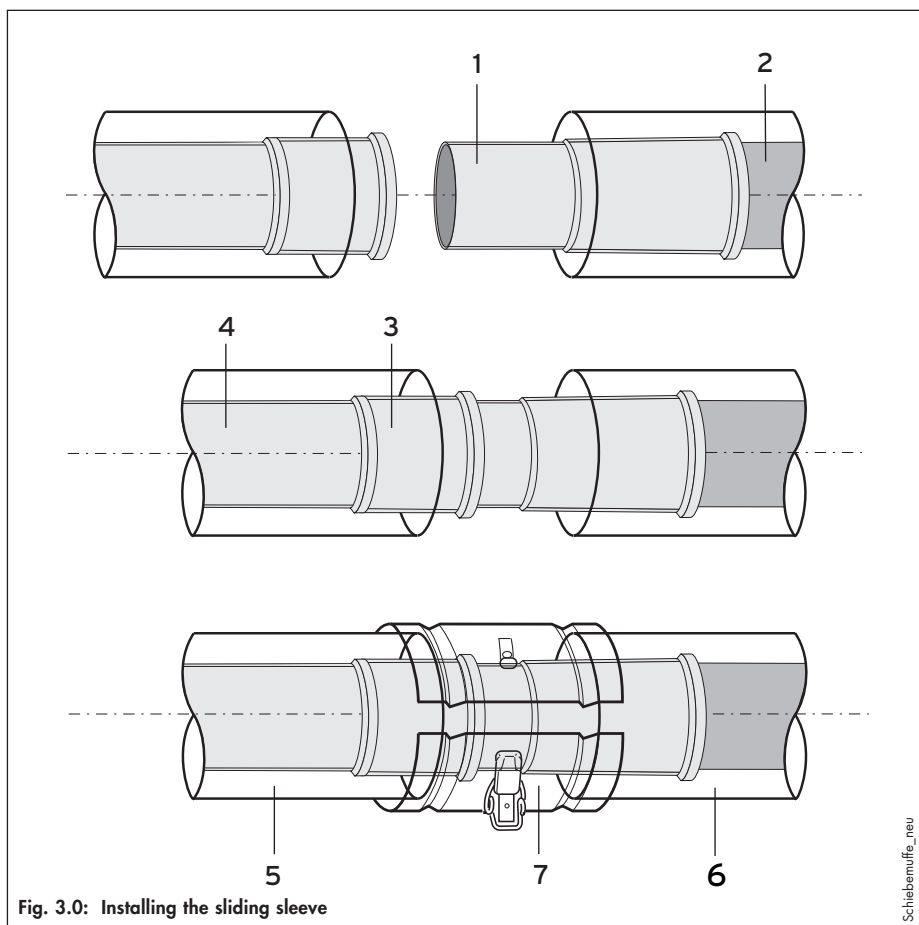


**The seals are sensitive to mineral oil-based grease products.**

**For this reason, the seals must not be greased. If the seals need wetting to aid in installation, use water only.**



## INSTALLATION OF THE SLIDING SLEEVE



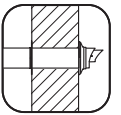
## INSTALLING THE AIR/FLUE DUCT SLIDING SLEEVE

### NOTE:

For installations where there is insufficient movement to allow fitting of the flue into flue outlet, a sliding sleeve (Accy. No. 303 215) is available. When using the sliding sleeve both the air and flue ducts of the last extension must be shortened by a further 85 mm.

- Push the sliding sleeve (1) over the cut end of the flue duct (2).
- Place the air duct clamp (7) over the air duct.
- Pull back the sliding sleeve so that it engages into the socket (3) of the boiler (4). Ensure that the sliding sleeve penetrates the socket such that there is at least 20 mm engagement at both ends of the sliding sleeve.
- Fit the air duct clamp over the air ducts (5 and 6) of the extension/terminal and boiler outlet. Close the snap clamp.
- Drill two holes 3 mm diameter through the air duct clamp (the centre of the holes should be 6 mm from the edge of the clamp). Ensure that the drill does not penetrate the inner flue duct. Screw the air duct clamp to the air duct of the sleeve using the screws provided.
- Complete the installation of the flue as detailed in these instructions.

# INSTALLATION OF THE HORIZONTAL AIR/FLUE DUCT



**Observe the maximum flue lengths as detailed in table on page 42.**

## IMPORTANT:

The air/flue duct is not concentric and the air duct has a slope of  $1.5^\circ$  (if the air flue duct is not cut). The hole through the wall can therefore be drilled horizontally with no slope.

Where extensions are used, these must be installed with a slope at  $3^\circ \pm 1^\circ$  (equivalent to  $50 \text{ mm} \pm 20 \text{ mm}$  rise per metre length) to ensure that condensate does not remain in the sleeve.

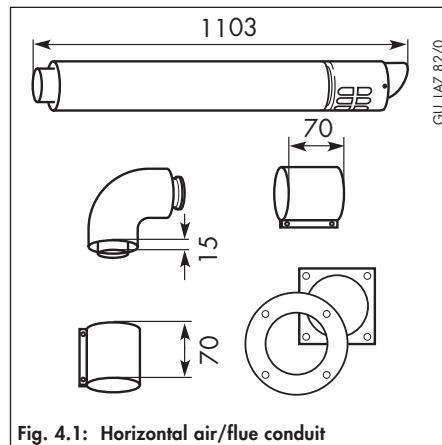


Fig. 4.1: Horizontal air/flue conduit

## Horizontal air/flue duct

Vaillant Accy No.: 303 209

Contents of the accessory:

- Horizontal air/flue duct
- $87^\circ$  elbow
- 2 x 70 mm air duct clamps
- 1 x internal plastic ring  $\varnothing 125$
- 1 x external metal plate

See page 39 et seq. for details of air/flue duct elements.

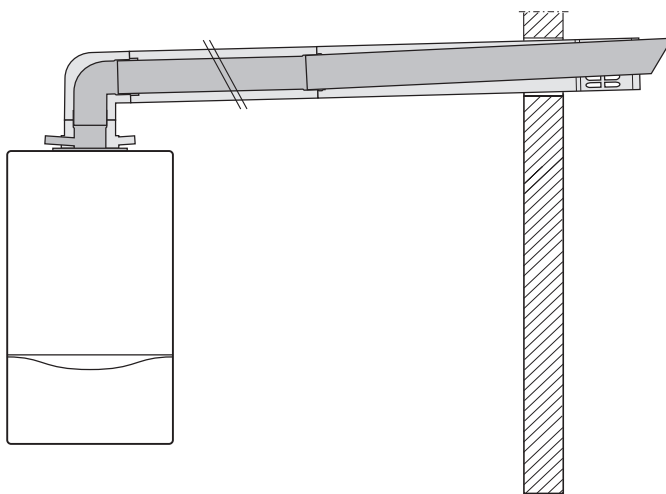
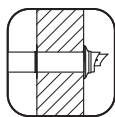


Fig. 4.2: Example of installation with horizontal air/flue duct



# INSTALLATION OF THE HORIZONTAL AIR/FLUE DUCT Ø 80/125 WITH EXTENSIONS

### IMPORTANT:

The air/flue duct is not concentric and the air duct has a slope of  $1.5^\circ$  (if the air flue duct is not cut). The hole through the wall can therefore be drilled horizontally with no slope.

Where extensions are used, these must be installed with a slope at  $3^\circ \pm 1^\circ$  (equivalent to  $50 \text{ mm} \pm 20 \text{ mm}$  rise per metre length) to ensure that condensate does not remain in the sleeve.

## Preparation

- Determine the installation site for the boiler with reference to the installation and servicing instructions supplied with the boiler.
- Ensure that all installation and service clearances are available and that the boiler flue can be installed as detailed in these instructions.
- Fix the paper template, supplied with the boiler, to the wall ensuring that the centreline of the template is vertical using a plumbline or spirit level.

## Side flue installations

- For installations where the air/flue duct is to be installed to the side, the position of the flue exit hole can be determined as follows:
- Identify the correct measurement as shown in fig. 4.3, carefully measure the distance from the bottom centre of the boiler hanging bracket (centreline of the two lower hanging bracket fixing holes). This gives the position of the centreline of the 127 mm flue elbow and adaptor when installed.
- The position of the flue exit hole can be determined by carefully levelling across the wall from this mark.
- The position of the flue exit hole should allow the flue to be installed with an upwards slope towards the terminal of approximately  $3^\circ \pm 1^\circ$ , equivalent to  $50 \text{ mm} \pm 20 \text{ mm}$  rise per metre of flue length. Calculate the required rise according to the flue length and mark the position of the flue exit hole (fig 4.4).

**Note:** Due to the long lengths of flue possible and the slope required, it may be necessary to adjust the location of the boiler installation template. Please check that both the boiler installation site and flue termination are in accordance with these instructions prior to drilling any holes for the boiler hanging bracket.

- Once the position of the flue exit hole has been determined, the hole should be cut through the wall using a core drill of 127 mm diameter. The flue exit hole should be cut with a rise towards outside of  $3^\circ$ .
- Measure the distance from the outside face of the wall to the centre of the fan outlet on the boiler (fig. 4.5). **This is dimension A.**
- For installations where the measured distance dimension A (fig. 4.5) is greater than 960 mm, an air/flue extension accessory will be required. The number of air/flue duct extensions which can be used depends on the boiler.

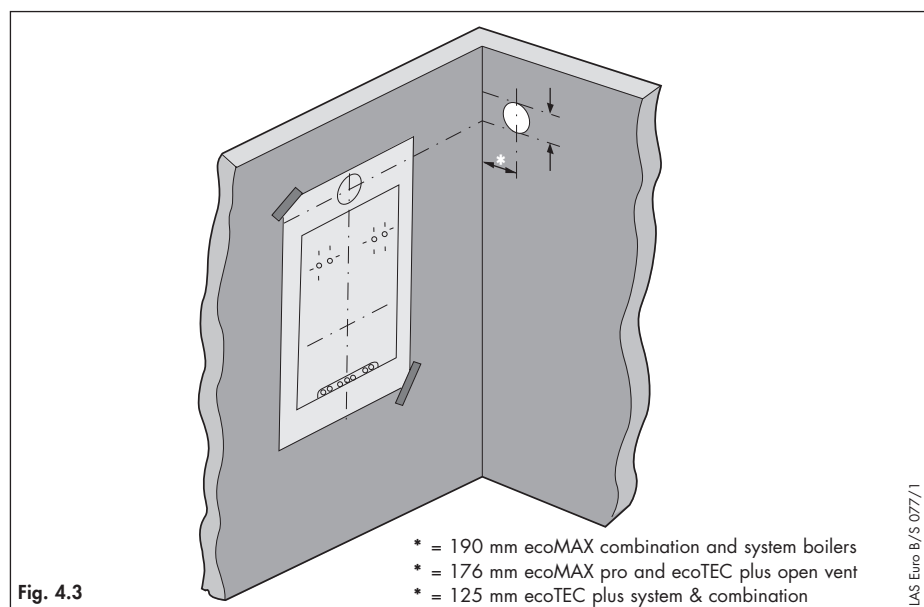


Fig. 4.3

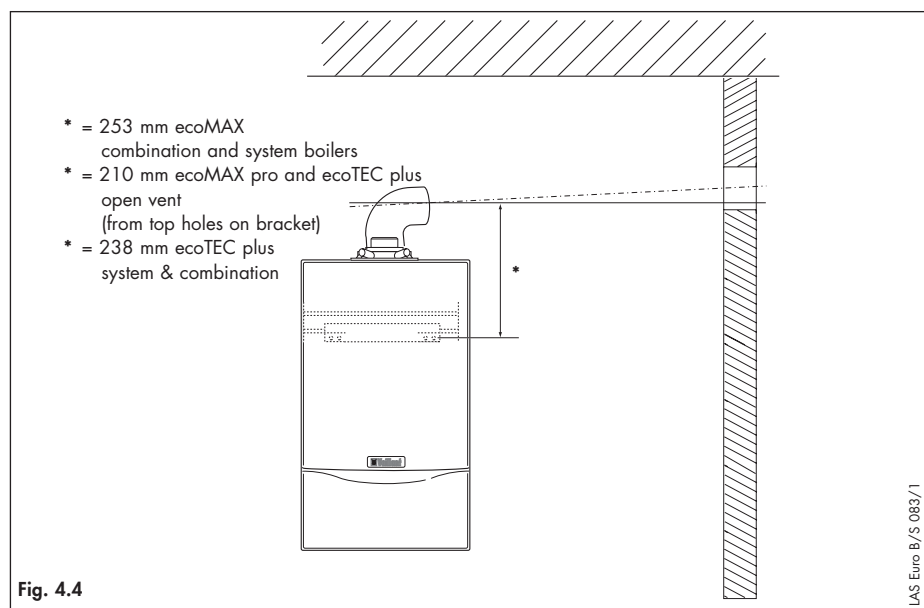
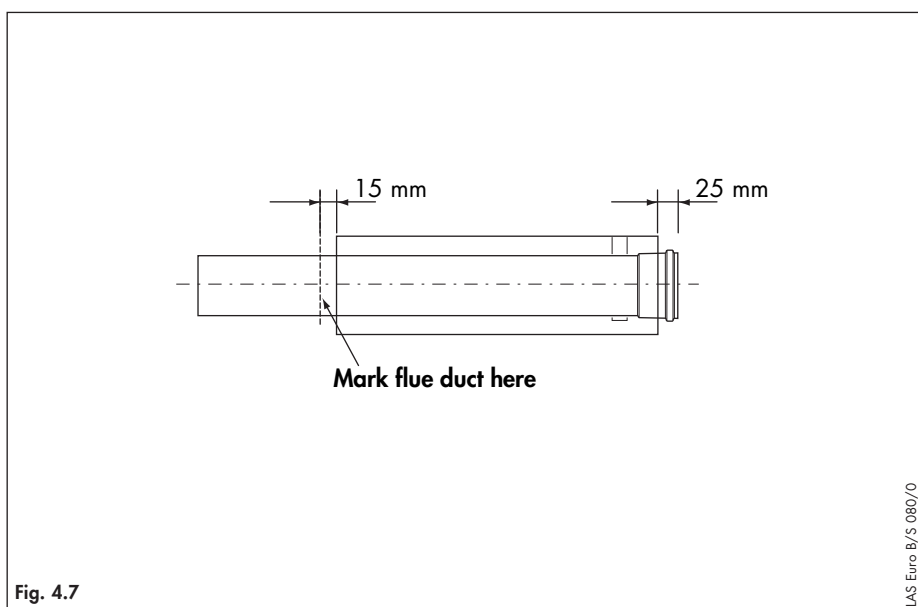
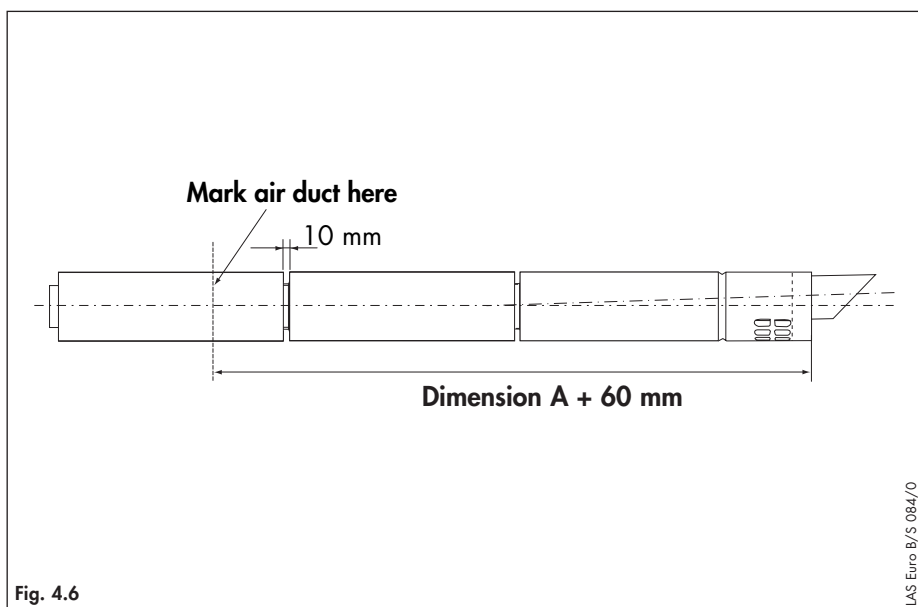
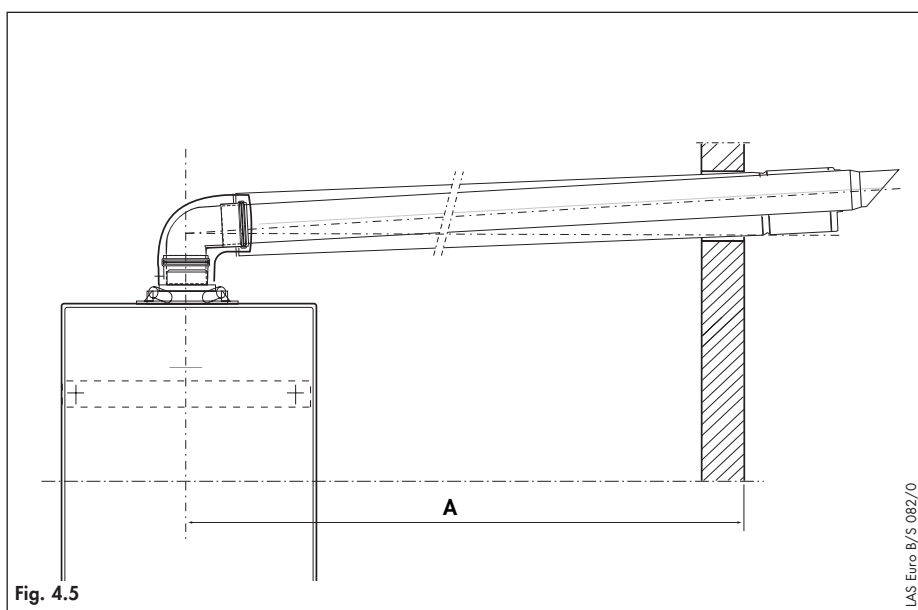
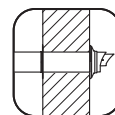


Fig. 4.4

# INSTALLATION OF THE HORIZONTAL AIR/FLUE DUCT Ø 80/125 WITH EXTENSIONS



- Taking each extension to be used, fit the flue duct into the air duct and secure using the 3 screws provided.
- For ease of measuring and marking the air/flue duct extensions, assemble them loosely together with the air/flue duct and terminal assembly as shown (fig. 4.6).

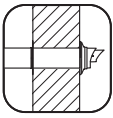
**Note:** The joints between the flue duct sections are of a push-fit type, with the flue duct spigot inserted into a socket containing a sealing ring. For ease of installation lubricate the seal using soap solution prior to assembling.

- Assemble the flue such that there is a gap of about 10 mm between each air duct, which will ensure the correct flue duct penetration into the flue sockets of 30 mm. All flue sockets should point towards the flue terminal.
- Measure from the flue terminal and mark the air duct to a length of:  
**Dimension A + 60 mm**
- Take the extension(s) to be shortened and remove the 3 screws. Separate the ducts.

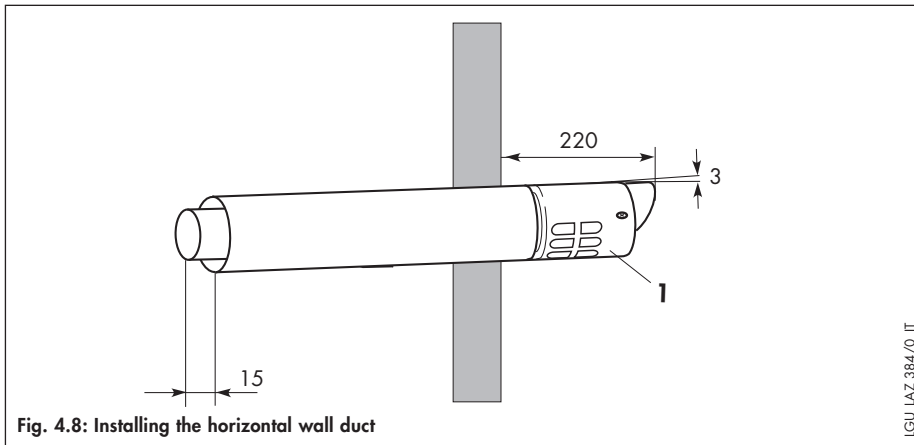
**Note:** For assembly reasons do not shorten any air duct to a length of less than 100 mm. If necessary shorten two adjacent extensions to achieve the overall required length.

- Cut the air duct square and remove any burrs.
- Refit the flue duct into the air duct and secure using the 3 screws.
- Cut the flue duct as detailed in fig. 4.7.
- When cutting the air and flue ducts it is important to remove any burrs with a file, this ensures easy fitting of the ducts and prevents any rough edges from damaging the flue seals.
- Care should be taken not to scratch the white surface of the air duct.
- If the installation requires the use of air/flue duct extensions, additional bends or elbows refer to the sections on pages 55 - 59.
- At this stage it is necessary to prepare and fit the boiler onto the hanging bracket – refer to the boiler installation instructions.
- Fit the appliance flue outlet adaptor to the boiler.





## INSTALLATION OF THE HORIZONTAL AIR/FLUE DUCT Ø 80/125 WITH EXTENSIONS



- Push the assembled air/flue duct and terminal assembly through the flue exit hole until it protrudes 220 mm out from the outside wall.
- Ensure that the terminal is correctly positioned with the air inlet grille at the bottom.
- Slide one of the two trim rings over the air duct until it is flush with the internal wall face.

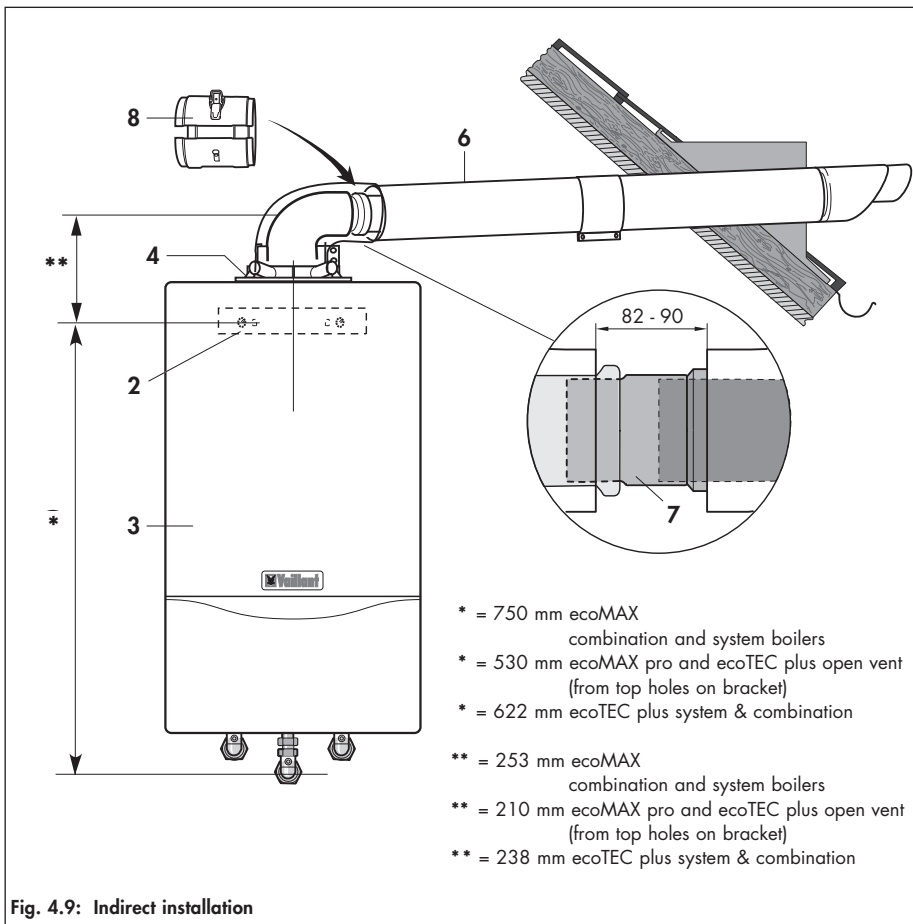
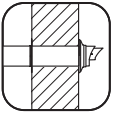


Fig. 4.9: Indirect installation

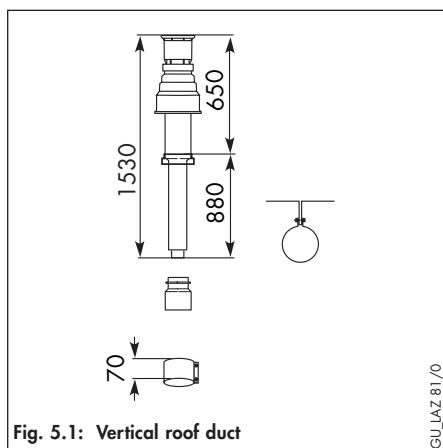
## Indirect installation

- Fit the wall mounting (2).
  - Install the appliance (3) with reference to the installation and servicing instructions supplied with the boiler.
  - Change the appliance connection-piece (4) as described on page 47.
  - Join the 87° elbow to the appliance connection piece.
  - Push the sliding sleeve (7) firmly into place on the appropriate extensions (6).
  - Install the extensions and join the sliding sleeve to the 87° elbow.
    - ☞ This section functions subsequently as a separation point.
  - Join all separation points with the air-conduit fixing collars (8).
- ☞ See pages 57 et seq. for further details on the installation of extensions and elbows.
- ☞ For horizontal flue installations through sloping roofs, please order the Horizontal Flue Flashing from Ubbink (Nothants, Tel: 01280 700211)



## INSTALLATION OF THE VERTICAL AIR/FLUE DUCT

Observe the maximum flue lengths as detailed in table on page 42.



### Vertical air/flue duct

Accy. No.: 303 200 (black)

Contents of the accessory:

- Vertical air/flue duct and terminal assembly
- Adapter (air) for Ø 110/125
- 70 mm air duct clamp
- Fixing bracket

See page 41 et seq. for details of air/flue duct elements.

The air/flue duct assembly may be connected directly to the flue outlet on top of the boiler.

In addition to the vertical air/flue duct and terminal accessory, air/flue duct extensions can be added to increase the length of the flue.

### Preparation

- Determine the installation site for the boiler with reference to the installation and servicing instructions supplied with the boiler.
- Ensure that all installation and service clearances are available and that the boiler flue can be installed as detailed in these instructions.
- Determine the point where the vertical air/flue duct and terminal assembly will penetrate the roof.

Please note: The vertical air/flue duct and terminal accessory (Accy. No. 303 200) may be shortened. The outer 'white' duct should be shortened first, then the inner flue duct cut so that it protrudes 15 mm out of the air duct. In case of installation directly to the boiler without elbows or bends, it is essential that the roof tile/collar is vertically aligned with the air/flue duct of the boiler.

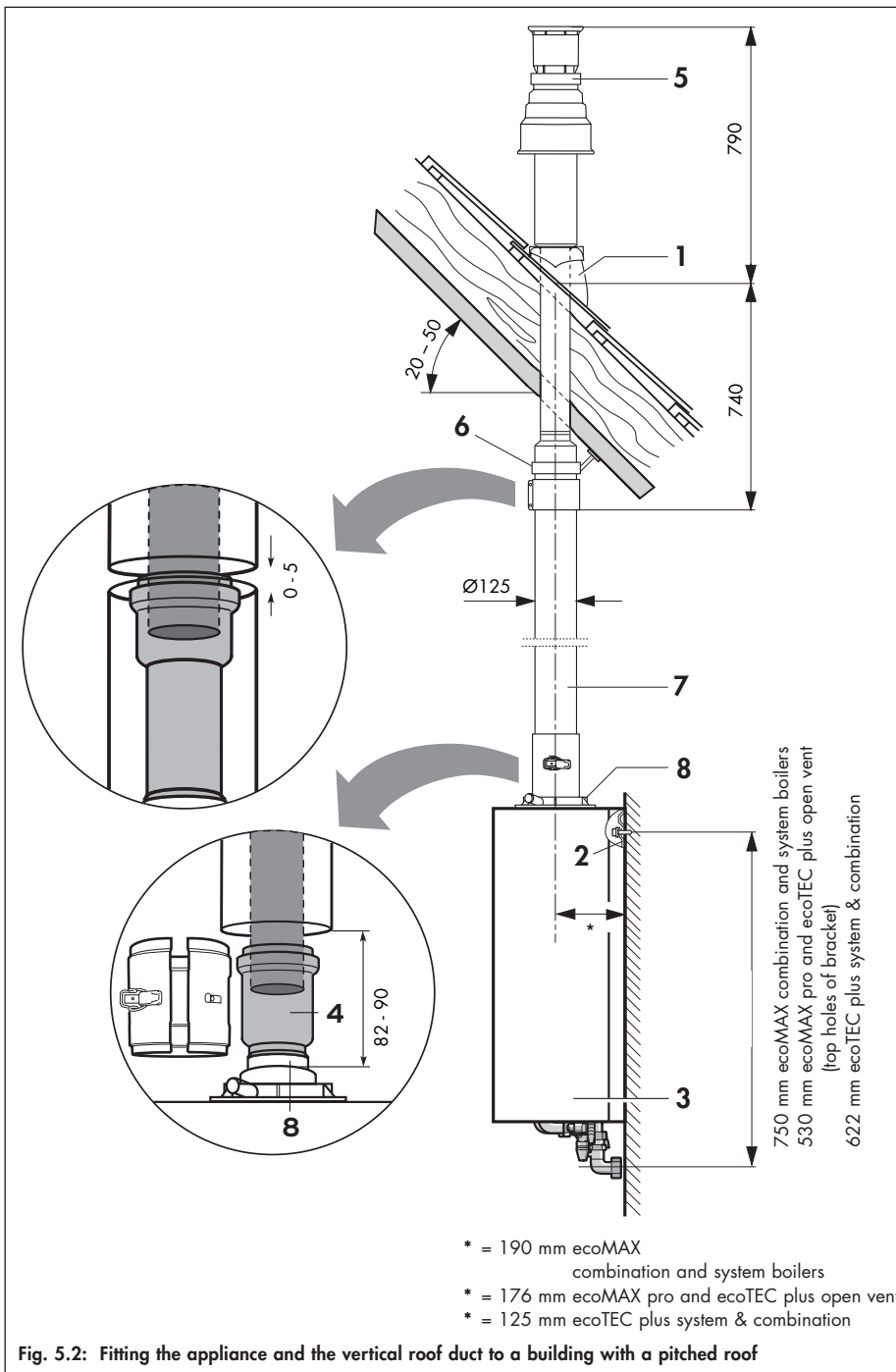
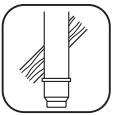
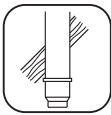


Fig. 5.2: Fitting the appliance and the vertical roof duct to a building with a pitched roof

## Pitched roof installation

- Determine the point where the vertical air/flue duct and terminal assembly will penetrate the roof.
- Fit the flexible pitched roof seal (1).
- Working from above, insert the vertical roof duct (5) through the roofing tile and push it firmly into place.
- Vertically align the roof duct and attach it to the roof structure with the fixing bracket (6) supplied.
- Fit the boiler hanging bracket (2).
- Install the appliance (3) with reference to the installation and servicing instructions supplied with the boiler.
- **See pages 57 et seq. for further details on the installation of extensions and elbows.**
- Push the sliding sleeve (4) firmly into place on the extension.
- Join the vertical flue duct (5) to the extension (7).
- Join the sliding sleeve (4) to the appliance's connection piece (8).
- **Using the sliding sleeve allows the appliance to be easily removed and replaced without dismantling the flue.**
- Drill two holes 3 mm Ø through the air duct of the flue/boiler clamp at the most convenient holes on the air duct clamp. (Ensure that the drill does not penetrate the inner flue duct). Screw the clamp to the air ducts of the flue assembly and the boiler using the screws supplied.
- Ensure that any air duct clamps used are positioned centrally and fixed to the air duct using the self tapping screws supplied.
- **Note:** The air/duct clamp must not be screwed to the bottom of the vertical air/flue duct and terminal accessory to allow for any slight movement in the roof structure.
- Ensure that at least one pipe clamp supports the air/flue duct at each extension fitted.



## INSTALLATION OF THE VERTICAL AIR/FLUE DUCT

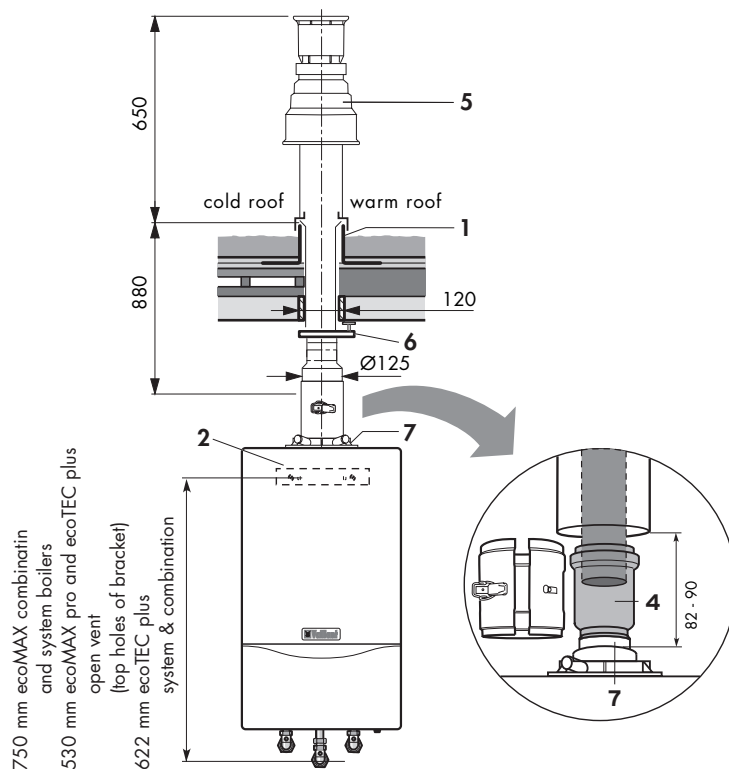


Fig. 5.3: Fitting the appliance and vertical flue duct to a building with a flat roof

### Flat-roof installation

- Determine the point where the vertical air/flue duct and terminal assembly will penetrate the roof.
- Fit the flat roof penetration collar (1).
- Stick the flat roof penetration collar firmly into place with adhesive in accordance with the codes of practice for flat roofs (CP 144) to ensure a watertight seal.
- Working from above, insert the vertical flue duct (5) through the flat roof collar and push it firmly into place.
- Vertically align the roof duct and attach it to the roof structure with the fixing bracket (6) supplied.
- Fit the boiler hanging bracket (2).
- Install the appliance (3) with reference to the installation and servicing instructions supplied with the boiler.

See pages 57 et seq. for further details on the installation of extensions and elbows.

- Push the sliding sleeve (4) firmly into place on the extension.
- Join the vertical roof duct (5) to the extension (7).
- Join the sliding sleeve (4) to the appliance's connection piece (8). This permits easy separation between the air/flue duct and the appliance.
- Drill two holes 3 mm Ø through the air duct of the flue/boiler clamp at the most convenient holes on the air duct clamp. (Ensure that the drill does not penetrate the inner flue duct). Screw the clamp to the air ducts of the flue assembly and the boiler using the screws supplied.
- Ensure that any air duct clamps used are positioned centrally and fixed to the air duct using the self tapping screws supplied.
- **Note:** The air/duct clamp must not be screwed to the bottom of the vertical air/flue duct and terminal accessory to allow for any slight movement in the roof structure.
- Ensure that at least one pipe clamp supports the air/flue duct at each extension fitted.



## How to add extensions

Use a saw, tin-snips, etc. to cut tubes to size.

- ✎ No tools are required when removing previously-fitted extensions for cutting to size air and flue tubes separately. When doing so, the flue conduit should be twisted into a position where the shoulders on the plastic tube can be pushed through the spacer-piece. After cutting to size, refit the flue conduit and secure it to the air conduit.

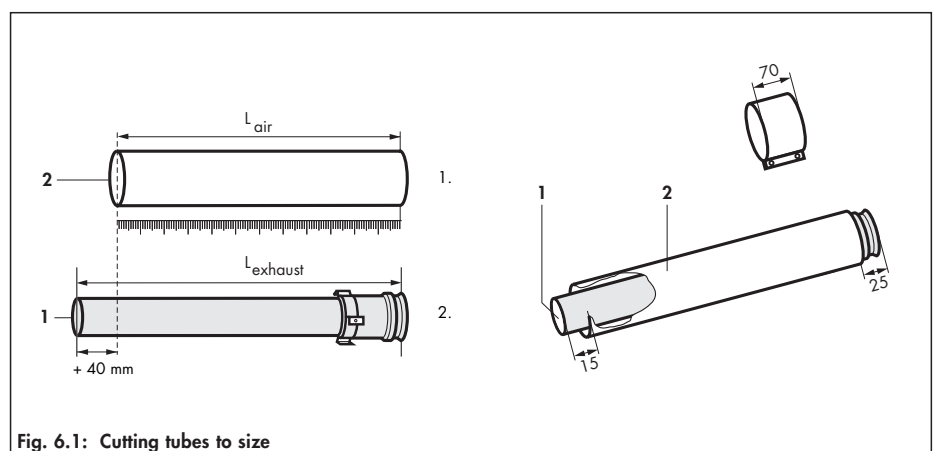


Fig. 6.1: Cutting tubes to size

### Tip:

Start by measuring the required length of air conduit\* ( $L_{air}$ ), and then calculate the corresponding length of flue conduit ( $L_{exhaust}$ ) as follows:

$$L_{exhaust} = L_{air} + 40 \text{ mm}$$

$$L_{exhaust} = \text{length of flue conduit}$$

$$L_{air} = \text{length of air conduit}$$

\* Minimum length of air-conduit extension: 100 mm.

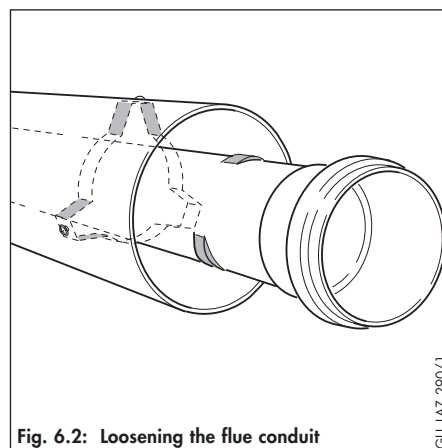


Fig. 6.2: Loosening the flue conduit

### Important:

You must fasten extensions to the ceiling or wall using pipe clamps. Use one clamp for each extension.

### Important:

Where extensions are used, these must be installed with a slope of  $3^\circ \pm 1^\circ$  to ensure that condensate does not remain in the sleeve (equivalent to 50 mm  $\pm$  20 mm rise per metre length).

- ✎ The seals are sensitive to mineral oil-based grease products. For this reason, the seals must not be greased. If the seals need wetting to aid in installation, use water only.
- ✎ De-burr and file down any rough edges on the tubes before fitting in order to prevent damage to the seals. Remove all metal filings and other debris.
- ✎ Do not use damaged or dented tubes, as they will not form an adequate seal.
- ✎ Ensure that the seals remain correctly aligned when installing the tubes. Do not fit damaged seals.
- ✎ Secure the exhaust conduit with the fixing device in order to ensure that it is correctly centred relative to the air conduit.



## FITTING AIR/FLUE DUCT EXTENSIONS

### How to install 2x 87° elbows

- When using 2 x 87° elbows follow fig. 6.1 to fig. 6.3 to avoid obstructions on outer wall.

**Note:** The elbows must be correctly aligned to avoid undue stress on the joints and risk of leakage.

The elbow fitted to the top of the boiler (1) should be twisted by 3° to ensure that the second 87° elbow (2) exits the wall perpendicular.

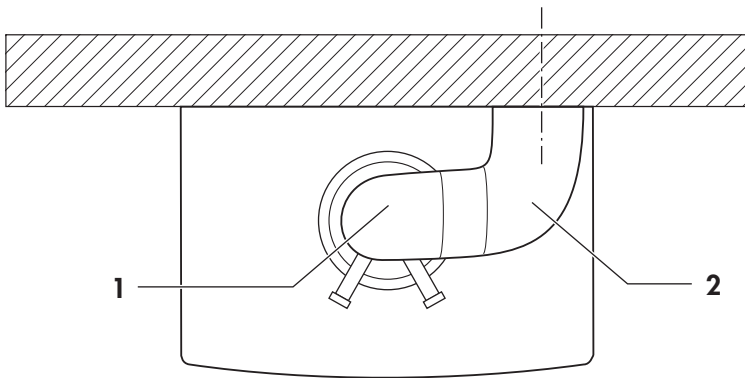


Fig. 6.1: Arrangement of 2 x 87° elbows - View from above

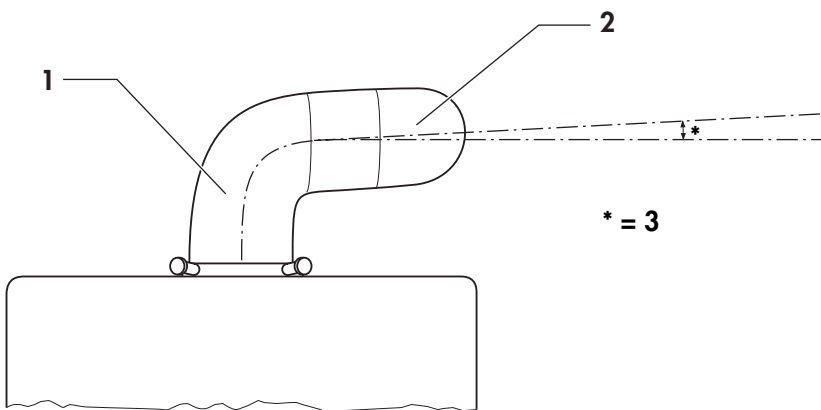


Fig. 6.2: Arrangement of 2 x 87° elbows - View from front

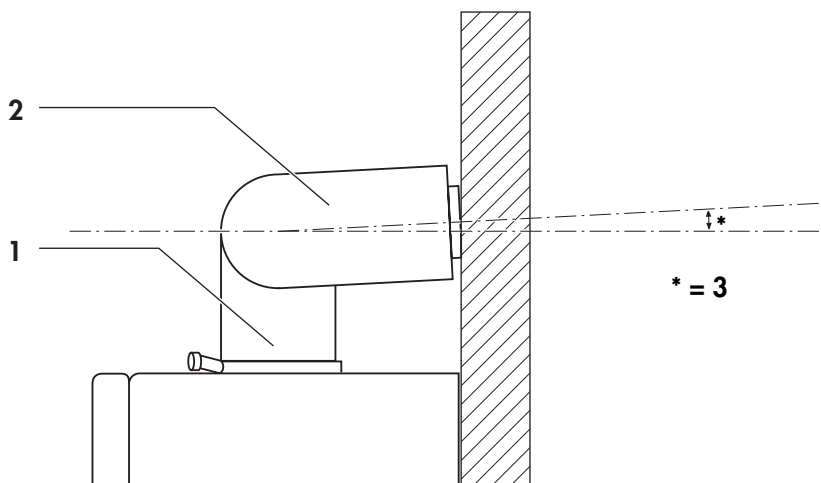
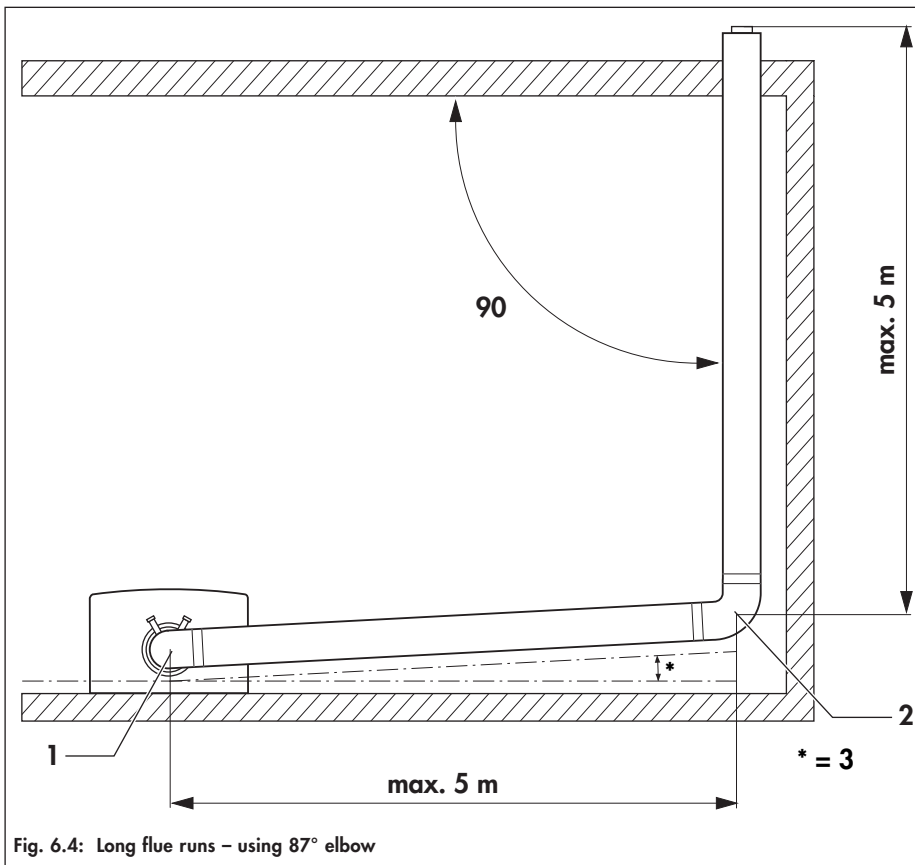


Fig. 6.3: Arrangement of 2 x 87° elbows - View from side

## FITTING AIR/FLUE DUCT EXTENSIONS

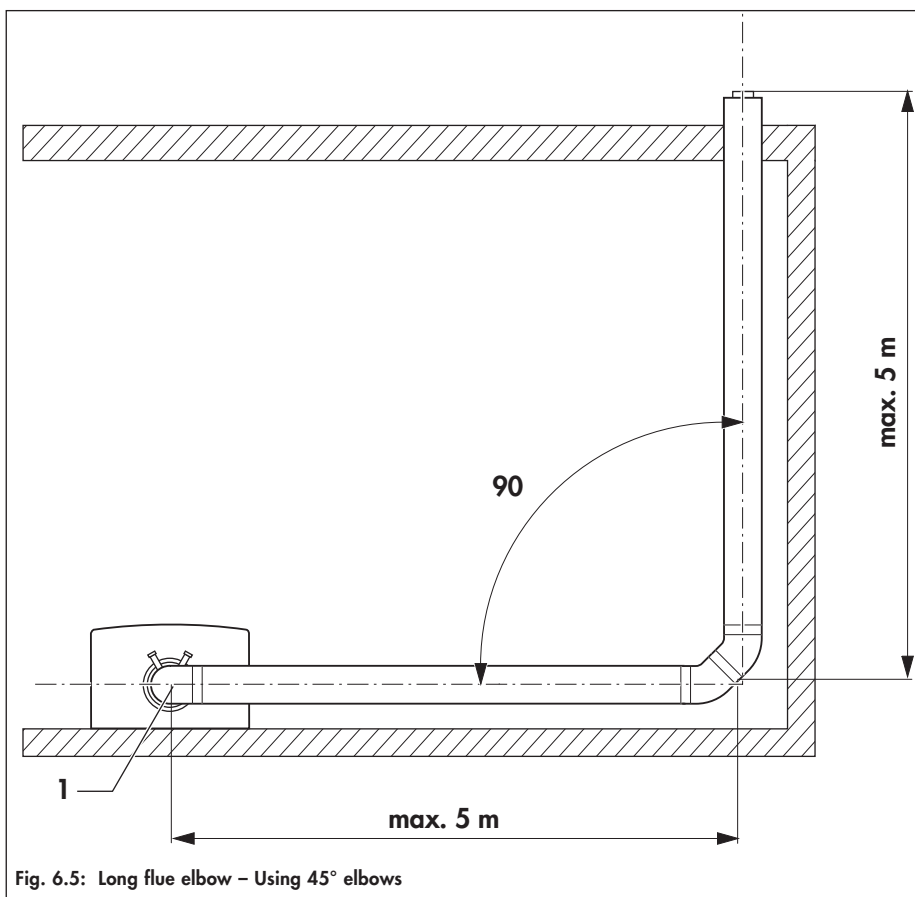


- When using elbows for long flue runs in a corner follow fig. 6.4 and fig. 6.5 to avoid obstructions.

**Note:** The elbows must be correctly aligned to avoid undue stress on the joints and risk of leakage.

The elbow fitted to the top of the boiler (1) should be twisted by 3° to ensure that the second 87° elbow (2) exits the wall perpendicular.

When using 87° elbow install with a slope of 3° between wall and air-flue pipe (fig. 6.4) or use 2 x 45° elbows (fig. 6.5).







## FITTING AIR/FLUE DUCT EXTENSIONS

### How to install 87° elbows

Accy. No.: 303 210

Example:

An offset of 400 mm is measured. This value is then used, along with the table below, to determine the length of the air conduit (= 190 mm in this case).



**Important:**

This gives a corresponding exhaust-conduit length of  $190 + 40 = 230$  mm.

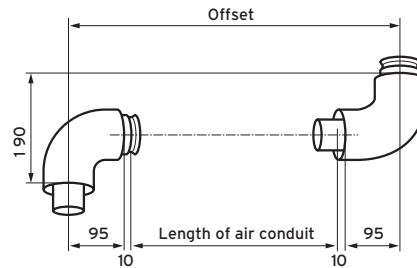
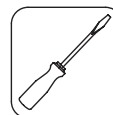


Fig. 6.3: Installation of 90° elbows

Table 6.1: Length of surplus with 90° elbows

Offset [in mm]	Length of air conduit [in mm]	Offset [in mm]	Length of air conduit [in mm]	Offset [in mm]	Length of air conduit [in mm]
200, 205 210,	0	505	295	730	520
	0	510	300	735	525
		515	305	740	530
> 210 to < 310 mm	<b>not possible</b>	520	310	745	535
		525	315	750	540
		530	320	755	545
310	100	535	325	760	550
315	105	540	330	765	555
320	110	545	335	770	560
325	115	550	340	775	565
330	120	555	345	780	570
335	125	560	350	785	575
340	130	565	355	790	580
345	135	570	360	795	585
350	140	575	365	800	590
355	145	580	370	805	595
360	150	585	375	810	600
365	155	590	380	815	605
370	160	595	385	820	610
375	165	600	390	825	615
380	170	605	395	830	620
385	175	610	400	835	625
390	180	615	405	840	630
395	185	620	410	845	635
400	190	625	415	850	640
405	195	630	420	855	645
410	200	635	425	860	650
415	205	640	430	865	655
420	210	645	435	870	660
425	215	650	440	875	665
430	220	655	445	880	670
435	225	660	450	885	675
440	230	665	455	890	680
445	235	670	460	895	685
450	240	675	465	900	690
455	245	680	470	905	695
460	250	685	475	910	700
465	255	690	480	915	705
470	260	695	485	920	710
475	265	700	490	925	715
480	270	705	495	930	720
485	275	710	500	935	725
490	280	715	505	940	730
495	285	720	510		
500	290	725	515		

GU\_LAZ 102/2GB



## How to install 45° elbows

Accy. No.: 303 211

Example:

An offset of 400 mm is measured.  
This value is then used, along with the table below, to determine the length of the air conduit (= 284 mm) and the height (= 420 mm).



### Important:

This gives a corresponding exhaust-conduit length of  $284 + 40 = 324$  mm.

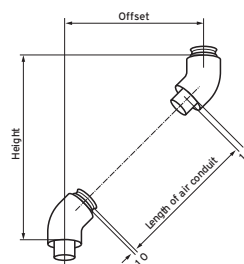


Fig. 6.4: Installation of 45° bends

GUJAZ 103/2GB

Table 6.2: Length of surplus with 45° bends

Offset [in mm]	Length of air conduit [in mm]	Height [in mm]	Offset [in mm]	Length of air conduit [in mm]	Height [in mm]	Offset [in mm]	Length of air conduit [in mm]	Height [in mm]
90	0	210	335	334	455	535	617	655
95	0	215	340	341	460	540	624	660
100	0	220	345	348	465	545	631	665
> 100 to < 170 mm	not possible		350	355	470	550	638	670
			355	362	475	555	645	675
			360	369	480	560	652	680
			365	376	485	565	659	685
			370	383	490	570	666	690
170	100	290	375	390	495	575	673	695
175	108	295	380	397	500	580	680	700
180	115	300	385	405	505	585	687	705
185	122	305	390	412	510	590	695	710
190	129	310	395	419	515	595	702	715
195	136	315	400	426	520	600	709	720
200	143	320	405	433	525	605	716	725
205	150	325	410	440	530	610	723	730
210	157	330	415	447	535	615	730	735
215	164	335	420	454	540	620	737	740
220	171	340	425	461	545	625	744	745
225	178	345	430	468	550	630	751	750
230	185	350	435	475	555	635	758	755
235	192	355	440	482	560	640	765	760
240	199	360	445	489	565	645	772	765
245	207	365	450	496	570	650	779	770
250	214	370	455	504	575	655	786	775
255	221	375	460	511	580	660	794	780
260	228	380	465	518	585	665	801	785
265	235	385	470	525	590	670	808	790
270	242	390	475	532	595	675	815	795
275	249	395	480	539	600	680	822	800
280	256	400	485	546	605	685	829	805
285	263	405	490	553	610	690	836	810
290	270	410	495	560	615	695	843	815
295	277	415	500	567	620	700	850	820
300	284	420	505	574	625	705	857	825
305	291	425	510	581	630	710	864	830
310	298	430	515	588	635	715	871	835
315	306	435	520	596	640	720	878	840
320	313	440	525	603	645			
325	320	445	530	610	650			
330	327	450						









**Vaillant Ltd**

Vaillant House ■ Medway City Estate ■ Trident Close ■ Rochester ■ Kent ME2 4EZ  
Telephone 01634 292300 ■ Fax 01634 290166 ■ [www.vaillant.co.uk](http://www.vaillant.co.uk) ■ [info@vaillant.co.uk](mailto:info@vaillant.co.uk)

# Spare part catalogue

0020010870.01 GB 03/2006



Wall-hung boilers ecoTEC plus 824, 831, 837, 612, 615, 618, 624, 630, 637

- VUW 246/3-5
- VUW 246/3-5 R1
- VUW 316/3-5
- VUW 316/3-5 R1
- VUW 376/3-5 R1
- VU 126/3-5
- VU 126/3-5 R1
- VU 156/3-5
- VU 156/3-5 R1
- VU 186/3-5
- VU 186/3-5 R1
- VU 246/3-5
- VU 246/3-5 R1
- VU 306/3-5
- VU 306/3-5 R1
- VU 376/3-5 R1





# Content

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<b>06 Heat exchanger</b>		Page 6
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<b>08a Connection parts</b>		Page 14
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<b>General view of sheet</b>	ecoTEC plus 612 VU 126/3-5 + R1 ecoTEC plus 615 VU 156/3-5 + R1 ecoTEC plus 618 VU 186/3-5 + R1 ecoTEC plus 624 VU 246/3-5 + R1 ecoTEC plus 630 VU 306/3-5 + R1 ecoTEC plus 637 VU 376/3-5 R1	Page 21
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In order to maintain the safe and efficient operation of this appliance, only genuine Vaillant spare parts must be used.

Subject to alteration !

Attention: Please take the gross price from the valid price list !

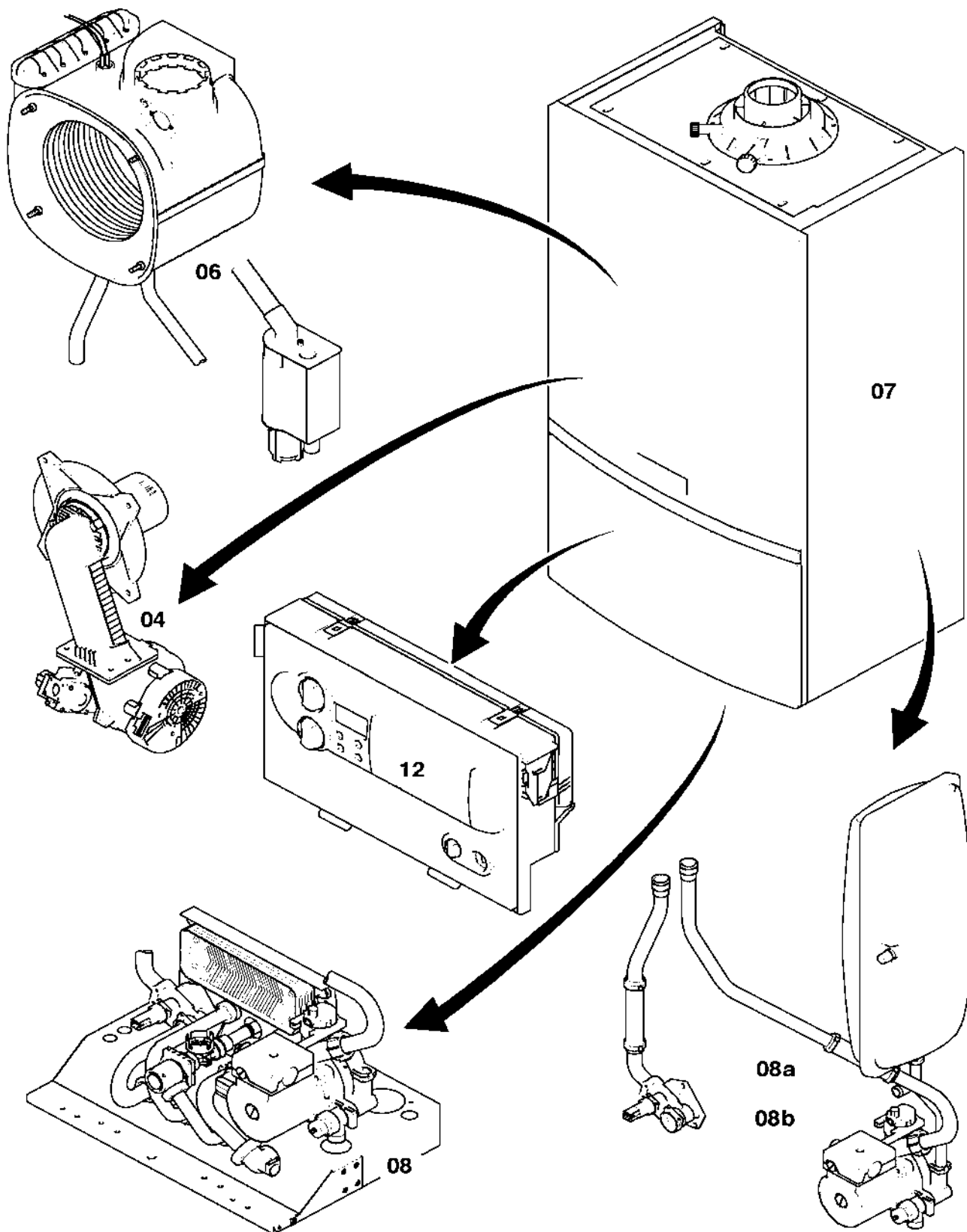


## General view of sheet

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1



02 - 00 - 077.01

Subject to alteration !

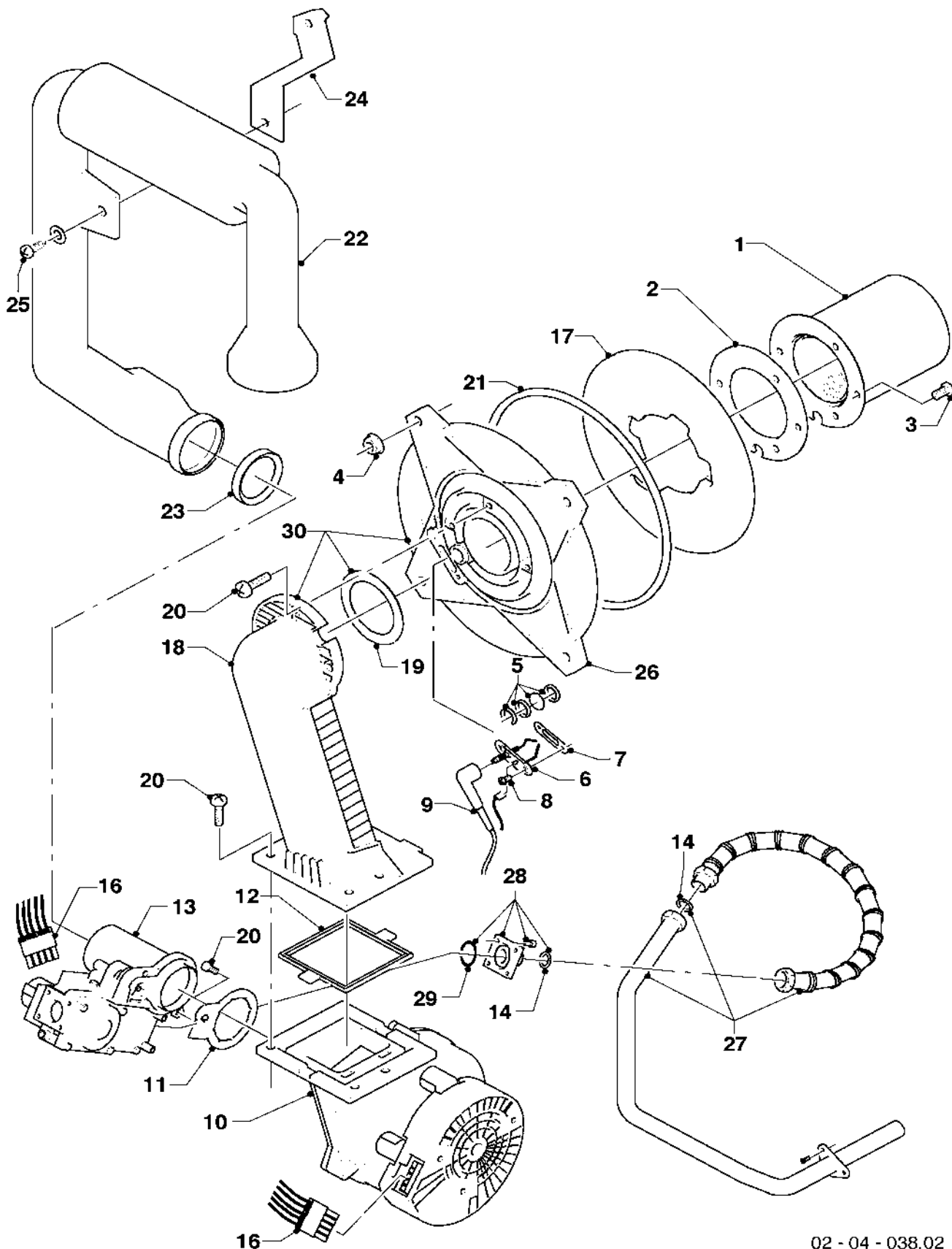
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## 04 Burner

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1



02 - 04 - 038.02

## 04 Burner

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-04-038	
00	0020010641	conversion set	H -> P (not shown)
00	0020010642	conversion set	P -> H (not shown)
01	049324	burner	VUW 246/3-5, with parts 02, 03
01	049324	burner	VUW 246/3-5 R1, with parts 02, 03
01	049345	burner	VUW 316/3-5, with parts 02, 03
01	049345	burner	VUW 316/3-5 R1, with parts 02, 03
01	050430	burner	VUW 376/3-5 R1, with parts 02, 03
02	981103	sealing ring, cpl.	
03	105900	screw, cpl. (set of 10)	
04	114828	flanged nut	
05	161245	inspection glass	
06	090709	ignition/monitoring electrode	
07	980961	gasket electrode	
08	118883	screw	
09	193590	ignition cable	
10	193593	fan	with parts 11, 12
11	981104	packing ring cpl.	
12	193594	packingring cpl.	
13	053470	gas valve	VUW 246/3-5, with parts 11, 14, 21
13	053470	gas valve	VUW 246/3-5 R1, with parts 11, 14, 21
13	053471	gas valve	VUW 316/3-5, with parts 11, 14, 21
13	053471	gas valve	VUW 316/3-5 R1, with parts 11, 14, 21
13	053500	gas valve	VUW 376/3-5 R1, with parts 11, 14, 21
14	981142	packingring (set of 10)	
16	193586	harness	VUW 246/3-5
16	193586	harness	VUW 246/3-5 R1
16	193586	harness	VUW 316/3-5
16	193586	harness	VUW 316/3-5 R1
16	0020025036	harness	VUW 376/3-5 R1
17	193595	insulation	with parts 02, 03
18	-	-	not available as spare part, see pos. 30
19	981107	packing ring cpl.	
20	193597	screw, cpl. (set of 10)	
21	0020025929	sealing gasket	
22	193599	air inlet duct, cpl.	VUW 246/3-5, with part 23
22	193599	air inlet duct, cpl.	VUW 246/3-5 R1, with part 23
22	103404	air inlet duct, cpl.	VUW 316/3-5, with part 23
22	103404	air inlet duct, cpl.	VUW 316/3-5 R1, with part 23
22	0020025039	air inlet duct, cpl.	VUW 376/3-5 R1, with part 23
23	981111	packingring cpl.	
24	103405	support, cpl.	
25	235756	screw	
26	-	-	not available as spare part, see pos. 30
27	180945	gas pipe	with part 28
28	0020010868	adaptor piece (gas valve)	
29	982319	O-ring seal	
30	0020010867	flange (set)	with parts 02, 03, 04, 05, 07, 08, 12, 14, 17, 19, 20, 21

Subject to alteration !

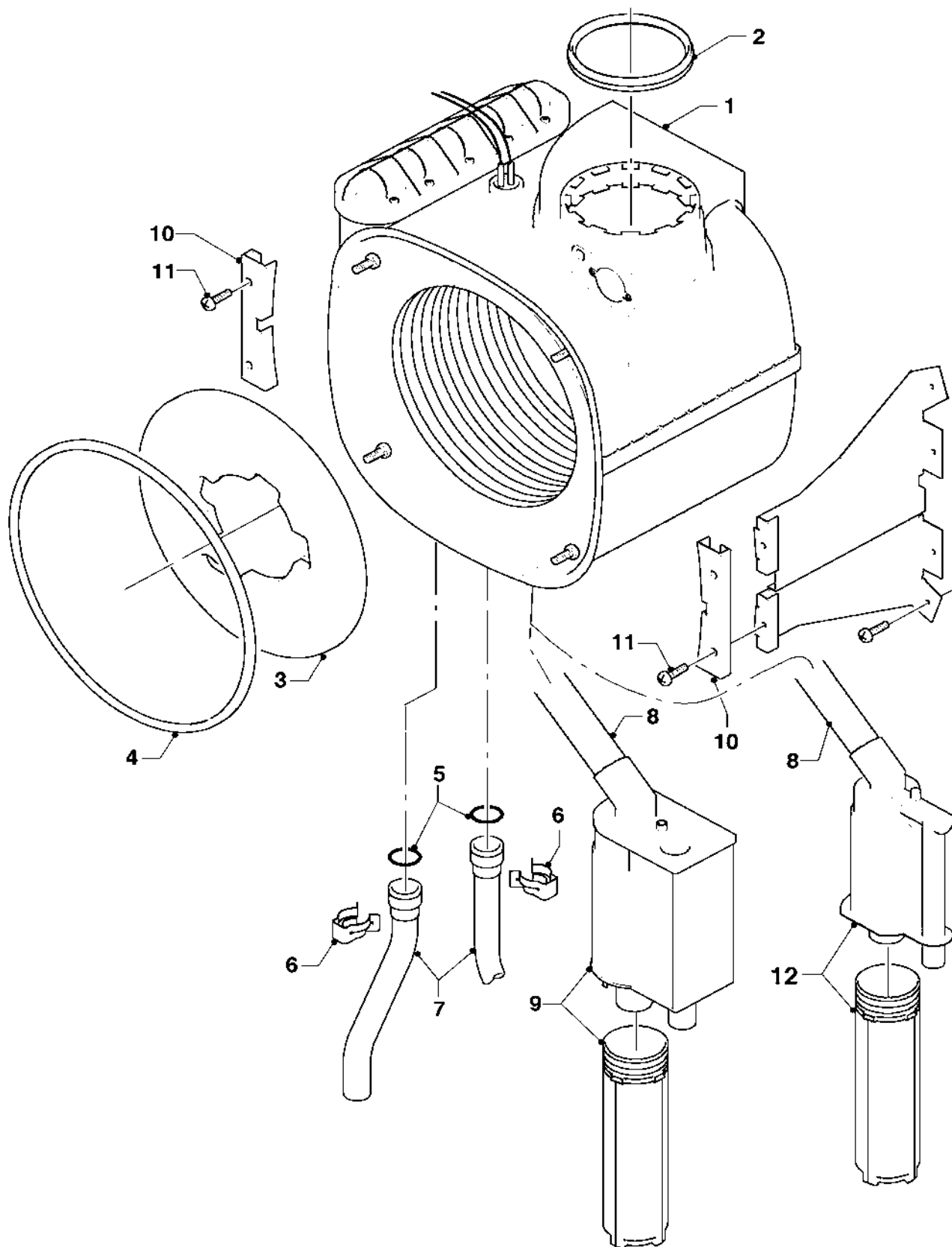
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## 06 Heat exchanger

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1



02 - 06 - 046.01

## 06 Heat exchanger

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-06-046	
01	103409	heat exchanger	VUW 246/3-5, with parts 02, 03, 04, 05, 06
01	0020018181	heat exchanger	VUW 246/3-5 R1, with parts 02, 03, 04, 05, 06
01	103411	heat exchanger	VUW 316/3-5, with parts 02, 03, 04, 05, 06
01	0020018182	heat exchanger	VUW 316/3-5 R1, with parts 02, 03, 04, 05, 06
01	0020025040	heat exchanger	VUW 376/3-5 R1, with parts 02, 03, 04, 05, 06
02	981227	packingring	
03	193595	insulation	
04	0020025929	sealing gasket	
05	103415	packingring (set of 10)	
06	103417	clip (set of 10)	
07	-	-	see main component 08a
08	-	-	not available as spare part, see pos. 09
09	180985	siphonic condensate trap	with part 08
10	180989	support, cpl. (set of 2)	with part 11
11	178968	screw (set of 10)	
12	-	-	not necessary

Subject to alteration !

Attention: Please take the gross price from the valid price list !

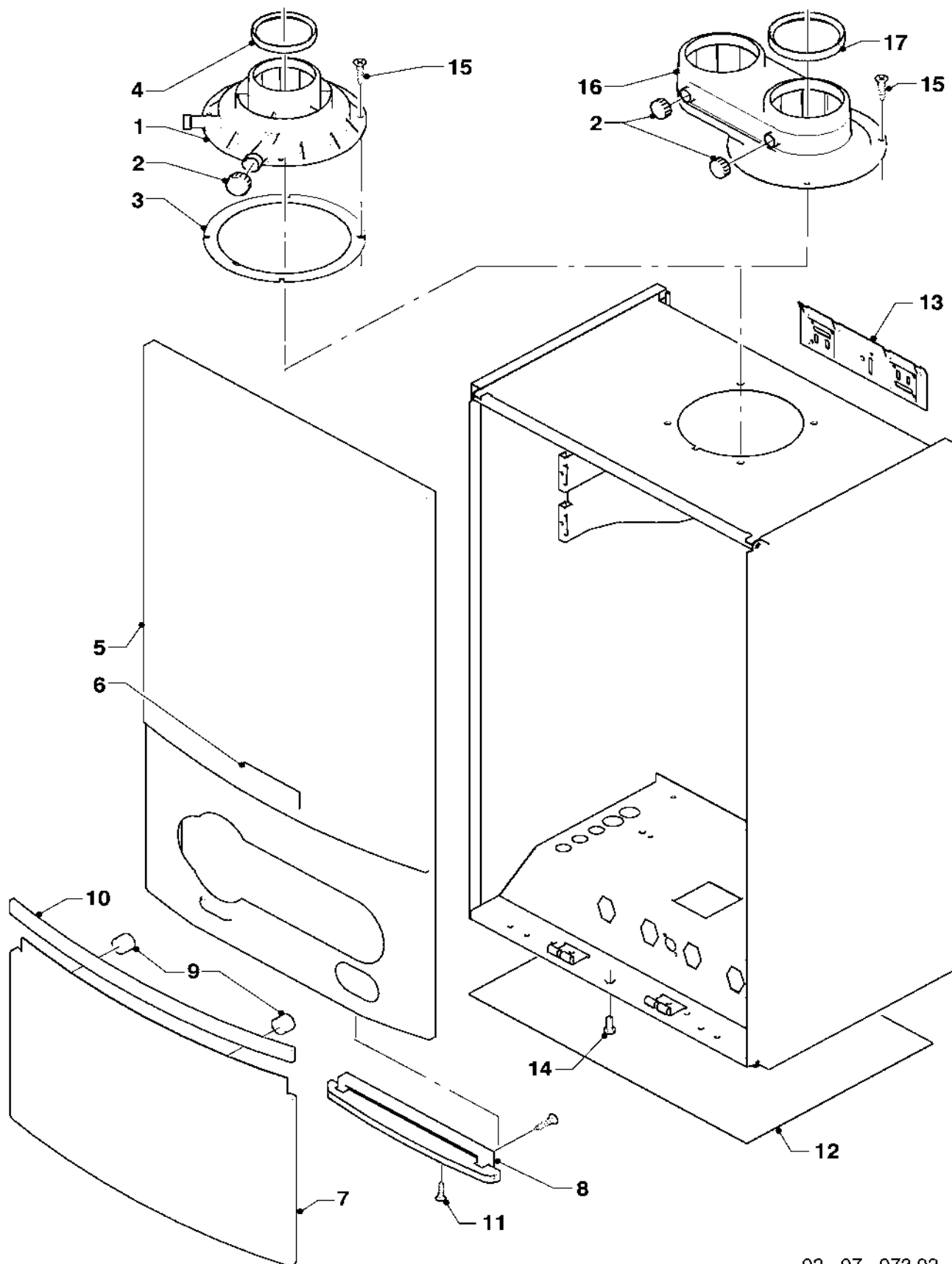


## 07 Casing parts

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1



02 - 07 - 073.02

## 07 Casing parts

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-07-073	
01	180932	flue adapter 60/100	with parts 02, 03, 04
02	147392	cap (set of 5)	
03	981232	packingring	
04	981233	packingring	
05	180935	covering, cpl.	VUW 246/3-5, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VUW 246/3-5 R1, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VUW 316/3-5, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VUW 316/3-5 R1, with parts 06, 07, 08, 09, 10, 11
05	180937	covering, cpl.	VUW 376/3-5 R1, with parts 06, 07, 08, 09, 10, 11
06	118096	badge, cpl.	
07	180940	cover	with parts 09, 10, 11
08	180944	hinge	with part 11
09	180941	magnet, cpl. (set of 2)	
10	180942	handle	
11	193538	screw (set of 10)	
12	180988	cover cpl.	
13	180987	support, cpl.	
14	139231	screw	
15	500046	screw	
16	-	-	not necessary
17	-	-	not necessary

Subject to alteration !

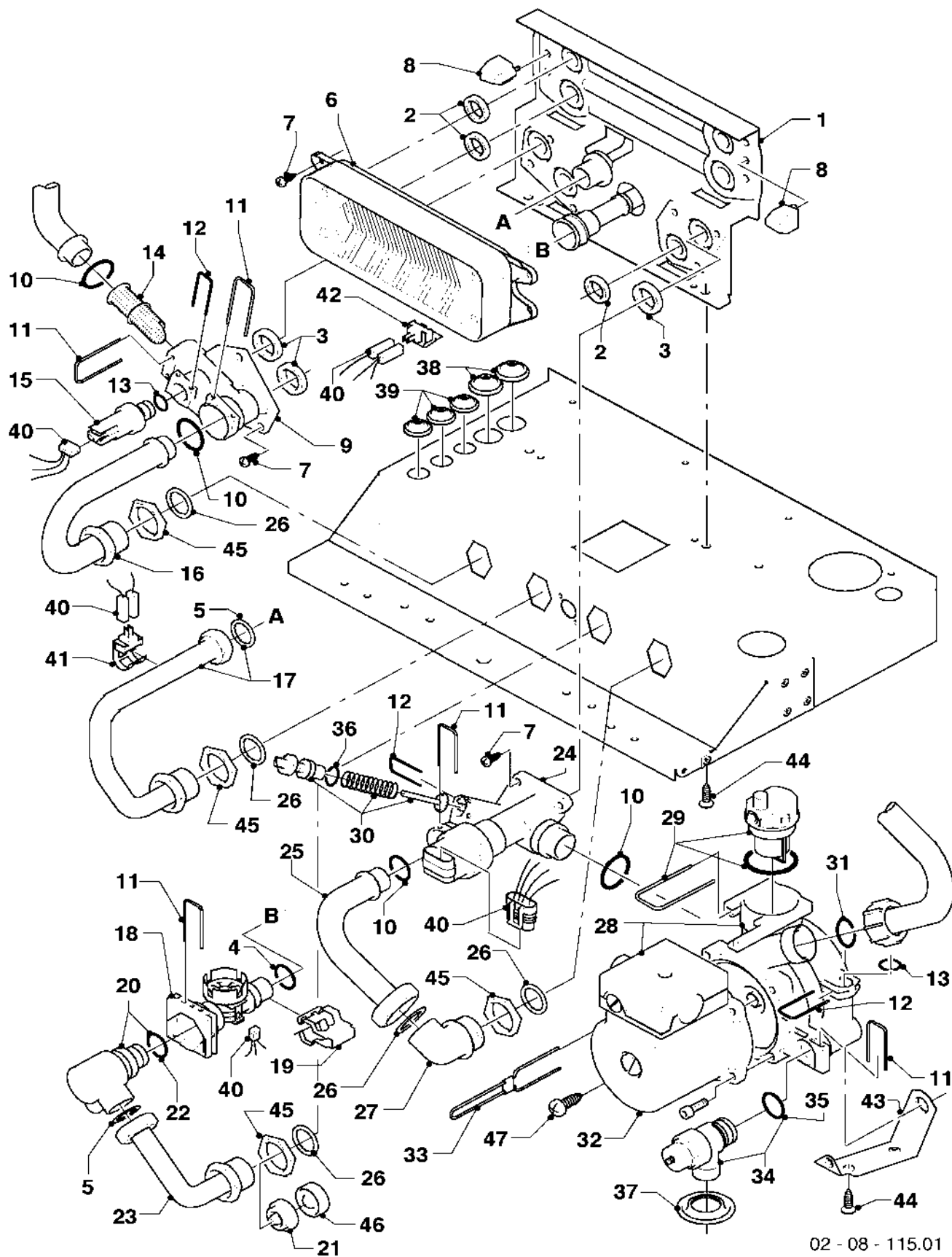
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## 08 Connection parts (Hydroblock)

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1



02 - 08 - 115.01

## 08 Connection parts (Hydroblock)

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-08-115	
01	178965	support	with parts 02, 03, 04, 05, 07, 08, 10, 19, 22, 26, 44
02	178969	packingring (set of 10)	
03	193535	packingring (set of 10)	
04	178991	packingring (set of 10)	
05	981142	packingring (set of 10)	
06	178973	DHW heat exchanger, 20 plates	VUW 246/3-5, with parts 02, 07
06	178973	DHW heat exchanger, 20 plates	VUW 246/3-5 R1, with parts 02, 07
06	178973	DHW heat exchanger, 20 plates	VUW 316/3-5, with parts 02, 07
06	178973	DHW heat exchanger, 20 plates	VUW 316/3-5 R1, with parts 02, 07
06	0020025041	<b>DHW heat exchanger, 36 plates</b>	<b>VUW 376/3-5 R1, with parts 02, 07</b>
07	178967	screw, cpl. (set of 10)	
08	193536	guide, phe (set of 2)	
09	179031	connection piece, cpl.	with parts 03, 07, 10, 11, 12, 13, 14
10	193537	packingring (set of 10)	
11	178992	clip (set of 10)	
12	154150	clip	
13	178993	packingring (set of 10)	
14	179030	filter, cpl.	with parts 10, 11
15	253595	CH pressure sensor	with parts 12, 13
16	179033	pipe	with parts 10, 26
17	179034	pipe	with part 26
18	178988	flow sensor, cpl. (black)	with parts 04, 11, 19, 22
19	178966	clip	
20	179032	connection piece, cpl.	with parts 05, 11, 22
21	012975	water quantity limitator (8.1 l/min)	VUW 246/3-5
21	012975	water quantity limitator (8.1 l/min)	VUW 246/3-5 R1
21	0020018069	water quantity limitator (10.4 l/min)	VUW 316/3-5
21	0020018069	water quantity limitator (10.4 l/min)	VUW 316/3-5 R1
21	012993	water quantity limitator (13 l/min)	VUW 376/3-5 R1
22	981163	packingring (set of 10)	
23	179037	pipe	with parts 05, 21, 26, 46
24	178978	diverter valve cpl.	with parts 02, 03, 07, 10, 11
25	179036	pipe	with parts 10, 26
26	981140	packingring (set of 10)	
27	179035	connection piece, cpl.	with part 26
28	178983	pump, cpl. (Vaillant 2004)	VUW 246/3-5, with parts 02, 03, 10, 11, 13, 29, 31, 34, 47
28	178983	pump, cpl. (Vaillant 2004)	VUW 246/3-5 R1, with parts 02, 03, 10, 11, 13, 29, 31, 34, 47
28	178983	pump, cpl. (Vaillant 2004)	VUW 316/3-5, with parts 02, 03, 10, 11, 13, 29, 31, 34, 47
28	178983	pump, cpl. (Vaillant 2004)	VUW 316/3-5 R1, with parts 02, 03, 10, 11, 13, 29, 31, 34, 47
28	0020025042	pump, cpl.	VUW 376/3-5 R1, with parts 02, 03, 10, 11, 13, 29, 31, 34, 47
29	104521	automatic air vent	
30	178980	bypass	with part 12
31	193539	packingring (set of 10)	
32	193534	pump head, cpl.	VUW 246/3-5
32	193534	pump head, cpl.	VUW 246/3-5 R1
32	193534	pump head, cpl.	VUW 316/3-5
32	193534	pump head, cpl.	VUW 316/3-5 R1
32	-	-	VUW 376/3-5 R1, not available as spare part
33	178981	clip	
34	178985	pressure relief valve, cpl. (3 bar)	with part 11

Subject to alteration !

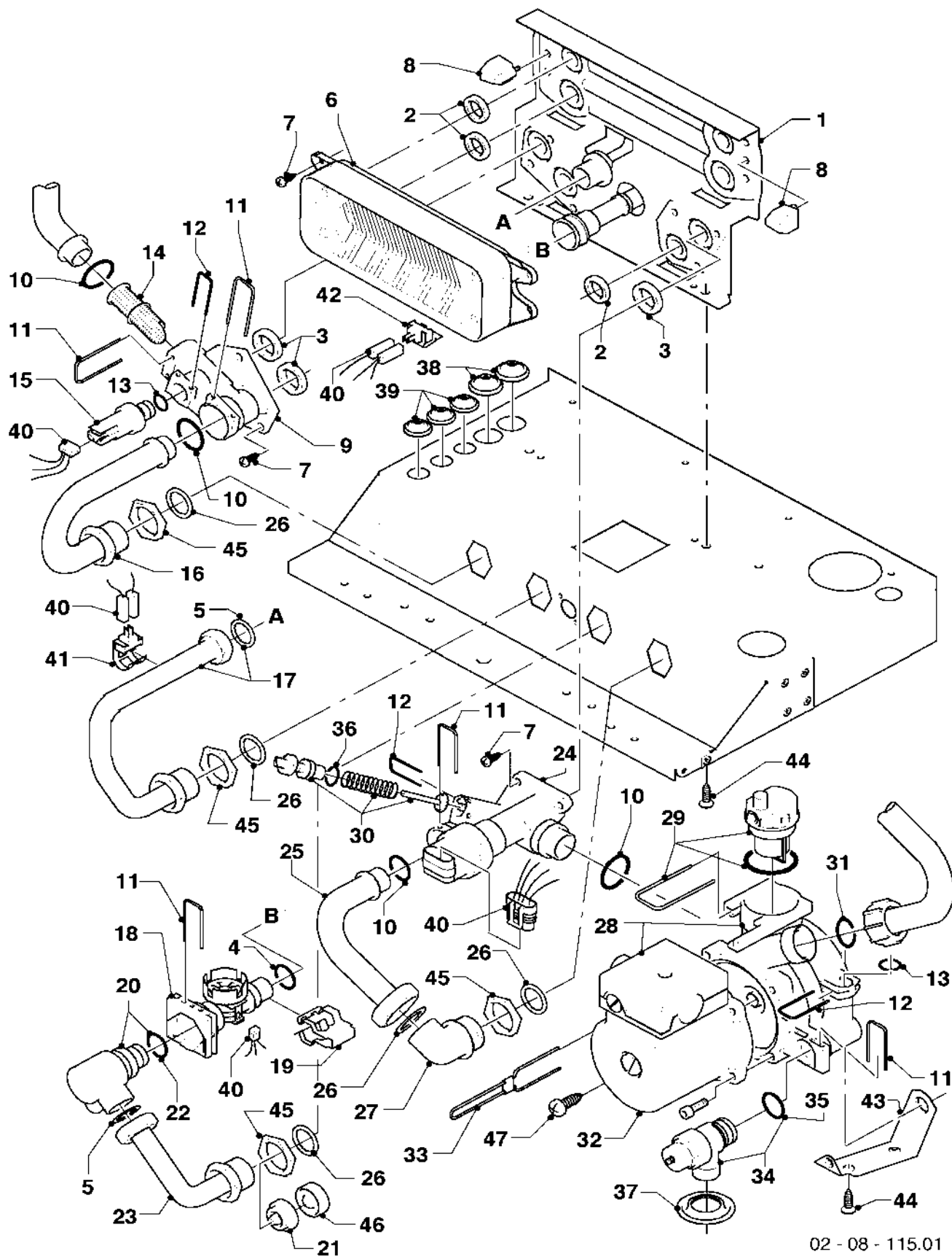
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## 08 Connection parts (Hydroblock)

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1



02 - 08 - 115.01

## 08 Connection parts (Hydroblock)

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-08-115	
35	-	-	not available as spare part, see pos. 34
36	981165	packingring (set of 10)	
37	980765	grommet	
38	509120	packingring (set of 10)	
39	509121	packingring (set of 10)	
40	193587	harness	VUW 246/3-5
40	193587	harness	VUW 246/3-5 R1
40	193587	harness	VUW 316/3-5
40	193587	harness	VUW 316/3-5 R1
40	0020025038	harness	VUW 376/3-5 R1
41	103429	NTC-sensor (DHW outlet pipe)	flow
42	103430	NTC-sensor (DHW heat exchanger)	heat exchanger
43	178984	support, cpl.	
44	235715	screw	
45	193598	nut (set of 4)	
46	074514	filter, cpl.	
47	235756	screw	

Subject to alteration !

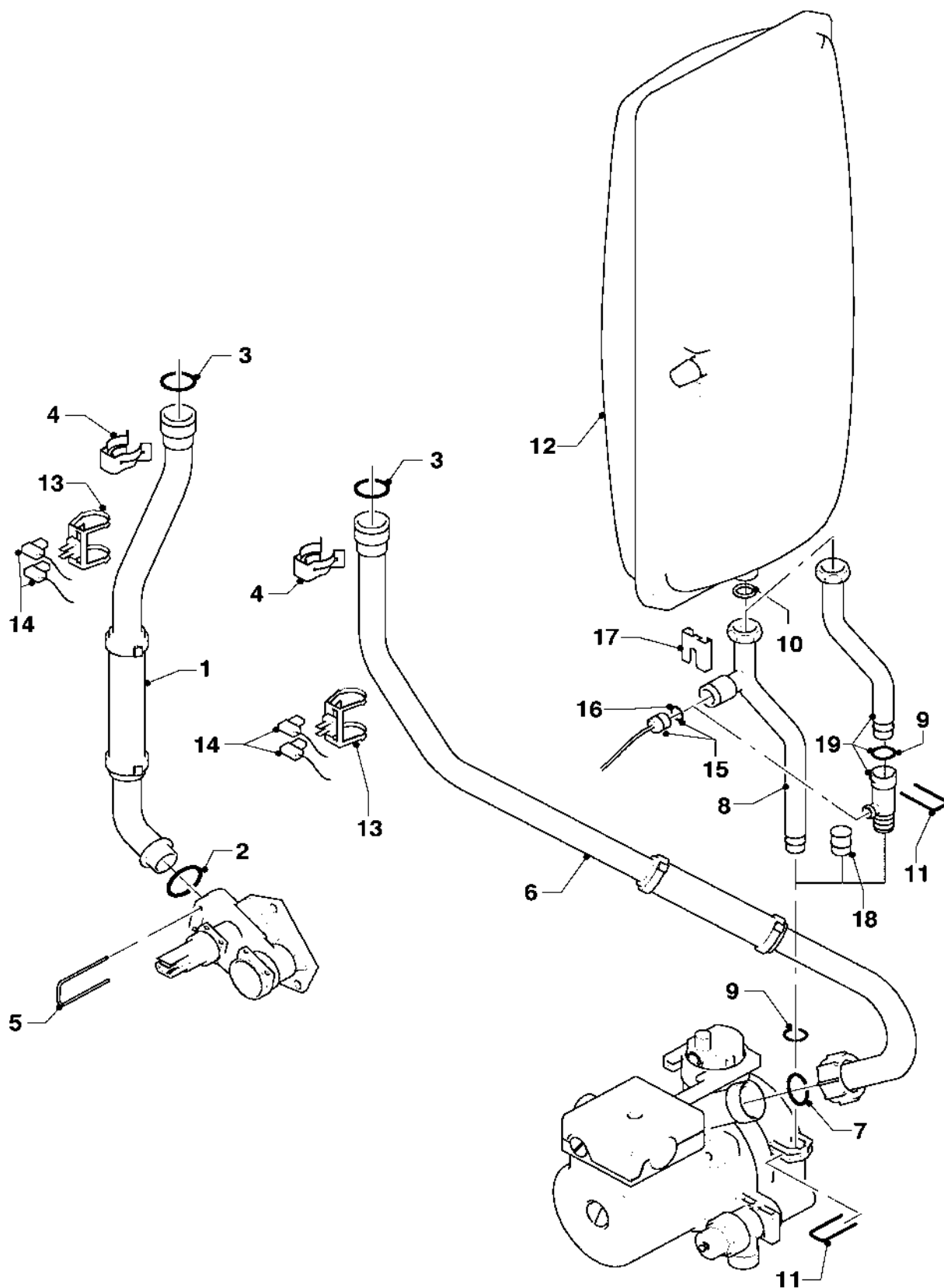
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## 08a Connection parts

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1



02 - 08 - 120.02

## 08a Connection parts

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-08-120	
01	180946	connection tube, cpl.	with parts 02, 03
02	193537	packingring (set of 10)	
03	103415	packingring (set of 10)	
04	103417	clip (set of 10)	
05	178992	clip (set of 10)	
06	180948	connection tube, cpl.	with parts 03, 07
07	193539	packingring (set of 10)	
08	180949	connection tube, cpl.	with parts 09, 10
09	178993	packingring (set of 10)	
10	981149	packingring (set of 10)	
11	154150	clip	
12	181051	expansion vessel, cpl.	10 Liter, with part 10
13	193592	NTC sensor (CH flow/CH return)	
14	193586	harness	VUW 246/3-5
14	193586	harness	VUW 246/3-5 R1
14	193586	harness	VUW 316/3-5
14	193586	harness	VUW 316/3-5 R1
14	0020025036	harness	VUW 376/3-5 R1
15	180982	pressure gauge	
16	981155	packingring (set of 10)	
17	085751	pressure gauge clip	
18	-	not necessary	
19	0020025045	connection tube, cpl.	with parts 10, 11, 16, 17

Subject to alteration !

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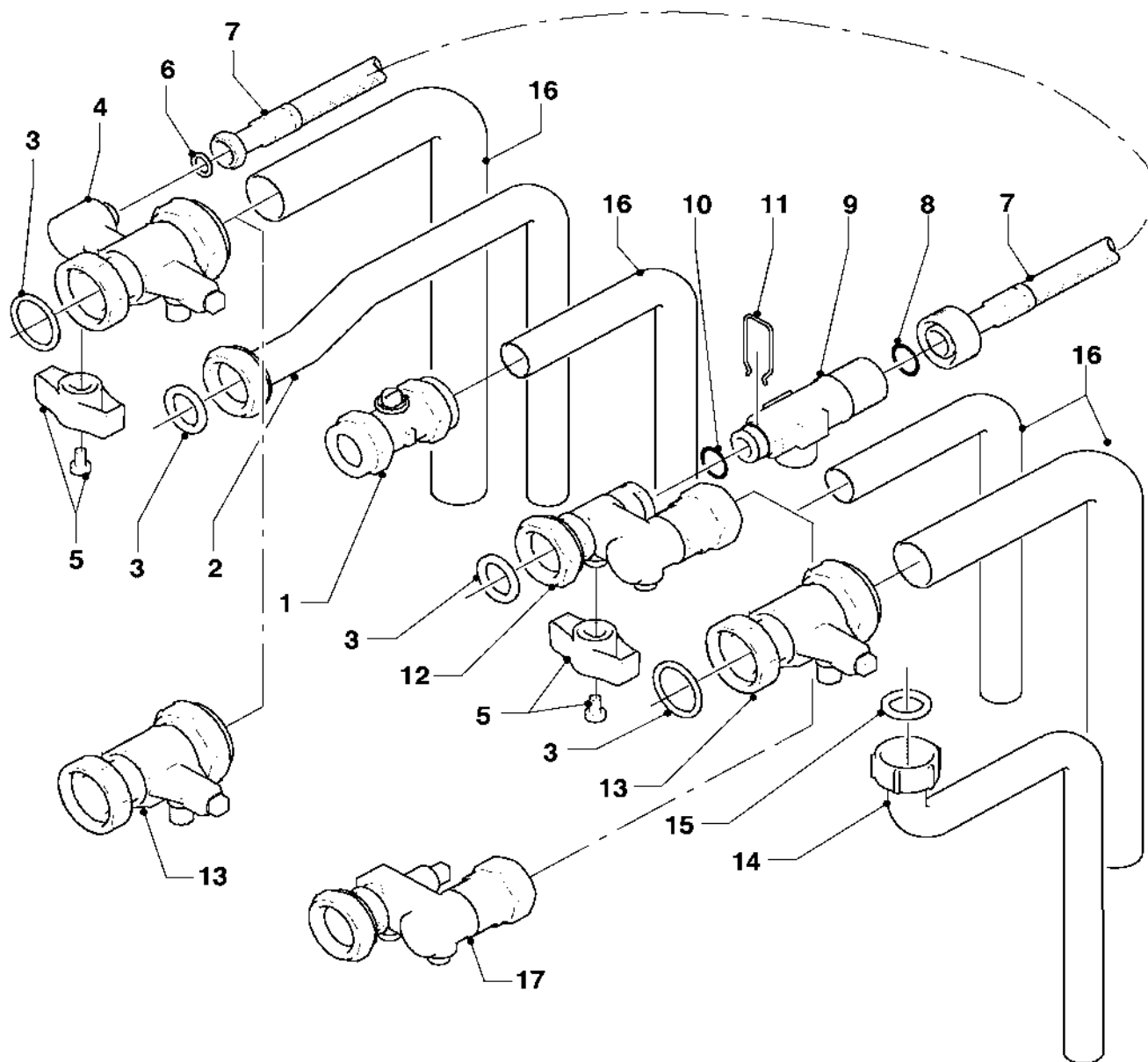


## 08b Connection parts (Acc.)

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1



02 - 08 - 125.01

## 08b Connection parts (Acc.)

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-08-125	
01	082782	gas shut-off valve, cpl.	VUW 246/3-5
01	082782	gas shut-off valve, cpl.	VUW 246/3-5 R1
01	082782	gas shut-off valve, cpl.	VUW 316/3-5
01	082782	gas shut-off valve, cpl.	VUW 316/3-5 R1
01	082794	gas shut-off valve, cpl. 36kW	VUW 376/3-5 R1
02	0020010290	pipe	with part 03
03	981140	packingring (set of 10)	
04	0020010291	service cock, cpl.	with parts 03, 05, 06
05	0020010292	handle (set of 2)	
06	981146	packingring (set of 10)	
07	0020010293	flexible tube, cpl.	with parts 06, 08
08	981165	packingring (set of 10)	
09	0020010294	valve, cpl.	with parts 08, 10, 11
10	981154	packingring (set of 10)	
11	154150	clip	
12	0020010295	valve, cpl.	with parts 03, 05, 10, 11
13	0020010296	service cock	with part 03
14	0020010297	pipe	with part 15
15	0020010298	packingring (set of 10)	
16	-	-	not available as spare part
17	-	-	not necessary

Subject to alteration !

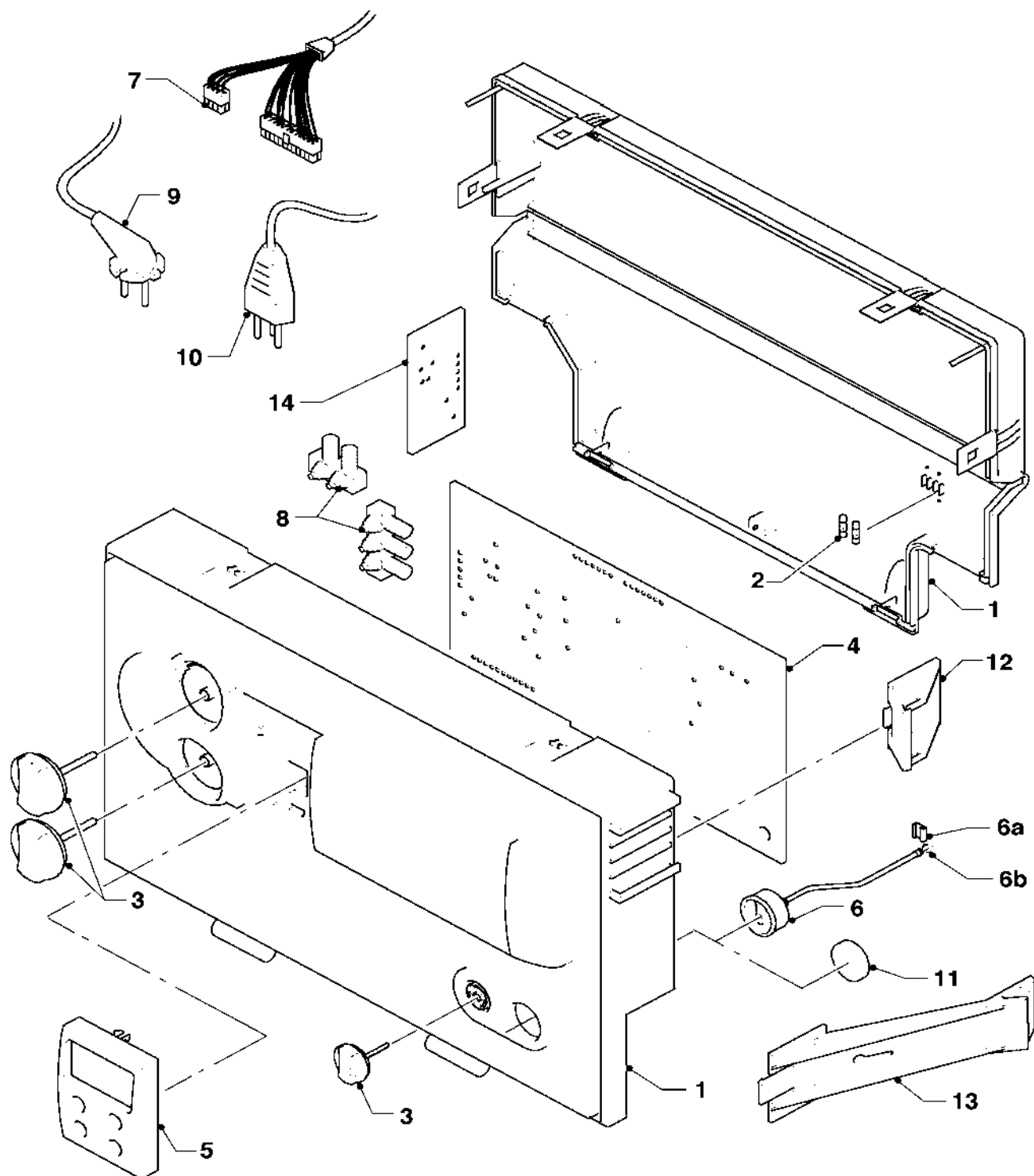
Attention: Please take the gross price from the valid price list !

## 12 Control box

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1



02 - 12 - 046.02

## 12 Control box

ecoTEC plus 824 VUW 246/3-5 + R1

ecoTEC plus 831 VUW 316/3-5 + R1

ecoTEC plus 837 VUW 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-12-046	
01	193582	casing, cpl.	
02	251955	fuse 2.0 AT (set of 10)	2.0 AT
03	117319	knobs, cpl. grey (3 knobs)	
04	0020028736	printed circuit board	with part 02
05	117321	display	
06	180982	pressure gauge	
06a	085751	pressure gauge clip	
06b	981155	packingring (set of 10)	
07	193586	harness	VUW 246/3-5, appliance
07	193586	harness	VUW 246/3-5 R1, appliance
07	193586	harness	VUW 316/3-5, appliance
07	193586	harness	VUW 316/3-5 R1, appliance
07	0020025036	harness	VUW 376/3-5 R1, appliance
07	193587	harness	VUW 246/3-5, hydraulik
07	193587	harness	VUW 246/3-5 R1, hydraulik
07	193587	harness	VUW 316/3-5, hydraulik
07	193587	harness	VUW 316/3-5 R1, hydraulik
07	0020025038	harness	VUW 376/3-5 R1, hydraulik
08	078533	cable fixation	
09	-	-	not necessary
10	-	-	not necessary
11	-	-	not necessary
12	193583	support, cpl.	VUW 246/3-5
12	193583	support, cpl.	VUW 246/3-5 R1
12	193584	support, cpl.	VUW 316/3-5
12	193584	support, cpl.	VUW 316/3-5 R1
12	193585	support, cpl.	VUW 376/3-5 R1
13	-	-	not necessary
14	-	-	not necessary

Subject to alteration !

Attention: Please take the gross price from the valid price list !

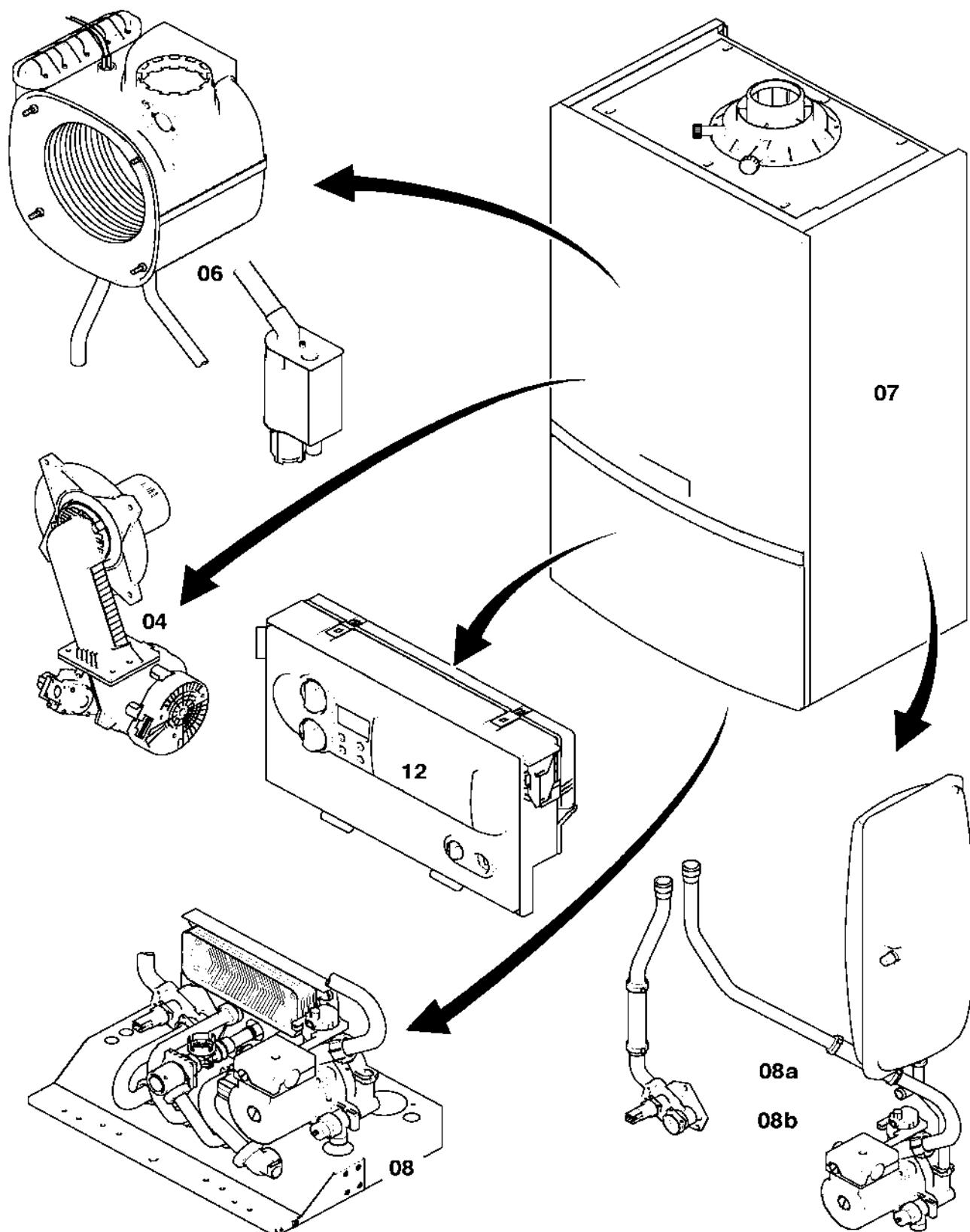


## General view of sheet

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 00 - 077.01

Subject to alteration !

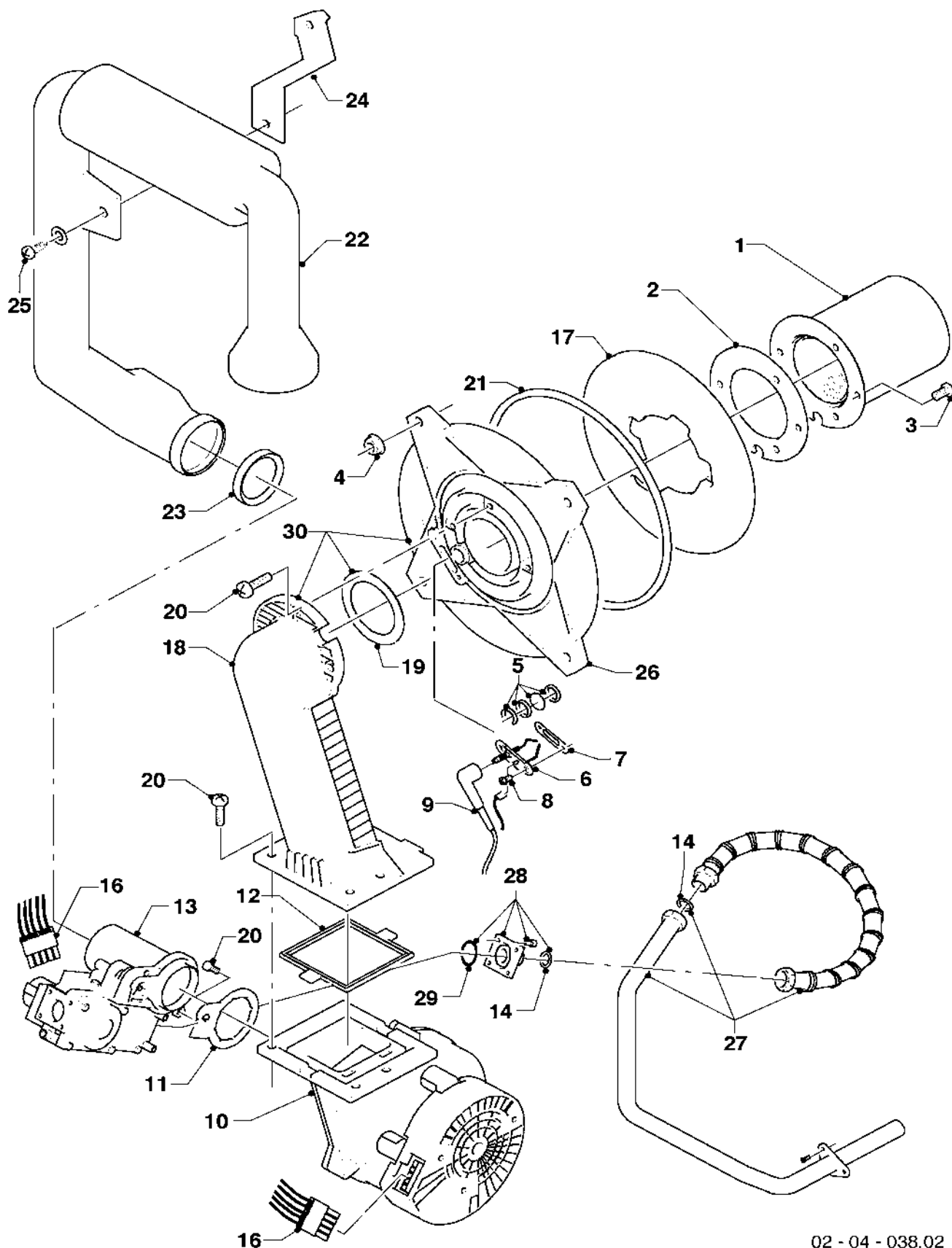
Attention: Please take the gross price from the valid price list !

## 04 Burner

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 04 - 038.02

## 04 Burner

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-04-038	
00	0020010641	conversion set	H -> P (not shown)
00	0020010642	conversion set	P -> H (not shown)
01	049324	burner	VU 126/3-5, with parts 02, 03
01	049324	burner	VU 126/3-5 R1, with parts 02, 03
01	049324	burner	VU 156/3-5, with parts 02, 03
01	049324	burner	VU 156/3-5 R1, with parts 02, 03
01	049324	burner	VU 186/3-5, with parts 02, 03
01	049324	burner	VU 186/3-5 R1, with parts 02, 03
01	049345	burner	VU 246/3-5, with parts 02, 03
01	049345	burner	VU 246/3-5 R1, with parts 02, 03
01	050430	burner	VU 306/3-5, with parts 02, 03
01	050430	burner	VU 306/3-5 R1, with parts 02, 03
01	050430	burner	VU 376/3-5 R1, with parts 02, 03
02	981103	sealing ring, cpl.	
03	105900	screw, cpl. (set of 10)	
04	114828	flanged nut	
05	161245	inspection glass	
06	090709	ignition/monitoring electrode	
07	980961	gasket electrode	
08	118883	screw	
09	193590	ignition cable	
10	193593	fan	with parts 11, 12
11	981104	packing ring cpl.	
12	193594	packingring cpl.	
13	053488	gas valve	VU 126/3-5, with parts 11, 14, 21
13	053488	gas valve	VU 126/3-5 R1, with parts 11, 14, 21
13	053488	gas valve	VU 156/3-5, with parts 11, 14, 21
13	053488	gas valve	VU 156/3-5 R1, with parts 11, 14, 21
13	053470	gas valve	VU 186/3-5, with parts 11, 14, 21
13	053470	gas valve	VU 186/3-5 R1, with parts 11, 14, 21
13	053471	gas valve	VU 246/3-5, with parts 11, 14, 21
13	053471	gas valve	VU 246/3-5 R1, with parts 11, 14, 21
13	053500	gas valve	VU 306/3-5, with parts 11, 14, 21
13	053500	gas valve	VU 306/3-5 R1, with parts 11, 14, 21
13	053500	gas valve	VU 376/3-5 R1, with parts 11, 14, 21
14	981142	packingring (set of 10)	
16	193586	harness	VU 126/3-5
16	193586	harness	VU 126/3-5 R1
16	193586	harness	VU 156/3-5
16	193586	harness	VU 156/3-5 R1
16	193586	harness	VU 186/3-5
16	193586	harness	VU 186/3-5 R1
16	193586	harness	VU 246/3-5
16	193586	harness	VU 246/3-5 R1
16	0020025036	harness	VU 306/3-5
16	0020025036	harness	VU 306/3-5 R1
16	0020025036	harness	VU 376/3-5 R1
17	193595	insulation	with parts 02, 03
18	-	-	not available as spare part, see pos. 30
19	981107	packing ring cpl.	

Subject to alteration !

Attention: Please take the gross price from the valid price list !

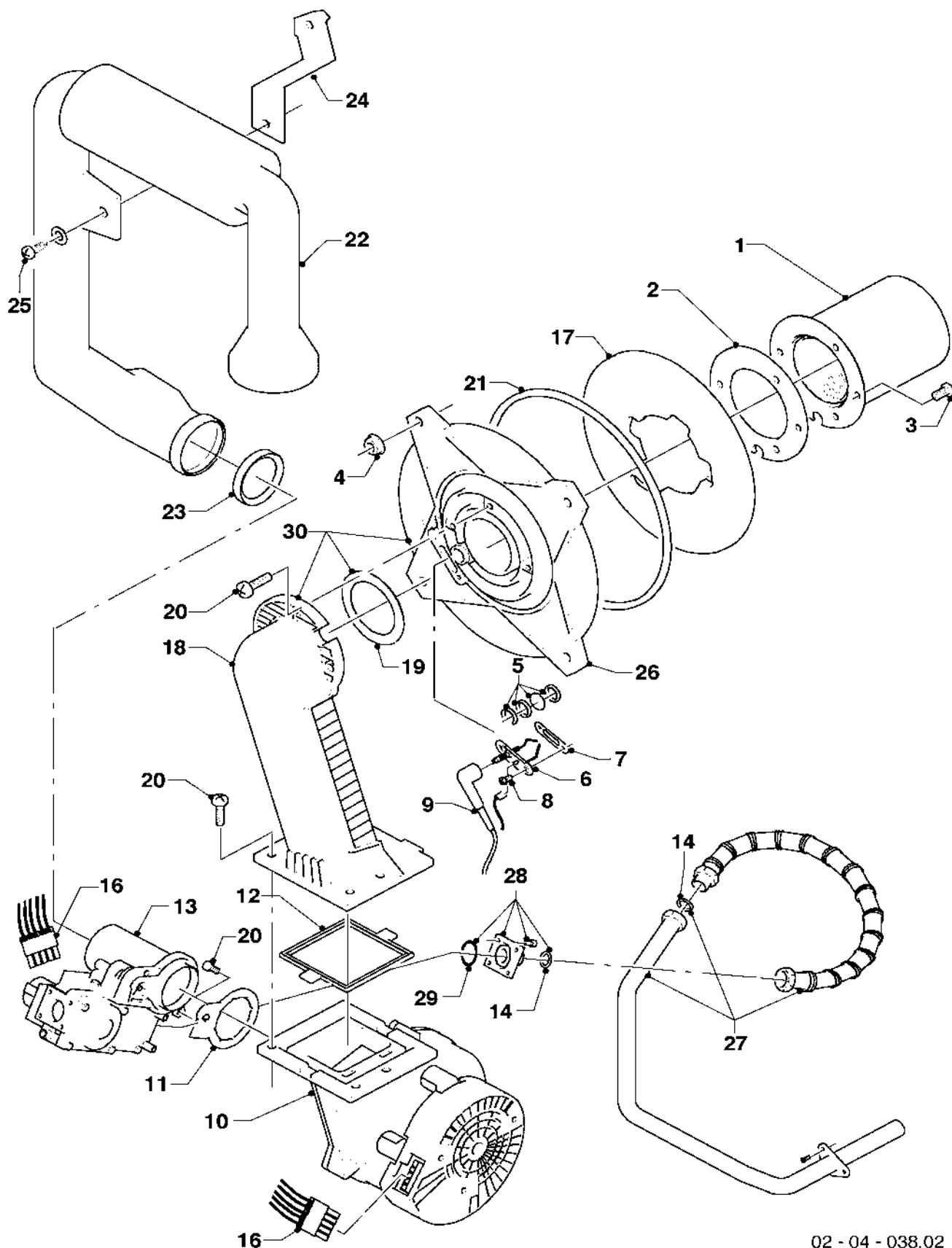


## 04 Burner

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 04 - 038.02

## 04 Burner

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-04-038	
20	193597	screw, cpl. (set of 10)	
21	0020025929	sealing gasket	
22	193599	air inlet duct, cpl.	VU 126/3-5, with part 23
22	193599	air inlet duct, cpl.	VU 126/3-5 R1, with part 23
22	193599	air inlet duct, cpl.	VU 156/3-5, with part 23
22	193599	air inlet duct, cpl.	VU 156/3-5 R1, with part 23
22	193599	air inlet duct, cpl.	VU 186/3-5, with part 23
22	193599	air inlet duct, cpl.	VU 186/3-5 R1, with part 23
22	103404	air inlet duct, cpl.	VU 246/3-5, with part 23
22	103404	air inlet duct, cpl.	VU 246/3-5 R1, with part 23
22	103404	air inlet duct, cpl.	VU 306/3-5, with part 23
22	103404	air inlet duct, cpl.	VU 306/3-5 R1, with part 23
22	0020025039	air inlet duct, cpl.	VU 376/3-5 R1, with part 23
23	981111	packingring cpl.	
24	103405	support, cpl.	
25	235756	screw	
26	-	-	not available as spare part, see pos. 30
27	180945	gas pipe	with part 28
28	0020010868	adaptor piece (gas valve)	
29	982319	O-ring seal	
30	0020010867	flange (set)	with parts 02, 03, 04, 05, 07, 08, 12, 14, 17, 19, 20, 21

Subject to alteration !

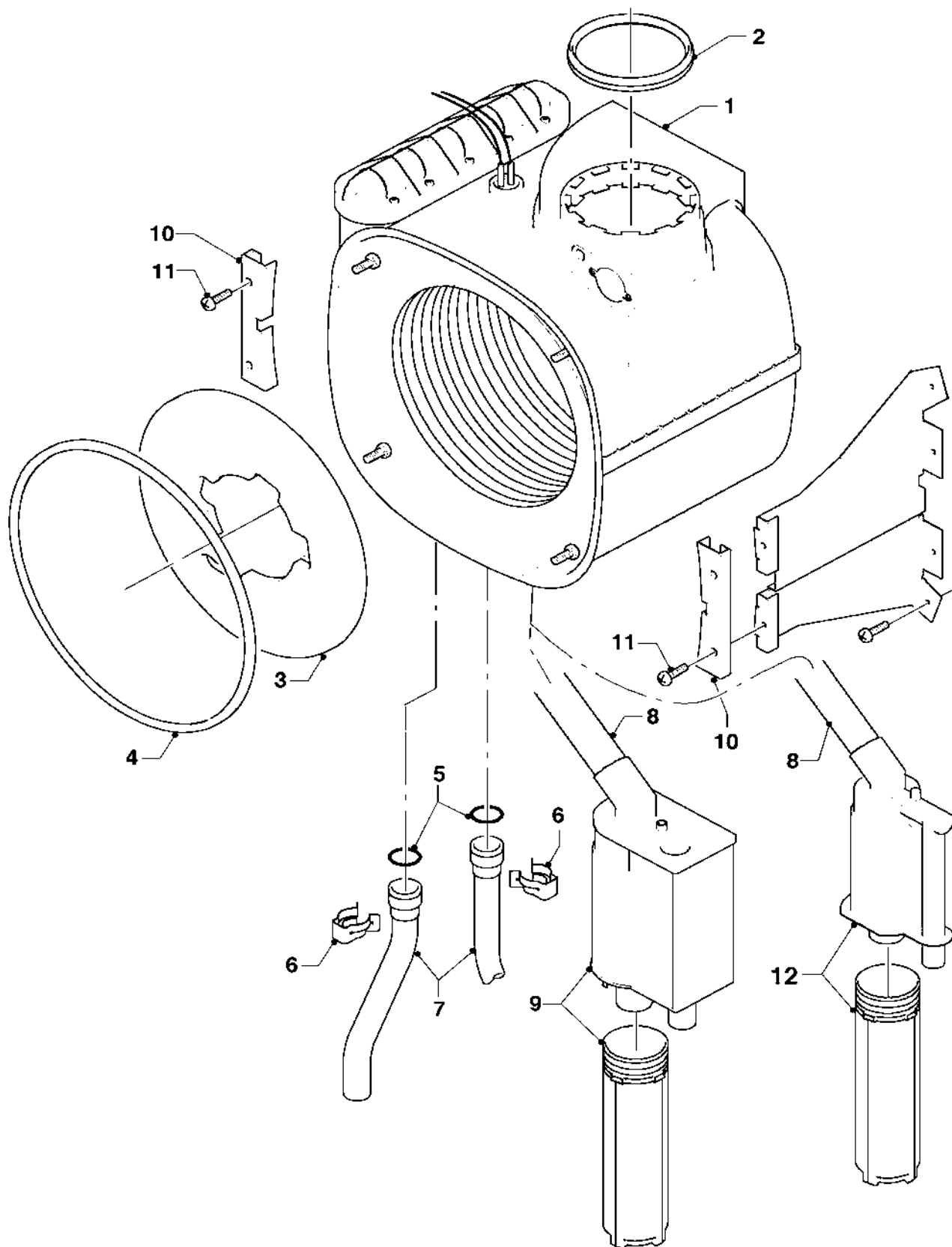
Attention: Please take the gross price from the valid price list !

## 06 Heat exchanger

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 06 - 046.01

## 06 Heat exchanger

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-06-046	
01	103409	heat exchanger	VU 126/3-5, with parts 02, 03, 04, 05, 06
01	0020018181	heat exchanger	VU 126/3-5 R1, with parts 02, 03, 04, 05, 06
01	103409	heat exchanger	VU 156/3-5, with parts 02, 03, 04, 05, 06
01	0020018181	heat exchanger	VU 156/3-5 R1, with parts 02, 03, 04, 05, 06
01	103409	heat exchanger	VU 186/3-5, with parts 02, 03, 04, 05, 06
01	0020018181	heat exchanger	VU 186/3-5 R1, with parts 02, 03, 04, 05, 06
01	103411	heat exchanger	VU 246/3-5, with parts 02, 03, 04, 05, 06
01	0020018182	heat exchanger	VU 246/3-5 R1, with parts 02, 03, 04, 05, 06
01	103412	heat exchanger	VU 306/3-5, with parts 02, 03, 04, 05, 06
01	0020018183	heat exchanger	VU 306/3-5 R1, with parts 02, 03, 04, 05, 06
01	0020025040	heat exchanger	VU 376/3-5 R1, with parts 02, 03, 04, 05, 06
02	981227	packingring	
03	193595	insulation	
04	0020025929	sealing gasket	
05	103415	packingring (set of 10)	
06	103417	clip (set of 10)	
07	-	-	see main component 08a
08	-	-	not available as spare part, see pos. 09
09	180985	siphonic condensate trap	with part 08
10	180989	support, cpl. (set of 2)	with part 11
11	178968	screw (set of 10)	
12	-	-	not necessary

Subject to alteration !

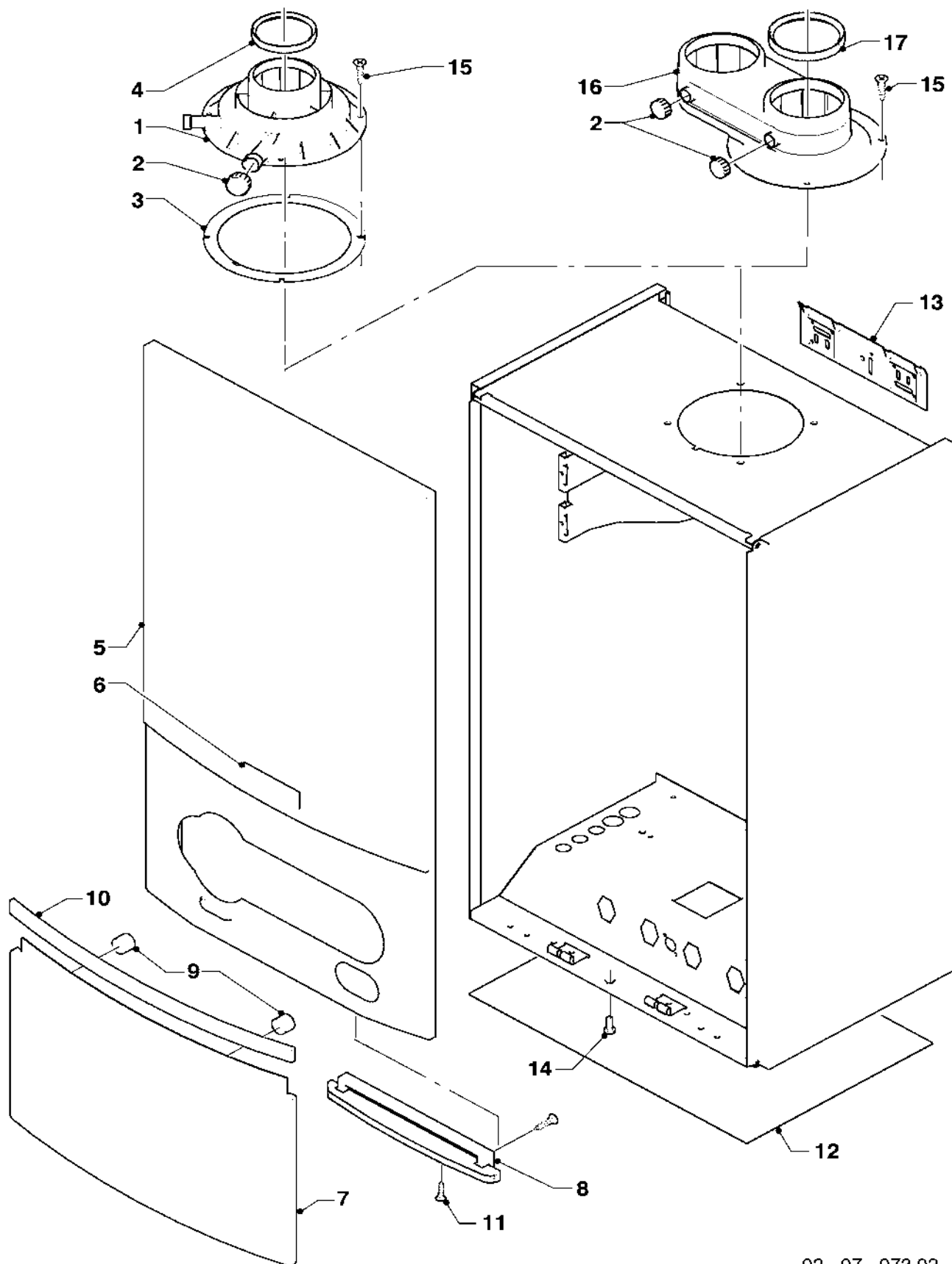
Attention: Please take the gross price from the valid price list !

## 07 Casing parts

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 07 - 073.02

## 07 Casing parts

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-07-073	
01	180932	flue adapter 60/100	with parts 02, 03, 04
02	147392	cap (set of 5)	
03	981232	packingring	
04	981233	packingring	
05	180935	covering, cpl.	VU 126/3-5, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VU 126/3-5 R1, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VU 156/3-5, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VU 156/3-5 R1, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VU 186/3-5, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VU 186/3-5 R1, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VU 246/3-5, with parts 06, 07, 08, 09, 10, 11
05	180935	covering, cpl.	VU 246/3-5 R1, with parts 06, 07, 08, 09, 10, 11
05	180936	covering, cpl.	VU 306/3-5, with parts 06, 07, 08, 09, 10, 11
05	180936	covering, cpl.	VU 306/3-5 R1, with parts 06, 07, 08, 09, 10, 11
05	180937	covering, cpl.	VU 376/3-5 R1, with parts 06, 07, 08, 09, 10, 11
06	118096	badge, cpl.	
07	180940	cover	with parts 09, 10, 11
08	180944	hinge	with part 11
09	180941	magnet, cpl. (set of 2)	
10	180942	handle	
11	193538	screw (set of 10)	
12	180988	cover cpl.	
13	180987	support, cpl.	
14	139231	screw	
15	500046	screw	
16	-	-	not necessary
17	-	-	not necessary

Subject to alteration !

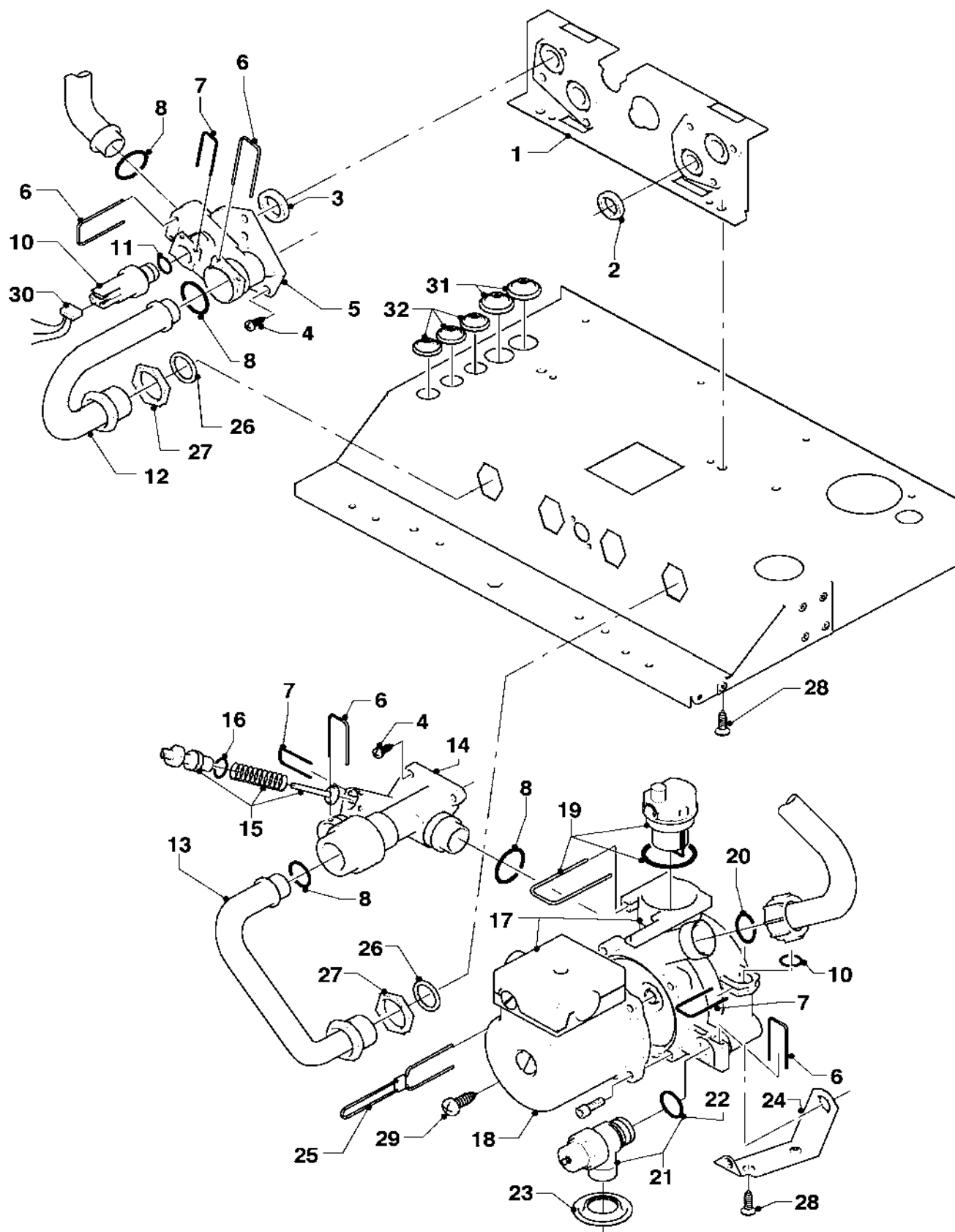
Attention: Please take the gross price from the valid price list !

## 08 Connection parts (Hydroblock)

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 08 - 121.01

## 08 Connection parts (Hydroblock)

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-08-121	
01	509142	support	with parts 02, 03, 07, 08, 26, 28
02	178969	packingring (set of 10)	
03	193535	packingring (set of 10)	
04	178967	screw, cpl. (set of 10)	
05	509143	connection piece,cpl.	with parts 03, 04, 06, 07, 08
06	178992	clip (set of 10)	
07	154150	clip	
08	193537	packingring (set of 10)	
10	253595	CH pressure sensor	with parts 06, 11
11	178993	packingring (set of 10)	
12	179033	pipe	with parts 08, 26
13	179036	pipe	with parts 08, 26
14	509119	connection piece,cpl.	with parts 02, 04, 06, 08, 15
15	178980	bypass	with part 07
16	193539	packingring (set of 10)	
17	178983	pump, cpl. (Vaillant 2004)	VU 126/3-5, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	178983	pump, cpl. (Vaillant 2004)	VU 126/3-5 R1, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	178983	pump, cpl. (Vaillant 2004)	VU 156/3-5, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	178983	pump, cpl. (Vaillant 2004)	VU 156/3-5 R1, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	178983	pump, cpl. (Vaillant 2004)	VU 186/3-5, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	178983	pump, cpl. (Vaillant 2004)	VU 186/3-5 R1, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	178983	pump, cpl. (Vaillant 2004)	VU 246/3-5, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	178983	pump, cpl. (Vaillant 2004)	VU 246/3-5 R1, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	178983	pump, cpl. (Vaillant 2004)	VU 306/3-5, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	178983	pump, cpl. (Vaillant 2004)	VU 306/3-5 R1, with parts 02, 06, 08, 10, 19, 20, 21, 29
17	0020025042	pump, cpl.	VU 376/3-5 R1, with parts 02, 06, 08, 10, 19, 20, 21, 29
18	193534	pump head, cpl.	VU 126/3-5
18	193534	pump head, cpl.	VU 126/3-5 R1
18	193534	pump head, cpl.	VU 156/3-5
18	193534	pump head, cpl.	VU 156/3-5 R1
18	193534	pump head, cpl.	VU 186/3-5
18	193534	pump head, cpl.	VU 186/3-5 R1
18	193534	pump head, cpl.	VU 246/3-5
18	193534	pump head, cpl.	VU 246/3-5 R1
18	193534	pump head, cpl.	VU 306/3-5
18	193534	pump head, cpl.	VU 306/3-5 R1
18	-	-	VU 376/3-5 R1, not available as spare part
19	104521	automatic air vent	
20	193539	packingring (set of 10)	
21	178985	pressure relief valve, cpl. (3 bar)	with part 06
22	-	-	not available as spare part, see pos. 21
23	980765	grommet	
24	178984	support, cpl.	
25	178981	clip	
26	981140	packingring (set of 10)	
27	193598	nut (set of 4)	
28	235715	screw	
29	235756	screw	

Subject to alteration !

Attention: Please take the gross price from the valid price list !

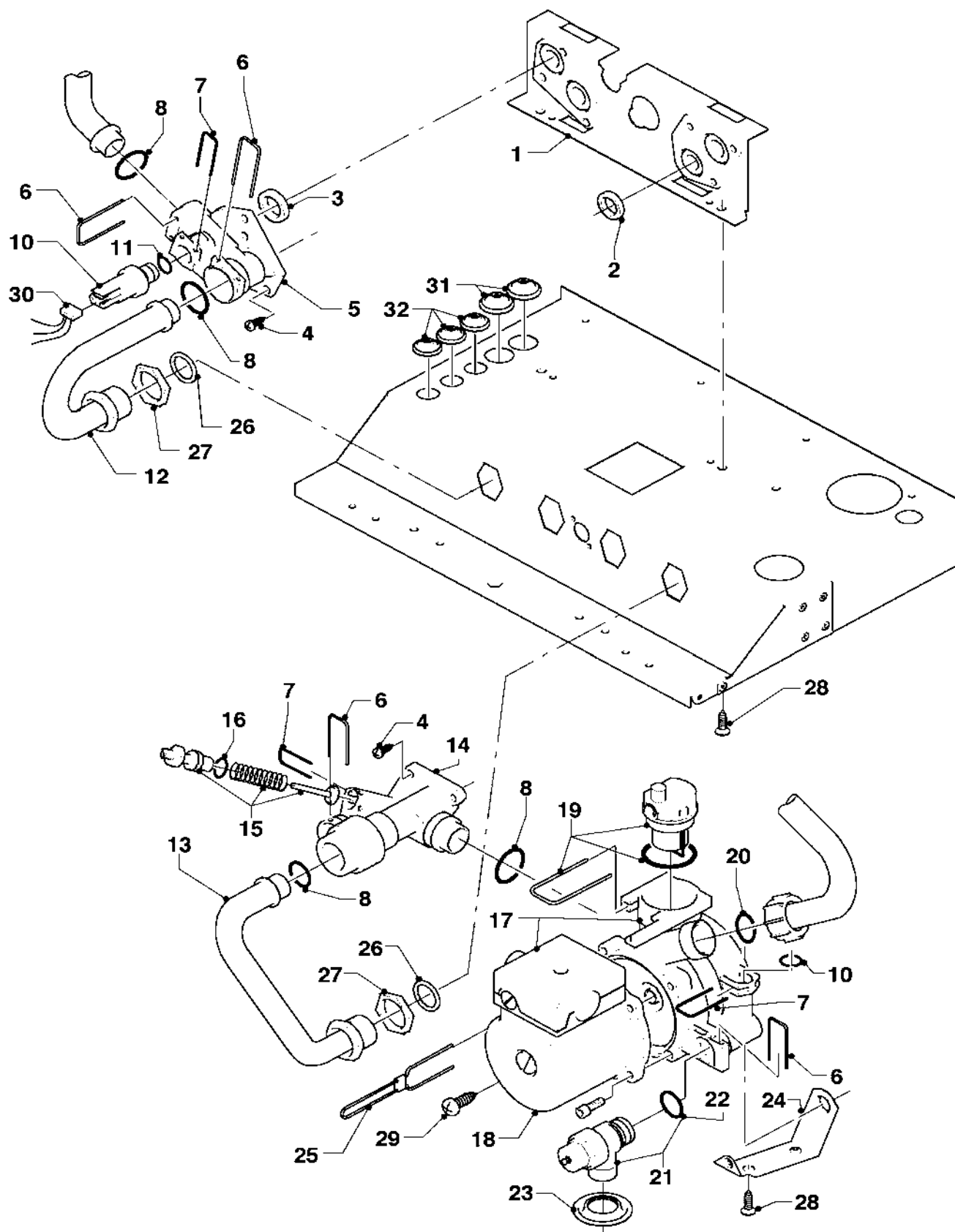


## 08 Connection parts (Hydroblock)

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 08 - 121.01

## 08 Connection parts (Hydroblock)

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-08-121	
30	193589	harness	VU 126/3-5
30	193589	harness	VU 126/3-5 R1
30	193589	harness	VU 156/3-5
30	193589	harness	VU 156/3-5 R1
30	193589	harness	VU 186/3-5
30	193589	harness	VU 186/3-5 R1
30	193589	harness	VU 246/3-5
30	193589	harness	VU 246/3-5 R1
30	193589	harness	VU 306/3-5
30	193589	harness	VU 306/3-5 R1
30	0020025037	harness	VU 376/3-5 R1
31	509120	packingring (set of 10)	
32	509121	packingring (set of 10)	

Subject to alteration !

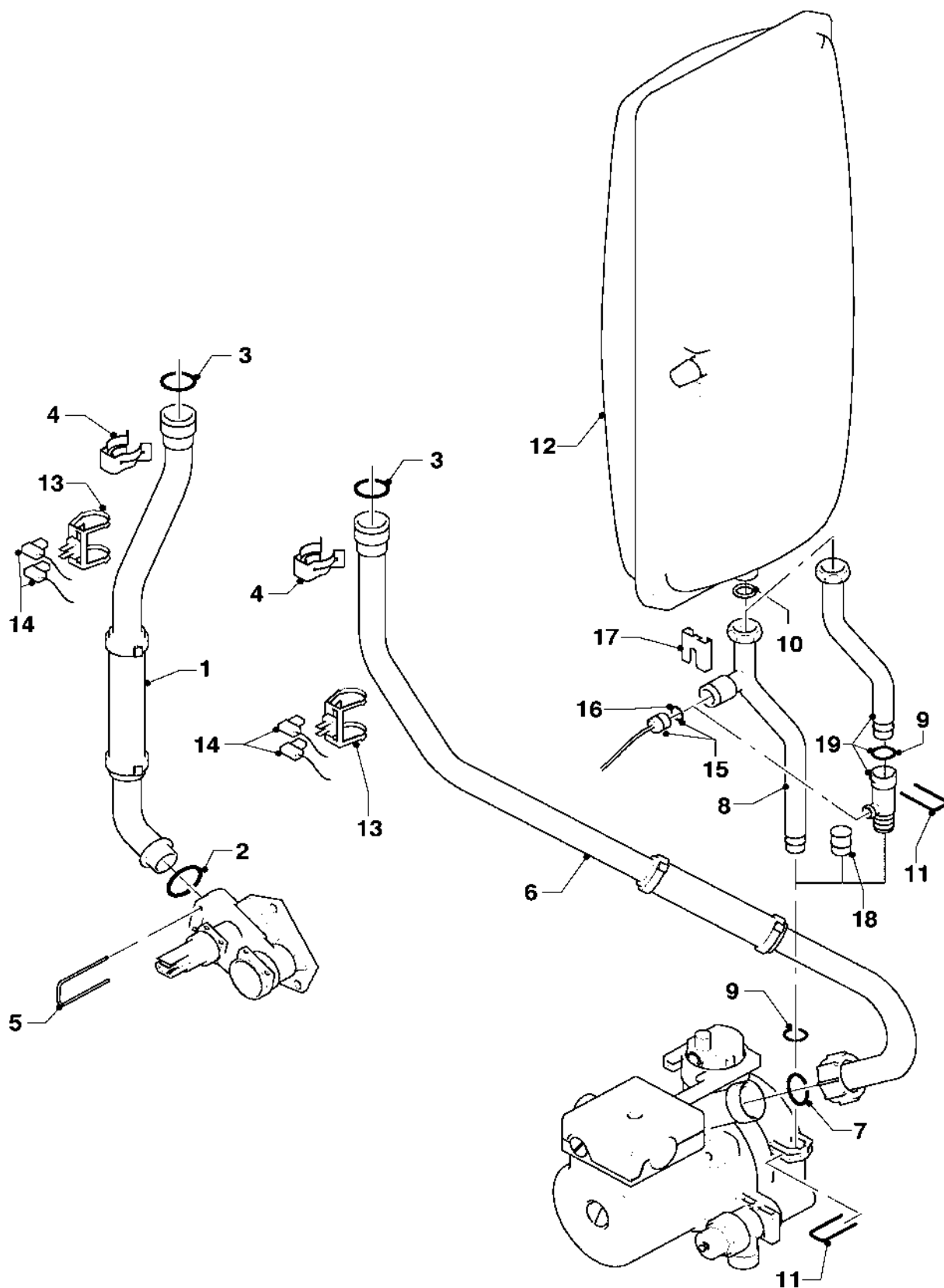
Attention: Please take the gross price from the valid price list !

## 08a Connection parts

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 08 - 120.02

## 08a Connection parts

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-08-120	
01	180946	connection tube, cpl.	VU 126/3-5, with parts 02, 03
01	180946	connection tube, cpl.	VU 126/3-5 R1, with parts 02, 03
01	180946	connection tube, cpl.	VU 156/3-5, with parts 02, 03
01	180946	connection tube, cpl.	VU 156/3-5 R1, with parts 02, 03
01	180946	connection tube, cpl.	VU 186/3-5, with parts 02, 03
01	180946	connection tube, cpl.	VU 186/3-5 R1, with parts 02, 03
01	180946	connection tube, cpl.	VU 246/3-5, with parts 02, 03
01	180946	connection tube, cpl.	VU 246/3-5 R1, with parts 02, 03
01	180947	connection tube, cpl.	VU 306/3-5, with parts 02, 03
01	180947	connection tube, cpl.	VU 306/3-5 R1, with parts 02, 03
01	180947	connection tube, cpl.	VU 376/3-5 R1, with parts 02, 03
02	193537	packingring (set of 10)	
03	103415	packingring (set of 10)	
04	103417	clip (set of 10)	
05	178992	clip (set of 10)	
06	180948	connection tube, cpl.	with parts 03, 07
07	193539	packingring (set of 10)	
08	180949	connection tube, cpl.	with parts 09, 10
09	178993	packingring (set of 10)	
10	981149	packingring (set of 10)	
11	154150	clip	
12	181051	expansion vessel, cpl.	10 Liter, with part 10
13	193592	NTC sensor (CH flow/CH return)	
14	193586	harness	VU 126/3-5
14	193586	harness	VU 126/3-5 R1
14	193586	harness	VU 156/3-5
14	193586	harness	VU 156/3-5 R1
14	193586	harness	VU 186/3-5
14	193586	harness	VU 186/3-5 R1
14	193586	harness	VU 246/3-5
14	193586	harness	VU 246/3-5 R1
14	0020025036	harness	VU 306/3-5
14	0020025036	harness	VU 306/3-5 R1
14	0020025036	harness	VU 376/3-5 R1
15	180982	pressure gauge	
16	981155	packingring (set of 10)	
17	085751	pressure gauge clip	
18	-	not necessary	
19	0020025045	connection tube, cpl.	with parts 10, 11, 16, 17

Subject to alteration !

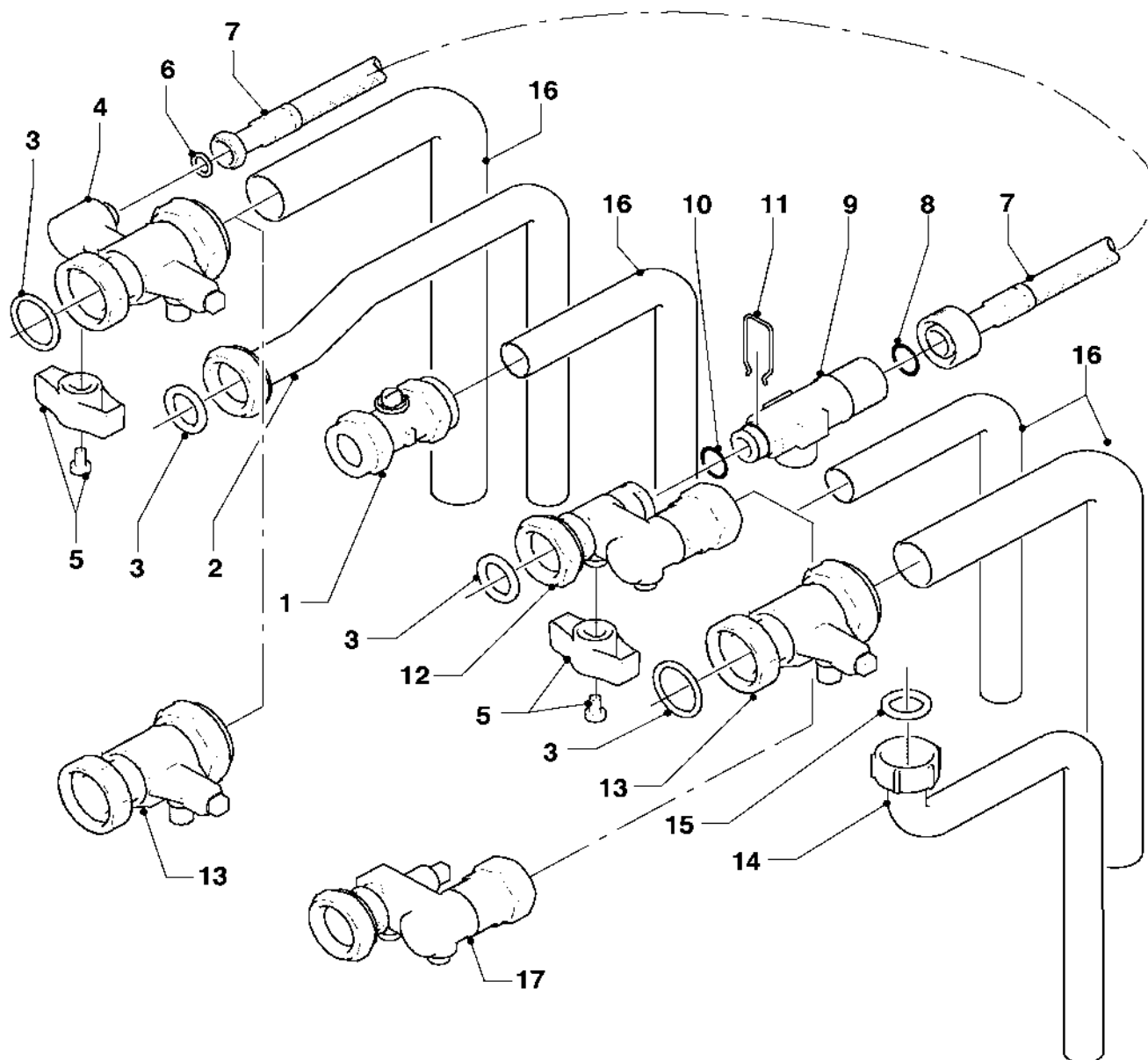
Attention: Please take the gross price from the valid price list !

## 08b Connection parts (Acc.)

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 08 - 125.01

## 08b Connection parts (Acc.)

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-08-125	
01	082782	gas shut-off valve, cpl.	VU 126/3-5
01	082782	gas shut-off valve, cpl.	VU 126/3-5 R1
01	082782	gas shut-off valve, cpl.	VU 156/3-5
01	082782	gas shut-off valve, cpl.	VU 156/3-5 R1
01	082782	gas shut-off valve, cpl.	VU 186/3-5
01	082782	gas shut-off valve, cpl.	VU 186/3-5 R1
01	082782	gas shut-off valve, cpl.	VU 246/3-5
01	082782	gas shut-off valve, cpl.	VU 246/3-5 R1
01	082782	gas shut-off valve, cpl.	VU 306/3-5
01	082782	gas shut-off valve, cpl.	VU 306/3-5 R1
01	082794	gas shut-off valve, cpl. 36kW	VU 376/3-5 R1
02	-	-	not necessary
03	981140	packingring (set of 10)	
04	-	-	not necessary, see pos. 13
05	-	-	not necessary
06	-	-	not necessary
07	-	-	not necessary
08	-	-	not necessary
09	-	-	not necessary
10	-	-	not necessary
11	-	-	not necessary
12	-	-	not necessary
13	0020010296	service cock	with part 03
14	0020010297	pipe	with part 15
15	0020010298	packingring (set of 10)	
16	-	-	not available as spare part
17	-	-	not necessary

Subject to alteration !

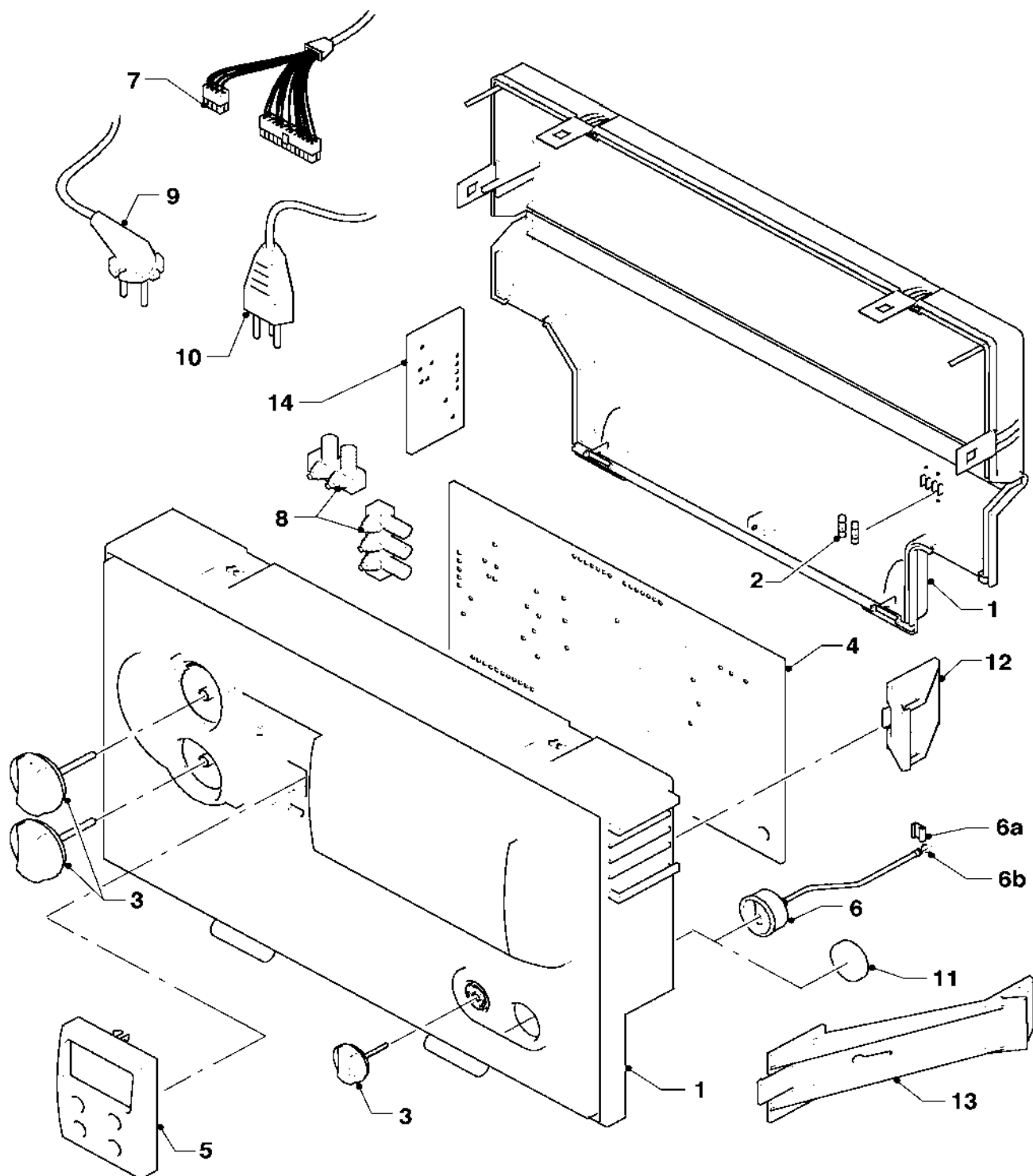
Attention: Please take the gross price from the valid price list !

## 12 Control box

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1



02 - 12 - 046.02

## 12 Control box

ecoTEC plus 612 VU 126/3-5 + R1, ecoTEC plus 615 VU 156/3-5 + R1

ecoTEC plus 618 VU 186/3-5 + R1, ecoTEC plus 624 VU 246/3-5 + R1

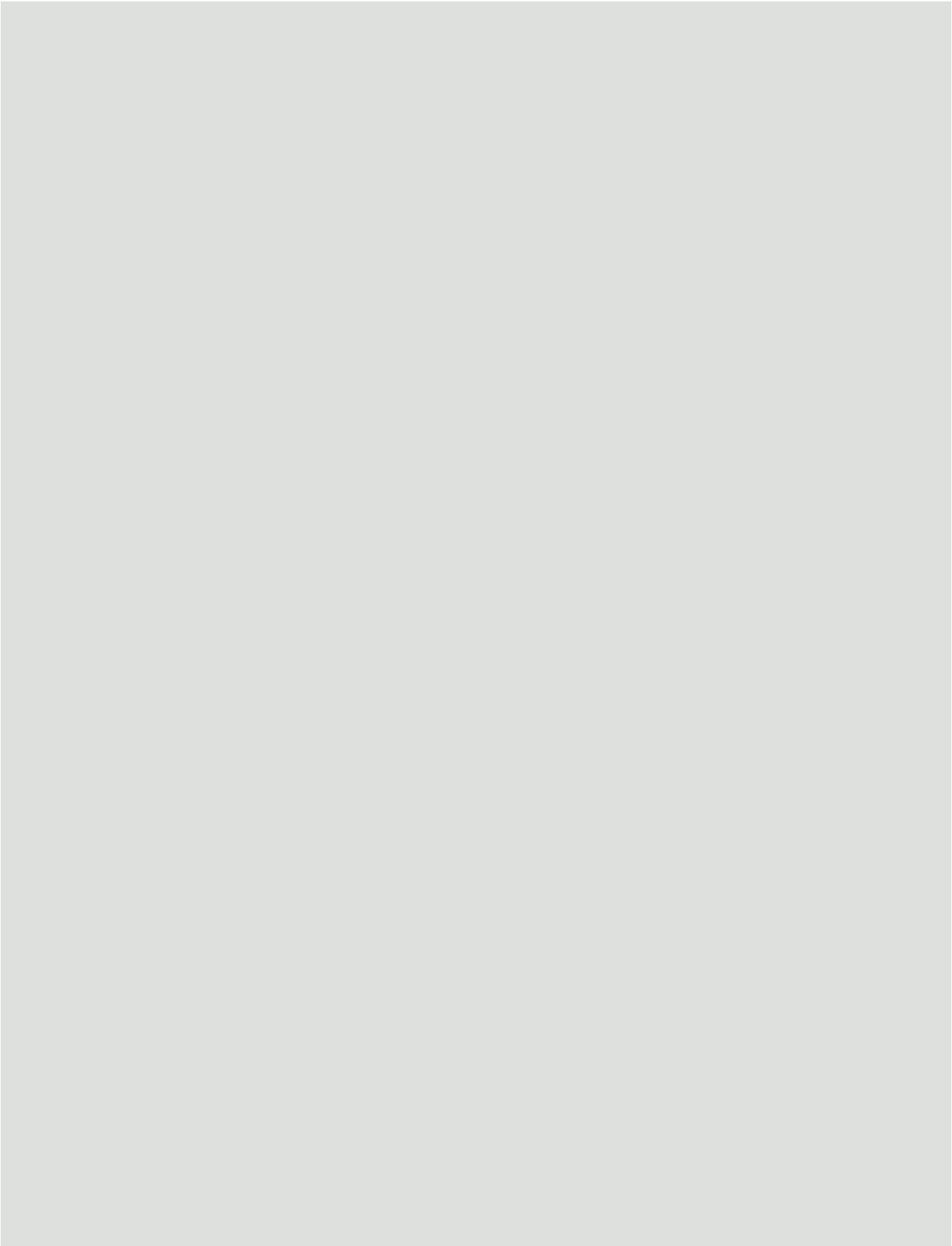
ecoTEC plus 630 VU 306/3-5 + R1, ecoTEC plus 637 VU 376/3-5 R1

Pos.	Art.-No	Part	Type, note
		02-12-046	
01	193582	casing, cpl.	
02	251955	fuse 2.0 AT (set of 10)	2.0 AT
03	117319	knobs, cpl. grey (3 knobs)	
04	0020028736	printed circuit board	with part 02
05	117321	display	
06	180982	pressure gauge	
06a	085751	pressure gauge clip	
06b	981155	packingring (set of 10)	
07	193586	harness	VU 126/3-5, appliance
07	193586	harness	VU 126/3-5 R1, appliance
07	193586	harness	VU 156/3-5, appliance
07	193586	harness	VU 156/3-5 R1, appliance
07	193586	harness	VU 186/3-5, appliance
07	193586	harness	VU 186/3-5 R1, appliance
07	193586	harness	VU 246/3-5, appliance
07	193586	harness	VU 246/3-5 R1, appliance
07	0020025036	harness	VU 306/3-5, appliance
07	0020025036	harness	VU 306/3-5 R1, appliance
07	0020025036	harness	VU 376/3-5 R1, appliance
07	193589	harness	VU 126/3-5, hydraulik
07	193589	harness	VU 126/3-5 R1, hydraulik
07	193589	harness	VU 156/3-5, hydraulik
07	193589	harness	VU 156/3-5 R1, hydraulik
07	193589	harness	VU 186/3-5, hydraulik
07	193589	harness	VU 186/3-5 R1, hydraulik
07	193589	harness	VU 246/3-5, hydraulik
07	193589	harness	VU 246/3-5 R1, hydraulik
07	193589	harness	VU 306/3-5, hydraulik
07	193589	harness	VU 306/3-5 R1, hydraulik
07	0020025037	harness	VU 376/3-5 R1, hydraulik
08	078533	cable fixation	
09	-	-	not necessary
10	-	-	not necessary
11	-	-	not necessary
12	193583	support, cpl.	VU 126/3-5
12	193583	support, cpl.	VU 126/3-5 R1
12	193583	support, cpl.	VU 156/3-5
12	193583	support, cpl.	VU 156/3-5 R1
12	193583	support, cpl.	VU 186/3-5
12	193583	support, cpl.	VU 186/3-5 R1
12	193583	support, cpl.	VU 246/3-5
12	193583	support, cpl.	VU 246/3-5 R1
12	193584	support, cpl.	VU 306/3-5
12	193584	support, cpl.	VU 306/3-5 R1
12	193585	support, cpl.	VU 376/3-5 R1
13	-	-	not necessary
14	-	-	not necessary

Subject to alteration !

Attention: Please take the gross price from the valid price list !







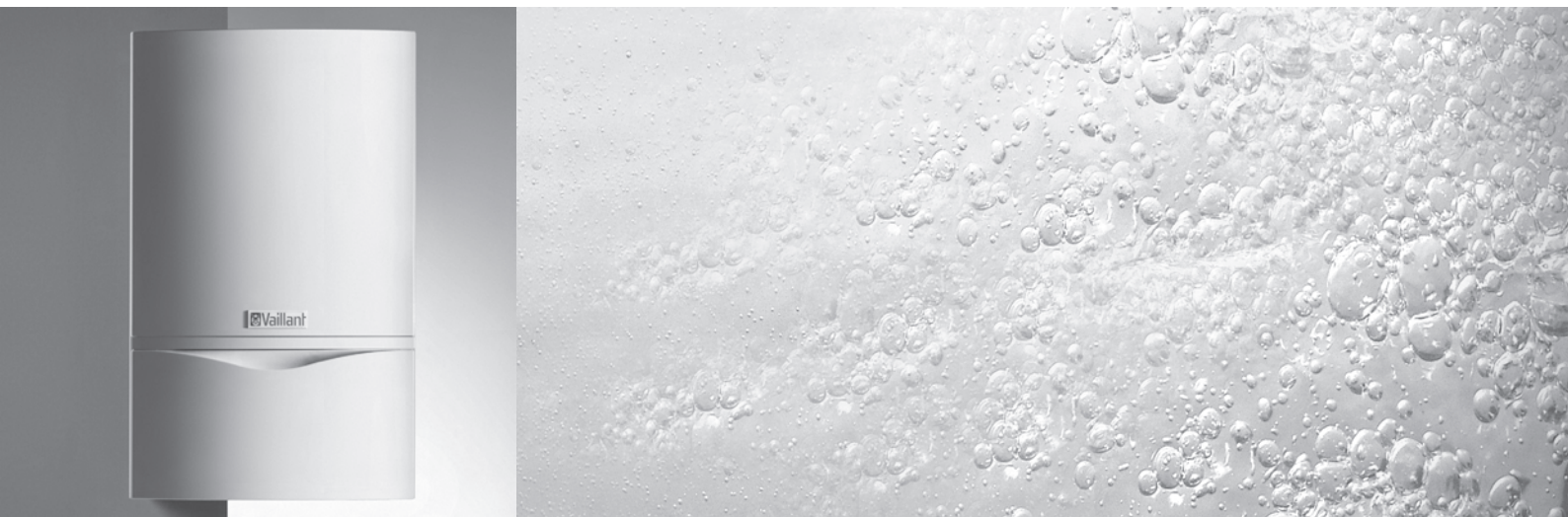
**Vaillant Ltd.**

Vaillant House Medway City Estate, Trident Close ■ Rochester / Kent ME2 4EZ  
Phone 01634 292300 ■ Fax 01634 290166 ■ [www.vaillant.co.uk](http://www.vaillant.co.uk) ■ [info@vaillant.co.uk](mailto:info@vaillant.co.uk)

0020010870.01 GB 03/2006 Subject to alteration ! / Attention: Please take the gross price from the valid price list !

For the owner

## Instructions for use **ecoTEC plus**



Wall hung open vent condensing boiler

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### Appliance characteristics

The Vaillant ecoTEC plus boilers are compact, wall hung condensing open vented boiler, designed to provide central heating from a fully pumped open-vented or sealed water system and hot water where a separate indirect hot water cylinder is incorporated to the system.

The central heating water temperature can be adjusted on the boiler. The domestic hot water temperature can also be adjusted on the boiler if the applicable optional accessories are fitted. Once the controls are set the boiler operates automatically. A frost protection programme is also included.

Please read these instructions and follow them carefully for the correct and economical use of your boiler.

These instructions are applicable to the following ecoTEC plus boilers, available in Natural Gas. All ecoTEC plus boilers can be converted to LPG.

APPLIANCE	MAXIMUM OUTPUT
ecoTEC plus 415	15kW
ecoTEC plus 418	18kW
ecoTEC plus 428	28kW
ecoTEC plus 438	38kW

## 1 Introduction

### 1.1 Notes on the documentation

To ensure clarity of information in instructions a new European standard of advice and symbols is being introduced. To ensure compliance with this new standard the following details are included. The following information is intended to help you throughout the boilers entire instruction pack.

**We assume no liability for any damage caused by non-observance of these instructions.**

#### 1.1.1 Other instruction supplied with this appliance.

**For the owner:**

Short operating instructions no. 838404

Warranty card with return envelope no. 802922

**For the installer/service engineer:**

Instructions for installation and servicing no. 0020020828

Flue installation instructions no. 834449

The instructions for any accessories and controllers used also apply.

The Benchmark gas boiler commissioning checklist (in the installation manual) should be completed by the installer and/or the commissioning engineer.

If, after reading these instructions, you have any questions on the operation of the boiler, please contact either your installer or Vaillant Technical Department.

#### 1.1.2 Retention of the documents

Please store this literature and all related documents so that they are available whenever they are required. If you move please pass on the documents to the buyer.

### 1.2 Symbols used in this manual

Please observe the safety instructions in this literature for the operation of the appliance.



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



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



**Danger!**  
Risk of burns or scalding!



**Caution**  
Potentially dangerous situations for the product and environment.



**Note!**  
Useful information and instructions.

- Symbol for a necessary task

### 1.3 CE marking

The purpose of CE marking is to certify that the boiler complies with the requirements of the directives covering gas fired appliances (Council directive 90/396/EEC) and electromagnetic compatibility (Council directive 89/336/EEC).

These appliances also comply with the requirements of the directive on operating efficiency (Council directive 92/42/EEC)



**The code of practice for the installation, commissioning & servicing of gas central heating**

 **Vaillant Ltd. support the Benchmark initiative.**  
At the rear of the installation manual, you will find a Benchmark gas boiler commissioning checklist. It is very important that this is completed correctly at the time of installation, commissioning and handover to the user.

## 2 Safety

### 2.1 Setup and adjustments

Installation and adjustment of the boiler as well as service, maintenance and repair of the boiler may only be carried out by a competent person in accordance with the Gas Safety (Installation and Use) Regulations 1998. (In the U.K. "CORGI" registered installers undertake the work to a safe and satisfactory standard). If the boiler is installed in a compartment do not obstruct any purpose provided ventilation openings, and do not use the compartment for storage purposes.

### 2.2 What to do in an emergency



**Danger!**  
Smell of gas. Risk of poisoning and explosion due to a malfunction

If you smell gas or suspect a gas leak:

- Do not switch lights on or off.
- Do not use any other electrical switches.
- Do not use a telephone in the hazardous area.
- Do not use naked flames, such as matches or cigarette lighters.
- Do not smoke.
- Turn off the gas supply at the gas meter.
- Open the windows and doors.
- Warn other residents.
- Get out of the house.
- Consult your gas supplier, service agent or other competent person.

## 2 Safety

### 2.3 Safety instructions

Always observe the following safety instructions and regulations.



**Danger!**

Inflammable mixtures of gas and air may explode. Do not use or store explosive or easily flammable substances such as petrol or paint in the same room as the appliance.



**Danger!**

Risk of poisoning and explosion due to a malfunction. Never put the safety devices out of operation or tamper with them so as to impair their function.

### 2.4 Modifications in and around the boiler

No modifications may be made to the following items:

- The boiler
- The gas, water and electrical supply
- The flue system
- The safety valve for the heating water
- Any structural changes around the appliance that could affect the operational safety of the boiler.



**Caution!**

Inappropriate modifications can cause damage. Never tamper with the boiler or other parts of the system. Never attempt to perform maintenance or repairs yourself.

- Do not damage or remove seals on components. Only authorised engineers or our customer service may remove sealed components.



**Danger!**

Risk of scalding.  
The water coming out of the tap can be very hot.



**Caution!**

Risk of damage.  
Do not use sprays, solvents, chlorinated cleaning agents, paint, adhesives or similar substances in the vicinity of the appliance. These substances can cause corrosion, including the flue system.

### 2.5 Installation and setting



**Caution!**

The appliance must be installed and serviced by a Competent Person as stated in the Gas Safety (Installation and Use) Regulations 1998. In IE, the installation must be in accordance with the current edition of I.S.813 'Domestic Gas Installations', the current Building Regulations and reference should be made to the current ETCI rules for electrical installation.



**Caution!**

The appliance may only be operated with its case properly and permanently closed. Otherwise, in unfavourable conditions, material damage or even injury or death can result.

#### Frost protection

Your boiler is equipped with a frost protection function: If the heating water temperature drops below 5 °C when the electrical supply to the boiler is on, then the boiler goes into operation and heats the boiler circuit to approx. 30°C.



**Note!**

It cannot be guaranteed that water will circulate throughout the entire heating system.

If the boiler is not operated for several hours during very cold weather there is the possibility of the system freezing. Please ensure that if you are absent during a period of frost the central heating remains in operation and all rooms are kept above freezing point.

It must be remembered, however, that the boiler will be automatically switched off by the built in monitoring devices if certain faults occur, e.g. interruption in the gas or electricity supply or faults in the flue gas system. To overcome this possibility you can drain both the central heating system and boiler.



**Note!**

Frost protection and monitoring devices can only function when the electrical supply to the boiler is on.

## 3 Information on installation and operation

### 3.1 Factory guarantee

#### 3.1.1 Two year guarantee for ecoTEC plus appliances

Vaillant undertakes to rectify any manufacturing defect that occurs within twenty-four months of the installation date. For the 2nd year of the guarantee to be valid an annual service must be carried out by a CORGI registered installer one year after installation. The cost of this annual service is not included in the guarantee.

#### 3.1.3 Registering with us

Registration is simple. Just complete the Guarantee Registration Card and return to Vaillant within 30 days of installation. Your details will then be automatically registered within the Vaillant scheme.



#### **Note!**

**No receipt will be issued.**

#### 3.1.4 Immediate help

If your Vaillant boiler develops a fault your first action should be to contact your installer, as his professional assessment is needed under the terms of our Guarantee. If you are unable to contact your installer, phone Vaillant Service Solutions: 0870 6060 777

### 3.2 Intended use

Vaillant ecoTEC boilers are state-of-the-art appliances which have been constructed in accordance with recognised safety regulations. Nevertheless, there is a risk of injury or death to the user or others and damage to the appliance or other property in the event of misuse or use for which the appliance is not intended. This appliance is designed to generate heat for connected hot water central heating systems. Any other use is considered to be use other than intended. The manufacturer/supplier is not liable for any resulting damage. The user alone bears the risk. Intended use includes the observance of the operating and installation manual and all other applicable documents, as well as adherence to the maintenance and inspection conditions.



#### **Caution!**

**Any incorrect use is forbidden.**

### 3.3 Care

- Clean the exterior of your appliance with a damp cloth and a little soap.



#### **Note!**

**Do not use scouring or cleaning agent, which might damage the housing or plastic fittings.**

### 3.4 Recycling and disposal

Both your Vaillant ecoTEC boiler and its packaging consist mainly of recyclable raw materials.

#### 3.4.1 The appliance

Do not dispose of your Vaillant ecoTEC boiler or any of its accessories with household waste. Make sure the old appliance and any existing accessories are disposed of properly.

#### 3.4.2 Packaging

Please leave the disposal of the transport packaging to the expert company which installed the appliance.



#### **Note!**

**Please observe the applicable national legal regulations.**



## 4 Operation

### 4 Operation

#### 4.1 Overview of controls on ecoTEC plus

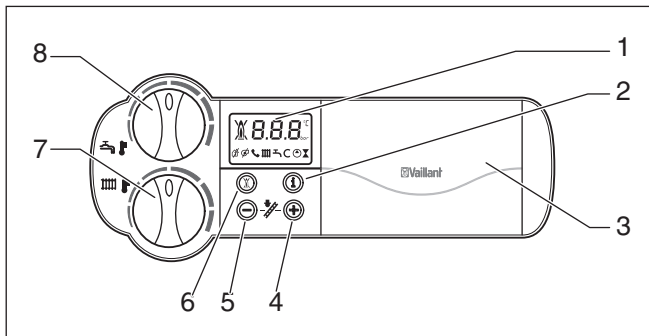


Fig. 4.1 ecoTEC plus controls

For access to the controls open the front flap by pulling at the centre of the case strip.

- 1 Display indicating the current heating flow temperature, the operating mode or additional information.
- 2 The "i" information button.
- 3 Built in control/timer (if fitted).
- 4 "+" button for moving forward in the display.
- 5 "-" button for moving back in the display.
- 6 "Reset" button.
- 7 Maximum radiator temperature control.
- 8 Optional maximum hot water temperature control available only when additional optional accessories are fitted (VR 65, VRT 360, VRC 400).

#### Advanced multifunctional display system

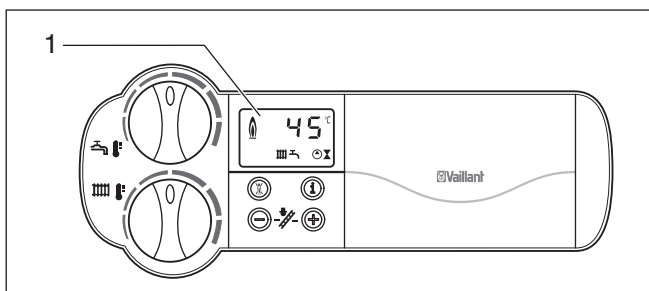


Fig. 4.2 Display on ecoTEC plus

The ecoTEC plus appliance is fitted with a digital information and analysis system. This system provides information on the operating status of your appliance. During normal operation, the display (1) shows the current heating flow temperature (in this example 45 °C). In the event of a fault, an error code appears instead of the temperature. The display also gives the following information:

- 1 Indication of the current heating flow temperature or display of a status or error code



Fan speed malfunction.



Fan speed malfunction.



As long as this symbol appears in the display, a heating flow temperature is set by the vrnetDIALOG accessory, which means the appliance uses temperatures other than those set using the controls (7) and (8).

This condition can only be ended:

- using vrnetDIALOG or
- by a change in temperature at controllers (7) or (8) of more than  $\pm 1$  K.

This condition cannot be ended:

- with the "Reset" button (6) or
- by turning the appliance off or on.



Heating mode active.

Illuminated: Heating mode.

Flashing: Anti cycling mode active.



Hot water supply active.

Illuminated: Heating of an indirect hot water cylinder turned on.

Flashing: Heating demand from the hot water cylinder, burner on if optional accessories are fitted.



External pump is running.



Gas valve is activated.



Flame with cross:

Boiler is at lock out and will display fault code.



Flame without cross:

Normal burner operation.

## 4.2 Initial checks before turning on

### 4.2.1 Opening the gas service valve

- Ensure the gas service valve is open.
- Ensure the electrical supply to the boiler is turned on.

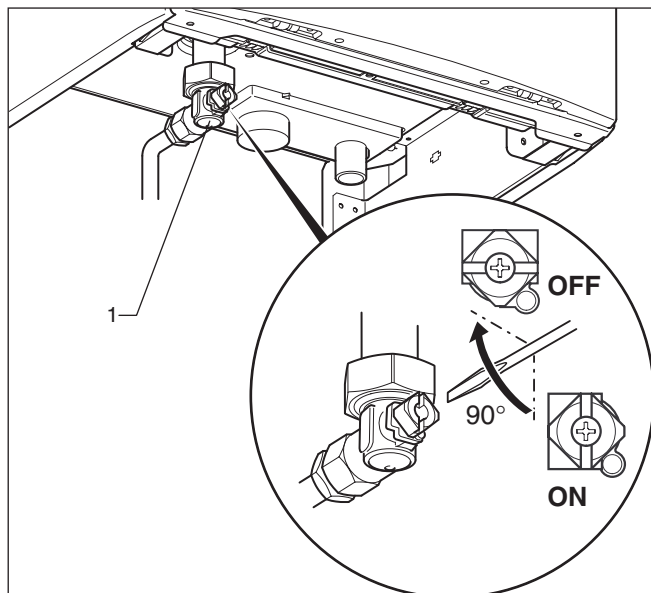


Fig. 4.3 Opening the gas service valve

## 4.3 Turning the boiler on

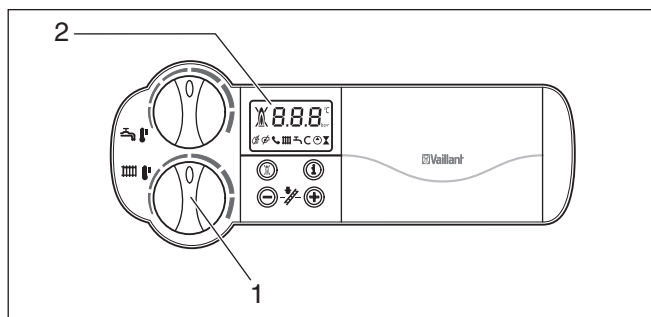


Fig. 4.4 Switching on the appliance

- Turn on appliance at control (1).

When you switch on the appliance, the current operating status appears in the display (2).

To adjust the appliance according to your requirements, read sections 4.4 and 4.5, which describe the setting options for hot water supply and heating.



### Caution!

#### Risk of damage.

The boiler frost protection and monitoring systems are only active when the electrical supply to the boiler is on and it is not disconnected from the main power supply.

## 4.4 Domestic hot water

The control of domestic hot water is only available if you have fitted the optional accessories (VR 65, VRT 360, VRC 400).

The boiler must only be used when the heating system contains water.

### 4.4.1 Setting the water temperature

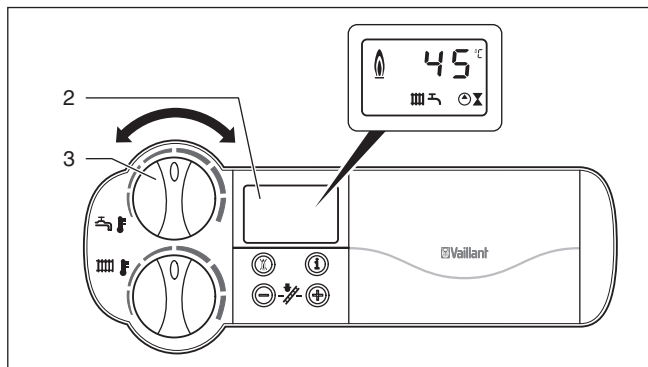


Fig. 4.5 Setting the water temperature

- Switch on the appliance as described in section 4.3.
- The domestic hot water temperature can be adjusted using the hot water temperature control (3).
- Turn the control clockwise to increase the temperature and anti-clockwise to decrease the temperature. This corresponds to:
 

- left limit approx.	35 °C
- right limit max.	65 °C.

## 4.5 Heating operation

The boiler must only be used when the heating system contains water.

## 4 Operation

### 4.5.1 Setting the maximum radiator temperature control

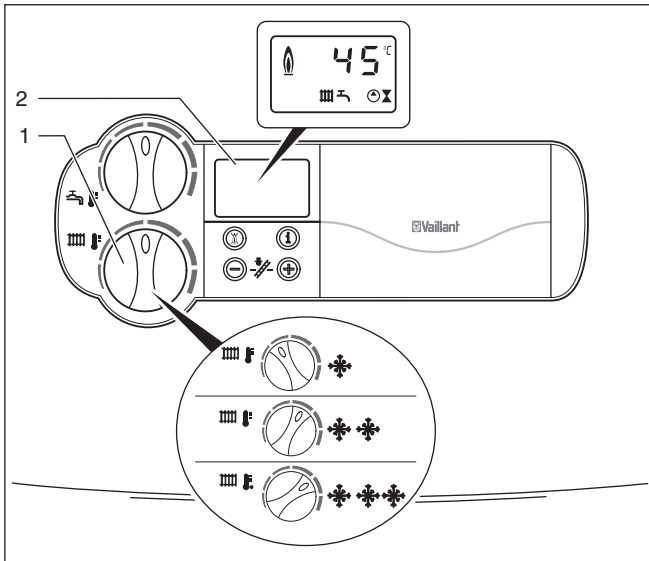


Fig. 4.6 Setting the maximum radiator temperature control

When you adjust the temperature, the set value is shown in the display (2). After five seconds the display returns to standard mode (the current heating flow temperature).

Normally you can adjust the knob (1) continuously up to a flow temperature of 75 °C. However, higher temperatures can be set on your appliance, have your engineer make adjustments so that you can operate the heating system at higher flow temperatures.

### 4.5.2 Setting a room or outside temperature controller

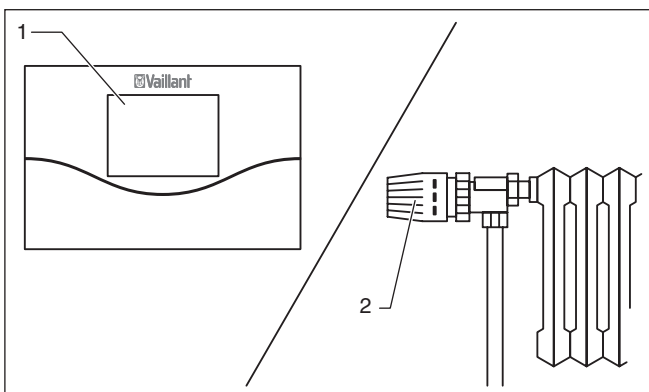


Fig. 4.7 Setting a room or outside temperature controller

- Set the room thermostat (1) and/or the thermostatic radiator valves (2) according to the instructions supplied with the control(s).



#### Note!

Vaillant offer room thermostat/time control accessories which give accurate and economic room temperature control as well as improved comfort.

The boiler will now operate automatically to provide central heating for the conditions selected on the external controls.

After the boiler stops operating the pump will continue to operate for a short period to fully disperse the heat from the boiler.

After a power cut or every 23 hour in frost setting /summer mode the pump will run for one minute to prevent it from sticking. This will also occur during normal operating if there is no demand for more than 24 hours.

### 4.6 Pump exercise



#### Note!

The boiler incorporates an anti-cycling economiser control to prevent energy wasteful on and off operation of the boiler for short periods when in the central heating mode. When turning the room thermostat to a higher setting there may be a short delay before the boiler operates.

### 4.7 Status displays

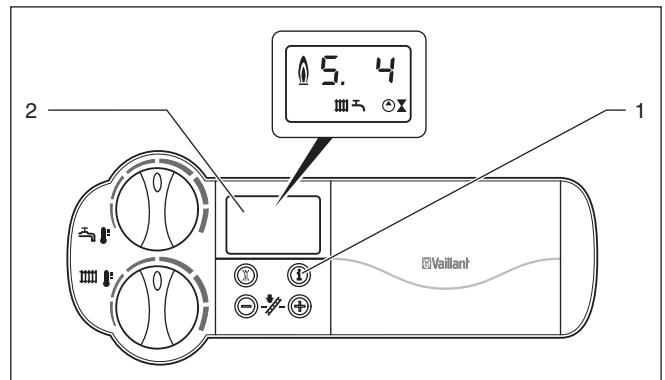


Fig. 4.8 Status displays

The status displays provide information on the operating status of the appliance.

- Press the "i" button (1) to activate the status displays.

The display (2) then shows the current status code, for example "S. 4" for burner operation. The table below explains the most important status codes. In switching phases, for example on starting up again after the flame was extinguished, the status message "S." briefly appears.

- Press the "i" button (1) again to switch the display back to normal mode.

Display	Meaning
	Displays during heating operation
S. 0	No heat required
S. 1	Pump running
S. 3	Ignition sequence (heating operation)
S. 4	Burner ignited
S. 6	Fan and pump overrun
S. 7	Pump overrun
S. 8	Anti cycling mode (after heating operation)
S.30	Room thermostat no heating demand
S.31	Summer mode active
S.34	Frost protection mode
	<b>Displays in cylinder charging mode (with optional accessories fitted)</b>
S.20	Cylinder charging request

**Table 4.1 Status codes (selection, a complete set of status codes can be found in the installation and servicing manual)**

#### 4.8 Troubleshooting

In the unlikely event that a problem occurs with the operation of the ecoTEC boiler, the following points should be checked:

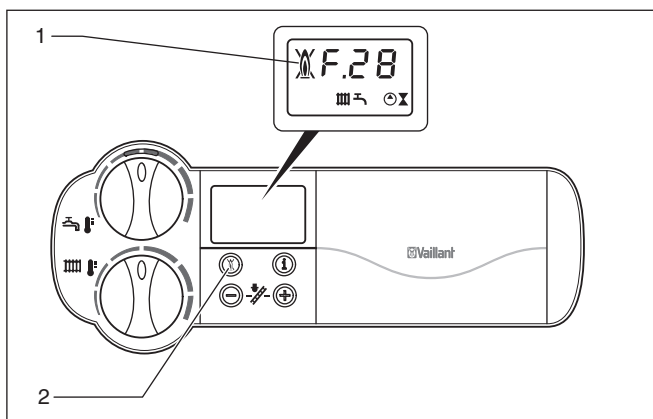
##### Boiler fails to operate:

- Is the gas supply turned on?
- Is there enough water in the heating system?
- Is the electrical supply switched on?
- Is there an ignition problem?



##### Caution!

**Inappropriate modifications can cause damage.** If your boiler still does not operate then please consult your installer or Vaillant Service Solutions (0870 6060 777).



#### 4.8.1 Ignition problems

##### Fig. 4.9 Troubleshooting

If the burner fails to ignite after five attempts, the device does not start up and switches to "Fault". This is indicated by the fault code "F.28" or "F.29" in the display.

The display also shows the flame symbol with a cross through it (1).

Automatic ignition can only take place after you manually reset the fault.

- To reset the fault, press the reset button (2) and hold it down for one second.





##### Caution!

**If the boiler still shuts off after three attempts of resetting, please consult your installer or Vaillant Service Solutions.**

#### 4.8.2 Flue problems

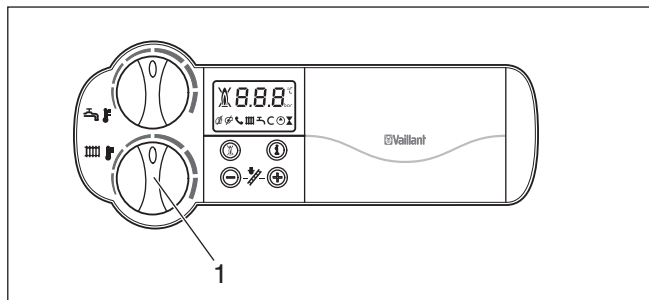
This appliance is fitted with a fan. If the fan does not work properly, the appliance will switch itself off.

The display shows the symbols  and  and the fault message "F.32".



##### Note!

**If contacting Vaillant Service Solutions please**



**remember to quote the fault code, as this will help to pinpoint the fault.**

#### 4.9 Turning off the boiler

##### Fig. 4.10 Switching off the appliance

- Turn the main on/off control (1) fully anti clockwise.



##### Caution!

**The boiler frost protection and monitoring systems are only active when the electrical supply to the boiler is on and it is not disconnected from the main power supply.**

To ensure that these protection devices remain active, switch your boiler on and off using the external controller.



##### Note!

**If the appliance is switched off for a long time (for example when you are on holiday) you should also turn off the gas supply and the electrical supply.**

## 4 Operation

### 4.10 Frost protection

The frost protection feature only protects the boiler. Any other parts of the system liable to frost damage should be protected accordingly.



**Caution!**

**The boiler frost protection and monitoring systems are only active when the electrical supply to the boiler is on and it is not disconnected from the main power supply.**

#### **Frost protection function**

The boiler has a frost protection function. If the heating flow temperature falls below 5 °C when the electrical supply to the boiler is on, the appliance starts up and heats the boiler to 30 °C.



**Caution!**

**Parts of the system may freeze. The frost protection function cannot guarantee that water flows through the entire heating system.**

### 4.11 Maintenance and customer service

#### **Inspection and maintenance**

Permanent operational readiness, reliability and a long service life require inspections and maintenance work to be regularly carried out by a competent person or Vaillant.

For further details please contact Vaillant Service Solutions: (0870 6060777).



**Danger!**

**Risk of injury and damage due to improper handling.**

**Never attempt to perform maintenance or repairs on the appliance yourself. Have a specialist heating company do the work. We recommend signing a service agreement. The reliability of the appliance can be impaired, resulting in damage to property or personal injury if maintenance work is not carried out.**

Regular servicing ensures maximum efficiency and economical operation of your boiler.



**Vaillant Ltd**

Vaillant House ■ Medway City Estate ■ Trident Close ■ Rochester ■ Kent ME2 4EZ  
Telephone 01634 292300 ■ Fax 01634 290166 ■ [www.vaillant.co.uk](http://www.vaillant.co.uk) ■ [info@vaillant.co.uk](mailto:info@vaillant.co.uk)