

For the competent person

Installation Manual



## Air/Flue Gas System for ecoTEC

**GB, IE**

# Contents

## Contents

<b>1</b>	<b>Notes on the documentation</b> .....	3	3.10	Fitting ridge tiles .....	30
1.1	Storing documents .....	3	3.10.1	Scope of delivery .....	30
1.2	Symbols used .....	3	3.10.2	Preparations .....	30
1.3	Applicability of the instructions .....	3	3.10.3	Fitting the ridge tile .....	30
1.4	Air/flue gas systems available .....	3	3.10.4	Fitting the ridge-tile terminal .....	31
<b>2</b>	<b>Safety</b> .....	4	3.11	Fitting concentric connector to a chimney air/flue pipe .....	32
2.1	Safety and warning information .....	4	3.11.1	Components suitable for connection .....	32
2.1.1	Classification of warnings .....	4	3.11.2	Installation example .....	32
2.1.2	Structure of warnings .....	4	3.11.3	Installing the boiler .....	33
2.2	General safety information .....	4	3.12	Fitting extensions and elbows .....	34
2.3	Regulations .....	5	3.12.1	Fitting extensions .....	34
2.4	Intended use .....	5	3.12.2	Fitting two 87° elbows .....	35
2.5	Certified air/flue gas systems .....	5	3.12.3	Fitting 87° elbows .....	37
<b>3</b>	<b>Concentric system (standard), dia. 60/100</b> .....	6	3.12.4	Fitting 45° elbows .....	38
3.1	Product range .....	6	<b>4</b>	<b>Concentric system (optional), dia. 80/125</b> .....	39
3.2	Maximum permissible pipe lengths .....	10	4.1	Product range .....	39
3.2.1	Maximum permitted pipe lengths for ecoTEC exclusive .....	11	4.2	Maximum permissible pipe lengths .....	41
3.2.2	Maximum permitted pipe lengths for ecoTEC .....	11	4.2.1	Maximum permitted pipe lengths for ecoTEC exclusive .....	42
3.3	Fitting the sliding sleeve .....	12	4.2.2	Maximum permitted pipe lengths for ecoTEC .....	42
3.4	Fitting the horizontal wall penetration .....	12	4.3	Replacing the boiler flue connection .....	43
3.4.1	Scope of delivery .....	13	4.3.1	Replacing the boiler flue connection on ecoTEC exclusive and ecoTEC plus open vented ..	43
3.4.2	Preparing for installation .....	13	4.3.2	Replacing the boiler flue connection on ecoTEC plus and ecoTEC pro .....	43
3.5	Fitting the telescopic horizontal air/flue pipe .....	15	4.4	Fitting the sliding sleeve .....	44
3.5.1	Scope of delivery .....	15	4.5	Fitting the horizontal air/flue pipe .....	44
3.5.2	Preparations .....	16	4.5.1	Scope of delivery .....	44
3.6	Fitting the black terminal kit .....	17	4.5.2	Preparations .....	45
3.6.1	Scope of delivery .....	17	4.5.3	Fitting with side flue exit .....	45
3.6.2	Assembling the black terminal kit before fitting the flue pipe .....	17	4.5.4	Installing the boiler with gap from external wall ..	47
3.6.3	Fitting the black terminal kit after fitting the flue pipe .....	18	4.6	Fitting the vertical air/flue pipe .....	48
3.7	Fitting the variable terminal kit (VTK) .....	19	4.6.1	Scope of delivery .....	48
3.7.1	Scope of delivery .....	19	4.6.2	Preparing for installation .....	48
3.7.2	Assembling the variable terminal kit before fitting the flue pipe .....	19	4.6.3	Fitting the pitched-roof penetration .....	48
3.7.3	Fitting the variable terminal kit after fitting the flue pipe .....	21	4.6.4	Fitting the flat-roof penetration .....	49
3.7.4	Fitting extensions .....	22	4.7	Fitting extensions and elbows .....	50
3.7.5	Fitting variable terminal kit extensions around roof overhangs .....	24	4.7.1	Fitting extensions .....	50
3.8	Fitting the deflector set .....	24	4.7.2	Fitting two 87° elbows .....	51
3.8.1	Scope of delivery .....	24	4.7.3	Fitting 87° elbows .....	53
3.8.2	Fitting the deflector set before fitting the flue pipe .....	24	4.7.4	Fitting 45° elbows .....	54
3.8.3	Fitting the deflector set after fitting the flue pipe .....	25	<b>5</b>	<b>Vaillant Service</b> .....	55
3.8.4	Fitting the variable terminal kit after fitting the flue pipe .....	26	<b>Index</b>	.....	56
3.9	Fitting the vertical roof penetration .....	27			
3.9.1	Scope of delivery .....	27			
3.9.2	Preparations .....	27			
3.9.3	Fitting the pitched-roof penetration .....	28			
3.9.4	Fitting the flat-roof penetration .....	29			

## 1 Notes on the documentation

The following instructions are intended to guide you throughout the entire documentation. Other documents apply in addition to these installation instructions. We accept no liability for any damage caused by non-observance of these instructions.

### Other applicable documents

For the competent person:

- Installation instructions for installed gas-fired wall hung high-efficiency boiler.

### 1.1 Storing documents

- Please pass on this installation manual, all other applicable documents and any additional aids required to the system operator.

The system operator will take responsibility for keeping them safe so that they are available when required.

### 1.2 Symbols used

The symbols used in this document are explained below.



Symbol that denotes danger:

- Imminent danger to life
- Risk of severe personal injury
- Risk of minor personal injury



Symbol that denotes danger:

- Risk of death from electric shock



Symbol that denotes danger:

- Risk of material damage
- Risk of damage to the environment



Symbol that denotes useful tips and information

- Symbol for a required action

### 1.3 Applicability of the instructions

This Installation Manual applies exclusively to the Vaillant appliances specified in the other applicable documents.

### 1.4 Air/flue gas systems available

There are two types of air/flue gas system available for the ecoTEC gas-fired wall-hung boilers:

- Concentric air/flue gas systems (standard) (external diameter 100 mm)
- Concentric air/flue gas system (optional) with larger diameter (external diameter 125 mm) which allows longer air/flue pipe systems to be constructed.



## 2 Safety

### 2.1 Safety and warning information

When installing the systems, observe the general safety instructions and warnings which appear before the instructions for each operation.

#### 2.1.1 Classification of warnings

The warnings are classified according to the severity of the potential danger using the following danger signs and signal words:

Danger sign	Signal word	Explanation
	<b>Danger!</b>	Immediate risk of death or risk of severe personal injury
	<b>Danger!</b>	Risk of death from electric shock
	<b>Warning.</b>	Risk of minor personal injury
	<b>Caution.</b>	Risk of material or environmental damage

#### 2.1 Meaning of danger signs and signal words

#### 2.1.2 Structure of warnings

Warnings signs are identified by an upper and lower separating line and are laid out according to the following basic principle:

**Signal word!****Type and source of danger!**

Explanation of the type and source of danger.

- Measures for averting the danger.

### 2.2 General safety information

- Observe the following safety instructions and requirements at all times.

#### Qualification of technical staff

The installation of the boiler and its flue must be carried out by a competent person approved at the time by the Health and Safety Executive.

- Furthermore, the requirements, rules and regulations specified in the installation instructions for the appliances must be followed.

#### Risk of fatal poisoning from escaping flue gases

All openings in the flue ducting that can be opened for inspection purposes must be closed before commissioning and while the system is in operation.

- Make sure that the openings in the flue duct system are only opened by a competent person.

Flue gas can escape from leaking pipes or damaged seals.

- When installing the flue system, use only flue pipes of the same material.

Mineral oil-based lubricants may damage the seals.

- On no account should mineral-oil based grease be used for installation.
- Only use water or commercially available soft soap, if necessary, to assist with installation.

Mortar residues, shavings, etc. in the flue ducts can restrict the outward flow of the flue gas. Flue gas may escape into the room.

- After installation, remove all mortar residues, shavings, etc. from the flue ducts.

Extensions that are not fixed to a wall or ceiling may become disconnected due to sagging or thermal expansion.

- Ensure that every extension is fixed to the wall or ceiling by means of a pipe bracket. The distance between two pipe brackets must not be greater than the length of the extension.

Unsecured joints on the air/flue gas ducting may become disconnected.

- Secure each air-pipe joint by screwing the air-pipe collars with the air-pipe ends or the boiler flue connection.

Condensate that collects in a particular place can damage the flue pipe seals.

- Install a horizontal flue pipe with a gradient of  $3^\circ \square 1^\circ$  sloping downwards to the appliance. That equates to a drop of approx.  $50 \text{ mm} \square 20 \text{ mm}$  per metre of pipe run.

#### Requirements for the air/flue pipe outlet

- Observe the requirements for the air/flue pipe outlet specified in the installation instructions for the boiler.

#### Fire risk from lightning strike

- Make sure that the flue system is incorporated in the building's lightning conductor circuit if the building has one.



### Risk of corrosion in the flue system

Sprays, solvents or cleaning agents, paints and adhesives may contain substances which, if the boiler is operating under the most unfavourable conditions, can cause corrosion in the flue system.

- Use only the appropriate Vaillant components when installing the flue system.
- Keep the combustion air that is drawn into the boiler free of chemicals that contain substances such as fluorine, chlorine or sulphur.

### Use of tools

Unsuitable tools and/or improper use of tools can cause damage (e.g. to casing panels or system components). Always use screwdrivers and spanners (open-ended) of the correct size when undoing or tightening screws, nuts and bolts. Do not use pipe wrenches, extensions, etc.

### Distance from adjacent components

The air/flue pipe operates at a very low temperature, which means that there is no minimum clearance required between the air pipe and adjacent supply lines.

## 2.3 Regulations

Installation of the gas-fired wall-hung boiler and its air/flue pipe must conform to the Gas Safety Regulations (Installation and Use) 1998, the Building Regulations and BS 5440 Part 1.

## 2.4 Intended use

Vaillant air/flue pipe systems are constructed using state-of-the-art technology in accordance with recognised safety regulations. Nevertheless, there is still a risk of injury or death to the system operator or others or of damage to the products and other property in the event of improper use or use for which the products are not intended.

The Vaillant air/flue pipe systems described in this manual may only be used in conjunction with the appliance types specified in this manual.

Any use other than or beyond that specified constitutes improper use and nullifies any responsibility or liability whatsoever on the part of the manufacturer/supplier for resulting loss or damage. In such cases, the risk is borne solely by the person carrying out the work and the user.

Intended use includes the following:

- observing the operating, installation and maintenance instructions supplied for the Vaillant product and any other parts and components of the system
- installing and fitting the product in accordance with the appliance and system approval
- complying with all of the inspection and maintenance conditions listed in the instructions.

## 2.5 Certified air/flue gas systems

The Vaillant ecoTEC gas-fired wall-hung boilers are certified in accordance with the EC Gas Appliance Directive 90/396/EEC or 2009/142/EC as heating boiler systems with associated flue systems. This Installation Manual is a component of the certification and is cited in the type approval certificate. Subject to compliance with the requirements for carrying out installation set out in this Installation Manual, the usability of the air/flue pipe system products identified by Vaillant article numbers is certified.



### Danger!

**Vaillant appliances are certified only for use with 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.

- Only use genuine Vaillant flue pipes.

## 3 Concentric system (standard), dia. 60/100

### 3 Concentric system (standard), dia. 60/100

The air pipes are made of galvanised steel, the flue pipes out of plastic.

#### 3.1 Product range



**0020060570** = Vertical air/flue pipe (black, RAL 9005)

**0020065937** = Vertical air/flue pipe (black, RAL 9005)



**303982** = Ridge tile terminal





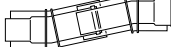

















**303933** = Horizontal air/flue pipe

**303936** = Horizontal telescopic air/flue pipe

Optional accessories	Art. no.	0020060570 0020065937	303982	303933	303936
Extensions, concentric 470 mm - dia. 60/100	303902	X	X	X	X
Extensions, concentric 970 mm - dia. 60/100	303903	X	X	X	X
Extensions, concentric 1970 mm - dia. 60/100	303905	X	X	X	X
Extensions, concentric <sup>1)</sup> 4000mm - dia. 60/100	0020138174	X	X	X	X
Elbows (PP), concentric (set of 2) 45° - dia. 60/100	303911	X	X	X	X
Elbow, concentric 87° - dia. 60/100	303910	X	X	X	X
Pipe brackets for flue pipe (set of 5), dia. 100	303821	X	X	X	X
Adjustable pipe brackets for flue pipe (set of 3); dia. 100	303935	X	X	X	X
Sliding sleeve (PP), dia. 60/100	303915	X	X	X	X
<p>1) In order to assist with longer flues within buildings with the minimum number of joints to be inspected a 4 metre air/flue duct extension will available - by special order only. (special delivery requirements along with a minimum order quantity and a no returns policy will apply). Note that the fall angle remains as with all other vaillant flues - so a 4 m length would require a total fall of 200mm. This must be taken into account when deciding upon the location of the boiler.</p>					

#### 3.1 Product range

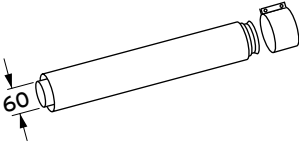
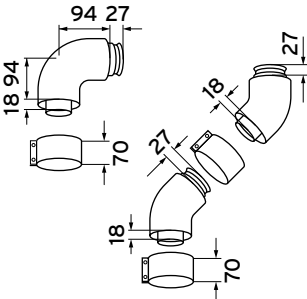
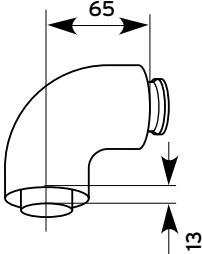
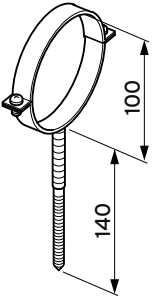
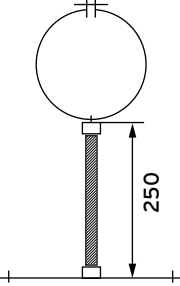
Optional accessories	Art. no.	303900	303982	303933	303936
					
Roof flashing plate for pitched roof 	009076 (black)	X			
Universal flashing plate, pitched roof 	303980	X			
Flat roof flashing 	009056	X			
Telescopic extension 440 - 690 mm - dia. 60/100 	303906	X	X		
Telescopic offset connector 	303919	X	X		
Black terminal kit for horizontal air/flue pipe 	303934			X	X
Variable terminal kit - black*) 	303942			X	X
Extension for variable terminal kit (VTK) dia. 60 mm x 1 m, black*) 	303943			X	X
87° elbow for variable terminal kit - black*) 	303944			X	X
45° elbow for variable terminal kit - black, set of 2) 	303945			X	X
Variable terminal kit - white*) 	303946			X	X
Extension for variable terminal kit (VTK), dia. 60 mm x 1 m - white*) 	303947			X	X
87° elbow for variable terminal kit - white*) 	303949			X	X
45° elbow for variable terminal kit - white (set of 2) 	303948			X	X
Deflector set, DN 60, PP black 	0020060584			X	X
Deflector set, DN 60, PP white 	0020060585			X	X

### 3.1 Product range

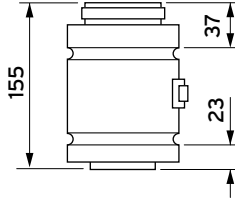
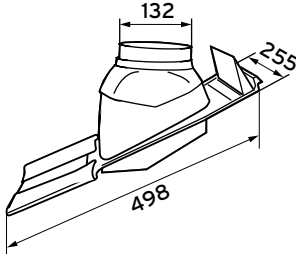
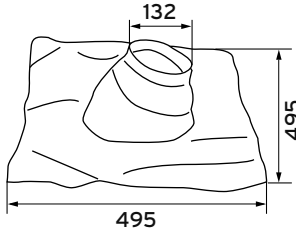
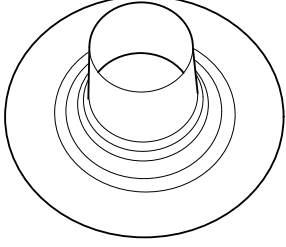
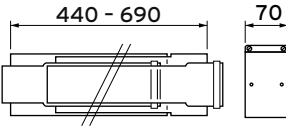
\*) Supplied with pipe brackets

### 3 Concentric system (standard), dia. 60/100

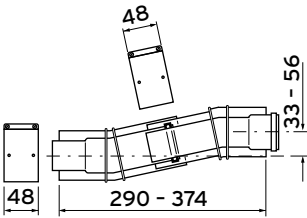
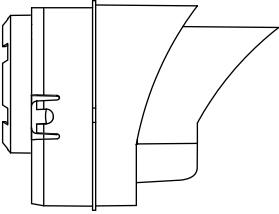
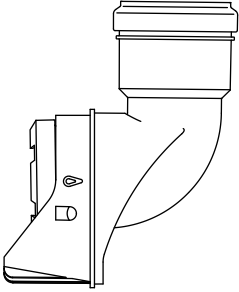

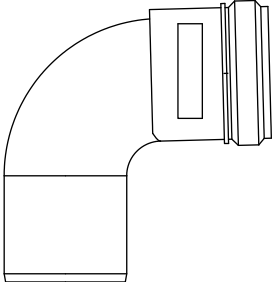
#### Description of components

Component	Description
	<b>Extension, dia. 60/100</b> 470 mm: Art. no. 303902 970 mm: Art. no. 303903 1970 mm: Art. no. 303905
	<b>Elbow, dia. 60/100</b> 87°: Art. no. 303910 45°: Art. no. 303911 (set of 2)
	<b>Elbow 87°, dia. 60/100</b> Only as part of: Art. no. 303933 Art. no. 303936
	<b>Pipe brackets for flue pipe,</b> dia. 100 (set of 5) Art. no. 303821
	<b>Adjustable pipe brackets for flue pipe, dia. 100</b> (set of 3) Art. no. 303935

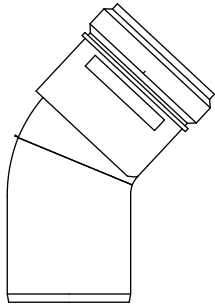
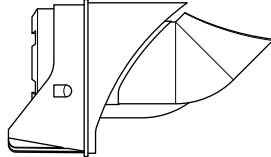
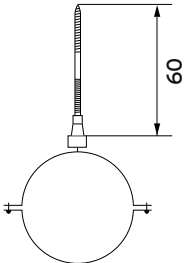
3.2 Components, dia. 60/100

Component	Description
	<b>Sliding sleeve (PP), dia. 60/100</b> Art. no. 303915
	<b>Roof flashing plate for pitched roof</b> Art. no. 009076 (black)
	<b>Universal flashing plate, pitched roof</b> (black)
	<b>Flat roof flashing</b> Art. no. 009056
	<b>Telescopic extension (PP), dia. 60/100</b> 440 mm - 690 mm Art. no. 303906

3.2 Components, dia. 60/100 (continued)

Component	Description
	<b>Telescopic offset connector, dia. 60/100</b> Art. no. 303919
	<b>Black terminal kit for horizontal air/flue pipe</b> Art. no. 303934 Only for 303933 and 303936
	<b>Variable terminal kit - black</b> Art. no. 303942 Only for 303933 and 303936  Variable terminal kit - white Art. no. 303946 Only for 303933 and 303936
	<b>Extension for variable terminal kit, dia. 60 mm x 1 m - black</b> inc. 1 pipe bracket Art. no. 303943  Extension pipe for variable terminal kit, dia. 60 mm x 1 m - white inc. 1 pipe bracket Art. no. 303 947
	<b>87° elbow for variable terminal kit - black</b> inc. 1 pipe bracket Art. no. 303944  87° elbow for variable terminal kit - white inc. 1 pipe bracket Art. no. 303949

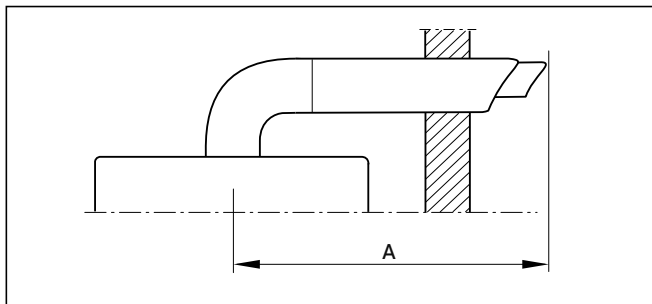
3.2 Components, dia. 60/100 (continued)

Component	Description
	<b>45° elbow for variable terminal kit - black</b> Art. no. 303945  45° elbow for variable terminal kit - white Art. no. 303948
	<b>Deflector set, DN 60, PP black</b> inc. wall seal Art. no. 0020060584  Deflector set, DN 60, PP white Art. no. 0020060585
	<b>Pipe bracket for flue pipe, dia. 60 mm</b> supplied with the sets

3.2 Components, dia. 60/100 (continued)

### 3 Concentric system (standard), dia. 60/100

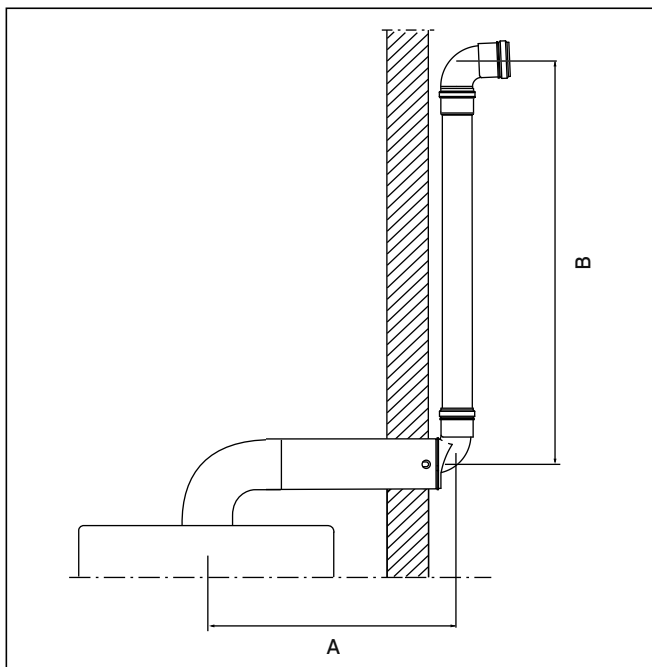
#### 3.2 Maximum permissible pipe lengths



3.1 Horizontal flue systems

**Key**

A Maximum pipe length

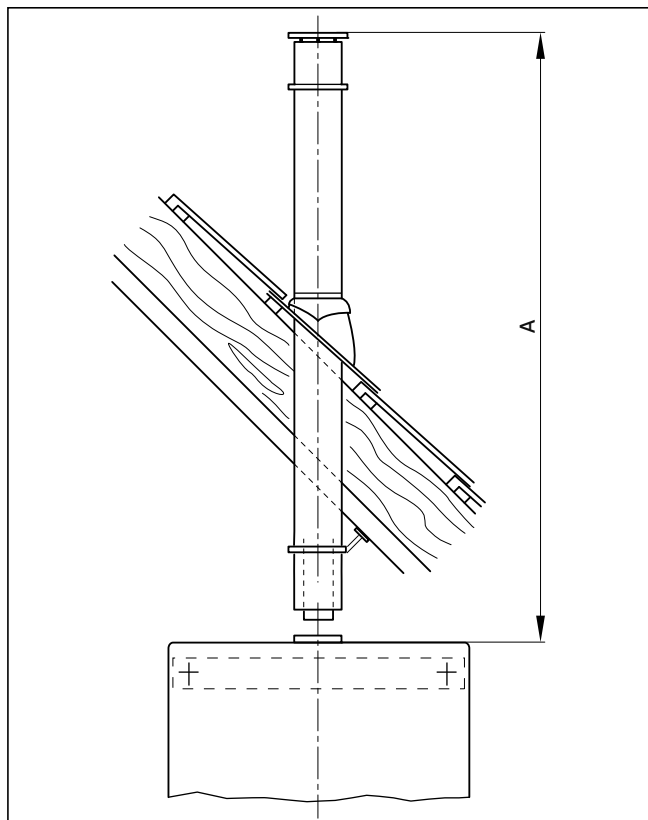


3.2 Horizontal flue systems with vertical terminal kit

**Key**

A Concentric pipe length

B Pipe length outdoors



3.3 Vertical flue systems

**Key**

A Maximum pipe length

**3.2.1 Maximum permitted pipe lengths for ecoTEC exclusive**

Accessories	Art. no.		ecoTEC exclusive	
			832	838
Horizontal air/flue pipe	303933 303936	Max. permissible concentric pipe length	4.0 m inc. 1 elbow, 87° The inclusion of additional elbows in the flue system reduces the maximum pipe length as follows: - by 1.0 m per 87° elbow, - by 0.5 m per 45° elbow.	
Variable terminal kit	303942 303946  Only in conjunction with 303933 and 303936	Max. permissible concentric pipe length	The permissible concentric pipe length stated above is reduced as follows: - by 0.5 m with the variable terminal - by 0.5 m per meter of VTK pipe - by 0.5 m per 87° elbow - by 0.5 m for every two 45° elbows	
Vertical air/flue pipe	0020060570 0020065937 303982	Max. permissible concentric pipe length	7.0 m The inclusion of additional elbows in the flue system reduces the maximum pipe length as follows: - by 1.0 m per 87° elbow, - by 0.5 m per 45° elbow.	

**3.3 Maximum permitted pipe lengths for ecoTEC exclusive**

**3.2.2 Maximum permitted pipe lengths for ecoTEC**

Accessories	Art. no.		ecoTEC					
			plus 612 plus 615	plus 618 plus 824 pro 24	plus 624 plus 831 pro 28 pro 828	plus 630	plus 637 plus 837 plus 937	plus 415 plus 418 plus 428 plus 438
Horizontal air/flue pipe	303933 303936	Max. permissible concentric pipe length	22.0 m inc. 1 elbow, 87°	12.0 m inc. 1 elbow, 87°	8.0 m inc. 1 elbow, 87°	8.0 m inc. 1 elbow, 87°	5.5 m inc. 1 elbow, 87°	10.0 m inc. 1 elbow, 87°
			The inclusion of additional elbows in the flue system reduces the maximum pipe length as follows: - by 1.0 m per 87° elbow, - by 0.5 m per 45° elbow.					
Variable terminal kit	303942 303946  Only in conjunction with 303933 and 303936	Max. permissible concentric pipe length	The permissible concentric pipe length stated above is reduced as follows: - by 0.5 m with the variable terminal - by 0.5 m per meter of VTK pipe - by 0.5 m per 87° elbow - by 0.5 m for every two 45° elbows  The pipe length outdoors must not exceed 10 m.					
Vertical air/flue pipe	0020060570 0020065937 303982	Max. permissible concentric pipe length	26.0 m	16.0 m	12.0 m	12.0 m	8.0 m	10.0 m
			The inclusion of additional elbows in the flue system reduces the maximum pipe length as follows: - by 1.0 m per 87° elbow, - by 0.5 m per 45° elbow.					

**3.4 Maximum permitted pipe lengths for ecoTEC**

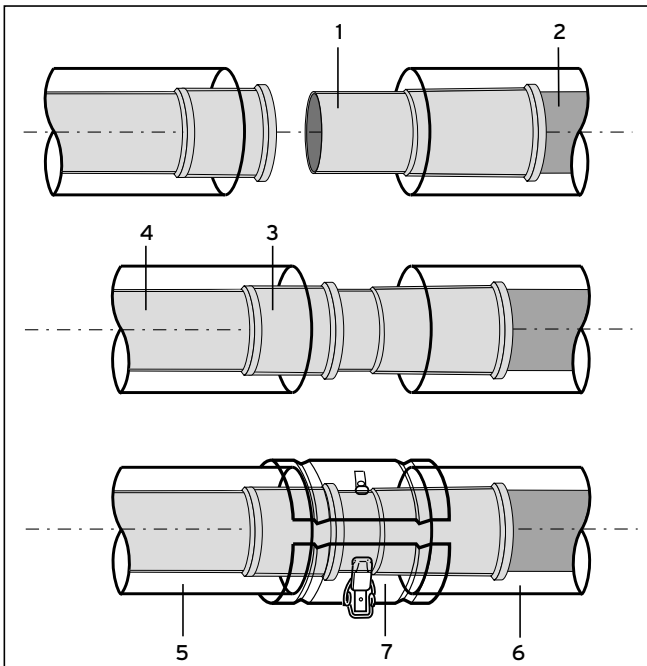
## 3 Concentric system (standard), dia. 60/100

### 3.3 Fitting the sliding sleeve



If there is sufficient space available, you can use a sliding sleeve (art. no. 303915) to connect the flue pipe to the boiler flue connection. This consists of a sliding sleeve for the inner flue and an over centred clip for the outer air duct which can facilitate easy disconnection of the boiler from the flue system.

When using the sliding sleeve, you must shorten the last extension pipe by an additional 95 mm.



### 3.4 Fitting the sliding sleeve

- Slide the sliding sleeve (1) onto the extension flue pipe (2) as far as the stop.
- Push the sliding sleeve back until it locates into the socket (3) of the boiler flue pipe (4).
- Make sure that both ends of the sliding sleeve overlap the flue pipes by at least 20 mm.
- Fit the air-pipe collar (7) around the air pipes (5 and 6).
- Close the catch on the air-pipe collar.



#### **Danger!** Risk of poisoning due to escaping flue gas.

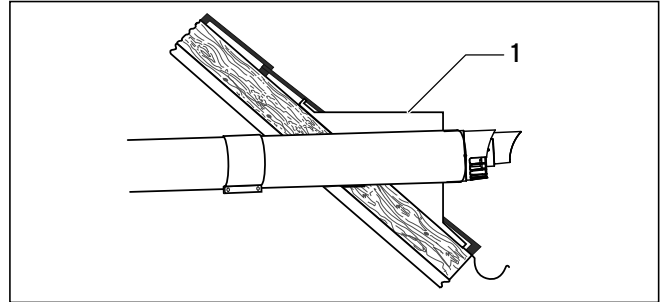
Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

- Drill two holes 3 mm in diameter through the air-pipe collar and the air pipe. The hole centres should be 6 mm from the edge of the air-pipe collar.

- Screw the air-pipe collar to the air pipes using the screws supplied.

### 3.4 Fitting the horizontal wall penetration



### 3.5 Flue pipe roof penetration



For horizontal flue systems exiting through pitched roofs, please order the flue pipe roof penetration (1) from: Ubbink (Northants, Tel: 01280 700211)



#### **Danger!** Risk of poisoning due to escaping flue gas.

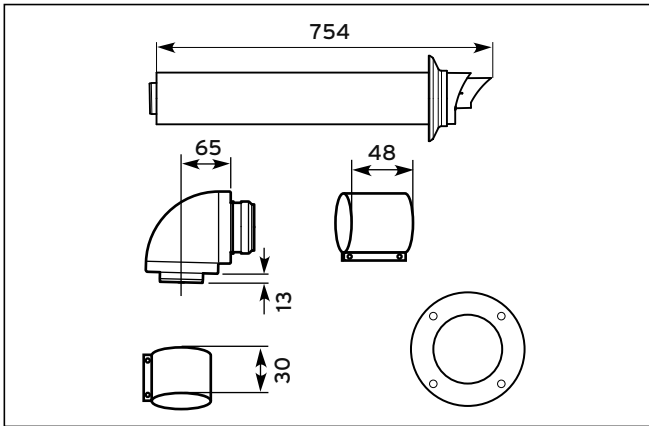
Condensate that collects in a particular place can damage the flue pipe seals.

- Install a horizontal flue pipe with a gradient of 3° ± 1° sloping downwards to the appliance. That equates to a drop of approx. 50 mm ± 20 mm per metre of pipe run.



The air/flue pipes of the horizontal wall penetration are not concentric. With the wall penetration fitted horizontally, the flue pipe slopes downwards at 1.5° towards the inside.

### 3.4.1 Scope of delivery

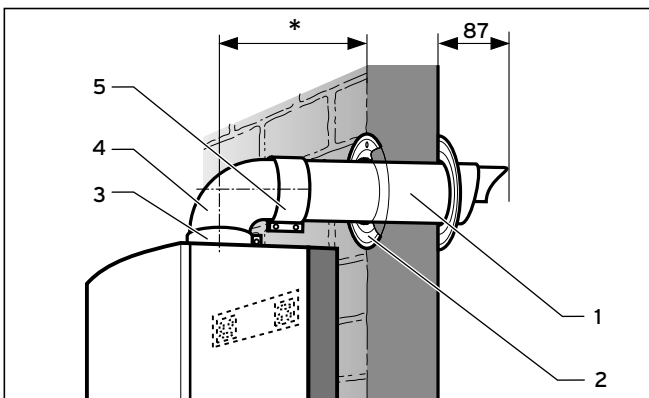


### 3.6 Horizontal air/flue pipe

Art. no. 303933

- Horizontal air/flue pipe
- 87° elbow
- 1 x 48-mm air-pipe collar
- 1 x 30-mm air-pipe collar
- Wall rosette, dia. 100
- External wall seal

### 3.4.2 Preparing for installation



### 3.7 Fitting the horizontal wall penetration

#### Key

- \* = 190 mm for ecoTEC exclusive combination boiler
- \* = 176 mm for ecoTEC plus open-vented
- \* = 125 mm for ecoTEC plus boiler & combination boiler
- \* = 323 mm for ecoTEC plus 937

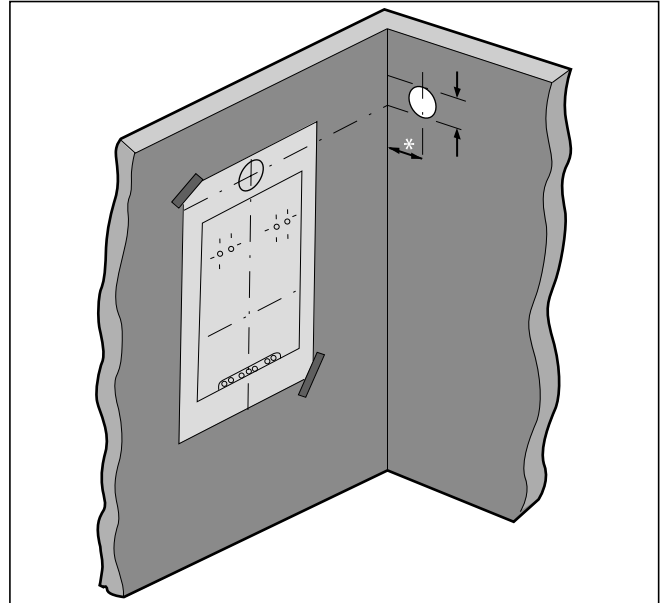
- Decide on the installation site for the boiler - see boiler installation instructions.
- Make sure that all clearances required for installation and servicing can be achieved and that the air/flue gas system can be installed in accordance with this manual.
- Attach the mounting template supplied with the boiler to the wall.

- Using a plumb line or spirit level, check that the centre line of the mounting template is vertical.

### Connection facing upwards, flue exit to rear

If you connect the air/flue pipe directly to the rear of the boiler, the mounting template shows the position of the wall penetration for horizontal installation connected to the top of the boiler.

### Connection facing upwards, flue exit to side



### 3.8 Distance to external wall

#### Key

- \* = 190 mm for ecoTEC exclusive combination boiler
- \* = 176 mm for ecoTEC plus open-vented
- \* = 125 mm for ecoTEC plus boiler & combination boiler
- \* = 323 mm for ecoTEC plus 937

If you wish to install the air/flue pipe to the side of the boiler, you can determine the position of the wall penetration by carefully transposing the centre line of the wall penetration marked on the mounting template (→ fig. 3.8).

The position of the wall penetration must allow for installation of the flue pipe with a slight rise of roughly 3° + or - 1° (that equates to 50 mm + or - 20 mm per metre of pipe length).

- Calculate the required rise according to the length of the flue pipe and then mark the position for the wall penetration.
- If possible drill the hole in the wall with a core drill, diameter 125 mm.



If the desired position for the wall penetration is accessible from the outside of the building, you can drill the hole with a 107 mm diameter core drill and insert the external wall seal from the outside of the building.

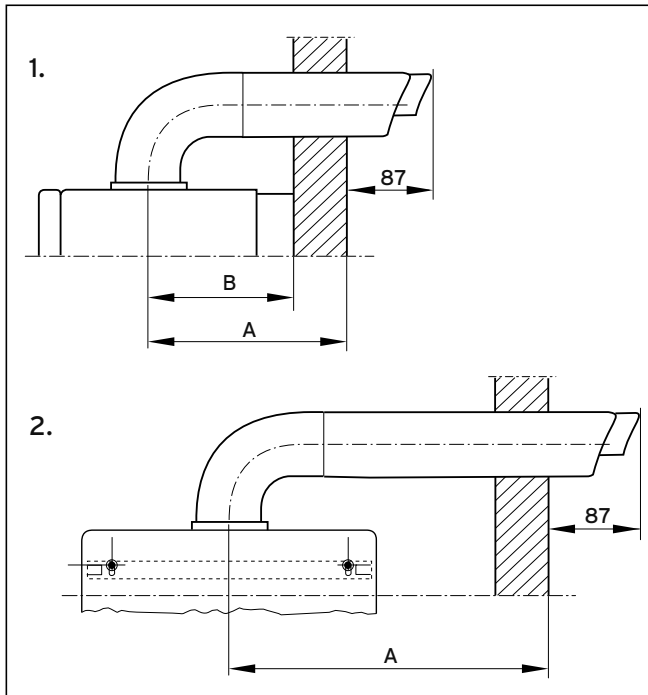
### 3 Concentric system (standard), dia. 60/100



If the desired position for the wall penetration is accessible from the outside of the building, you can drill the hole with a 107 mm diameter core drill and insert the external wall seal from the outside of the building.



When cutting the air and flue pipes, remove all sharp burrs with a file. That will simplify connecting the pipes together and prevent damage to the flue pipe seals by sharp edges.

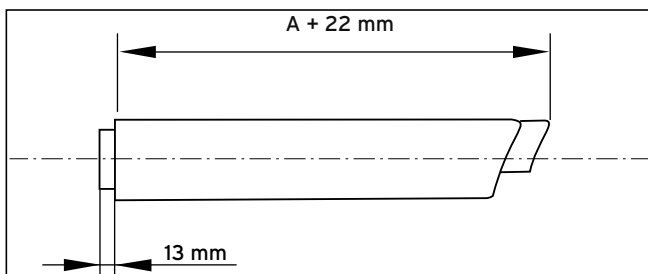


**3.9 Distance to external wall**

**Key**

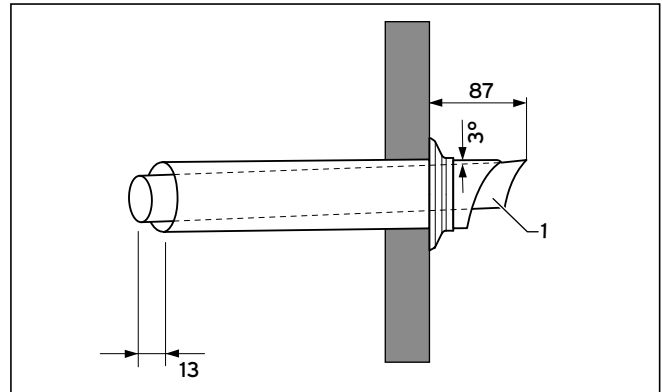
- 1. Flue exit to rear
- 2. Flue exit to side
- A Distance to external wall
- B Distance to internal wall:
  - = 190 mm for ecoTEC exclusive combination boiler
  - = 176 mm for ecoTEC plus open-vented
  - = 125 mm for ecoTEC plus boiler & combination boiler
  - = 323 mm for ecoTEC plus 937

- Measure the distance from the outside of the wall to the centre of the boiler flue connection. That corresponds to the dimension A (→ **fig. 3.9**).



**3.10 Length of air pipe**

- Cut the air and flue pipes to length (→ **fig. 3.10**). All flue pipe sockets must face towards the terminal.



**3.11 Fitting the horizontal wall penetration**

- Take care not to scratch the white surface of the air pipe. If extensions or additional elbows are required for installing the air/flue pipe, → **section 3.12**.
- Push the air/flue pipe (1) together with the external wall seal through the wall until the external wall seal opens out again on the outside.
- Pull the air/flue pipe back towards the boiler until the external wall seal is in contact with the external wall (→ **fig. 3.6** and → **fig. 3.11**).
- Make sure that the air/flue pipe (1) is central inside the hole and that the terminal is correctly positioned with the inlet grille on the underneath (→ **fig. 3.6** and → **fig. 3.11**).
- Slide the wall rosette (2) over the air pipe until it is flush against the wall (→ **fig. 3.7**).
- Fix the boiler in position - see boiler installation instructions.
- Fix the elbow (4) to the boiler by pushing the elbow spigot into the socket of the boiler flue connection and securing it with the 30-mm air-pipe collar (3) supplied (→ **fig. 3.7**).
- Pull the air/flue pipe back through the wall so that the flue pipe is pushed fully home into the socket of the flue elbow.
- Fit the 48-mm air-pipe collar. When doing so, take care to align it centrally (5, → **fig. 3.7**).



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

- Through the holes in each air-pipe collar, drill a hole 3 mm in diameter in the air pipe.

- Screw the air-pipe collars to the air pipes, the elbow and the boiler using the screws supplied.
- Slide the wall rosette back against the wall and fix it in position with a small amount of sealant if necessary.



If installing close to a light source, the outlet can become dirty due to large numbers of flying insects. Point out to the operator that the outlet should be regularly cleaned.

### 3.5 Fitting the telescopic horizontal air/flue pipe



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

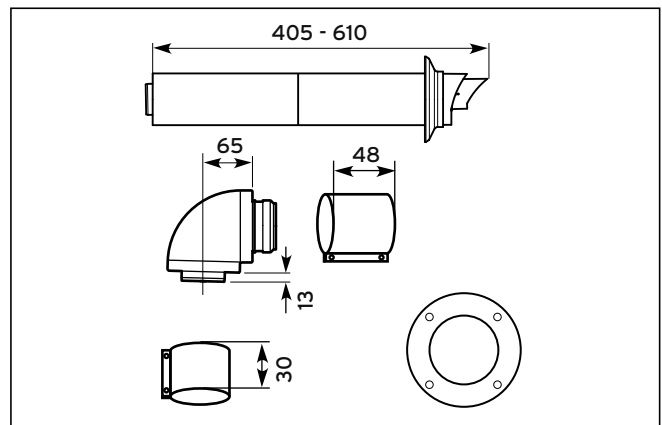
Condensate that collects in a particular place can damage the flue pipe seals.

- Install the horizontal flue pipe with a gradient of  $3^\circ \square 1^\circ$  sloping downwards to the appliance. That equates to a drop of approx. 50 mm  $\square$  20 mm per metre of pipe run.



The air/flue pipes of the horizontal wall penetration are not concentric. With the wall penetration fitted horizontally, the flue pipe slopes downwards at  $1.5^\circ$  towards the inside.

#### 3.5.1 Scope of delivery

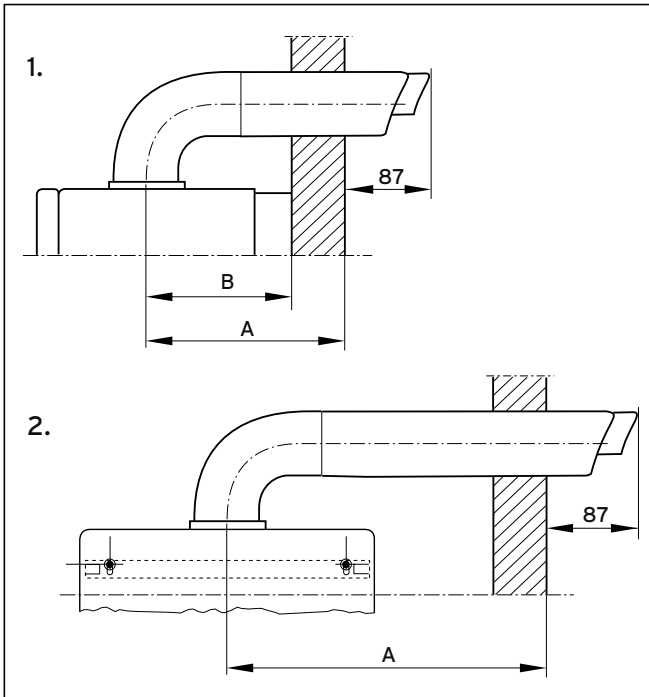


#### 3.12 Telescopic horizontal air/flue pipe

- Art. no. 303936, length 0.4 - 0.61 m
- Telescopic horizontal air/flue pipe
  - $87^\circ$  elbow
  - 1 x 48-mm air-pipe collar
  - 1 x 30-mm air-pipe collar
  - Wall rosette, dia. 100
  - External wall seal

### 3 Concentric system (standard), dia. 60/100

#### 3.5.2 Preparations

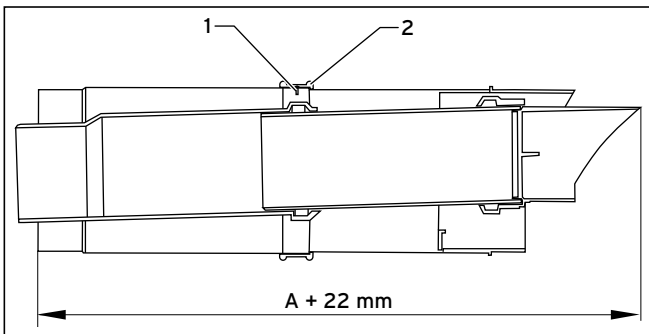


**3.13 Distance to external wall**

**Key**

- 1. Flue exit to rear
- 2. Flue exit to side
- A Distance to external wall
- B Distance to internal wall:  
 = 190 mm for ecoTEC exclusive combination boiler  
 = 176 mm for ecoTEC plus open-vented  
 = 125 mm for ecoTEC plus boiler & combination boiler  
 = 323 mm for ecoTEC plus 937

- Measure the distance from the outside of the wall to the centre of the boiler flue connection (→ **fig. 3.13**). That corresponds to the dimension A.



**3.14 Fixing the air pipes**

**Key**

- 1 Screw
- 2 Tape

Adjust the length of the air and flue pipes to the dimension shown in **fig. 3.14**.



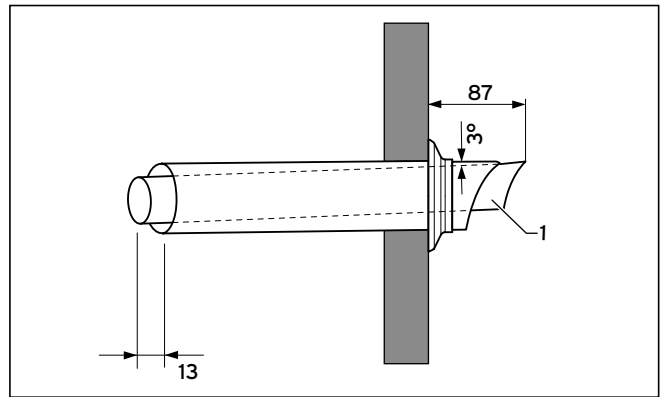
**Danger!**

**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

- Secure the air-pipe sections by drilling a hole with a diameter of 3 mm through the locating hole in the air pipe and inserting the screws supplied.
  - Tape over the gap in the telescopic extension with adhesive tape (2) (→ **fig. 3.14**).
- All flue pipe sockets must face towards the terminal.
- Take care not to scratch the white surface of the air pipe. If extensions or additional elbows are required for installing the air/flue pipe, → **section 3.12**.



**3.15 Fitting the horizontal wall penetration**

- Push the air/flue pipe (1) together with the external wall seal through the wall until the external wall seal opens out again on the outside wall.
- Pull the air/flue pipe back towards the boiler until the external wall seal is in contact with the external wall (→ **fig. 3.7** and → **fig. 3.15**).
- Make sure that the air/flue pipe (1) is central inside the hole and that the terminal is correctly positioned with the inlet grille on the underneath (→ **fig. 3.7** and → **fig. 3.15**).
- Slide the wall rosette (2) over the air pipe until it is flush against the wall (→ **fig. 3.7**).
- Install the boiler - see boiler installation instructions.
- Fix the elbow (4) to the boiler by pushing the elbow spigot into the socket of the boiler flue connection and securing it with the 30-mm air-pipe collar (3) supplied (→ **fig. 3.7**).
- Pull the air/flue pipe back through the wall so that the flue pipe is pushed fully home into the socket of the elbow.
- Fit the 48-mm air-pipe collar (5). When doing so, take care to align it centrally (→ **fig. 3.7**).



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

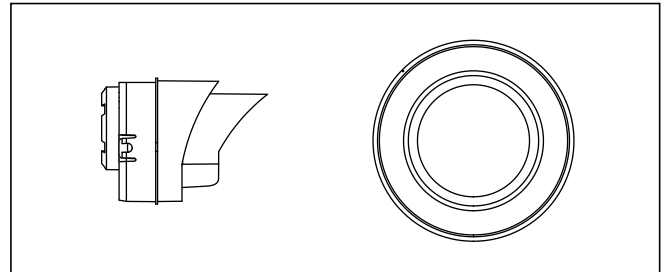
- Through the holes in each air-pipe collar, drill a hole 3 mm in diameter in the air pipe.
- Screw the air-pipe collars to the air pipes, the elbow and the boiler using the screws supplied.
- Slide the wall rosette back against the wall and fix it in position with a small amount of sealant if necessary.



If installing close to a light source, the outlet can become dirty due to large numbers of flying insects. Point out to the operator that the outlet should be regularly cleaned.

**3.6 Fitting the black terminal kit**

**3.6.1 Scope of delivery**

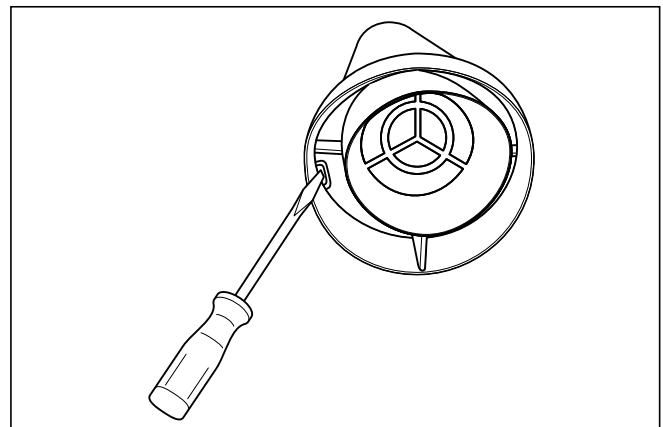


**3.16 Black terminal kit,**

Art. no. 303934

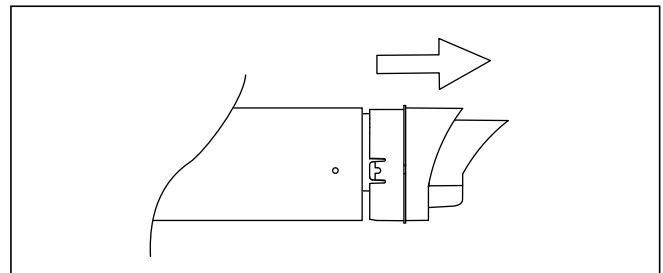
- Black terminal kit
- External wall seal

**3.6.2 Assembling the black terminal kit before fitting the flue pipe**



**3.17 Releasing the catches**

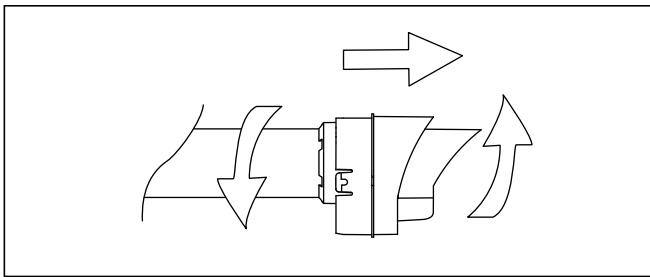
- Using an 8-mm screwdriver, press the catches inwards.



**3.18 Pulling out the terminal**

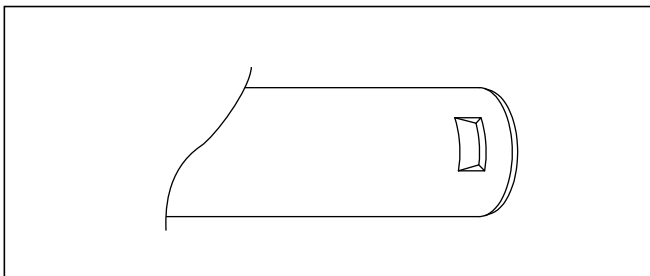
- Pull the terminal out of the air pipe together with the flue pipe.

### 3 Concentric system (standard), dia. 60/100



3.19 Releasing the catch

- Release the catch between the terminal and the flue pipe by twisting the two components in opposite directions.
- Remove the terminal from the flue pipe.



3.20 Recess in flue pipe

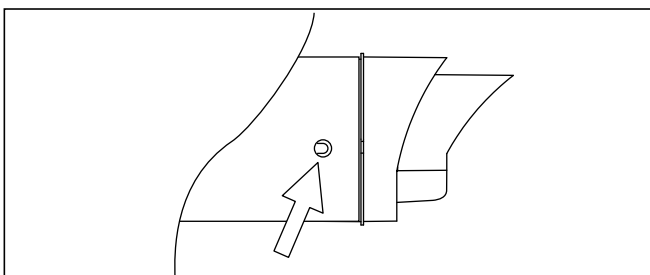


**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas may escape when disconnecting the pipes.

- Make sure that the lug on the top of the terminal engages securely in the recess in the flue pipe.
- Make sure the seal is correctly seated.

- Push the new terminal into the flue pipe so that it snaps into place.



3.21 Engaging the catch



**Caution.**  
**Risk of damage to the air pipe and appliance.**

If rain enters the air pipe, it may cause corrosion of the air pipe and the appliance.

- Make sure that the air-pipe seam is at the top.

- Push the flue pipe together with the terminal back into the air pipe so that both lugs snap into place.
- Fit the horizontal air/flue pipe according to the instructions in **sections 3.4** and **3.5**.

#### 3.6.3 Fitting the black terminal kit after fitting the flue pipe



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

- Before starting the conversion work, shut down the boiler and secure it against being inadvertently started up again.

- Remove the wall seal from the terminal.
- Using an 8-mm screwdriver, press the catches inwards (→ **fig. 3.17**).



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

If you twist the flue pipe when pulling the terminal out of the air pipe, the next flue pipe may become detached from the spacer.

- Take care not to twist the flue pipe when pulling out the terminal.

- Pull the terminal out of the air pipe together with the flue pipe (→ **fig. 3.18**).
- Release the catch between the terminal and the flue pipe by twisting the two components in opposite directions (→ **fig. 3.19**).
- Remove the terminal from the flue pipe.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas may escape when disconnecting the pipes.

- Make sure that the lug on the top of the terminal engages securely in the recess in the flue pipe (→ **fig. 3.20**).
- Make sure the seal is correctly seated.

- Push the new terminal into the flue pipe so that it snaps into place.
- Push the flue pipe together with the terminal back into the air pipe.
- Carefully push the flue pipe back into the socket of the pipe or elbow behind. Make sure the two lugs snap into place (→ fig. 3.21).
- Fit the wall seal.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

If the flue pipe is not properly fitted, flue gas can escape.

- Before starting up the boiler, check that all flue pipe joints are properly seated and air-tight.

### 3.7 Fitting the variable terminal kit (VTK)

#### Minimum clearances for flue terminal

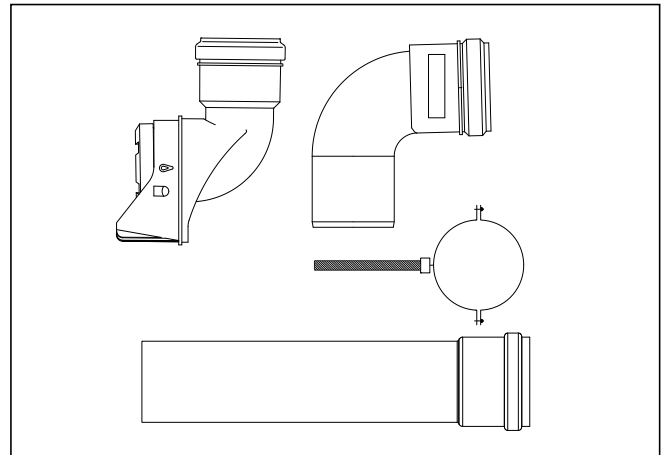
The minimum clearances for the flue terminal as defined in BS 5440 must be observed unless the boiler manufacturer is permitted to use smaller clearances that are not considered safety-critical.

Vaillant has reduced the minimum clearances for the flue terminal and specifies them in the boiler installation instructions. Those clearances are minimum distances applicable to all types of installation except to installation of the variable terminal kit (VTK).

If a VTK is connected to a horizontal flue pipe, the terminal clearances for the air inlet are smaller. The terminal clearances for the "new" flue outlet at the end of the VTK are unchanged.

For the VTK, the minimum clearance of air inlets A, B and C from openings such as a window have been reduced to 150 mm. That means that the terminal on the horizontal flue pipe becomes an air inlet when a VTK is connected and thus can be installed at a distance of less than 300 mm from a window opening or ventilation brick.

### 3.7.1 Scope of delivery



#### 3.22 Variable terminal kit

Contents of kit (art. no. 303942, black; art. no. 303946, white):

- Variable terminal
- 2 x 1 m extension
- 3 x pipe brackets
- 87° elbow with bird-guard grille

### 3.7.2 Assembling the variable terminal kit before fitting the flue pipe

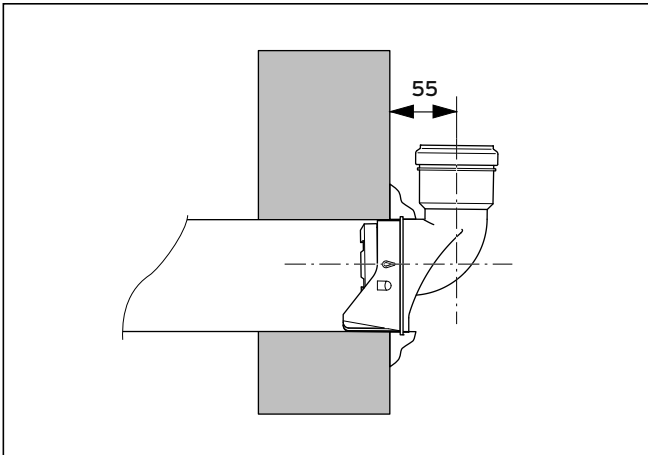


**Caution.**  
**Risk of damage to the air pipe and appliance.**

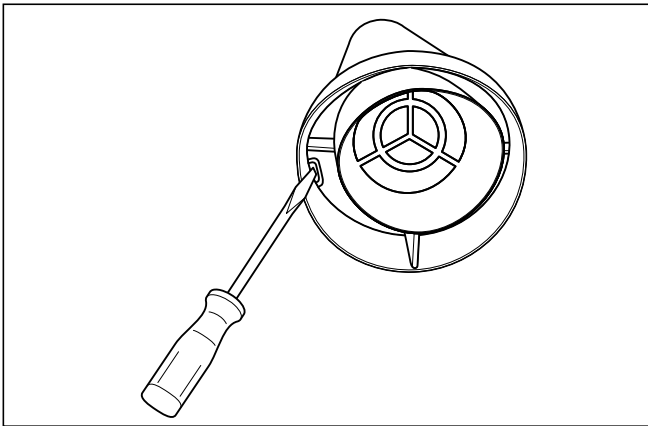
If rain enters the air pipe, it may cause corrosion of the air pipe and the appliance.

- Make sure that the flue outlet of the variable terminal points straight upwards.

### 3 Concentric system (standard), dia. 60/100

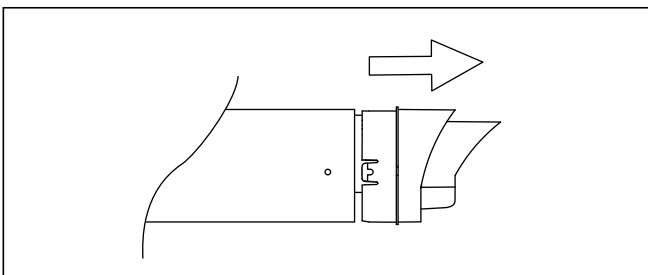


**3.23 Wall clearance**



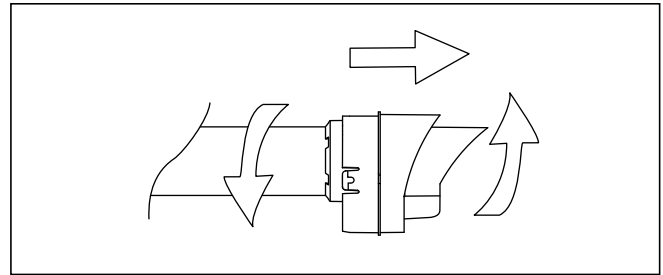
**3.24 Releasing the catches**

- Using an 8-mm screwdriver, press the catches inward.



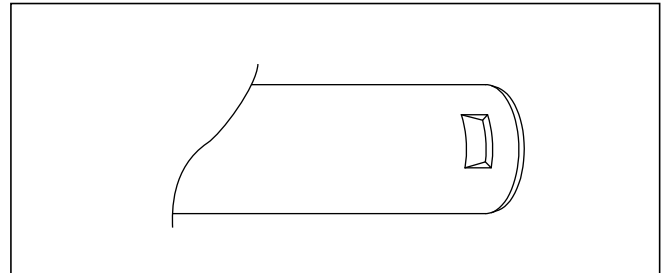
**3.25 Pulling out the terminal**

- Pull the terminal out of the air pipe together with the flue pipe.



**3.26 Releasing the catch**

- Release the catch between the terminal and the flue pipe by twisting the two components in opposite directions.
- Remove the terminal from the flue pipe.



**3.27 Recess in flue pipe**

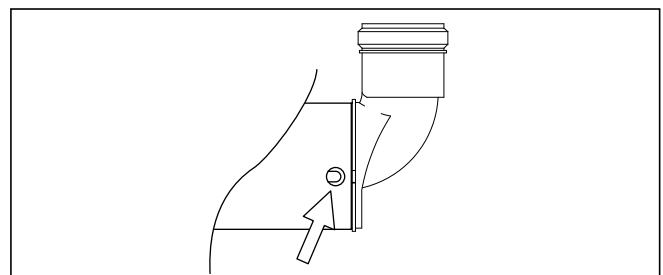


**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas may escape when disconnecting the pipes.

- Make sure that the lug on the top of the terminal engages securely in the recess in the flue pipe.
- Make sure the seal is correctly seated.

- Push the variable terminal into the flue pipe so that it snaps into place.



**3.28 Engaging the catch**



**Caution.**  
**Risk of damage to the air pipe and appliance.**

If rain enters the air pipe, it may cause corrosion of the air pipe and the appliance.

- Make sure that the air-pipe seam is at the top.

- Push the flue pipe together with the variable terminal back into the air pipe so that both lugs snap into place.
- Fit the horizontal air/flue pipe according to the instructions in **sections 3.4** and **3.5**.



Installation is not possible from inside.

- Fit the rest of the variable terminal kit according to the instructions in **section 3.7.4**.

**3.7.3 Fitting the variable terminal kit after fitting the flue pipe**



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

- Before starting the conversion work, shut down the boiler and secure it against being inadvertently started up again.

- Remove the wall seal from the terminal.
- Using an 8-mm screwdriver, press the catches inwards (→ **fig. 3.24**).



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

If you twist the flue pipe when pulling the terminal out of the air pipe, the next flue pipe may become detached from the spacer.

- Take care not to twist the flue pipe when pulling out the terminal.

- Pull the terminal out of the air pipe together with the flue pipe (→ **fig. 3.25**).
- Release the catch between the terminal and the flue pipe by twisting the two components in opposite directions (→ **fig. 3.26**).
- Remove the terminal from the flue pipe.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas may escape when disconnecting the pipes.

- Make sure that the lug on the top of the terminal engages securely in the recess in the flue pipe.
- Make sure the seal is correctly seated.

- Push the new variable terminal onto the flue pipe so that it snaps into place.
- Push the flue pipe together with the terminal back into the air pipe.
- Carefully push the flue pipe back into the socket of the pipe or elbow behind.
- Make sure the two lugs snap into place (→ **fig. 3.28**).
- Fit the wall seal to the variable terminal.
- Fit the rest of the VTK according to the instructions in **section 3.7.4**.

## 3 Concentric system (standard), dia. 60/100

### 3.7.4 Fitting extensions



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Extensions that are not fixed to a wall may become disconnected due to sagging or thermal expansion.

- Fix the extensions to the wall using pipe brackets.
- Use one bracket for each extension, positioned right next to the socket.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Extensions can become disconnected due to thermal expansion.

- Leave a space of 1 cm in each socket to allow for expansion.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

If the flue pipe becomes detached, leakage can occur.

- Before starting up the boiler, check that all flue pipe joints are properly seated and air-tight.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

If the flue system is not regularly checked, leaks and corrosion damage can occur.

- As part of the annual service, check the flue system for the following:
  - visible damage such as brittle or damaged material
  - tightly connected pipe joints
  - obstruction of the air inlet and flue outlet by foliage, dead insects, etc.



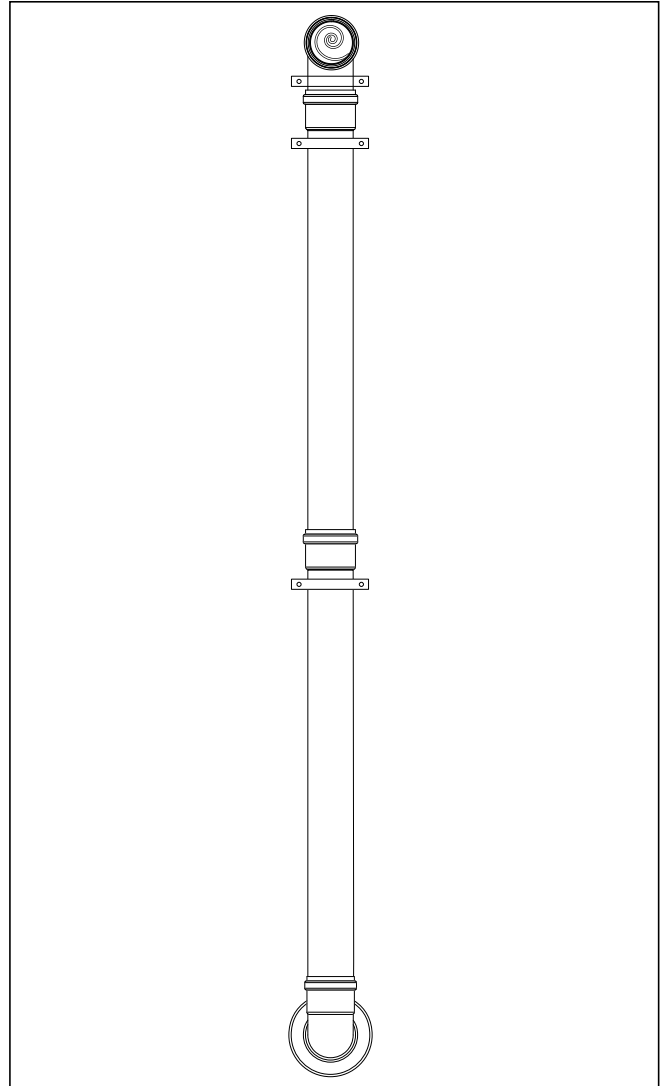
If installing close to a light source, the outlet can become dirty due to large numbers of flying insects. Point out to the operator that the outlet should be regularly cleaned.



When fitting the variable terminal kit, observe the maximum permissible pipe lengths (→ **section 3.2**).



The components are assembled simply by being push-fitted together (not screwed).



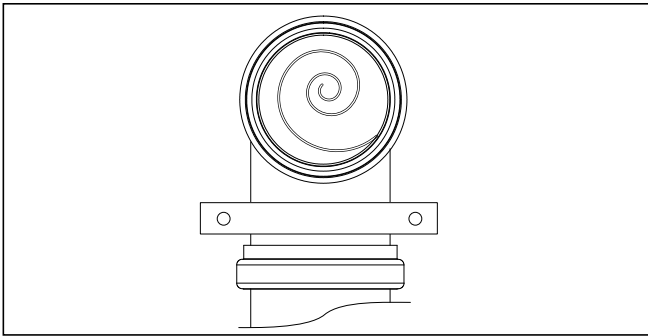
**3.29 Basic set detailing position of pipe brackets**



**Danger!**  
**Risk of poisoning due to flue gas.**

If the 87° elbow with the bird-guard grille is turned out of position, flue gas may enter the building through windows or air vents.

- Fix the 87° elbow with bird-guard grille in position using a separate pipe bracket.



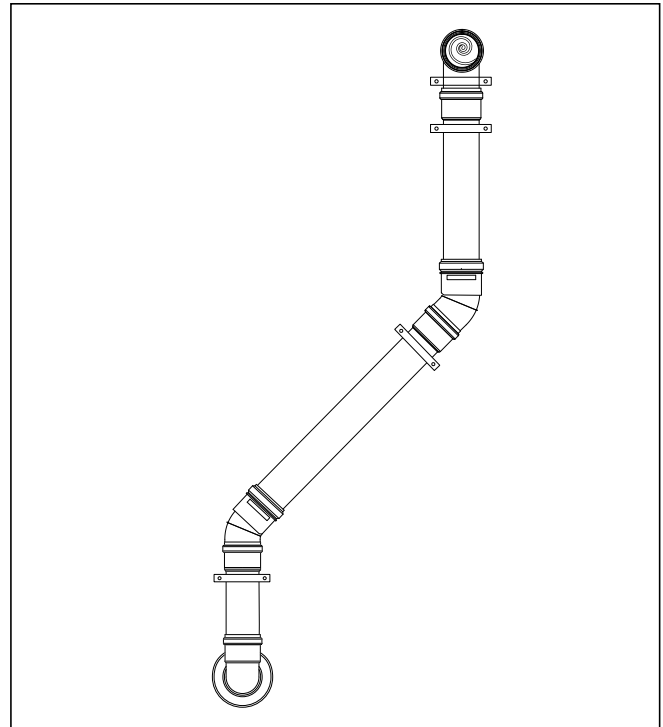
3.30 87° elbow with bird-guard grille and pipe bracket



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

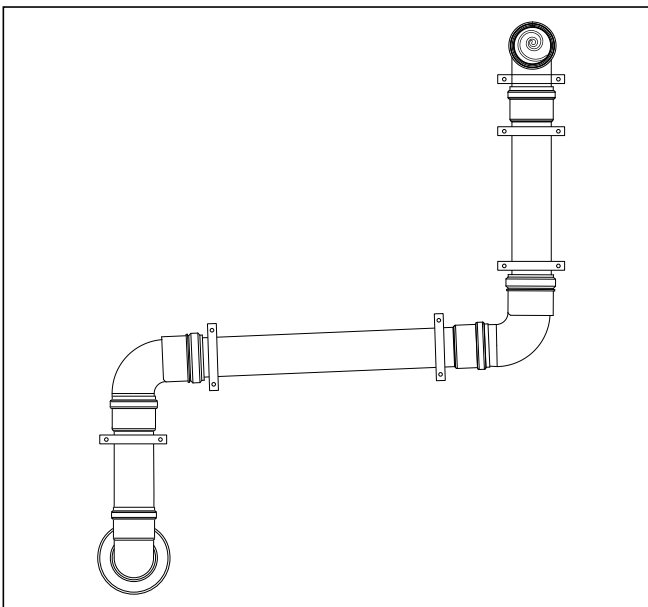
Extensions that are not fixed to a wall may become disconnected due to sagging or thermal expansion.

- After each 87° elbow, fix an extra pipe bracket to the extension.



3.32 Basic set with two additional 45° elbows and detailing position of pipe brackets

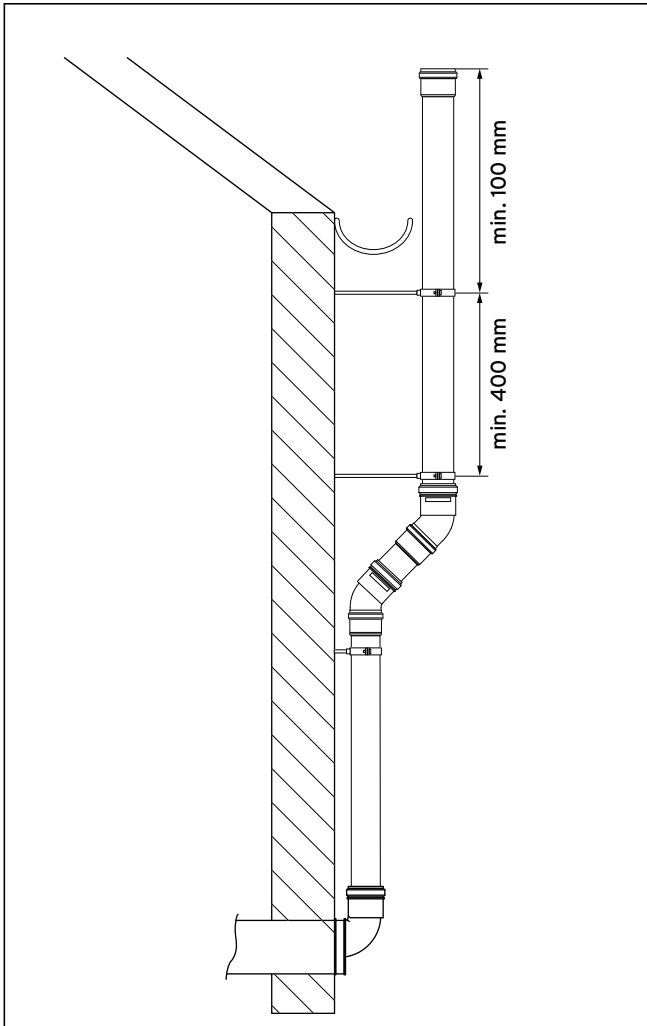
- Fix the pipes and elbows starting from the variable terminal and using the pipe brackets supplied (→ **figs. 3.29** to **3.33**).



3.31 Basic set with two additional 87° elbows and detailing position of pipe brackets

## 3 Concentric system (standard), dia. 60/100

### 3.7.5 Fitting variable terminal kit extensions around roof overhangs



#### 3.33 Fitting extensions around roof overhangs

When routing the variable terminal kit around roof overhangs, extra M8 stud bolts are required for the pipe brackets. The stud bolts are available commercially.

- Fix the bird-guard grille from the 87° elbow in the last extension.



If you use the 87° elbow, you should insert the extension seal.

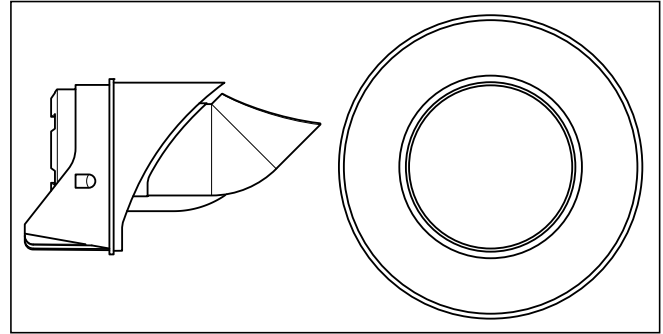
- You must fix the last extension with two pipe brackets spaced at least 400 mm apart.



Additional 45° elbows may be required under certain circumstances.

### 3.8 Fitting the deflector set

#### 3.8.1 Scope of delivery

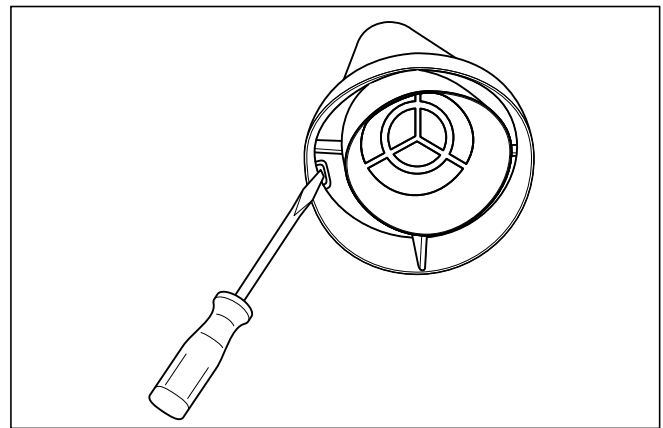


#### 3.34 Deflector set

Deflector set, DN 60, PP black  
(art. no. 0020060584)  
- Black terminal kit  
- External wall seal

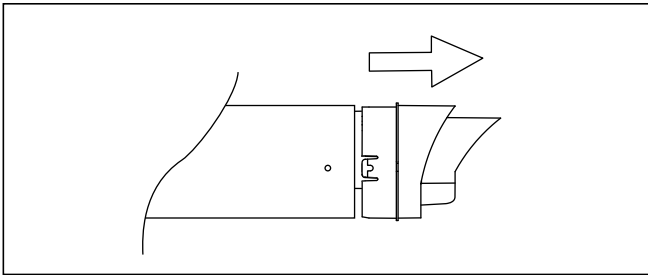
Deflector set, DN 60, PP white  
(art. no. 0020060585)  
- White terminal kit

#### 3.8.2 Fitting the deflector set before fitting the flue pipe



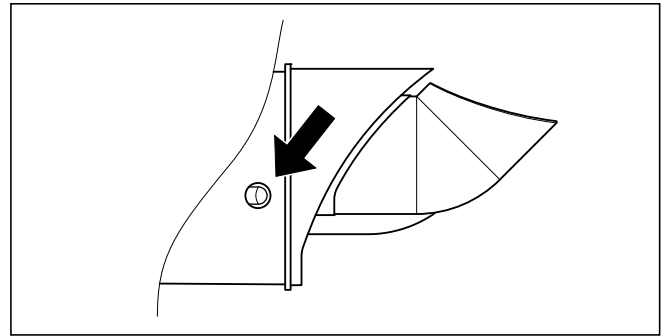
#### 3.35 Releasing the catches

- Using an 8-mm screwdriver, press the catches inwards.

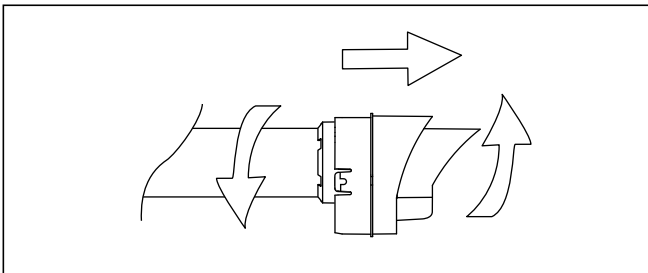


**3.36 Pulling out the terminal**

- Pull the terminal out of the air pipe together with the flue pipe.

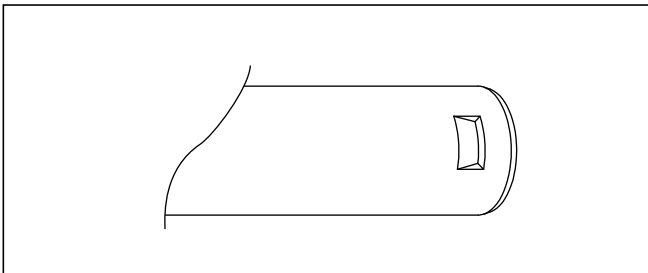


**3.39 Engaging the catch**



**3.37 Releasing the catch**

- Release the catch between the terminal and the flue pipe by twisting the two components in opposite directions.
- Remove the terminal from the flue pipe.



**3.38 Recess in flue pipe**



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas may escape when disconnecting the pipes.

- Make sure that the lug on the top of the terminal engages securely in the recess in the flue pipe.
- Make sure the seal is correctly seated.

- Push the new terminal into the flue pipe so that it snaps into place.



**Caution.**

**Risk of damage to the air pipe and appliance.**

If rain enters the air pipe, it may cause corrosion of the air pipe and the appliance.

- Make sure that the air-pipe seam is at the top.

- Push the flue pipe together with the deflector back into the air pipe so that both lugs snap into place.
- Fit the horizontal air/flue pipe according to the instructions in **Sections 3.4** and **3.5**.

**3.8.3 Fitting the deflector set after fitting the flue pipe**



The deflector's flue pipe terminal must point straight upwards in the centre position.

**Minimum clearances for flue terminal**

The minimum clearances for the flue terminal as defined in BS 5440 must be observed unless the boiler manufacturer is permitted to use smaller clearances that are not considered safety-critical.

Vaillant has reduced the minimum clearances for the flue terminals and specifies them in the boiler installation instructions. Those clearances are minimum distances applicable to all types of installation.

For the VTK, the minimum clearance of flue terminals A, B and C from openings such as a window have been reduced to 150 mm. That means that the terminal on the horizontal flue pipe becomes an air inlet when a VTK is connected and thus can be installed at a distance of less than 300 mm from a window or ventilation brick.

### 3 Concentric system (standard), dia. 60/100

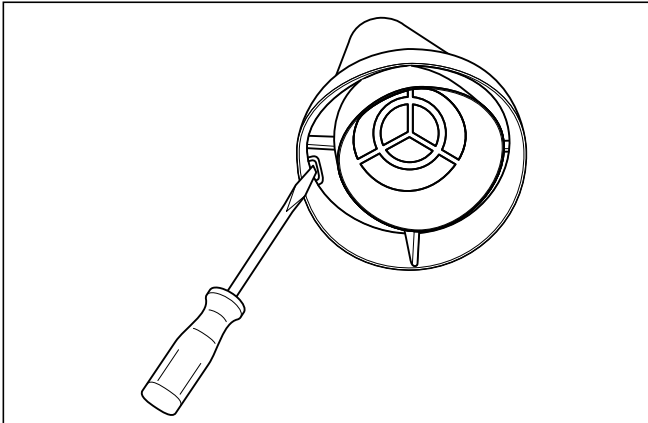
#### 3.8.4 Fitting the variable terminal kit after fitting the flue pipe



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

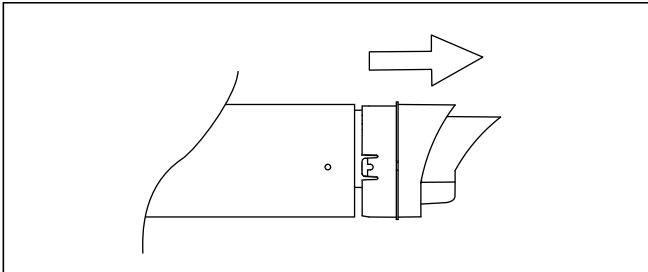
- Before starting the conversion work, shut down the boiler and secure it against being inadvertently started up again.

- Remove the wall seal from the terminal.



3.40 Releasing the catches

- Using an 8-mm screwdriver, press the catches inward.



3.41 Pulling out the terminal

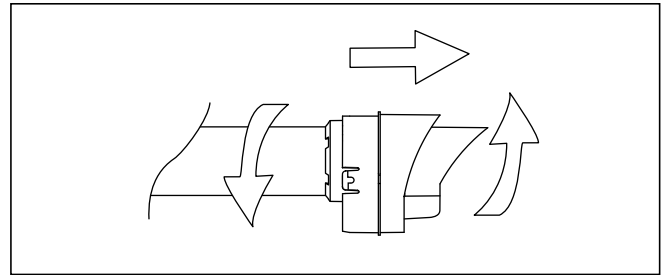


**Danger!**  
**Risk of poisoning due to escaping flue gas.**

If you twist the flue pipe when pulling the terminal out of the air pipe, the next flue pipe may become detached from the spacer.

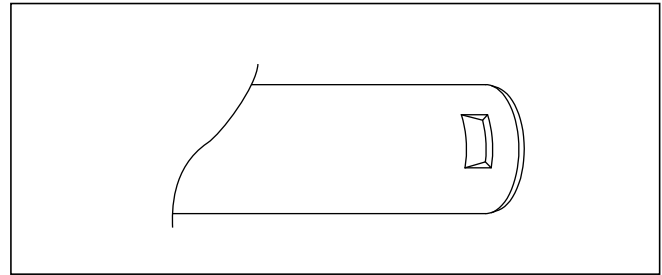
- Take care not to twist the flue pipe when pulling out the terminal.

- Pull the terminal out of the air pipe together with the flue pipe.



3.42 Releasing the catch

- Release the catch between the terminal and the flue pipe by twisting the two components in opposite directions.
- Remove the terminal from the flue pipe.



3.43 Recess in flue pipe

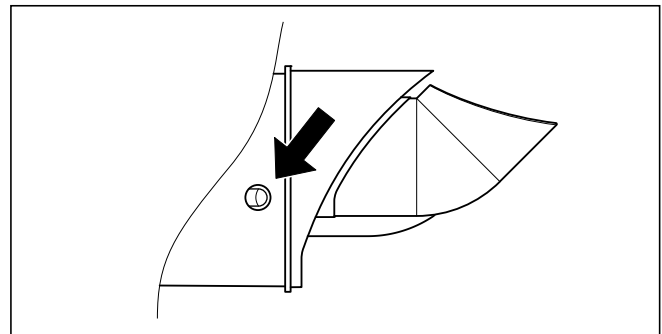


**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas may escape when disconnecting the pipes.

- Make sure that the lug on the top of the terminal engages securely in the recess in the flue pipe.
- Make sure the seal is correctly seated.

- Fit the deflector on the flue pipe.



3.44 Engaging the catch

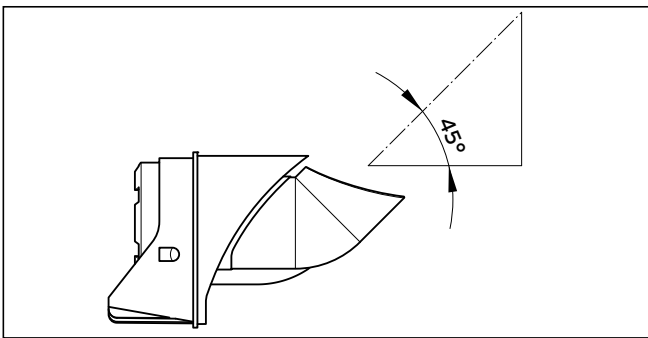


**Caution.**  
**Risk of damage to the air pipe and appliance.**

If rain enters the air pipe, it may cause corrosion of the air pipe and the appliance.

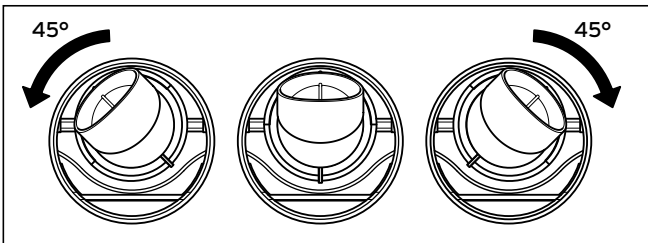
- Make sure that the air-pipe seam is at the top.

- Push the flue pipe together with the terminal back into the air pipe.
- Carefully push the flue pipe back into the socket of the pipe or elbow behind.
- Make sure the two lugs snap into place.
- Fit the wall seal on the deflector.



**3.45 Flue outlet angle in centre position**

The flue gas stream is directed upwards at an angle of approx. 45° when the deflector is set in the centre position.



**3.46 Possible sideways adjustment**

If necessary, the deflector terminal can be rotated 45° to the left or right. This adjustment possibility enables additional optimisation of the flue.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

The deflector may turn of its own accord if not properly engaged. Flue gas could then enter the building through windows or air vents.

- Turn the deflector to one of the three possible positions until it perceptibly snaps into position.

**3.9 Fitting the vertical roof penetration**

You can connect the air/flue pipe directly to the boiler flue connection on the top of the boiler. To obtain longer flue pipes, you can add extensions.

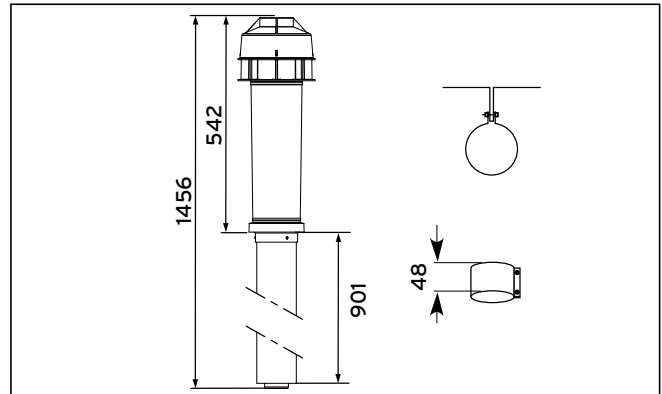


Observe the maximum permissible pipe lengths (→ **section 3.2**).



Components of the air/flue pipe (→ **section 3.1**).

**3.9.1 Scope of delivery**



**3.47 Vertical roof penetration**

Art. no. 0020060570 (black)

- Vertical roof penetration
- 48 mm air-pipe collar
- Fixing hoop

Art. no. 0020065937 (black with rosette)

- Vertical roof penetration
- 48 mm air-pipe collar
- Fixing hoop
- Rosette

**3.9.2 Preparations**

- Decide on the installation site for the boiler - see boiler installation instructions.
- Make sure that all clearances required for installation and servicing can be achieved and that the air/flue gas system can be installed in accordance with this manual.
- Determine the position for the roof penetration.

### 3 Concentric system (standard), dia. 60/100

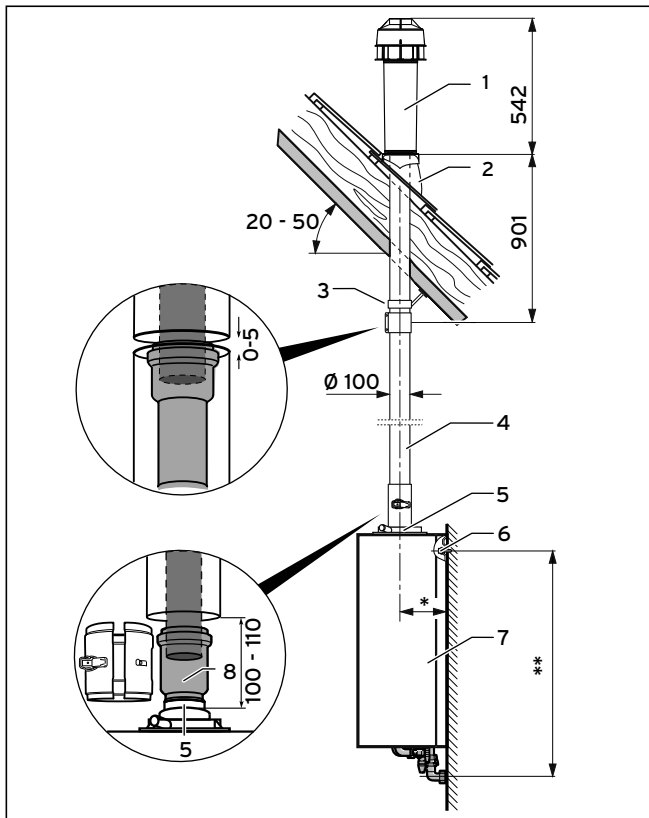


You can shorten the vertical air/flue pipe (art. no. 0020060570, 0020065937). You should shorten the outer "white" pipe (air pipe) first and then the inner pipe (flue pipe) so that it protrudes 13 mm beyond the air pipe. If the flue is connected directly to the boiler without elbows, the roof flashing plate penetration must be aligned vertically.



If you connect an 87° elbow directly to the boiler, use the 48-mm air-pipe collar supplied at that point.

#### 3.9.3 Fitting the pitched-roof penetration



3.48 Vertical roof penetration for pitched roof

#### Key

- \* = 190 mm for ecoTEC exclusive combination boiler
- \* = 176 mm for ecoTEC plus open-vented
- \* = 125 mm for ecoTEC plus boiler & combination boiler
- \* = 323 mm for ecoTEC plus 937
- \*\* = 750 mm for ecoTEC exclusive combination boiler
- \*\* = 530 mm for ecoTEC plus open-vented (top holes in bracket)
- \*\* = 622 mm for ecoTEC plus boiler & combination boiler
- \*\* = 622 mm for ecoTEC plus 937



#### Danger

**Risk of poisoning and material damage due to escaping flue gas as a result of roof penetration shearing off.**

Snow and ice sliding down pitched roofs can break off the vertical roof penetration where it exits the roof.

- In regions where heavy snow falls/extensive ice formation can be expected, sit the vertical roof penetration close to the ridge or fit a snow guard mesh above the roof penetration.

- Determine the point where the vertical air/flue pipe is to pass through the roof.
- Insert the roof flashing plate (2).
- Insert the roof penetration (1) through the roof flashing plate from above and push it down until it is flush.
- Align the roof penetration vertically.
- Fix the roof penetration to the roof with the hoop supplied (3).
- Fit the boiler mounting bracket (6).
- Install the boiler (7) - see boiler installation instructions.



Fitting extensions and elbows (→ section 3.12).

- Push the sliding sleeve (8) firmly onto the extension.
- Connect the vertical roof penetration (1) to the extension (4).
- Connect the sliding sleeve (8) to the boiler flue connection (5).



The sliding sleeve provides for straightforward fitting and disconnection of the air/flue pipe to/from the appliance (→ section 3.3).



#### Danger!

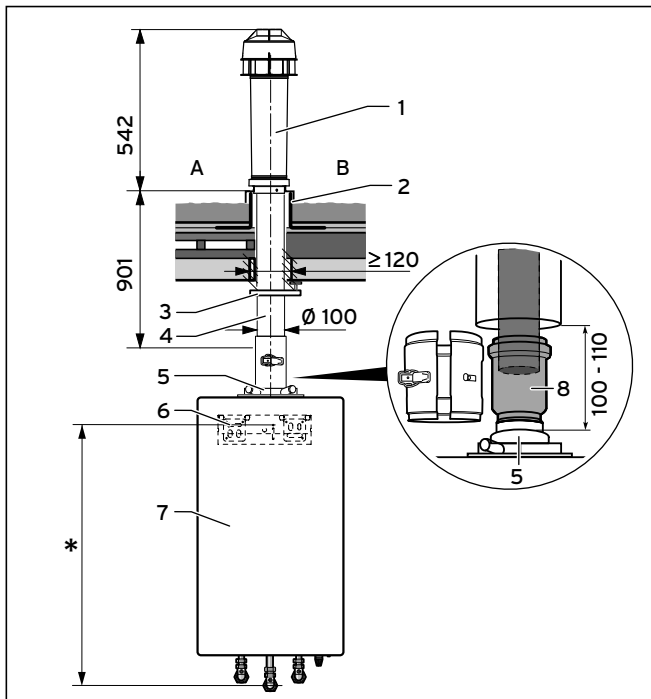
**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

- Drill two holes 3 mm in diameter through the air-pipe collar and the air pipe. The hole centres should be 6 mm from the edge of the air-pipe collar.
- Screw the air-pipe collar to the extension air pipe and the boiler flue connection using the screws supplied.
- Make sure that all air-pipe collars are centred and screwed to the air pipes using the self-tapping screws supplied.
- Fix every extension with at least one pipe bracket.

### 3.9.4 Fitting the flat-roof penetration



3.49 Vertical roof penetration for flat roof

#### Key

A Cold roof

B Hot roof

\* = 750 mm for ecoTEC exclusive combination boiler

\* = 530 mm for ecoTEC plus open-vented (top holes in bracket)

\* = 622 mm for ecoTEC plus boiler & combination boiler

\* = 622 mm for ecoTEC plus 937

- Fit the flat-roof flashing (2).
- Press the flat-roof flashing firmly in place and glue it according to the requirements for flat roofs (CP 144) to ensure it is water-tight.
- Insert the roof penetration (1) from above through the flat-roof flashing until it is flush.
- Align the roof penetration vertically.
- Fix the roof penetration to the roof structure with the fixing hoop supplied (3).
- Fit the boiler mounting bracket (6).
- Install the boiler (7) - see boiler installation instructions.



Fitting extensions and elbows (→ section 3.12).

- Push the sliding sleeve (8) firmly onto the vertical roof penetration (1) or onto an extension (4) if necessary.
- Connect the sliding sleeve (8) to the boiler flue connection (5).



The sliding sleeve provides for straightforward fitting and disconnection of the air/flue pipe to/from the appliance (→ section 3.3).



#### Danger!

#### Risk of poisoning due to escaping flue gas.

Flue gas can escape if the flue pipe is damaged.

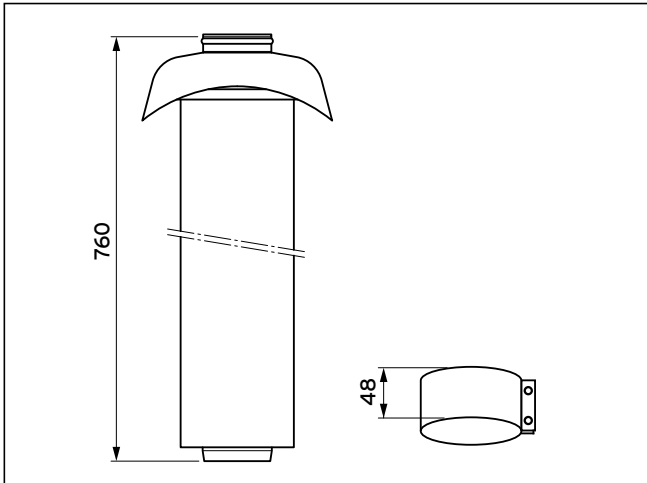
- Take care that the flue pipe is not damaged when drilling.

- Drill two holes 3 mm in diameter through the air-pipe collar and the air pipe. The hole centres should be 6 mm from the edge of the air-pipe collar.
- Screw the air-pipe collar to the extension air pipe and the boiler flue connection using the screws supplied.
- Make sure that all air-pipe collars are centred and screwed to the air pipes using the self-tapping screws supplied.
- Fix every extension with at least one pipe bracket.

## 3 Concentric system (standard), dia. 60/100

### 3.10 Fitting ridge tiles

#### 3.10.1 Scope of delivery



#### 3.50 Ridge-tile terminal

Ridge-tile terminal, black (art. no. 303982)

- Ridge-tile terminal
- 48 mm air-pipe collar

You can add elbows and extensions to connect the ridge-tile terminal to the boiler.



Components of the air/flue pipe (→ **section 3.1**).



Observe the maximum permissible pipe lengths (→ **section 3.2**).

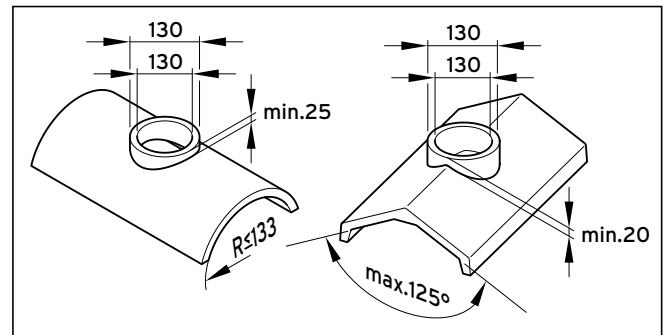
#### 3.10.2 Preparations

- Decide on the installation site for the boiler - see boiler installation instructions.
- Make sure that all clearances required for installation and servicing can be achieved and that the air/flue gas system can be installed in accordance with this manual.
- Determine the point where the ridge-tile terminal is to pass through the ridge.



If you connect an 87° elbow directly to the boiler, use the 48-mm air-pipe collar supplied with the vertical air pipe at that point.

#### 3.10.3 Fitting the ridge tile



#### 3.51 Ridge tile dimensions

The ridge tile must be purchased from a roof tile manufacturer:

Recommended manufacturers:

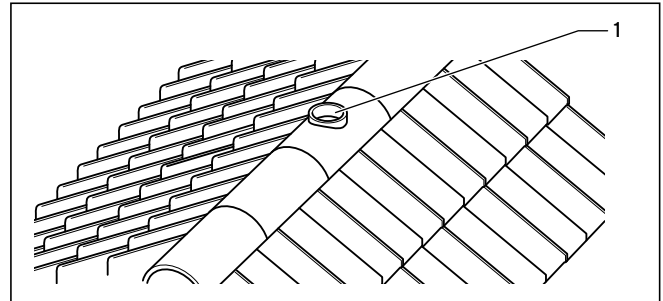
Aspect East Anglia Limited  
The Old Mill, East Harling  
NORWICH, Norfolk  
NR16 2QW

Website: [www.aspectroofing.co.uk](http://www.aspectroofing.co.uk)

Contact: Chris Haythorpe  
General Manager - Tile Division

Tel: 01953 717777

Fax: 01953 717164



#### 3.52 Fitting the ridge tile

- Fit the ridge tile (1) according to the tile manufacturer's instructions.

### 3.10.4 Fitting the ridge-tile terminal



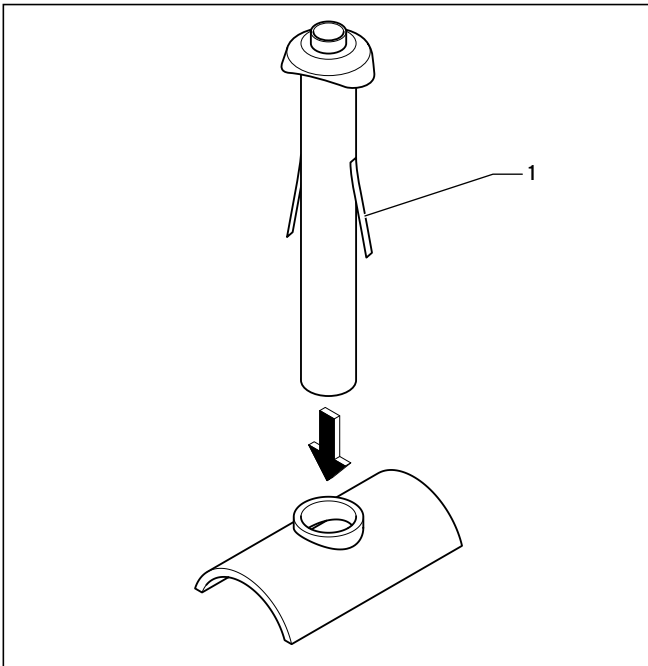
Fitting extensions and elbows (→ section 3.12).



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

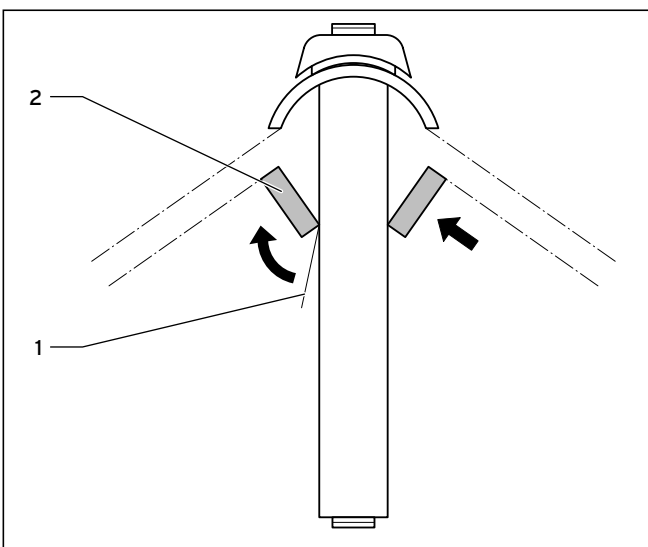
Flue gas can escape if the flue pipe is damaged.

- ▶ Take care that the flue pipe is not damaged when drilling.



**3.53 Fitting the ridge-tile terminal**

- ▶ Insert the ridge-tile terminal in the ridge tile.
- ▶ Align the ridge-tile terminal so that the two fixing tabs (1) are at right-angles to the line of the ridge. That ensures that the combustion air can be drawn in between ridge tile and the air-pipe hood above the ridge tile.



**3.54 Fixing the ridge-tile terminal**

- ▶ Bend the two fixing tabs (1) around a roof beam (2).
- ▶ Fix the fixing tabs with nails or screws.
- ▶ Install the boiler - see boiler installation instructions.
- ▶ Connect the ridge-tile terminal to the boiler using extensions and elbows.

- ▶ Through the holes in the air-pipe collars, drill holes 3 mm in diameter in the air pipe.
- ▶ Screw the air-pipe collars to the air pipes, the elbow and the boiler using the screws supplied.
- ▶ Make sure that the air-pipe collars are centred and screwed to the air pipes using the screws supplied.
- ▶ Make sure that every extension is held by at least one pipe bracket.

### 3 Concentric system (standard), dia. 60/100

#### 3.11 Fitting concentric connector to a chimney air/flue pipe



The air/flue gas system is assigned identifications according to EN 1443 from which it is evident that the system meets the fundamental requirements of the Building Products Directive. The air/flue gas system is not approved as part of the heating boiler.

The chimney air/flue pipe must be designed by the manufacturer and approved for negative-pressure operation. The chimney air/flue pipe should be rated on its identification plate for operation with condensing boilers and a flue gas temperature of at least 120 °C.

Requirements regarding fire-resistance must be complied with.

The listed Vaillant ecoTEC gas-fired wall-hung boilers are approved in accordance with the European and British standard "PD CEN /TR 1749: 2005, European Guide to the Classification of Gas Appliances according to the Type of Flue for the Use of Shared Flue Systems for Type C43 Appliances":

ecoTEC plus 612, 615, 618, 624, 630, 637

ecoTEC pro 24, pro 28

ecoTEC plus 824, plus 831, plus 837 and plus 937

ecoTEC exclusive 832 and 838

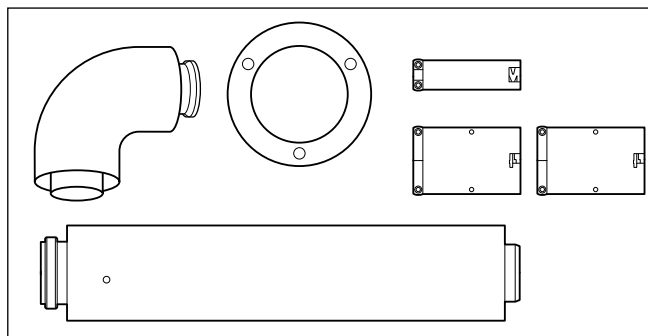
ecoTEC plus, models 415, 418, 428 and 438



The length of the air/flue pipe must not exceed 1.4 m and 3 elbows.

That equates to a maximum length of 3.4 m for the C43 connection.

#### 3.11.1 Components suitable for connection



#### 3.55 Set for connecting the chimney air/flue pipe

- 87° elbow Art. 303910
- Extensions
  - 470 mm Art. 303902
  - 970 mm Art. 303903
  - 1970 mm Art. 303905
- Air-pipe collars Art. 303821

#### 3.11.2 Installation example



#### **Danger!** **Risk of poisoning due to escaping flue gas.**

Condensate that collects in a particular place can damage the flue pipe seals.

- Install the horizontal flue pipe with a gradient of 3° ± 1° sloping downwards to the appliance. That equates to a drop of approx. 50 mm ± 20 mm per metre of pipe run.



#### **Danger!** **Risk of poisoning due to escaping flue gas.**

The gas-fired wall-hung boilers are **not** suitable for use with a flue system that operates under pressure.

- The competent person must **always** ensure that the air/flue pipe creates negative pressure in the system (in accordance with the European and British standard PD CEN /TR 1749: 2005, European Guide to the Classification of Gas Appliances according to the Type of Flue).

- Lay out the air/flue gas system according to EN 13384. When doing so, observe the technical specifications (flue gas temperature and mass flow rate) as set out in the boiler manual.

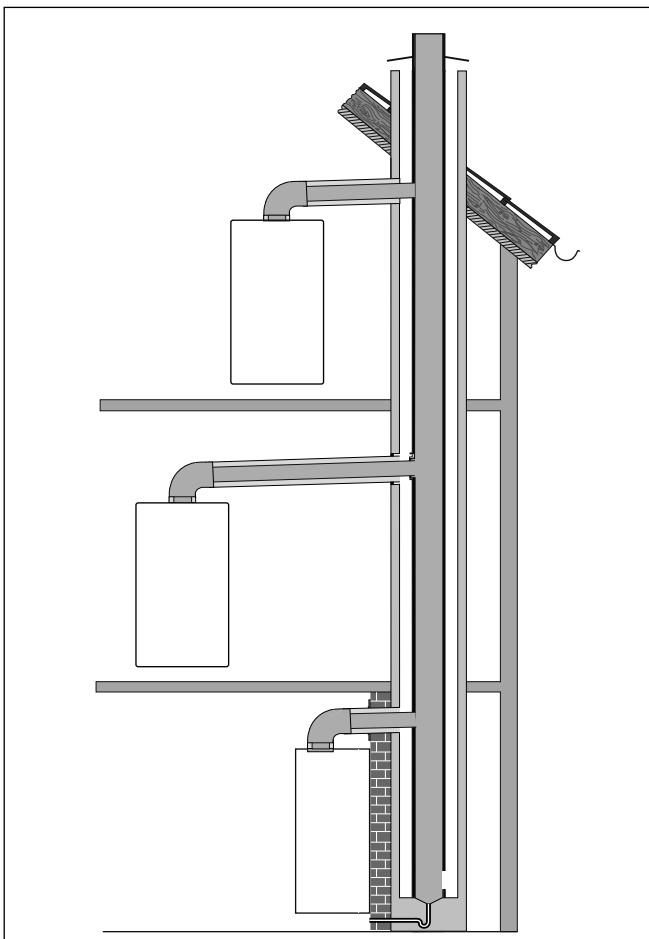


**Danger!**  
**Risk of injury due to damage to structural integrity.**

The air/flue gas system may be installed in a fireproof casing or space with suitable access points for annual visual inspection of the entire flue pipe. It must be provided with suitable fire-proofing at the points where the flue pipe passes through walls.

- Take care not to damage fire walls when installing the system.

The stability and fire-proofing properties of chimney shaft walls can be altered by the insertion of wall plugs and screws. Therefore, you should mount the appliance on walls of which the fire-proofing properties will not be impaired by screws and wall plugs.



**3.56 Installation example**

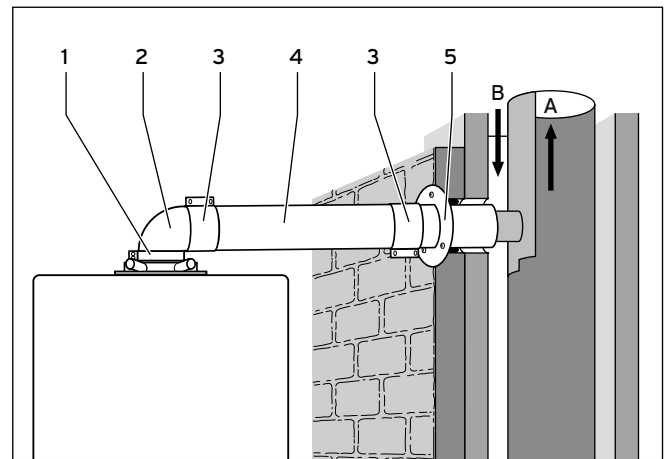
**3.11.3 Installing the boiler**



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Extensions that are not fixed to a wall or ceiling may become disconnected due to sagging or thermal expansion.

- Ensure that every extension is fixed to the wall or ceiling by means of a pipe bracket. The distance between two pipe brackets must not be greater than the length of the extension.



**3.57 Installing the boiler**

A Flue gas  
B Combustion air

Dimensions:

- \* = 190 mm for ecoMAX combination boiler
- \* = 176 mm for ecoTEC plus open-vented
- \* = 125 mm for ecoTEC plus system & combination boiler
- \* = 323 mm for ecoTEC plus 937

- Install the boiler - see boiler installation instructions.
- Slide the wall rosette (5) onto the air pipe.
- Fit the extension (4) and the elbow (2) between the boiler flue connection and the flue pipe.
- Fit the 40-mm air-pipe collar (1). Take care to align it centrally.
- Fit the 70-mm air-pipe collars (3). Take care to align them centrally.
- If necessary, use extensions and elbows (→ fig. 3.57).

### 3 Concentric system (standard), dia. 60/100

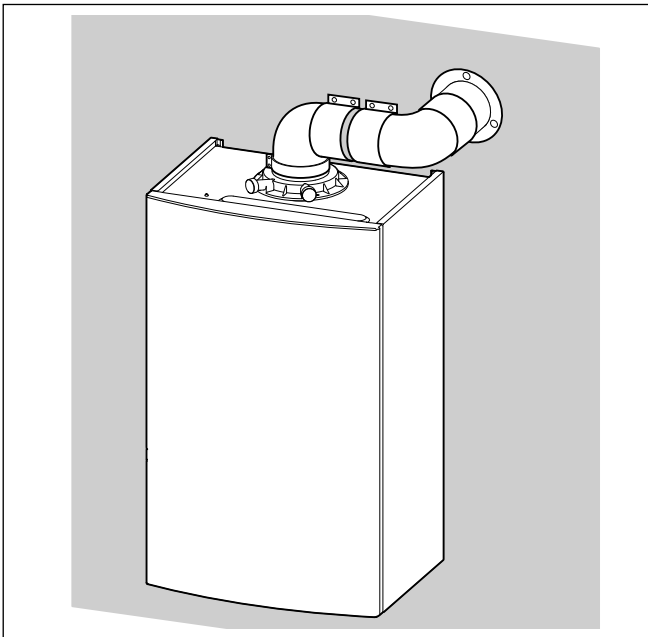


**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

- Through the holes in the air-pipe collars, drill holes 3 mm in diameter in the air pipe.
- Screw the air-pipe collars to the air pipes, the elbow and the boiler using the screws supplied.



3.58 Example of connection using an additional elbow

#### 3.12 Fitting extensions and elbows

##### 3.12.1 Fitting extensions



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Extensions that are not fixed to a wall or ceiling may become disconnected due to sagging or thermal expansion.

- Ensure that every extension is fixed to the wall or ceiling by means of a pipe bracket. The distance between two pipe brackets must not be greater than the length of the extension.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Condensate that collects in a particular place can damage the flue pipe seals.

- Install the horizontal flue pipe with a gradient of  $3^\circ \square 1^\circ$  sloping downwards to the appliance. That equates to a drop of approx. 50 mm  $\square$  20 mm per metre of pipe run.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Mineral oil-based lubricants may damage the seals. The seals should therefore not be lubricated.

- Only use water or commercially available soft soap, if necessary, to assist with installation.
- Do not fit any damaged seals.
- When fitting the pipes, make absolutely sure the seals are correctly seated.
- File off sharp burrs and chamfer the ends of the pipes before assembling them so that the seals are not damaged, and dispose of the shavings.
- Do not fit any pipes that are dented or damaged in any other way.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue pipes can separate if they are not correctly centred.

- Secure the flue pipe with the bracket so that it is correctly centred relative to the air pipe.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Unsecured joints on the air/flue gas ducting may become disconnected.

- Secure each air-pipe joint by screwing the air-pipe collars with the air-pipe ends or the boiler flue connection.

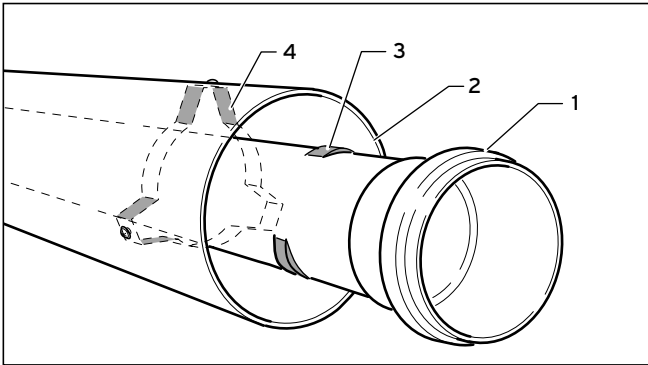
**3.12.2 Fitting two 87° elbows**



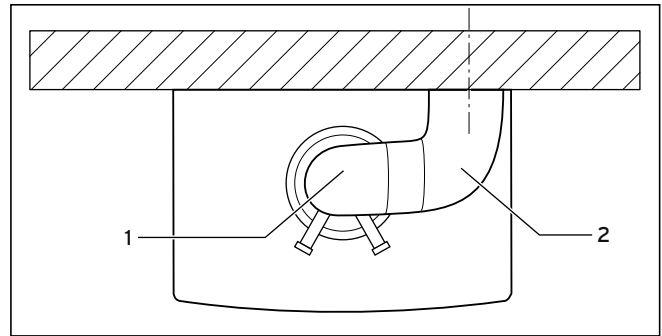
**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Unnecessary strain on the joints can cause leaks.

- Align the elbows correctly.



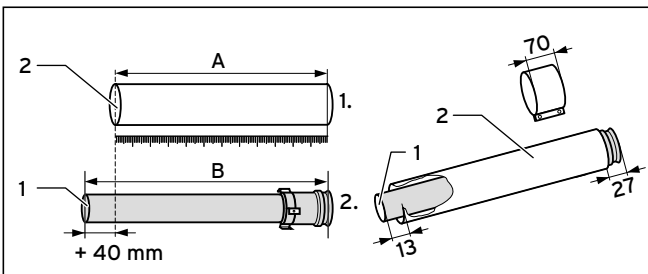
**3.59 Detaching the flue pipe**



**3.61 Arrangement of two 87° elbows - overhead view**



To cut the air and flue pipes to length separately, you can dismantle the pre-assembled extensions without the use of tools.



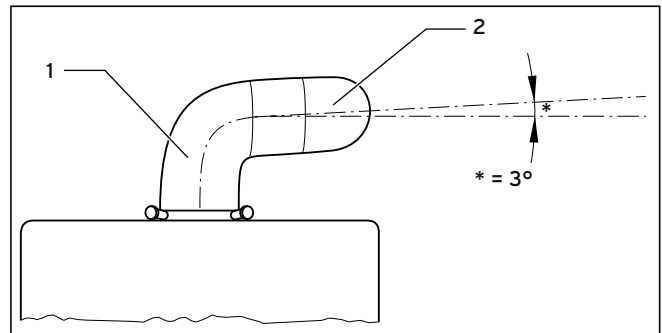
**3.60 Shortening pipes**

- First measure the required air pipe length\* (**A**) and then calculate from that the corresponding flue pipe length (**B**):

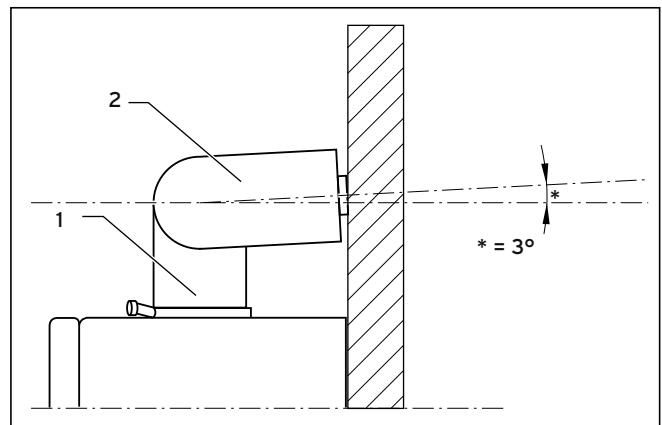
$$\text{Length of flue pipe} = \text{Length of air pipe} + 40 \text{ mm}$$

- Cut the pipes with a saw, panel shears, etc.
- After shortening, locate the flue pipe (1) inside the air pipe (2) again.

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



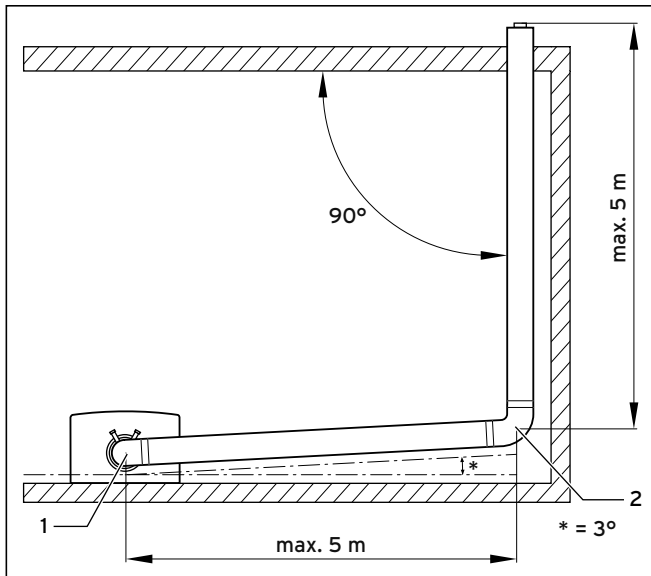
**3.62 Arrangement of two 87° elbows - front view**



**3.63 Arrangement of two 87° elbows - side view**

- When using two 87° elbows, refer to **figs. 3.61 to 3.63**.

### 3 Concentric system (standard), dia. 60/100



**3.64 Connecting extensions with 87° elbows**



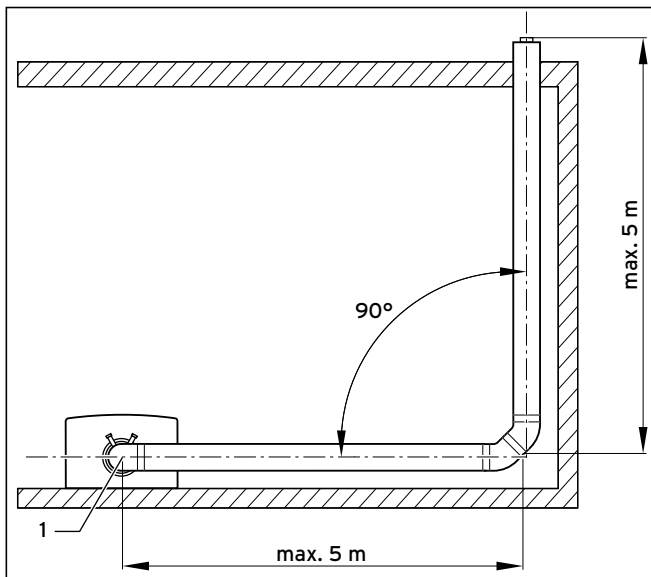
**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Unsecured joints on the air/flue gas ducting may become disconnected.

- Secure each air-pipe joint by screwing the air-pipe collars with the air-pipe ends or the boiler flue connection.



The elbow (1) fitted on the top of the boiler must be turned by 3° so that the second 87° elbow (2) can pass through the wall at right-angles.



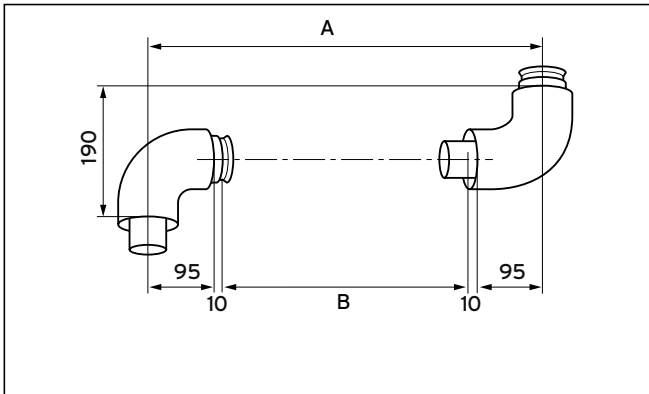
**3.65 Connecting extensions with 45° elbows**

- When using elbows for routing long flue pipes around a corner, refer to **fig. 3.64** and **fig. 3.65**.



An 87° elbow must be fitted with an angle of 3° between the wall and the air/flue pipe  
→ **fig. 3.64**, or else use two 45° elbows  
→ **fig. 3.65**.

3.12.3 Fitting 87° elbows



Key

A = Offset

B = Length of air pipe



The elbow supplied with the flue sets 303933 and 303936 does not have the dimensions shown here.

Example:

Measure the offset (**A**), e.g. 400 mm.

With that figure, refer to the table below to determine the length of the air pipe (**B**) = 190 mm

From that, the corresponding flue pipe length can be calculated as 190 + 40 = 230 mm

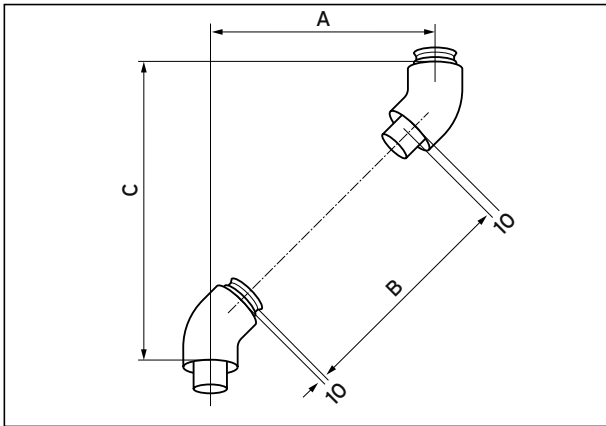
3.66 87° elbows (art. no. 303910), fitting

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

3.5 Table of offset dimensions

### 3 Concentric system (standard), dia. 60/100

#### 3.12.4 Fitting 45° elbows



**Key**

- A = Offset
- B = Length of air pipe
- C = Height

**Example:**

Measure the offset (**A**), e.g. 300 mm.

With that figure, refer to the table below to determine the length of the air pipe (**B**) = 284 mm and the height (**C**) = 420 mm.

From that, the corresponding flue pipe length is calculated as  $284 + 40 = 324$  mm

3.67 45° elbows (art. no. 303911), fitting

Offset [in mm]	Length of air pipe [in mm]	Height [in mm]	Offset [in mm]	Length of air pipe [in mm]	Height [in mm]	Offset [in mm]	Length of air pipe [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
> 105 to < 155 mm	not possible	340	340	341	460	540	624	660
		345	345	348	465	545	631	665
		350	350	355	470	550	638	670
		355	355	362	475	555	645	675
		360	360	369	480	560	652	680
160	86	280	365	376	485	565	659	685
165	93	285	370	383	490	570	666	690
170	100	290	375	390	495	575	673	695
175	107	295	380	397	500	580	680	700
180	115	300	385	404	505	585	687	705
185	122	305	390	412	510	590	694	710
190	129	310	395	419	515	595	701	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	206	365	450	496	570	650	779	770
250	214	370	455	503	575	655	786	775
255	221	375	460	511	580	660	793	780
260	228	380	465	519	585	665	800	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			
285	263	405	490	553	610			
290	270	410	495	560	615			
295	277	415	500	567	620			
300	284	420	505	574	625			
305	291	425	510	581	630			
310	298	430	515	588	635			
315	306	435	520	595	640			
320	313	440						

3.6 Table of offset dimensions

## 4 Concentric system (optional), dia. 80/125

The air pipes are made of galvanised steel, the flue pipes out of plastic.

### 4.1 Product range

















303200 = Vertical air/flue pipe (black)



303926, 0020147469 = Boiler flue connection



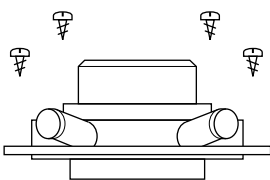
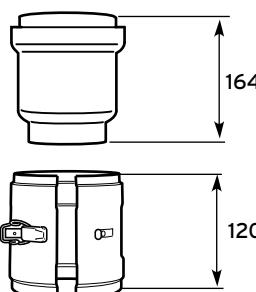
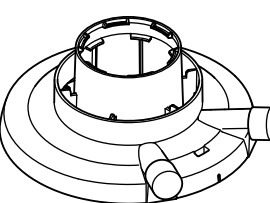
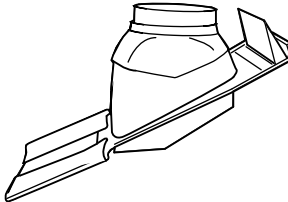
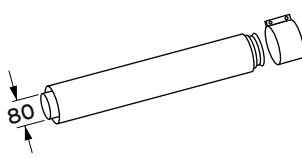
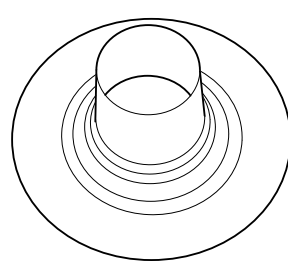
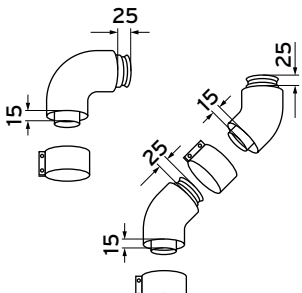
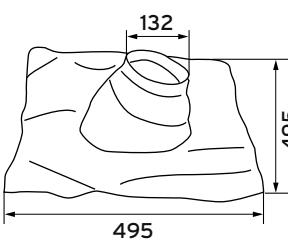
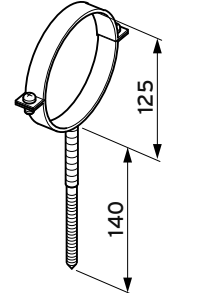
303209 = Horizontal air/flue pipe

Optional accessories	Art. no.	303 200 	303209 
Boiler flue connection (screw holes, 4 x) 	303926	X	X
Boiler flue connection bayonet fixing 	0020147469	X	X
Extensions, concentric 470 mm - dia. 80/125 	303202	X	X
Extensions, concentric 970 mm - dia. 80/125 	303203	X	X
Extensions, concentric 1970 mm - dia. 80/125 	303205	X	X
Elbows (PP), concentric (set of 2) 45° - dia. 80/125 	303211	X	X
Elbow (PPs), concentric 87° - dia. 80/125 	303210	X	X
Pipe brackets (set of 5), dia. 125 	303616	X	X
Sliding sleeve (PPs), dia. 80/125 	303215	X	X
Roof flashing plate for pitched roof 	009076 (black)	X	
Flat roof flashing 	009056	X	
Universal flashing plate, pitched roof 	303980	X	

### 4.1 Product range

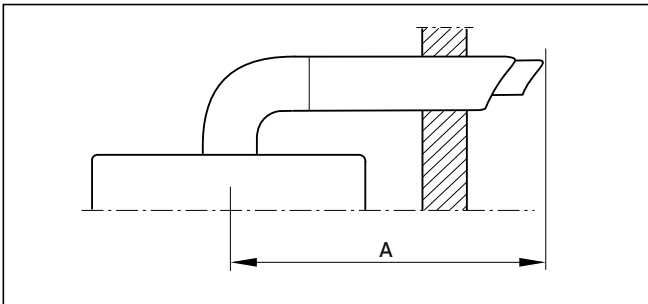
## 4 Concentric system (optional), dia. 80/125

### Description of components

Component	Description	Component	Description
	<b>Boiler flue connection, dia. 80/125</b> Art. no. 303926 (with 2 testing points)		<b>Sliding sleeve (PP), dia. 80/125</b> Art. no. 303215
	<b>Boiler flue connection, dia. 80/125</b> Art. no. 0020147469 (with 2 testing points) Bayonet fixing		<b>Roof flashing plate for pitched roof</b> Art. no. 009076 (black)
	<b>Extension (PP), dia. 80/125</b> 470 mm: Art. no. 303202 970 mm: Art. no. 303203 1970 mm: Art. no. 303205		<b>Flat roof flashing</b> Art. no. 009056
	<b>Elbow (PP), 87°, dia. 80/125</b> Art. no. 303210  Elbows (PPs), 45°, dia. 80/125 (set of 2) Art. no. 303211		<b>Universal flashing plate, pitched roof (black)</b> Art. no. 303980
	<b>Pipe brackets, dia. 125 (set of 5)</b> Art. no. 303616	<b>4.2 Components, dia. 80/125 (continued)</b>	

### 4.2 Components, dia. 80/125

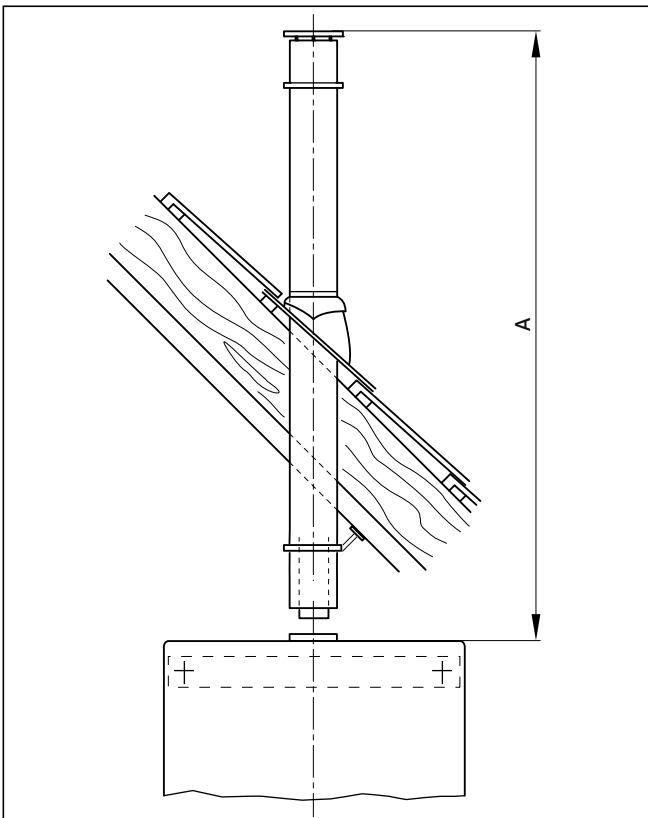
#### 4.2 Maximum permissible pipe lengths



##### 4.1 Horizontal flue systems

**Key**

A Maximum length of flue pipe



##### 4.2 Vertical flue systems

**Key**

A Maximum length of flue pipe

## 4 Concentric system (optional), dia. 80/125

### 4.2.1 Maximum permitted pipe lengths for ecoTEC exclusive

Accessories	Art. no.		ecoTEC exclusive	
			832	838
Horizontal air/flue pipe	303209	Max. permissible concentric pipe length	21.0 m inc. 1 elbow, 87°	The inclusion of additional elbows in the flue system reduces the maximum pipe length as follows: - by 2.5 m per 87° elbow, - by 1.0 m per 45° elbow.
Vertical air/flue pipe	303200	Max. permissible concentric pipe length	22.0 m	The inclusion of additional elbows in the flue system reduces the maximum pipe length as follows: - by 2.5 m per 87° elbow, - by 1.0 m per 45° elbow.

### 4.3 Maximum permitted pipe lengths for ecoTEC exclusive

### 4.2.2 Maximum permitted pipe lengths for ecoTEC

Accessories	Art. no.		ecoTEC					
			plus 612 plus 615	plus 618 plus 824 pro 24	plus 624 plus 831 pro 28 pro 828	plus 630	plus 637 plus 837 plus 937	plus 415 plus 418 plus 428 plus 438
Horizontal air/flue pipe	303209	Max. permissible concentric pipe length	25.0 m inc. 1 elbow, 87°	39.0 m inc. 1 elbow, 87°	29.0 m inc. 1 elbow, 87°	27.0 m inc. 1 elbow, 87°	32.0 m inc. 1 elbow, 87°	25.0 m inc. 1 elbow, 87°
			The inclusion of additional elbows in the flue system reduces the maximum pipe length as follows: - by 2.5 m per 87° elbow, - by 1.0 m per 45° elbow.					
Vertical air/flue pipe	303200	Max. permissible concentric pipe length	27.0 m	41.0 m	31.0 m	29.0 m	34,0	27.0 m
			The inclusion of additional elbows in the flue system reduces the maximum pipe length as follows: - by 2.5 m per 87° elbow, - by 1.0 m per 45° elbow.					

### 4.4 Maximum permitted pipe lengths for ecoTEC

### 4.3 Replacing the boiler flue connection

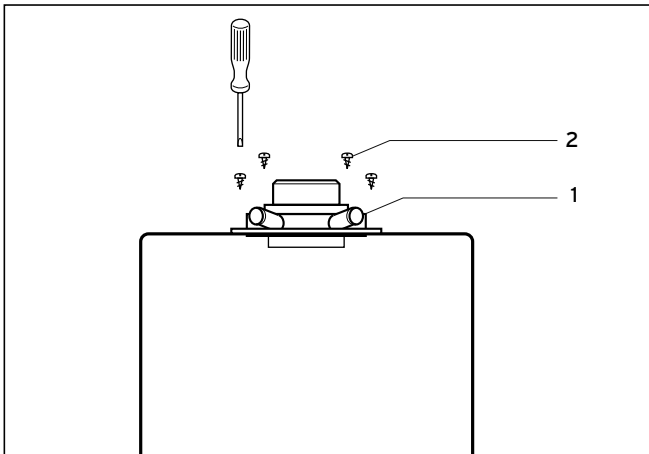


**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Mineral oil-based lubricants may damage the seals. The seals should therefore not be lubricated.

- Only use water or commercially available soft soap, if necessary, to assist with installation.

#### 4.3.1 Replacing the boiler flue connection on ecoTEC exclusive and ecoTEC plus open vented

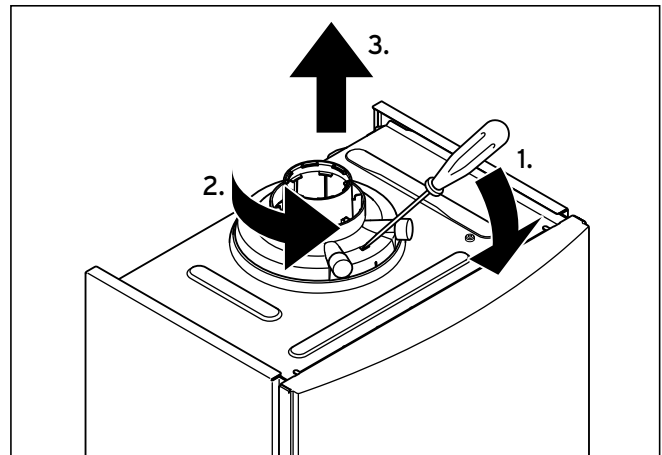


4.3 Boiler flue connection (art. no. 303926)

The boiler is supplied with an boiler flue connection for the size 60/100 air/flue pipe system.

- Undo the four screws (2).
- Remove the boiler flue connection (1) by pulling it out upwards.
- Fit the 80/125 diameter boiler flue connection spigot end into the socket of the flue header box from above.
- Press the boiler flue connection downwards until the flange lies flush against the vacuum chamber.
- Re-tighten the 4 screws (2).

#### 4.3.2 Replacing the boiler flue connection on ecoTEC plus and ecoTEC pro



4.4 Boiler flue connection (art. no. 0020147469)

The boiler is supplied with an boiler flue connection for the size 60/100 air/flue gas system.

The boiler flue connection is attached to the boiler by a bayonet fitting.

- Insert a screwdriver of a suitable size into the slot between the testing ports.
- Carefully press the screwdriver downwards to release the boiler flue connection from the catch.
- Turn the boiler flue connection anticlockwise as far as the stop and then remove it by pulling it upwards.
- Fit the new boiler flue connection (diameter 80/125) from above so that the lugs locate in the slots in the socket of the flue header box.
- Turn the boiler flue connection clockwise until it snaps into position.

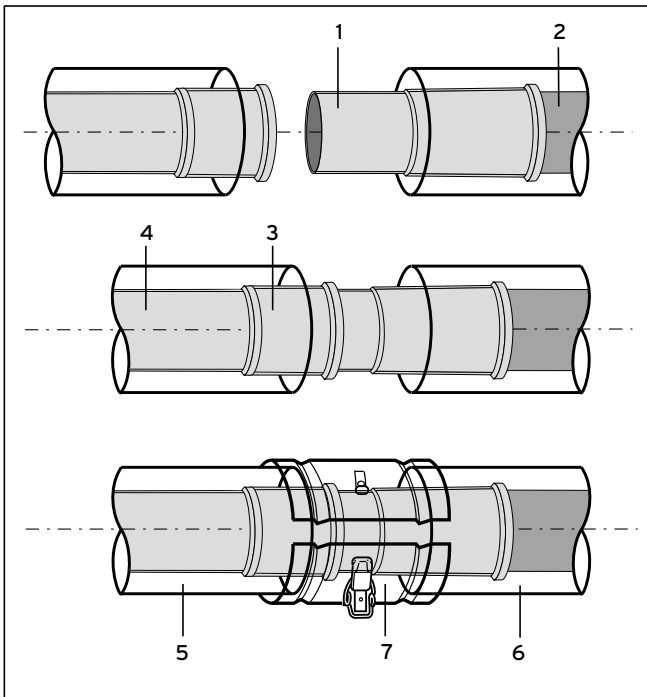
## 4 Concentric system (optional), dia. 80/125

### 4.4 Fitting the sliding sleeve



If there is sufficient space available, you can use a sliding sleeve (art. no. 303215) to connect the flue pipe to the boiler flue connection. This consists of a sliding sleeve for the inner flue and an over centred clip for the outer air duct which can facilitate easy disconnection of the boiler from the flue system.

When using the sliding sleeve, you must shorten the last extension pipe by an additional 85 mm.



### 4.5 Fitting the sliding sleeve

- Slide the sliding sleeve (1) onto the extension flue pipe (2) as far as the stop.
- Push the sliding sleeve back until it locates into the socket (3) of the boiler flue pipe (4).
- Make sure that both ends of the sliding sleeve overlap the flue pipes by at least 20 mm.
- Fit the air-pipe collar (7) around the air pipes (5 and 6).
- Close the catch on the air-pipe collar.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

- Drill two holes 3 mm in diameter through the air-pipe collar and the air pipe. The hole centres should be 6 mm from the edge of the air-pipe collar.
- Screw the air-pipe collar to the air pipes using the screws supplied.

### 4.5 Fitting the horizontal air/flue pipe



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Condensate that collects in a particular place can damage the flue pipe seals.

- Install the horizontal flue pipe with a gradient of  $3^\circ \square 1^\circ$  sloping downwards to the appliance. That equates to a drop of approx. 50 mm  $\square$  20 mm per metre of pipe run.



The air/flue pipes of the horizontal wall penetration are not concentric. With the wall penetration fitted horizontally, the flue pipe slopes downwards at  $1.5^\circ$  towards the inside.

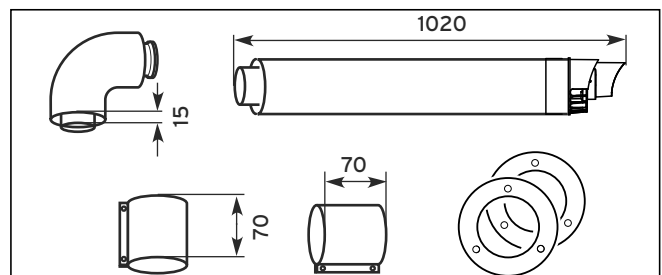


Observe the maximum permissible pipe lengths (→ section 4.2).



Components of the air/flue pipe (→ section 4.1).

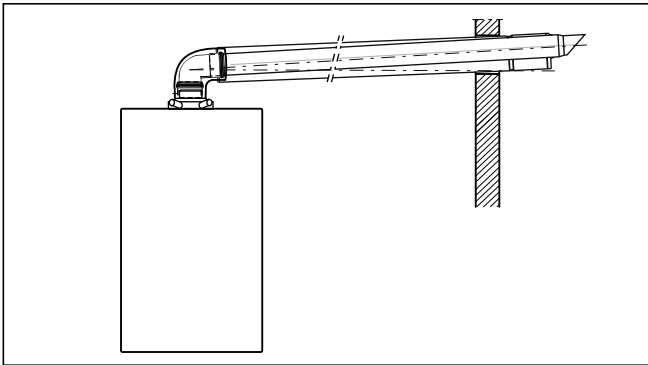
### 4.5.1 Scope of delivery



### 4.6 Horizontal air/flue pipe

Art. no. 303209

- Horizontal air/flue pipe
- $87^\circ$  elbow
- 2 x 70 mm air-pipe collar
- 2 x wall rosette, dia. 125



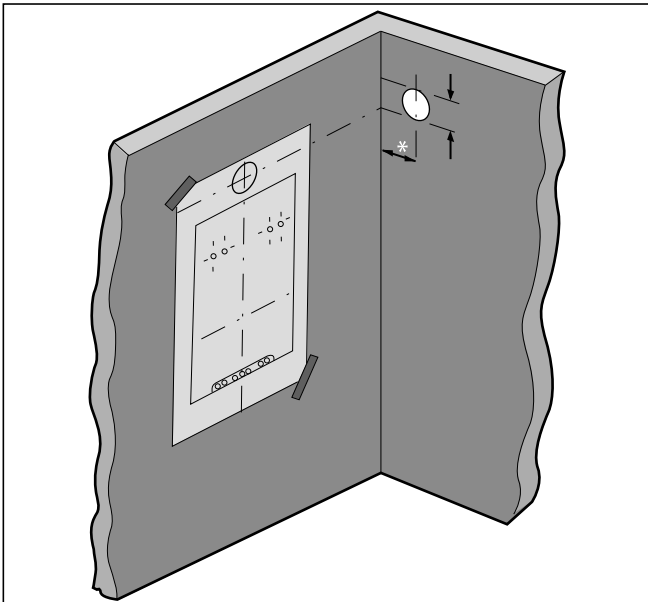
4.7 Installation example for horizontal air/flue pipe

#### 4.5.2 Preparations

- ▶ Decide on the installation site for the boiler - see boiler installation instructions.
- ▶ Make sure that all clearances required for installation and servicing can be achieved and that the air/flue gas system can be installed in accordance with this manual.
- ▶ Attach the mounting template supplied with the boiler to the wall. Using a plumb line or spirit level, check that the centre line of the mounting template is vertical.

#### 4.5.3 Fitting with side flue exit

- ▶ If the air/flue pipe is to exit to the side, you can determine the position of the air/flue pipe as follows:

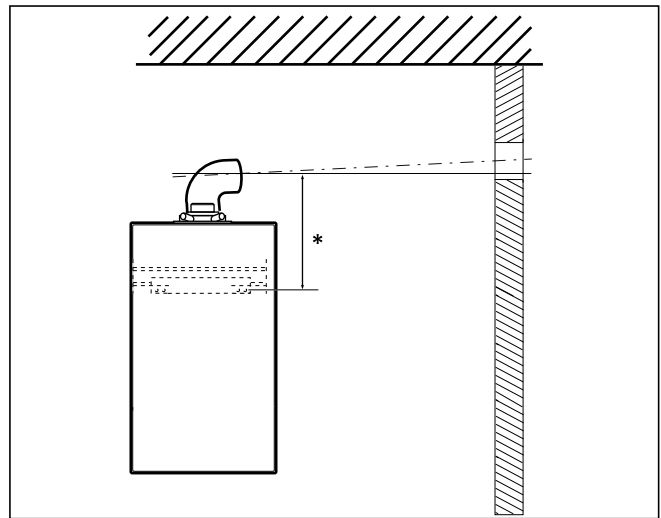


4.8 Distance to external wall

#### Key

- \* = 190 mm for ecoTEC exclusive combination boiler
- \* = 176 mm for ecoTEC plus open-vented
- \* = 125 mm for ecoTEC plus boiler & combination boiler
- \* = 323 mm for ecoTEC plus 937

- ▶ Determine the correct dimensions.
- ▶ Measure the distance between the centre line of the two lower fixing holes in the boiler mounting bracket (→ fig. 4.9). That then gives the position of the centre line of the 87° elbow and the wall penetration.
- ▶ The position of the wall penetration can then be determined by carefully transposing that mark along the wall.



4.9 Distance of boiler mounting bracket - wall penetration

#### Key

- \* = 190 mm for ecoTEC exclusive combination boiler
- \* = 176 mm for ecoTEC plus open-vented
- \* = 125 mm for ecoTEC plus boiler & combination boiler
- \* = 323 mm for ecoTEC plus 937

The position of the wall penetration must allow for installation of the flue pipe with a rise to the terminal of roughly 3° ± 1°. That equates to 50 mm ± 20 mm per metre of flue pipe length.

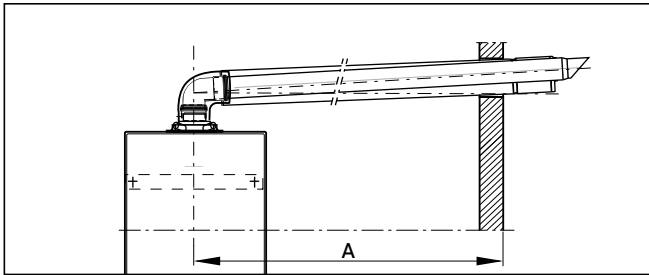
- ▶ Calculate the required rise according to the length of the flue pipe and then mark the position for the wall penetration.



Due to the possible length of the air/flue pipe and the required slope, it may be necessary to alter the position of boiler. Before drilling the holes for the boiler mounting bracket you should check that both the mounting position of the boiler and the position of the wall penetration meet the specified requirements.

- ▶ If possible drill the hole in the wall with a core drill, diameter 127 mm.

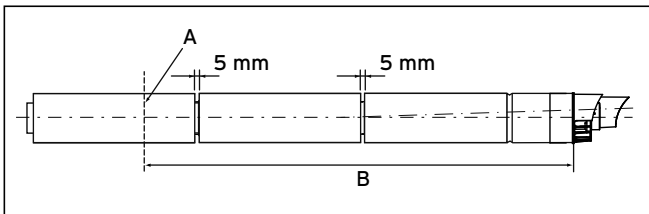
## 4 Concentric system (optional), dia. 80/125



**4.10 Distance to external wall**

- Measure the distance from the outside of the wall to the centre of the boiler flue connection. That corresponds to the dimension **A**.

If the measured distance **A** is greater than 960 mm, an air/flue pipe extension is required. The number of extensions usable depends on the boiler.



**4.11 Air pipe**

**Key**

A = Mark for air pipe  
B = Dimension A + 10 mm

- For easier measurement, loosely fit the extensions together with the terminal.



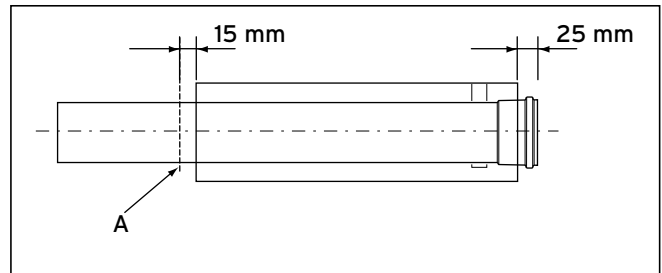
The individual extensions are joined by push-fitting them together, the spigot of the flue pipe fitting into a socket with a seal in each case. To simplify assembly, the seal can be lubricated with a soap-and-water solution beforehand.

- Fit the flue pipe so that there is a gap of 5 mm between the individual air pipes. That ensures that the spigots are inserted in the sockets to the correct depth of 30 mm. All flue pipe sockets must face towards the terminal.
- Measure from the flue pipe outlet and mark the air pipe length as follows: dimension A + 60 mm.
- Separate the air and flue pipes.



For reasons of correct assembly, you must not shorten the flue pipes to less than 100 mm. If necessary, two successive extensions must be shortened to obtain the desired length.

- Cut off the flue pipe at right-angles and remove all sharp burrs.
- Re-insert the flue pipe into the air pipe and locate it.



**4.12 Flue pipe**

**Key**

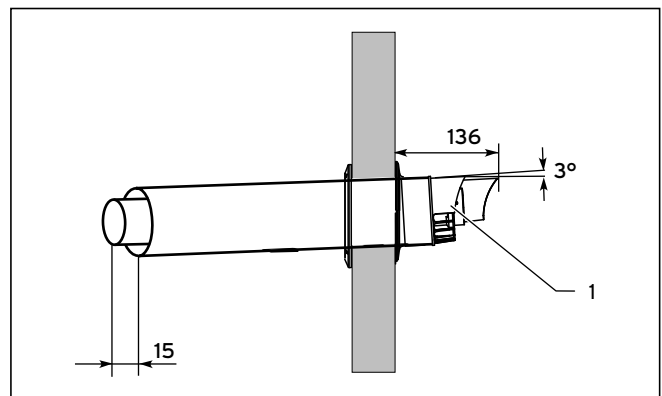
A = Marking for flue pipe

- Cut the flue pipes to length (→ **fig. 4.12**).



When cutting the air and flue pipes, remove all sharp burrs with a file. That will simplify connecting the pipes together and prevent damage to the seals by sharp edges.

- Take care not to scratch the white surface of the air pipe. If necessary, use additional extensions and elbows (→ **section 4.7**).
- Install the boiler - see boiler installation instructions.
- Fit the boiler flue connection (→ **section 4.3**).



**4.13 Fitting the horizontal wall penetration**

- Push the assembled air/flue pipe and terminal through the wall until it protrudes 136 mm from the outside wall.
- Make sure that the terminal is correctly positioned with the inlet grille on the underneath.
- Slide one of the two wall rosettes over the air pipe until it lies flush against the interior wall.
- Fit the 87° elbow to the boiler flue connection.
- Connect the wall duct with the 87° elbow.
- Fit the extensions beginning with the wall duct and connect these with the 87° elbow.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

- Fit the air-pipe collar (1) on the sliding sleeve.



This section will subsequently serve as a disconnection point.

- Join all other disconnection points with air-pipe collars.

- Through the holes in the air-pipe collars, drill holes 3 mm in diameter in the air pipe.
- Screw the air-pipe collars to the air pipes, the elbow and the boiler using the screws supplied.

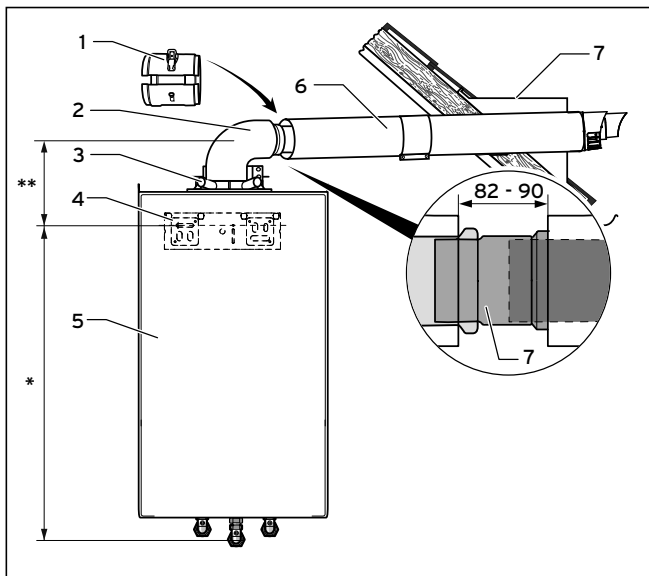


**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

**4.5.4 Installing the boiler with gap from external wall**



- Through the holes in the air-pipe collars, drill holes 3 mm in diameter in the air pipe.
- Screw the air-pipe collars to the air pipes, the elbow and the boiler using the screws supplied.



Fitting extensions and elbows (→ section 4.7).



For horizontal flue systems exiting through pitched roofs, please order the flue pipe roof penetration (7) from: Ubbink (Northants, Tel: 01280 700211)

**4.14 Distance to external wall**

**Key**

- \* = 750 mm for ecoTEC exclusive combination boiler
- \* = 530 mm for ecoTEC plus open-vented (from top holes in bracket)
- \* = 622 mm for ecoTEC plus boiler & combination boiler
- \* = 622 mm for ecoTEC plus 937
- \*\* = 253 mm for ecoTEC exclusive combination boiler
- \*\* = 210 mm for ecoTEC plus open-vented (from top holes in bracket)
- \*\* = 238 mm for ecoTEC plus boiler & combination boiler
- \*\* = 238 mm for ecoTEC plus 937

- Fit the boiler mounting bracket (4).
- Install the boiler (5) - see boiler installation instructions.
- Replace the boiler flue connection (3) (→ section 4.3).
- Fit the 87° elbow to the boiler flue connection.
- Connect the sliding sleeve (7) to the extension (6) (→ section 4.4).
- Fit the extensions and connect the sliding sleeve to the 87° elbow.

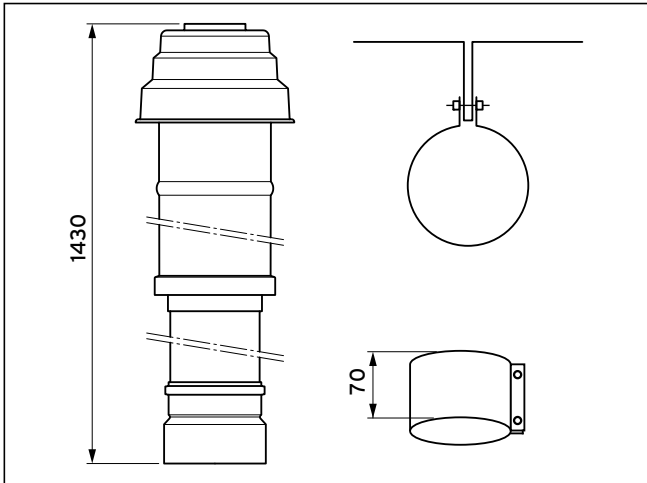
## 4 Concentric system (optional), dia. 80/125

### 4.6 Fitting the vertical air/flue pipe



Observe the maximum permissible pipe lengths (→ **section 4.2**).

#### 4.6.1 Scope of delivery



#### 4.15 Vertical roof penetration

Vertical air/flue pipe, black (art. no. 303200)

- Vertical roof penetration
- Adaptor (air) for dia. 110/125
- 70 mm air-pipe collar
- Fixing hoop



Components of the air/flue pipe (→ **section 4.1**).

You can connect the air/flue pipe directly to the boiler flue connection on the top of the boiler. Extensions can be added to the vertical air/flue pipe and the terminal.

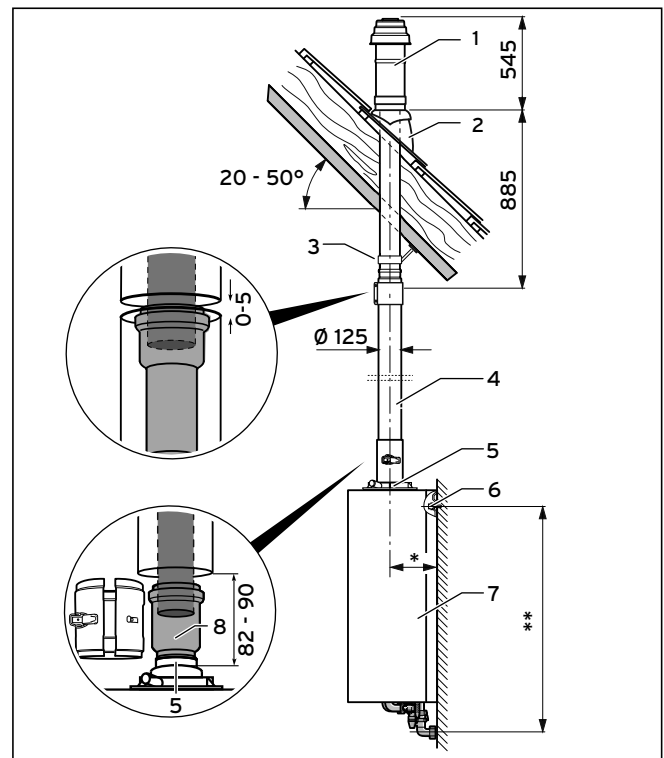
#### 4.6.2 Preparing for installation

- ▶ Decide on the installation site for the boiler - see boiler installation instructions.
- ▶ Make sure that all clearances required for installation and servicing can be achieved and that the air/flue gas system can be installed in accordance with this manual.
- ▶ Determine the position for the roof penetration.



You can shorten the vertical air/flue pipe (art. no. 303200). You should shorten the outer "white" pipe (air pipe) first and then the inner pipe (flue pipe) so that it protrudes 15 mm beyond the air pipe. If the flue is connected directly to the boiler without elbows, the roof flashing plate penetration must be aligned vertically.

#### 4.6.3 Fitting the pitched-roof penetration



#### 4.16 Vertical roof penetration for pitched roof

##### Key

- \* = 190 mm for ecoTEC exclusive combination boiler
- \* = 176 mm for ecoTEC plus open-vented
- \* = 125 mm for ecoTEC plus boiler & combination boiler
- \* = 323 mm for ecoTEC plus 937
- \*\* = 750 mm for ecoTEC exclusive combination boiler
- \*\* = 530 mm for ecoTEC plus open-vented (top holes in bracket)
- \*\* = 622 mm for ecoTEC plus boiler & combination boiler
- \*\* = 622 mm for ecoTEC plus 937



**Danger**  
**Risk of poisoning and material damage due to escaping flue gas as a result of roof penetration shearing off.**

Snow and ice sliding down pitched roofs can break off the vertical roof penetration where it exits the roof.

- In regions where heavy snow falls/extensive ice formation can be expected, fit the vertical roof penetration close to the ridge or fit a snow guard mesh above the roof penetration.

- Insert the roof flashing plate (2).
- Insert the roof penetration (1) through the roof flashing plate from above and push it down until it is flush.
- Align the roof penetration vertically.
- Fix the roof penetration to the roof structure with the hoop supplied (3).
- Fit the boiler mounting bracket (6).
- Install the boiler (7) - see boiler installation instructions.



Fitting extensions and elbows (→ section 4.7).

- Push the sliding sleeve (8) firmly onto the extension.
- Connect the vertical roof penetration (1) to the extension (4).
- Connect the sliding sleeve (8) to the boiler flue connection (5).



The sliding sleeve provides for straightforward fitting and disconnection of the air/flue pipe to/from the appliance (→ section 4.3).



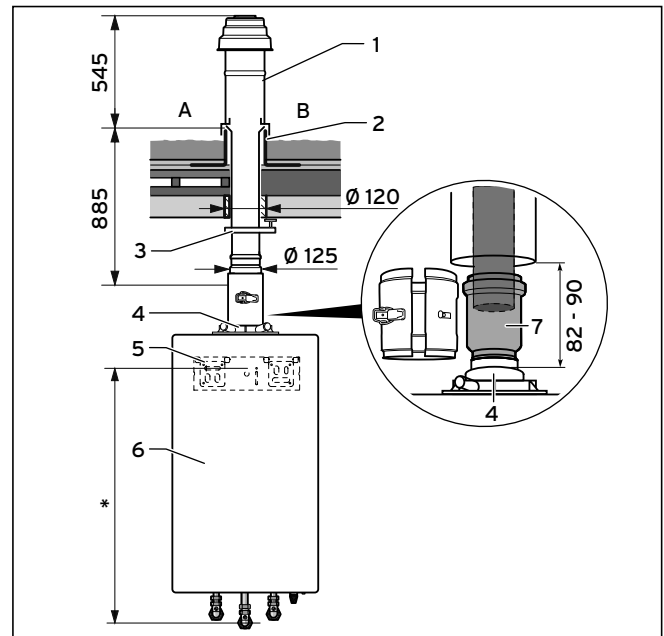
**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

- At suitable points, drill two holes 3 mm in diameter through the air-pipe collar of the sliding sleeve.
- Screw the air-pipe collar to the extension air pipe and the boiler flue connection using the screws supplied.
- Make sure that all air-pipe collars are centred and screwed to the air pipes using the self-tapping screws supplied.
- Fix every extension with at least one pipe bracket.

**4.6.4 Fitting the flat-roof penetration**



**4.17 Vertical roof penetration for flat roof**

**Key**

- A Cold roof
- B Hot roof
- \* = 750 mm for ecoTEC exclusive combination boiler
- \* = 530 mm for ecoTEC plus open-vented (top holes in bracket)
- \* = 622 mm for ecoTEC plus boiler & combination boiler
- \* = 622 mm for ecoTEC plus 937

- Fit the flat-roof flashing (2).
- Press the flat-roof flashing firmly in place and glue it according to the requirements for flat roofs (CP 144) to ensure it is water-tight.
- Insert the vertical roof penetration (1) through the roof flashing plate from above and push it down until it is flush.
- Align the roof penetration vertically.
- Fix the roof penetration to the roof structure with the hoop supplied (3).
- Fit the boiler mounting bracket (5).
- Install the boiler (6) - see boiler installation instructions.



Fitting extensions and elbows (→ section 4.7).

## 4 Concentric system (optional), dia. 80/125

- Push the sliding sleeve (7) firmly onto the vertical roof penetration (1) or onto an extension if necessary.
- Connect the sliding sleeve (7) to the boiler flue connection (4).



The sliding sleeve provides for straightforward fitting and disconnection of the air/flue pipe to/from the appliance (→ section 4.3).



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Flue gas can escape if the flue pipe is damaged.

- Take care that the flue pipe is not damaged when drilling.

- Drill two holes 3 mm in diameter through the air-pipe collar and the air pipe. The hole centres should be 6 mm from the edge of the air-pipe collar.
- Screw the air-pipe collar to the extension air pipe and the boiler flue connection using the screws supplied.
- Make sure that all air-pipe collars are centred and screwed to the air pipes using the self-tapping screws supplied.
- Fix every extension with at least one pipe bracket.

### 4.7 Fitting extensions and elbows

#### 4.7.1 Fitting extensions



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Extensions that are not fixed to a wall or ceiling may become disconnected due to sagging or thermal expansion.

- Ensure that every extension is fixed to the wall or ceiling by means of a pipe bracket. The distance between two pipe brackets must not be greater than the length of the extension.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Condensate that collects in a particular place can damage the flue pipe seals.

- Install the horizontal flue pipe with a gradient of 3° ± 1° sloping downwards to the appliance. That equates to a drop of approx. 50 mm ± 20 mm per metre of pipe run.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Mineral oil-based lubricants may damage the seals. The seals should therefore not be lubricated.

- Only use water or commercially available soft soap, if necessary, to assist with installation.
- Do not fit any damaged seals.
- When fitting the pipes, make absolutely sure the seals are correctly seated.
- File off sharp burrs and chamfer the ends of the pipes before assembling them so that the seals are not damaged, and dispose of the shavings.
- Do not fit any pipes that are dented or damaged in any other way.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

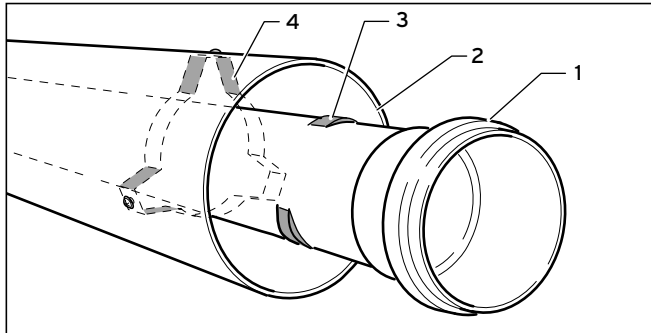
- Secure the flue pipe with the bracket so that it is correctly centred relative to the air pipe.



**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Unsecured joints on the air/flue gas ducting may become disconnected.

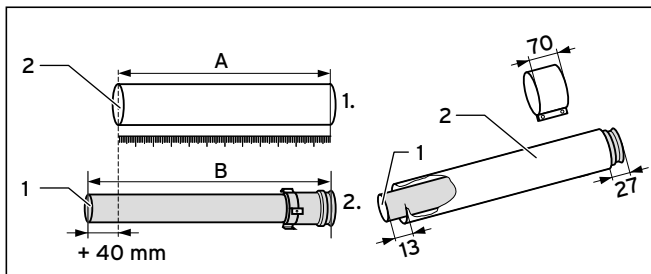
- Secure each air-pipe joint by screwing the air-pipe collars with the air-pipe ends or the boiler flue connection.



4.18 Detaching the flue pipe



To cut the air and flue pipes to length separately, you can dismantle the pre-assembled extensions without the use of tools.



4.19 Shortening pipes

- First measure the required air pipe length\* (**A**) and then calculate from that the corresponding flue pipe length (**B**):

$$\text{Length of flue pipe} = \text{Length of air pipe} + 40 \text{ mm}$$

- Cut the pipes with a saw, panel shears, etc.
- After shortening, locate the flue pipe (1) inside the air pipe (2) again.

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



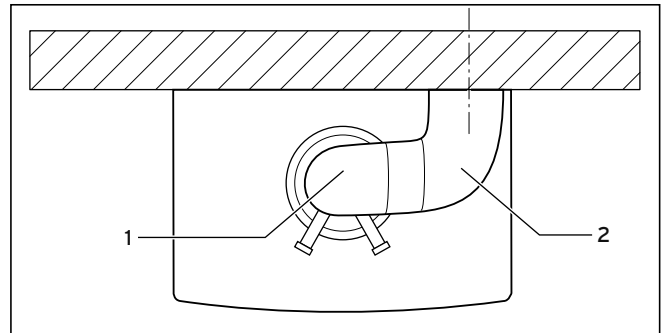
4.7.2 Fitting two 87° elbows



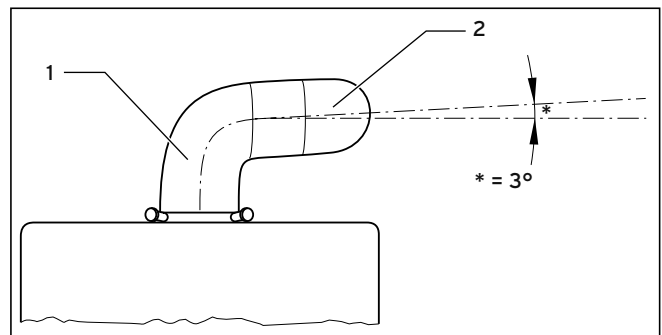
**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Unnecessary strain on the joints can cause leaks.

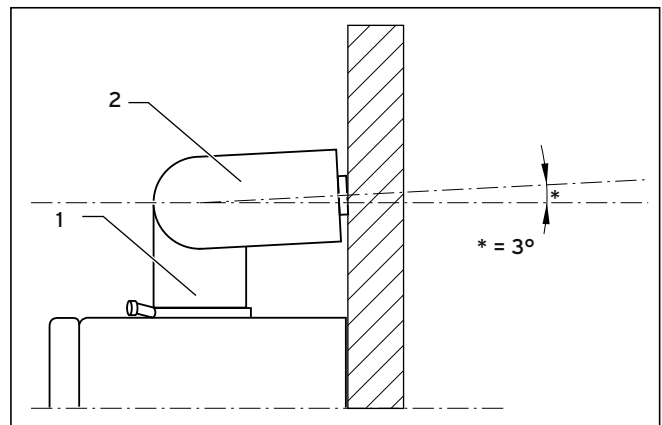
- Align the elbows correctly.



4.20 Arrangement of two 87° elbows - overhead view



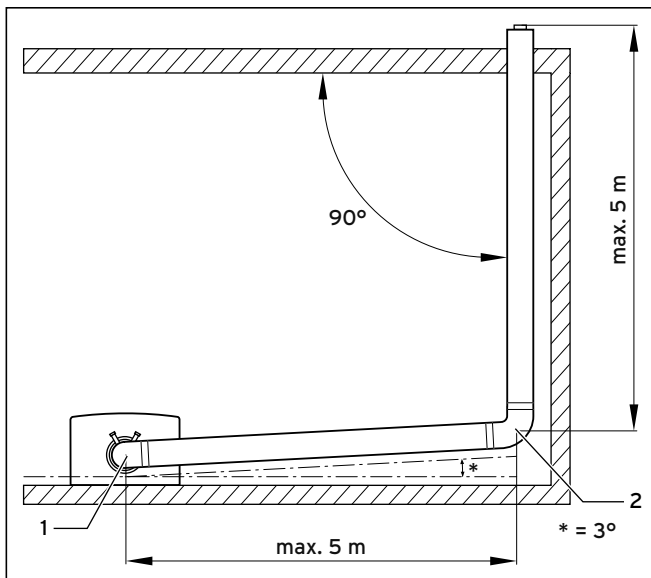
4.21 Arrangement of two 87° elbows - front view



4.22 Arrangement of two 87° elbows - side view

- When using two 87° elbows, refer to **figs. 4.20 to 4.22.**

## 4 Concentric system (optional), dia. 80/125



4.23 Connecting extensions with 87° elbows



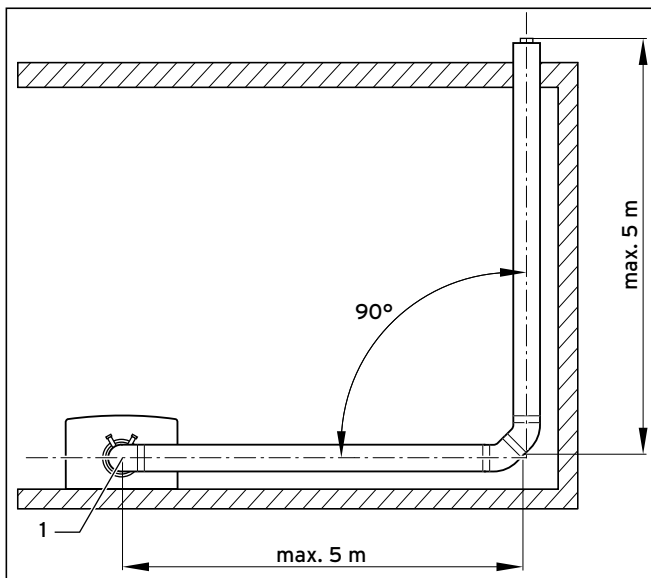
**Danger!**  
**Risk of poisoning due to escaping flue gas.**

Unsecured joints on the air/flue gas ducting may become disconnected.

- Secure each air-pipe joint by screwing the air-pipe collars with the air-pipe ends or the boiler flue connection.



The elbow (1) fitted on the top of the boiler must be turned by 3° so that the second 87° elbow (2) can pass through the wall at right-angles.



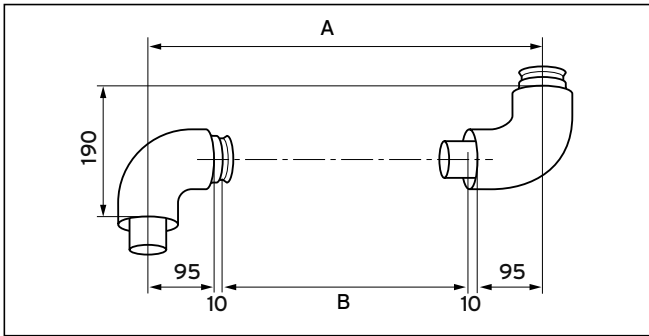
4.24 Connecting extensions with 45° elbows

- When using elbows for routing long flue pipes around a corner, refer to **fig. 4.23** and **fig. 4.24**.



An 87° elbow must be fitted with an angle of 3° between the wall and the air/flue pipe (→ **fig. 4.23**), or else use two 45° elbows (→ **fig. 4.24**).

**4.7.3 Fitting 87° elbows**



**Key**

A = Offset  
B = Length of air pipe

**Example:**

Measure the offset (**A**), e.g. 400 mm.  
With that figure, refer to the table below to determine the length of the air pipe (**B**) = 190 mm

From that, the corresponding flue pipe length is calculated as 190 + 40 = 230 mm

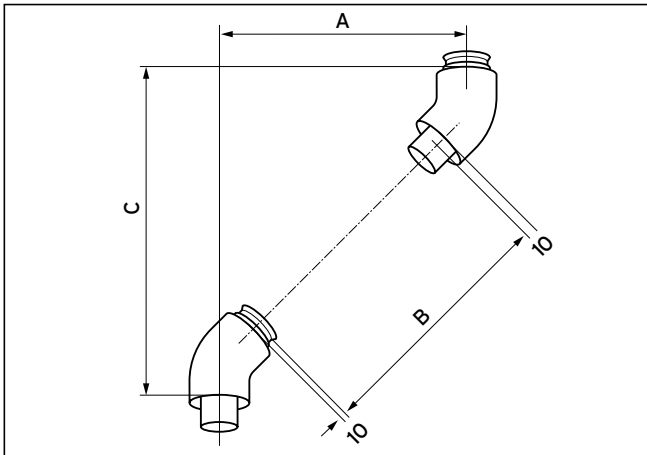
**4.25 Fitting 87° elbows (art. no. 303210)**

Offset [in mm]	Length of air pipe [in mm]	Offset [in mm]	Length of air pipe [in mm]	Offset [in mm]	Length of air pipe [in mm]
200, 205, 210	0	505	295	730	520
		510	300	735	525
		515	305	740	530
> 210 to < 310	not possible	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
440	220	655	445	880	670
445	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		

**4.5 Table of offset dimensions**

## 4 Concentric system (optional), dia. 80/125

### 4.7.4 Fitting 45° elbows



#### Key

A = Offset  
B = Length of air pipe  
C = Height

#### Example:

Measure the offset (**A**), e.g. 300 mm.  
With that figure, refer to the table below to determine the length of the air pipe (**B**) = 284 and the height (**C**) = 420 mm.

From that, the corresponding flue pipe length is calculated as  $284 + 40 = 324$  mm

4.26 Fitting 45° elbows (art. no. 303211)

Offset [in mm]	Length of air pipe [in mm]	Height [in mm]	Offset [in mm]	Length of air pipe [in mm]	Height [in mm]	Offset [in mm]	Length of air pipe [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
170	100	290	370	383	490	570	666	690
175	108	295	375	390	495	575	673	695
180	115	300	380	397	500	580	680	700
185	122	305	385	405	505	585	687	705
190	129	310	390	412	510	590	695	710
195	136	315	395	419	515	595	702	715
200	143	320	400	426	520	600	709	720
205	150	325	405	433	525	605	716	725
210	157	330	410	440	530	610	723	730
215	164	335	415	447	535	615	730	735
220	171	340	420	454	540	620	737	740
225	178	345	425	461	545	625	744	745
230	185	350	430	468	550	630	751	750
235	192	355	435	475	555	635	758	755
240	199	360	440	482	560	640	765	760
245	207	365	445	489	565	645	772	765
250	214	370	450	496	570	650	779	770
255	221	375	455	504	575	655	786	775
260	228	380	460	511	580	660	794	780
265	235	385	465	518	585	665	801	785
270	242	390	470	525	590	670	808	790
275	249	395	475	532	595	675	815	795
280	256	400	480	539	600	680	822	800
285	263	405	485	546	605	685	829	805
290	270	410	490	553	610	690	836	810
295	277	415	495	560	615	695	843	815
300	284	420	500	567	620	700	850	820
305	291	425	505	574	625	705	857	825
310	298	430	510	581	630	710	864	830
315	306	435	515	588	635	715	871	835
320	313	440	520	596	640	720	878	840
325	320	445	525	603	645			
330	327	450	530	610	650			

4.6 Table of offset dimensions

## 5 Vaillant Service

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

## Index

### B

Bird-guard grille ..... 23

### C

#### Components

dia. 60/100 ..... 8

dia. 80/125 ..... 40

### D

#### Deflector terminal

Possible adjustment ..... 27

### F

#### Fitting extensions and elbows

dia. 60/100 ..... 34

dia. 80/125 ..... 50

Fitting extensions around roof overhangs ..... 24

Fitting ridge tiles ..... 30

Fitting the black terminal kit ..... 17

Fitting the deflector set ..... 24

Fitting the disconnection joint ..... 12, 44

Fitting the variable terminal kit (VTK) ..... 19

#### Flat-roof penetration

dia. 60/100 ..... 29

dia. 80/125 ..... 49

### H

Horizontal wall penetration ..... 12

### M

Minimum clearances for flue terminal ..... 19, 25

Mounting template ..... 13

### P

#### Pipe lengths

dia. 60/100 ..... 10

dia. 80/125 ..... 41

#### Pitched-roof penetration

dia. 60/100 ..... 28

dia. 80/125 ..... 48

#### Product range

dia. 60/100 ..... 6

dia. 80/125 ..... 39

### R

Replacing boiler flue connection ..... 43

### T

Telescopic horizontal air/flue pipe ..... 15

### V

Vertical roof penetration ..... 27

VTK ..... 19, 25

[Visit Plumb2u](#)

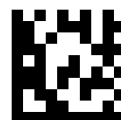
[See product](#)

[Visit Plumb2u](#)

[See product](#)

[Visit Plumb2u](#)

[See product](#)



834449

## Supplier

Vaillant Ltd

Nottingham Road ■ Belper ■ Derbyshire ■ DE56 1JT

Telephone 0845 602 2922 ■ [www.vaillant.co.uk](http://www.vaillant.co.uk) ■ [info@vaillant.co.uk](mailto:info@vaillant.co.uk)

## Manufacturer

Vaillant GmbH

Berghauser Str. 40 ■ D-42859 Remscheid ■ Telefon 0 21 91/18-0

Telefax 0 21 91/18-28 10 ■ [www.vaillant.de](http://www.vaillant.de) ■ [info@vaillant.de](mailto:info@vaillant.de)

449\_16 GBIE 052012 - Subject to change

Visit [Plumb2u](http://Plumb2u)

See product