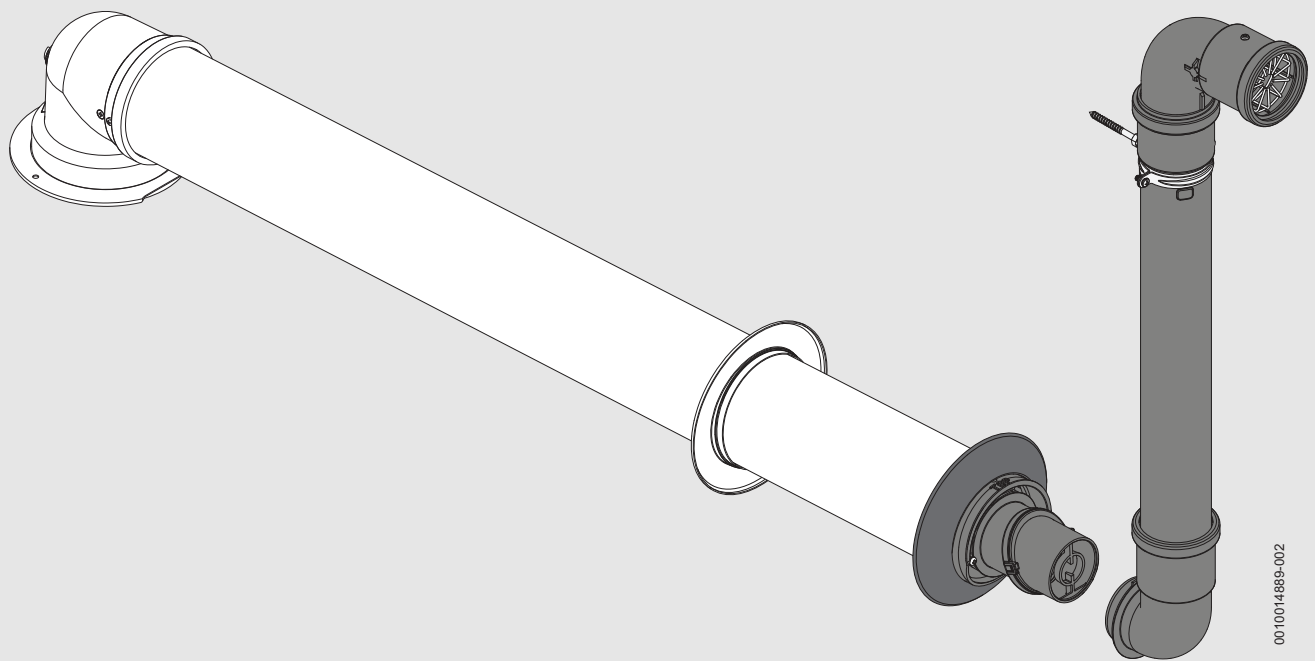


Flue kit installation instructions

## Wall mounted gas condensing appliance flue

### **Greenstar Condensfit II**

60/100 Horizontal 1050mm fixed flue, 7 733 600 298, 7 716 191 086



0010014889-002



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# 1 Explanation of symbols and safety instructions

## 1.1 Explanation of symbols

### Warnings

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

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



#### **DANGER:**

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



#### **WARNING:**

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



#### **CAUTION:**

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

#### **NOTICE:**

**NOTICE** indicates that material damage may occur.

### Important information



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

### Additional symbols

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

Table 1

## 1.2 General safety instructions

**⚠ Important - These instructions are to be used in conjunction with appliance Installation and maintenance instructions.**

Please read these instructions in conjunction with the appliance Installation and maintenance instructions manual carefully before starting installation.

- ▶ Observe all the safety precautions described in the Installation and maintenance instructions for the appliance this accessory is being installed onto.

### ⚠ Packaging

The following points should be observed during unpacking.

- ▶ Check the delivery immediately upon receipt for completeness and possible transport damage.
- ▶ In the event of transport damage, the delivery should only be accepted conditionally.
- ▶ Do not use damaged components for assembly.
- ▶ Carefully unpack the unit.
- ▶ Ensure that all packaging material is removed and that the unit is free from all materials that may prevent the unit from operating correctly.

### 1.3 Requirements

#### Condensate disposal with the flue system

Extended horizontal flue runs (over the standard flue length) need to allow for proper disposal of condensate through the flue system back to the appliance.

- ▶ All horizontal flue sections must rise by at least 52mm per metre away from the appliance to ensure that the condensate flows back into the appliance for safe disposal via the condensate waste pipe.

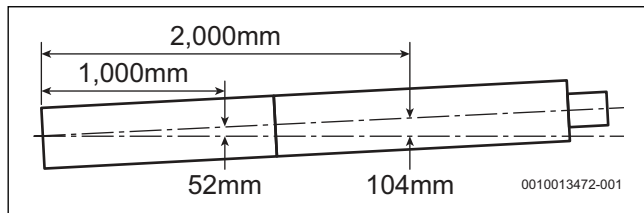


Fig. 1 Slope for condensate disposal

- ▶ Although referred to as 90° elbow they are in fact 93°.
  - They have a built in 3° (52mm per metre) rise from the appliance to help maintain condensate flow back into the appliance for safe disposal.

#### Flue and plume management termination positions

The flue termination positions and, if fitted, the plume management termination positions are covered in the appliance Installation and maintenance instructions as they are part of the appliance installation location considerations.

- Ensure the maximum flue length and, if fitted, the plume management maximum length are not exceeded for the appliance model, maximum lengths are detailed in the appliance Installation and maintenance instructions.

#### Installation

The flue installation must be fitted and terminated in accordance with your local regulations.

#### Support

Flues require adequate support throughout their entire run. It is advised to support the flue at every metre and changes of direction.

#### Flue System



Only use the approved Condensifit II flue system accessories with this flue kit.

#### Replacing an existing flue

When replacing an existing Condensifit II flue on an appliance:

- ▶ Ensure it is the correct flue system for the appliance as we have a separate flue system for Wall Hung and Floor Standing gas appliances.
- ▶ Ensure the flue installation meets current Building Regulation requirements.
  - Building Regulation requirements may have changed from the original date of installation of the existing flue system.

#### Flue system in voids

Where a flue system is going to be concealed, provision for access must be made for service and inspection:

- ▶ Access points for inspection of the flue system must be sufficiently sized for visual inspection, particularly at any joint in the flue system.
  - The access panels must be no less than 300mm square.
  - Larger access panels can be considered if the whole flue system needs to be viewed.
  - Any access must not contravene any other building regulations or fire regulations. Refer to Building Regulations Approved Documents B, L and E.
- ▶ Flue joints within the void must not be more than 1.5m from the edge of the inspection hatch.
- ▶ Inspection hatches should be located at changes of flue direction.
  - If this is not possible, elbows should be viewable from both directions.

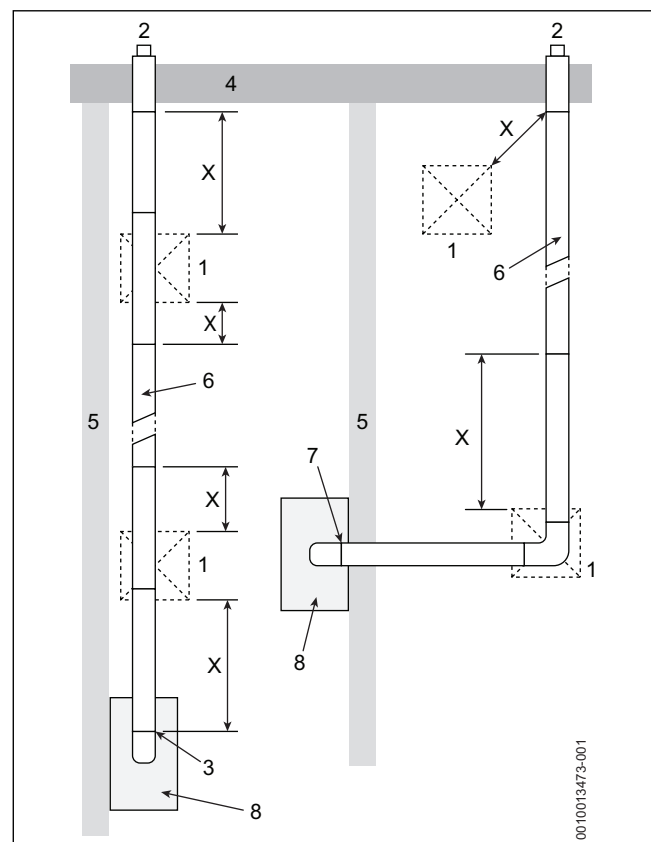


Fig. 2 Flues in voids

- [X] This dimension must not be more than 1.5 metres.
- [1] Inspection hatch
- [2] Flue terminal
- [3] Concealed flue connection
- [4] External wall
- [5] Internal wall
- [6] Any intervening joints must be visible within 1.5 metres of the inspection hatch.
- [7] Accessible flue connection

#### Annual inspection

When the flue system is inspected during the annual service, the engineer must inspect and confirm that:

- ▶ The flue system is continuous without any breaks.
- ▶ All joints in the flue system are secure and correctly assembled according to the manufacturers instructions.
- ▶ The flue has a fall of 3° (52 millimetres per metre) back to the boiler.
- ▶ The terminal is not damaged or restricted.
- ▶ The plume management kit is not damaged (if fitted).

## 2 Product Information

### Intended use

These instructions cover the following flue accessories kits:

- 7 733 600 298 Room Sealed horizontal fixed flue
- 7 716 191 086 Plume management system

These 60/100mm flue kit accessories are intended for use with Worcester Greenstar wall mounted condensing gas appliances.

The flue adaptor elbow has an in-built 3° angle giving the flue assembly the rise from the appliance to ensure the condensate flows back to the appliance. The flue terminal plume re-direct allows to change the discharge direction of the plume exhaust. The terminal plume redirect can also be replaced with the plume management system to discharge away from the property to a more suitable location.

### 2.1 Standard package

- 60/100mm Horizontal fixed flue kit:
  - Part No.: 7 733 600 298

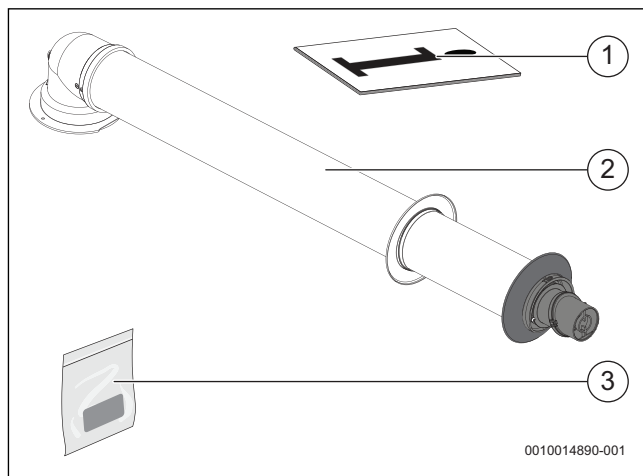


Fig. 3 Standard package contents

- [1] Instructions
- [2] Fixed flue assembly
  - Inner seal (white)
  - Outer seal (black)
  - Elbow
  - Fixed length flue (1,000mm)
- [3] Grease pack
  - Securing screws x 2
  - Sachet of grease

### 2.2 60/100mm flue accessories

1	High level horizontal flue adaptor *	7 719 002 432
2	220mm extension	7 716 191 133
3	1,000mm extension	7 716 191 083
4	2,000mm extension	7 716 191 172
5	90° elbow	7 716 191 084
6	45° elbow (set of 2)	7 716 191 085
7	Support bracket kit	7 716 191 177
8	Support bracket kit (set of 6)	7 716 191 178

Table 2

\* High level horizontal flue adaptor is required when connecting the horizontal flue kit for higher level flue discharge compared to the standard 90° adaptor turret.

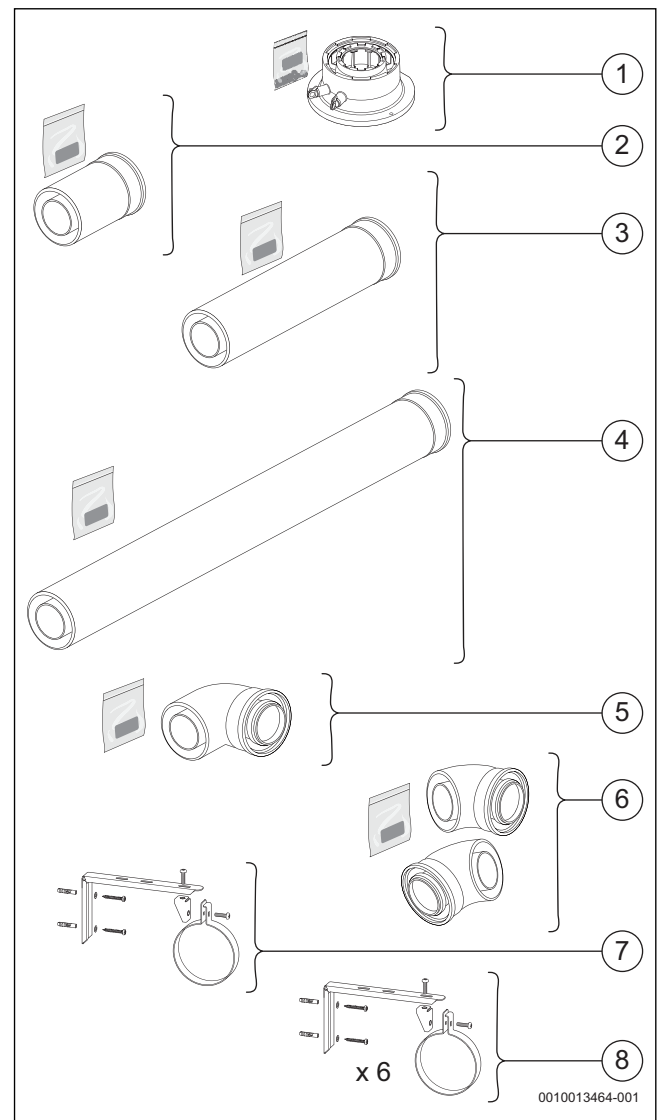


Fig. 4 Accessories

### 3 Pre-installation



#### CAUTION:

#### Flue joints and cut sections

- ▶ Secure all joints with the screws supplied in the appropriate flue kit and accessory.  
The sole purpose of the screws is to ensure that a correctly assembled joint cannot become separated due to external influences. They are not intended to provide any mechanical strength or support.
- ▶ A hole must be pre-drilled in the outer flue using a 3mm drill-bit wherever a screw is used to secure a joint. The joint may not be properly secured if the outer flue is not pre-drilled. Ensure you do not accidentally drill the plastic inner flue.
- ▶ When cutting sections, always take care not to damage the tubes, chamfer the edge of the plastic inner tube and remove any burrs from both tube sections to assist in ease of connection and to prevent seal damage.



#### Flue joints fixing screws

- ▶ Whenever possible, two screws should be fitted, at 180° from each other on the flue connections, however we recognise that some installation may make it difficult to access the joint sufficiently to fit two screws. On these occasions we would deem one screw to be acceptable.
- ▶ Where only one screw is used, the screw must be in a visible position for inspection purposes.
- ▶ Whenever a flue is identified to have only one screw in each joint, providing the flue is correctly supported and the screw is only being used for its intended purpose to prevent the joint from separating and not for mechanical support, then this would be acceptable.



#### Maximum flue lengths:

- ▶ For maximum flue lengths see the Installation and maintenance instructions manual for the appliance the flue kit is being installed onto.

### 3.1 Preparation

#### 3.1.1 Flue measuring

#### NOTICE:

#### Flue and plume management length:

- ▶ Do not exceed the maximum straight length for a horizontal 60/100mm flue or a 60mm plume management system (if used) as stated in the relevant appliance Installation and maintenance instructions manual.



The maximum flue length can be found in the Installation and maintenance instructions manual for the appliance.

The horizontal fixed flue length can be reduced for an effective length  $L$  of less than 1,000mm is required.

- ▶ Measure the flue length  $L$  from the centre line of the flue turret, along the route of the flue system, to the face of the outside wall.
- ▶ Select the required number of extensions and elbows to achieve the required flue run.

- ▶ If cutting is required:

- Where possible it is recommended to cut extensions rather than the horizontal fixed flue.

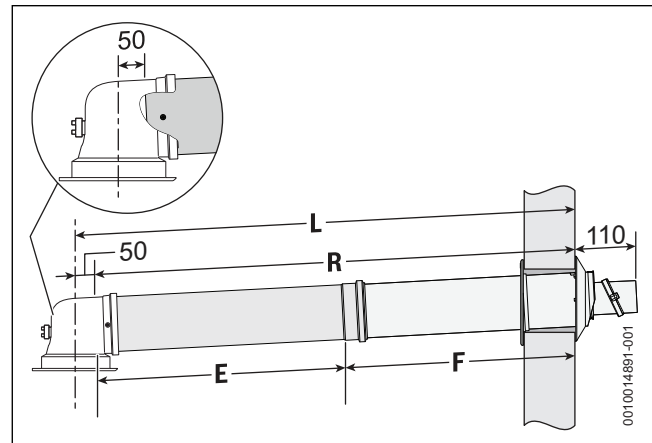


Fig. 5 Flue length determination (extended flue example)

- [L] Effective length of the flue system
- [R] Actual length of the flue sections ( $L-50 = R$ )
- [E] Extension flue length
- [F] Fixed flue length (unmodified length of 1,000mm)



#### Effective length

- ▶ Each flue elbow is rated as a certain straight length of flue, refer to the relevant appliance Installation instructions. The “effective length” of each elbow is added to the straight length of flue. Adding elbows to the flue system reduces the actual flue length available.
- ▶ The effective length of the flue must not exceed that stated in the relevant appliance Installation and maintenance instructions manual.

#### 90° Elbow offset dimensions

Figure 6 shows the offset between 2 x 90° elbows.

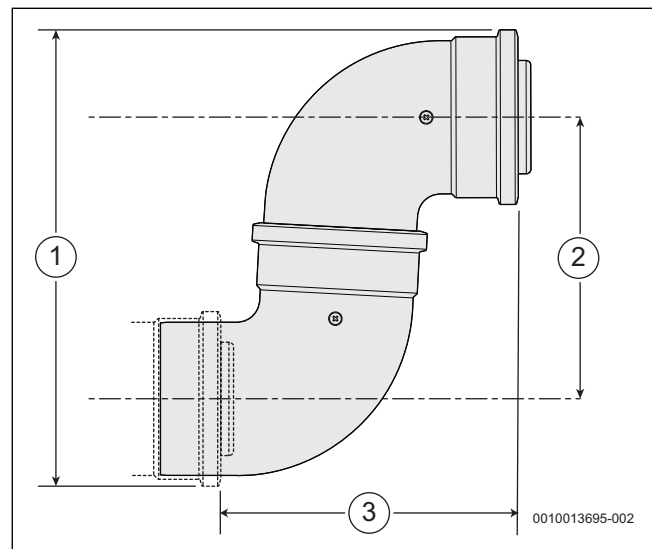


Fig. 6 90° elbows offset

- [1] 299mm
- [2] 185mm
- [3] 190mm

Figure 7 shows the actual length added by a 90° elbow when used with an extension in either orientation.

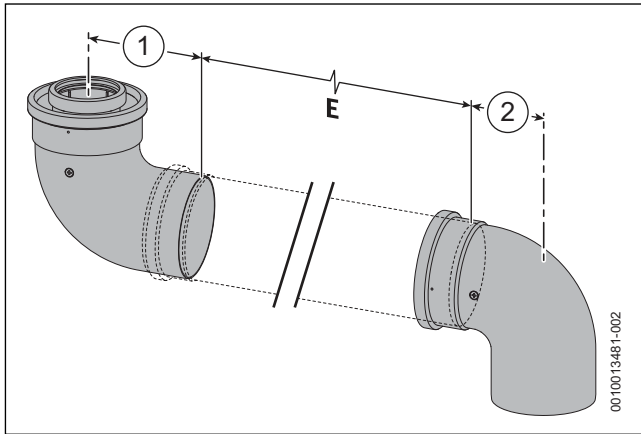


Fig. 7 90° elbow with extension offset dimensions

- [E] Extension flue length
- [1] 112mm
- [2] 73mm

If using an extension between the two elbows, refer to graphs in elbow instructions manual.

**45° Elbows offset dimensions**

Figure 8 shows the 45° elbow offset.

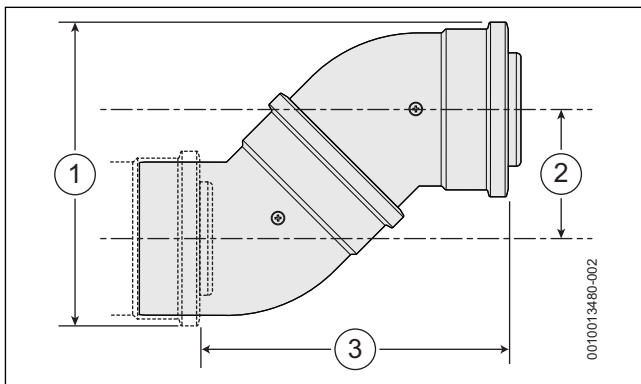


Fig. 8 45° elbows offset dimensions

- [1] 197mm
- [2] 85mm
- [3] 200mm

If using an extension between the 2 x 45° elbows, for offset between centres refer to graphs in elbow instructions manual.

**45 degree elbow offset to the wall**



Not all appliances can use this option.

- ▶ This option can be used for the following appliances:
  - Greenstar Si, i Junior and i System.
  - Greenstar Compact Combi's and System.
  - Greenstar Compact Ri.
  - Greenstar Compact ErP Combi's and System.
  - Greenstar Compact ErP Ri

Figure 9 shows a possible application for a 45° elbow in conjunction with the 90° adaptor turret, this can be used when exiting the appliance from either the left or right. In this application the flue would be 100mm closer to the wall.

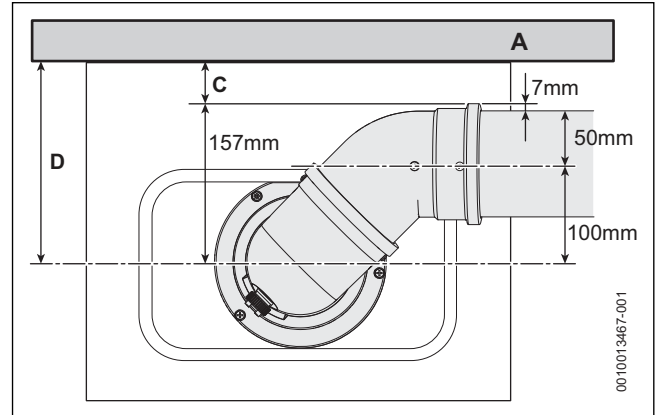


Fig. 9 45° elbow offset to wall

- [A] Wall
- [C] Clearance between flue system and wall
- [D] Depth from centre of appliance flue outlet to wall

Appliance	Depth [D]	Clearance [C]
Greenstar Si, i Junior & i System	189mm	32mm
Greenstar Compact Combi's & System	180mm	23mm
Greenstar Compact Ri	170mm	13mm
Greenstar Compact ErP Combi's & System	180mm	23mm
Greenstar Compact ErP Ri	170mm	13mm

Table 3 Dimensions when using 45° elbow offset to wall

**45° Elbow offset from wall dimension**

Figure 10 shows a possible application for a 45° elbow in conjunction with the 90° elbow and high level horizontal flue adaptor, this can be used when exiting the appliance from either the left or right. In this application the flue would be 105mm further from the wall.



The flue centre can be found in the Installation and maintenance instructions manual for the appliance.

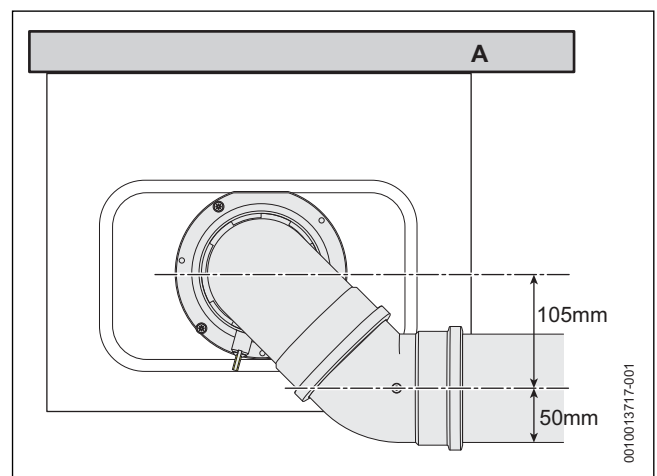


Fig. 10 45° elbow offset from the wall

- [A] Wall

### Minimum extension length between elbows

The minimum extension length between two elbows/offsets is 130mm, this allows for a good seal at the connection joints.

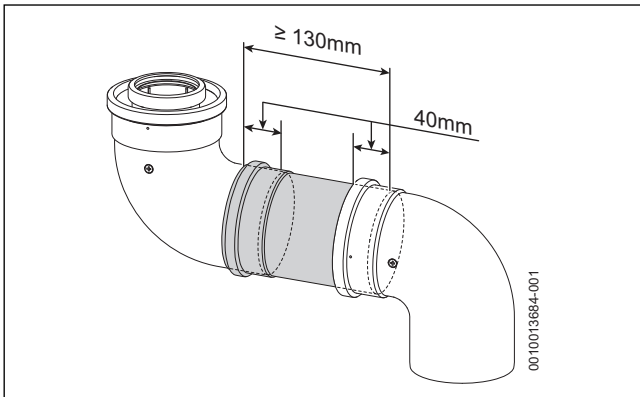


Fig. 11 Example with 90° elbows

### 3.1.2 Horizontal fixed flue length

The fixed flue is 1,000mm in length but this can be reduced if required by cutting the fixed flue.

#### Reducing the fixed flue length

- ▶ Remove the securing screws [2] located each side, at the end of the elbow [1] and separate the elbow from the fixed flue [3].

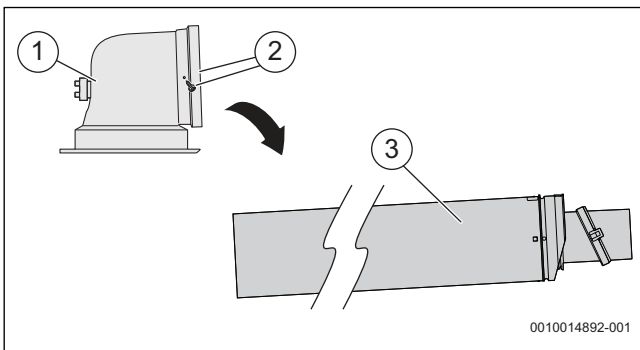


Fig. 12 Removing adaptor elbow from the fixed flue

Refer to figure 13

- ▶ Mark the length required from the raised tab [1] on the terminal end down the length of the terminal section, minimum 330mm.
- ▶ Cut square, taking care not to damage the tubes, remove the unwanted section [2], chamfer the edge of the plastic inner tube and remove any burrs from both tube sections.

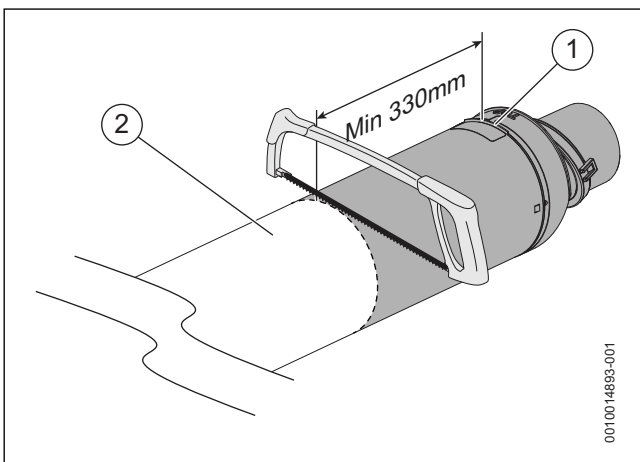


Fig. 13 Shortening the terminal assembly

### 3.1.3 Reducing extension flue tube length



Flue extensions:

- ▶ Flue extension are available in 3 sizes, a 220mm, 1,000mm and 2,000mm lengths.

To shorten the flue extension tube:

- ▶ Mark the length required on the extension tube, measuring from the socket end [1].
- ▶ Cut square, taking care not to damage the tubes, remove the unwanted section [2], chamfer the edge of the plastic inner tube and remove any burrs from both tube sections.

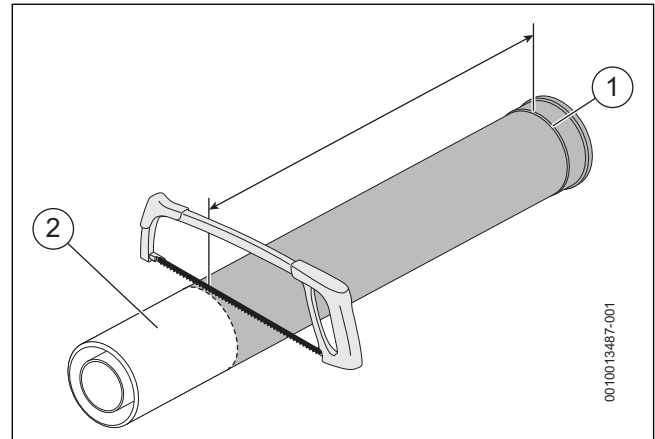


Fig. 14 Cutting an extension tube

### 3.1.4 Horizontal flues through pitched roofs

Whilst this is an acceptable method of installation, it is preferred that a vertical flue terminal is used where possible through a pitched roof.

It is possible to install a horizontal concentric flue through a pitched roof so long as the following criteria are met:

- ▶ Ensure the minimum distance of 300mm measured vertically between the roof pitch and the flue terminal.
- ▶ Ensure no exposed flue joints are external to the roof flashing.
- ▶ The flue must be adequately supported to ensure a constant fall back to the appliance at an angle of 3°, (52mm per metre).
  - Supporting approximately every metre for example at flue joint connections and any change of direction.
- ▶ Ensure that the terminal cannot be affected by a build up of snow etc.
- ▶ All flue terminal clearance must be kept as per appliance Installation and maintenance instructions.

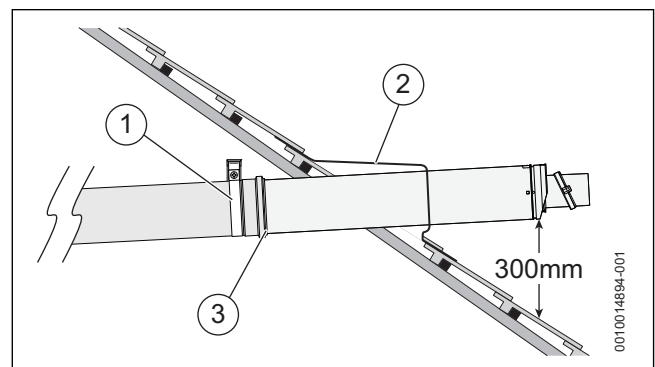


Fig. 15 Example horizontal flue through a pitched roof

- [1] Support bracket
- [2] Roof flashing
- [3] Flue joint



Roof flashing considerations:

- ▶ The flue should be weather sealed to the roof using an Ubbink type flashing, lead flashing can be used at the installer’s discretion, but the installer must ensure a weather tight seal.
- ▶ Due to the nature of condensing appliances, condense may drip from the flue terminal and it is advised to protect the roof.

**3.1.5 High level horizontal flue installations**

It is possible to convert the horizontal fixed flue kit to a high level horizontal flue system, there are a few considerations to be taken into account.

- ▶ Removal of the 90° adaptor turret.
- ▶ Fitting the high level horizontal flue adaptor to the appliance flue outlet.
- ▶ A 90° elbow can be fitted directly into the high level horizontal flue adaptor or use an extension between the high level horizontal flue adaptor and the 90° elbow.

Once the wall template has been fixed to the wall, the new position for the flue outlet must be measured to correctly mark and drill the hole for the flue exit. When installing with the high level horizontal flue adaptor the flue is 68mm taller than the standard horizontal fixed flue option.

- ▶ For the new centre line for the 60/100mm flue, on the appliance wall mounting template:
  - Measure above from the existing 60/100mm centre 68mm.
  - Mark the new centre line [1] for the 60/100mm flue exit.
  - Drill hole using a core drill or similar, a 125mm diameter hole is required. However, if using the weather sealing collar by pushing it through from inside the property, then a 150mm diameter hole is required to accommodate this.

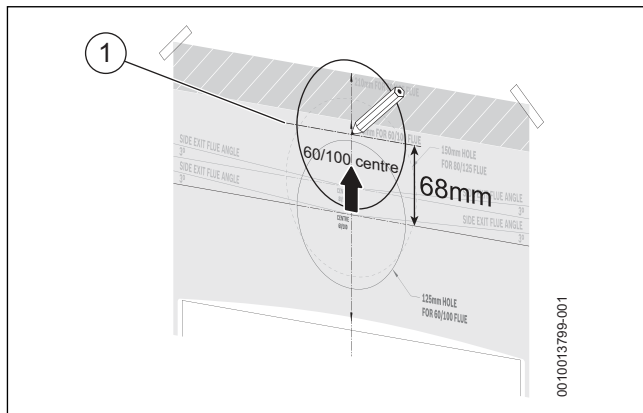


Fig. 16 Adjusted 60/100mm flue exit hole

**3.1.6 Extended terminal outside the building fabric**



This Installation is acceptable if the standard flue positions are not possible.

- ▶ This type of installation is only used if it is not possible to terminate the flue in the normal manner.

**Installations under eaves, balconies or car ports**

In order to prevent the products of combustion and condensation emissions from impinging on any bordering surfaces, the practice of extending the flue terminal past the external face of the wall is considered acceptable where the following conditions are met:

- ▶ The flue must not be closer than 25mm to combustible material.
- ▶ The flue must be adequately supported to ensure a constant fall back to the appliance at an angle of 3°, (52mm per metre).
  - Supporting approximately every metre, for example, at flue joint connections and any change of direction.
- ▶ The flue terminal must extend 100mm past any overhang to avoid excessive over flow run off from roofs and gutters [1].
- ▶ The minimum clearances according to BS 5440-1:2008 are met.
- ▶ The maximum equivalent flue length (as stated in the Installation and maintenance instructions manual) must not be exceeded.

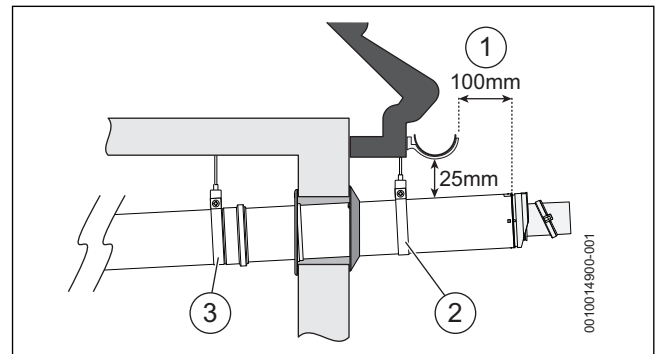


Fig. 17 Installations under eaves example

- [1] 100mm clearance to avoid excessive over flow run off from roofs and gutters from entering the air intake.
- [2] Support bracket to provide support to flue terminal extending past obstruction.
- [3] Support bracket, supporting approximately every metre for example at flue joint connections and any change of direction.

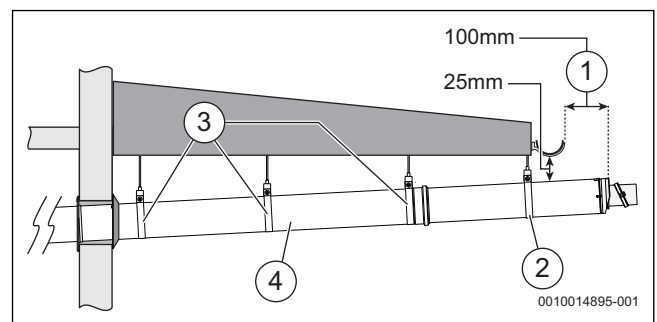


Fig. 18 Installations under balconies or car ports example

- [1] 100mm clearance to avoid excessive over flow run off from roofs and gutters from entering the air intake.
- [2] Support bracket to provide support to flue terminal extending past obstruction.
- [3] Support bracket, supporting approximately every metre for example at flue joint connections and any change of direction.
- [4] Using 2,000mm extension reduces the connection joints external to building fabric and adds more stability to the flue run.

### Installations below pipes or service ducts/tubes

In order to prevent the products of combustion and condensation emissions from impinging on any bordering surfaces, the practice of extending the flue terminal past the external face of the wall is considered acceptable where the following conditions are met:

- ▶ The flue must not be closer than 25mm to combustible material.
- ▶ The flue must be adequately supported to ensure a constant fall back to the appliance at an angle of 3°, (52mm per metre).
  - Supporting approximately every metre for example at flue joint connections and any change of direction.
- ▶ The flue terminal must extend 100mm from the wall to avoid combustion and condensation emissions from impinging on any bordering surfaces pipes or service ducts/tubes [1].
- ▶ The minimum clearances according to BS 5440-1:2008 are met.
- ▶ The maximum equivalent flue length (as stated in the Installation and maintenance instructions manual) must not be exceeded.

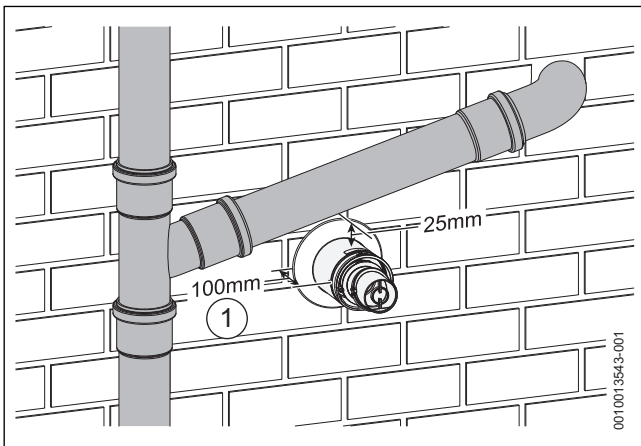


Fig. 19 Installations under pipes or service ducts/tubes

- [1] 100mm clearance from the wall to avoid combustion and condensation emissions from impinging on any bordering surfaces pipes or service ducts/tubes.

## 4 Installation



### Flue considerations

- ▶ If extensions are to be added then the complete flue must rise at an angle of 3° or 52mm for every metre of flue length.
- ▶ When using a 100mm diameter flue, a 125mm diameter hole through the wall is required.
 

However, if installing the flue from inside the property and fitting the weather sealing collar before the flue is pushed through the hole, then a 150mm diameter hole is required.
- ▶ Flue terminations close to a light source can become dirty due to large numbers of flying insects. Point out to the homeowner that the outlet should be regularly cleaned.



### WARNING:

#### Risk of poisoning due to escaping flue gases!

Flue gases can escape from a damaged flue system.

- ▶ When drilling fixing points in the outer flue tube, take care not to drill into the inner tube.



### WARNING:

#### Risk of poisoning due to escaping flue gases!

Flue gases can escape from incorrectly assembled flue system.

- ▶ Ensure all seals are correctly seated.
- ▶ Ensure joints are secured with the screws provided in the flue kit and accessories.
- ▶ Ensure the flue system is adequately supported, approximately one metre intervals and a change of direction.
- ▶ Ensure you carry out a flue integrity check when commissioning the appliance.

### 4.1 Installing the fixed flue through the wall



### WARNING:

#### Products of combustion!

To ensure products of combustions do not enter the property through the flue hole.

- ▶ Where possible the flue hole should be sealed to the building fabric on the inner and outer face using a suitable building material. As a minimum, the flue must be sealed to the inner wall using a suitable building material and the rubber collar fitted to the flue against the outside face. Providing the face of the outside wall is flat then the rubber collar is considered to be an adequate seal.



Correct orientation of the terminal assembly:

- ▶ Ensure that the “TOP” label on the terminal assembly is orientated correctly before securing the fixed flue in position. This must be done to allow the correct fit and use of the plume management system.

Refer to figure 20

- ▶ If installing an unmodified fixed flue kit:
  - Slide the inner wall seal [1] onto the fixed flue.
- ▶ If fitting the flue from inside the property:
  - Slide on the outer wall seal [2], locating the ridge on the seal with the groove on the terminal.
  - Slide the fixed flue [4] through the flue opening until the outer wall seal opens out again on the outside wall.
  - Pull the fixed flue [4] back towards the appliance until the outer wall seal is in contact with the external wall.
  - If the flue terminal is in a position that cannot be accessed with reasonable ease then the flue tube must be sealed to the inner wall with a suitable building material before sliding the inner wall seal [1] into position. Providing the outer wall surface is flat then the rubber collar is deemed to be an adequate seal.
- ▶ If fitting the outer seal from outside the building:
  - Slide the outer wall seal onto the terminal as shown, locating the ridge on the seal with the groove on the terminal.
  - Slide the fixed flue [4] through the flue opening.
  - Position terminal [3] through the flue opening in the wall to the outside of the building by the distance shown.
  - The flue should be sealed to the outside wall with a suitable building material once the flue is assembled.
  - Before sliding the inner wall seal [1] against the wall, seal the gap around the fixed flue to secure in position.

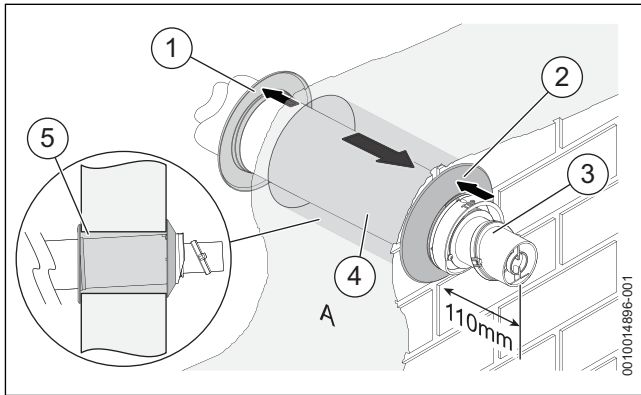


Fig. 20 Fixed length flue through the wall

- [A] Wall
- [1] Inner wall seal
- [2] Outer wall seal
- [3] Terminal
- [4] Fixed flue
- [5] Flue hole

#### 4.2 Turret flue adaptor installation

The turret is fixed by 3 screws to the top of Greenstar wall mounted condensing gas appliance.

- ▶ Some models use an additional 3 screws for the appliance flue connector.
  - Refer to relevant Installation and maintenance Instructions.
- ▶ Remove the 3 appropriate screws securing the flue outlet to the appliance.
- ▶ Align the turret to the appliance flue outlet with the flat [2] facing to the rear of the appliance.
- ▶ Fit to the appliance using the 3 removed previously (1) and secure the turret in position.

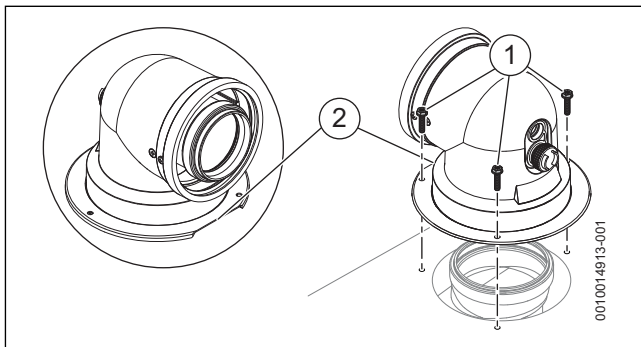


Fig. 21 Adaptor installation

#### 4.3 Vertical flue adaptor installation

The vertical adaptor is fixed by three screws to the top of the Greenstar wall mounted condensing gas appliance.

- ▶ Some models use an additional three screws for the appliance flue connector.
  - Refer to relevant Installation and maintenance Instructions.
- ▶ Remove the three appropriate screws securing the flue outlet to the appliance and discard.
- ▶ Align the high level horizontal flue adaptor to the appliance flue outlet with the flat [2] facing to the rear of the appliance.

- ▶ Fit to the appliance using the three longer screws (1) provided with the high level horizontal flue adaptor.

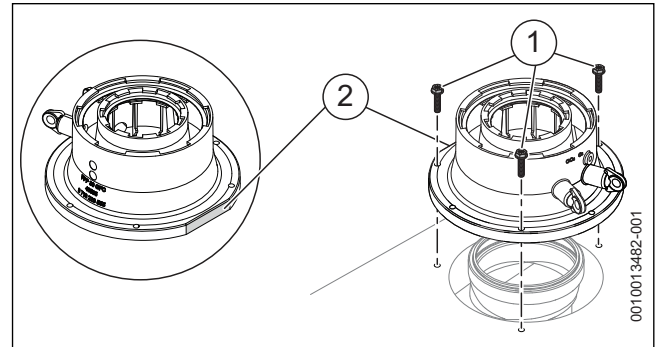


Fig. 22 Adaptor installation

#### 4.4 Flue joint connection examples



**CAUTION:**

##### Damage to flue system!

- ▶ Take care when drilling fixing points in the outer flue tube, do not to drill into the inner tube.

##### Connection to the flue adaptor, Greenstar wall mounted condensing gas appliances

Flue extension and 90° elbow (→ figure 23)

- ▶ Fit the extension piece [4] into the flue adaptor [5] and drill pilot hole through the outer flue tube of extension [4] and flue adaptor [5].
- ▶ Secure with the screw provided in the high level horizontal flue adaptor kit.
- ▶ Fit the 90° elbow [1] firmly into the extension piece [4] use the silicone grease provided with the extension kit.
- ▶ Drill two pilot holes, through the outer flue tube of extension [4] and 90° elbow [1].
- ▶ Secure the 90° elbow [1] into the extension piece [4] with the screws [3] provided with the extension kit.

90° elbow (→ figure 23)

- ▶ Fit the 90° elbow [2] firmly into the flue adaptor [5] and drill pilot hole through the flue adaptor [5] and 90° elbow [2].
- ▶ Secure with the screw provided.

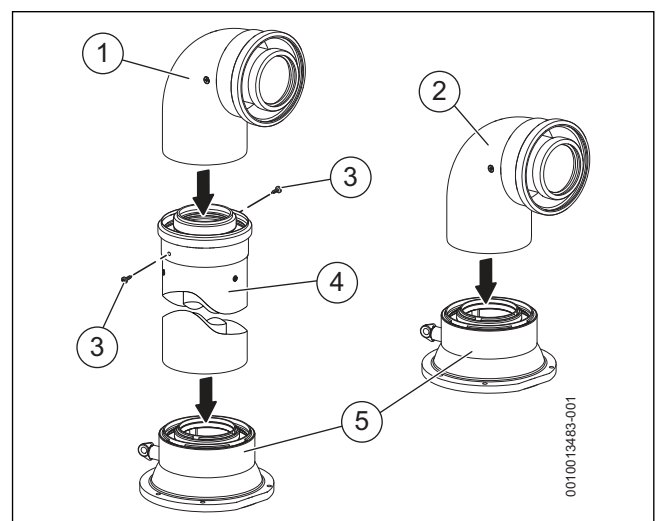


Fig. 23 Connection to the flue adaptor examples

### Elbow connections example (90° elbow)

Flue extension into a 90° elbow (vertical orientation → figure 24)

- ▶ Slide the support clamps [3] onto the flue extension.
- ▶ Fit the extension piece [4] into the 90° elbow using the silicone grease provided as a lubricant. Working from the appliance, secure the support clamps [3] to its wall bracket to take the weight of the flue.
- ▶ Drill two holes, 180° apart, through the outer flue tube of the extension and secure with the screws [2] provided.

Flue extension into a 90° elbow (horizontal orientation → figure 24)

- ▶ Working from the appliance, support the flue extension with elbow using the support clamps [5].
- ▶ Slide the support clamps [3] onto the flue extension.
- ▶ Fit the extension piece [4] into the 90° elbow using the lubricant provided. Working from the appliance, fit the support clamps [3] to their wall brackets to take the weight of the flue.
- ▶ Drill two holes, 180° apart, through the outer flue tube of the extension and secure with the screws [2] provided for all assembled joints.

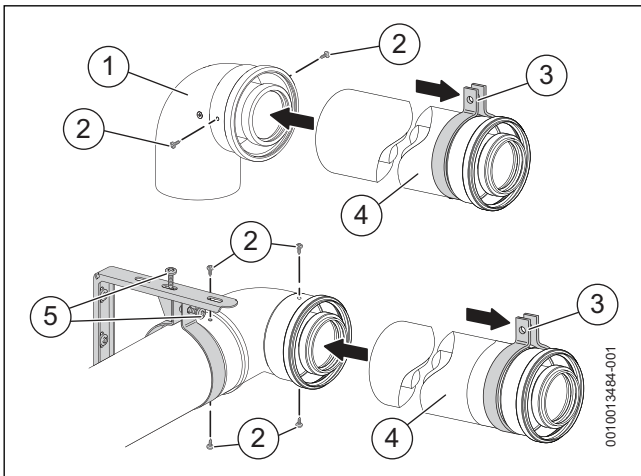


Fig. 24 Elbow connection examples (90° elbow)

### Extension and fixed flue connection examples

Additional extensions (→ figure 25)

- ▶ Working from the appliance, support the first extension flue using the wall brackets and support clamps [1]. Drill and secure using the two screws provided.
- ▶ Slide the support clamps [3] onto the next flue extension using the silicone grease provided as a lubricant.
- ▶ Fit the extension [4] into the previous extension using the lubricant provided. Fit the wall bracket and support clamps [3] to take the weight of the flue.
- ▶ Drill two holes, 180° apart, through the outer flue tube of the extension and secure with the screws [2] provided.

Fixed flue into flue extension (→ figure 25)

- ▶ Working from the appliance, support the flue extension using the wall bracket and support clamps [1].
- ▶ Fit the fixed flue [5] into the flue extension using the lubricant provided.
- ▶ See section 4.1 "Installing the fixed flue through the wall" for installing the fixed flue through a wall.
- ▶ Drill two holes, 180° apart, through the outer flue tube of the extension and secure with the screws [2] provided.

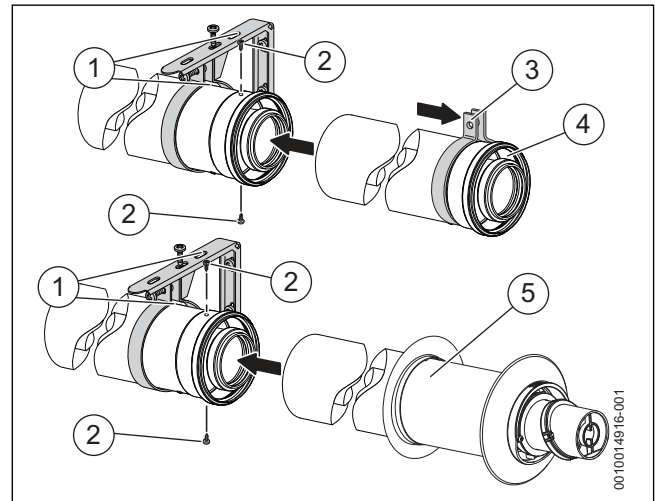


Fig. 25 Extension and fixed flue connection examples

**4.5 Flue terminal plume redirection**

The flue discharge can be re-directed to allow some plume redirection control. Alternatively, a complete plume management system can be fitted to the flue terminal.

**Re-directing the flue discharge**

**NOTICE:**

**Damage to flue or terminal outlet.**

The flue terminal outlet has built-in stops to limit rotation for horizontal fluing. This allows condensate to run back to the boiler for safe disposal

- ▶ Do not rotate the complete flue terminal assembly.
  - ▶ Do not attempt to force beyond the limit stops.
- 
- ▶ Using a suitable tool release the clip [2] either side, unclip the terminal end [1].
  - ▶ Rotate the end by 180° and refit the terminal end [1], ensuring to engage the clips [2] to secure.
    - If it is required to also angle the plume off the vertical line, the deflector can be rotated 80° either side.
  - ▶ Loosen the screws securing the entire outlet assembly and rotate by ± 80° to the desired position and re-secure the assembly.

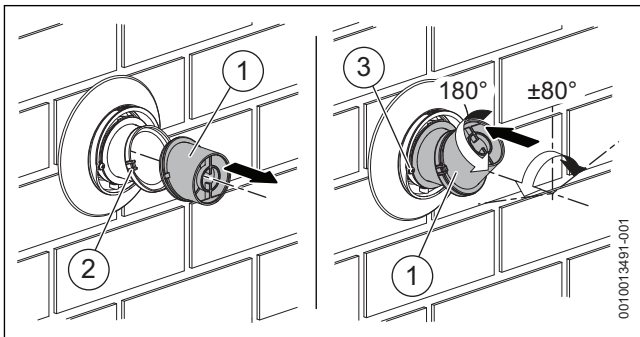


Fig. 26 Plume redirection

**NOTICE:**

**Outlet positions**

- ▶ The flue terminal outlet position must follow those shown in figure 27.
- ▶ When redirecting the flue discharge the terminal end must be at least 1,500mm from any opening in the direction of the discharge to prevent combustion products from entering the building as shown

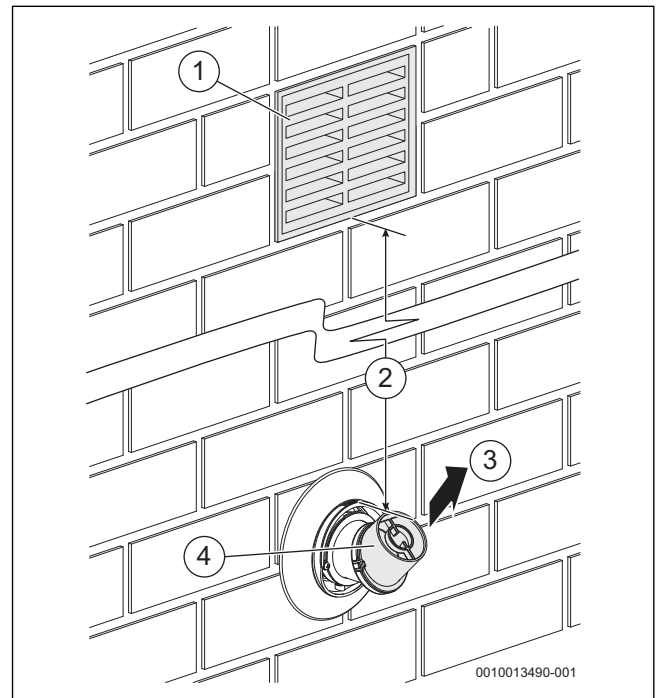


Fig. 27 Plume redirect distance to opening

- [1] Opening to building
- [2] Minimum 1,500mm from an opening in the building
- [3] Flue gas discharge
- [4] Terminal end

## 5 Plume management system

### 5.1 Plume management product information

#### Plume management kit - 7 716 191 086

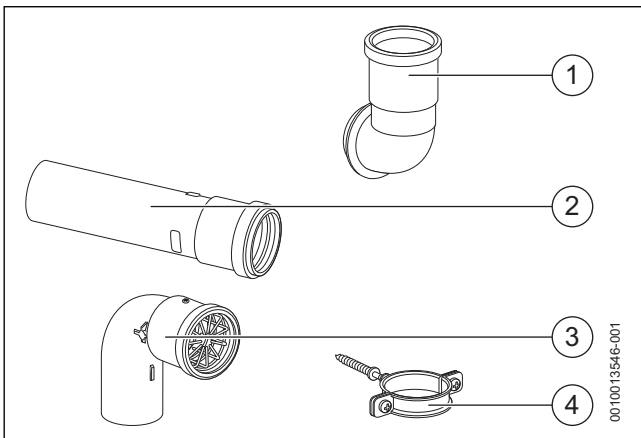


Fig. 28 60mm plume management kit components

- [1] Terminal elbow
- [2] Extension 500mm
- [3] Outlet assembly
- [4] Clamp pack

#### 60mm plume management accessories

1	1,000mm extension with support clamp	7 716 191 087
2	90° elbow	7 716 191 088
3	45° elbow (set of 2)	7 716 191 089
4	Terminal guard	7 716 191 176
5	Support bracket	8 716 111 275 0

Table 4

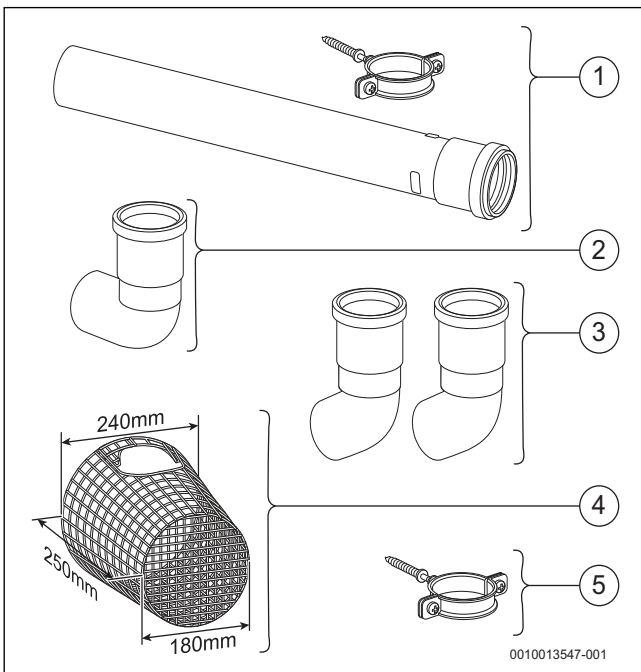


Fig. 29 Plume management accessories

### 5.2 Plume management options and measurements

#### NOTICE:

#### Plume management length:

- ▶ The plume management length must be a minimum of 500mm and must not exceed the maximum straight length for a horizontal Ø 60/100mm flue with a 60mm plume management system as stated in the relevant appliance Installation and maintenance instructions.



#### Horizontal plume management runs

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



#### WARNING:

#### Minimum plume management length:

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

- ▶ Do not terminate the plume management inside the terminal exclusion zone (shaded area) shown in figure 30.

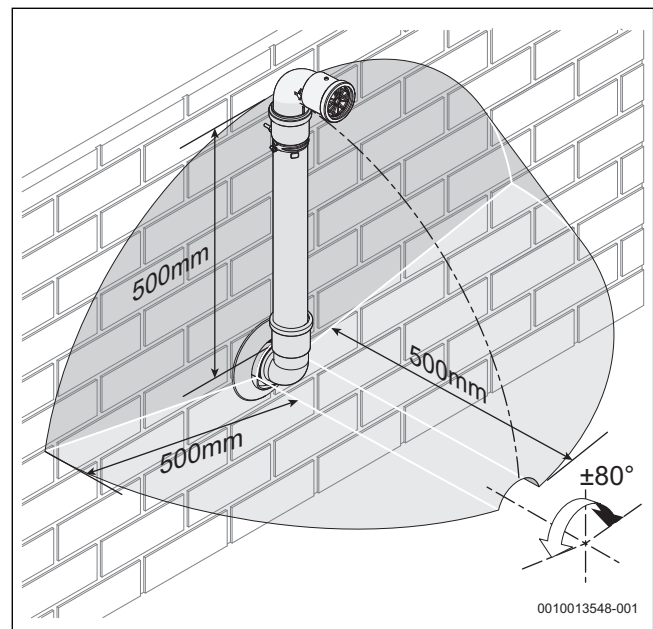


Fig. 30 Terminal exclusion zone

#### NOTICE:

#### Cutting the 500mm pipe

If the 500mm plume management pipe kit is cut, an additional elbow will be required to join the pipe work.

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

**5.2.1 Example plume management installation options**

M	Plume management effective length
X	Terminal exclusion zone
1	Terminal elbow
2	Extension 500mm
3	Outlet assembly/90° elbow
4	Support clamp
5	1,000mm extension with support clamp
6	45° elbow
7	60mm support clamp (third party)

Table 5 Key to example installation options

**5.2.2 Standard plume management kit**

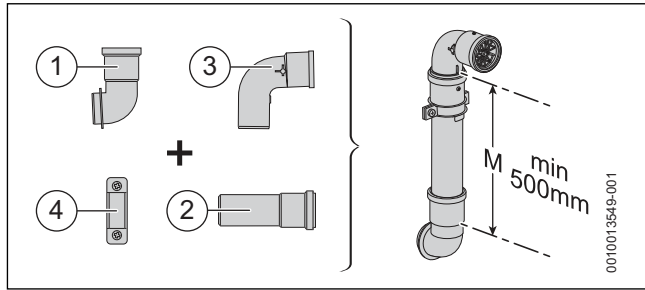


Fig. 31 Standard option

**5.2.3 Extended plume management kit example**

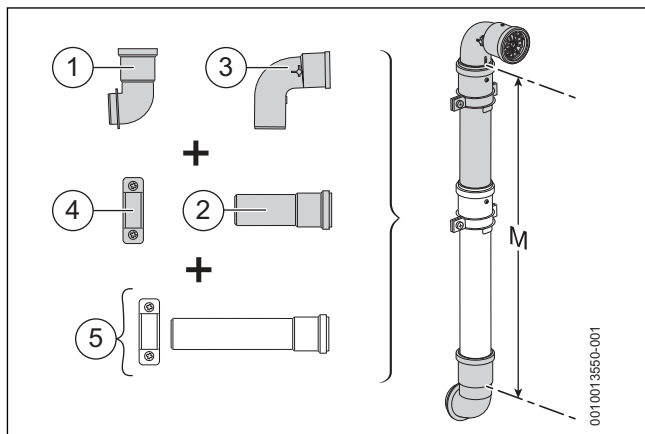


Fig. 32 Extended option

**5.2.4 Offset plume management kit example**

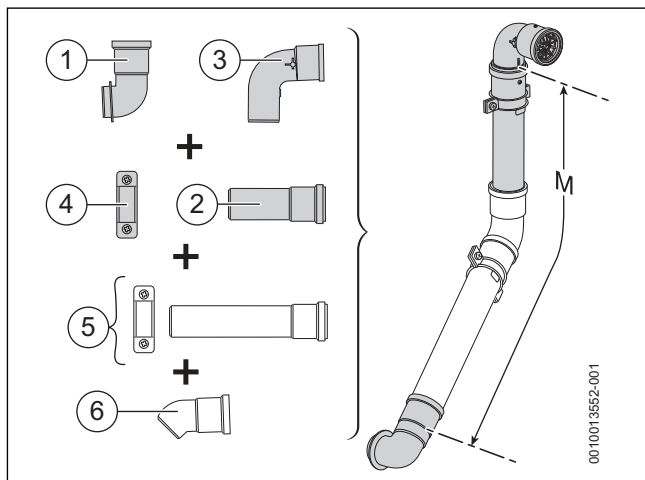


Fig. 33 Offset option

**5.2.5 45° Elbow offset plume management kit example**

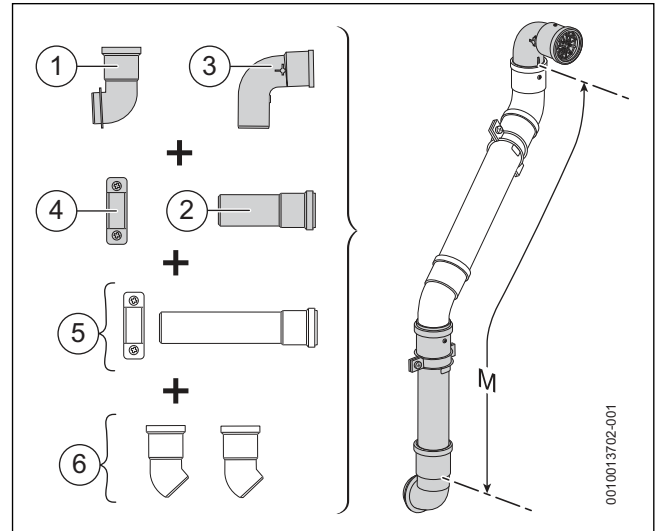


Fig. 34 45° offset option

**5.2.6 Angled plume management kit example**

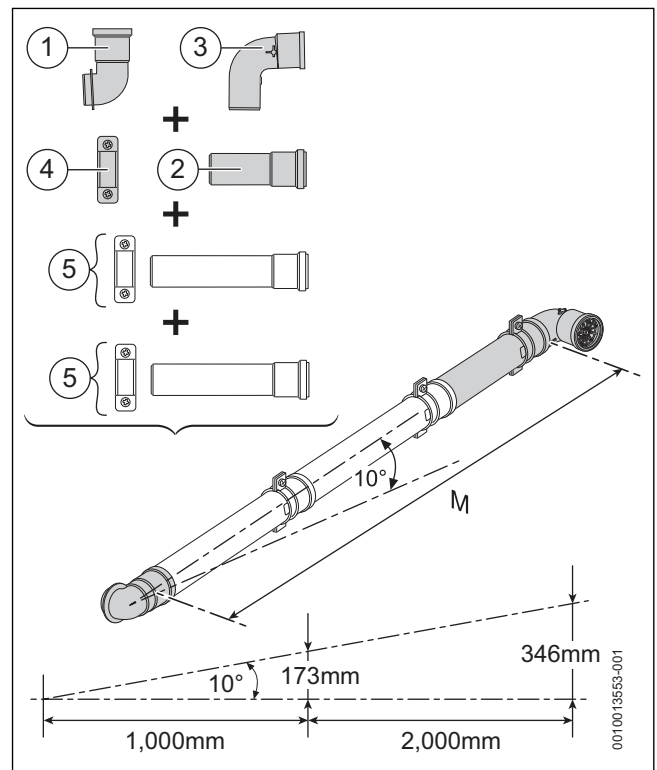


Fig. 35 Angled option

### 5.2.7 Plume management kit under a balcony/overhang example



The extension pipe [2] must be supported as close to the 90° elbow [3] and before the end of the balcony/overhang to provide adequate support.

- If the supplied brackets are not long enough then third party 60mm pipe brackets [7] can be used.



The shaded area X is the exclusion zone for plume discharge. The discharge must be outside this zone.

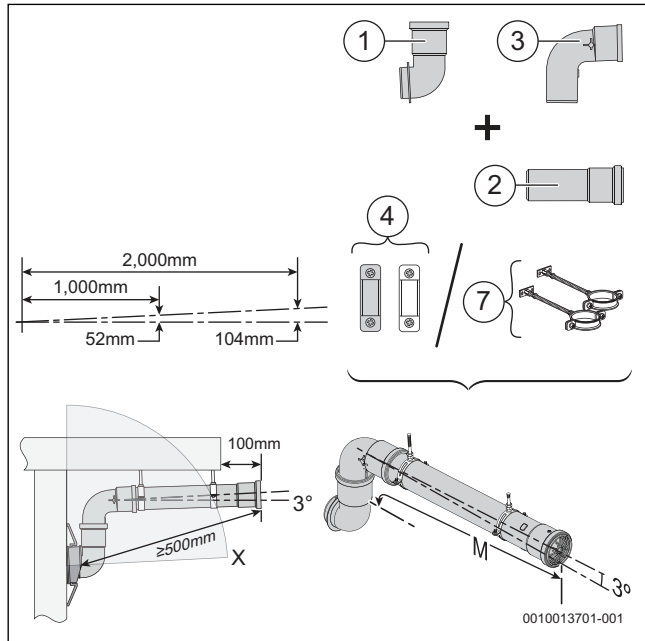


Fig. 36 Under a balcony/overhang option

### 5.2.8 Extended plume management kit under a balcony/overhang example



The shaded area X is the exclusion zone for plume discharge. The discharge must be outside this zone.

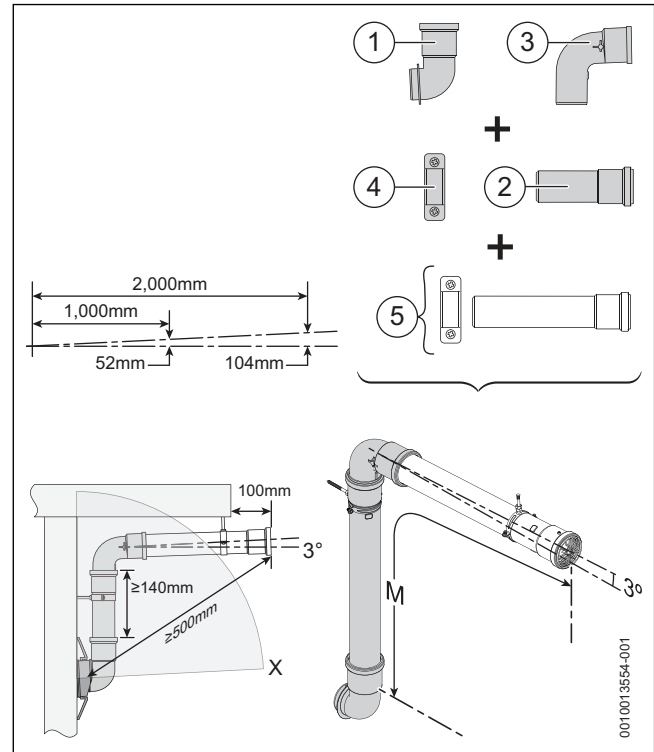


Fig. 37 Extended under a balcony/overhang option

**5.2.9 Vertical plume discharge above roof/overhang example**



This type of installation is only used if it is not possible to terminate the plume management kit in the normal manner.

- ▶ Ensure the discharge pipe is adequately supported as potentially the majority of the discharge pipe extends past the roof/overhang.
- ▶ The discharge pipe must vertically clear the roof/overhang by a minimum of 100mm.
- ▶ The discharge pipe must have a clearance of 300mm to a surface or boundary line.
- ▶ If the supplied brackets are not long enough then third party 60mm pipe brackets can be used.

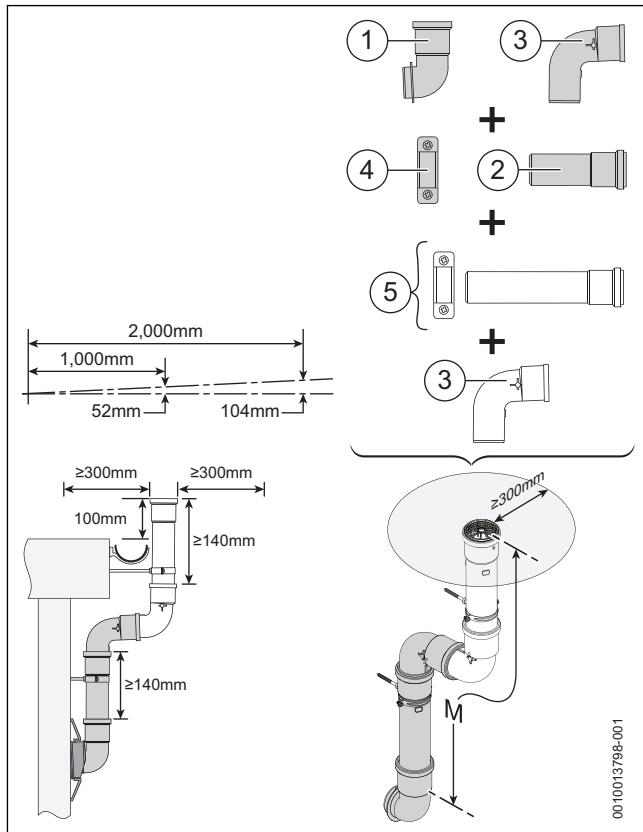


Fig. 38 Vertical plume discharge above roof/overhang option

**5.3 Determine the plume management system length**



The maximum permissible length of the plume management for Worcester Greenstar wall mounted condensing gas appliances is 4,500mm. The primary length of internal Condensfit II flue will be reduced by fitting the plume management kit.

Refer to relevant appliance Installation instructions to determine the appropriate plume length (M) versus the flue length (L).

The flue length is the effective length (L), which includes the effective length of any elbows plus the straight flue lengths.

Once the length L is know, find that value in the relevant appliance Installation instruction to determine the maximum plume length (M) allowed.

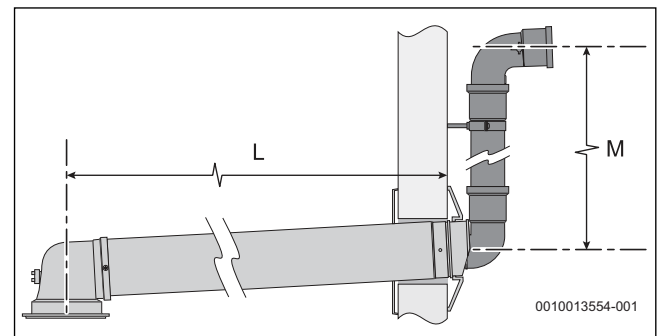


Fig. 39 Effective lengths determination

- [L] Effective flue length
- [M] Effective plume management length

### Effective flue lengths versus plume management lengths

The graph for the appliances listed below detail the effective flue lengths versus plume management lengths, for all other appliances the details are in the Flue sections of the appliance Installation and maintenance instructions.

The lengths for both plume and flue are the effective lengths, which includes the effective length of any elbows plus the straight lengths.



#### Appliances covered

- ▶ For the CDi range of appliances including British Gas variants, the available plume length [M] is reduced as the flue length [L] increases.
- ▶ The Si, i System, i Junior and Ri can use up to 4,500mm of plume management regardless of flue length.
- ▶ Any flue must have a minimum of 500mm plume length.

The graph can be used to calculate:

- **Effective flue length [L]** if a specific effective plume length is required.
- **Effective plume length [M]** if a specific effective flue length is required.

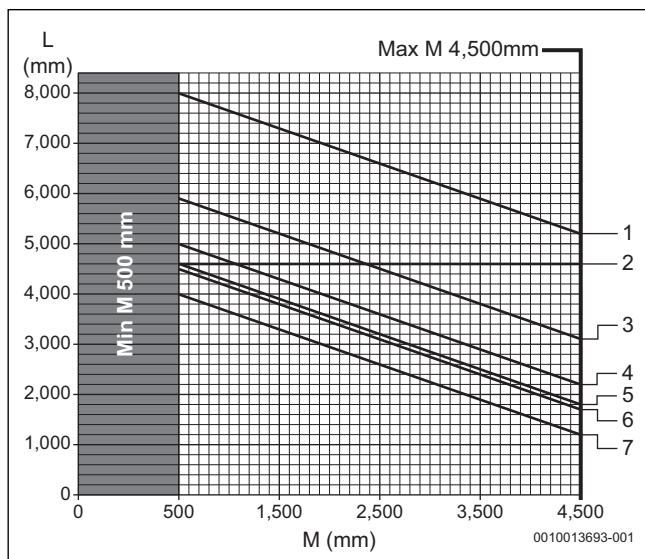


Fig. 40 Effective flue lengths versus plume management lengths

[L] Effective flue length

[M] Plume management length allowed

Appliance
1 Greenstar 27CDi
2 Greenstar Si, i Junior, i System & Ri
3 BG430/i, Greenstar 30CDi Regular, System, 29CDi ErP, 30CDi Regular ErP & 30CDi System ErP
4 Greenstar 30CDi, 34CDi Erp & 35CDi System ErP
5 BG532/i
6 BG537/i & Greenstar 37CDi
7 BG542/i Greenstar 42CDi, 40CDi Regular, 40CDi Regular ErP, 38CDi ErP & 42CDi ErP

Table 6 Appliances effective flue lengths versus plume management lengths

### 5.3.1 Plume management length

Plume management length (M) is calculated from the centre of the terminal, along the required route to the centre of the plume outlet.

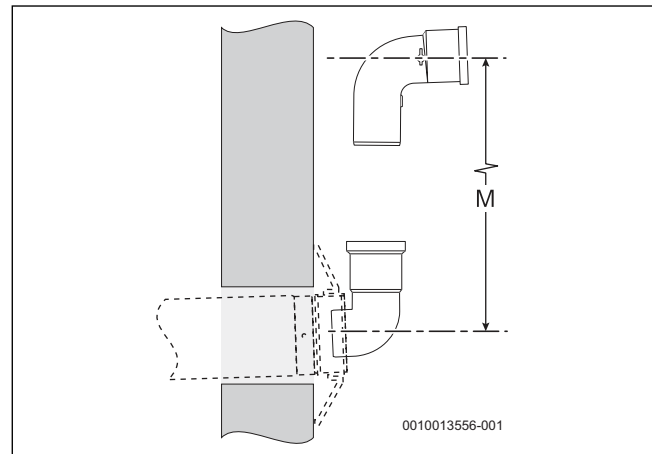


Fig. 41 Plume management length M

### Minimum plume extension length

The minimum extension length between two elbows/offsets is 140mm, this allows for a good seal at the connection joints,

Also remember when fitting the extension tube into elbows/extension fully into the outlet assembly [2], then withdraw the tube approximately 10mm to allow for expansion

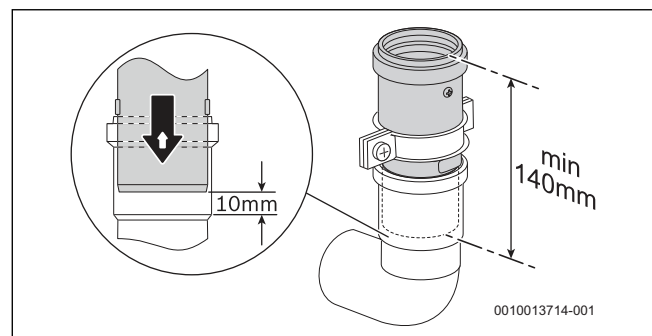


Fig. 42

### 5.3.2 Plume management elbows

Adding additional elbows to the standard plume management kit system reduces the actual plume management length. Each elbow has an equivalent straight length and must be factored into the overall effective length.

- 90° elbow is equivalent to 1,500mm.
- 45° elbow is equivalent to 750mm.

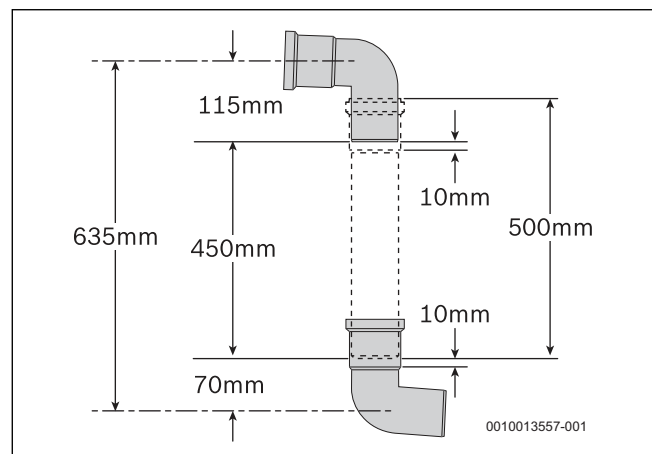


Fig. 43 Plume management 90° elbows offset example

**90° Elbows offset dimensions**



The plume management kit run must be adequately supported to ensure it does not separate.

- ▶ Use support brackets either side of the offset.

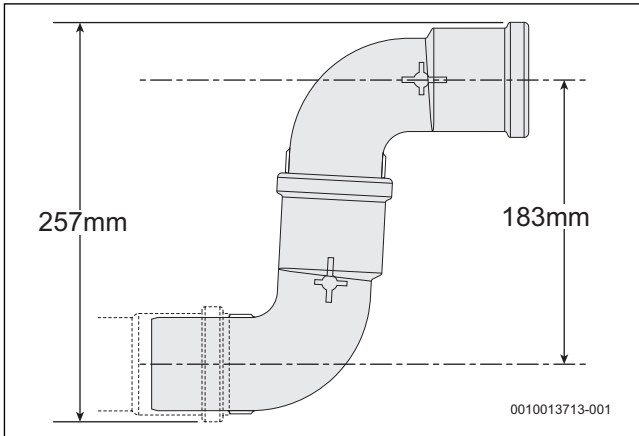


Fig. 44 90° elbows offset dimensions

**45° Elbows offset dimensions**



The plume management kit run must be adequately supported to ensure it does not separate.

- ▶ Use support brackets either side of the offset.

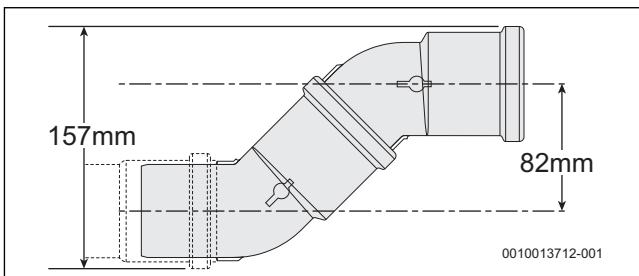


Fig. 45 45° elbows offset dimensions

**5.4 Plume management Installation**



To ease assembly of the flue components, lightly grease the seals with the solvent-free grease supplied.

- ▶ Check all the seals are properly seated in the grooves provided and are in good condition.
- ▶ All flue joints must be sealed to prevent leakage of condensate and flue products.



Horizontal plume management runs:

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

**NOTICE:**

**Damage to flue or terminal outlet.**

Do not rotate the complete flue terminal assembly.

- ▶ The flue terminal outlet has built-in stops to limit rotation for horizontal fluing. This prevents unwanted rain water from entering the appliance. Do not attempt to force beyond the limit stops.

**5.4.1 Installation examples**



The plume extensions include a support clamp and are used to support the plume management system at the joint connection point. Each support clamp retains one length of Plume management extension. When assembling multiple lengths of plume management, fully engage the extension and then withdraw the tube approximately 10mm to allow for expansion and contraction during operation and expansion due to weather conditions.

**Support clamp fitting**

Support clamp (→ figure 46)

- ▶ Mark the position [1] for the wall clamp [2] so that it coincides with the extension tube just below the top fitting (there are tabs [3] that will position the clamp up against the top fitting). Allow for the 10mm expansion gap on all joints.
- ▶ Drill a hole to suit the wall plug and fit the wall plug.
- ▶ Screw in the support clamp into the wall plug to the distance shown in figure 46.

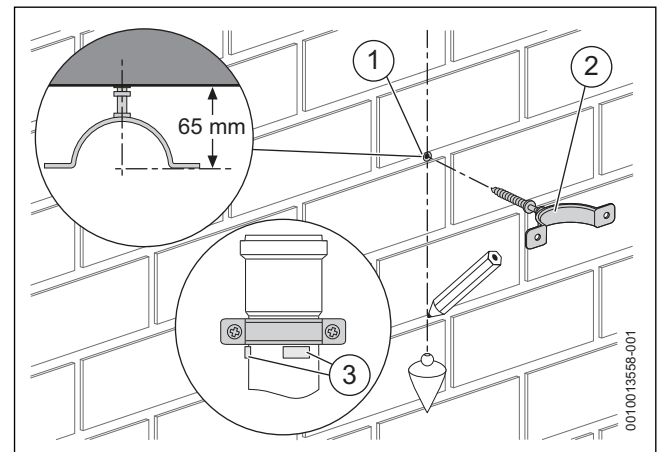


Fig. 46 Support clamp fitting

### Terminal elbow fitting

Terminal elbow (→ figure 47)

- ▶ Remove and retain the retaining screws [2] and discard the terminal end [3].
- ▶ Fit the terminal elbow [1] to the terminal outlet and set the rotation of the terminal elbow depending on the plume installation option required.
- ▶ Secure the terminal end [1] with the screws [2] removed previously.

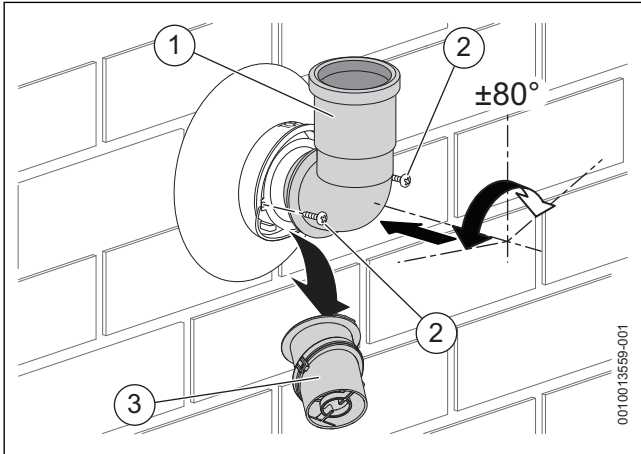


Fig. 47 Plume management terminal elbow

### Extension fitting

Extension tube (→ figure 48)

- ▶ Push the extension tube [2] fully into the terminal elbow [3], then withdraw the tube approximately 10mm to allow for expansion.
- ▶ Secure the extension [2] to the wall with the support clamp and screws provided [1].

Extension tube with additional elbow (45° elbow example → figure 48)

- ▶ Push the extension tube [2] fully into the terminal elbow [3], then withdraw the tube approximately 10mm to allow for expansion.
- ▶ Secure the extension [2] to the wall with the support clamp and screws provided [1].
- ▶ Push the 45° elbow [4] fully into the extension tube [2], the stop tabs set the depth and allow for expansion.
- ▶ Further extensions are fitted in the same way as previously described.

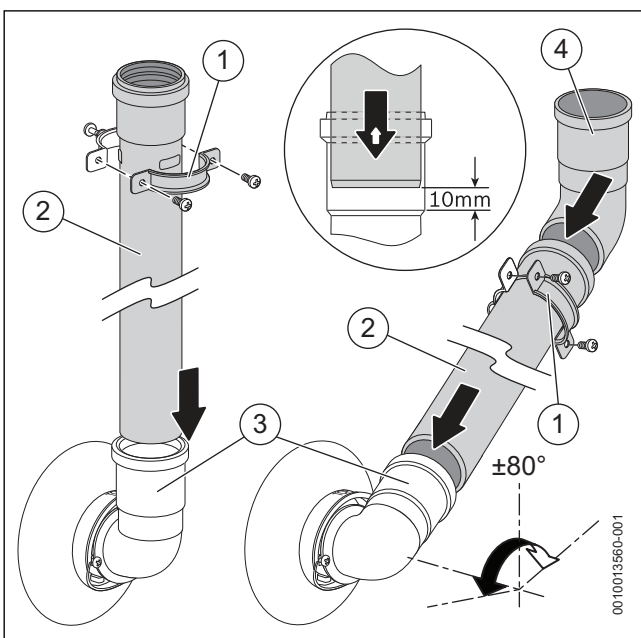


Fig. 48 Plume extension fitting

### Discharge elbow fitting

Outlet assembly (vertical orientation → figure 49)

- ▶ Secure the extension [4] to the wall with the support clamp and screws provided [3].
- ▶ Push the outlet assembly elbow [1] fully into the extension tube [4], the stop tabs set the depth and allow for expansion.
- ▶ Rotate the outlet assembly [1] to the required direction permitted.
- ▶ Secure the outlet assembly elbow [1] to the extension [4] with the self-tapping screw [2] provided.

Outlet assembly (angled orientation → figure 49)

- ▶ Secure the extension [4] to the wall with the support clamp and screws provided [3].
- ▶ Push the outlet assembly elbow [1] fully into the extension tube [4], the stop tabs set the depth and allow for expansion.
- ▶ Rotate the outlet assembly elbow [1] to the required direction permitted.
- ▶ Secure the outlet assembly elbow [1] to the extension [4] with the self-tapping screw [2] provided.

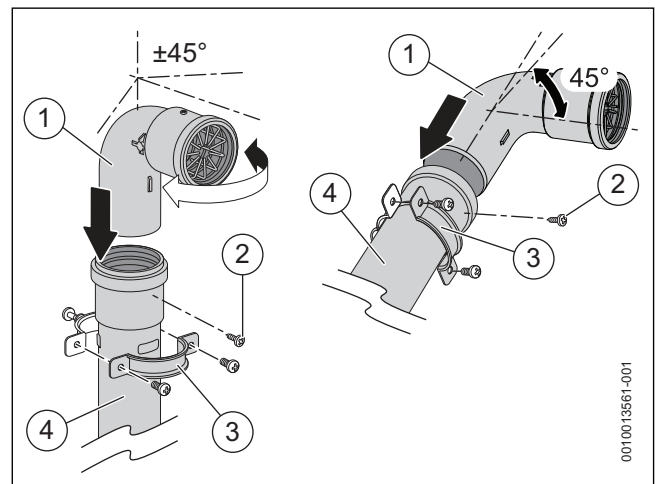


Fig. 49 Fitting the discharge elbow

**Under balcony/overhang extension fitting**

Refer to figure 50.

- ▶ Secure the extension [7] to the wall with the support clamp and screws provided [5].
- ▶ Remove the screw [1] from the outlet assembly elbow [2] and remove the grill [3].
- ▶ Push the outlet assembly elbow [2] fully into the extension tube [7], the stop tabs set the depth and allow for expansion.
- ▶ Mark the support for the extension run under the balcony/overhang, a support clamp is supplied with the extension tube.



The outlet of the extension tube must project at least 100mm passed the balcony/overhang

- ▶ Drill a hole to suit the wall plug and fit the wall plug.
- ▶ Screw in the support clamp into the balcony/overhang plug to the distance shown in figure 50.
- ▶ Push the extension tube [4] fully into the outlet assembly [2], then withdraw the tube approximately 10mm to allow for expansion.
- ▶ Secure the extension [4] to the wall with the support clamp and screws provided [5].
- ▶ Drill a hole through the plume outlet end secure the grill in place with the screw [1] removed earlier from the outlet assembly elbow.

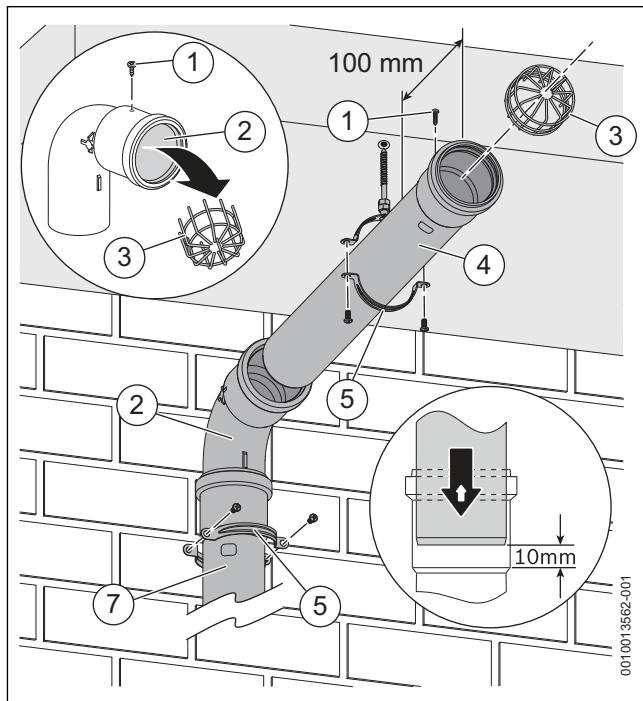


Fig. 50 Fitting extension under balcony/overhang

**Terminal guard fitting**

A flue terminal guard should be fitted over a terminal, if persons could come into contact with the terminal, or it could be subject to damage and where the terminal is less than 2,000mm from the finished floor level.

**NOTICE:**

**Terminal end position with terminal guard**

- ▶ The terminal end must not be swivelled inside the guard. The terminal end must be mounted at right angles with respect to the wall.



The terminal guard does not have to be fitted over the flue inlet, but is recommended to protect the flue from third party damage.

Refer to figure 51.

- ▶ Fit the terminal guard centrally over the flue inlet [3] or outlet [4].
- ▶ Mount the terminal guard to the wall utilising the three mounting points attached to the guard.
- ▶ Fold the gates in the order stated below or the gates will not latch properly.
- ▶ Fold the single pronged gate [1] in and latch onto the guard frame.
- ▶ Fold the two pronged gate [2] in and latch onto the guard frame.

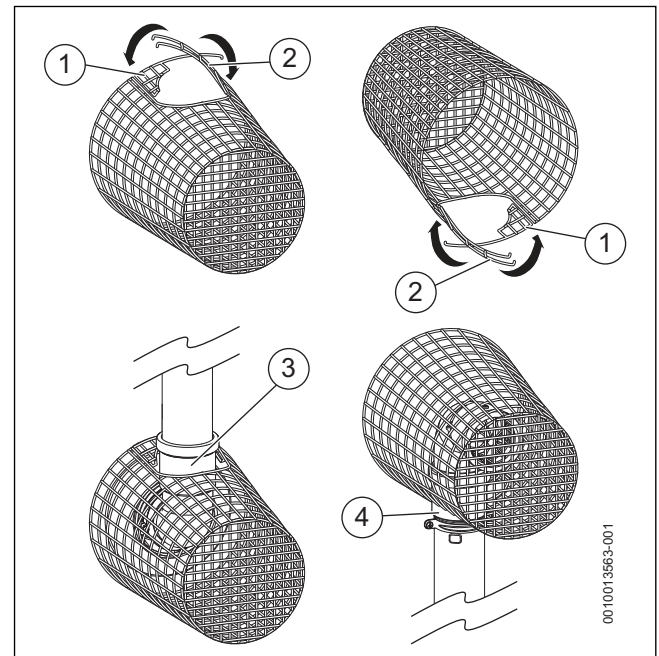


Fig. 51 Terminal guard fitting

### 5.5 Redirecting the plume terminal discharge



The plume deflector can be adjusted to redirect the flue discharge.

**NOTICE:**

**FLUE DISCHARGE**

- ▶ The Plume terminal outlet position must follow the conditions stated in figure 52. When redirecting the flue discharge the outlet must be at least 1,500mm from and angle at least 45° away from any opening in the direction of the discharge, as shown. This is to prevent combustion products from entering the building.

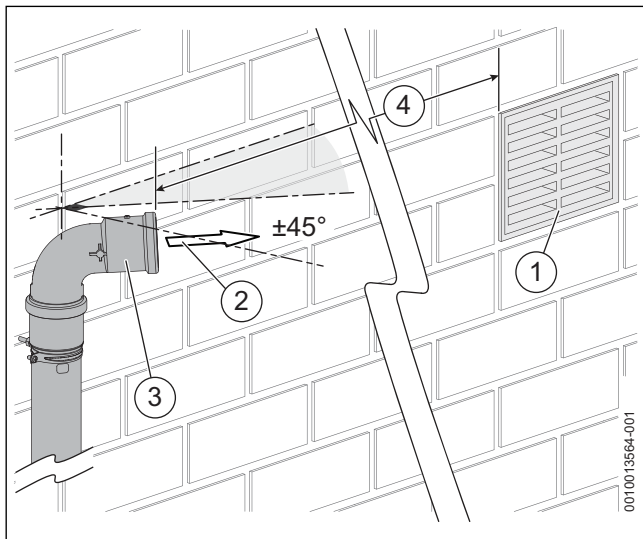


Fig. 52 Plume direction conditions

- [1] Opening in the building i.e. air brick, window.
- [2] Direction of the flue products, must be more than 45° from the wall or structure.
- [3] Plume terminal.
- [4] At least 1,500mm from any opening in the building.

## 6 Inspection and spares

### 6.1 Inspection and maintenance

- ▶ An annual visual check of the flue system including the plume management kit (if fitted) must be carried out in addition to the checks stated in the appliance Installation and maintenance Instructions.

**NOTICE:**

**Painting**

- ▶ Do not paint the plume management kit.

### 6.2 Spare parts

Replacement wall mounted horizontal flue components.

Terminal outlet assembly 8 716 11 209 0	Wall seal - inner 8 716 11 211 0
Wall seal - outer 8 716 111 212 0	Collar - Flue turret 8 716 11 254 0
Air sample point plug - Flue turret 8 716 11 253 0	Flue gas sample point cap & seal - Flue turret 8 716 11 252 0
Air sample point plug - Flue turret (silver) 8 7137 709 576	Flue gas sample point cap & seal - Flue turret (silver) 8 737 709 577
Connection joint seal - 102mm 8 716 111 673 0	Connection joint seal - 62mm 8 711 004 367 0
Flue screw pack 8 713 406 039 0	

Table 7 Spare parts list



TECHNICAL SUPPORT: 0330 123 3366  
RENEWABLE SUPPORT: 0330 123 9229  
CONTROLS AND CONNECTIVITY TEAM: 0330 123 3641  
APPOINTMENTS: 0330 123 9339  
SPARES: 0330 123 9779  
LITERATURE: 0330 123 9119  
TRAINING: 0330 123 0166  
SALES: 0330 123 9669

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