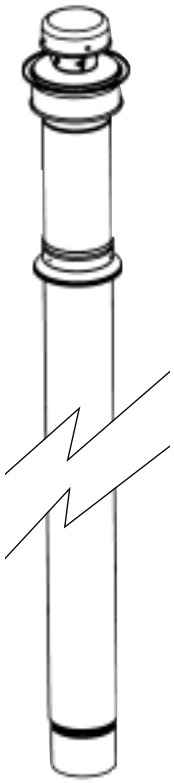
WORCESTER

Bosch Group

VERTICAL BALANCED FLUE SYSTEM

INSTALLATION INSTRUCTIONS



ROOM SEALED NON-CONDENSING COMBINATION/SYSTEM BOILERS AND WATER HEATERS

24i	47 311 37/38	9/14 CBi	41 311 50/51
28i	47 311 54	14/19 CBi	41 311 52/53
25Si	47 311 49/50	19/24 CBi	41 311 54/55
28Si	47 311 51/52	WR325	52 311 02
24CDi	47 311 30/31	24Si II	47 311 65/66
28CDi	47 311 34/35	28Si II	47 311 67/68
35CDi II	47 311 51/52	RD628	47 108 14
15SBi	41 311 43/45	24i Junior	47 311 69/71
24SBi	41 311 44/46	28i Junior	47 311 70/72

IMPORTANT: THIS BOOKLET MUST BE READ FULLY IN CONJUNCTION WITH THE APPLIANCE INSTALLATION AND SERVICING INSTRUCTIONS

THESE INSTRUCTIONS APPLY IN THE UK ONLY

THESE INSTRUCTIONS ARE TO BE LEFT WITH THE USER OR AT THE GAS METER

1. Flue Terminal Position

The Flue System must be installed in accordance with BS 5440: Part 1 2000 where applicable.

When installed the minimum clearance between the terminal and any adjoining vertical walls or obstructions must be at least 500mm.

The terminal must not be installed within 600mm of an openable window, air vent or any other ventilation opening. See Fig. 1.

If the flue needs to go through a wall next to the appliance adequate space must be allowed for the flue bend to be fitted.

When the flue is taken through the ceiling and into the roof space, or room above there must be a minimum air gap of 25mm between any part of the flue system and any combustion material.

Note: It is absolutely essential to ensure, that in practice, products of combustion discharging from the flue terminal cannot re-enter the building or any other adjacent building through ventilators, windows, doors, other sources of natural air infiltration, or forced ventilation/air conditioning. If this should occur, the appliance **MUST** be turned off immediately and the local Gas region called in to investigate.

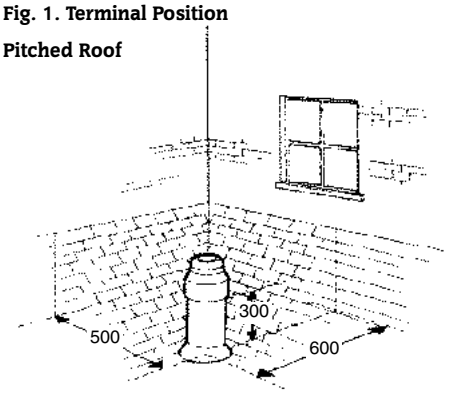
The Flue System must be supported by brackets (not supplied) such that the weight of the flue system is not resting on the appliance flue connection.

The Flue System is suitable for installation in dwellings with pitched or flat roofs.

The minimum distance the Flue Terminal Assembly shall extend above the surface of the roof is 300mm. This dimension is measured from the outside surface of a flat roof or the highest point on a pitched roof to the underside of the air inlet flange on the terminal assembly. See Fig 2.

Fig. 1. Terminal Position

Pitched Roof



Flat Roof

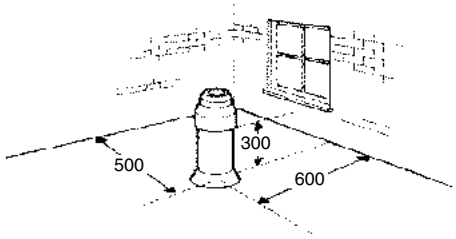
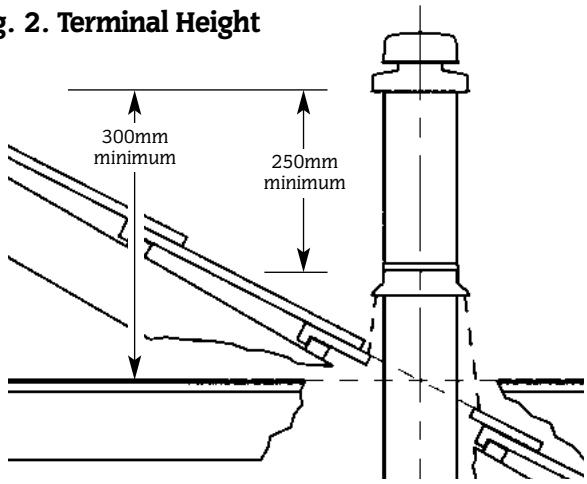


Fig. 2. Terminal Height



2. Vertical Balanced Flue Options

Important: All the Flue items referred to in this section are supplied as optional extras and should be purchased before the installation is started. The components should be checked against the parts and part numbers shown in Table 1. Worcester Bosch does not offer a roof flashing plate as an accessory, however a suitable product (Seldek®) is available from Selkirk (01271 326633).

Table. 1

Key No.	The Vertical Flue Kit consists of:-	Quantity	Part Number
1	Flue Terminal Assembly	1	7 716 191 079
2	Weather Sealing Collar	1	8 716 102 321
3	Flue Adaptor*	1	7 716 191 016
4	Fire Stop Spacer	2	8 716 100 281
5	Silicone Sealant	1	ZJADH 019
The following components MUST be ordered separately to suit the installation requirements			
6	Extension Flue Kit (750mm) including Flue Spacer	As req'd	7 716 191 006
7	90° Flue Bend	1	7 716 191 013
8	45° Flue Bend	1 pair	7 716 191 014

*NOTE: A Vertical Flue Adaptor is supplied in the Vertical Flue Kit, and the separate Part No. should therefore only be ordered in the case of a vertical exit from the boiler but horizontal termination

2.1. TERMINAL ASSEMBLY

The overall height of the terminal assembly is 1100mm.

Note. A minimum of 300mm shall extend above the surface of the roof. Refer to Fig. 2.

2.2. NOMINAL FLUE HEIGHT (NO OFFSET).

The maximum equivalent flue heights, excluding the flue terminal assembly are:

Table 2.

24i, 28i, 35CDi II	2.3m
WR325	2.6m
25Si, 28Si	3.0m
15SBi, 24SBi, 24CDi, 80ic	4.0m
9/14, 14/19CBi	3.0m
19/24CBi	2.25m
28CDi	3.5m
24Si II, 28Si II, RD628, G20	4.0m
24Si II, 28Si II LPG	2.5m
24 / 28i Junior	3.0m

2.3. FLUE WITH OFFSET USING TWO FLUE BENDS.

A flue offset can be provided using, 2 at 90° **(except for WR325 RSF water heaters where 90° bends cannot be used)** or 2 at 45° bends.

When using an offset the overall length of the system is reduced.

A 90° bend is equivalent to 750mm of straight flue.

A 45° bend is equivalent to 375mm of straight flue.

Note: For the 24i, 28i and 35CDi II 2 x 90° bends allows a maximum straight length to not exceed 800mm or 1550mm for 2 x 45° bends.

When measuring between the centre-lines of flue ducts an allowance must be made for the relevant elbow. Refer to Fig. 3.

Fig. 3. Flue Offset

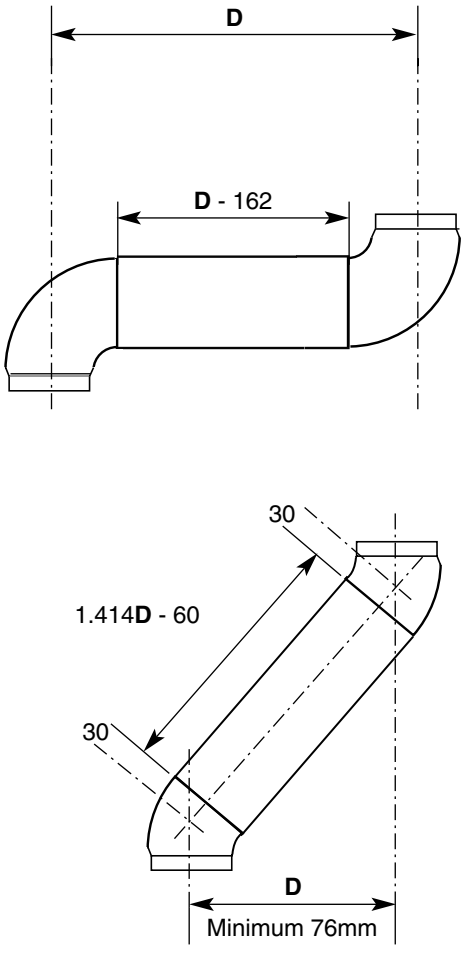
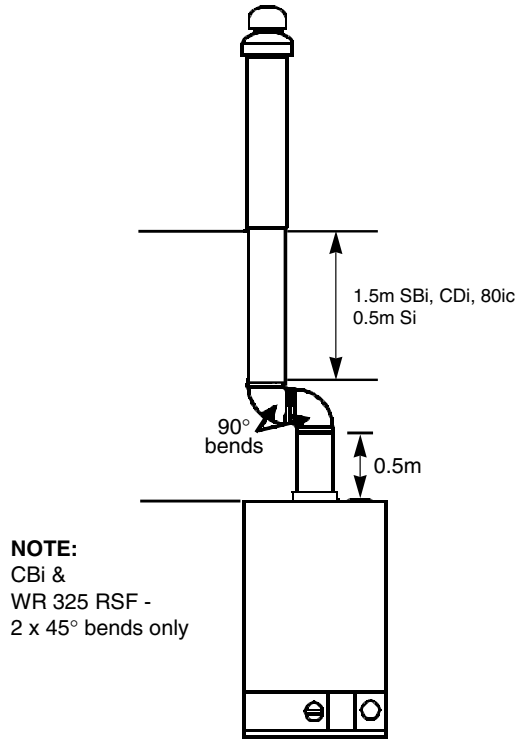


Fig. 4. Example of vertical flue assembly showing equivalent straight flue lengths



IMPORTANT: The flue terminal assembly must always be vertical at the roof outlet.

2.4. FLUE RESTRICTOR RINGS

The flue restrictor rings are in the appliance installation pack. Refer to the relevant Installation/service instructions for the method of fitting a restrictor ring.

Table. 3.

MODEL	EQUIVALENT FLUE LENGTHS UP TO 1M	EQUIVALENT FLUE LENGTHS 1M TO 4M
15SBi	79mm	NONE
24SBi	75mm	NONE
	EQUIVALENT FLUE LENGTHS UP TO 725MM	**EQUIVALENT FLUE LENGTHS 725MM TO 3M**
Si Series	79mm	NONE
	TERMINAL ASSEMBLY ONLY	**EQUIVALENT FLUE LENGTHS UPTO MAX LENGTH**
9/14CBi 14/19CBi	72mm	NONE
19/24CBi	79mm	NONE
24i Junior	76mm	NONE
28i Junior	80mm	NONE
WR325 RSF	UP TO 2600mm	
	NONE	
35CDi II	UP TO 1m	1m-2.3m
	85	NONE
24CDi	NONE	
28CDi	NONE	
24Si II	With terminal section only use 78 mm restrictor	With longer flues no restrictor must be fitted
28Si II & RD628	With terminal section only use 82 mm restrictor	With longer flues no restrictor must be fitted

3. Preparation and General Notes

3.1. FLUE HEIGHT AND OFFSETS.

Determine the height of the flue system and if offsets are needed for the system to miss ceiling/roof joists and any other obstruction. Refer to Fig. 8.

3.2. INSTALLATION OF BOILER.

Refer to the relevant Installation and Servicing Instructions for the fitting of the wall-mounting frame assembly and the boiler.

Flush the system and, where required, the cold water supply before connecting the boiler.

3.3. FLUE KITS AND EXTENSIONS.

Remove all the packing from the ducts, flue terminal assembly and flue bends.

Important: The air duct, flue duct, flue bends and the terminal assembly are made from aluminium and must be handled appropriately.

3.4. FLUE ADAPTOR

For some options a flue adaptor must be fitted into the spigot on the top of the appliance casing. Refer to Fig. 9,10.

Fix the flue adaptor in position with the clamping screw ensuring that it is correctly located against the stop. Refer to Fig. 5.

If a flue bend **(WR325 RSF may only use 45° bends)** is to be fitted directly to the top of the appliance then the flue adaptor is not required.

3.5. FLUE SUPPORT

Flue assembly lengths over 2000mm should be appropriately supported. Refer to Fig. 6 and Section 5.4.

3.6. FIRE STOP SPACER

The fire stop spacer is supplied with the flue kit. Refer to Fig. 7 and Section 5.3.

3.7. ROOF FLASHING

The roof flashing is not supplied. This is available, as a proprietary item (Selkirk Seldek® or similar) from the building suppliers to suit a flue size of 125mm diameter and to suit pitched and flat roofs.

Fig. 5. Adaptor

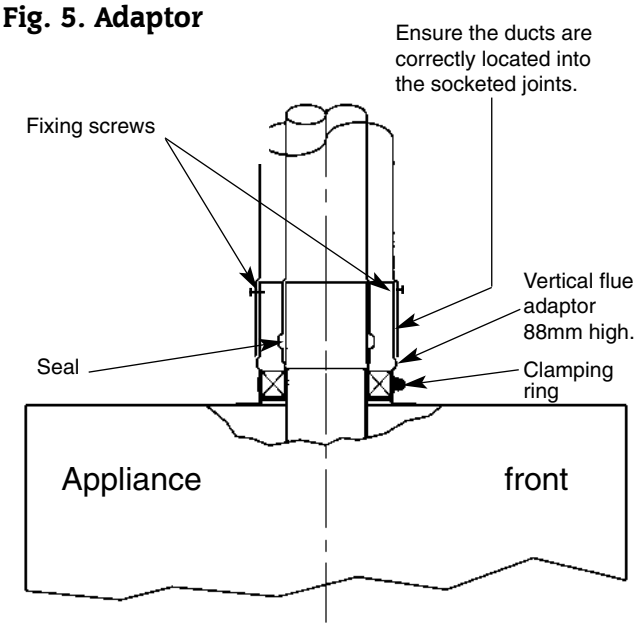


Fig. 6. Flue support - not supplied

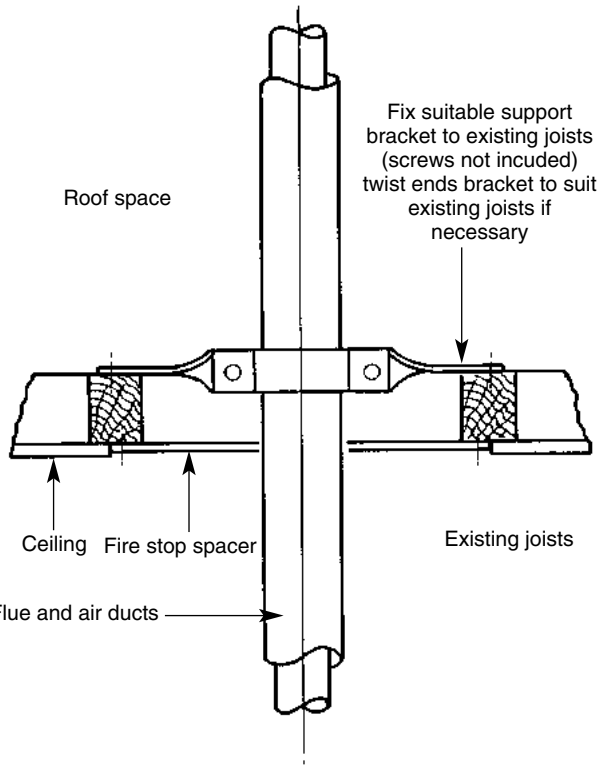
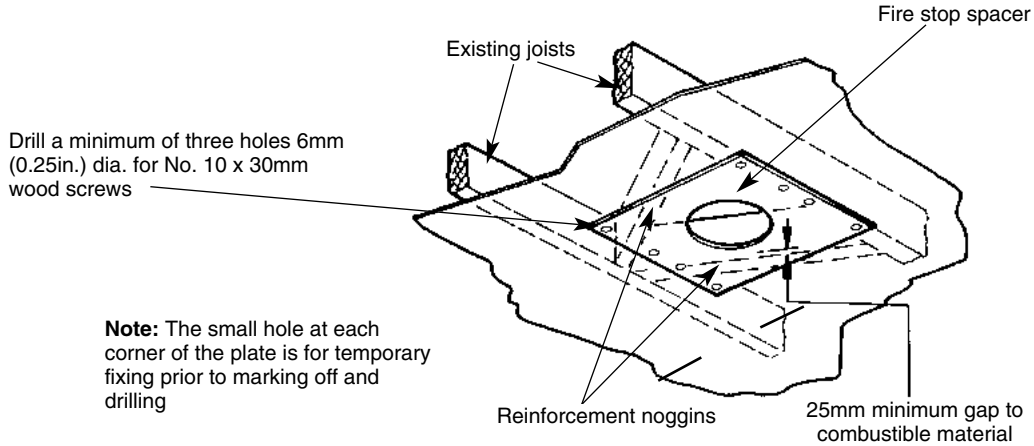


Fig. 7. Fire Stop Spacer



3.8. POSITIONING THE FLUE SYSTEM

It may be necessary to deviate from the following method of installation because of site conditions. However, joints must be sealed and fixed as described.

Align the centre of the flue spigot with the ceiling and mark the centre position. Refer to Fig. 8. Cut a hole 175mm (7in.) diameter in the ceiling.

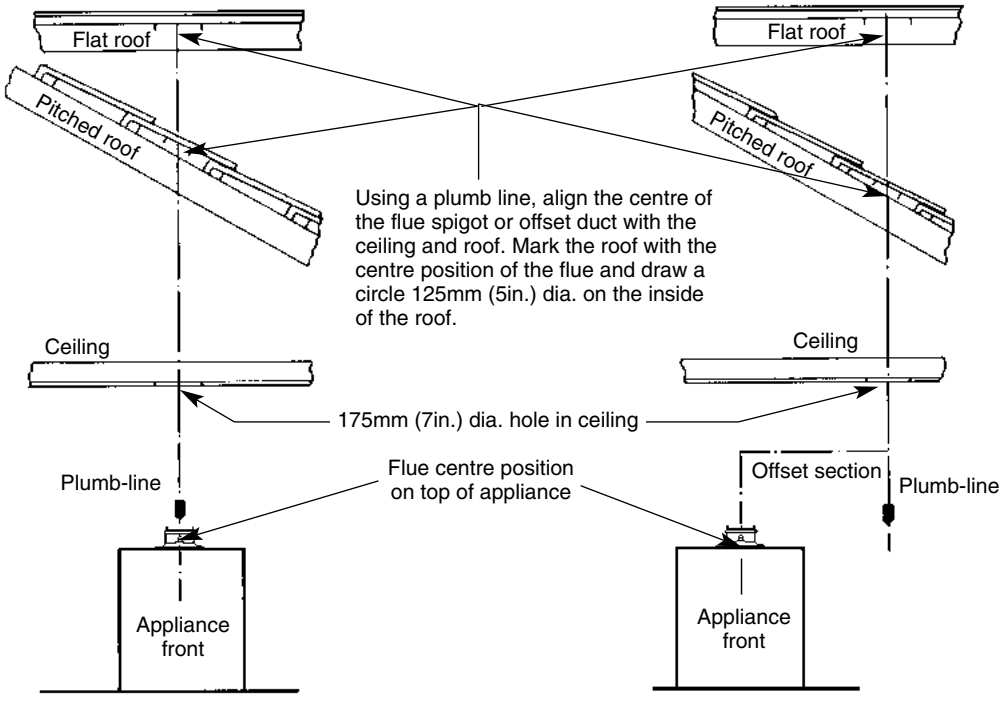
Working within the roof space repeat the procedure and mark the centre position of the flue on the inside surface of the roof.

Mark a 125mm diameter circle on the inside surface to represent the outside diameter of the flue. Refer to Fig. 8.

This procedure is the same for flat and pitched roofs.

Important: The terminal assembly must extend at least 300mm above the surface or pitch of the roof. The distance may vary depending upon the type of roof and surrounding structures. In these instructions the distance is refered to as dimension 'F'. Refer to Fig. 9.10.11.12.

Fig. 8. Marking out the flue assembly position.



Vertical Flue System (no offset)

Vertical Flue System (with an offset)

4. Measurement of Ducts

4.1 AIR AND FLUE DUCT LENGTHS - NO OFFSET

For a flat roof measure the distance from the appliance top panel to the outside edge of the hole diameter marked on the inside surface of the roof. This is dimension **'E¹'** Refer to Fig. 9.

For a pitched roof, measure the distance from the appliance top panel to the highest point of the hole diameter. This is dimension **'E²'**. Refer to Fig. 9.

Determine dimension **'F'** which must not be less than 300mm.

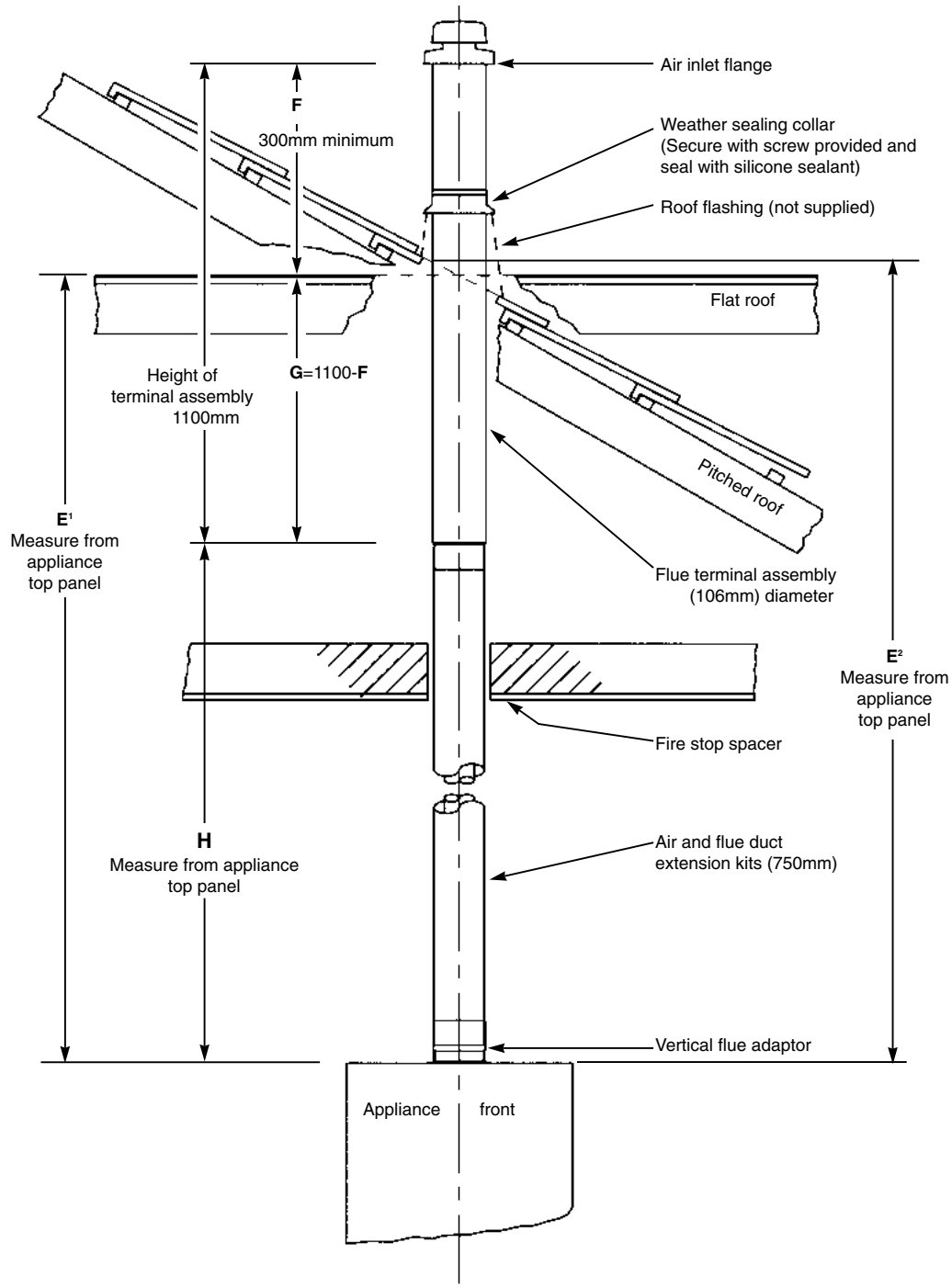
Duct Length = **H** — 92mm

Derivation: Dimension **G** = 1100 — **F**mm

Dimension **H** = **E** — **G**

Refer to 2.2 for maximum duct length.

Fig. 9. Vertical flue system (No offset)



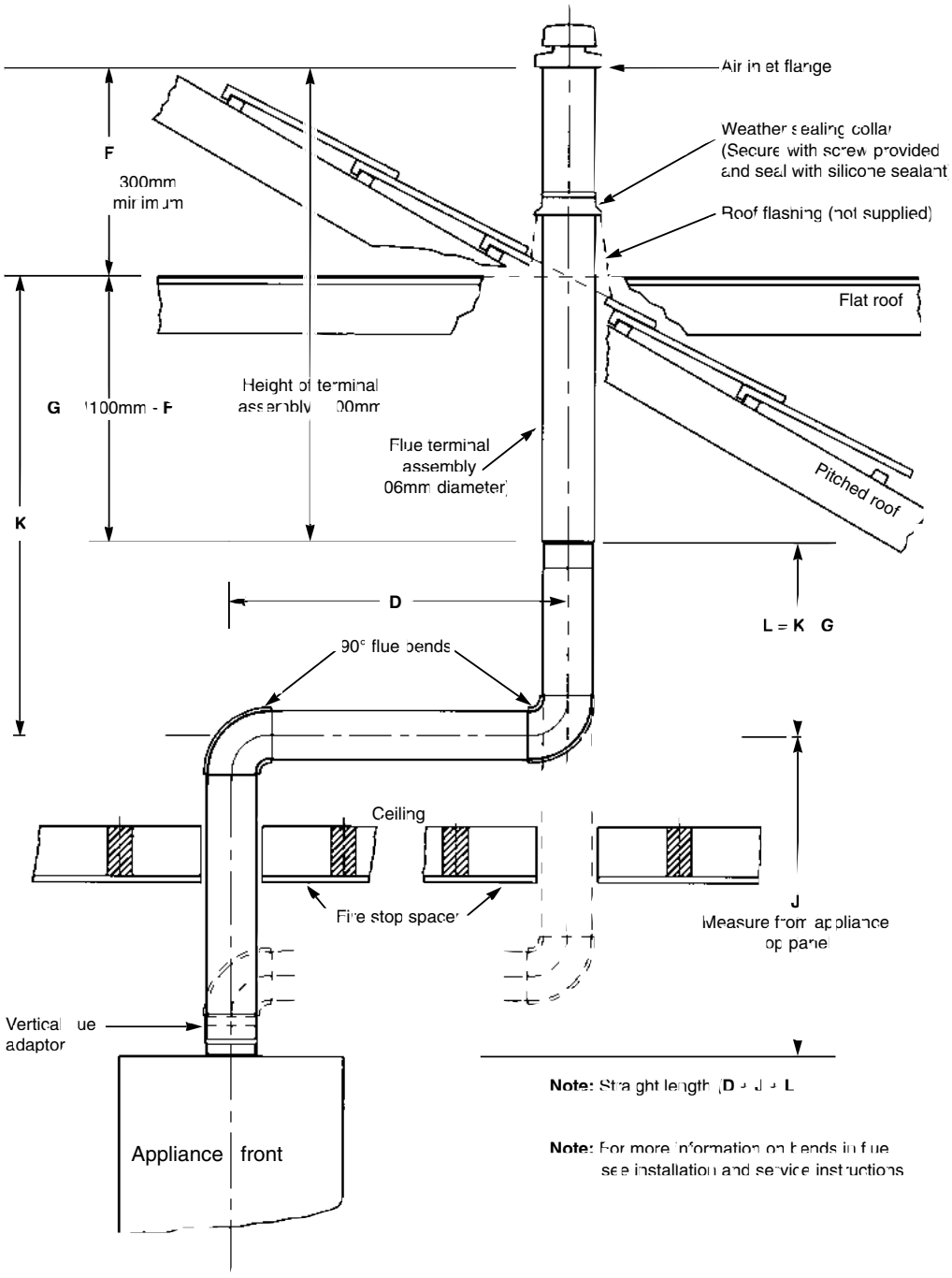
4.2 AIR AND FLUE DUCT LENGTHS - OFFSET WITH VERTICAL ADAPTER (90° or, where applicable, 45° bends)

1st Vertical Section:
Measure from the top of the flue spigot on the appliance to the centre-line of the horizontal section of the offset. Dimension **'J'**.
Refer to Fig. 10.
Duct Length = **J** — 173mm
Note: The air duct must not be less than 25mm.
If the elbow fits directly onto the spigot then **J** = 173mm.

Offset (Horizontal) Section:
Measure from the centre of the flue spigot on the appliance to the centre-line of the 2nd vertical section. Dimension **'D'**.
Refer to Fig. 10.
Duct Length = **D** — 162mm
Note: The dimension **D** must not be less than 210mm.

2nd Vertical Section:
Measure the distance from centre-line of the horizontal offset to the outside edge of the hole diameter marked on the inside surface of the roof. Dimension **'K'**. Refer to Fig. 7.
Note: Dimension **K**, for a pitched roof, must go to the highest point of the hole diameter.
Determine dimension **'F'**. Refer to Fig.1 and 7 for the limiting figure.
Duct Length = **L** — 81mm
Derivation: Dimension **G** = 1100 — **F**mm
Dimension **L** = **K** — **G**
Note: The air duct must not be less than 100mm.

Fig. 10. Vertical flue system offset with vertical adaptor (Not to be used with WR325 Water Heaters)



4.3 AIR AND FLUE DUCT LENGTHS - OFFSET WITHOUT VERTICAL ADAPTER (90° or, where applicable, 45° bends)

Measure the distance from the centre of the flue spigot on top of the appliance to the centre line of the vertical sections. Dimension **D.** Refer to Fig. 11,12.

Duct Length: 90° bends = **D** — 162mm

45° bends = (1.414 x **D**) — 60mm

Note: D must not be less than 210mm with 90° bends or 76mm with 45° bends.

Minimum length of air/flue duct is 48mm.

When 45° bends are used the equivalent overall height of that section is D + 60mm.

Vertical Section:

Measure the distance from the centre-line of the horizontal offset to the outside edge of the hole diameter marked on the inside surface of the roof. Dimension **'K'**. Refer to Fig. 6 and 7.

Note: Dimension K For a pitched roof must go to the highest point of the hole diameter.

Determine dimension **'F'** which must not be less than 300mm.

Duct Length = **L** — 81mm

Dimension **G** = 1100 — **F** mm

Dimension **L** = **K** — **G**

Fig. 11. Vertical flue system offset without vertical adaptor (Not to be used with WR325 Water Heaters)

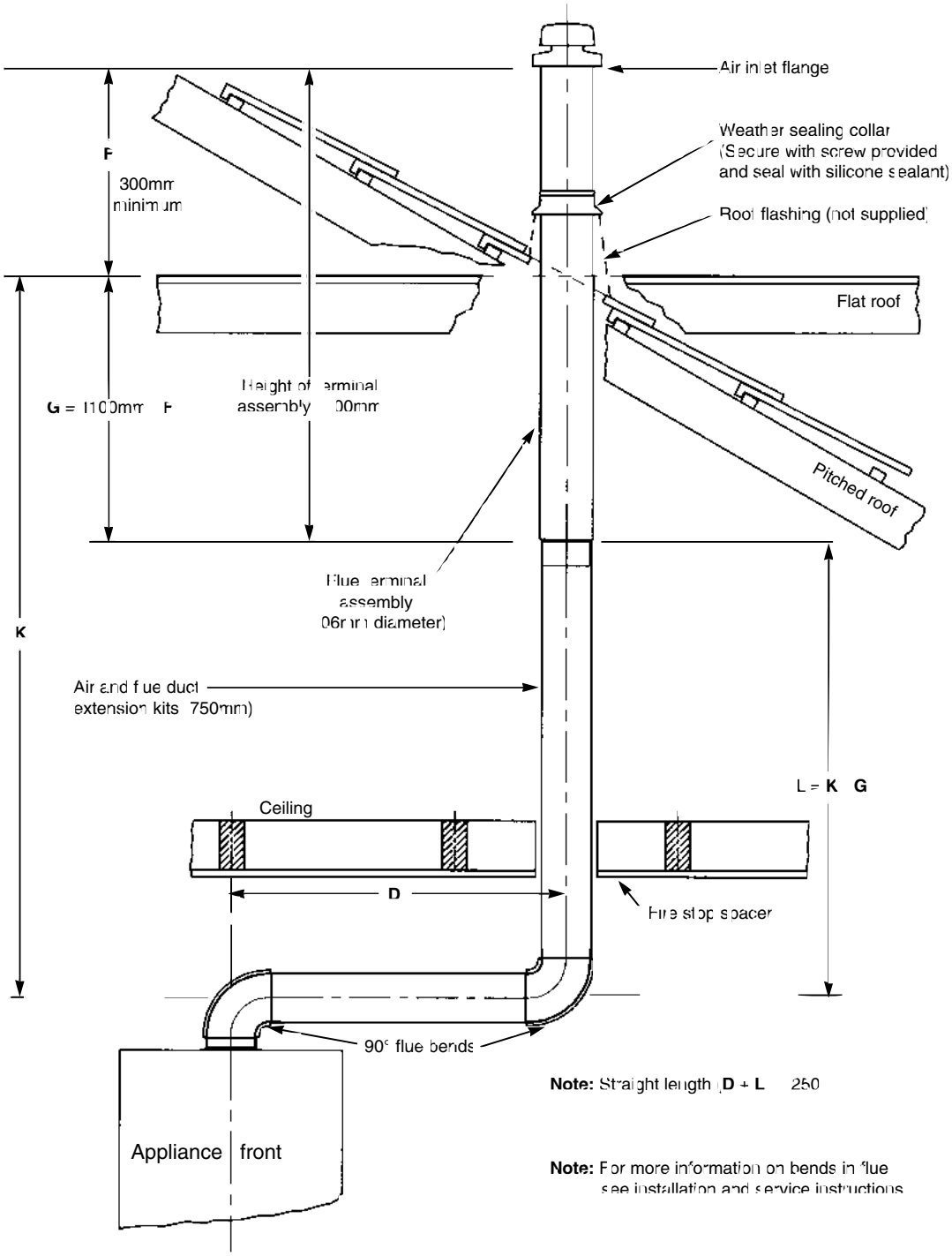
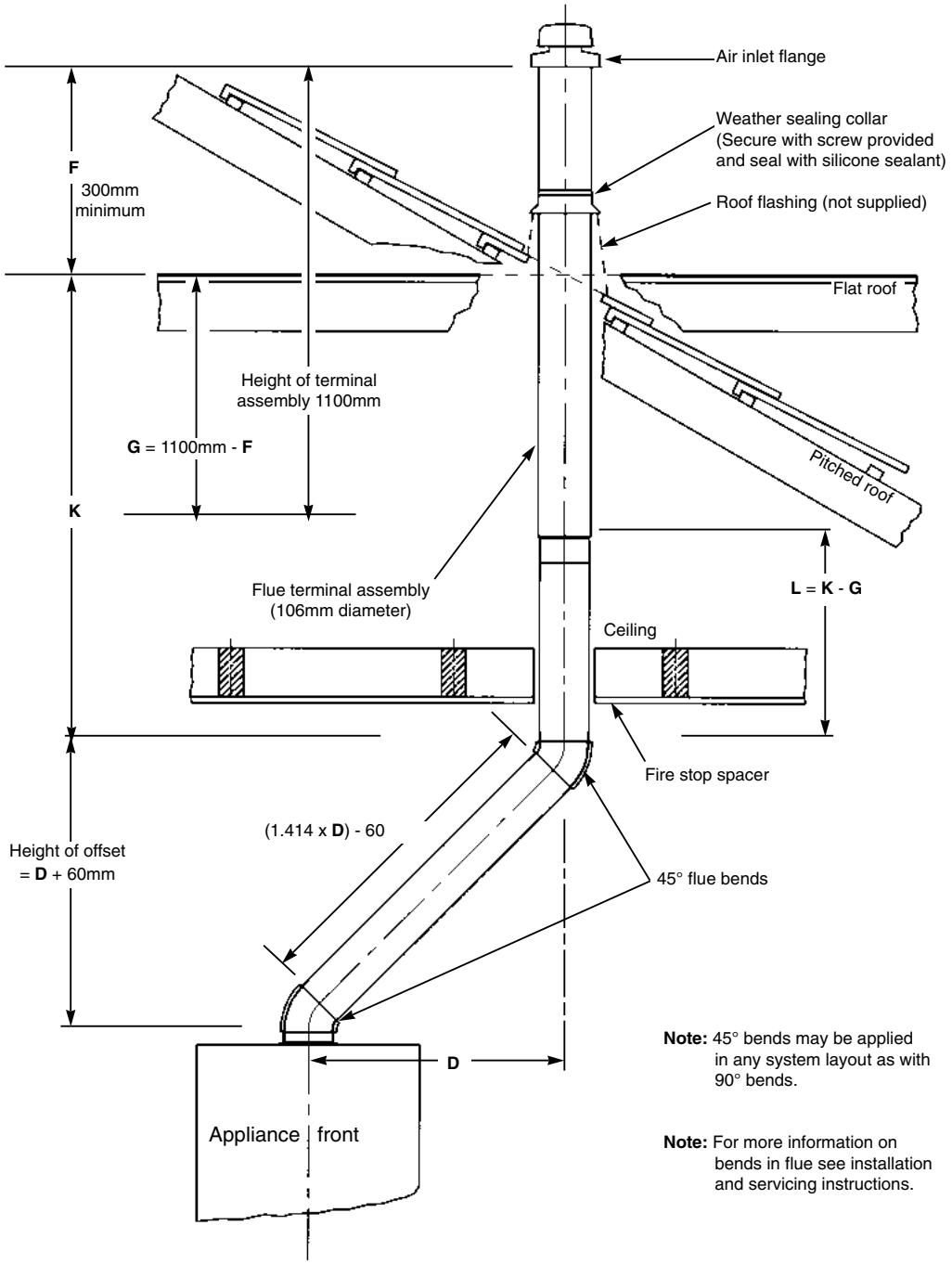


Fig. 12. Vertical flue system (offset with 45° flue bends)



5. Installation of Flue

5.1 It may be necessary to deviate from the following method of installation because of site conditions, however, the joints must be sealed and fixed as described.

5.2 CUT DUCTS

When measurements have been made and **checked**, cut the air and flue ducts to length ensuring that the cuts are square and free from burrs.

All dimensions refer to straight lengths and do not include the expanded ends. Do not cut the expanded ends unless specifically instructed to do so.

5.3 POSITION OF THE FIRE STOP SPACER ASSEMBLY

Fit the fire stop spacer centrally over the hole in the ceiling. Ensure the hole aligns with the flue spigot on top of the appliance casing.

Mark the four fixing hole positions in each half for No.10 x 30mm wood screws (not supplied) and fix either into the existing joists or into reinforcement noggins. Alternatively, the plate may be fixed to the ceiling using plasterboard toggle screws. Refer to Fig. 7.

5.4 POSITION OF THE FLUE DUCT SUPPORT BRACKET

From inside the roof space fit the support centrally over the hole in the ceiling. Ensure the hole aligns with the fire stop spacer and flue spigot on top of the appliance casing.

Mark and fix into position as previously described for the fire stop spacer. Refer to Fig. 6.

Remove the fire stop spacer and support bracket until the flue is assembled.

5.5 ASSEMBLY OF DUCTS

5.5.1 AIR DUCTS

Check the assembled length of the ducts. Drill two holes through the pilot holes in the expanded end of the air duct and fix the ducts together with the screws provided.

5.5.2 FLUE DUCTS

Fix the flue ducts together with screws provided ensuring that any extension ducts have the seals fitted. Refer to Fig. 8.

The 750mm extension kits come complete with one flue spacer. These must be fitted at about half distance, before the ducts are finally assembled.

Assemble the flue duct into the air duct.

5.6 FITTING FLUE AND AIR DUCTS ONTO AN ELBOW AT THE APPLIANCE

Fit the flue duct to the elbow ensuring that it is fully against the stop.

Drill two holes through the duct into the elbow. Separate and apply a smear of silicone sealant and fix with screws provided. Fit the air duct over the elbow entry and repeat the above process.

5.7 PREPARE THE ROOF

Remove sufficient roof tiles, or if a flat roof, cut a hole approximately 175mm diameter for the flue terminal assembly.

5.8 FIX THE FLUE SYSTEM ASSEMBLY TO THE APPLIANCE

From inside the building, assemble the flue system starting at the appliance. refer to Fig. 6, 8, 9 and 10.

Align the flue assembly or the first section of flue with the flue adapter fitted on top of the appliance casing. Drill two holes through the air duct and flue adapter and fix with the screws provided.

If an elbow is fitted straight onto the boiler then locate the elbow against the stop on the spigot on the boiler and fix with the clamp. Refer to Fig. 8, 9 and 10.

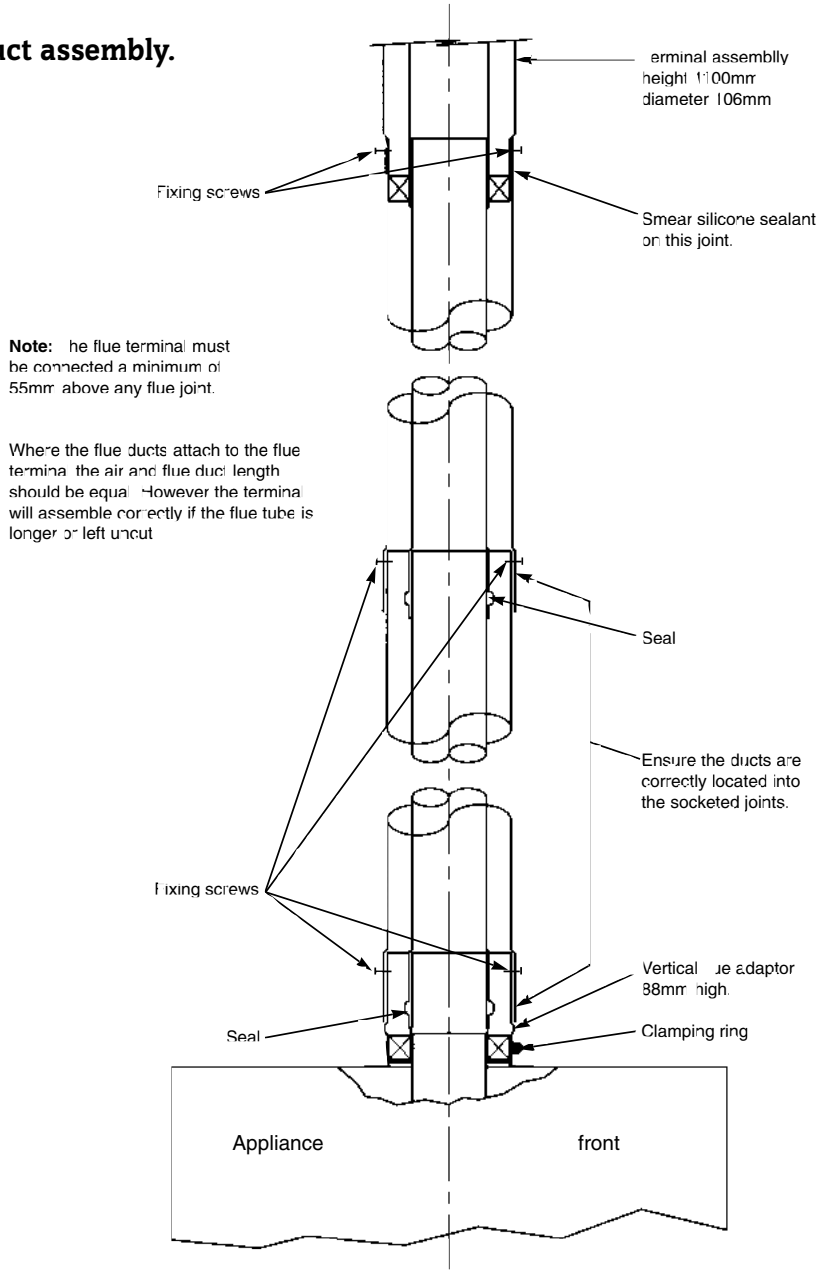
Note: All ducts must be truly horizontal or vertical unless the 45° elbows are being used.

Check at each stage of the system assembly that each section is properly aligned.

Each air and flue duct joint must be sealed and fixed. Each air and flue duct connection to an elbow must be sealed with silicone sealant and fixed with the screws provided.

Support any sections of the system until they are permanetely fixed into place using suitable support brackets.

Fig. 13. Typical duct assembly.



Important: Do not forget to fix the fire stop spacer as the assembly of the system proceeds.

5.9 FIX THE FLUE TERMINAL ASSEMBLY

Fit the roof flashing loosely to the roof.

From outside, pass the terminal assembly through the roof flashing.

From inside the roof space align the assembly with the air and flue ducts. If required, loosely fit the support bracket ensuring that the assembly is located correctly. Refer to Fig. 6.

Drill two holes through the holes in the air duct. Separate the assembly and apply silicone sealant to the outside of the air duct.

Re-connect the assembly and fix with the screws provided.

Note: The sealant and screws are not required for the flue duct. Refer to Fig. 13.

5.10 SEAL THE TERMINAL ASSEMBLY TO THE ROOF

From outside the building make good the roof structure and ensure the roof is weather sealed by fixing the roof flashing.

Apply sealant around the air duct at the top of the flashing.

Lower the weather-sealing collar over the roof flashing and tighten the self tapping screws provided and apply sealant around the top edge of the weather sealing collar.

Refer to Fig. 9, 10, 11,12.

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