## EcoShield range Flue Guide





#### **DOCUMENT CONTROL**

Article	Language	Version	Modified by
EcoShield flue guide	English	V1.3 June 2024	S Addis

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#### **GENERAL**

Lochinvar Water Heaters are certified for use on the following flue categories:

Installation type	Category	Description
B23	Open flue	An appliance intended to be connected to a flue that evacuates the products of combustion to the outside of the room containing the appliance. The combustion air is drawn directly from the room.
C13	Closed Flue	An appliance connected to either a concentric or twin-pipe flue system with a Horizontal flue terminal. Both the air inlet and flue exhaust must be in the same pressure zone.
C33	Closed Flue	An appliance connected to either a concentric or twin-pipe flue system with a Vertical flue terminal. Both the air inlet and flue exhaust must be in the same pressure zone.
C53	Closed Flue	An appliance connected to a twin-pipe flue system with a Horizontal or Vertical flue terminal. Both air inlet and flue exhaust may be in different pressure zones.
C63	Closed Flue	An appliance intended to be connected to a separately approved and marketed system for the supply of combustion air and discharge of combustion products (i.e. other than that supplied by the water heater manufacturer).

#### All installations should comply with the requirements of:

- 1. For appliances up to 70kW net input- BS5440-1:2023- Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases). Specification for installation of gas appliances to chimneys and for maintenance of chimneys.
  - a. Refer to drawing 1 and table 1 for details of terminal locations.
- 2. For appliances over 70kW net input- IGEM/UP/10 Edition 4 +A: 2016 Installation of flued gas appliances in industrial and commercial premises, specific attention should be paid to the following sections.
  - a. Refer to drawing 1 and table 1 for details of terminal locations.
  - b. Horizontal terminations shall be located according to the minimum distances given in table 1, and subject to the risk assessment criteria shown in table 2.
  - c. Horizontal flue terminations (other than for fan dilution systems) must not be installed for any single appliance or group of appliances with a total nett input exceeding 333kW net heat input.
  - d. For any single appliance or group of appliances with a total net heat input exceeding 333 kW, the general requirements of IGEM/UP/10 Edition 4 +A: 2016 shall apply and approval must be sought from the Local Authority prior to commencement of the installation.
- 3. The Clean Air Act for installations exceeding 333kW nett input.

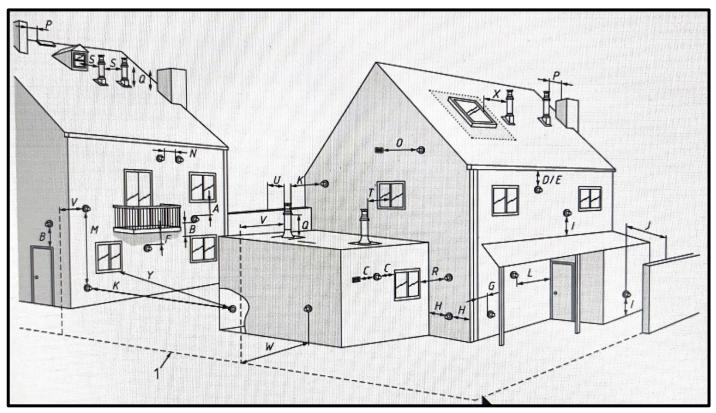


TABLE 1 WATER HEATER TERMINAL LOCATIONS ACOORDING TO BS5440-1-2023

Location	Description		SHW35-245CE	SHW46-325CE	SHW61-325CE
	Water heater nett input	kW	33.3	39.6	55.4
Α	Directly below an opening, air brick, opening windows etc.	mm	300	300	300
В	Above an opening, air brick, opening windows etc.	mm	300	300	300
С	Horizontally to an opening, air brick, opening windows etc.	mm	300	300	300
D	Below a gutter or sanitary pipework	mm	75	75	75
Е	Below the eaves	mm	300	300	300
F	Below a balcony or car port roof	mm	200	200	200
G	From a vertical drain or soil pipe	mm	150	150	150
Н	From an internal or external corner	mm	300	300	300
I	Above ground, roof or balcony level	mm	300	300	300
J	From a surface facing the terminal	mm	600	600	600
K	From a terminal facing the terminal	mm	1200	1200	1200
L	From an opening in the car port (e.g. door, window) into the dwelling	mm	1200	1200	1200
М	Vertically from a terminal on the same wall	mm	1500	1500	1500
N	Horizontally from a terminal on the same wall	mm	300	300	300
0	Horizontally from a mechanical air inlet on the same wall	mm	1000	1000	1000
Р	From a vertical structure on the roof	mm	N/A	N/A	N/A
Q	Above intersection with the roof	mm	300	300	300
R	Diagonally across from an opening into a building on a different wall	mm	600	600	600
S	Vertical terminal from another vertical terminal	mm	600	600	600
T	Vertical terminal adjacent to an opening into a building	mm	1500	1500	1500
U	Vertical terminal from a wall	mm	500	500	500
V	Terminal alongside a boundary	mm	300	300	300
W	Terminal facing a boundary	mm	600	600	600
Χ	Adjacent to an opening into a building on a pitched roof	mm	Contact Loc	chinvar technica	al support
Υ	Terminal facing an opening into a building	mm	2000	2000	2000

The table above should be used in conjunction with the following notes:

- The above should be read in conjunction with the latest edition of BS5440-1
- For Water Heater installation above 333kW nett input the table above should not be used, these installations are covered by the clean air act and must comply with its requirements in full, contact your local environmental health team for further guidance

For further guidance please contact Lochinvar Technical support

Environmental Health officer for assistance and/or approval

No.	Regarding the flue position	No	Yes
1	Will the flue terminal contravene the positions set out in table C.1 for room sealed chimney outlets?	No	Yes
2	Will the terminal be sited in a position that will likely allow products of combustion to build up (e.g. enclosed by adjacent structures)?	No	Yes
3	Is the termination in a light well?	No	Yes
4	Is the termination within a carport without two unobstructed sides?	No	Yes
5	Will the termination be in an area that might have combustible material in the vicinity?	No	Yes
6	Will the termination be in an area that might have hazardous material in the vicinity (e.g. petrochemicals)?	No	Yes
7	Will the termination be sited within a covered walkway?	No	Yes
8	Are there any restrictions stopping the fitting of a terminal guard if required?	No	Yes
9	Will the termination discharge over a boundary?	No	Yes
10	Is a plume management kit required to circumvent the termination distances as required in table C.1?	No	Yes
No.	Nuisance considerations	No	Yes
11	Is the termination sited over a pathway that is likely to cause nuisance (e.g. head height or pluming towards users)?	No	Yes
12	Is the termination likely to cause a nuisance to neighbours?	No	Yes
12 <b>No.</b>	Is the termination likely to cause a nuisance to neighbours?  Chimney/flue routes	No No	
			Yes Yes Yes
	Chimney/flue routes	No	Yes
	Chimney/flue routes  Will the flue be installed in a void that will not be able to satisfy a full visual inspection?	No No	Yes
	Chimney/flue routes  Will the flue be installed in a void that will not be able to satisfy a full visual inspection?  Are there any restrictions that will prevent the flue from being supported throughout its entire length?	No No	Yes Yes
	Chimney/flue routes  Will the flue be installed in a void that will not be able to satisfy a full visual inspection?  Are there any restrictions that will prevent the flue from being supported throughout its entire length?  Do the flue materials contravene building regulations(e.g. high risk buildings)?	No No No	Yes Yes Yes
	Chimney/flue routes  Will the flue be installed in a void that will not be able to satisfy a full visual inspection?  Are there any restrictions that will prevent the flue from being supported throughout its entire length?  Do the flue materials contravene building regulations(e.g. high risk buildings)?  Will the flue route pass though any fire protected areas without the ability to maintain its protection?	No No No No	Yes Yes Yes Yes

DRAWING 2 WATER HEATER TERMINAL LOCATIONS ACCORDING TO IGEM UP10

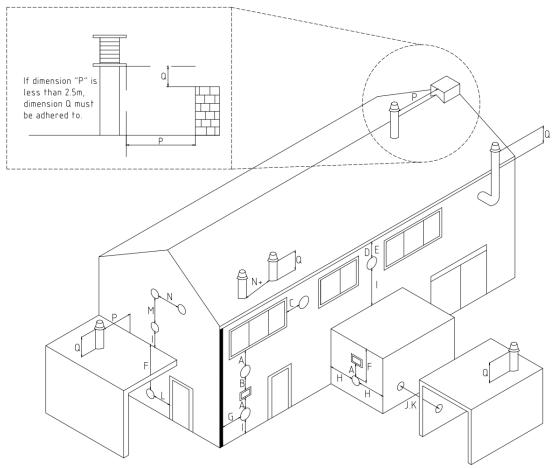


Table 3 Water Heater terminal locations according to IGEM UP10  $\,$ 

Location	Description	SHW86-410CE	SHW116-410CE	SHW146-410CE
Α	Directly below an opening, air brick, opening windows etc.	2000	2000	2000
В	Above an opening, air brick, opening windows etc.	1000	1000	1000
С	Horizontally to an opening, air brick, opening windows etc.	1000	1000	1000
D	Below a gutter or sanitary pipework	75	75	75
Е	Below the eaves	200	200	200
F	Below a balcony or car port roof	200	200	200
G	From a vertical drain or soil pipe	150	150	150
Н	From an internal or external corner	300	300	300
I	Above ground, roof or balcony level	300	300	300
J	From a surface facing the terminal	1000	1000	1000
K	From a terminal facing the terminal	2000	2000	2000
L	From an opening in the car port (e.g. door, window) into the dwelling	1200	1200	1200
М	Vertically from a terminal on the same wall	1500	1500	1500
N	Horizontally from a terminal on the same wall	600	600	600
N+	Vertically from a terminal on the same roof	600	600	600
Р	From a vertical structure on the roof	300	300	300
Q	Above intersection with the roof	300	300	300

The table above should be used in conjunction with the following notes:

- The above should be read in conjunction with the latest edition of IGEM UP10
- For Water Heater installation above 333kW nett input the table above should not be used, these installations are covered by the clean air act and must comply with its requirements in full, contact your local environmental health team for further guidance

For further guidance please contact Lochinvar Technical support

TABLE 4 RISK ASSESMENT ACCORDING TO IGEM UP10

#### The table below is an excerpt from IGEMUP10 and should be used in conjunction with that document

Further to the requirements in IGEM/UP/10 Edition 4 +A: 2016 Section 8 under clause 8.7.3.3 and Figure 7 the following risk assessment gives guidance for the positioning of horizontal flues. This form should be completed before work commences and undertaken by a person who is competent to undertake the risk assessment.

Type C applia	ances with net heat input exceeding 70 kW and not exceeding 333 kW low level flue discharge heat input for groups of appliances)	ge risk assessme	nt (including net
No.	Regarding the flue position	No	Yes
1	Is the proposed flue termination within the distance in Figure K of a road, path, track, thoroughfare, walkway, property boundary or area, which is used for general public access other than for maintenance purposes?	No	Yes
2	Is the proposed flue termination within the distance in Figure K to a playground, school, yard, seating area, or area where there may be a public gathering	No	Yes
3	If the proposed flue termination enclosed on more than two sides then does it comply with the requirements of Figure 11B?	No	Yes
4	Is the proposed flue termination within the distance in Figure K of a surface or building element that may be affected by corrosion or deterioration from plume condensate?	No	Yes
5	Is the proposed flue position in an area where vehicles could be parked within distances from Figure 12 Line G to the flue?	No	Yes
6	Are there shrubs or trees within minimum distances shown on Figure K of the proposed terminal position?	No	Yes
7	Is the proposed flue termination within a light well?	No	Yes
8	Are the products of combustion from the proposed flue position likely to build up under unfavourable atmospheric conditions, due to poor cross flow of air caused by enclosures or adjacent structures and/or likely to cause nuisance?	No	Yes
9	Is the flue termination position likely to cause a nuisance to adjoining properties?	No	Yes
Build	ding Regulations part J		
10	Is the proposed flue termination less than 300 mm from the boundary of the property, as measured from the side of the terminal to the boundary?	No	Yes
Rega	arding the Clean Air Act		
11	Is the total output of the individual, or group of flue terminals (if within 5U (see A3.7)), greater than 333 kW net heat input?	No	Yes
Gene	eral		
12	Are there any other considerations that are required for this risk assessment, see separate sheet.	No	Yes
13	Comments:		
	are Dive then the flue position should be suitable		

If all answers are Blue then the flue position should be suitable

If any answer is Orange then the flue position is unsuitable, consider revising the position or type of flue outlet or contact the local Environmental Health officer for assistance and/or approval

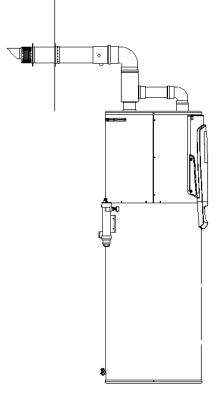
#### CONCENTRIC FLUE SYSTEMS

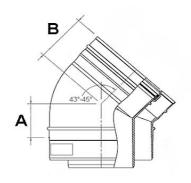
#### CONCENTRIC HORIZONTAL SYSTEMS

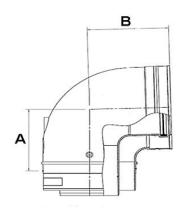
SHHF003 <b>CONCENTRIC HORIZONTAL FLUE ASSEMBLY</b> MODELS - SHW35-245,SHW46-325,SHW61-325			
COMPONE	NTS INCLUDED		
Item No.	Description	Included	
M75256	AIR INLET TRANSITION Ø80mm S/S	1	
M121602	TRANSITION PIECE - CUTABLE	1	
M84471	SAMPLING POINT Ø80/125mm PP	1	
LV310735	CONCENTRIC BEND 90° Ø80/125mm PP	1	
LV310757	CONCENTRIC HORIZONTAL TERMINAL - Ø80/125mm PP	1	

Maximum Flue Lengths
Maximum equivalent flue length = 30 Metres
Reduction for each 90 bend = 1 Metre, Reduction for each 45 bend = 0.5 Metre

Additional Flue Ancillary Items			
Item No.	Description		
LV310740	CONCENTRIC EXTENSION - Ø80/125mm PP FIXED 250mm		
LV310745	CONCENTRIC EXTENSION - Ø80/125mm PP 500mm		
LV310742	CONCENTRIC EXTENSION - Ø80/125mm PP FIXED 1000mm		
LV310743	CONCENTRIC EXTENSION - Ø80/125mm PP FIXED 2000mm		
LV310744	CONCENTRIC EXTENSION - Ø80/125mm PP TELESCOPIC		
LV310734	CONCENTRIC BEND 45° Ø80/125mm PP (A=45mm B=62.5mm)		
LV310735	CONCENTRIC BEND 90° Ø80/125mm PP (A=95mm B=110mm)		
M84481	WALL CLAMP Ø125mm		







## SHHF004 **CONCENTRIC HORIZONTAL FLUE ASSEMBLY**MODELS - SHW86-410,SHW116-410,SHW146-410

COMPONENTS INCLUDED			
Item No.	Description	Included	
M75257	AIR INLET TRANSITION Ø100mm S/S	1	
M121605	TRANSITION PIECE	1	
M84421	SAMPLING POINT Ø100/150mm PP	1	
M84412	CONCENTRIC BEND 90° Ø100/150mm PP	1	
LV310758	CONCENTRIC HORIZONTAL TERMINAL Ø100/150mm PP	1	

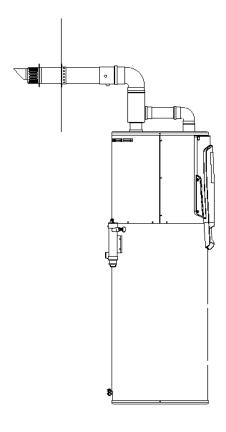
Maxi	mum	Flue	Leng	ths

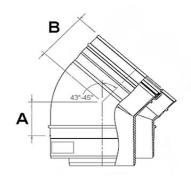
Maximum equivalent flue length = 30 Metres for models SHW86-410, SHW116-410

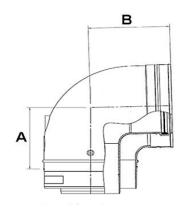
Maximum equivalent flue length = 13 Metres for models SHW146-410

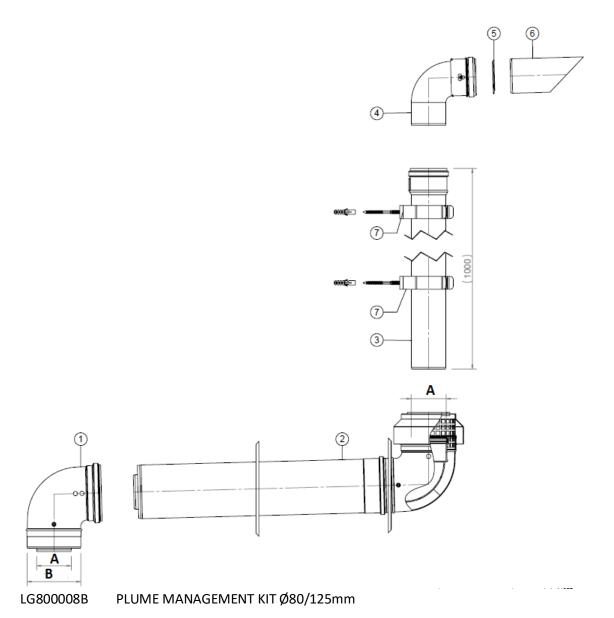
Reduction for each 90 bend = 1 Metre, Reduction for each 45 bend = 0.5 Metre

Additional Flue Ancillary Items			
Item No.	Description		
M84405	CONCENTRIC EXTENSION Ø100/150mm PP CUT TO LENGTH 500mm		
M84402	CONCENTRIC EXTENSION Ø100/150mm PP FIXED 1000mm		
M84412	CONCENTRIC BEND 90° Ø100/150mm PP (A=223mm B=208mm)		
M84413	CONCENTRIC BEND 45° Ø100/150mm PP (A=128mm B=128mm)		
M84421	SAMPLING POINT Ø100/150mm PP		
M87196	WALL CLAMP Ø150mm		









No	Description	All models	
1	CONCENTRIC BEND 90°-PP	Ø80/125mm	
2	CONCENTRIC HORIZONTAL PLUME KIT TERMINAL -PP	Ø80/125mm	
3	EXTENSION -PP CUTABLE (1000mm)	Ø80mm	
4	BEND 90°-PP	Ø80mm	
5	PLUME KIT BIRD GUARD	Ø80mm	
6	PLUME KIT FLUE EXIT-PP	Ø80mm	
7	WALL CLAMP	Ø80mm	
Α	INTERNAL DIAMETER	Ø80mm	
В	EXTERNAL DIAMETER	Ø125mm	



The plume kit <u>must not be used</u> to correct an illegal terminal location



The plume kit can only be used as supplied, further extensions are not permitted

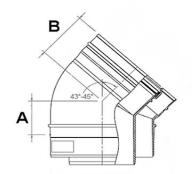
#### CONCENTRIC FLUE SYSTEMS

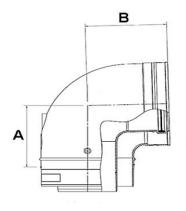
#### CONCENTRIC VERTICAL SYSTEMS

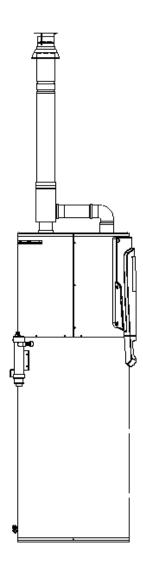
SHVF003 <b>CONCENTRIC VERTICAL FLUE ASSEMBLY</b> MODELS - SHW35-245,SHW46-325,SHW61-325			
COMPONE	COMPONENTS INCLUDED		
Item No.	Description	Included	
M75256	AIR INLET TRANSITION Ø80mm S/S	1	
M121602	TRANSITION PIECE	1	
M84471	SAMPLING POINT Ø80/125mm PP	1	
LV310753	CONCENTRIC VERTICAL TERMINAL - Ø80/125mm PP	1	

# Maximum Flue Lengths Maximum equivalent flue length = 30 Metres Reduction for each 90 bend = 1 Metre, Reduction for each 45 bend = 0.5 Metre

Additional Fl	onal Flue Ancillary Items		
Item No.	Description		
LV310740	CONCENTRIC EXTENSION - Ø80/125mm PP FIXED 250mm		
LV310745	CONCENTRIC EXTENSION - Ø80/125mm PP 500mm		
LV310742	CONCENTRIC EXTENSION - Ø80/125mm PP FIXED 1000mm		
LV310743	CONCENTRIC EXTENSION - Ø80/125mm PP FIXED 2000mm		
LV310744	CONCENTRIC EXTENSION - Ø80/125mm PP TELESCOPIC		
LV310734	CONCENTRIC BEND 45° Ø80/125mm PP (A=45mm B=62.5mm)  CONCENTRIC BEND 90° Ø80/125mm PP (A=95 B=110mm)  WALL CLAMP Ø125mm		
LV310735			
M84481			







	SHVF004 <b>CONCENTRIC VERTICAL FLUE ASSEMBLY</b> MODELS - SHW86-410,SHW116-410,SHW146-410	
COMPONE	NTS INCLUDED	
Item No.	Description	Included
M75257	AIR INLET TRANSITION Ø100mm S/S	1
M121605	TRANSITION PIECE - CUTABLE	1
M84421	SAMPLING POINT Ø100/150mm PP	1
LV310754	CONCENTRIC VERTICAL TERMINAL Ø100/150mm PP	1

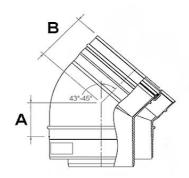
#### **Maximum Flue Lengths**

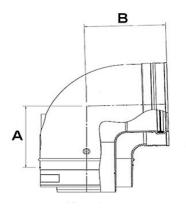
Maximum equivalent flue length = 30 Metres for models SHW86-410, SHW116-410

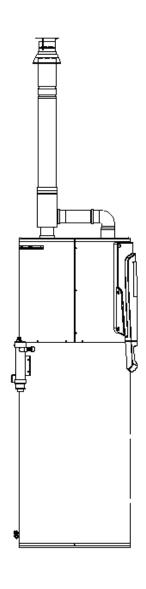
Maximum equivalent flue length = 13 Metres for models SHW146-410

Reduction for each 90 bend = 1 Metre, Reduction for each 45 bend = 0.5 Metre

Additional Flue Ancillary Items		
Item No.	Description	
M84405	CONCENTRIC EXTENSION Ø100/150mm Cuttable 500mm	
M84402	CONCENTRIC EXTENSION Ø100/150mm PP FIXED 1000mm	
M84412	CONCENTRIC BEND 90° Ø100/150mm PP (A=223mm B=208mm)	
M84413	CONCENTRIC BEND 45° Ø100/150mm PP (A=128mm B=128mm)	
LV306017	SLOPING ROOF FLASHING Ø100/150mm LEAD	
LV302509	FLAT ROOF FLASHING ALU  WALL CLAMP	
M87196		

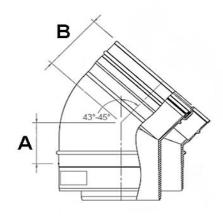






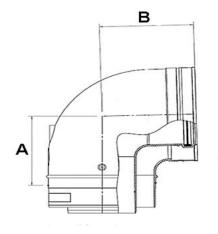
#### TWIN-PIPE FLUE SYSTEMS

SHTF003 <b>TWIN PIPE FLUE ASSEMBLY</b> MODELS - SHW35-245,SHW46-325,SHW61-325			
COMPONE	NTS REQUIRED TO START INSTALLATION		
Item No.	Description	Included	
M75256	AIR INLET TRANSITION Ø80mm S/S	1	
M85279	SAMPLING POINT Ø80mm	1	
VERTICAL FLUE			
LV310753	CONCENTRIC VERTICAL TERMINAL - Ø80/125mm PP		
LV305016	HORIZONTAL AIR INLET Ø80mm		
HORIZONT	AL FLUE		
LV310757	CONCENTRIC HORIZONTAL TERMINAL - Ø80/125mm PP		
LV305016	LV305016 HORIZONTAL AIR INLET Ø80mm		
M28925	TERMINAL WALL PLATES		

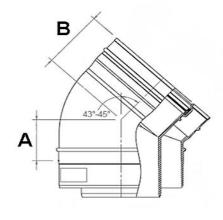


Maximum Flue Lengths			
Maximum equivalent flue length = 60 Metres			
	Reduction for each 90 bend = 1 Metre, Reduction for each 45 bend = 0.5 Metre		

Additional Flue A	Ancillary Items
Item No.	Description
LV310718	EXTENSION - Ø80mm PP 250mm
M85271	EXTENSION Ø80mm PP 500mm
M85272	EXTENSION Ø80mm PP 1000mm
LV310721	EXTENSION - Ø80mm (2000mm) PP 2000mm
LV310722	EXTENSION - Ø80mm PP TELESCOPIC 500mm
M85292	BEND 45° Ø80mm PP (A=72.5mm B=72.5mm)
M85291	BEND 90° Ø80mm PP (A=80mm B=100mm)
M87191	WALL CLAMP Ø80mm
LV302520	FLAT ROOF FLASHING Ø140mm ALU



SHTF004 <b>TWIN PIPE FLUE ASSEMBLY</b> MODELS - SHW86-410,SHW116-410,SHW146-410			
COMPONE	COMPONENTS REQUIRED TO START INSTALLATION		
Item No.	Description	Included	
M75257	AIR INLET TRANSITION Ø100mm S/S	1	
M85189	SAMPLING POINT - 100mm	1	
VERTICAL FLUE			
LV310754	CONCENTRIC VERTICAL TERMINAL Ø100/150mm PP		
LV305039	HORIZONTAL AIR INLET Ø100mm ALU		
HORIZONTAL FLUE			
LV310758	CONCENTRIC HORIZONTAL TERMINAL Ø100/150mm PP		
LV305039	HORIZONTAL AIR INLET Ø100mm ALU		
M28925	TERMINAL WALL PLATES		

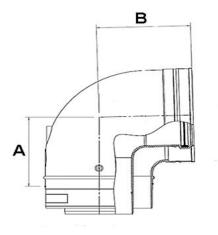


### Maximum Flue Lengths

Maximum equivalent flue length = 60 Metres

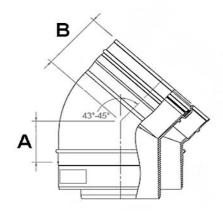
Reduction for each 90 bend = 1 Metre, Reduction for each 45 bend = 0.5 Metre

Additional Flue Ancillary Items		
Item No. Description		
M85176	EXTENSION Ø100mm PP 500mm	
M85177	EXTENSION Ø100mm PP 1000mm	
M85181	BEND 90° Ø100mm PP (A=115mm B=115mm)	
M85182	BEND 45° Ø100mm PP (A=78mm B=65mm)	
M87193	WALL CLAMP Ø100mm	



#### CONVENTIONAL FLUE SYSTEMS

SHCF003 CONVENTIONAL FLUE ASSESMBLY MODELS - SHW35-245,SHW46-325,SHW61-325 COMPONENTS REQUIRED TO START INSTALLATION		
Item No.	Description	Included
M75256	AIR INLET TRANSITION Ø80mm S/S	1
M85279	SAMPLING POINT Ø80mm	1
M73039	M73039 APPLIANCE AIR INLET GUARD Ø80mm ALU	
VERTICAL FLUE		
LV310753	CONCENTRIC VERTICAL TERMINAL - Ø80/125mm PP	
HORIZONTAL FLUE		
LV310757	CONCENTRIC HORIZONTAL TERMINAL - Ø80/125mm PP	
M28925	TERMINAL WALL PLATES	

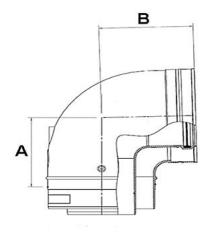


Maximum Flue Lengths

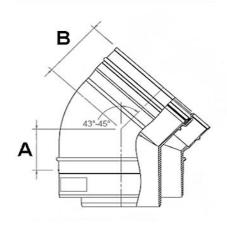
Maximum equivalent flue length = 60 Metres

Reduction for each 90 bend = 1 Metre, Reduction for each 45 bend = 0.5 Metre

Additional Flue Ancillary Items		
Item No.	Description	
LV310718	EXTENSION - Ø80mm PP 250mm	
M85271	EXTENSION Ø80mm PP 500mm	
M85272	EXTENSION Ø80mm PP 1000mm	
LV310721	EXTENSION - Ø80mm PP 2000mm	
LV310722	EXTENSION - Ø80mm PP TELESCOPIC 500mm	
M85292	BEND 45° Ø80mm PP (A=72.5mm B=72.5mm)	
M85291	BEND 90° Ø80mm PP (A=80mm B=100mm)	
M87191	WALL CLAMP Ø80mm	
LV302520	FLAT ROOF FLASHING Ø140mm ALU	

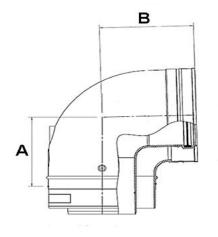


SHCF004 <b>CONVENTIONAL FLUE ASSEMBLY</b> MODELS - SHW86-410,SHW116-410,SHW146-410						
COMPONE	COMPONENTS REQUIRED TO START INSTALLATION					
		Include				
Item No.	Description	d				
M75257	AIR INLET TRANSITION Ø100mm S/S	1				
M85189	SAMPLING POINT - 100mm	1				
M86787	APPLIANCE AIR INLET GUARD Ø100mm	1				
VERTICAL FLUE						
LV31075 4	CONCENTRIC VERTICAL TERMINAL Ø100/150mm PP					
HORIZONTAL FLUE						
LV31075 8	CONCENTRIC HORIZONTAL TERMINAL Ø100/150mm PP					



Maximum Flue Lengths		
Maximum equivalent flue length = 60 Metres		
Reduction for each 90 bend = 1 Metre, Reduction for each 45 bend = 0.5 Metre		

Additional Flue Ancillary Items		
Item No.	Description	
M85176	EXTENSION Ø100mm PP 500mm	
M85177	EXTENSION Ø100mm PP 1000mm	
M85181	BEND 90° Ø100mm PP (A=115mm B=115mm)	
M85182	BEND 45° Ø100mm PP (A=78mm B=65mm)	
M87193	WALL CLAMP Ø100mm	



#### ORDER FORM AND NOTES

Notes-Items to Order				
Item No	No Required	Notes		

Contact Lochinvar customer service to order additional flue items on 01295 269981

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