

EcoForce Water Heater range Flue Guide



Models covered:

EF80
EF100
EF120

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GENERAL

Lochinvar Ecoforce 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.
C43	Closed Flue	An appliance connected to a common air inlet and flue exhaust system, which is designed for more than one appliance. This common system has a single air inlet and flue exhaust and is part of the building not the appliance.
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).
C83	Closed Flue	An appliance connected via one of its ducts to a single or common duct system. This duct system consists of a single natural draught duct (i.e. not incorporating a fan) that evacuates the products of combustion. The appliance is connected via a second of its ducts to a terminal, which supplies air to the appliance from outside the building.

All installations should comply with the requirements of:

1. For appliances up to 70kW net input- BS5440-1:2008- 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.

DRAWING 1 WATER HEATER TERMINAL LOCATIONS

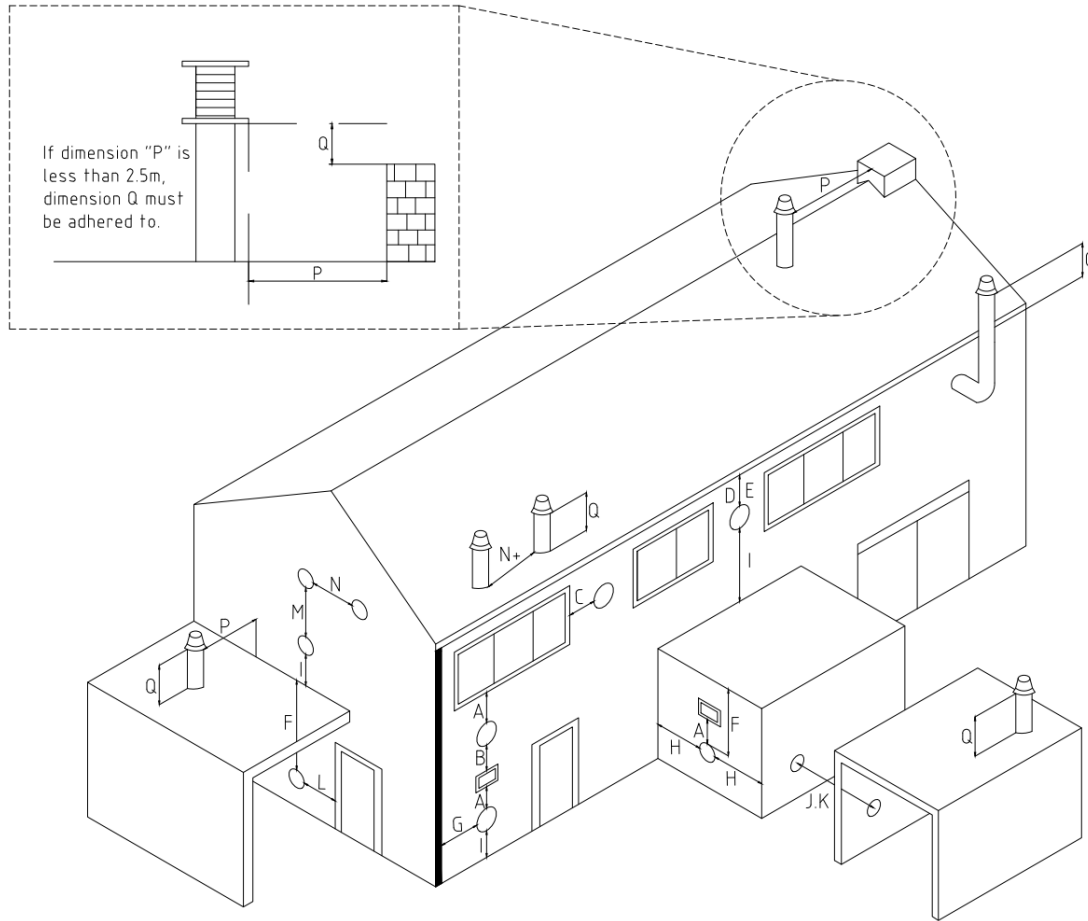


TABLE 1 WATER HEATER TERMINAL LOCATIONS

Location	Description	EF80 – EF180
A	Directly below an opening, air brick, opening windows etc.	2000
B	Above an opening, air brick, opening windows etc.	960
C	Horizontally to an opening, air brick, opening windows etc.	960
D	Below a gutter or sanitary pipework	75
E	Below the eaves	200
F	Below a balcony or car port roof	200
G	From a vertical drain or soil pipe	144
H	From an internal or external corner	300
I	Above ground, roof or balcony level	300*
J	From a surface facing the terminal	960
K	From a terminal facing the terminal	2000
L	From an opening in the car port (e.g. door, window) into the dwelling	1160
M	Vertically from a terminal on the same wall	1440
N	Horizontally from a terminal on the same wall	577
P	From a vertical structure on the roof	300
Q	Above intersection with the roof	300

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

- Distances shown ensure the water heater will operate without problems under most conditions, these distances can be reduced in certain circumstances
- The above should be read in conjunction with the latest edition of BS5440-1 and IGEN 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

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 appliances with net heat input exceeding 70 kW and not exceeding 333 kW low level flue discharge risk assessment (including net heat input for groups of appliances)			
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
Building 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
Regarding 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
General			
12	Are there any other considerations that are required for this risk assessment, see separate sheet.	No	Yes
13	Comments:		
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			

Model Number		EF80	EF100	EF120	EF150	EF180
FLUE DATA TYPE B₂₃						
Nominal flue diameter	mm	80	100		130	
Maximum flue gas temp	°C	120				
Flue gas temperature	°C	85 - 95				
Flue draught requirements	mba r	-0.03 to -0.1				
Available pressure for the flue system	Pa	200				
Maximum flue gas volume	g/s	6.52 to 38.6	7.69 to 47.9	11.6 to 57.7	15.2 to 71.7	20.1 to 86.2
FLUE DATA TYPE C₁₃ & C₃₃						
Nominal flue diameter	mm	80/125	100/150			
Maximum flue gas temp	°C	120				
FLUE DATA TYPE C₄₃ & C₅₃						
Nominal flue diameter	mm	80	100		130	
Maximum flue gas temp	°C	120				

CONCENTRIC FLUE SYSTEMS

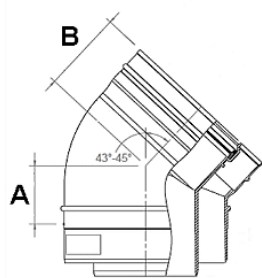
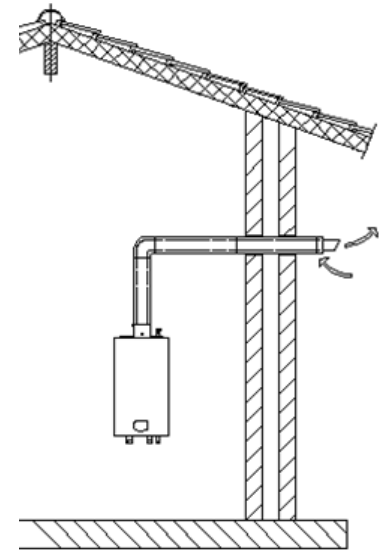
HORIZONTAL TYPE C13

EFHF002 CONCENTRIC HORIZONTAL FLUE ASSEMBLY MODELS - EF80			
Item No	Description	Included	EF80
LV310757	CONCENTRIC HORIZONTAL TERMINAL - Ø80/125mm PP	1	80.1
LV310735	CONCENTRIC BEND 90° Ø80/125mm PP	1	28.7
Maximum resistance in the flue system ≤200pa		Total	108.8

Additional Flue Ancillary Items		
Item No.	Description	Dimensions
LV310742	CONCENTRIC EXTENSION - Ø80/125mm PP FIXED	1000mm
LV310745	CONCENTRIC EXTENSION - Ø80/125mm PP	500mm
LV310734	CONCENTRIC BEND 45° Ø80/125mm PP	-
M84481	WALL CLAMP	125mm
M84472	CONDENSATE DRAIN PP 80/125mm	-

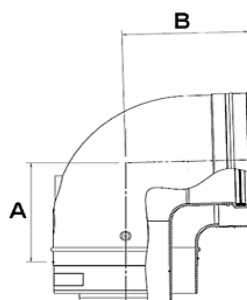
EFHF004 CONCENTRIC HORIZONTAL FLUE ASSEMBLY MODELS - EF100, EF120				
Item No	Description	Included	EF100	EF120
LV302505	CONCENTRIC HORIZONTAL TERMINAL Ø100/150 ALU	1	58	84
M84410	CONCENTRIC BEND 90° Ø100/150mm PP SHORT RADIUS	1	23.6	34.2
Maximum resistance in the flue system ≤200pa		Total	81.6	118.2

Additional Flue Ancillary Items		
Item No.	Description	Dimensions
M84402	CONCENTRIC EXTENSION Ø100/150mm PP FIXED	1000mm
M84405	CONCENTRIC EXTENSION Ø100/150mm Cuttable	500mm
M84413	CONCENTRIC BEND 45° Ø100/150mm PP	-
M84331	WALL CLAMP	150mm
M84422	CONDENSATE DRAIN PP 100/150mm	-



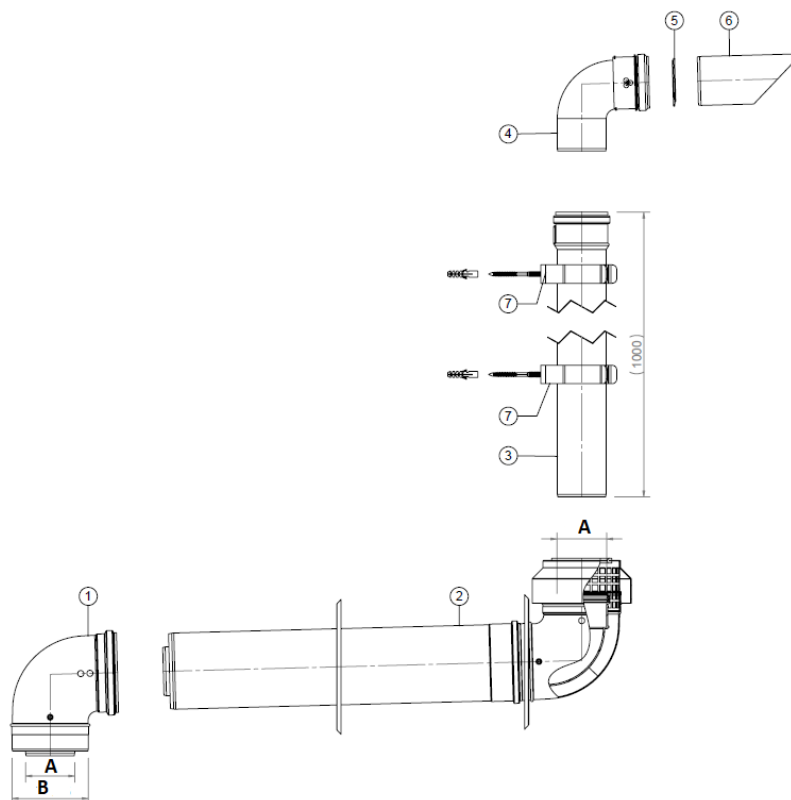
EF80
A=45mm
B=62.5mm

EF100-120
A=128mm
B=128mm



EF80
A=95mm
B=110mm

EF100-120
A=223mm
B=208mm



PLUME MANAGEMENT KITS	
LG800008B	PLUME MANAGEMENT KIT Ø80/125mm
LG800009B	PLUME MANAGEMENT KIT Ø100/150mm

No	Description	EF80	EF100	EF120
1	CONCENTRIC BEND 90°-PP	Ø80/125mm	Ø100/150mm	Ø100/150mm
2	CONCENTRIC HORIZONTAL PLUME KIT TERMINAL -PP	Ø80/125mm	Ø100/150mm	Ø100/150mm
3	EXTENSION -PP CUTABLE (1000mm)	Ø80mm	Ø100mm	Ø100mm
4	BEND 90°-PP	Ø80mm	Ø100mm	Ø100mm
5	PLUME KIT BIRD GUARD	Ø80mm	Ø100mm	Ø100mm
6	PLUME KIT FLUE EXIT-PP	Ø80mm	Ø100mm	Ø100mm
7	WALL CLAMP	Ø80mm	Ø100mm	Ø100mm
A	INTERNAL DIAMETER	Ø80mm	Ø100mm	Ø100mm
B	EXTERNAL DIAMETER	Ø125mm	Ø150mm	Ø150mm



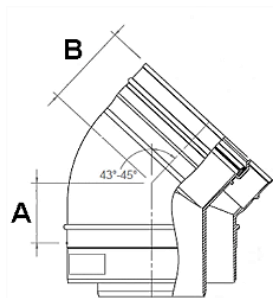
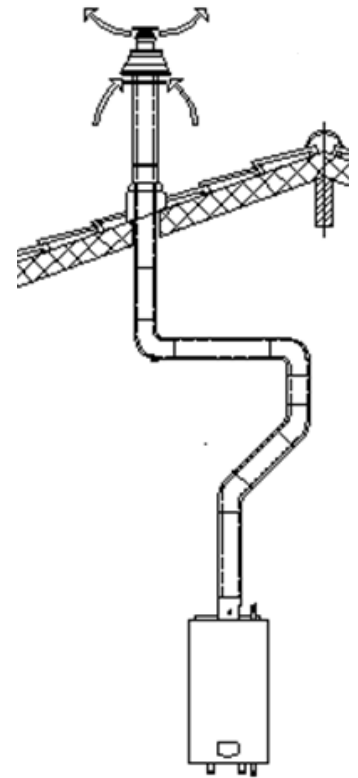
The plume kit must not be used to correct an illegal terminal location

EFVF002 CONCENTRIC VERTICAL FLUE ASSEMBLY MODELS - EF80			
Item No	Description	Included	EF80
LV310753	CONCENTRIC VERTICAL TERMINAL - Ø80/125mm PP	1	109.8
LV310745	CONCENTRIC EXTENSION - Ø80/125mm PP (500mm)	1	9.05
Maximum resistance in the flue system ≤200pa		Total	118.85

Additional Flue Ancillary Items		
Item No.	Description	Dimensions
LV310742	CONCENTRIC EXTENSION - Ø80/125mm PP FIXED	1000mm
LV310735	CONCENTRIC BEND 90° Ø80/125mm PP	-
LV310734	CONCENTRIC BEND 45° Ø80/125mm PP	-
M84481	WALL CLAMP	125mm
M84472	CONDENSATE DRAIN PP 80/125mm	-
LV302520	FLAT ROOF FLASHING ALU	140mm
LV303506	SLOPING ROOF FLASHING Ø80/125MM (25°-45°) LEAD	-

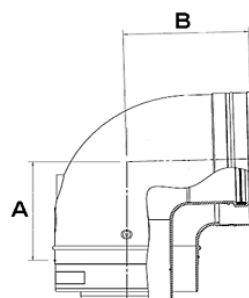
EFVF004 CONCENTRIC VERTICAL FLUE ASSEMBLY MODELS - EF100, EF120				
Item No	Description	Included	EF100	EF120
LG800010A	CONCENTRIC VERTICAL TERMINAL Ø100/150mm PP	1	80	115.9
M84405	CONCENTRIC EXTENSION Ø100/150mm (500mm) Cutttable	1	6.5	9.45
Maximum resistance in the flue system ≤200pa		Total	86.5	125.35

Additional Flue Ancillary Items		
Item No.	Description	Dimensions
M84402	CONCENTRIC EXTENSION Ø100/150mm PP FIXED	1000mm
M84412	CONCENTRIC BEND 90° Ø100/150mm PP	-
M84413	CONCENTRIC BEND 45° Ø100/150mm PP	-
M84331	WALL CLAMP	150mm
M84422	CONDENSATE DRAIN PP 100/150mm	-
LV302520	FLAT ROOF FLASHING ALU	140mm
LV303506	SLOPING ROOF FLASHING Ø80/125MM (25°-45°) LEAD	-



EF80
A=45mm
B=62.5mm

EF100-120
A=128mm
B=128mm



EF80
A=95mm
B=110mm

EF100-120
A=223mm
B=208mm



Concentric flue is unable to be used with EF180

CONCENTRIC FLUE SIZING/CALCULATIONS

	EF80 (80/125)	EF100 (100/150)	EF120 (100/150)	EF150 (100/150)	EF180 (100/150)
Wall terminal	80.1	58	84	129.9	188
Roof terminal	109.8	80	115.9	179.2	259.3
Straight tube (m)	18.1	13	18.9	29.2	42.2
45° Elbow	15.4	15.5	22.4	34.7	50.2
90° Elbow	28.7	23.6	34.2	52.9	76.5

To be used for Lochinvar supplied M&G flue system components resistance only

Use the table below to calculate the total flue system resistance

Item	Quantity	Resistance	Total
Wall terminal			
Roof terminal			
Straight tube (m)			
45° Elbow			
90° Elbow			
Plume kit			
Total Resistance (Pa)			

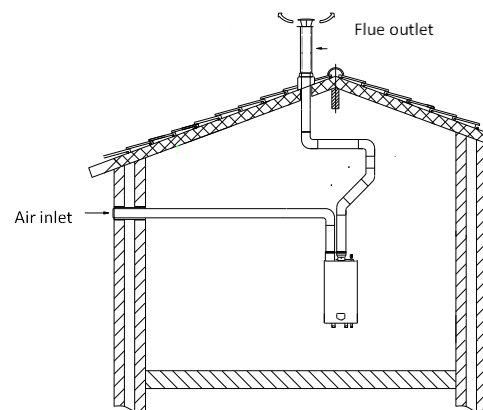


Total calculated system resistance must be less than 200pa

EF TWIN-PIPE FLUE ASSEMBLY MODELS EF80			
Vertical Flue			
Item No	Description	No Required	EF80
LV310753B	CONCENTRIC VERTICAL TERMINAL Ø80/125mm PP	1	73.2
LV305016	HORIZONTAL AIR INLET Ø80mm	1	-
M28925B	TERMINAL WALL PLATES (PAIR)	1	-
Maximum resistance in the flue system ≤200pa		Total	73.2

EF TWIN-PIPE FLUE ASSEMBLY MODELS EF80			
Horizontal Flue			
Item No	Description	No Required	EF80
LV310757B	CONCENTRIC HORIZONTAL TERMINAL Ø80/125mm PP	1	53.4
LV305016	HORIZONTAL AIR INLET Ø80mm	1	-
M28925B	TERMINAL WALL PLATES (PAIR)	1	-
Maximum resistance in the flue system ≤200pa		Total	53.4

Additional Flue Ancillary Items		
Item No.	Description	Dimensions
LV310718B	EXTENSION - Ø80mm PP CUT TO LENGTH	250mm
M85271B	EXTENSION Ø80mm PP CUT TO LENGTH	500mm
M85272B	EXTENSION Ø80mm PP CUT TO LENGTH	1000mm
LV310721B	EXTENSION - Ø80mm PP CUT TO LENGTH	2000mm
LV310722B	EXTENSION - Ø80mm PP TELESCOPIC	240-360mm
M85292B	BEND 45° 80mm PP	See Drawing Below
M85291B	BEND 90° 80mm PP	See Drawing Below
M87191B	WALL CLAMP Ø80mm	N/A



EF TWIN-PIPE FLUE ASSEMBLY MODELS EF100, EF120

Vertical Flue

Item No	Description	No Required	EF100	EF120
LV310754B	CONCENTRIC VERTICAL TERMINAL Ø100/150mm PP	1	53.33	77.26
Maximum resistance in the flue system ≤200pa		Total	53.33	77.26

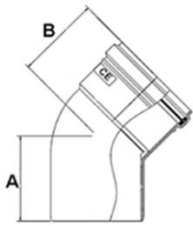
EF TWIN-PIPE FLUE ASSEMBLY MODELS EF100, EF120

Horizontal Flue

Item No	Description	No Required	EF100	EF120
LV310758B	CONCENTRIC HORIZONTAL TERMINAL Ø100/150mm PP	1	38.66	56
LV305039B	HORIZONTAL AIR INLET Ø100mm ALU	1	-	-
Maximum resistance in the flue system ≤200pa		Total	38.66	56

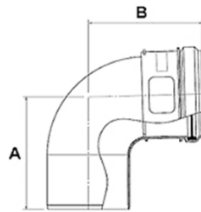
Additional Flue Ancillary Items

Item No.	Description	Dimensions
M85176B	EXTENSION Ø100mm PP CUT TO LENGTH	500mm
M85177B	EXTENSION Ø100mm PP CUT TO LENGTH	1000mm
M85181B	BEND 90° 100mm PP	See Drawing Below
M85182B	BEND 45° 100mm PP	See Drawing Below
M87193B	WALL BAND (100mm)	n/a



EF80
A=72.5mm,
B=72.5mm

EF100-120
A=78mm,
B=65mm



EF80
A=110mm,
B=110mm

EF100-120
A=78mm,
B=65mm

TWIN-PIPE FLUE SIZING/CALCULATIONS

Item	Size (mm)	Resistance (Pa)				
		EF80	EF100	EF120	EF150	EF180
Straight tube (per metre)	80	8.2	X	X	X	X
Straight tube (per metre)	100	2.3	3.5	5.0	X	X
Straight tube (per metre)	130	0.6	0.9	1.2	1.9	2.8
45° Elbow	80	7.6	X	X	X	X
45° Elbow	100	5.1	7.9	11.5	X	X
45° Elbow	130	1.0	1.6	2.3	3.5	5.1
90° Elbow	80	18.0	X	X	X	X
90° Elbow	100	8.3	12.7	18.4	X	X
90° Elbow	130	2.4	3.7	5.4	8.4	12.1
Vertical inlet cap	80	22.2	X	X	X	X
Vertical inlet cap	100	8.7	13.4	19.4	X	X
Vertical inlet cap	130	2.9	4.5	6.5	10.1	14.6

To be used for Lochinvar supplied M&G air inlet system components resistance only

Item	Size (mm)	Resistance (Pa)				
		EF80	EF100	EF120	EF150	EF180
Straight tube (per metre)	80	7.1	X	X	X	X
Straight tube (per metre)	100	2.0	3.0	4.4	X	X
Straight tube (per metre)	130	0.5	0.7	1.1	1.7	2.4
45° Elbow	80	6.5	X	X	X	X
45° Elbow	100	4.4	6.8	9.9	X	X
45° Elbow	130	0.9	1.4	2.0	3.0	4.4
90° Elbow	80	15.6	X	X	X	X
90° Elbow	100	7.1	11.0	16.0	X	X
90° Elbow	130	2.1	3.2	4.7	7.2	10.5
Vertical exhaust cap	80	19.2	X	X	X	X
Vertical exhaust cap	100	7.5	11.6	16.8	X	X
Vertical exhaust cap	130	2.5	3.9	5.6	8.7	12.6

To be used for Lochinvar supplied M&G flue exhaust system components resistance only

Use the table below to calculate the flue system resistance.

Flue exhaust	Item	Quantity	Resistance	Total
	Straight tube (m)			
	45° Elbow			
	90° Elbow			
	Concentric Vertical terminal			
Total Resistance flue exhaust (Pa)				
Air Inlet	Item	Quantity	Resistance	Total
	Straight tube (m)			
	45° Elbow			
	90° Elbow			
	Air Inlet			
Total Resistance air inlet (Pa)				
Total Resistance air inlet and flue exhaust (Pa)				



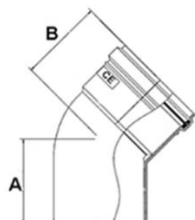
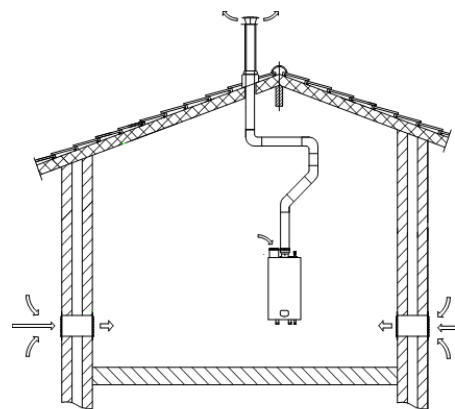
Total calculated system resistance must be less than 200pa

CONVENTIONAL (EXHAUST ONLY) FLUE SYSTEMS TYPE B₂₃

EF CONVENTIONAL FLUE ASSEMBLY MODELS EF80				
Item No	Description	No Required	EF80	
LV305030B	APPLIANCE AIR INTAKE GUARD Ø80/125mm	1	22.2	
M86864B	CONCENTRIC VERTICAL TERMINAL Ø80/125mm PP	1	73.2	
Maximum resistance in the flue system ≤200pa		Total	95.4	

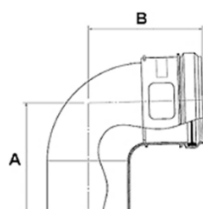
Additional Flue Ancillary Items		
Item No.	Description	Dimensions
LV310718B	EXTENSION - Ø80mm PP CUT TO LENGTH	250mm
M85271B	EXTENSION Ø80mm PP CUT TO LENGTH	500mm
M85272B	EXTENSION Ø80mm PP CUT TO LENGTH	1000mm
LV310721B	EXTENSION - Ø80mm PP CUT TO LENGTH	2000mm
LV310722B	EXTENSION - Ø80mm PP TELESCOPIC	240-360mm
M85292B	BEND 45° 80mm PP	See Drawing Below
M85291B	BEND 90° 80mm PP	See Drawing Below
M87191B	WALL CLAMP Ø80mm	N/A

EF CONVENTIONAL FLUE ASSEMBLY MODELS EF100, EF120				
Item No	Description	No Required	EF100	EF120
LV304872B	APPLIANCE AIR INTAKE GUARD Ø100/150mm	1	13.4	19.4
LV310754B	CONCENTRIC VERTICAL TERMINAL Ø100/150mm PP	1	53.33	77.26
Maximum resistance in the flue system ≤200pa		Total	66.73	96.66



EF80
A=72.5mm,
B=72.5mm

EF100-120
A=78mm,
B=65mm



EF80
A=110mm,
B=110mm

EF100-120
A=78mm,
B=65mm

Item	Size (mm)	Resistance (Pa)				
		EF80	EF100	EF120	EF150	EF180
Straight tube (per metre)	80	8.2	X	X	X	X
Straight tube (per metre)	100	2.3	3.5	5.0	X	X
Straight tube (per metre)	130	0.6	0.9	1.2	1.9	2.8
45° Elbow	80	7.6	X	X	X	X
45° Elbow	100	5.1	7.9	11.5	X	X
45° Elbow	130	1.0	1.6	2.3	3.5	5.1
90° Elbow	80	18.0	X	X	X	X
90° Elbow	100	8.3	12.7	18.4	X	X
90° Elbow	130	2.4	3.7	5.4	8.4	12.1
Vertical inlet cap	80	22.2	X	X	X	X
Vertical inlet cap	100	8.7	13.4	19.4	X	X
Vertical inlet cap	130	2.9	4.5	6.5	10.1	14.6

To be used for Lochinvar supplied M&G air inlet system components resistance only

Use the table below to calculate the flue system resistance.

Item	Quantity	Resistance	Total
Straight tube (m)			
45° Elbow			
90° Elbow			
Concentric Vertical terminal			
Total Resistance flue exhaust (Pa)			



Total calculated system resistance must be less than 200pa

In general, water heaters are certified with their own purpose supplied Concentric or Twin Pipe flue systems, C63 certified appliances allow the installer to use other flue systems when installing the water heater however, they must be of a suitable minimum standard as per table below.

CE string flue gas material	European standard	Temperature class	Pressure class	Resistance to condensate	Corrosion resistance class	Metal: liner specifications	Soot fire resistance class	Distance to combustible material	Plastics: location	Plastics: fire behaviour	Plastics: enclosure
min. eis PP	EN 14471	T120	P1	W	1		O	30	I of E	C/E	L
min. eis RVS	EN 1856-1	T120	P1	W	1	L20040	O	40			

Material	Water heater	d _{nom} mm	D _{outside} mm	d _{inside} mm	L _{insert} mm
SS	EF80	80	80 + 0.3 / -0.7	81 + 0.3 / -0.3	50 + 2 / -2
SS	EF100-EF120	100	100 + 0.3 / -0.7	101 + 0.3 / -0.3	50 + 2 / -2
SS	EF150-EF180	130	130 + 0.3 / -0.7	131 + 0.5 / -0.5	50 + 2 / -2
PP	EF80-EF80	80	80 + 0.6 / -0.6		50 + 20 / -2
PP	EF100-EF120	100	100 + 0.6 / -0.6		50 + 20 / -2
PP	EF150-EF180	130	130 + 0.9 / -0.9		50 + 20 / -2



Aluminium flue pipe must not be used on this appliance as it may lead to premature failure of the heat exchanger and will invalidate the warranty.

COMMON FLUE SYSTEMS

Lochinvar can supply a PP common flue header see separate guide available at www.lochinvar.ltd.uk

Alternatively the installer can use a flue installation specialist to design and supply a separate flue system under the flue designation C63 using the specifications shown on page 13 and information in the table below.

Any installations using flue type C63 must be designed and installed in compliance with any local Building or planning regulations, but as these systems use a flue system not supplied by Lochinvar, Lochinvar cannot comment / advise or provide support on the design of this type of flue system. To design such a flue system, the installer/contractor must consult a specialist flue supplier who will be responsible for the design and installation of the separate flue system. When designing the type C63 flue system, the instructions in the Installation Manual, provided with the water heater, must be taken into account. Lochinvar will provide pressure loss figures for the specific units, but other than that, Lochinvar cannot provide support on Common Flue requests because flue certification is limited to the certified categories in the table on page 2. Lochinvar cannot accept any responsibility for Flue system design.

	EF80	EF100	EF120	EF150	EF180
Available pressure at the flue gas outlet	200Pa	200Pa	200Pa	200Pa	200Pa
Flue Gas Mass Rate (G20) 96% (g/sec)	38.6	47.9	57.7	71.7	86.2
Flue Gas Mass Rate (G20) 25% (g/sec)	6.52	7.69	11.6	15.2	20.1
Flue Gas Mass Rate (G31) 96% (g/sec)	38.6	47.9	57.7	71.7	86.2
Flue Gas Mass Rate (G31) 25% (g/sec)	6.52	7.69	11.6	15.2	20.1



The EcoForce water heater range does not have an internal Non Return Valve (NRV) as such any flue must be designed on zero or negative pressure unless a suitable NRV is fitted and if necessary interlocked to the appliance. Non Return Valves are included with the Lochinvar common flue header.

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