Cascade Flue System Guide

For use with the following appliances: CPM 58 CPM 77 CPM 96 CPM 116 EF80 EF100 EF120

CPM_ANCIL/CASCADE FLUE GUIDE_V1_JANUARY 2016



Introduction

This guide has been produced to assist in the selection of Lochinvar Cascade flue kits only and cannot be used for sizing any other type of flue. The final flue design should take into account relevant guides and regulations and pay particular attention to the requirements of the clean air act or memorandum

The Lochinvar Cascade flue kits consist of the vertical header from each appliance each with a non-return valve to prevent combustion products recirculating into non-operational appliances within the cascade. There is also a horizontal header. The final vertical flue and termination are not included within these kits.

Suitable appliances

The Lochinvar cascade flue system is suitable for use with the following appliances only:

- CPM 58
- CPM 77
- CPM 96
- CPM 116
- EF80
- EF100
- EF120

Using this Guide

To size a suitable cascade kit first check the standard kit sizing from table 1.1, this should then be checked using tables 1.2 and 1.3 or by using the cascade flue kit calculator. If the finished equivalent length is over the total allowed then select the next kit up if available and re-check. See example on page 5. Finally see the detailed breakdown of each kit starting on page 6, this also shows any available ancillaries to complete the flue system. If the system you are looking at is outside the parameters of the Lochinvar Cascade kits then a suitable flue manufacturer will need to be contacted for an alternative flue arrangement.

Model	Quantity	Total Boiler	(MEL) Maximum Equivalent Vertical Length (m)					
		Output kW	150mm Header 150mm Flue	CASKIT	150mm Header 200mm Flue	CASKIT	200mm Header 200mm Flue	CASKIT
CPM 58	2	112	50	001	50	NA	50	N/A
CPM 77/EF80	2	148	50	001	50	N/A	50	N/A
CPM 96/EF100	2	184	50	002	50	N/A	50	N/A
CPM 116/EF120	2	222	50	002	50	N/A	50	N/A
CPM 58	3	168	50	003	50	N/A	50	N/A
CPM 77/EF80	3	222	29	003	50	004	50	005
CPM 96/EF100	3	276	23	006	50	007	50	008
CPM 116/EF120	3	333	13	006	50	007	50	008
	1	I						1
CPM 58	4	224	13	009	50	010	50	011
CPM 77/EF80	4	296	N/A	N/A	50	010	50	011
CPM 96/EF100	4	368	N/A	N/A	50	012	50	013
CPM 116/EF120	4	444	N/A	N/A	50	012	50	013

Table 1.1 Cascade kit/appliance cross reference

Sizing

Once you have established the cascade kit required from table 1.1 any additional bends and lengths of flue need to be taken into consideration to ensure the total equivalent flue length (TEL) does not exceed the permitted maximum equivalent vertical flue length (MEL) from table 1.1. If TEL is greater than MEL then the next cascade kit up will need to be used. If there is no alternative shown the Lochinvar Cascade flue kit cannot be used.

Equivalent flue lengths

The tables below show the extra to add onto to the TEL for every additional metre of flue and elbow used on the flue system

	Equivalent vertical length		
Flue pipe size	150mm horizontal flue	200mm horizontal flue	
150mm/150mm flue pipe	1.0	N/A	
150mm/200mm flue pipe	4.4	1.1	
200mm/200mm flue pipe	N/A	1.1	
Note that vertical flue is counted as one metre per each metre of flue			

Table 1.2 equivalent for horizontal flue lengths

Elbow type	Equivalent vertical length		
Elbow type	150mm flue	200mm flue	
45°	1.1	1.5	
90°	2.5	3.3	

Table 1.3 equivalent for elbows

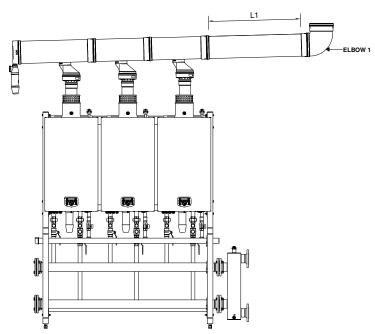


Diagram 1.0 Cascade Kit Showing L1 and Elbow1

Example

A boiler system of 3no CPM 77 boilers are to be used on a cascade system consisting of:

5 metre extra horizontal run after header – Dimension L1 A total of 10 metres horizontal sections after Elbow 1 2 Additional 90° Bends after Elbow 1 - Do not count Elbow1 A total of 22 meters vertical sections after Elbow 1

Using table 1.1 the first cascade kit available is the 150mmHeader/150mm Flue CASKIT 003, this has an **MEL** of **29 metres**. Using tables 1.2 and 1.3 we can calculate the below:

Total equivalent length (TEL) = 5 met	res horizontal flue (L1)	5.0 x 1.0 =5.0
90° be	end (150mm)	2.0 x 2.5 =5.0
Additi	onal Horizontal Sections	10.0 x 1.0 = 10.0
22 me	ters vertical flue	22.0 x 1.0 = 22.0
TEL =5.0+5.0+10.0+22.0 =42.0 metres	6	

The allowed MEL for CASKIT003 is **29.0 metres**, meaning this flue system is **not suitable**.

Now move up to the next available cascade kit 150mmHeader/200mmFlue CASKIT004 This has an **MEL** of **50 metres**. Using tables 1.2 and 1.3 we can calculate the below:

Total equivalent length (TEL) = 5 meters horizontal flue (L1)	5.0 x 4.4 =22.0
90° bend (200mm)	2.0 x 3.3 =6.6
Additional Horizontal Sections (200mm)	10.0 x 1.1 = 11
22.0 metres vertical flue =	22.0 x 1 = 22.0

TEL =22.0+6.6+11.0 +22.0 =61.6 metres

Allowed MEL for CASKIT004 =50 so this flue system is not suitable.

The next available cascade kit 200mmHeader/200mmFlue CASKIT005 This has an **MEL** of **50 metres**. Using tables 1.2 and 1.3 we can calculate the below:

Total equivalent length (TEL) = 5 metres horizontal flue (L1)	5.0 x 1.1 =5.5
90º bend (200mm)	2.0 x 3.3 = 6.6
Additional Horizontal Sections	10.0 x 1.1= 11.0
22 meters vertical flue	22.0 x 1.0 = 22.0
TEL = E E + E E + 11 0 + 22 0 = 4E 1 motroe	

TEL =5.5+6.6+11.0+22.0 =<u>45.1 metres</u>

The allowed MEL for CASKIT005 is 50.0 metres, meaning this flue system is suitable.

CASKIT005 should be selected.

M70324 EXTENSION - 150mm x 2000mm

M70331 ELBOW 150mm - 90°

M70332 ELBOW 150mm - 45°

M87196 WALL CLAMP - 150mm

CONDENSATE DRAIN - 150mm

M70327

CASCADE FLUE SYSTEM FOR 2 APPLIANCES MODELS CPM 58 & CPM 77 **EF80** 150 mm HEADER – 150 mm FLUE Maximum Equivalent Flue Length = 50 Metres (All Models) Deduct 2.5 metres for each 90° Bend Deduct 1.1 metres for each 45° Bend Deduct 1.0 metre for each 1.0 metre of 150 mm dia horizontal length Each Flue Kit includes all items marked as Std Spec Part No Description M81630 CASCADE SYSTEM - 150mm - 2 BOILERS M85271 EXTENSION - 80mm X 500mm M85283 EXPANDER 80mm - 100mm M87927 AIR INTAKE FILTER 80/125 CONCENTRIC M70359 **ROOF TERMINAL - 150mm** M70322 EXTENSION - 150mm x 1000mm

Std Spec

1

2

2

2

	CASCADE FLUE SYSTEM FOR 2 APPLIANCES	
	MODELS CPM 96 & CPM 116 EF100 & EF120	
	150 mm HEADER – 150 mm FLUE	
	Maximum Equivalent Flue Length = 50 Metres (All Models)	
	Deduct 2.5 metres for each 90° Bend Deduct 1.1 metres for each 45° Bend Deduct 1.0 metre for each 1.0 metre of 150 mm dia horizontal length	
	Each Flue Kit includes all items marked as Std Spec	
Part No	Description	Std Spec
M81630	CASCADE SYSTEM - 150mm - 2 BOILERS	1
M87957	AIR INTAKE FILTER 100/150 CONCENTRIC	2
M70359	ROOF TERMINAL - 150mm	
M70322	EXTENSION - 150mm x 1000mm	
M70324	EXTENSION - 150mm x 2000mm	
M70327	CONDENSATE DRAIN - 150mm	
M70331	ELBOW 150mm - 90°	
M70332	ELBOW 150mm - 45°	
M87196	WALL CLAMP - 150mm	

	CASCADE FLUE SYSTEM FOR 3 APPLIANCES	
	MODELS CPM 58 & CPM 77	
	EF80	
	150 mm HEADER – 150 mm FLUE	
	Maximum Equivalent Flue Length = 50 Metres (CPM 58)	
	Maximum Equivalent Flue Length = 29 Metres (CPM 77 & EF80)	
	Deduct 2.5 metres for each 90° Bend Deduct 1.1 metres for each 45° Bend Deduct 1.0 metre for each 1.0 metre of 150 mm dia horizontal length	
	Each Flue Kit includes all items marked as Std Spec	
Part No	Description	Std Spec
M81630	CASCADE SYSTEM - 150mm - 2 BOILERS	1
M81631	CASCADE SYSTEM - 150mm - ADDITIONAL BOILER	1
M85271	EXTENSION - 80mm X 500mm	3
M85283	EXPANDER 80mm - 100mm	3
M87927	AIR INTAKE FILTER 80/125 CONCENTRIC	3
M70359	ROOF TERMINAL - 150mm	
	EXTENSION - 150mm x 1000mm	
	EXTENSION - 150mm x 2000mm	
M70327	CONDENSATE DRAIN - 150mm	
M70331	ELBOW 150mm - 90°	
M70332	ELBOW 150mm - 45°	
M87196	WALL CLAMP - 150mm	

	CASCADE FLUE SYSTEM FOR 3 APPLIANCES	
	MODELS CPM 77	
	EF80	
	150 mm HEADER – 200 mm FLUE	
	Maximum Equivalent Flue Length = 50 Metres	
	Deduct 1.1 metres for each 150 mm 90° Bend Deduct 3.3 metres for each 200 mm 90° Bend Deduct 1.1 metres for each 150 mm 45° Bend Deduct 1.1 metres for each 200 mm 45° Bend Deduct 4.0 metres for each 1.0 metre of 150 mm dia horizontal length Deduct 1.1 metres for each 1.0 metre of 200 mm dia horizontal length	
	Each Flue Kit includes all items marked as Std Spec	
Part No	Description	Std Spec
M70342	Description EXPANDER 150mm - 200mm	1
M70342 M81630	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS	1
M70342 M81630 M81631	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER	
M70342 M81630 M81631 M85271	DescriptionEXPANDER 150mm - 200mmCASCADE SYSTEM - 150mm - 2 BOILERSCASCADE SYSTEM - 150mm - ADDITIONAL BOILEREXTENSION - 80mm X 500mm	1 1 1 3
M70342 M81630 M81631 M85271 M85283	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER EXTENSION - 80mm X 500mm EXPANDER 80mm - 100mm	1 1 1 3 3
M70342 M81630 M81631 M85271 M85283	DescriptionEXPANDER 150mm - 200mmCASCADE SYSTEM - 150mm - 2 BOILERSCASCADE SYSTEM - 150mm - ADDITIONAL BOILEREXTENSION - 80mm X 500mm	1 1 1 3
M70342 M81630 M81631 M85271 M85283 M87927	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER EXTENSION - 80mm X 500mm EXPANDER 80mm - 100mm AIR INTAKE FILTER 80/125 CONCENTRIC	1 1 1 3 3
M70342 M81630 M81631 M85271 M85283 M87927 M70439	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER EXTENSION - 80mm X 500mm EXPANDER 80mm - 100mm AIR INTAKE FILTER 80/125 CONCENTRIC ROOF TERMINAL - 200mm	1 1 1 3 3
M70342 M81630 M81631 M85271 M85283 M87927 M70439 M70439	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER EXTENSION - 80mm X 500mm EXPANDER 80mm - 100mm AIR INTAKE FILTER 80/125 CONCENTRIC ROOF TERMINAL - 200mm EXTENSION - 150mm x 1000mm	1 1 1 3 3
M70342 M81630 M81631 M85271 M85283 M87927 M70439 M70322 M70324	DescriptionEXPANDER 150mm - 200mmCASCADE SYSTEM - 150mm - 2 BOILERSCASCADE SYSTEM - 150mm - ADDITIONAL BOILEREXTENSION - 80mm X 500mmEXPANDER 80mm - 100mmAIR INTAKE FILTER 80/125 CONCENTRICROOF TERMINAL - 200mmEXTENSION - 150mm x 1000mmEXTENSION - 150mm x 2000mm	1 1 1 3 3
M70342 M81630 M81631 M85271 M85283 M87927 M70439 M70439 M70322 M70324 M70402	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER EXTENSION - 80mm X 500mm EXTENSION - 80mm X 500mm AIR INTAKE FILTER 80/125 CONCENTRIC ROOF TERMINAL - 200mm EXTENSION - 150mm x 1000mm EXTENSION - 150mm x 2000mm EXTENSION - 200mm X 1000mm	1 1 1 3 3
M70342 M81630 M81631 M85271 M85283 M87927 M70439 M70439 M70322 M70324 M70402 M70404	DescriptionEXPANDER 150mm - 200mmCASCADE SYSTEM - 150mm - 2 BOILERSCASCADE SYSTEM - 150mm - ADDITIONAL BOILEREXTENSION - 80mm X 500mmEXPANDER 80mm - 100mmAIR INTAKE FILTER 80/125 CONCENTRICROOF TERMINAL - 200mmEXTENSION - 150mm x 1000mmEXTENSION - 150mm x 2000mmEXTENSION - 200mm X 1000mmEXTENSION - 200mm X 2000mm	1 1 1 3 3
M70342 M81630 M81631 M85271 M85283 M87927 M70439 M70439 M70322 M70324 M70324 M70402 M70404	DescriptionEXPANDER 150mm - 200mmCASCADE SYSTEM - 150mm - 2 BOILERSCASCADE SYSTEM - 150mm - ADDITIONAL BOILEREXTENSION - 80mm X 500mmEXPANDER 80mm - 100mmAIR INTAKE FILTER 80/125 CONCENTRICROOF TERMINAL - 200mmEXTENSION - 150mm x 1000mmEXTENSION - 150mm x 2000mmEXTENSION - 200mm X 1000mmEXTENSION - 200mm X 2000mmEXTENSION - 200mm X 2000mmEXTENSION - 90°	1 1 1 3 3
M70342 M81630 M81631 M85271 M85283 M87927 M70439 M70439 M70322 M70324 M70402 M70402 M70404 M70411 M70412	DescriptionEXPANDER 150mm - 200mmCASCADE SYSTEM - 150mm - 2 BOILERSCASCADE SYSTEM - 150mm - ADDITIONAL BOILEREXTENSION - 80mm X 500mmEXPANDER 80mm - 100mmAIR INTAKE FILTER 80/125 CONCENTRICROOF TERMINAL - 200mmEXTENSION - 150mm x 1000mmEXTENSION - 150mm x 2000mmEXTENSION - 200mm X 1000mmEXTENSION - 200mm X 2000mm	1 1 1 3 3

CASCADE FLUE SYSTEM FOR 3 APPLIANCES MODELS **CPM 77 EF80** 200 mm HEADER – 200 mm FLUE Maximum Equivalent Flue Length = 50 Metres Deduct 3.3 metres for each 90° Bend Deduct 1.5 metres for each 45° Bend Deduct 1.1 metres for each 1.0 metre of 200 mm dia horizontal length Each Flue Kit includes all items marked as Std Spec Part No Description **Std Spec** M81632 CASCADE SYSTEM - 200mm - 2 BOILERS 1 M81633 CASCADE SYSTEM - 200mm - ADDITIONAL BOILER 1 M85271 EXTENSION - 80mm X 500mm 3 M85283 EXPANDER 80mm - 100mm 3 M87927 AIR INTAKE FILTER 80/125 CONCENTRIC 3 M70439 ROOF TERMINAL - 200mm M70402 EXTENSION - 200mm X 1000mm M70404 EXTENSION - 200mm X 2000mm M70411 ELBOW 200mm - 90° M70412 ELBOW 200mm - 45° M87198 WALL CLAMP - 200mm

MODELS CPM 96 & CPM 116 EF100 & EF120 ISO mm HEADER – 150 mm FLUE Maximum Equivalent Flue Length = 23 Metres (CPM 96/EF100) Maximum Equivalent Flue Length = 23 Metres (CPM 96/EF100) Maximum Equivalent Flue Length = 23 Metres (CPM 96/EF100) Maximum Equivalent Flue Length = 13 Metres (CPM 116/EF120) Deduct 2.5 metres for each 90° Bend Deduct 1.0 metre of 150 mm dia horizontal length Deduct 1.0 metre of 150 mm dia horizontal length Deduct 1.0 metre of 150 mm dia horizontal length Deduct 1.0 metre of 150 mm dia horizontal length Deduct 1.0 metre of 2 BOILERS 1 M81630 CASCADE SYSTEM - 150mm - 2 BOILERS 1 M81631 CASCADE SYSTEM - 150mm - 2 BOILERS 1 M870359 ROOF TERMINAL - 150mm M70332 M70332 DEDATIONAL BOILER M70332 M70333 <td< th=""><th></th><th>CASCADE FLUE SYSTEM FOR 3 APPLIANCES</th><th></th></td<>		CASCADE FLUE SYSTEM FOR 3 APPLIANCES	
Maximum Equivalent Flue Length = 23 Metres (CPM 96/EF100) Maximum Equivalent Flue Length = 13 Metres (CPM 116/EF120) Deduct 2.5 metres for each 90° Bend Deduct 1.1 metres for each 45° Bend Deduct 1.0 metre for each 1.0 metre of 150 mm dia horizontal length Each Flue Kit includes all items marked as Std Spec Part No Description Std Spec M81630 CASCADE SYSTEM - 150mm - 2 BOILERS 1 M81631 CASCADE SYSTEM - 150mm - ADDITIONAL BOILER 1 M87957 AIR INTAKE FILTER 100/150 CONCENTRIC 3 M70359 ROOF TERMINAL - 150mm 1 M70322 EXTENSION - 150mm x 1000mm 1 M70324 EXTENSION - 150mm x 2000mm 1 M70331 ELBOW 150mm - 90° 1 M70332 ELBOW 150mm - 45° 1		CPM 96 & CPM 116	
Maximum Equivalent Flue Length = 13 Metres (CPM 116/EF120) Deduct 2.5 metres for each 90° Bend Deduct 1.1 metres for each 45° Bend Deduct 1.0 metre for each 1.0 metre of 150 mm dia horizontal length Each Flue Kit includes all items marked as Std Spec Part No Description Std Spec M81630 CASCADE SYSTEM - 150mm - 2 BOILERS 1 M81631 CASCADE SYSTEM - 150mm - ADDITIONAL BOILER 1 M87957 AIR INTAKE FILTER 100/150 CONCENTRIC 3 M70359 ROOF TERMINAL - 150mm 1 M70322 EXTENSION - 150mm x 1000mm 1 M70324 EXTENSION - 150mm x 2000mm 1 M70327 CONDENSATE DRAIN - 150mm 1 M70331 ELBOW 150mm - 90° 1 M70332 ELBOW 150mm - 45° 1		150 mm HEADER – 150 mm FLUE	
Deduct 2.5 metres for each 90° Bend Deduct 1.1 metres for each 45° Bend Deduct 1.0 metre for each 1.0 metre of 150 mm dia horizontal length Each Flue Kit includes all items marked as Std Spec Part No Description Std Spec M81630 CASCADE SYSTEM - 150mm - 2 BOILERS 1 M81631 CASCADE SYSTEM - 150mm - ADDITIONAL BOILER 1 M87957 AIR INTAKE FILTER 100/150 CONCENTRIC 3 M70359 ROOF TERMINAL - 150mm 1 M70322 EXTENSION - 150mm x 2000mm 1 M70324 EXTENSION - 150mm x 2000mm 1 M70327 CONDENSATE DRAIN - 150mm 1 M70331 ELBOW 150mm - 90° 1 M70332 ELBOW 150mm - 45° 1		Maximum Equivalent Flue Length = 23 Metres (CPM 96/EF100)	
Deduct 1.1 metres for each 45° Bend Deduct 1.0 metre for each 1.0 metre of 150 mm dia horizontal length Each Flue Kit includes all items marked as Std Spec Part No Description Std Spec M81630 CASCADE SYSTEM - 150mm - 2 BOILERS 1 M81631 CASCADE SYSTEM - 150mm - ADDITIONAL BOILER 1 M87957 AIR INTAKE FILTER 100/150 CONCENTRIC 3 M70359 ROOF TERMINAL - 150mm - M70322 EXTENSION - 150mm x 1000mm - M70324 EXTENSION - 150mm x 2000mm - M70327 CONDENSATE DRAIN - 150mm - M70331 ELBOW 150mm - 90° - M70332 ELBOW 150mm - 45° -		Maximum Equivalent Flue Length = 13 Metres (CPM 116/EF120)	
Part No Description Std Spec M81630 CASCADE SYSTEM - 150mm - 2 BOILERS 1 M81631 CASCADE SYSTEM - 150mm - ADDITIONAL BOILER 1 M87957 AIR INTAKE FILTER 100/150 CONCENTRIC 3 M70359 ROOF TERMINAL - 150mm 1 M70322 EXTENSION - 150mm x 1000mm 1 M70324 EXTENSION - 150mm x 2000mm 1 M70327 CONDENSATE DRAIN - 150mm 1 M70331 ELBOW 150mm - 90° 1 M70332 ELBOW 150mm - 45° 1		Deduct 1.1 metres for each 45° Bend	
M81630 CASCADE SYSTEM - 150mm - 2 BOILERS 1 M81631 CASCADE SYSTEM - 150mm - ADDITIONAL BOILER 1 M87957 AIR INTAKE FILTER 100/150 CONCENTRIC 3 M70359 ROOF TERMINAL - 150mm 1 M70322 EXTENSION - 150mm x 1000mm 1 M70324 EXTENSION - 150mm x 2000mm 1 M70331 ELBOW 150mm - 90° 1			
M81631 CASCADE SYSTEM - 150mm - ADDITIONAL BOILER 1 M87957 AIR INTAKE FILTER 100/150 CONCENTRIC 3 M70359 ROOF TERMINAL - 150mm 1 M70322 EXTENSION - 150mm x 1000mm 1 M70324 EXTENSION - 150mm x 2000mm 1 M70327 CONDENSATE DRAIN - 150mm 1 M70331 ELBOW 150mm - 90° 1 M70332 ELBOW 150mm - 45° 1		Each Flue Kit includes all items marked as Std Spec	
M87957 AIR INTAKE FILTER 100/150 CONCENTRIC 3 M70359 ROOF TERMINAL - 150mm 150mm M70322 EXTENSION - 150mm x 1000mm 150mm x 2000mm M70324 EXTENSION - 150mm x 2000mm 150mm x 2000mm M70327 CONDENSATE DRAIN - 150mm 150mm M70331 ELBOW 150mm - 90° 150mm - 45°	Part No		Std Spec
M70359 ROOF TERMINAL - 150mm M70322 EXTENSION - 150mm x 1000mm M70324 EXTENSION - 150mm x 2000mm M70327 CONDENSATE DRAIN - 150mm M70331 ELBOW 150mm - 90° M70332 ELBOW 150mm - 45°		Description	
M70322 EXTENSION - 150mm x 1000mm M70324 EXTENSION - 150mm x 2000mm M70327 CONDENSATE DRAIN - 150mm M70331 ELBOW 150mm - 90° M70332 ELBOW 150mm - 45°	M81630	Description CASCADE SYSTEM - 150mm - 2 BOILERS	1
M70322 EXTENSION - 150mm x 1000mm M70324 EXTENSION - 150mm x 2000mm M70327 CONDENSATE DRAIN - 150mm M70331 ELBOW 150mm - 90° M70332 ELBOW 150mm - 45°	M81630 M81631	Description CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER	1 1
M70324 EXTENSION - 150mm x 2000mm M70327 CONDENSATE DRAIN - 150mm M70331 ELBOW 150mm - 90° M70332 ELBOW 150mm - 45°	M81630 M81631	Description CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER	1 1
M70327 CONDENSATE DRAIN - 150mm M70331 ELBOW 150mm - 90° M70332 ELBOW 150mm - 45°	M81630 M81631 M87957	Description CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC	1 1
M70331 ELBOW 150mm - 90° M70332 ELBOW 150mm - 45°	M81630 M81631 M87957 M70359	Description CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 150mm	1 1
M70332 ELBOW 150mm - 45°	M81630 M81631 M87957 M70359 M70322	Description CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 150mm EXTENSION - 150mm x 1000mm	1 1
	M81630 M81631 M87957 M70359 M70322 M70324	Description CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 150mm EXTENSION - 150mm x 1000mm EXTENSION - 150mm x 2000mm	1 1
M87196 WALL CLAMP - 150mm	M81630 M81631 M87957 M70359 M70322 M70324 M70327	Description CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 150mm EXTENSION - 150mm x 1000mm EXTENSION - 150mm x 2000mm CONDENSATE DRAIN - 150mm	1 1
	M81630 M81631 M87957 M70359 M70322 M70324 M70327 M70331	Description CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 150mm EXTENSION - 150mm x 1000mm EXTENSION - 150mm x 2000mm CONDENSATE DRAIN - 150mm ELBOW 150mm - 90°	1 1

	CASCADE FLUE SYSTEM FOR 3 APPLIANCES	
	MODELS	
	CPM 96 & CPM 116	
	EF100 & EF120	
	150 mm HEADER – 200 mm FLUE	
	Maximum Equivalent Flue Length = 50 Metres (All Models)	
	Deduct 1.1 metres for each 150 mm 90° Bend Deduct 3.3 metres for each 200 mm 90° Bend Deduct 1.1 metres for each 150 mm 45° Bend Deduct 1.1 metres for each 200 mm 45° Bend Deduct 4.0 metres for each 1.0 metre of 150 mm dia horizontal length Deduct 1.1 metres for each 1.0 metre of 200 mm dia horizontal length	
	Each Flue Kit includes all items marked as Std Spec	
Part No	Each Flue Kit includes all items marked as Std Spec Description	Std Spec
		Std Spec
M70342	Description	
M70342 M81630	Description EXPANDER 150mm - 200mm	1
M70342 M81630 M81631	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS	1 1
M70342 M81630 M81631 M87957	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER	1 1 1 1
M70342 M81630 M81631 M87957 M70439	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC	1 1 1 1
M70342 M81630 M81631 M87957 M70439 M70322	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 200mm	1 1 1 1
M70342 M81630 M81631 M87957 M70439 M70322 M70324	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 200mm EXTENSION - 150mm x 1000mm	1 1 1 1
M70342 M81630 M81631 M87957 M70439 M70322 M70324 M70324	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 200mm EXTENSION - 150mm x 1000mm EXTENSION - 150mm x 2000mm	1 1 1 1
M70342 M81630 M81631 M87957 M70439 M70322 M70324 M70402 M70404	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 200mm EXTENSION - 150mm x 1000mm EXTENSION - 150mm x 2000mm EXTENSION - 200mm X 1000mm	1 1 1 1
M70342 M81630 M81631 M87957 M70439 M70322 M70324 M70402 M70404 M70401	Description EXPANDER 150mm - 200mm CASCADE SYSTEM - 150mm - 2 BOILERS CASCADE SYSTEM - 150mm - ADDITIONAL BOILER AIR INTAKE FILTER 100/150 CONCENTRIC ROOF TERMINAL - 200mm EXTENSION - 150mm x 1000mm EXTENSION - 150mm x 2000mm EXTENSION - 200mm X 1000mm EXTENSION - 200mm X 2000mm	1 1 1 1
M70342 M81630 M81631 M87957 M70439 M70322 M70324 M70402 M70402 M70404 M70411 M70412	DescriptionEXPANDER 150mm - 200mmCASCADE SYSTEM - 150mm - 2 BOILERSCASCADE SYSTEM - 150mm - ADDITIONAL BOILERAIR INTAKE FILTER 100/150 CONCENTRICROOF TERMINAL - 200mmEXTENSION - 150mm x 1000mmEXTENSION - 150mm x 2000mmEXTENSION - 200mm X 1000mmEXTENSION - 200mm X 2000mmEXTENSION - 200mm X 2000mmEXTENSION - 90°	1 1 1 1

CASCADE FLUE SYSTEM FOR 3 APPLIANCES

MODELS

CPM 96 & CPM 116 EF100 & EF120

200 mm HEADER – 200 mm FLUE

Maximum Equivalent Flue Length = 50 Metres (All Models)

Deduct 3.3 metres for each 90° Bend Deduct 1.5 metres for each 45° Bend Deduct 1.1 metres for each 1.0 metre of 200 mm dia horizontal length

Each Flue Kit includes all items marked as Std Spec

Part No	Description	Std Spec
M81632	CASCADE SYSTEM - 200mm - 2 BOILERS	1
M81633	CASCADE SYSTEM - 200mm - ADDITIONAL BOILER	1
M87957	AIR INTAKE FILTER 100/150 CONCENTRIC	3
M70439	ROOF TERMINAL - 200mm	
M70402	EXTENSION - 200mm X 1000mm	
M70404	EXTENSION - 200mm X 2000mm	
M70411	ELBOW 200mm - 90°	
M70412	ELBOW 200mm - 45°	
M87198	WALL CLAMP - 200mm	

CASCADE FLUE SYSTEM FOR 4 APPLIANCES MODELS **CPM 58** 150 mm HEADER – 150 mm FLUE Maximum Equivalent Flue Length = 13 Metres Deduct 2.5 metres for each 90° Bend Deduct 1.1 metres for each 45° Bend Deduct 1.0 metre for each 1.0 metre of 150 mm dia horizontal length Each Flue Kit includes all items marked as Std Spec Part No Description **Std Spec** M81630 CASCADE SYSTEM - 150mm - 2 BOILERS 1 M81631 CASCADE SYSTEM - 150mm - ADDITIONAL BOILER 2 M85271 EXTENSION - 80mm X 500mm 4 M85283 EXPANDER 80mm - 100mm 4 M87927 AIR INTAKE FILTER 80/125 CONCENTRIC 4 M70359 ROOF TERMINAL - 150mm M70322 EXTENSION - 150mm x 1000mm M70324 EXTENSION - 150mm x 2000mm M70327 CONDENSATE DRAIN - 150mm M70331 ELBOW 150mm - 90° M70332 ELBOW 150mm - 45° M87196 WALL CLAMP - 150mm

CASCADE FLUE SYSTEM FOR 4 APPLIANCES				
MODELS CPM 58 & CPM 77 EF80				
150 mm HEADER – 200 mm FLUE				
	Maximum Equivalent Flue Length = 50 Metres (All Models)			
	Deduct 1.1 metres for each 150 mm 90° Bend Deduct 3.3 metres for each 200 mm 90° Bend Deduct 1.1 metres for each 150 mm 45° Bend Deduct 1.1 metres for each 200 mm 45° Bend Deduct 4.0 metres for each 1.0 metre of 150 mm dia horizontal length Deduct 1.1 metres for each 1.0 metre of 200 mm dia horizontal length			
Each Flue Kit includes all items marked as Std Spec				
Part No	Description	Std Spec		
M70342	EXPANDER 150mm - 200mm	1		
M81630	CASCADE SYSTEM - 150mm - 2 BOILERS	1		
M81631	CASCADE SYSTEM - 150mm - ADDITIONAL BOILER	2		
M85271	EXTENSION - 80mm X 500mm	4		
	EXPANDER 80mm - 100mm	4		
M87927	AIR INTAKE FILTER 80/125 CONCENTRIC	4		
1170420				
	ROOF TERMINAL - 200mm			
	EXTENSION - 150mm x 1000mm EXTENSION - 150mm x 2000mm			
	EXTENSION - 200mm X 1000mm			
	EXTENSION - 200mm X 2000mm			
	IFI BUWY ZUUMMM - 90			
	ELBOW 200mm - 90° ELBOW 200mm - 45°			
M70412	ELBOW 200mm - 45° WALL CLAMP - 150mm			

CASCADE FLUE SYSTEM FOR 4 APPLIANCES MODELS CPM 58 & CPM 77 EF80

200 mm HEADER – 200 mm FLUE

Maximum Equivalent Flue Length = 50 Metres (All Models)

Deduct 3.3 metres for each 90° Bend Deduct 1.5 metres for each 45° Bend Deduct 1.1 metres for each 1.0 metre of 200 mm dia horizontal length

Each Flue Kit includes all items marked as Std Spec

Part No	Description	Std Spec
M81632	CASCADE SYSTEM - 200mm - 2 BOILERS	1
M81633	CASCADE SYSTEM - 200mm - ADDITIONAL BOILER	2
M85271	EXTENSION - 80mm X 500mm	4
M85283	EXPANDER 80mm - 100mm	4
M87927	AIR INTAKE FILTER 80/125 CONCENTRIC	4
M70439	ROOF TERMINAL - 200mm	
M70402	EXTENSION - 200mm X 1000mm	
M70404	EXTENSION - 200mm X 2000mm	
M70411	ELBOW 200mm - 90°	
M70412	ELBOW 200mm - 45°	
M87198	WALL CLAMP - 200mm	

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CASCADE FLUE SYSTEM FOR 4 APPLIANCES				
	MODELS			
	CPM 96 & CPM 116			
	EF100 & EF120			
	150 mm HEADER – 200 mm FLUE			
	Maximum Equivalent Flue Length = 50 Metres (All Models)			
	Deduct 1.1 metres for each 150 mm 90° Bend Deduct 3.3 metres for each 200 mm 90° Bend Deduct 1.1 metres for each 150 mm 45° Bend Deduct 1.1 metres for each 200 mm 45° Bend Deduct 4.0 metres for each 1.0 metre of 150 mm dia horizontal length Deduct 1.1 metres for each 1.0 metre of 200 mm dia horizontal length			
Each Flue Kit includes all items marked as Std Spec				
Part No	Description	Std Spec		
M70342	EXPANDER 150mm - 200mm	1		
M81630	CASCADE SYSTEM - 150mm - 2 BOILERS	1		
M81631	CASCADE SYSTEM - 150mm - ADDITIONAL BOILER	2		
M87957	AIR INTAKE FILTER 100/150 CONCENTRIC	4		
M70439	ROOF TERMINAL - 200mm			
M70322	EXTENSION - 150mm x 1000mm			
M70324	EXTENSION - 150mm x 2000mm			
M70402	EXTENSION - 200mm X 1000mm			
	EXTENSION - 200mm X 2000mm			
	ELBOW 200mm - 90°			
	ELBOW 200mm - 45°			
M87198	WALL CLAMP - 200mm			

CASCADE FLUE SYSTEM FOR 4 APPLIANCES MODELS CPM 96 & CPM 116 EF100 & EF120 200 mm HEADER – 200 mm FLUE Maximum Equivalent Flue Length = 50 Metres (All Models) Deduct 3.3 metres for each 90° Bend Deduct 1.5 metres for each 45° Bend Deduct 1.1 metres for each 1.0 metre of 200 mm dia horizontal length Each Flue Kit includes all items marked as Std Spec Part No Description **Std Spec** M81632 CASCADE SYSTEM - 200mm - 2 BOILERS 1 M81633 CASCADE SYSTEM - 200mm - ADDITIONAL BOILER 2 M87957 AIR INTAKE FILTER 100/150 CONCENTRIC 4 M70439 ROOF TERMINAL - 200mm M70402 EXTENSION - 200mm X 1000mm M70404 EXTENSION - 200mm X 2000mm M70411 ELBOW 200mm - 90° M70412 ELBOW 200mm - 45° M87198 WALL CLAMP - 200mm