



# Why Vaillant?

Because we offer wall-to-wall solutions for every commercial specification.



Commercial Systems

■ Vaillant **WALL-HUNG COMMERCIAL ecoTEC** range

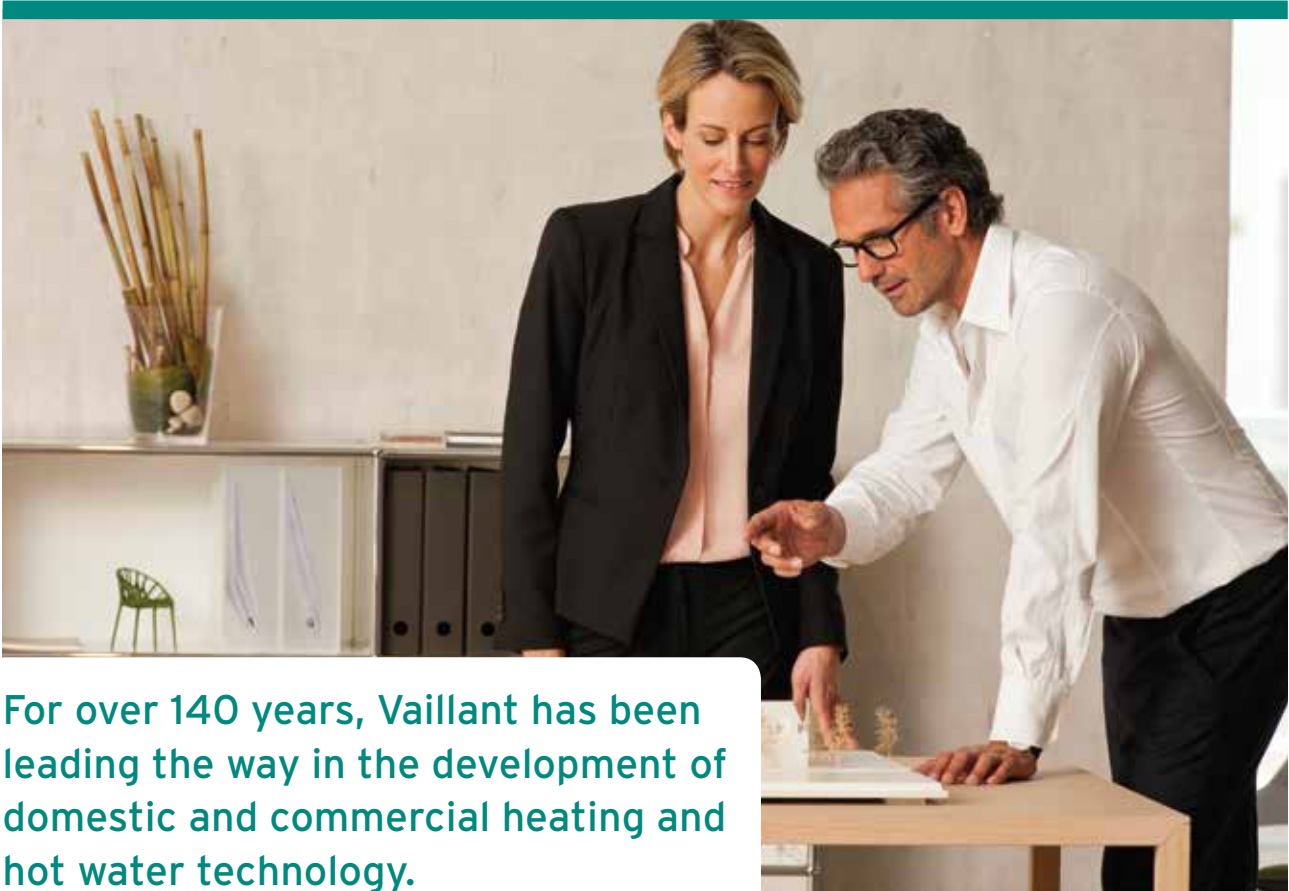
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## Why Vaillant Commercial Systems?



**For over 140 years, Vaillant has been leading the way in the development of domestic and commercial heating and hot water technology.**

### **A family-owned global company**

As a renowned global family-owned company, we have pioneered in manufacturing products that have revolutionised the heating industry and today, our innovative solutions are still setting the standards in the heating marketplace. Vaillant offers a vast selection of products to cater for most applications. Our portfolio consists of large-output wall-hung and floor-standing condensing commercial boilers with compatible cascade rigs and accessories to cater for simple and large-scale projects. For those seeking alternative renewable offerings, our commercial renewable solutions consist of solar thermal and multi-source heat pumps, capable of providing heating and hot water to large-scale commercial applications - see our renewable product range for further information.

### **Pioneering commercial heating and renewable products**

Vaillant is not only looking forward in terms of its products. For just about as long as we've been creating appliances that transform the heating industry, we've also been focusing on developing

better and more productive relationships with you - our customers.

That's because we know that the partnerships we establish with specifiers, consultants, engineers and installers are key to our continued future success - and the success of our partners' businesses.

### **Unwavering service**

The commercial industry's most advanced heating solutions go hand-in-hand with the industry's most developed and forward-thinking service solutions. At Vaillant there's an unwavering commitment to providing service excellence before, during and after the installation of the Vaillant appliance. In fact, we look after the project from conception to solution and, through our unrivalled service back up, afterwards as well.

### **Europe's leading heating technology manufacturer**

These combined objectives - to deliver the best products and to provide the best service to you - are the twin driving forces that keep Vaillant out in front as Europe's market-leading heating technology manufacturer.



**Vaillant Commercial System's ecoTEC 46, 65, 80, 100 and 120 are high efficiency condensing gas boilers. With a host of built-in features, installation and servicing of the ecoTEC range is very straightforward.**

Compact with a comprehensive range of flues, fittings and accessories means Vaillant ecoTEC boilers can be sited almost anywhere. For larger or more complex buildings, multiple boilers can be fitted in cascade formations in various configurations, providing a highly efficient heating system.

- Stainless steel heat exchanger
- High efficiency ErP compliant shunt pump
- ErP rating 'A'
- Pressure sensor to monitor system pressure via diagnostics
- Flow sensor to monitor water flow through boiler
- Air separator with auto air vent and filter for bleeding system and filtering of fine particles
- Production to ISO 9001
- Five-year guarantee as standard, subject to conditions
- Flue gas and air analysis points
- LPG conversion available for 46, 80, 100 and 120 models
- 0 - 10 V compatible for BEMS systems (via VR 34 accessory)
- Range of eBUS controls including weather compensation available

Why Vaillant?



**Vaillant's Commercial Systems draw on 140 years of experience in the domestic world to ensure our large-output boilers and system accessories offer the highest efficiency and adaptability. Our customers can be assured they are installing the very best solution for their heating and hot water requirements.**

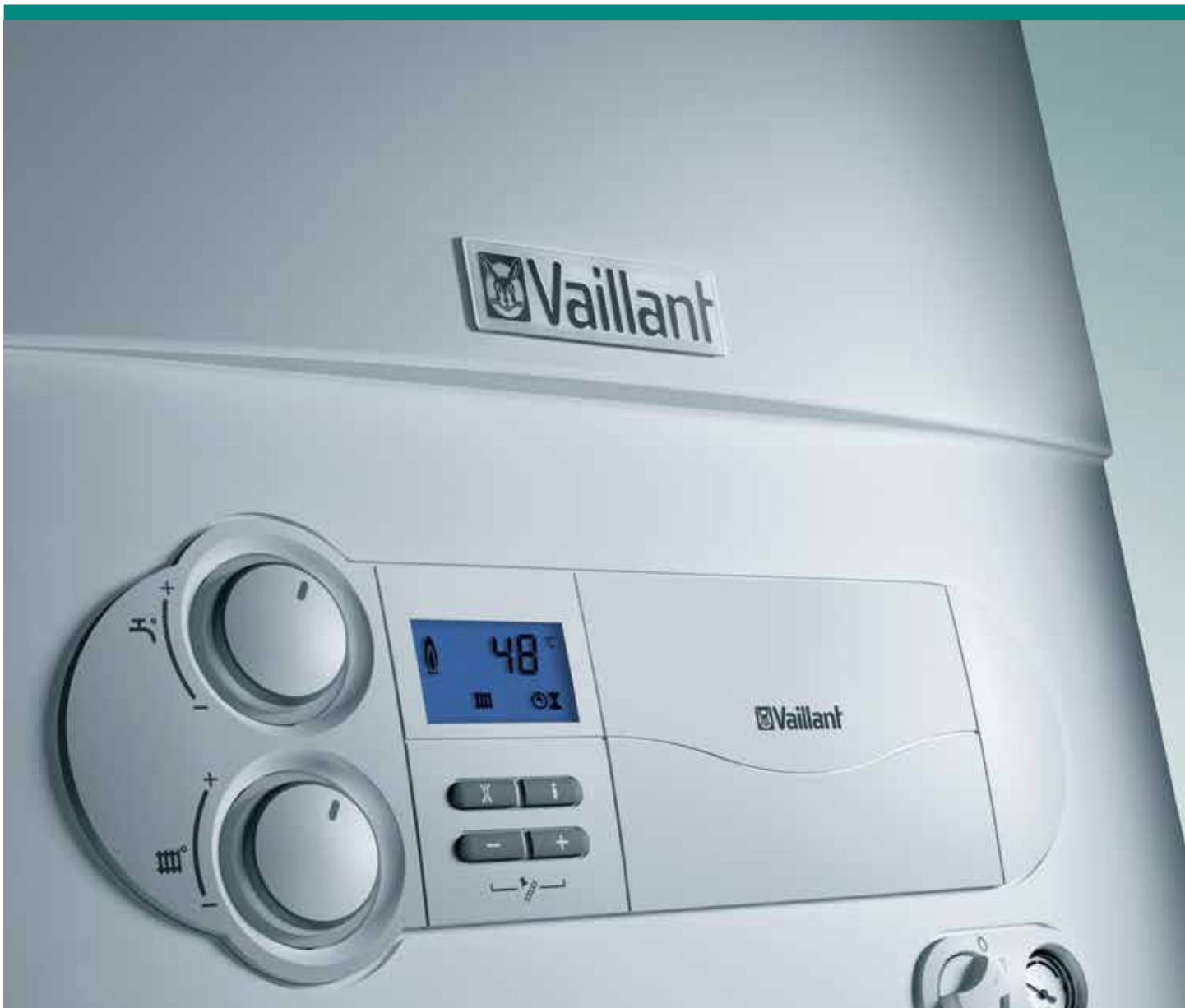
The world is changing and just as we recognise the importance of developing ever-more sustainable heating solutions for the home, Vaillant is also harnessing its unrivalled expertise to deliver these same technological advances to the commercial heating environment.

For instance, we have developed a range of large-output boilers that has the ability to cascade and has been designed to specifically meet the requirements of a commercial installation.



Furthermore, Vaillant is leading the way in commercial systems that utilise renewable energy sources.

Note: All Vaillant ecoTEC 46, 65, 80, 100 and 120kW boilers and ecoCRAFT boiler systems will require appropriately sized expansion vessels to be fitted to accommodate thermal expansion of the system water.



With a whole host of built-in features, making them suitable for large domestic or light commercial systems, the installation and servicing of ecoTEC commercial boilers could not be more straightforward. Lightweight for its class with a compact design and a comprehensive range of flues, fittings and accessories, the ecoTEC boiler can be sited almost anywhere. For larger buildings, or buildings with more complex layouts, multiple boilers can be installed in cascade to provide a highly effective and extremely efficient heating system. They are configured to automatically optimise heat and hot water supply according to the demands on the system at any particular time.



## Easy installation

Model	Case dimensions	Heat output range 50/30°C	Heat output range 80/60°C
ecoTEC 46	800mm (H) x 480mm (W) x 450mm (D)	12.9 - 46.4kW	12.3 - 44.1kW
ecoTEC 65	800mm (H) x 480mm (W) x 472mm (D)	14.6 - 67.6kW	13.7 - 63.7kW

Connections
1 1/4" female BSP flow and return service valves
1" female BSP gas service valve
20mm gas connection with adapter for 1" (ecoTEC 46)
25mm gas connection with adapter for 1" (ecoTEC 65)
Pressure safety valve outlet: 3/4" female BSP (ecoTEC 46) 1" female BSP (ecoTEC 65)
Condensate trap connection = 19mm ID Combined filling/emptying valve on return pipe Built-in condensate trap (ecoTEC 46) Built-in siphonic condensate discharge (ecoTEC 65 only)
0 - 10v compatible for BEMS applications via VR 34 accessory
Both models have built-in high efficiency shunt pumps

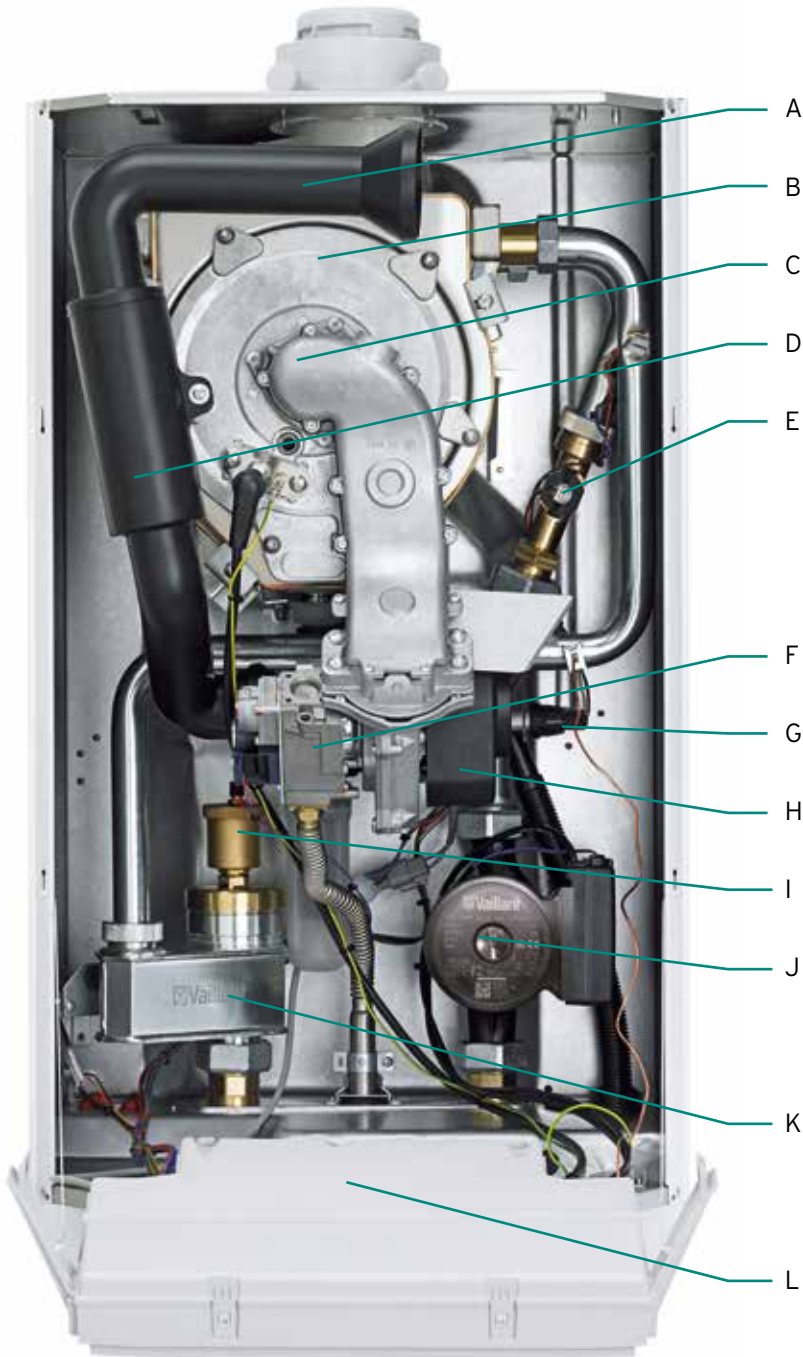
Features	Benefits
High-quality stainless steel heat exchangers	Offers more resistance to oxidation, seizing, corrosion and fouling and are easier to keep clean
All major components built-in	Easy installation. Also includes energy-saving two-stage frost protection system, pressure sensor to monitor system pressure via diagnostics and a flow sensor
Fully modulating low NOx burner	Lower NOx emissions are achieved
Built-in status and diagnostics backlit display	Easier boiler management
Easy access to all components from the front, along with a single electronic circuit board and flue gas analysis point	Repairs and servicing are easier than ever
All models are equipped with an air separator with auto air vent and filter	To remove fine particles
A full range of intelligent eBUS controls, including weather compensators and multiple boiler management control systems	To ensure your system is reliable and easy to run, whatever your requirements
LPG conversion kit available (ecoTEC 46 only)	Flexibility where mains gas is not available
Standard 80/120mm flue system	Simple to install

A five year guarantee comes as standard on our Commercial Systems boilers, with two years available on Vaillant rigs and accessories. A full commissioning service is available. Speak to your Vaillant sales representative for more details.



Authorised User No. 00581

ecoTEC 46 - key components



**Key:**

- A. Air intake
- B. Heat exchanger
- C. Burner
- D. Silencer
- E. Flow switch
- F. Gas valve
- G. Pressure switch
- H. Fan
- I. Automatic air vent
- J. High efficiency pump
- K. Air separator
- L. Electronics/PCB

**Service valves**

Flow and return isolation valve



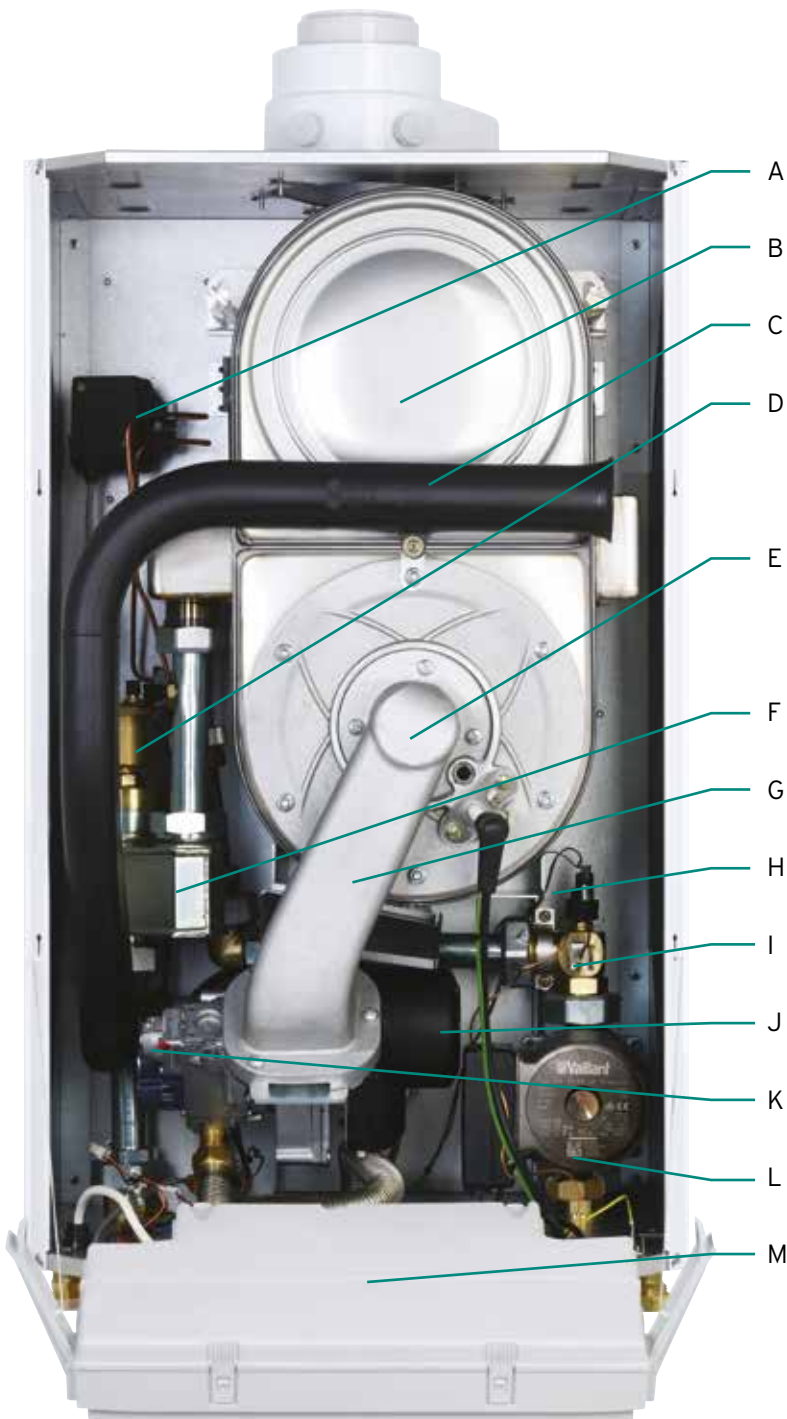
Gas isolation valve

Pressure release valve



All ecoTEC boilers are supplied with the above

ecoTEC 46

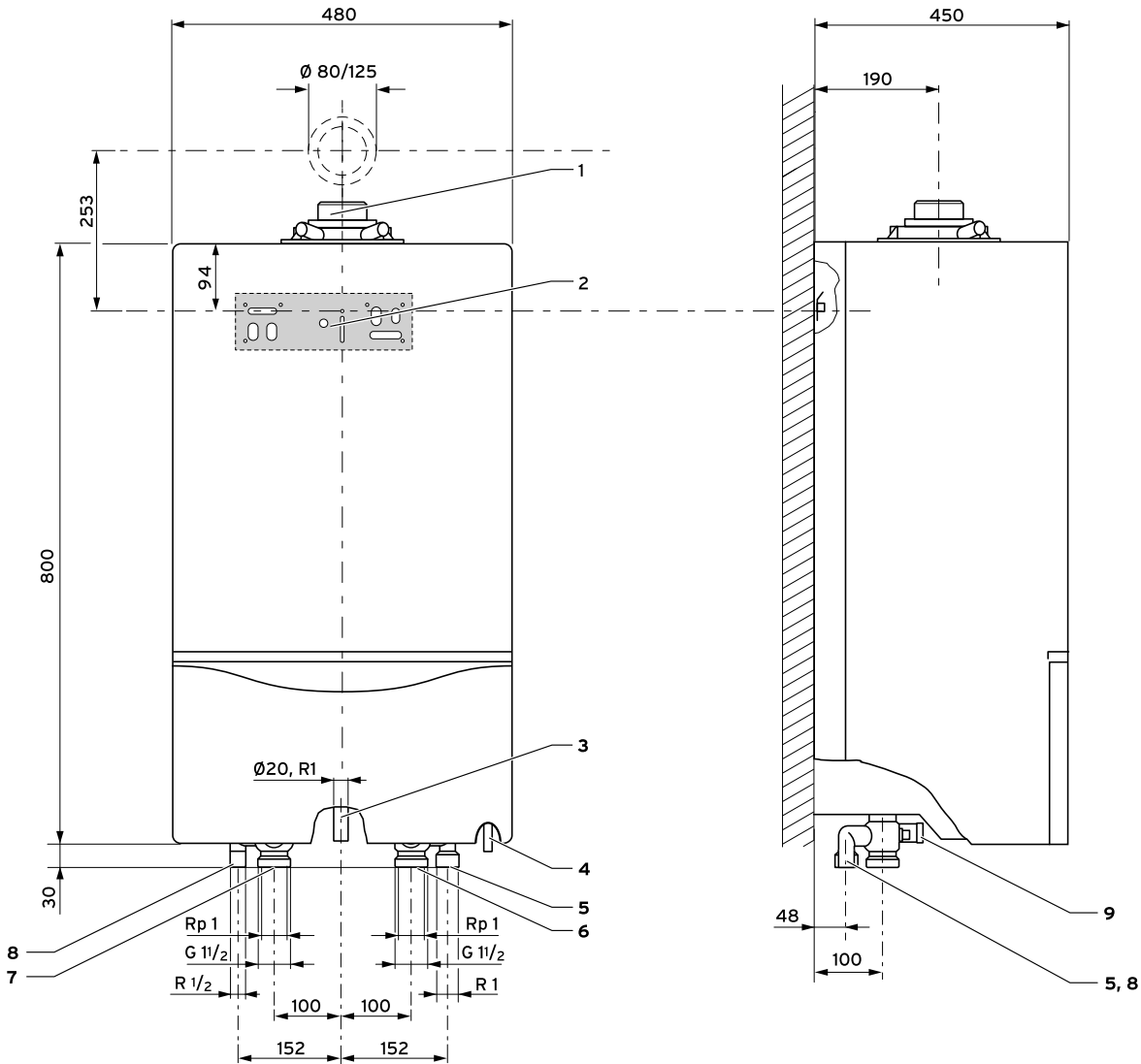


**Key:**

- A. Pressure differential switch
- B. Heat exchanger
- C. Air intake
- D. Auto air vent
- E. Burner
- F. Air separator
- G. Mixing arm
- H. Pressure switch
- I. Flow switch
- J. Fan
- K. Gas valve
- L. High efficiency pump
- M. Electronics/PCB

ecoTEC 65

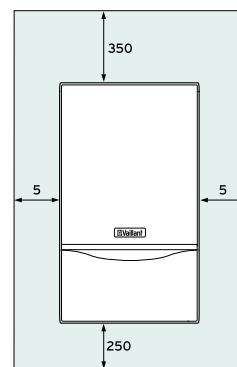
ecoTEC 46 - connections and dimensions



Connection dimensions in mm

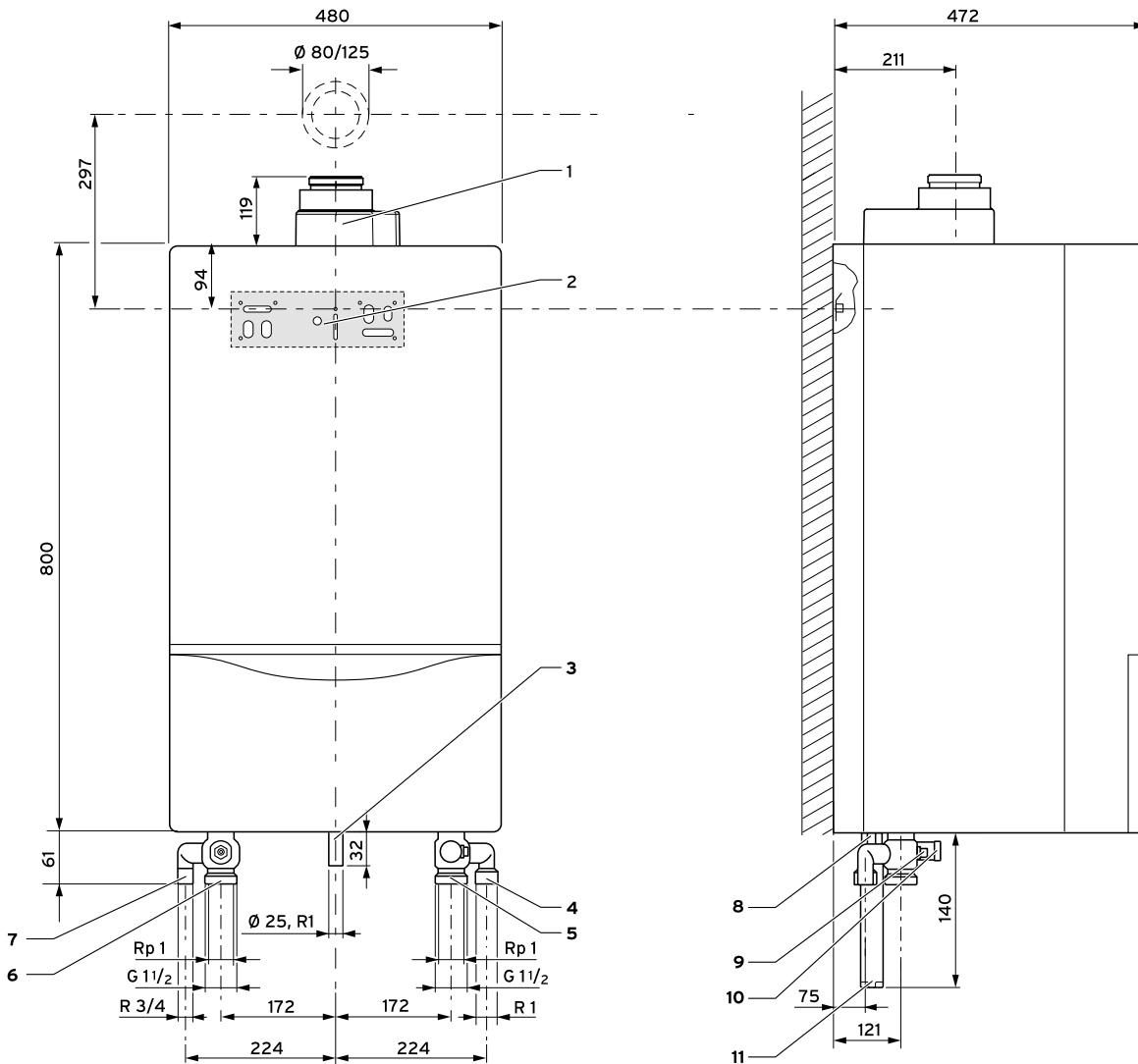
Key:

1. Flue gas connection, 80/125mm diameter, dimension A (hanging bracket - centre of air/flue gas pipe) with 87° elbow: 253mm
2. Hanging bracket
3. Gas pipe, 20mm diameter, gas connection R1"
4. Connection for condensate drain pipework
5. Connection for expansion vessel
6. Connection for heating return
7. Connection for heating flow
8. Connection for expansion relief valve
9. Filling device (combined filling and emptying valve)



Required minimum gaps/assembly clearances

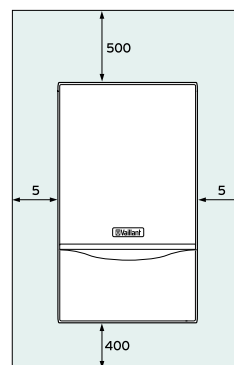
Once installed, it is not necessary to ensure a particular clearance between the boiler and combustible materials or components as the boiler will always be less than 85°C at its rated heating output. You do need a minimum of 500mm clearance in front of the boiler to enable easy access for servicing. This may be provided by an accessible door.



### Connection dimensions in mm

#### Key:

1. Flue gas connection, 80/125mm diameter, dimension A (hanging bracket - centre of air/flue gas pipe) with 87° elbow: 297mm
2. Hanging bracket
3. Gas pipe, 25mm diameter, gas connection R1"
4. Connection provision for expansion vessel
5. Connection for heating return
6. Connection for heating flow
7. Connection provision for expansion relief valve
8. Connection for condensate drain pipework
9. Flow line drainage opening
10. Connection provision for filling (combined filling and emptying valve)
11. Siphon cartridge



### Required minimum gaps/assembly clearances

Once installed, it is not necessary to ensure a particular clearance between the boiler and combustible materials or components as the boiler will always be less than 85°C at its rated heating output. You do need a minimum of 500mm clearance in front of the boiler to enable easy access for servicing. This may be provided by an accessible door.



Vaillant is pushing back the technological boundaries to provide commercial wall-hung boiler solutions that are bigger and better than ever before. Incorporating all the same high performance and efficiency features as its smaller domestic counterparts, the ecoTEC range offers superb outputs of 80kW, 100kW and 120kW with the ability to cascade up to 960kW. A wall-to-wall solution for every commercial specification.

## Easy installation

Model	Case dimensions	Heat output range 50/30°C	Heat output range 80/60°C
ecoTEC 80	960mm (H) x 480mm (W) x 602mm (D)	16.5 - 82.3kW	14.9 - 74.7kW
ecoTEC 100		20.7 - 102.8kW	18.8 - 93.3kW
ecoTEC 120		24.7 - 123.4kW	22.4 - 112kW

Connections
1 1/4" female BSP flow and return service valves
1" female BSP gas service valve
Pressure safety valve outlet - 1" female BSP
Condensate trap beneath boiler for easy access
Combined filling/emptying valve on return pipe
Condensate trap with flexible pipe 22mm OD (19mmID).
Energy saving two-stage frost protection
0 - 10v compatible for BEMS applications (via VR 34 accessory)
High efficiency head shunt pump (available as an accessory)
Pressure sensor to monitor system pressure via diagnostics
Flow sensor to monitor water flow through boiler
Auto air vent
Push-fit flue system
Full range of intelligent eBUS controls including weather compensators and multiple boiler management controls available

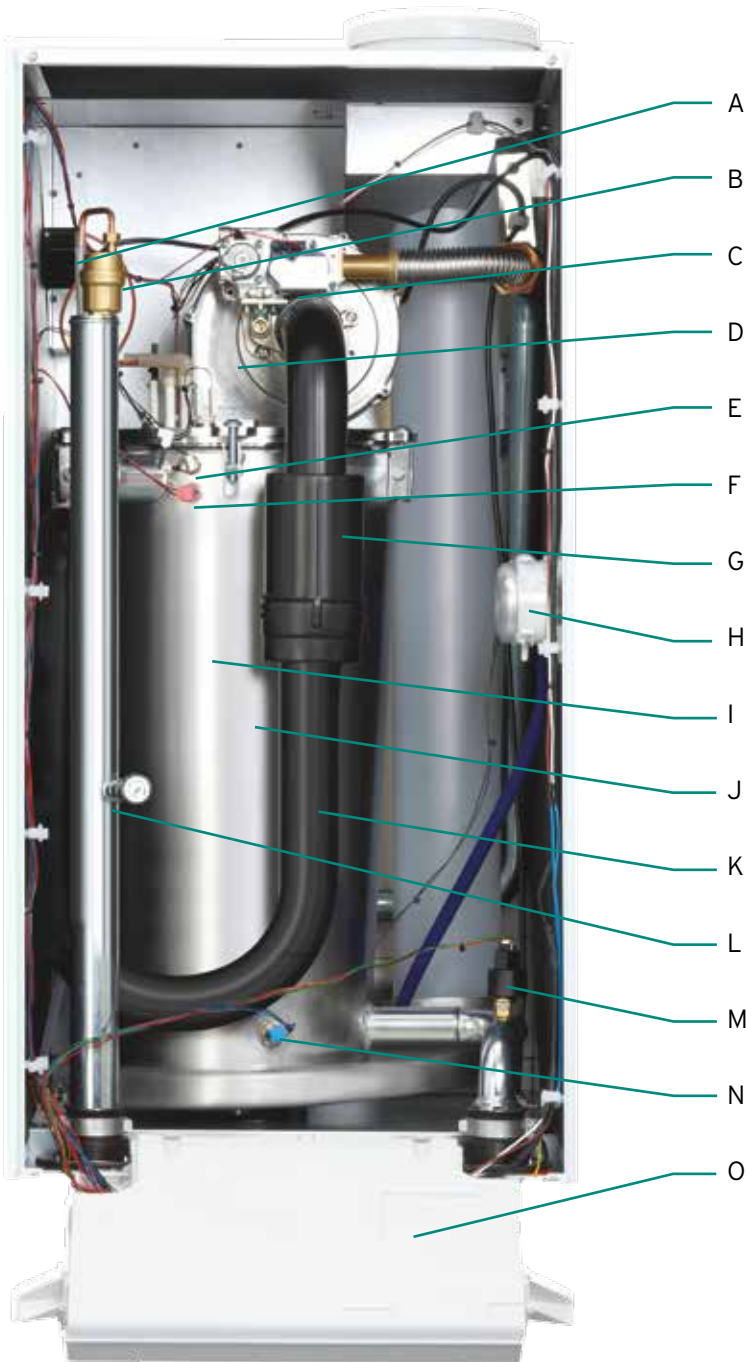
Features	Benefits
High-quality stainless steel heat exchangers	Offers more resistance to oxidation, seizing, corrosion and fouling and are easier to keep clean
All major components built-in	Easy installation. Also includes energy saving two-stage frost protection system, pressure sensor to monitor system pressure via diagnostics and a flow sensor
Fully modulating low NOx burner	Lower NOx emissions are achieved
Built-in status and diagnostics backlit display	Easier boiler management
Easy access to all components from the front, along with a single electronic circuit board and flue gas analysis point	Repairs and servicing are easier than ever
All models are equipped with an air separator with auto air vent	To continuously remove fine air bubbles from system water
A full range of intelligent eBUS controls, including weather compensators and multiple boiler management control systems	To ensure your system is reliable and easy to run, whatever your requirements

A five-year guarantee comes as standard on our Commercial Systems boilers, with two years available on Vaillant rigs and accessories. A full commissioning service is available. Speak to your Vaillant sales representative for more details.



Authorised User No. 00581

ecoTEC 80, 100 and 120 - key components



**Key:**

- A. Ignition transformer
- B. Automatic air vent
- C. Gas valve
- D. Fan
- E. Flow STL
- F. Flow NTC
- G. Silencer
- H. Flue gas pressure switch
- I. Burner (inside heat exchanger)
- J. Heat exchanger
- K. Air intake
- L. Pressure gauge
- M. Water pressure sensor
- N. Return NTC
- O. Electronics/PCB

**Service valves**

Flow and return isolation valve



Gas isolation valve

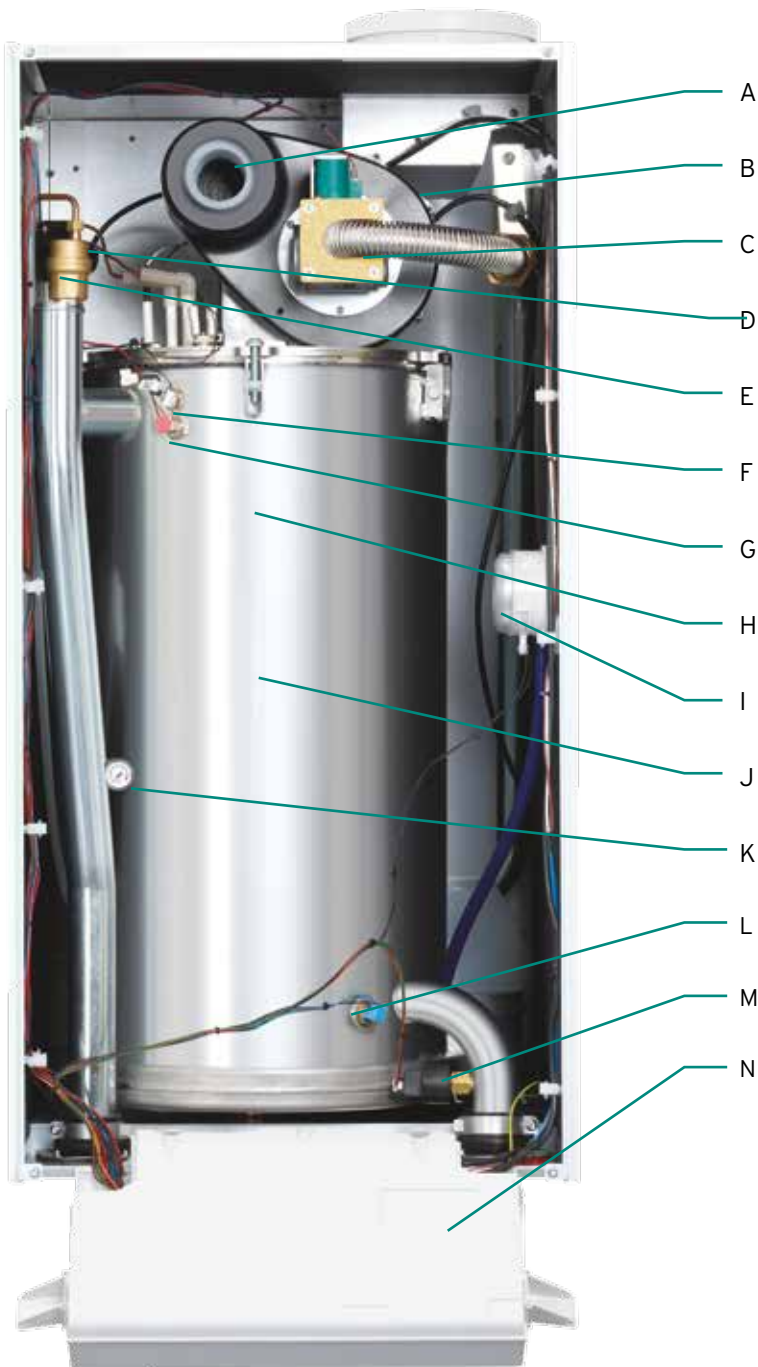
Pressure release valve



All ecoTEC 80, 100 and 120 boilers are supplied with the above

ecoTEC 80





**Key:**

- A. Air intake
- B. Fan
- C. Gas valve
- D. Ignition transformer
- E. Automatic air vent
- F. Flow STL
- G. Flow NTC
- H. Burner (inside heat exchanger)
- I. Flue gas pressure switch
- J. Heat exchanger
- K. Pressure gauge
- L. Return NTC
- M. Pressure sensor
- N. Electronics/PCB

ecoTEC 100 and 120

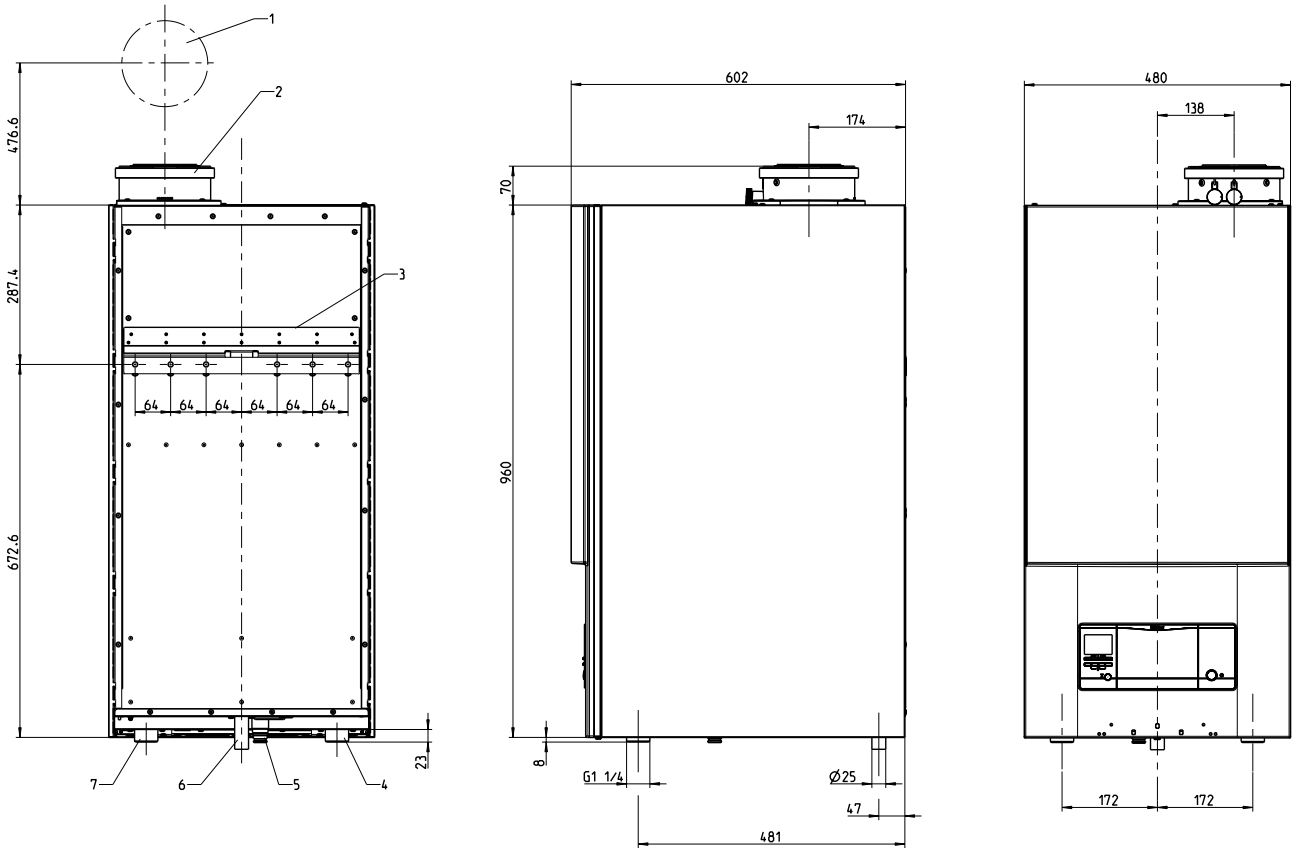
Pump group  
(includes pump  
and insulation)

Pump BOM  
Article number  
0020175314



Available as an accessory

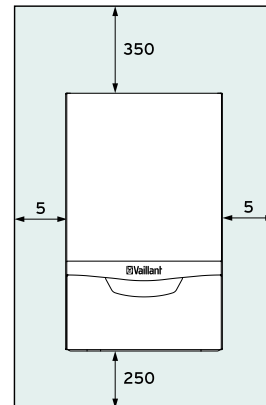
ecoTEC 80, 100 and 120 connections and dimensions



Connection dimensions in mm

Key:

- 1. 180mm (diameter) core hole
- 2. Flue turret
- 3. Hanging bracket
- 4. Boiler flow
- 5. Condensate drain
- 6. Gas pipe
- 7. Boiler return

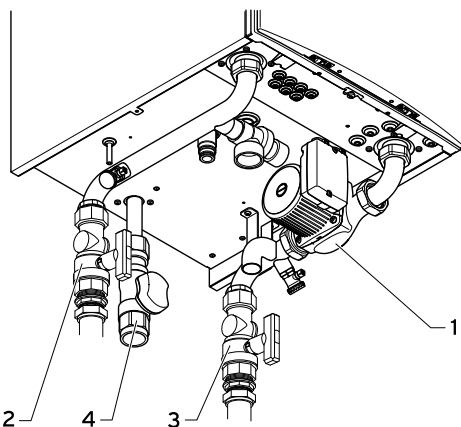


Required minimum gaps/assembly clearances

Once installed, it is not necessary to ensure a particular clearance between the boiler and combustible materials or components as the boiler will always be less than 85°C at its rated heating output. You do need a minimum of 500mm clearance in front of the boiler to enable easy access for servicing. This may be provided by an accessible door.

Connections:

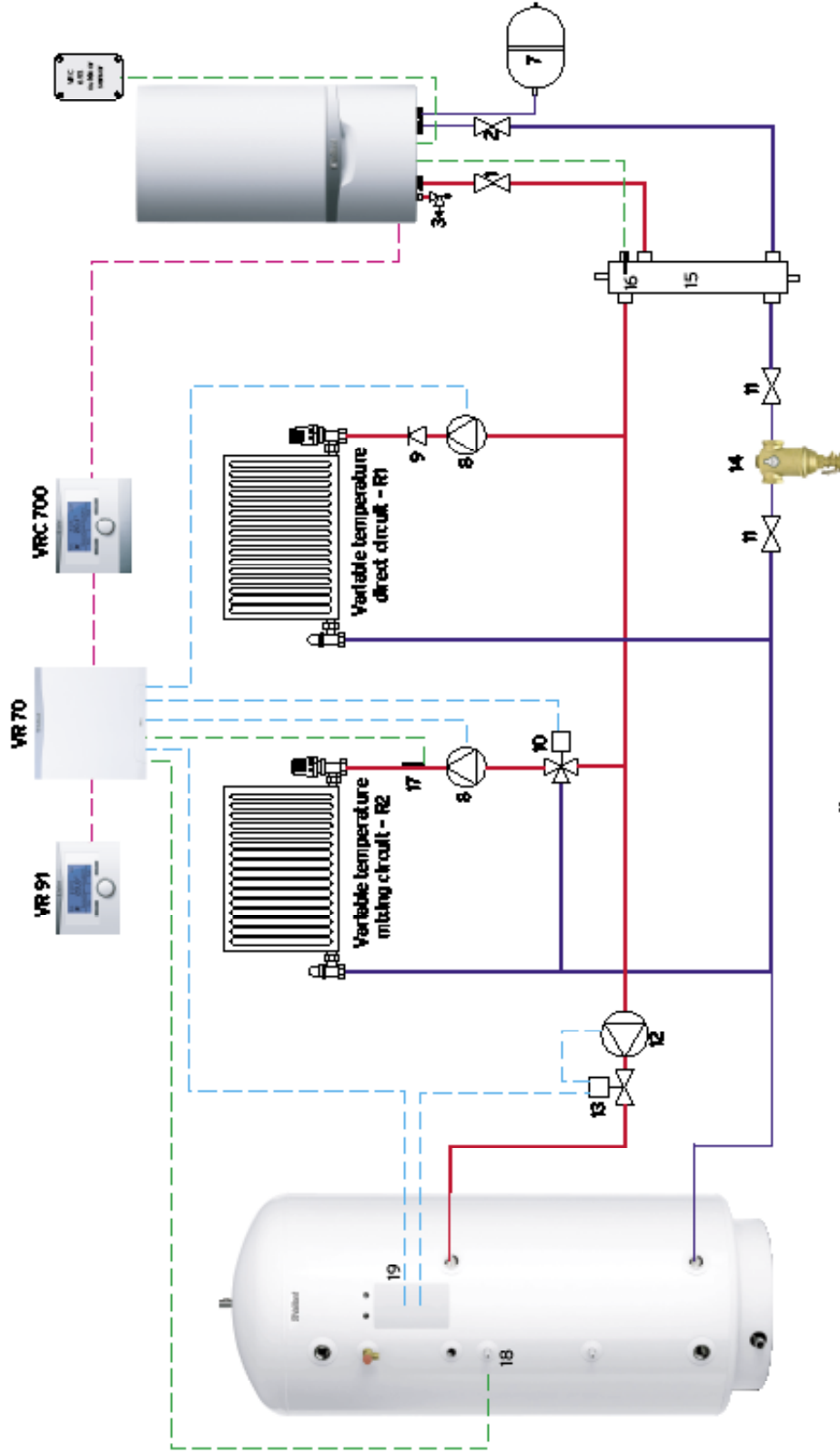
- 1. Pump group
- 2. Heating flow
- 3. Heating return
- 4. Gas valve



ecoTEC technical specification		46	65	80	100	120
Article number		0010017819	0010017820	0010010767	0010010780	0010010791
	unit					
Heat output range Nat Gas G20 at 20mb (kW)	80/60	12.3 - 44.1	13.8 - 63.7	14.9 - 74.7	18.7 - 93.3	22.4 - 112.0
	50/30	12.9 - 46.4	14.6 - 67.6	16.5 - 82.3	20.7 - 102.8	24.7 - 123.4
Conversion to LPG G31 - 37mb Only by Vaillant Service (kW)	80/60	12.5 - 45.0	Not available	37.4 - 74.7	46.7 - 93.3	56.0 - 112.0
	50/30	12.5 - 46.4	Not available	41.2 - 82.3	51.4 - 102.8	61.7 - 123.4
Maximum heat input (net)	kW	46.0	65.0	76.2	95.2	114.3
Modulation ratio - N : 1	%	3.6 : 1 (28%)	4.6 : 1 (22%)	5.0 : 1 (20%)	5.0 : 1 (20%)	5.0 : 1 (20%)
Seasonal efficiency* Band A	NG %	95.8	95.5	95.6	95.9	96.0
	LPG	98.0	Not available	97.9	98.0	98.1
Net efficiency 100%	80/60	98.4	98.0			
Net efficiency 30%	50/30	108.3	108.2	108.3	108.5	108
Gas working pressure NG /LPG	mbar	20 / 37	20 / -	20 / 37		
Nominal gas consumption G20 at 150C 1013mb G31	m <sup>3</sup> /h	4.8	6.9	8.1	10.1	12.1
	kg/h	3.5	Not available	5.92	7.40	8.88
NOx class 5 - 0% oxygen - dry	mg/kWh	36	36	39	36	38
Min/Max. flow temp	°C	35 / 85				
Nominal CH flow rate Δ t = 20 K	L/hr	1940	2750	3440	4300	5160
The boilers operate variable Δ t from 28 Kelvin down to 11 Kelvin. To obtain correct system flow use Low-loss plate or Low-loss header from page 37						
Pump head without check valve	mbar	180	250	600	480	320
Pump head with check valve	mbar	150	190	520	400	240
Condensate - max - PH 3.5-4.0	L/hr	4.5	6.5	12.8	16	19.2
Stand-by los Δ t = 50 K	%	< 2				
Max power consumption	W	165	245	345	355	355
Power - stand-by/IP rating	W	< 2 (230v/50Hz/4A/IP x 4D)				
Noise level - load EN 15036-1 dB(A) re1pW	Full	45	54	54.4	62.3	60.6
	Part	36	45	33.8	36.3	37.8
Dimensions - H x W x D	mm	800 x 480 x 450	800 x 480 x 472	960 x 480 x 603		
Dry weight (inc pump 46/65)	kg	46	75	68	86	90
Internal water capacity/quality must be kept clean and free of debris	L	4.5	6.5	17.0	23.7	22.5
	PH Min/max	6.5 - 8.5 (for systems that may contain aluminium)				
Flue - concentric	mm	80 / 125		110 / 160		
Connection size (B23p)	mm	80		110		
Certification for GB		C13, C33, C43, C53, C93, B23, B23p, B53, B53p				
Max length horizontal concentric	m	18	15	22	20	11
Max length vertical concentric	m	21	18	24	18	9
Flue mass flow Qmax G20	g/s	20.5	30.3	34.7	43.4	52.1
Flue gas temperature min/max	°C	40 / 70		40 / 85		
Fan duty B23p in single	Pa	125	190	150	200	
Fan duty B23p in cascade	Pa	50				
Connections - flow and return	BSP	1-1/4"				
Gas connection	BSP	1"				
Condensate connection pipe	Ø mm	24mm OD				
Pressure relief valve size Min / Max operating pressure	BSP bar	3/4" 0.8 / 3	1" 0.8 / 3	1" 0.8 / 6		
High efficiency pump (EEI ≤0.23)		Built-in to boiler		Available as accessory: 0020175314		

ecoTEC 46 - 120 - schematic

A typical sinale boiler installation



Key

1. Boiler flow isolation valve (supplied only with ecoTEC)
2. Boiler return isolation valve (supplied only with ecoTEC)
3. Boiler safety valve (supplied only with ecoTEC)
4. Boiler shunt pump (supplied internally with ecoTEC-46 & 65, available as an accessory with ecoTEC 80, 100 & 120 ranges)
5. Single check valve
6. Primary pressurisation unit (available as an accessory)
7. Primary expansion vessel (available as an accessory)
8. Heating pumps
9. System check valve
10. Heating circuit mixing valve
11. Service valves (not supplied by Vaillant)
12. Cylinder primary pump
13. Cylinder modulated valve (not supplied by Vaillant)
14. Dirt separator or strainer (available as an accessory)
15. Low-loss header (available as an accessory)
16. Low-loss header (supplied with low-loss header)
17. Heating circuit VR 10 sensor (supplied with VR 70 wiring centre)
18. Cylinder VR 10 sensor (supplied with VR 70 wiring centre)
19. Cylinder high limit thermostat (supplied only with UNISTOR cylinders)

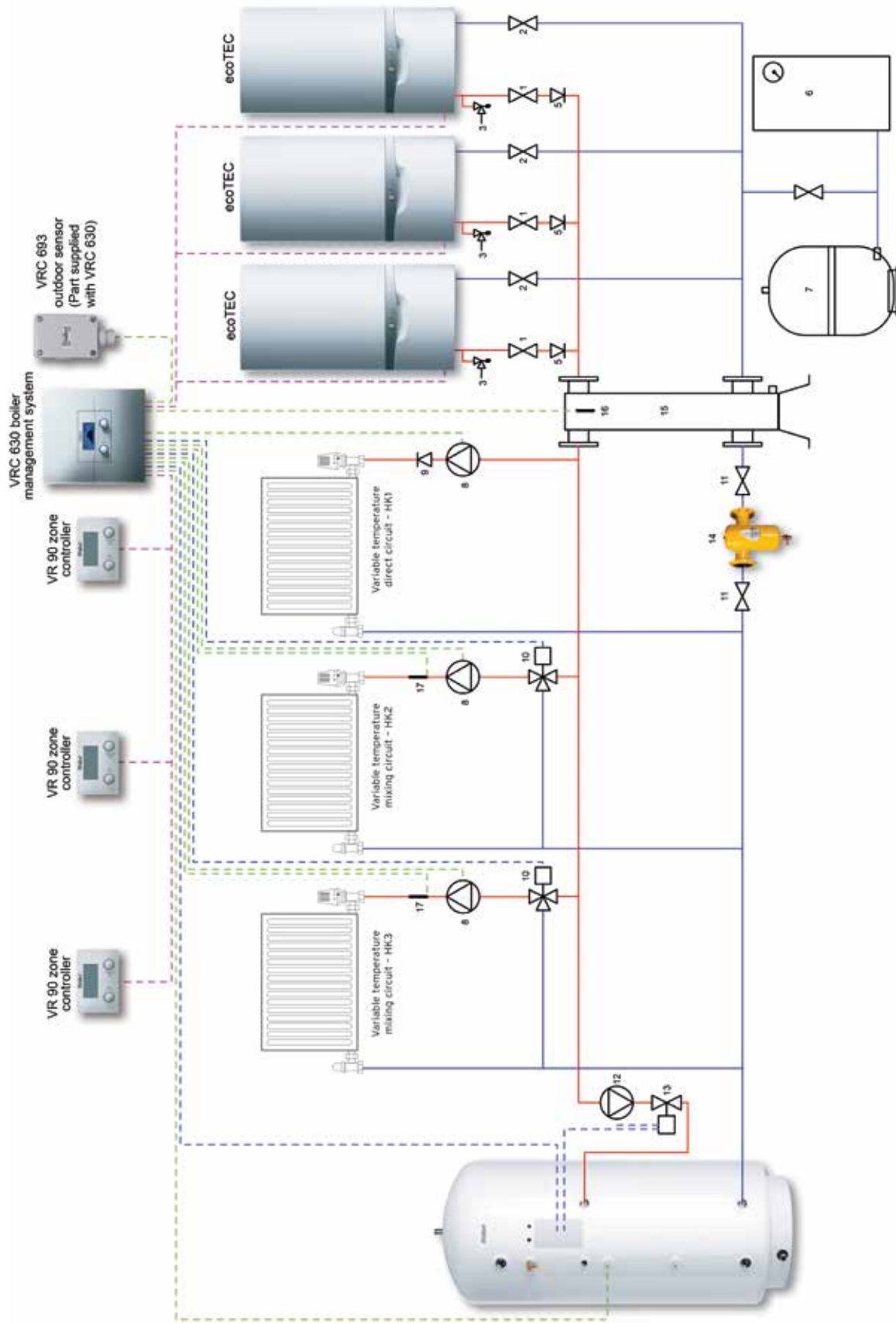
Note: Items are not supplied by Vaillant unless stated

- Note:
1. Vaillant strongly recommends the installation of a suitably sized dirt separator in the return pipe work to the header or system as per part 10 to the heat exchanger, particularly in the case of old systems.
  2. The schematic drawings depicted in this brochure are a suggested layout of a typical system and should not be solely relied upon as a definitive design.

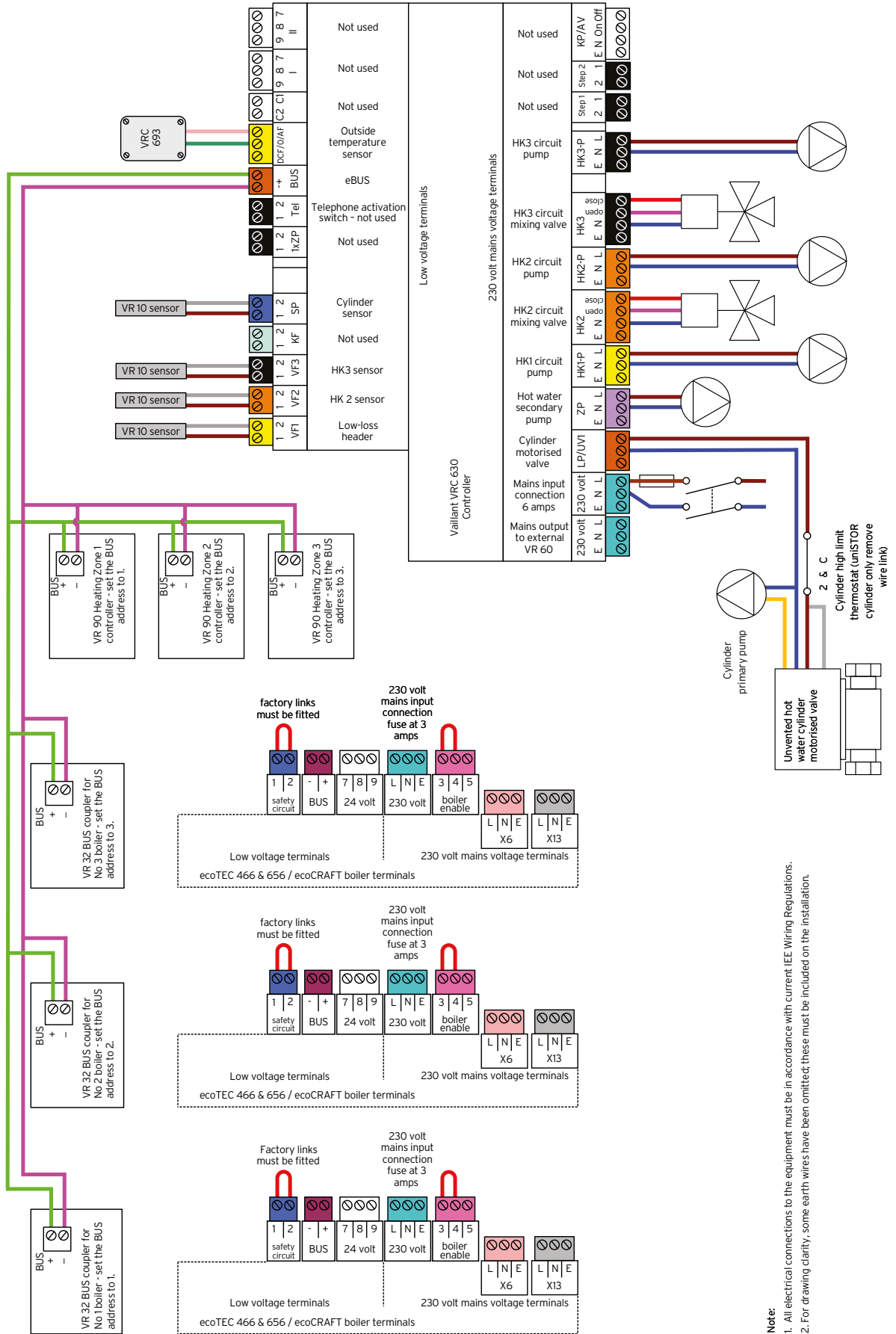




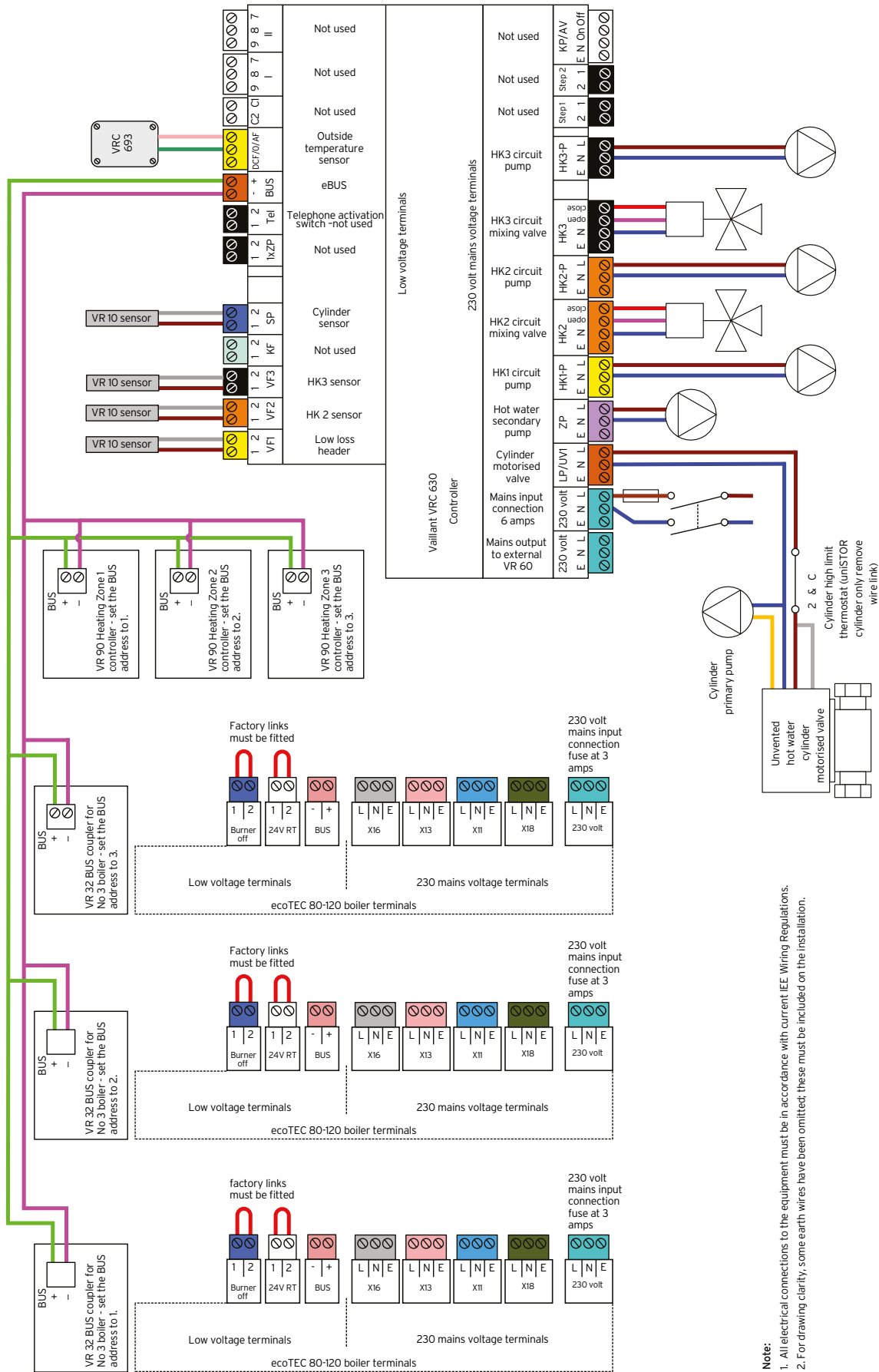
A typical cascade boiler installation



ecoTEC 46 and 65 - wiring diagram







## ecoTEC 46 and 65 single appliance flue accessories

## Overview

To complement the wide range of wall-hanging boilers available, Vaillant offers a selection of flue system components that can be specified according to the requirements of the installation. Vaillant's proprietary components have been designed to perfectly match each model of boiler and should be used to ensure full compliance with the necessary certification for each installation.

These flue components include concentric horizontal and vertical flues. The 80/125mm size is suitable for the ecoTEC 46 and 65 vertical and horizontal terminals along with 87° and 45° elbows. For terminations requiring an outdoor run of flue pipe, Vaillant can supply a vertical facade flue system with the external components manufactured in stainless steel. These are shown in the following pages.

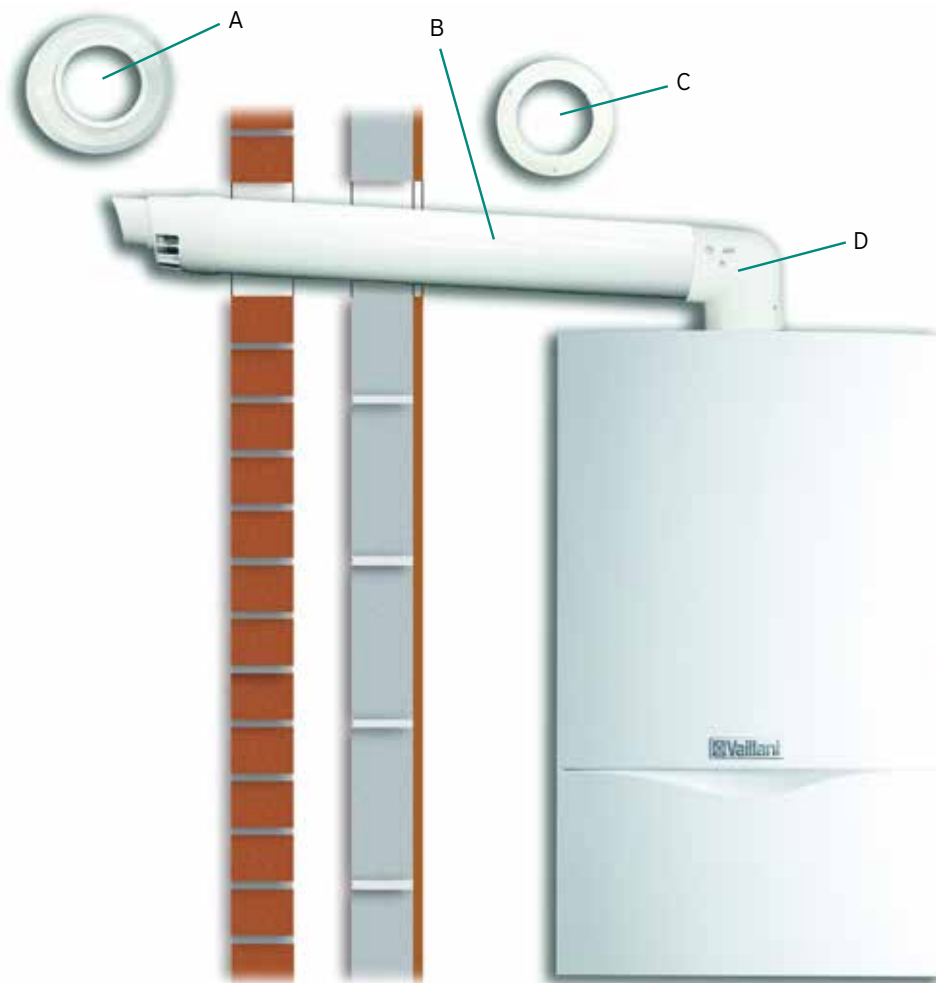
Where non-Vaillant flue systems are used, adequate provision must be made by the flue provider to allow removable access of flue components for repair/service. If no means of access or removal is provided, responsibility lies with the flue provider.

High efficiency flue accessories 80/125mm	Article number
Horizontal air/flue duct inc. elbow and terminal	303209
Vertical air/flue duct and terminal	303200
87° elbow	303210
45° elbow (2 in box)	303211
Air/flue duct extension (470mm)	303202
Air/flue duct extension (970mm)	303203
Air/flue duct extension (1970mm)	303205
Sliding sleeve	303215
Flue support clips (pack of 5)	303616
Pitched roof adjustable roof tile	009076
Flexible roof seal	303980
Flat roof penetration collar	009056

ecoTEC Model	1 boiler	Multiple boilers on a cascade flue system
ecoTEC 46	80/125mm Concentric	Bespoke cascade flues should make use of the 80mm non-return valve Article number <b>303960</b> . May be omitted if system designed to EN 13384-2 with draught exceeding system pressure loss.
ecoTEC 65	80/125mm Concentric	

Further information can be found at [www.vaillantcommercial.co.uk](http://www.vaillantcommercial.co.uk)

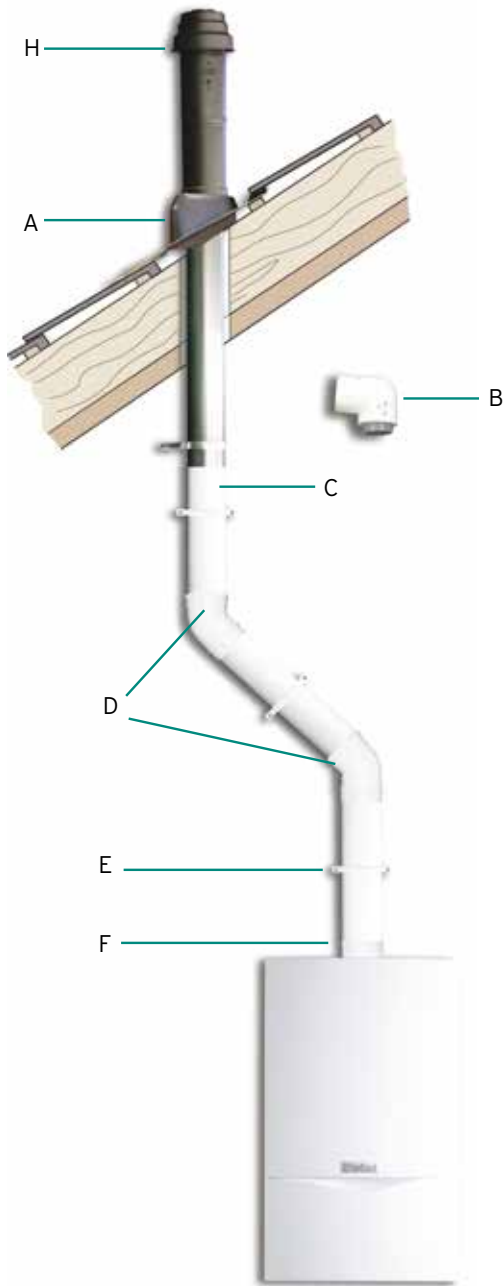
Maximum horizontal flue length		
	ecoTEC 46	ecoTEC 65
Maximum permissible length of concentric flue	18.0m plus 1 elbow, 87°	15.0m plus 1 elbow, 87°
	Maximum length of flue is reduced by 2.5m for each additional 87° elbow Maximum length of flue is reduced by 1.0m for each additional 45° elbow	



80/125mm concentric horizontal flue

Key	125mm horizontal flue	Article number
A	Outer rosette	303209
B	Terminal duct - 970mm to face of wall	
C	Inner rosette	
D	87° elbow	

Vertical flue accessories

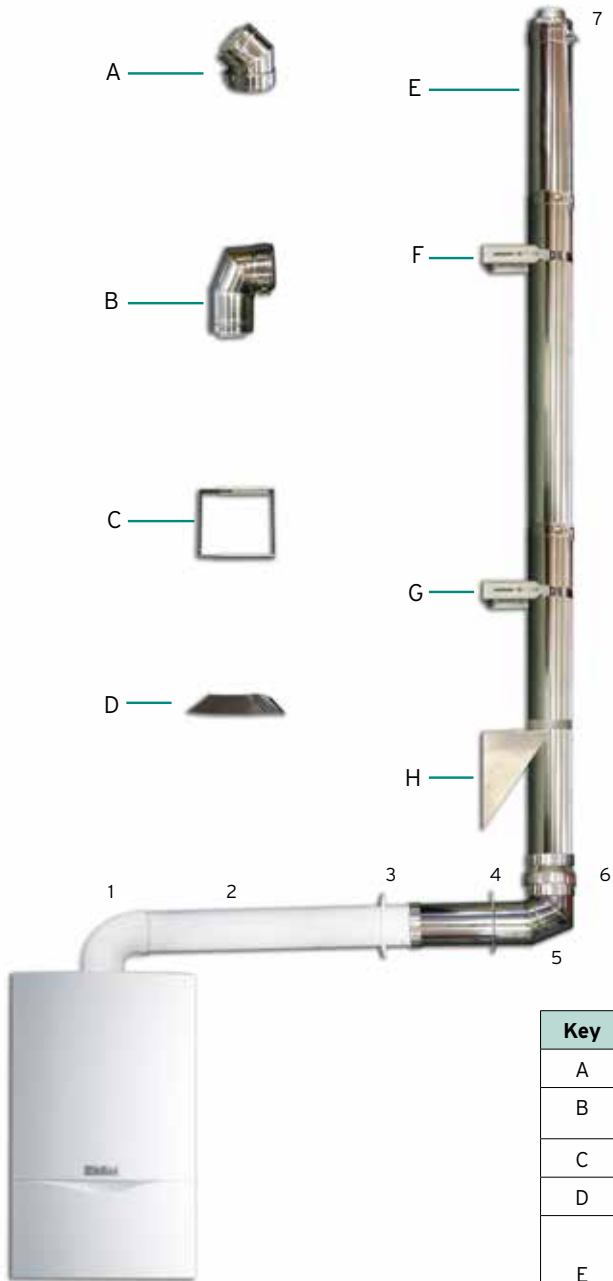


80/125mm concentric vertical flue

	ecoTEC 46	ecoTEC 65
Maximum permissible length of concentric flue	21.0m without elbow	18.0m without elbow
	Maximum length of flue is reduced by 2.5m for each additional 87° elbow	
	Maximum length of flue is reduced by 1.0m for each additional 45° elbow	



Key	125mm vertical flue	Article number
A	Pitched roof adjustable roof tile	009076
B	87° elbow	303210
C	Air/flue duct extension (470mm)	303202
	Air/flue duct extension (970mm)	303203
	Air/flue duct extension (1970mm)	303205
D	45° elbow - pack of 2	303211
E	Flue support clips - pack of 5	303616
F	Sliding sleeve	303215
G	Flat roof penetration collar	009056
H	Vertical air/flue duct and terminal	303200
I	Lead slate penetration seal for pitched roofs	303980



80/125mm concentric stainless steel facade flue

	ecoTEC 46	ecoTEC 65
Maximum permissible length of concentric flue gas pipe	22.0m plus 3 x 87° elbows and support elbow	22.0m plus 3 x 87° elbows and support elbow
	Air intake piece positioned no further than 4m from the connection with the boiler	

Key	125mm PP stainless steel facade flue	Article number
A	45° elbow - pack of 2	can be used to terminate horizontally
B	87° elbow	
C	Fixing bracket extension	0020042752
D	Rain collar	0020042760
E	1.0m extension	0020042754
	0.5m extension	0020042753
	0.5m adjustable extension	0020042755
F	Fixing bracket	0020042751
G		
H	Adjustable wall support for heights over 4m	0020042749

Key	Facade basic connection set	Article number
1	87° elbow	0020042748
2	Transition piece	
3	Inner wall rosette	
4	Outer wall rosette	
5	Wall penetration elbow	
6	Air intake piece	
7	Bird guard terminal	

ecoTEC 46 and 65 flue accessories

## Overview

When considering flue termination options, there are many factors to take into account, particularly with regards to clearances and discharge of condensate and combustion gases into the external atmosphere.

Systems up to 70kW net must comply with British Standards, which recommends that all fanned flue terminals should be a minimum distance from any openings into a building. Also, consideration must be given to buildings directly opposite or adjacent to a flue termination. When siting a flue terminal, the products of combustion must not be discharged straight across a boundary and there are minimum distances for terminating beside a boundary. In all cases, the possibility of the plume of condensate touching building fabric or discharging where it may be considered a nuisance or where they may not freely disperse must be avoided.

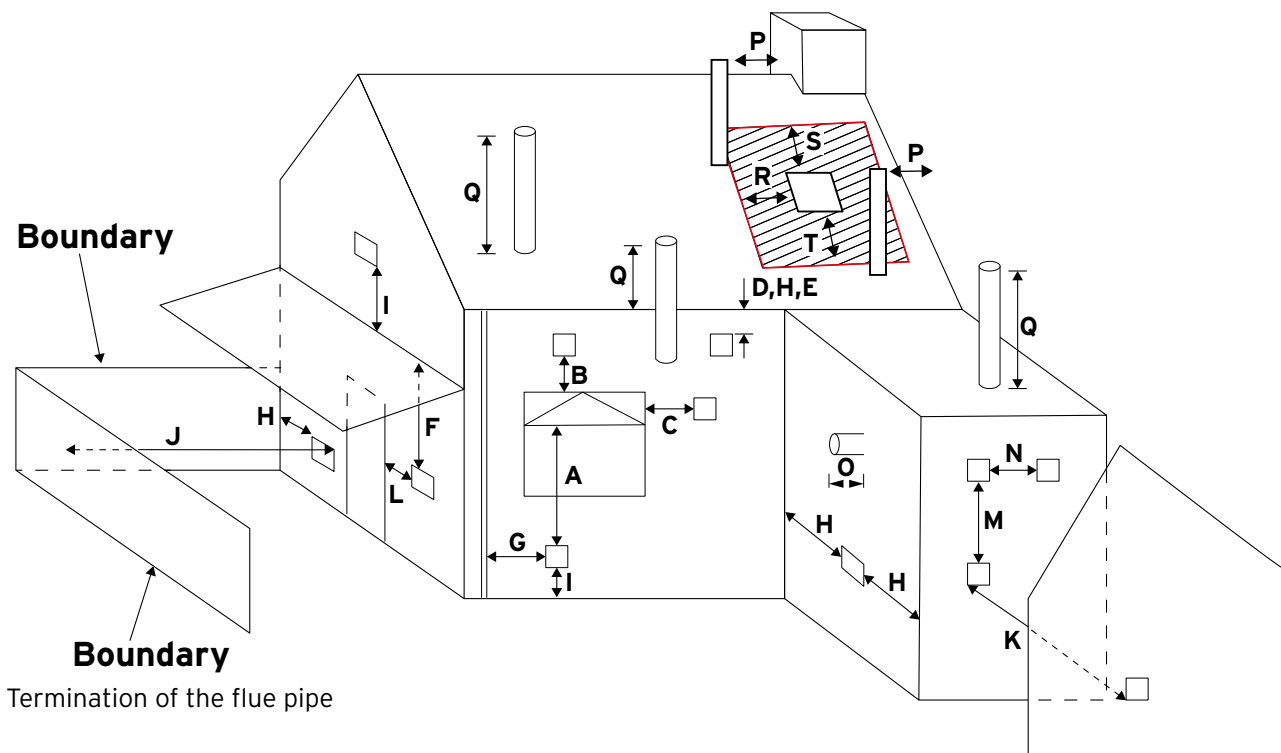
The position of the condensate discharge pipe also requires careful consideration to ensure the condensate is disposed of directly into a foul water drain and where required it should be neutralised.

The diagram and tables here show the minimum clearance requirements according to the model/output of the boilers used.

Given the number of acts and regulations that are in force regarding the siting of flues, Vaillant always recommends that advice is sought from a specialist flue installation adviser to ensure all national and local regulations and requirements are closely observed.

The most important acts and regulations that affect the installation of commercial gas boiler systems are:

- BS5440-1
- IS813
- The Clean Air Act

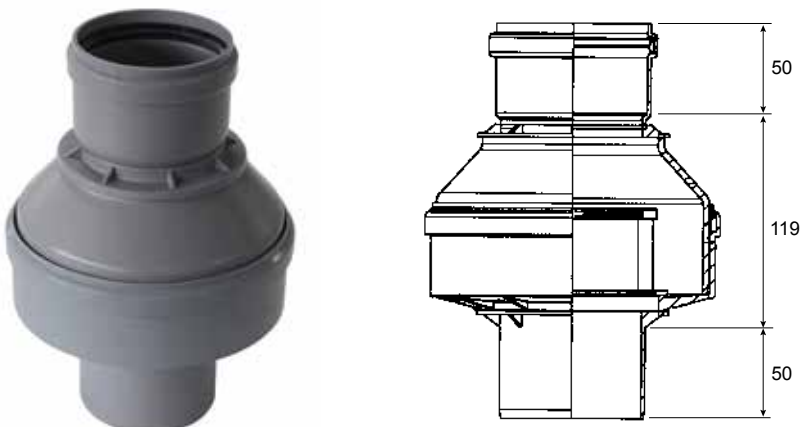


Key	Location	Minimum dimensions (mm)
A	Directly below openings into the building i.e. windows or air bricks	300
B	Above openings into the building i.e. windows or air bricks	300
C	Horizontally to openings into the building i.e. windows or air bricks	300
D	Below gutters, soil pipes or drain pipes (consider extending out*)	75
E	Below eaves (if ventilated, extend out to prevent entry of products)	200
F	Below balconies or car port roofs	200
G	From vertical soil pipes or waste pipes and gutter downpipes	25
H	From internal or external corners or a boundary alongside the terminal	300
I	Above ground, roof or balcony level	300
J	From a surface facing a terminal	600
K	From a terminal facing a terminal	1200
L	From an opening under the car port leading into the building	1200
M	Vertical from a terminal on the same wall	1500
N	Horizontal from a terminal on the same wall	300
O	Air duct rosette to face of wall (Flue can be extended out up to 500mm)*	0 (face of wall)
P	From nearby structure or neighbouring (taller) building**	300
Q	Above flat roof or intersection with pitched roof	300
R	Horizontal from opening roof lights and windows on pitched or flat roofs	600
S	Above an opening roof light or windows on pitched roofs	600
T	Below an opening roof light or windows on pitched roofs	2000
	* Ensure terminal is sealed to air duct to prevent water ingress	
	** Ensure products disperse freely and do not contact building surfaces	

All flue terminations must be positioned such that the flue products can discharge freely from the terminal for dispersal and cannot enter or re-enter a building. Also, it must be ensured that the products disperse in a way that they do not come into contact with objects or building fabrics as these could be damaged by the condensate.

## Cascade flue installations of 46 and 65

Whenever ecoTEC boilers are being fitted in any cascade formation, it is vital that a flue gas non-return flap/valve is fitted to each boiler to ensure that gas cannot re-enter the boiler. The only circumstances where a non-return flap is not necessary is if the chimney is designed to EN 13384-2 and the natural draught is greater than the pressure losses. Vaillant offers a mechanical 80mm flap valve for the ecoTEC 46 and 65 models.



80mm flue non-return flap valve  
Article number 303960

ecoTEC 80, 100 and 120 flue accessories

## Overview

This range of Vaillant boilers utilises a 110mm/160mm concentric flue system for which we offer a number of flue system options which can be specified according to the requirements of the installation. Our standard concentric flue pipes can be purchased with a range of fittings to easily construct the appropriate flue system with horizontal or vertical terminations for your building. These comprise a white coated 160mm outer air duct with a 110mm PP inner flue.

A variety of stainless steel facade flues can also be obtained to complement all flue system arrangements. Additional accessories including brackets, rain collars, sleeves and terminals are also available.

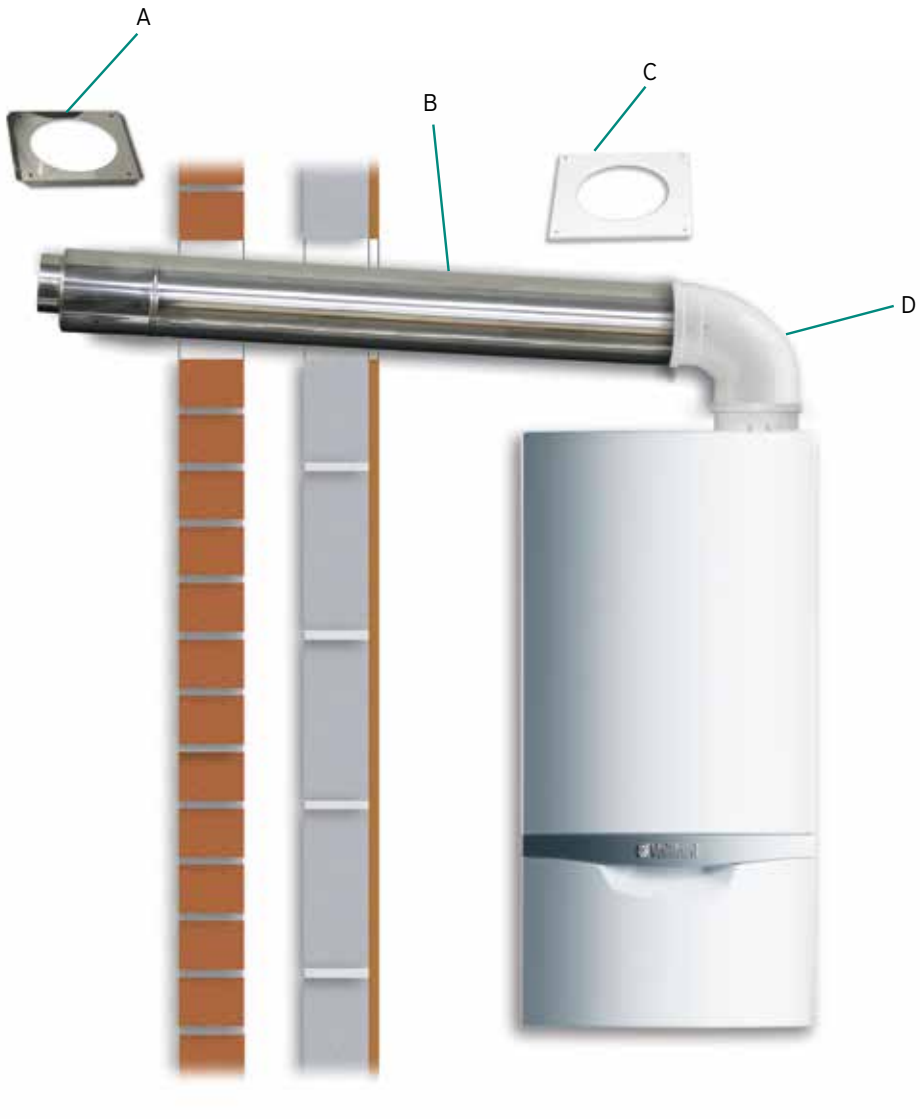
A range of flues comprising 110/160mm concentric flue pipe and fittings enable flexible appliance locations to be used with maximum flue lengths as shown in the table opposite.

Description	Article number
Vertical terminal, concentric, black	0020166853
Horizontal terminal, elbow and collar	0020166854
0.5m extension (110/160mm PP)	0020106376
1m extension (110/160mm PP)	0020106377
2m extension (110/160mm PP)	0020106378
45° elbow (110/160mm PP)	0020106379
87° elbow (110/160mm PP)	0020106380
Fastening clamps (5) with S & P (160mm)	0020106381
Stainless steel facade kit	0020166855
Wall bracket (stainless)	0020106400
Extension for wall bracket (stainless)	0020106401
Pipe 0.5m pp internal 110/160mm (stainless)	0020106402
Pipe 1.0m pp internal 110/160mm (stainless)	0020106403
45° bend pp 110mm/160mm (stainless)	0020106405

ecoTEC Model	1 boiler	Multiple boilers on a cascade flue system
ecoTEC 80	110/160mm Concentric	Cascade flues for these should make use of a non-return valve. There are two versions available. The mechanical valve - Article number <b>0020207200</b> . Alternatively, where a lower profile is required, the motorised flue NRV kit which includes the VR 40 control board can be used to reduce the header height by 100mm. Article number <b>0020177845</b>
ecoTEC 100	111/160mm Concentric	
ecoTEC 120	112/160mm Concentric	
For B23 flue use PP flue and terminate via facade system		



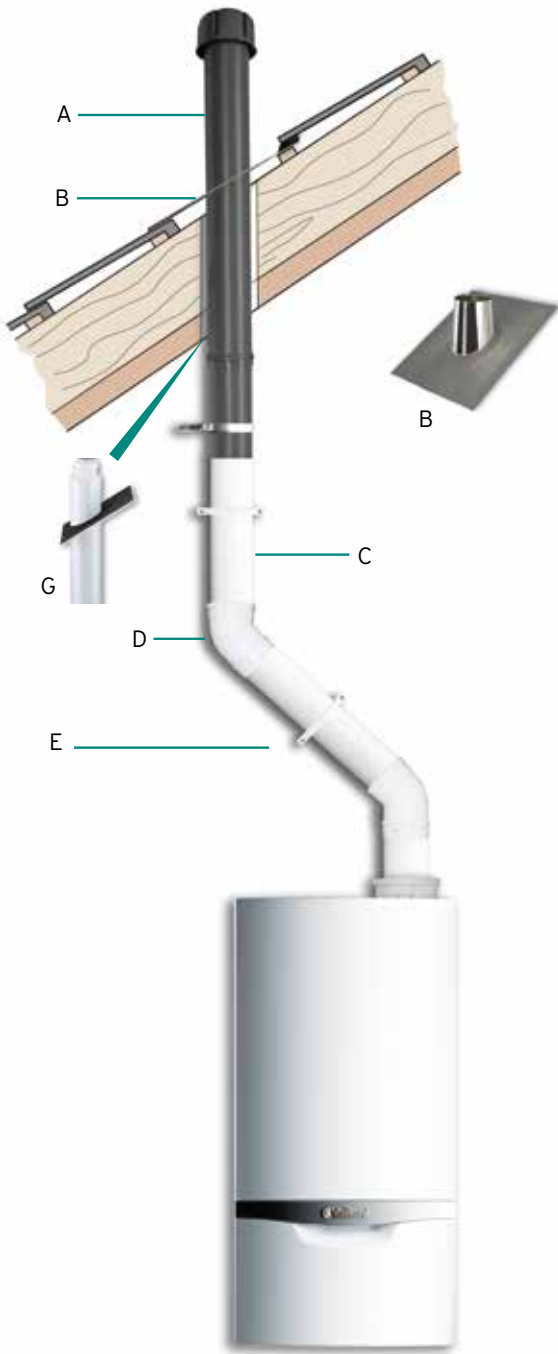
	ecoTEC 80	ecoTEC 100	ecoTEC 120
Maximum permissible length of concentric flue	22.0m including 87° elbow	18.0m including 87° elbow	9.0m including 87° elbow
	Maximum length of flue is reduced by 1.5m for each additional 87° elbow Maximum length of flue is reduced by 1.0m for each additional 45° elbow		



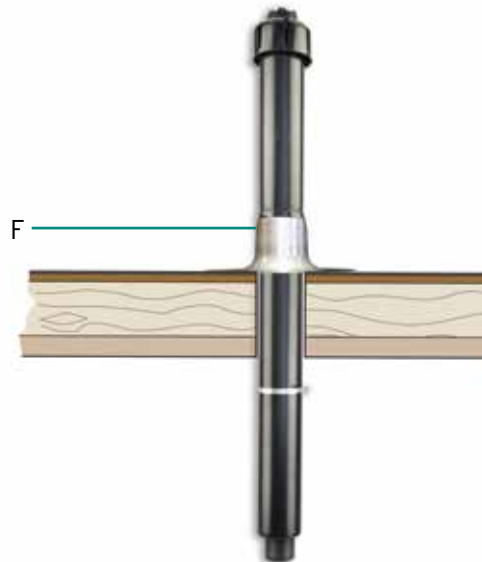
Key	110/160mm horizontal flue	Article number
A	Outer rosette	0020166854
B	Terminal duct - 910mm to face of wall	
C	Inner rosette	
D	87° elbow	

ecoTEC 80-120 vertical flue accessories

Single boiler, 160mm flue



	ecoTEC 80	ecoTEC 100	ecoTEC 120
Maximum permissible length of concentric flue	24.0m including 2 x 87° elbows	20.0m including 2 x 87° elbows	11.0m including 2 x 87° elbows
	Maximum length of flue is reduced by 1.5m for each additional 87° elbow		
	Maximum length of flue is reduced by 1.0m for each additional 45° elbow		



Key	110/160mm vertical flue	Article number
A	Vertical flue duct and terminal (includes item G)	0020166853
B	Pitched roof flashing	0020106409
C	500mm extension 1000mm extension 2000mm extension	0020106376 0020106377 0020106378
D	45° elbow - pack of 2	0020106379
E	Flue support clips - pack of 5	0020106381
F	Flat roof penetration collar	0020106411
G	Internal decorative cover	included with A

Connections to external flue systems		
VU GB 806/5-5	VU GB 1006/5-5	VU GB 1206/5-5
Internal concentric flue pipe		
3.0 (m)		2.0 (m)
plus 3 x 87° elbows	plus 1 x 87° elbow	
Along with 1 x basic connection support elbow (supplied as part of Article number 002016855)		
If additional elbows or flue pipe is used on the Internal flue run to those shown above then the outside lengths shown below shall be reduced:		
By 5.3m for each 87° elbow		
By 3.2m for each 45° elbow		
By 3.2m for each 1 m extension		
Maximum outside lengths (m)		
50.0		29.0
If additional elbows are used on the external flue run then the outside lengths shall then be reduced:		
By 1m for each 87° elbow		
By 0.5m for each 45° elbow		



ecoTEC 80, 100 and 120  
flue accessories

Key	110/160mm Stainless facade flue	Article number
1	Basic facade kit 110/160mm	0020166855
Additional items		
A	45° elbow	0020106405
B	External wall bracket (50 - 90mm)	0020106400
C	External wall bracket extension (50 - 90mm)	0020106401
D	Stainless pipe 500mm	0020106402
	Stainless pipe 1000mm	0020106403
E	Flue band - Pipe clamp 160mm - 1 required per extension	002143394

## Overview

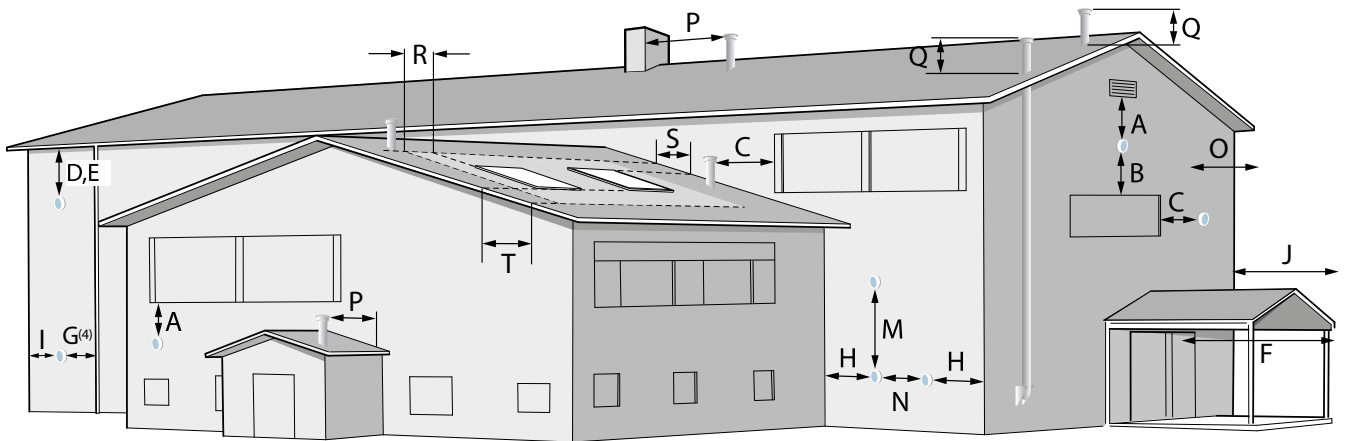
The diagram below is relevant for the installation of boilers with a gross heat input > 70kW net but less than 333kW net. For further guidance see the current IGEN UP/10 risk assessment appendix for guidance on suitable flue terminal locations

For installations above 333kW net input, refer to the "Clean Air Act," as the discharge of flue products must comply with the stated and calculated distances above ground (see note 3).

It is essential to ensure that discharged flue products do not create any hazard or nuisance to persons within the discharge area and do not come into contact with building surfaces or build-up within an area where they may re-enter a building.

### Notes:

1. None of the above installations should discharge into a courtyard, light well, car port or enclosed environment.
2. Care should be taken to ensure that even if the installation complies with the minimum dimensions shown below, that all site conditions are taken into consideration to avoid the plume becoming a nuisance or causing wall staining.
3. The height and termination of flues will require approval from the local authority.



Key	Minimum clearances for concentric terminations		All systems >120kW
	<b>Horizontal (- &gt; 70kW up to 120kW)</b>	<b>mm</b>	
A	Directly below an opening, air brick, opening windows	2500	Designer or installer to carry out a risk assessment inline with IGEM UP/10 appendix 9 Above 333kW net heat input, the clean air act must also be adhered to
B(5)	Above an opening, air brick, opening windows	900	
C	Horizontal to an opening, air brick, opening windows	900	
D(1,4)	Below gutter, drain/soil pipe (extending out to clear)	75	
E(1,4)	Below eaves, adjacent to drain pipes	200	
F(6)	Below balcony or car port - should be extended to clear air	25	
G(4)	From a vertical drain pipes and soil pipes	50	
H(9)	From internal/external corner	300	
I(2)	To a boundary alongside the terminal/external corner	300	
J	Facing a boundary or surface opposite	2200	
J	From a terminal opposite facing the terminal	3000	
M	Vertical from a terminal	1500	
N	Horizontal from a terminal	300	
O	Rosette to face of wall (can be extended up to 500mm*)	0	
	<b>Vertical flues</b>		
C(3)	From adjacent non-opening window	1000	All systems over 333kW net heat input must comply with the clean air act and be approved by local authority
P(9)	From nearby structure or neighbouring (taller) building	300**	
Q	Above flat roof or intersection with pitched roof	600	
R	Horizontal from opening windows on pitched or flat roofs	900	
S	Above an opening roof light or windows on pitched roofs	600	
S(8,9)	From adjacent opening window (extended above opening)	1500	
S(9)	From adjacent wall to flue	300	
T	Below an opening roof light or windows on pitched roofs	2000	

\*Terminal and wall entry must be sealed to prevent water ingress

\*\*Products must disperse freely and not contact building surfaces

- There should be no ventilation/opening in the eaves within 900mm of the terminal.
- These dimensions comply with the building regulations, but they may need to be increased to avoid wall staining and nuisance from plumbing depending on site conditions.
- It is recommended that an elbow termination is fitted to direct the plume away from the window.
- If the pipe is shielded from the heat, this dimension may be reduced to 25mm.
- The flue through the roof should not be located within the shaded area.
- It is recommended that the terminal should not be located below 2m in any occupied space.
- Terminals below 2m must be fitted with a suitable terminal guard and should be a minimum of 300mm above surface level.
- It is the installer's responsibility to carry out a suitable risk assessment to ensure the location of the terminal is safe and products can freely disperse without causing nuisance or harm to persons. Refer to IGEM/UP/10.
- All flue terminations must be positioned such that the flue products can discharge freely from the terminal for rapid dispersal and cannot enter or re-enter a building, whilst ensuring they do not come into contact with objects or building fabrics as these could be damaged by the condensate.

Low-loss plate heat exchangers for standalone installations

### Overview

Manufactured to the highest standards of quality, a Vaillant low-loss plate heat exchanger is the ideal solution where it is impossible to guarantee system cleanliness and therefore water quality flowing through the boiler.

The exchanger operates by separating the boiler water from the system water. It is particularly suitable for older applications where the systems cannot be pressurised. By separating the boiler from the system the integrity of the boiler is maintained and it can operate as a pressurised system whilst still allowing the boiler to operate on the existing open-vented system. However, care must be taken to ensure that the system water circulating through the plate is filtered.



PHE S 120-70

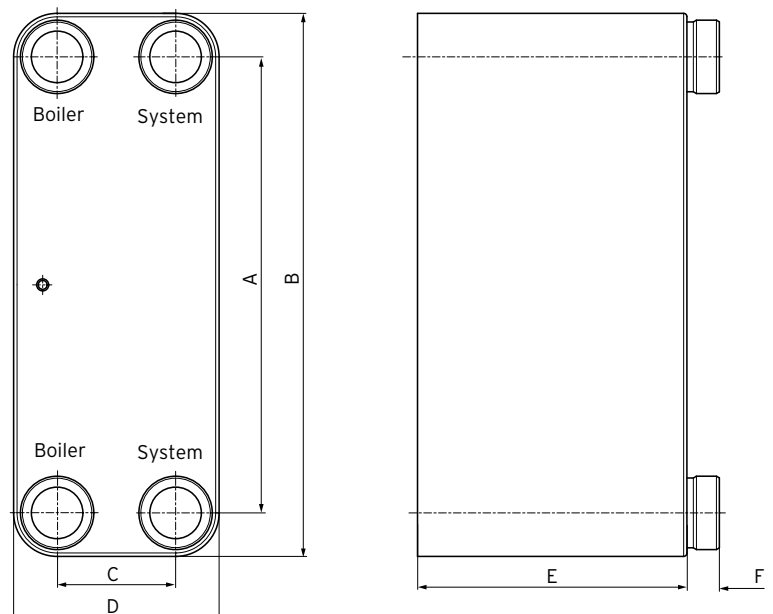
Model	Article number	Flow rate		Output (kW)	Pressure Loss		Temperature differential °C	Connection sizes	Header width	Plate depth (distance between connections)	Total height	Distance between connection
		(Ltr/s)	(Ltr/h)		(kPa)	mbar						
PHE S 120-70	0020137069	1.44	5169	115	10.8	108	10	1 1/4" BSP (m)	124	186	335	281

### Overview

The main purpose of the low-loss header is to maintain the correct flow of water through the boiler and allow a constant temperature supply of water to reach multiple heating circuits downstream of the low-loss header connection.

These heating circuits may have different temperature and flow-rate requirements (e.g. underfloor heating and radiator circuits). Cooler return water from the heating circuits is mixed with water from the boiler in the low-loss header. An NTC is used to monitor the temperature of water supplied by the boiler. It is recommended that a suitable dirt filter is fitted in the return flow between the low-loss header and the heating circuits as a precaution to prevent system dirt from entering the boiler.

### Low-loss headers for use with independently piped systems



Model	Unit	A	B	C	D	E	F
PHE S 120-70	mm	281	335	73	124	166	20

Low-loss headers for standalone installations

Recommended system connection for cascade rigs without hydraulics				
Model	1 x boiler	2 x boiler	3 x boiler	4 x boiler
	Plate heat exchangers and low-loss headers to be sized according to load and flow rates required*			
Plate Heat Exchanger	PHE S 120-70 0020137069	Contact Vaillant commercial sales		
Low-loss Header	WH 40 306720 WH 95 306721		WH 95 306721 WH 160 306726 WH 280 306725	

\* Dirt filtration and fully inhibited water quality must be maintained

Boiler models	Low-loss header	kW at 20K	kW at 11K
ecoTEC 46 / 65 / 80 / 100 / 120	WH 40	70	40
	WH 95	190	102
	WH 160	280	150
	WH 280	490	270

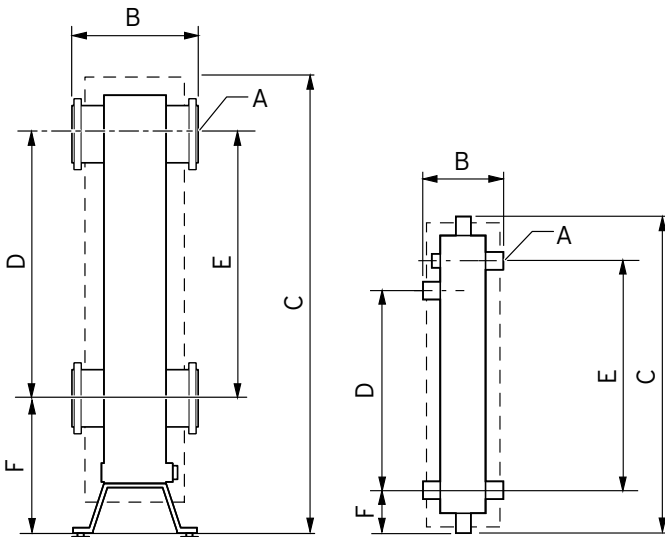
For larger requirements contact your Vaillant RBM



WH 40



WH 95



D= Boiler side

E= System side



WH 160



WH 280

Model	Article number	Connections (A)	Dimensions (mm)					Flow rates		Pressure drop
			(B)	(C)	(D)	(E)	(F)	m <sup>3</sup> /Hr	L/Hr	mb
WH 40	306720	1 1/4" BSP (f)	115	500	280	340	200	3.5	3500	1.40
WH 95	306721	2" BSP (f)	155	750	470	540	200	8	8000	7.40
WH 160	306726	DN65/PN6	120	1350	900	900	270	12	12000	4.00
WH 280	306725	DN80/PN6	160	1390	930	930	240	21.5	21500	3.80

Each low-loss header is supplied with the following items: Insulated low-loss header, fixing bracket/stand for larger models, dry pocket for sensor, air vent, drain plug and VR 10 NTC sensor.

Low-loss headers for cascade rigs

Low-loss headers for use with cascade systems

Boiler models	Low-loss header	kW at 20k	kW at 11k
ecoTEC 46 / 65 / 80 / 100 / 120	WH C 110	220	120
	WH C 160	320	176
	WH C 280	495	275
	WH C 350	700	380
For larger requirements contact your Vaillant RBM			

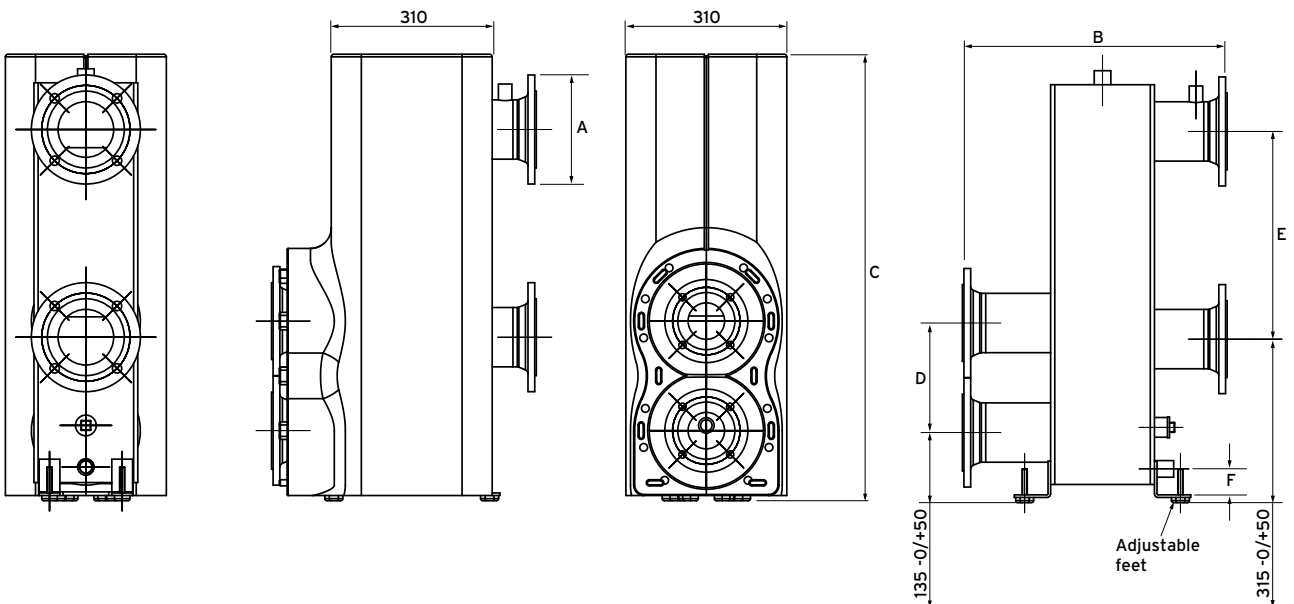


WH C 160 with insulation

The system pump will need to be suitably size to provide the required system water flow rate.

Model	Article number	Connections (A)	Dimensions (mm)					m <sup>3</sup> /Hr	L/Hr	mbar
			(B)	(C)	(D)	(E)	(F)			
WH C 110	0020175310	DN65 / PN6	510	860	211	400	50	9.5	9500	3.40
WH C 160	0020175311	DN65 / PN6						15	15000	7.33
WH C 280	0020175312	DN100/PN6						21	21000	4.44
WH C 350	0020175313	DN100/PN6						25	25000	3.38

All supplied as sets with magnetic filter, air vent, drain cock, NTC with pocket, adjustable feet and one size insulation.  
(Insulation - H = 850mm W = 310mm D = 310mm)





Low-loss plate heat exchanger technical specifications

Low-loss headers for up to 720kW

Boiler models	Plate heat exchanger	kW
ecoTEC 46 / 65 / 80 / 100 / 120 models up to 120kW output. Not using Vaillant cascade hydraulics (1-1 1/4" BSP)	PHE S 120-70	120
ecoTEC 65 / 80 / 100 / 120 models up to 240 or 360kW output for each plate. When using Vaillant cascade hydraulics	PHE C 240-40	240
	PHE C 360-70	360
ecoTEC 80 / 100 / 120 models up to 240 or 360kW output for each plate. When using Vaillant cascade hydraulics	PHE C 480-90	480
	PHE C 600-120	600
	PHE C 720-170	720
For larger requirements contact your Vaillant RBM		

Note: System design of  $\Delta t$  20

For systems requiring different temperatures, it may be beneficial to use the flow rate and pressure loss graphs within this document. The system designer will need to suitably size the pump to achieve the necessary flow rates. For requirements outside of those given please contact your Vaillant Regional Business Manager (RBM) with full details of your exact system requirements who can then advise as required.



PHE C 240-40



PHE C 360-70



PHE C 480-90



PHE C 720-120

Note: Images not to scale, refer to data tables

Low-loss plate heat exchanger technical specifications

Plates from PHE C 240 and above are supplied with the necessary pipes to connect to the appropriate cascade rig.

	PHE S 120-70	PHE C 240-40	PHE C 360-70	PHE C 480-90	PHE C 600-120	PHE C 720-170
Article number	0020137069	0020175315	0020175316	0020175317	0020175318	0020175319
Material	Stainless steel					
Connection	1/4" screw connection	Flange connection DN65 / PN6		Flange connection DN80 / PN6		
Weight (kg)	10.70	40.80	57.00	70.92	87.12	114.12
Plates	70	40	70	90	120	170
Volume in litres (primary side)	2.21	4.20	7.51	9.72	13.04	18.56
Volume in litres (secondary side)	2.28	4.42	7.74	9.95	13.26	18.79
Operating temperature (°C)	-196...+200					
Max. operating pressure MPa (bar)	3.0 (30)	0.6 (6)				

Dimensions

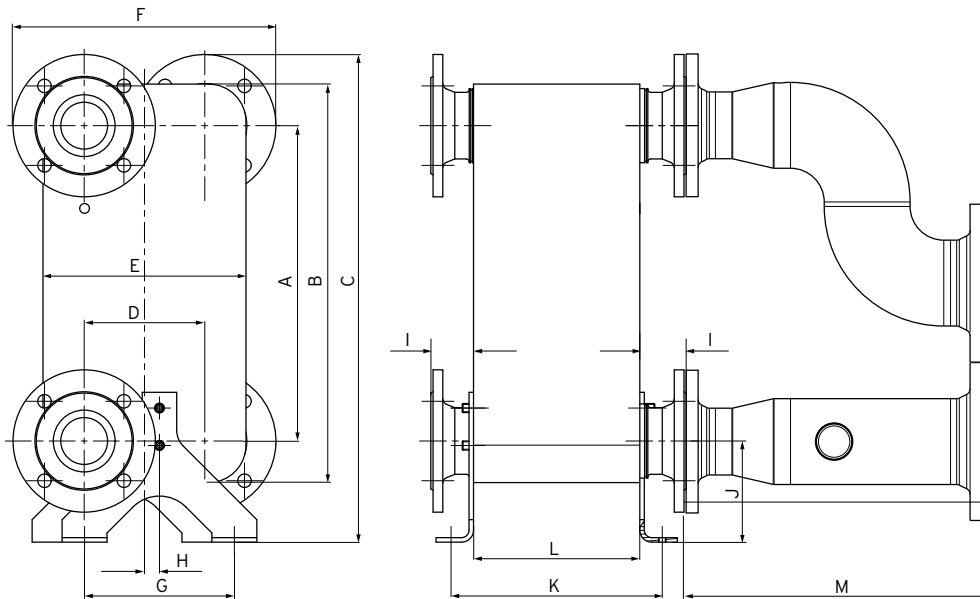


Plate Heat Exchanger Set	Unit	A	B	C	D	E	F	G	H	I	J	K	L	M
<b>0020175315</b> VCP2 PHE C240-40 Exc Ins DN65 240kW d20	mm											175	105	
<b>0020175316</b> VCP3 PHE C360-70 Exc Ins DN65 360kW d20	mm			636			321			86		246	176	
<b>0020175317</b> VCP4 PHE C480-90 Exc Ins DN100 480kW d20	mm	421	532		161	271		200	20		135	292	222	400
<b>0020175318</b> VCP5 PHE C600-120 Exc Ins DN100 600kW d20	mm			651			351			62		362	292	
<b>0020175319</b> VCP6 PHE C720-170 Exc Ins DN100 720kW d20	mm											479	409	

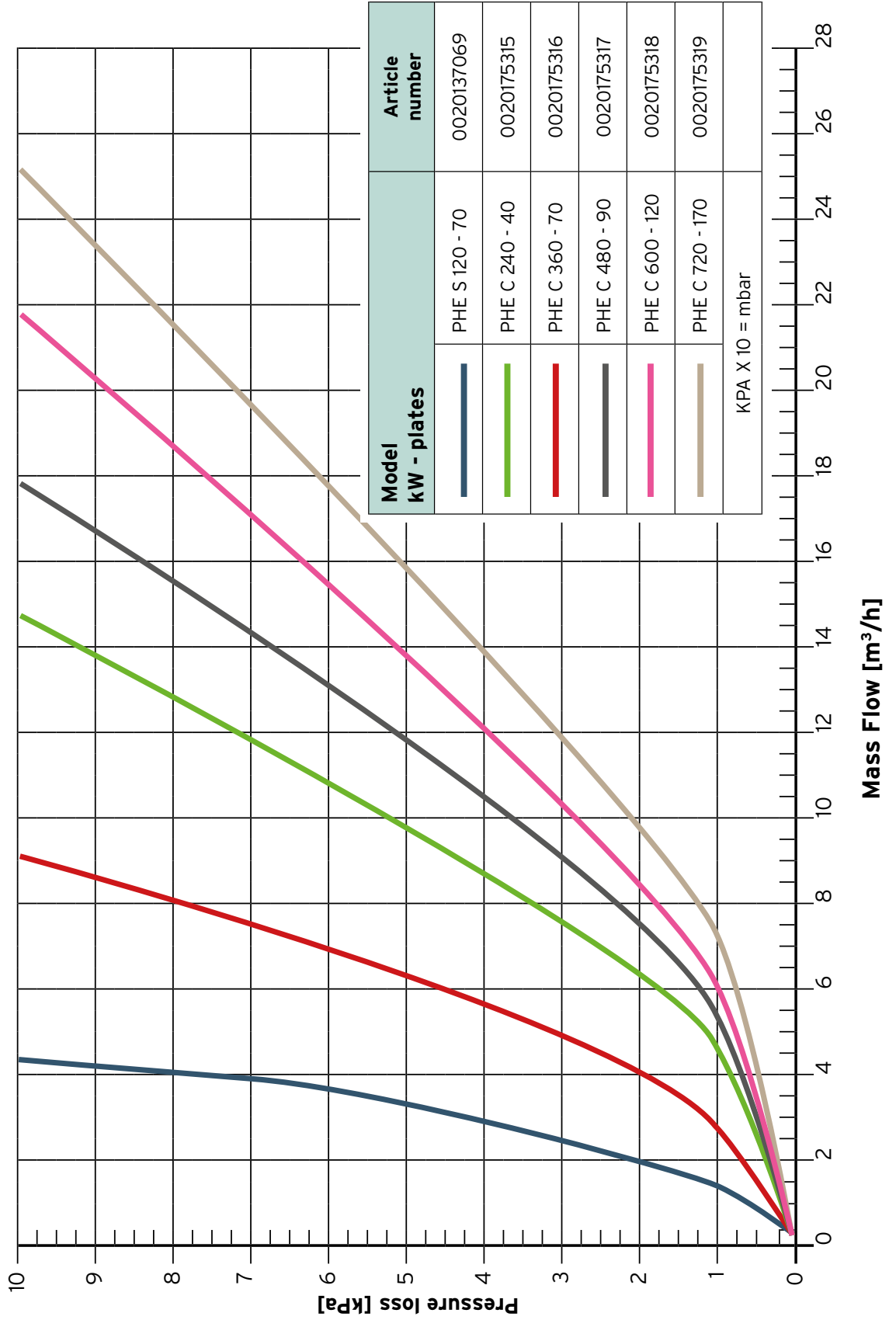
### Cascade rigs ecoTEC 46kW boilers

Model	Required $\Delta T$	Water flow volumes	
		L/Hr	m <sup>3</sup> /hr
ecoTEC	K		
46	11	3518	3.518
65	11	5099	5.099
80	11	6258	6.258
100	11	7804	7.804
120	11	9349	9.349
46	15	2580	2.580
65	15	3740	3.740
80	15	4390	4.390
100	15	5474	5.474
120	15	6558	6.558
46	20	1935	1.935
65	20	2805	2.805
80	20	3442	3.442
100	20	4292	4.292
120	20	5142	5.142
46	23	1682	1.682
65	23	2439	2.439
80	23	2863	2.863
100	23	3570	3.570
120	23	4277	4.277
46	28	1382	1.382
65	28	2003	2.003
80	28	2352	2.352
100	28	2932	2.932
120	28	3513	3.513

System pumps must always be suitably sized to achieve the required system flow rates. This is particularly important when transferring heat at temperature differences lower than 20K as the required water flow rates are considerably increased. Use the pressure loss and flow graphs opposite to calculate flow rates and pressure losses for Vaillant plate heat exchangers. For further support, contact your Vaillant Regional Business Manager with full details of your requirements.

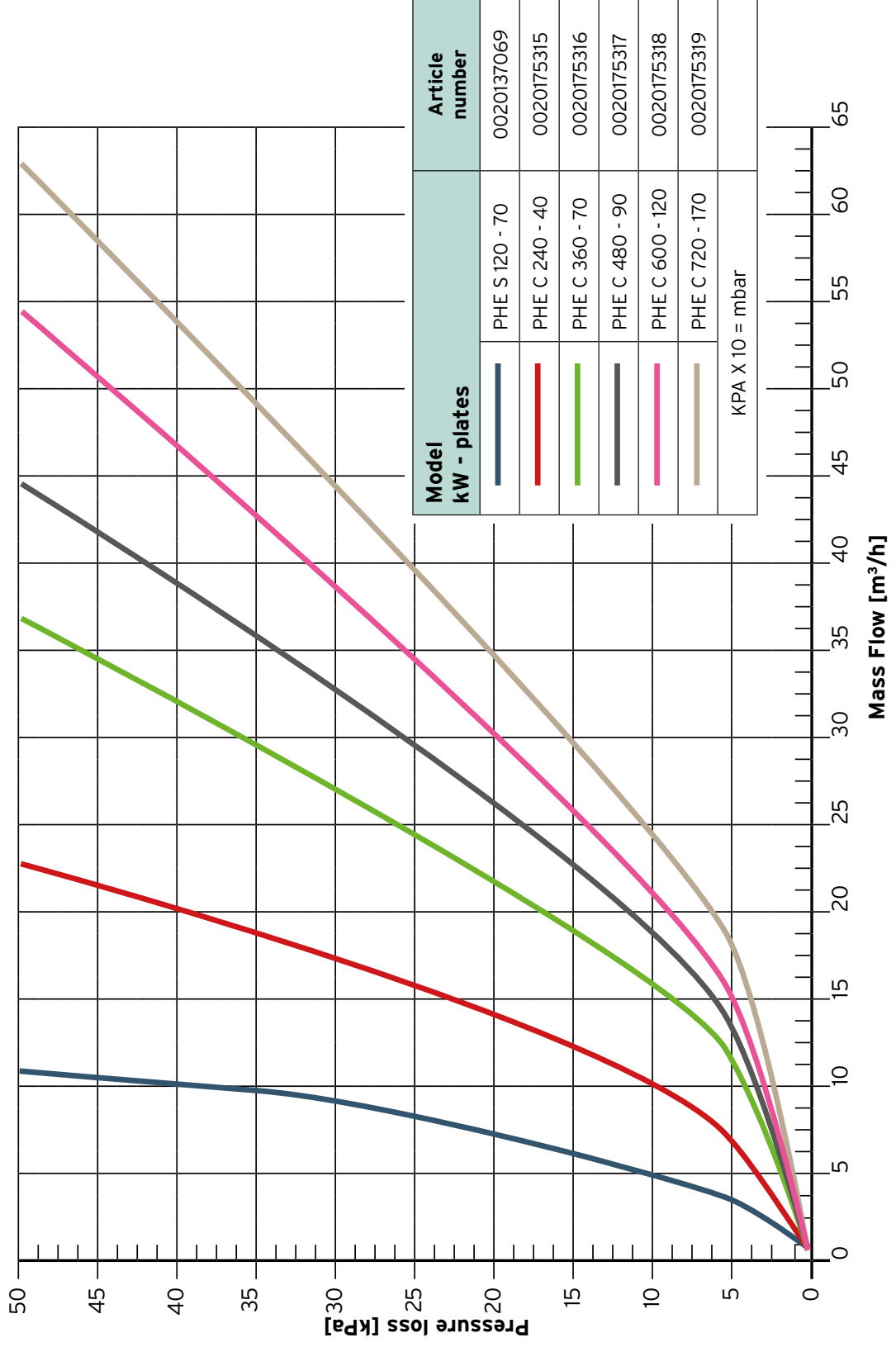
Low-loss plate heat exchanger technical specifications

Low-loss Plate Heat Exchangers - Primary Side



## Low-loss plate heat exchanger technical specifications

### Low-loss Plate Heat Exchangers - Secondary Side





## Introducing the new Vaillant cascade rigs offering even more efficiency and flexibility on outputs.

Vaillant now offers a comprehensive range of cascade options for larger properties. An easily expandable modular system can provide up to 960kW of energy and can be configured to fit any plant room. Up to eight boilers can be fitted on a rig back-to-back, in-line or around corners.

A large range of accessories and flueing options ensures there is a Vaillant cascade solution for every kind of commercial installation.

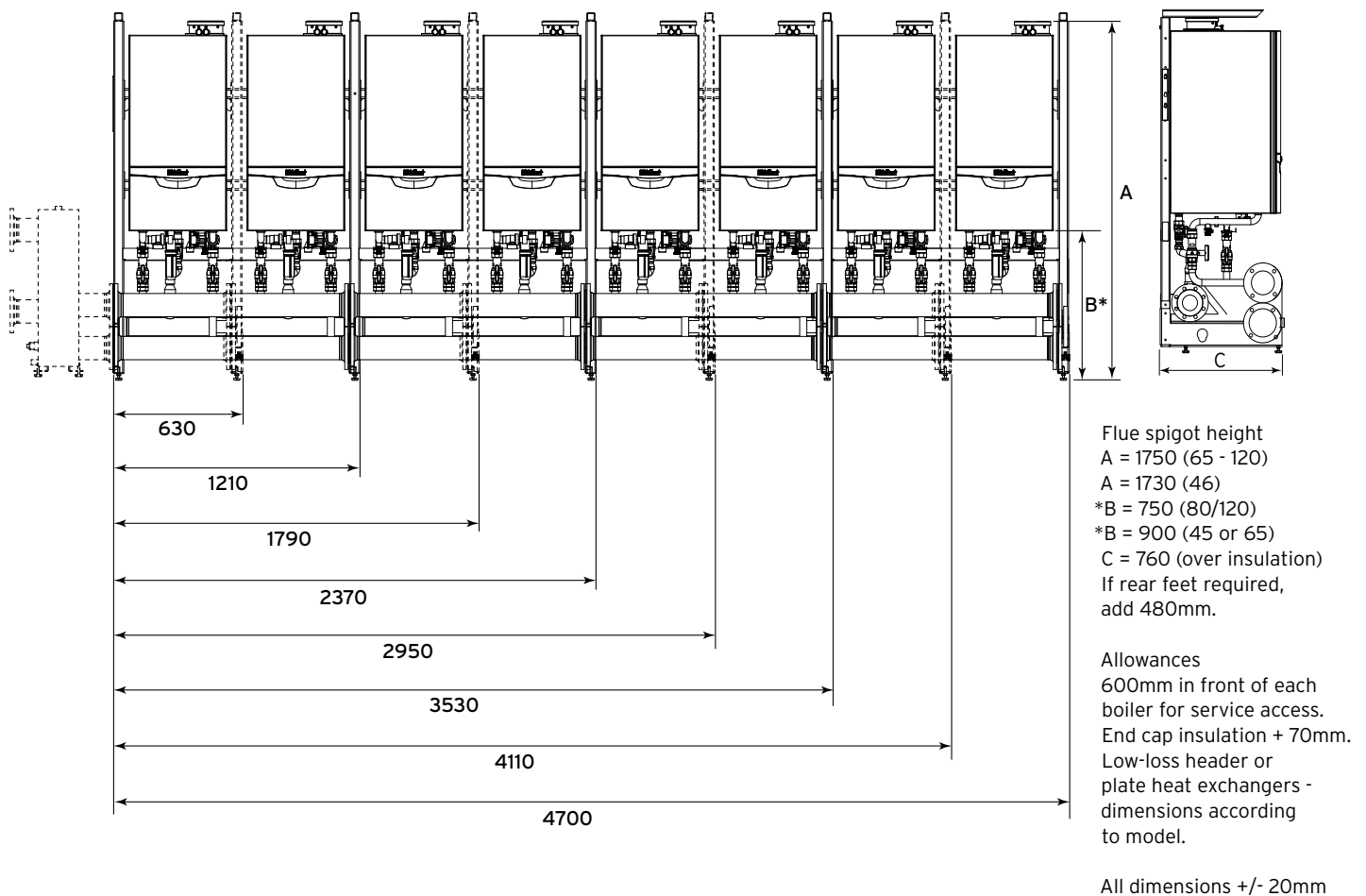


## Cascade rigs with hydraulics - technical specifications

For larger systems, Vaillant offers a number of cascade rig solutions, allowing system designers greater flexibility on outputs and system configurations. These options can be particularly useful when modifying existing freestanding systems and where walls may not be suitable for the installation of wall-hanging boilers. Described below, these are supplied in comprehensive sets that include all frames, gas, flow, return and header hydraulics and insulation, and are easily transported and assembled on site. They can accommodate from one to eight boilers in various configurations either in-line, back-to-back or around a corner, utilising any of our wall-hung commercial boilers; from the 46 to the 120 models.

When using cascade rigs, consideration needs to be given to system connectivity. Vaillant recommends the use of a plate heat exchanger to separate the boiler from the larger volume of system water. However, where systems require, we also supply low-loss headers. Designers and installers must ensure that all systems are clean and water quality is maintained to a high standard from first ignition for the whole life of the system. The cascade rigs are available with DN65 headers for systems of up to 400kW. When larger systems are being designed, options include DN100 headers which - with the correct design - can be used for systems of up to 960kW.

### Cascade rigs for 1 to 8 boilers in-line





Cascade rigs with DN65 or DN100 hydraulics

Connection options

Article numbers for cascade rigs boilers in-line with DN65 hydraulics Recommended system connection for cascade rigs with hydraulics*				
	1 x boiler	2 x boiler	3 x boiler	4 x boiler
<b>ecoTEC Model 46</b>	<b>VCR 461</b> 0020201762	<b>VCR 462</b> 0020201763	<b>VCR 463</b> 0020201764	<b>VCR 464</b> 0020201765
<b>Low-loss Plate</b>	PHE S - 120-70 0020175315		<b>VCP2</b> PHE - C 240-40 - 0020175315	
<b>Low-loss Header</b>	<b>VHC1</b> WHC 110 - 0020175310			
<b>ecoTEC Model 65</b>	<b>VCR 651</b> 0020201768	<b>VCR 652</b> 0020201769	<b>VCR 653</b> 0020201770	<b>VCR 654</b> 0020201771
<b>Low-loss Plate</b>	PHE S - 120-70 0020175315	<b>VCP 2 PHE - C 240-40</b> 0020175315		
<b>Low-loss Header</b>	<b>VHC1</b> WHC 110 - 0020175310			
<b>ecoTEC Model 80</b>	<b>VCR-51</b> 0020175291	<b>VCR-52</b> 0020175292	<b>VCR-53</b> 0020175293	<b>VCR-54</b> 0020175294
<b>Low-loss Plate</b>	<b>VCP2</b> PHE - C 240-40 0020175315			<b>VCP3</b> PHE-C 360-70 002015316
<b>Low-loss Header</b>	<b>VHC1</b> WHC 110 - 0020175310		<b>VHC 2</b> WHC 160 - 0020175311	<b>VHC 2</b> WHC 160 - 0020175311
<b>ecoTEC Model 100</b>	<b>VCR-51</b> 0020175291	<b>VCR-52</b> 0020175292	<b>VCR-53</b> 0020175293	<b>VCR-54</b> 0020175294
<b>Low-loss Plate</b>	<b>VCP2</b> PHE - C 240-40 0020175315		<b>VCP3</b> PHE-C 360-70** 002015316	
<b>Low-loss Header</b>	<b>VHC1</b> WHC 110 - 0020175310		<b>VHC 2</b> WHC 160 0020175311	<b>VHC 2</b> WHC 160 0020175311
<b>ecoTEC Model 120</b>	<b>VCR-51</b> 0020175291	<b>VCR-52</b> 0020175292	<b>VCR-53</b> 0020175293	Use DN100 rig
<b>Low-loss Plate</b>	<b>VCP2</b> PHE - C 240-40 0020175315		<b>VCP3</b> PHE-C 360-70 002015316	Use DN100 rig
<b>Low-loss Header</b>	<b>VHC1</b> WHC 110 0020175310	<b>VHC2</b> WHC 160 0020175311	<b>VHC2</b> WHC 160 0020175311**	Use DN100 rig

Article numbers for cascade rigs boilers in-line with DN100 hydraulics Recommended system connection for cascade rigs with hydraulics								
	1 x boiler	2 x boiler	3 x boiler	4 x boiler	5 x boiler	6 x boiler	7 x boiler	8 x boiler
<b>ecoTEC Model 80</b>	<b>VCR 101</b> 0020175298	<b>VCR 102</b> 0020175299	<b>VCR 103</b> 0020175300	<b>VCR 104</b> 0020175301	<b>VCR 105</b> 0020175302	<b>VCR 106</b> 0020175303	<b>VCR 107</b> 0020175304	<b>VCR 108</b> 0020175305
<b>Low-loss Plate</b>	<b>VCP4</b> PHE - C 480-90 0020175317						<b>VCP5</b> PHE - C 600-120 0020175318	<b>VCP6</b> PHE - C 720-170 0020175319
<b>Low-loss Header</b>	<b>VHC 3</b> WHC 280 0020175312						<b>VHC 3</b> WHC 350 0020175313	
<b>ecoTEC Model 100</b>	<b>VCR 101</b> 0020175298	<b>VCR 102</b> 0020175299	<b>VCR 103</b> 0020175300	<b>VCR 104</b> 0020175301	<b>VCR 105</b> 0020175302	<b>VCR 106</b> 0020175303	<b>VCR 107</b> 0020175304	<b>VCR 108</b> 0020175305
<b>Low-loss Plate</b>	<b>VCP4</b> PHE - C 480-90 0020175317				<b>VCP5</b> PHE - C 600-120 0020175318		<b>VCP6</b> PHE - C 720-170 0020175319	#
<b>Low-loss Header</b>	<b>VHC 3</b> WHC 280 0020175312				<b>VHC 3</b> WHC 350 0020175313			
<b>ecoTEC Model 120</b>	<b>VCR 101</b> 0020175298	<b>VCR 102</b> 0020175299	<b>VCR 103</b> 0020175300	<b>VCR 104</b> 0020175301	<b>VCR 105</b> 0020175302	<b>VCR 106</b> 0020175303	<b>VCR 107</b> 0020175304	<b>VCR 108</b> 0020175305
<b>Low-loss Plate</b>	<b>VCP4</b> PHE - C 480-90 0020175317				<b>VCP5</b> PHE - C 600-120 0020175318	<b>VCP6</b> PHE - C 720-170 0020175319	#	#
<b>Low-loss Header</b>	<b>VHC 3</b> WHC 280 0020175312				<b>VHC 3</b> WHC 350 0020175313			

# Contact your sales representative

\* Dirt filtration and fully inhibited water quality must be maintained

\*\* Check the required water flow volumes

Cascade rigs with hydraulics technical specifications

Cascade rigs (ecoTEC 46kW boilers)

Breakdown of items included in 46 in-line DN65 cascade rigs with hydraulics							
0020201762		0020201763		0020201764		0020201765	
VCR-461		VCR-462		VCR-463		VCR-464	
Cascade 1 x boiler in-line		Cascade 2 x boiler in-line		Cascade 3 x boiler in-line		Cascade 4 x boiler in-line	
Cascade frame support 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1
Frame support for 1 or 2 boilers 0020151813	1	Hydraulic block, start up module 0020151816	1	Frame support for 1 or 2 boilers 0020151813	1	Hydraulic block, start up module 0020151816	1
Hydraulic block, start up module 0020151816	1	Frame support for 2 or 4 boilers 0020151814	1	Hydraulic block, start up module 0020151816	1	Frame support for 2 or 4 boilers 0020151814	2
Hydraulic block for 1 or 2 boilers 0020151818	1	Hydraulic block for 2 or 4 boilers 0020151820	1	Hydraulic block for 1 or 2 boilers 0020151818	1	Hydraulic block for 2 or 4 boilers 0020151820	2
Connector, pipe front 45 0020151823	1	Connector, pipe front 45 0020151823	2	Frame support for 2 or 4 boilers 0020151814	1	Connector, pipe front 45 0020151823	4
Fittings pack, gas front 45 0020151839	1	Fittings pack, gas front 45 0020151839	2	Hydraulic block for 2 or 4 boilers 0020151820	1	Fittings pack, gas front 45 0020151839	4
Gas pipe, DN50 for 1 or 2 boilers 0020107866	1	Gas pipe, DN50 for 2 or 4 boilers 0020107867	1	Connector, pipe front 45 0020107823	3	Gas pipe, DN50 for 2 or 4 boilers 0020107867	2
Flange (blank) gas DN50 0020151835	1	Flange (blank) gas DN50 0020151835	1	Fittings pack, gas front 45 0020151839	3	Flange (blank) gas DN50 0020151835	1
Heat insulation straight 0020151853	1	Heat insulation straight 0020151853	2	Gas pipe, DN50 for 1 or 2 boilers 0020107866	1	Heat insulation straight 0020151854	4
Heat insulation, end cap 0020151854	1	Heat insulation, end cap 0020151854	1	Gas pipe, DN50 for 2 or 4 boilers 0020107867	1	Heat insulation, end cap 0020151854	1
				Flange (blank) gas DN50 0020151835	1		
				Heat insulation straight 0020151853	3		
				Heat insulation, end cap 0020151854	1		

Cascade rigs (ecoTEC 65kW boilers)

Breakdown of items included in 65 in-line with DN65 hydraulics							
0020201768		0020201769		0020201770		0020201771	
VCR-651 Cascade 1 x boiler in-line		VCR-652 Cascade 2 x boiler in-line		VCR-653 Cascade 3 x boiler in-line		VCR-654 Cascade 4 x boiler in-line	
Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1
Frame support for 1 or 2 boilers 0020151813	1	Hydraulic block, start up module 0020151816	1	Frame support for 1 or 2 boilers 0020151813	1	Hydraulic block, start up module 0020151816	1
Hydraulic block, start up module 0020151816	1	Frame support for 2 or 4 boilers 0020151814	1	Hydraulic block, start up module 0020151816	1	Frame support for 2 or 4 boilers 0020151814	2
Hydraulic block for 1 or 2 boilers 0020151818	1	Hydraulic block for 2 or 4 boilers 0020151820	1	Hydraulic block for 1 or 2 boilers 0020151818	1	Hydraulic block for 2 or 4 boilers 0020151820	2
Connector, pipe front 65 0020107864	1	Connector, pipe front 65 0020107864	2	Frame support for 2 or 4 boilers 002015814	1	Connector, pipe front 65 0020107864	4
Fittings pack, gas front 65 0020151840	1	Fittings pack, gas front 65 0020151840	2	Hydraulic block for 2 or 4 boilers 0020151820	1	Fittings pack, gas front 65 0020151840	4
Gas pipe, DN50 for 1 or 2 boilers 0020107866	1	Gas pipe, DN50 for 2 or 4 boilers 0020151867	1	Connector, pipe front 65 0020151864	3	Gas pipe, DN50 for 2 or 4 boilers 0020107867	2
Flange (blank) gas DN50 0020151835	1	Flange (blank) gas DN50 0020151835	1	Fittings pack, gas front 65 0020151840	3	Flange (blank) gas DN50 0020151835	1
Heat insulation straight 0020151853	1	Heat insulation straight 0020151853	2	Gas pipe, DN50 for 1 or 2 boilers 0020107866	1	Heat insulation straight 0020151853	4
Heat insulation, end cap 0020151854	1	Heat insulation, end cap 0020151854	1	Gas pipe, DN50 for 2 or 4 boilers 0020107867	1	Heat insulation, end cap 0020151854	1
				Flange (blank) gas DN50 0020151835	1		
				Heat insulation straight 0020151853	3		
				Heat insulation, end cap 0020151854	1		

Cascade rigs

Cascade rigs - In-line with DN65 hydraulics

Cascade rigs (ecoTEC 80kW to 120kW boilers)

Breakdown of items included in 80 - 120 in-line DN65 cascade rigs with hydraulics							
0020175291		0020175292		0020175293		0020175294	
VCR-51 Cascade 1 x boiler in-line		VCR-52 Cascade 2 x boiler in-line		VCR-53 Cascade 3 x boiler in-line		VCR-54 Cascade 4 x boiler in-line	
Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1
Frame support for 1 or 2 boilers 0020151813	1	Hydraulic block, start up module 0020151816	1	Frame support for 1 or 2 boilers 0020151813	1	Hydraulic block, start up module 0020151816	1
Hydraulic block, start up module 0020151816	1	Frame support for 2 or 4 boilers 0020151814	1	Hydraulic block, start up module 0020151816	1	Frame support for 2 or 4 boilers 0020151814	2
Hydraulic block, extension 1 or 2 boilers 0020151818	1	Hydraulic block for 2 or 4 boilers 0020151820	1	Hydraulic block, extension 1 or 2 boilers 0020151818	1	Hydraulic block for 2 or 4 boilers 0020151820	2
Connector, pipe front 80/100/120 0020151822	1	Connector, pipe front 80/100/120 0020151822	2	Frame support for 2 or 4 boilers 020151814	1	Connector, pipe front 80/100/120 0020151822	4
Fittings pack, gas front 80/100/120 0020151838	1	Fittings pack, gas front 80/100/120 0020151838	2	Hydraulic block, extension 2 or 4 boilers 0020151820	1	Fittings pack, gas front 80/100/120 0020151838	4
Gas pipe DN50 for 1 or 2 boilers 0020107866	1	Gas pipe DN50 for 2 or 4 boilers 0020107867	1	Connector, pipe front 80/100/120 0020151822	3	Gas pipe DN50 for 2 or 4 boilers 0020107867	2
Flange (blank) gas DN50 0020151835	1	Flange (blank) gas DN50 0020151835	1	Fittings pack, gas front 80/100/120 0020151838	3	Flange (blank) gas DN50 0020151835	1
Heat insulation straight 0020151853	1	Heat insulation straight 0020151853	2	Gas pipe DN50 for 1 or 2 boilers 0020107866	1	Heat insulation straight 0020151853	4
Heat insulation, end cap 0020151854	1	Heat insulation, end cap 0020151854	1	Gas pipe, pipe DN50 for 2 or 4 boilers 0020107867	1	Heat insulation, end cap 0020151854	1
				Flange (blank) gas DN50 0020151835	1		
				Heat insulation, Hydraulic straight 0020151853	3		
				Heat insulation, end cap 0020151854	1		

Cascade flue options starting from page 61

Cascade rigs (ecoTEC 80kW to 120kW)

Breakdown of items included in 80 - 120 in-line DN100 cascade rigs with hydraulics							
0020175298		0020175299		0020175300		0020175301	
VCR101 Cascade 1 x boiler in-line		VCR102 Cascade 2 x boiler in-line		VCR103 Cascade 3 x boiler in-line		VCR104 Cascade 4 x boiler in-line	
Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1
Frame support for 1 or 2 boilers 0020151813	1	Frame support for 2 or 4 boilers 0020151817	1	Frame support for 2 or 4 boilers 0020151813	1	Frame support for 2 or 4 boilers 0020151814	2
Hydraulic block, start up module 0020151817	1	Hydraulic block, start up module 0020151814	1	Hydraulic block, start up module 0020151817	1	Hydraulic block, start up module 0020151817	1
Hydraulic block for 1 or 2 boilers 0020151819	1	Hydraulic block for 2 or 4 boilers 0020151821	1	Hydraulic block, extension 2 or 4 boilers 0020151819	1	Hydraulic block for 2 or 4 boilers 0020151821	2
Connector, pipe front 80/100/120 0020151822	1	Connector, pipe front 80/100/120 0020151822	2	Frame support for 1 or 2 boilers 0020151814	1	Connector, pipe front 80/100/120 0020151822	4
Fittings pack, gas front 80/100/120 0020151838	1	Fittings pack, gas front 80/100/120 0020151838	2	Hydraulic block for 1 or 2 boilers 0020151821	1	Fittings pack, gas front 80/100/120 0020151838	4
Gas pipe DN80 connection 1 or 2 boilers 0020107869	1	Gas pipe DN80 for 2 or 4 boilers 0020107870	1	Connector, pipe front 80/100/120 0020151822	3	Gas pipe DN80 for 2 or 4 boilers 0020107870	2
Flange (blank) gas DN80 0020151836	1	Flange (blank) gas DN80 0020151836	1	Fittings pack, gas front 80/100/120 0020151838	3	Flange (blank) gas DN80 0020151836	1
Heat insulation straight 0020151853	1	Heat insulation straight 0020151853	2	Gas pipe DN80 connection 1 or 2 boilers 0020107869	1	Heat insulation straight 0020151853	4
Heat insulation, end cap 0020151854	1	Heat insulation, end cap 0020151854	1	Gas pipe DN80 connection 2 or 4 boilers 0020107870	1	Heat insulation, end cap 0020151854	1
				Flange (blank) gas DN80 0020151836	1		
				Heat insulation straight 0020151853	3		
				Heat insulation, end cap 0020151854	1		
<b>Cascade flue options starting from page 61</b>							

Cascade rigs

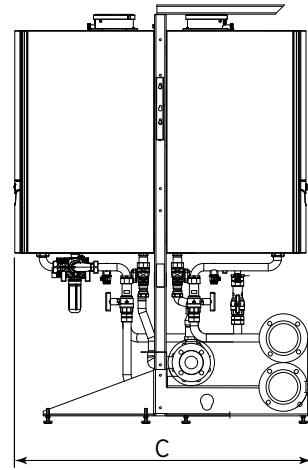
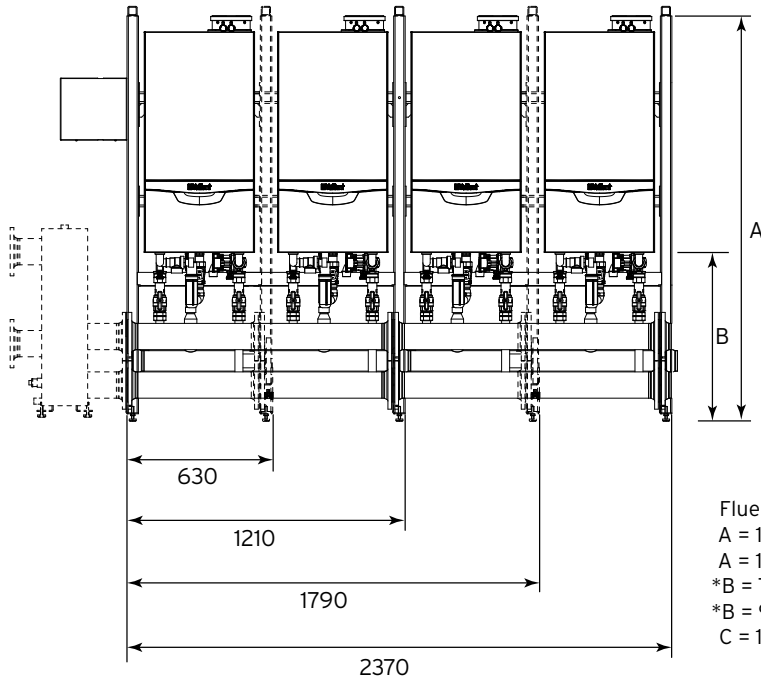
Cascade rigs - In-line with DN100 hydraulics

Cascade rigs (ecoTEC 80kW to 120kW boilers)

Breakdown of items included in 80 - 120 in-line DN100 cascade rigs with hydraulics							
0020175302		0020175303		0020175304		0020175305	
VCR105 Cascade 5 x boiler in-line		VCR106 Cascade 6 x boiler in-line		VCR107 Cascade 7 x boiler in-line		VCR108 Cascade 8 x boiler in-line	
Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1
Frame support for 1 or 2 boilers 0020151813	1	Hydraulic block, start up module 0020151817	1	Frame support for 1 or 2 boilers 0020151813	1	Hydraulic block, start up module 0020151817	1
Hydraulic block, start up module 0020151817	1	Frame support for 2 or 4 boilers 0020151814	3	Hydraulic block, start up module 0020151817	1	Frame support for 2 or 4 boilers 0020151814	4
Hydraulic block for 1 or 2 boilers 0020151819	1	Hydraulic block for 2 or 4 boilers 0020151821	3	Hydraulic block, extension 1 or 2 boilers 0020151819	1	Hydraulic block for 2 or 4 boilers 0020151821	4
Frame support for 2 or 4 boilers 0020151814	2	Connector, pipe front 80/100/120 0020151822	6	Frame support for 1 or 2 boilers 0020151814	3	Connector, pipe front 80/100/120 0020151822	8
Hydraulic block for 2 or 4 boilers 0020151821	2	Fittings pack, gas front 80/100/120 0020151838	6	Hydraulic block for 1 or 2 boilers 0020151821	3	Fittings pack, gas front 80/100/120 0020151838	8
Connector, pipe front 80/100/120 0020151822	5	Gas pipe DN80 for 2 or 4 boilers 0020107870	3	Connector, pipe front 80/100/120 0020151822	7	Gas pipe DN80 for 2 or 4 boilers 0020107870	4
Fittings pack, gas front 80/100/120 0020151838	5	Flange (blank) gas DN80 0020151836	1	Fittings pack, gas front 80/100/120 0020151838	7	Flange (blank) gas DN80 0020151836	1
Gas pipe DN80 connection 1 or 2 boilers 0020107869	1	Heat insulation straight 0020151853	6	Gas pipe DN80 connection 1 or 2 boilers 0020107869	1	Heat insulation straight 0020151853	8
Gas pipe DN80 connection 2 or 4 boilers 0020107870	2	Heat insulation, end cap 0020151854	1	Gas pipe DN80 connection 2 or 4 boilers 0020107870	3	Heat insulation, end cap 0020151854	1
Flange (blank) gas DN80 0020151836	1			Flange (blank) gas DN80 0020151836	1		
Heat insulation straight 0020151853	5			Heat insulation straight 0020151853	7		
Heat insulation, end cap 0020151854	1			Heat insulation, end cap 0020151854	1		

Cascade flue options starting from page 61

Cascade rigs for ecoTEC boilers back-to-back



Flue spigot height  
 A = 1750 (65 - 120)  
 A = 1730 (46)  
 \*B = 750 (80/120)  
 \*B = 900 (45 or 65)  
 C = 1360 (over insulation)

Allowances  
 600mm in front of each boiler  
 for service access.  
 End cap insulation + 70mm.  
 Low-loss header or plate  
 heat exchangers - dimensions  
 according to model.

All dimensions +/- 20mm



Cascade rigs - back-to-back with DN65 hydraulics

## Connection options

	<b>Article numbers for cascade rigs boilers back-to-back with DN65 hydraulics</b> Recommended system connection for cascade rigs with hydraulics*		
	<b>2 x boiler</b>	<b>3 x boiler</b>	<b>4 x boiler</b>
<b>ecoTEC 46</b>	<b>VCBB 462</b> 0020201766	N/A	<b>VCR 464</b> 0020201767
<b>ecoTEC 65</b>	<b>VCBB 462</b> 0020201773	N/A	<b>VCBB 654</b> 0020201723
<b>Low-loss Plate</b>	<b>VCP2</b> PHE - C 240-40 0020175315	N/A	<b>VCP2</b> PHE - C 240-40 0020175315
<b>Low-loss Header</b>	<b>VHC1</b> WHC 110 0020175310	N/A	<b>VHC1</b> WHC 110 0020175310
<b>ecoTEC 80</b>	<b>VCBB 52</b> 0020175315	<b>VCBB 53</b> 0020175296	<b>VCBB 54</b> 0020175297
<b>Low-loss Plate</b>	<b>VCP2</b> PHE - C 240-40 0020175315	<b>VCP2</b> PHE - C 240-40 0020175315	<b>VCP3</b> PHE - C 360-70 0020175316
<b>Low-loss Header</b>	<b>VHC1</b> WHC 110 0020175310	<b>VHC2</b> WHC 160 0020175311	<b>VHC2</b> WHC 160 0020175311
<b>ecoTEC 100</b>	<b>VCBB 52</b> 0020175295	<b>VCBB 53</b> 0020175296	<b>VCBB 54</b> 0020175297
<b>Low-loss Plate</b>	<b>VCP2</b> PHE - C 240-40 0020175315	<b>VCP3</b> PHE-C 360-70 002015316	Use DN100 rig
<b>Low-loss Header</b>	<b>VHC1</b> WHC 110 0020175310	<b>VHC2</b> WHC 160 0020175311	Use DN100 rig
<b>ecoTEC 120</b>	<b>VCBB 52</b> 0020175295	<b>VCBB 53</b> 0020175296	<b>VCBB 54</b> 0020175297
<b>Low-loss Plate</b>	<b>VCP2</b> PHE - C 240-40 0020175315	<b>VCP3</b> PHE-C 360-70 002015316	Use DN100 rig
<b>Low-loss Header</b>	<b>VHC2</b> WHC 160 0020175311	<b>VHC2</b> WHC 160 0020175311 **	Use DN100 rig
* Dirt filtration and fully inhibited water quality must be maintained. ** subject to 20 Δ T			



Breakdown of items included in 46 back-to-back DN65 cascade rigs with hydraulics					
0020201766			0020201767		
VCBB-462 Cascade 2 x boiler back-to-back			VCBB-464 Cascade 4 x boiler back-to-back		
Frame support cascade	0020151805	1	Frame support cascade	0020151805	1
Frame support for 1 or 2 boilers	0020151813	1	Hydraulic block, start up module	0020151814	1
Hydraulic block, start up module	0020151816	1	Frame support for 2 or 4 boilers	0020151816	1
Hydraulic block for 1 or 2 boilers	0020151818	1	Hydraulic block for 2 or 4 boilers	0020151820	1
Connector, pipe front 45	0020151823	1	Connector, pipe front 45	0020151823	2
Fittings pack, gas front 45	0020151839	1	Fittings pack, gas front 45	0020151839	2
Fittings pack, gas back 45	0020151825	1	Fittings pack, gas back 45	0020151825	2
Connector, pipe back 45	0020151845	1	Connector, pipe back 45	0020151845	2
Gas pipe, DN50 for 1 or 2 boilers	0020107866	1	Gas pipe, DN50 for 2 or 4 boilers	0020107867	1
Flange (blank) gas DN50	0020151835	1	Flange (blank) gas DN50	0020151835	1
Heat insulation straight	0020151853	1	Heat insulation straight	0020151853	2
Heat insulation, end cap	0020151854	1	Heat insulation, end cap	0020151854	1
Feet pair B	0020151815	1	Feet pair B	0020151815	1

Breakdown of items included in 65 back-to-back DN65 cascade rigs with hydraulics					
0020201772			0020201773		
VCBB-652 Cascade 2 x boiler back-to-back			VCBB-654 Cascade 4 x boiler back-to-back		
Frame support cascade	0020151805	1	Frame support cascade	0020151805	1
Frame support for 1 or 2 boilers	0020151813	1	Hydraulic block, start up module	0020151814	1
Hydraulic block, start up module	0020151816	1	Frame support for 2 or 4 boilers	0020151816	1
Hydraulic block for 1 or 2 boilers	0020151818	1	Hydraulic block for 2 or 4 boilers	0020151820	1
Connector, pipe front 65	0020107864	1	Connector, pipe front 65	0020151864	1
Fittings pack, gas front 65	0020151840	1	Fittings pack, gas front 65	0020151840	2
Fittings pack, gas back 65	0020107865	1	Fittings pack, gas back 65	0020107865	2
Connector, pipe back 65	0020151846	1	Connector, pipe back 65	0020151846	2
Gas pipe, DN50 for 1 or 2 boilers	0020107866	1	Gas pipe, DN50 for 2 or 4 boilers	0020107867	2
Flange (blank) gas DN50	0020151835	1	Flange (blank) gas DN50	0020151835	1
Heat insulation straight	0020151853	1	Heat insulation straight	0020151853	1
Heat insulation, end cap	0020151854	1	Heat insulation, end cap	0020151854	2
Feet pair B	0020151815	1	Feet pair B	0020151815	1

Cascade rigs - back-to-back with DN100 hydraulics

Breakdown of items included in 80 - 120 back-to-back DN65 cascade rigs with hydraulics					
0020175295		0020175296		0020175297	
VCBB-52		VCBB-53		VCBB-54	
Cascade 2 x boiler back-to-back		Cascade 3 x boiler back-to-back		Cascade 4 x boiler back-to-back	
Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1
Frame support for 1 or 2 boilers 0020151813	1	Support for 2 or 4 boilers 0020151814	1	Support for 2 or 4 boilers 0020151814	1
Hydraulic block, start up module 0020151816	1	Hydraulic block, start up module 0020151816	1	Hydraulic block, start up module 0020151816	1
Hydraulic block for 1 or 2 boilers 0020151818	1	Hydraulic block for 2 or 4 boilers 0020151820	1	Hydraulic block for 2 or 4 boilers 0020151820	1
Connector, pipe front 80/100/120 0020151822	1	Connector, pipe front 80/100/120 0020151822	2	Connector, pipe front 80/100/120 0020151822	2
Fittings pack, gas front 80/100/120 0020151838	1	Fittings pack, gas front 80/100/120 0020151838	2	Fittings pack, gas front 80/100/120 0020151838	2
Fittings pack, gas back 80/100/120 0020151844	1	Fittings pack, gas back 80/100/120 0020151844	1	Fittings pack, gas back 80/100/120 0020151844	2
Connector, pipe back 80/100/120 0020151824	1	Connector, pipe back 80/100/120 0020151824	1	Connector, pipe back 80/100/120 0020151824	2
Gas pipe DN50 for 1 or 2 boilers 0020107866	1	Gas pipe DN50 for 2 or 4 boilers 0020107867	1	Gas pipe DN5 for 2 or 4 boilers 0020107867	1
Flange (blank) gas DN50 0020151835	1	Flange (blank) gas DN50 0020151835	1	Flange (blank) gas DN50 0020151835	1
Heat insulation straight 0020151853	1	Heat insulation straight 0020151853	2	Heat insulation straight 0020151853	2
Heat insulation, end cap 0020151853	1	Heat insulation, end cap 0020151853	1	Heat insulation, end cap 0020151853	1
Feet pair B 0020151815	1	Feet pair B 0020151815	1	Feet pair B 0020151815	1
<b>Cascade flue options starting from page 61</b>					

Breakdown of items included in 80 - 120 back-to-back DN100 cascade rigs with hydraulics							
0020175306		0020175307		0020175308		0020175309	
VBB102		VBB104		VBB106		VBB108	
Cascade 2 x boiler back-to-back		Cascade 4 x boiler back-to-back		Cascade 6 x boiler back-to-back		Cascade 8 x boiler back-to-back	
Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1	Frame support cascade 0020151805	1
Frame support for 1 or 2 boilers 0020151813 0020151813	1	Support for 2 or 4 boilers 0020151814	1	Support for 1 or 2 boilers 0020151813	1	Support for 2 or 4 boilers 0020151814	2
Hydraulic block, start up module 0020151817	1	Hydraulic block, start up module 0020151817	1	Hydraulic block, start up module 0020151817	1	Hydraulic block, start up modules 0020151817	1
Hydraulic block for 1 or 2 boilers 0020151819	1	Hydraulic block for 2 or 4 boilers 0020151821	1	Frame support for 2 or 4 boilers 0020151814	1	Hydraulic block for 2 or 4 boilers 0020151821	2
Connector, pipe front 80/100/120 0020151822	1	Connector, pipe front 80/100/120 0020151822	2	Hydraulic block for 1 or 2 modules 0020151819	1	Connector, pipe front 80/100/120 0020151822	4
Fittings pack, gas front 80/100/120 0020151838	1	Fittings pack, gas front 80/100/120 0020151838	2	Hydraulic block for 2 or 4 boilers 0020151821	1	Fittings pack, gas front 80/100/120 0020151838	4
Fittings pack, gas back 80/100/120 0020151844	1	Fittings pack, gas back 80/100/120 0020151844	2	Connector, pipe front 80/100/120 0020151822	3	Fittings pack, gas back 80/100/120 0020151844	4
Connector, pipe back 80/100/120 0020151824	1	Connector, pipe back 80/100/120 0020151824	2	Fittings pack, gas front 80/100/120 0020151838	3	Connector, pipe back 80/100/120 0020151824	4
Gas pipe DN80 for 1 or 2 boilers 0020107869	1	Gas pipe DN80 for 2 or 4 boilers 0020107870	1	Fittings pack, gas back 80/100/120 0020151844	3	Gas pipe DN80 for 2 or 4 boilers 0020107870	2
Flange (blank) gas DN80 0020151836	1	Flange (blank) gas DN80 0020151836	1	Connector, pipe back 80/100/120 0020151824	3	Flange (blank) gas DN80 0020151836	1
Heat insulation straight 0020151853	1	Heat insulation straight 0020151853	2	Gas pipe DN80 for 2 or 4 boilers 0020107870	1	Heat insulation straight 0020151853	4
Heat insulation, end cap 0020151854	1	Heat insulation, end cap 0020151854	1	Flange (blank) gas DN80 0020151836	1	Heat insulation, end cap 0020151854	1
Feet pair B 0020151815	1	Feet pair B 0020151815	1	Heat insulation straight 0020151853	1	Feet pair B 0020151815	2
				Feet pair B 0020151815	1		
<b>Cascade flue options starting from page 61</b>							

	Recommended System connections DN100 back-to-back			
	2 x boiler	4 x boiler	6 x boiler	8 x boiler
<b>ecoTEC Model 80</b>	<b>VBB 102</b> 0020175306	<b>VBB 104</b> 0020175307	<b>VBB 106</b> 0020175308	<b>VBB 108</b> 0020175309
<b>Low-loss Plate</b>	<b>VCP4</b> PHE - C 480-90 0020175317			<b>VCP6</b> PHE -C 720-170 0020175319
<b>Low-loss Header</b>	<b>VHC 3</b> WHC 280 0020175312			<b>VHC 3</b> WHC 350 0020175313
<b>ecoTEC Model 100</b>	<b>VBB 102</b> 0020175306	<b>VBB 106</b> 0020175308	<b>VBB 108</b> 0020175309	<b>VBB 108</b> 0020175309
<b>Low-loss Plate</b>	<b>VCP4</b> PHE - C 480-90 0020175317		<b>VCP5</b> PHE - C 600-120 0020175318	Contact Vaillant RBM*
<b>Low-loss Header</b>	<b>VHC 3</b> WHC 280 0020175312		<b>VHC 3</b> WHC 350 0020175313	
<b>ecoTEC Model 120</b>	<b>VBB 102</b> 0020175306	<b>VBB 104</b> 0020175307	<b>VBB 106</b> 0020175308	<b>VBB 108</b> 0020175309
<b>Low-loss Plate</b>	<b>VCP4</b> PHE - C 480-90 0020175317		<b>VCP6</b> PHE-C 720-170 0020175319	Contact Vaillant RBM*
<b>Low-loss Header</b>	<b>VHC 3</b> WHC 280 0020175312		<b>VHC 3</b> WHC 350 0020175313	Contact Vaillant RBM*

\* Contact your Regional Business Manager (RBM) for more details

Cascade rigs - with DN100 hydraulics - around corner systems

Cascade rigs for 1 to 8 boilers around a corner



(A)



Heat insulation, module corner

**(A) Breakdown of items included in an around a corner pipe kit for 80 - 120 rigs with DN100 hydraulics**

0020176695		
DN100 Around corner pipe kit		
Around corner kit for DN100 hydraulics and insulation set		
Pipe elbows DN100 flow and return	0020151834	1
Heat insulation, module corner	0020151856	1
Pipe elbow DN80/PN16 gas	0020151837	1

Once the output of a cascade system has been ascertained the specification of the internal and external flue requirements can be determined. Vaillant supplies a variety of diameters in its flue components range, including all appropriate fixings, tiles, collars and pipes. It is vital that the diameter of the flue components is correctly matched to the outputs required. Please refer to the flue table to ensure correct components are selected to complete the flue to the necessary dimensions.

## Overview

The wide range of flue accessories available from Vaillant means that flue systems can be designed in a variety of configurations: in-line, round a corner and back-to-back. The systems can exit to the left or the right of the rig depending on the space available.

All flue installations must comply with the current Gas Safety (Installation and Use) regulations. Vaillant strongly recommends advice should be sought from a specialist flue installation company to ensure that each installation fulfils all pertinent national and local regulations, codes and standards.



### 80 - 120 Non-return Valves

ecoTEC 80, 100 and 120 models installed in a cascade array will need to be fitted with a flue non-return flap valve. Vaillant can supply a 110mm mechanical flue non-return flap valve which is easily installed on top of each boiler before connecting the flue header. When dealing with plantrooms with restricted heights, the Vaillant electrical flue non-return flap valve kit has a lower profile and can be specified in place of the mechanical flap valve, but these should not be mixed within an array.

Flue systems for high-output cascades may require guidance from a specialist flue company to ensure that a system is designed and sized correctly in accordance with all relevant regulations, codes and standards. For systems over 70kW, the current edition of the IGEM/UP10 guide should be followed and for larger systems over 333kW net, the Clean Air Act requirements and any local council approvals that may be required should be followed.

The IGEM/UP 10 risk assessment can be used to determine the most suitable position for larger flue system termination positions.



Cascade Mechanical Flue NRV DN110  
Article number 0020207200

ecoTEC 80 - 100 and 120 cascade flue systems

Alternative low profile motorised NRV option

The sales article 0020177845 below provides both the 110mm motorised NRV and the VR 40 module necessary to achieve this and should be ordered for each boiler in such an array.

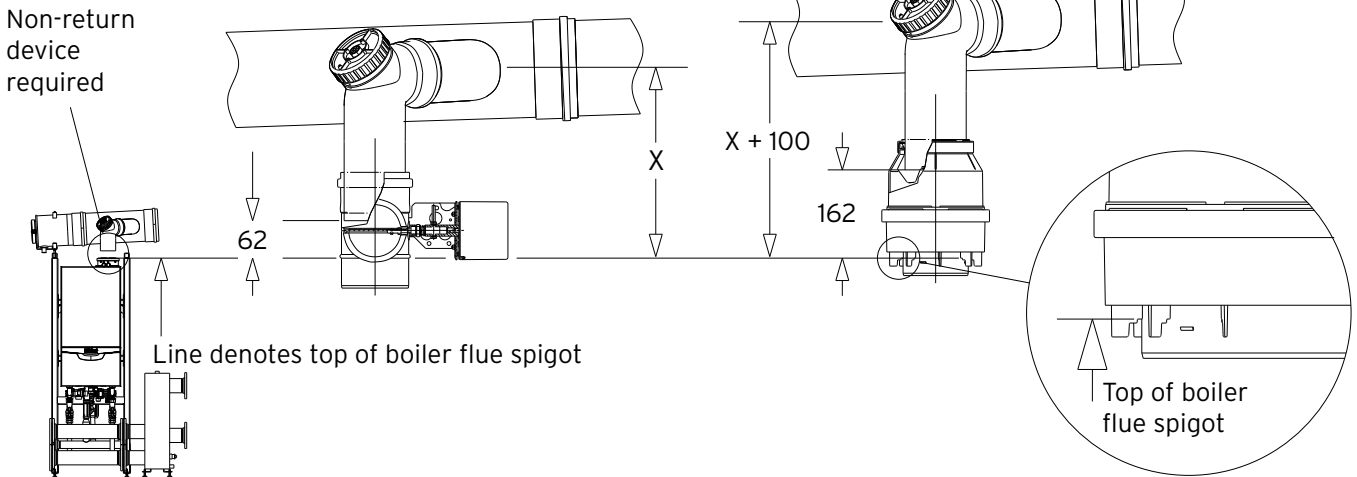
110mm motorised NRV



VR 40 Multi-function module 2-in-7

Motorised flap kit DN110mm  
Article 0020177845

Mechanical flap DN 110mm  
Article 0020207200



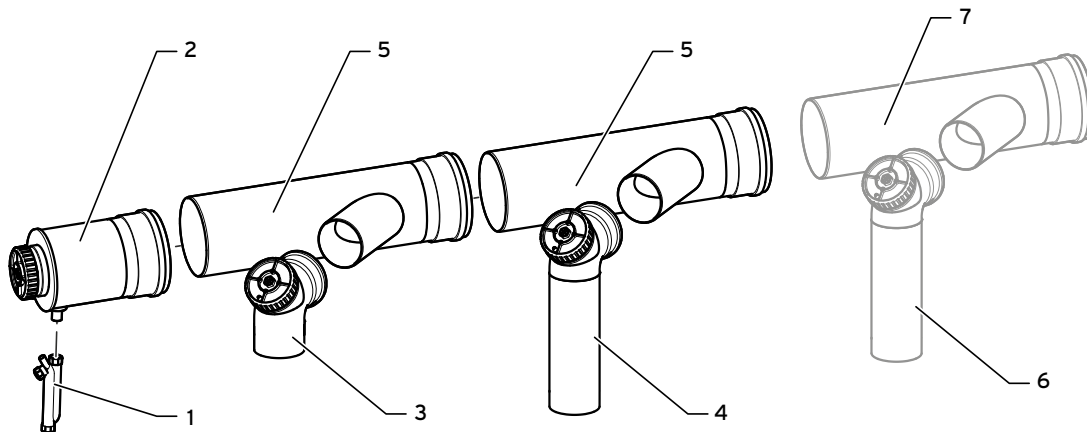
X is the minimum height of the first boiler flue. When fitted with the shortest 87° 110mm elbow and the electrical flap, this is 300mm. The mechanical flap is 100mm taller. This height will increase with each additional boiler to create the required 3° (50mm per metre) fall.

For in-line flue systems the cascade flue and header must be installed with a minimum fall back to the boilers of 3° (50mm per metre) this means that the 110mm pipe from each boiler needs to increase in length by 33mm.

For back-to-back systems, see opposite.

Requirements for cascade flue WITH an NRV (diameter in mm)				
Boilers	Height	VC 806	VC 1006	VC 1206
2	2 - 50m	160	160	160
3	2 - 50m	160	200	200
4	2 - 50m	200	200	250
5	2 - 50m	250	250	250
6	2 - 50m	250	250	250

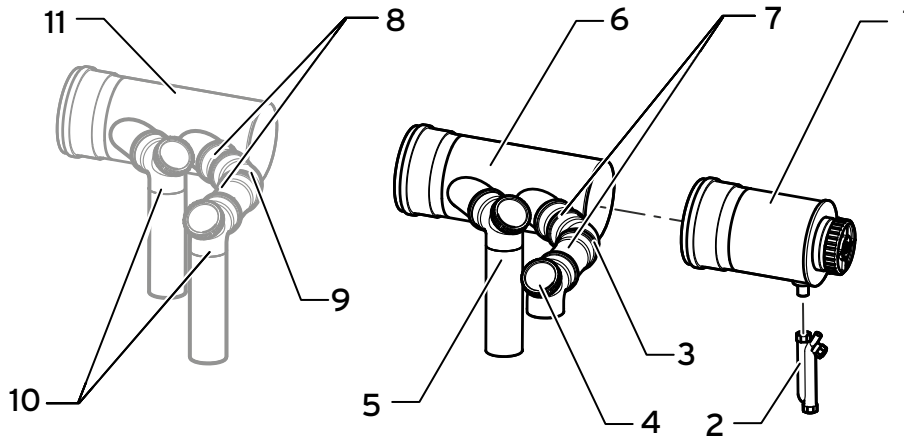
Requirements for cascade flue WITHOUT an NRV (diameter in mm)						
Boilers	VC 806		VC 1006		VC 1206	
	Diameter (mm)	Height (m)	Diameter (mm)	Height (m)	Diameter (mm)	Height (m)
2	200	160	200	3 - 50	200	3 - 50
	160	160				
3	200	10 - 50	250	3 - 50	250	3 - 50
4	250	8 - 50	250	10 - 50	~~~~~	



Key	Basic connection set - in-line
1	Siphon (1 pc)
2	Terminal with condensate discharge
3	Inspection elbow, 110mm (W) x 140mm (H)
4	Inspection elbow, 110mm (W) x 390mm (H)
5	Flue pipe with oblique entry (2 pcs)

Key	Expansion set - additional boilers in-line
6	Inspection elbow, 110mm (W) x 390mm (H)
7	Flue pipe with oblique entry (1 pc)
Increase 110mm pipe by 30mm per boiler to gain minimum fall	

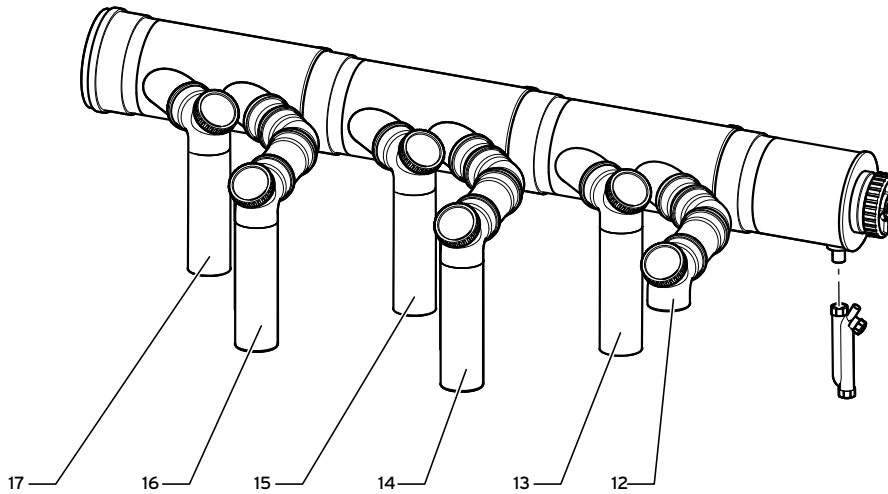
ecoTEC 80, 100 and 120 - Cascade flue headers



Key	Basic connection set - back-to-back
1	Terminal with condensate discharge
2	Siphon (1 pc)
3	45° elbow, 110mm diameter
4	Inspection elbow, 110mm (W) x 140mm (H)
5	Inspection elbow, 110mm (W) x 390mm (H)
6	Flue pipe with two oblique entries
7	Flue pipe, 110mm x 250mm (L)

Key	Expansion set - boilers back-to-back
8	Flue pipe, 110mm x 250mm (L)
9	45° elbow, 110mm diameter
10	Inspection elbow, 110mm (W) x 390mm (H)
11	Flue pipe with two oblique entries

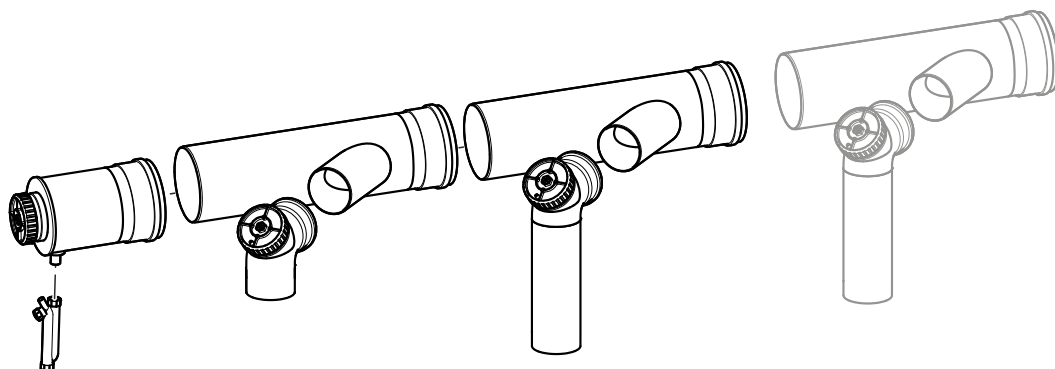
Required length for the 110mm diameter flue pipes



Unit 1 (1) has the shortest elbow with length A. The other inspection elbow lengths are indicated in the following table.

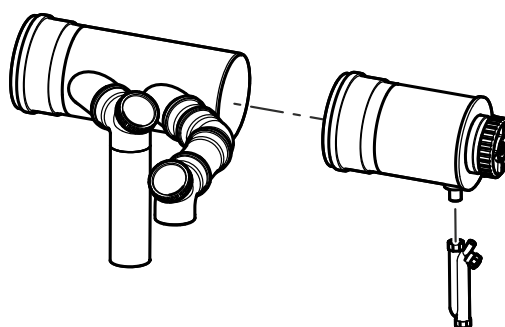
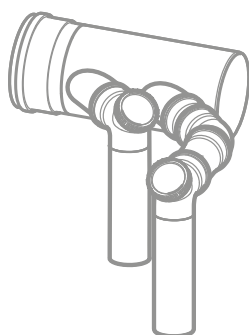
Unit	Length of flue pipe (mm)
12	A
13	A + 62
14	A + 30
15	A + 92
16	A + 61
17	A + 123





Basic connection set - in-line	
160mm / 225mm up to 240kW	
Article number	0020106412
200mm / 300mm up to 400kW	
Article number	0020106428
200mm / 300mm over 400kW	
Article number	0020106553

Expansion set - additional boilers in-line	
160mm / 225mm up to 240kW	
Article number	0020106413
200mm / 300mm up to 400kW	
Article number	0020106429
200mm / 300mm over 400kW	
Article number	0020106554



Basic connection set - back-to-back	
160mm / 225mm up to 240kW	
Article number	0020106414
200mm / 300mm up to 400kW	
Article number	0020106430
200mm / 300mm over 400kW	
Article number	0020106555

Expansion set - boilers back-to-back	
160mm / 225mm up to 240kW	
Article number	0020106415
200mm / 300mm up to 400kW	
Article number	0020106431
200mm / 300mm over 400kW	
Article number	0020106556

Cascade flue header bracket requirements - in-line cascades							
Number of boilers Maximum 720kW	2	3	4	5	6	7	8
Number of brackets required	2	3	3	4	4	5	5
Cascade flue header bracket requirements - back-to-back cascades							
Number of boilers Maximum 720kW	2	3	4	5	6	7	8
Number of brackets required	2	2	2	3	3	3	3



0020107879  
Bracket for cascade flue header

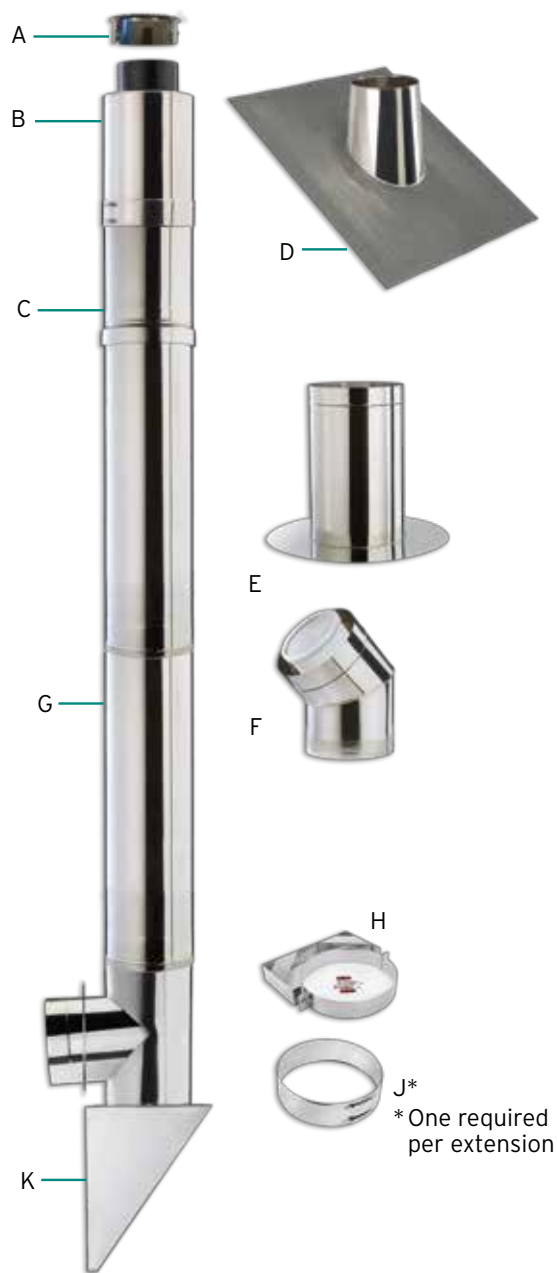
External cascade facades up to 720kW

Once the output of a cascade system has been ascertained the specification of the internal and external flue requirements can be determined. Vaillant can supply a range of flue components including pipe and fittings in sizes up to 250mm for internal use and within 350mm stainless steel for outer facade pipe. These, along with additional accessories such as fixing brackets, flat roof and pitched roof weather ring collars enable a complete cascade flue system to be ordered for your project. It is vital that the diameter of the flue components is correctly matched to the outputs required. Please refer to the tables below to ensure that all the correct component parts are selected to complete the flue to the necessary dimensions.

Key	Stainless steel facade flue up to 240kW 160mm PP / 225mm Stainless steel	Article number
A	Bird Protection grid DN160	0020230630
B	Terminal - 160mm / 225mm	0020095583
C	Vertical terminal through roof section 160mm	0020095581
D	Roof tile 160mm 35-45°	0020130600
E	Collar for flat roof 160mm	0020095587
F	Bend 45°	0020095544
G	Extension 160mm x 500mm Extension 160mm x 1000mm	0020095577 0020095579
H	Wall bracket (stainless steel) 160mm	0020095575
J	Pipe clamp 160mm	0020095540
K	Support kit 160mm / 225mm facade	0020095573

Key	Stainless steel facade flue up to 400kW 200mm PP / 300mm Stainless steel	Article number
A	Bird protection grid DN200	0020228943
B	Terminal 200mm	0020095584
C	Vertical terminal through roof section	0020095582
D	Roof tile - 25-35°	0020130602
E	Collar for flat roof	0020095588
F	Elbow 45°	0020095548
G	Extension x 500mm Extension x 1000mm	0020095578 0020095580
H	Wall bracket (stainless steel)	0020095576
J	Pipe clamp	0020095536

Key	Stainless steel facade flue over 400kW 250mm PP / 300mm Stainless steel	Article number
A	Bird protection grid DN250	0020231158
B	Terminal	0020108008
C	Vertical terminal through roof section	0020108007
D	Roof tile - 25-35°	0020145573
E	Collar for flat roof	0020108013
F	Elbow 45°	0020108009
G	Extension x 500mm Extension x 1000mm	0020108005 0020108006
H	Wall bracket (stainless steel)	0020106559
J	Pipe clamp	0020108011
K	Support kit 250mm cascade facade	0020106434

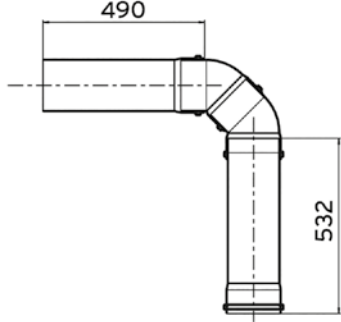
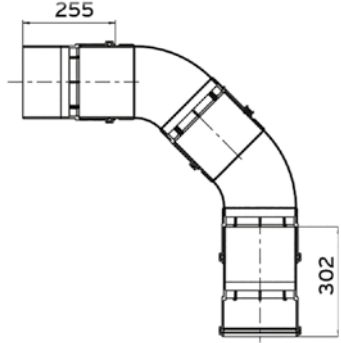
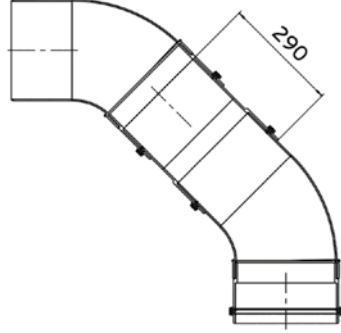


Concentric stainless steel facade flue

J\*  
\*One required per extension

**Requirements for corner cascade flue systems**

When fitting a cascade in a corner system, the sizing and components for the flue systems listed below will be used.

Diameter (mm)	Components	Geometry
<p><b>160 diameter</b> Up to 240kW</p>	<p>2 x 45° elbows Article number: 0020095556</p> <p>1 x 500mm extension Article number: 0020095545</p> <p>1 x 1000mm extension Article number: 0020095546</p>	
<p><b>200 diameter</b> Up to 400kW</p>	<p>2 x 45° elbows Article number: 0020095557</p> <p>2 x 500mm extension Article number: 0020095545</p>	
<p><b>250 diameter</b> Up to 720kW</p>	<p>2 x 45° elbows Article number: 0020106564</p> <p>1 x 500mm extension Article number: 0020145507</p>	

Cascade rigs without hydraulics - technical specifications

The top article number refers to the BOM which contains the items listed beneath



Vaillant cascade rigs - without hydraulics		
Article number 0020175287		
VCR x 1 Cascade 1 x boiler in-line (no hydraulic)		
Frame support cascade	002015805	1
Frame support with extension for 1 inline <sup>A</sup>	002015813	1
Feet pair <sup>B</sup>	002015815	1

Article number 0020175288		
VCR x 2 Cascade 2 x boiler in-line (no hydraulic)		
Frame support cascade	002015805	1
Frame support with extension for 2 inline <sup>A</sup>	002015814	1
Feet pair <sup>B</sup>	002015815	1

Article number 0020175289		
VCR x 3 Cascade 3 x boiler in-line (no hydraulic)		
Frame support cascade	002015805	1
Frame support with extension for 1 inline <sup>A</sup>	002015813	1
Frame support with extension for 2 inline <sup>A</sup>	002015814	1
Feet pair <sup>B</sup>	002015815	2

Article number 0020175290		
VCR x 4 Cascade 4 x boiler in-line (no hydraulic)		
Frame support cascade	002015805	1
Frame support with extension for 2 inline <sup>A</sup>	002015814	2
Feet pair <sup>B</sup>	002015815	2

<sup>A</sup> Boilers can be mounted back-to-back doubling the number of boilers that each rig can support.

<sup>B</sup> Additional feet can be fitted at the rear of the frames when free standing (applies to all Vaillant cascade rigs).

Article number	Dimensions mm		
	H	W	D*
0020175287	1750	630	540
0020175288		1210	
0020175289		1790	
0020175290		2370	
*Allow 480mm behind if rear feet are to be fitted			



## Installing a Vaillant system control solution has never been so easy.

### VRC 700 wired weather compensating programmable room thermostat.

The VRC 700 system control allows you to take control of your Vaillant heating and hot water system. Designed to work harmoniously with all current Vaillant products, the VRC 700 effortlessly ensures your appliances are working to their peak performance and always maintaining optimum efficiency.

- **Designed with simplicity and familiarity in mind**  
The VRC 700 control has been designed with ease of use in mind. Using a familiar menu structure makes controlling the system easy and efficient.
- **Takes care of all Vaillant equipment automatically**  
Intelligently communicates with all Vaillant appliances. The hybrid management system will also automatically choose the most efficient and cost-effective appliance to deliver the most cost-effective and energy-efficient solution.
- **Works with our complete range of boilers**  
Compatible with Vaillant combination, system and open vent boilers.
- **Flexible time programs**  
Three heating and three hot water time periods can be set for each week, day or over a 24-hour period.
- **Clear, high-contrast backlit display**  
Blue backlit display, using proven technology offers outstanding contrast, resulting in clear information, with low energy consumption on both the VRC 700 and VR 91.
- **Works with S and Y plan systems**  
Can control either an S or Y plan system when used with our VR 66 wiring centre.
- **Up to three heating circuits with domestic hot water control**  
VR 91 additional heating zone controls are designed to mirror the functionality of the VRC 700. This is to provide our customers with a familiar user experience anywhere in their property.
- **Accepts on/off signals from third party devices**  
The VRC 700 can accept on/off signals from third party underfloor heating controls. This provides total system flexibility when designing your customers complete heating system.
- **Boiler modulation**  
eBUS connection to fully modulate the boiler ensuring peak performance
- **Holiday function**  
Prevents the heating and hot water coming on whilst away and reinstates it upon return.
- **Programs stored in memory permanently**  
Holds time and temperature programs permanently, even in the event of a power failure.

Controls – cascade

I would like to...

**Control a combination boiler** with one wired heating zone and control everything from a single programmable thermostat.



**Programmable Room Thermostat**  
Wired VRC 700 Pack  
0020236291

ERP Class  
**VI**  
+4%

**Control a system or open vent boiler** with one wired heating zone and hot water, and control everything from a single programmable thermostat.



**System Control Pack**  
Wired VRC 700 one radiator zone and DHW  
0020236292

ERP Class  
**VI**  
+4%

**Control a system or open vent boiler** with one traditional S or Y plan wired heating zone, and control everything from a single programmable thermostat.



**Programmable Room Thermostat**  
Wired VRC 700  
0020236291



**Wiring Centre**  
VR 66  
0020135785

ERP Class  
**VI**  
+4%

**Control a combination, system or open vent boiler** with two wired heating zones and hot water, and control everything from each zone programmable thermostat.



**System Control Pack**  
Wired VRC 700 two radiator zones and DHW  
0020236293

ERP Class  
**VI**  
+4%

**Control a combination, system or open vent boiler** with one wired heating zone and Vaillant's solar thermal hot water, and control everything from each zone programmable thermostat.



**System Control Pack**  
Wired VRC 700 one radiator zone and Solar thermal DHW  
0020236295

ERP Class  
**VI**  
+4%

**Control a combination, system or open vent boiler** with three wired heating zones and hot water, and control everything from each zone programmable thermostat.



**System Control Pack**  
Wired VRC 700 three radiator zones and DHW  
0020236294

ERP Class  
**VI**  
+4%



## VRC 630 Boiler Management Control

### VRC 630 Boiler Management Control

Article 0020092438

The VRC 630 control provides weather-compensated flow temperature control for a heating system and has time programs for controlling a heating and hot water system. This versatile control manages multiple boilers in cascade and multiple heating circuits using additional accessories. The VRC 630 control can also be easily used for single boiler applications, bringing benefits of multiple heating zone control. The VRC 630 can control the following system circuits:

- A direct heating circuit
- Two mixed circuits, e.g. compensated heating
- An indirectly heated hot water cylinder (can be designated as a heating circuit)
- A hot water secondary re-circulation pump

The system can be extended by adding up to six further extension modules (accessory VR 60). Each VR 60 allows two further circuits which can either be central heating or hot water. A maximum of 15 heating circuits can be controlled in total (1 x VRC 630 - three circuits and 6 x VR 60 - two circuits each). The extension circuits are programmed at the central VRC 630 control. For more convenience, the heating circuits can be controlled locally using separate room/zone controls (VR 80 or VR 90) for each extension circuit. These room/zone controls can be connected to the first eight heating circuits. Up to eight Vaillant ecoTEC, ecoCRAFT or atmoCRAFT boilers can be connected to the VRC 630 using a bus coupler (accessory VR 32 for ecoTEC/ecoCRAFT and VR 30 for atmoCRAFT).

The VRS 620 Solar Cascade Control is also available for solar installations.



### **VR 80 Room/Zone Control**

Article 306766

#### **VR 80 Room/Zone Control (for use with VRC 630 only)**

The VR 80 control is similar to the VR 90 but with fewer functions. Up to eight VR 80s can be used, each controlling one heating zone. The VR 80 allows a user to set the target room temperature and heating mode (auto, eco, off and over-ride/party). The control can take into account the actual room temperature measured by the built-in room sensor, if necessary. It is also possible for the user to adjust some parameters for the associated heating circuit and to select special functions (party etc). The VR 80 control is connected to the rest of the control system via 2-core eBUS cable to enable communication.



### **VR 60 Zone Extension Module**

Article 306782

#### **VR 60 Zone Extension Module**

The VR 60 is an extension module which will allow two additional mixer circuits to be added to the system. Both circuits can be programmed via the central controller or a separate VR 90 remote device.



### **VR 90 Room/Zone Control**

Article 0020040079

#### **VR 90 Room/Zone Control (for use with VRC 630 only)**

A remote room/zone control for use with the VRC 630 only. Up to eight VR 90 controls can be connected to the VRC 630. The VR 90 allows a user to set the operating mode and the target room temperature. Up to three time periods can be programmed and the user can select 5 day, 2 day, 7 day or 24 hour operation. The control can take into account the actual room temperature measured by the built-in room sensor, if necessary. It is possible for the user to adjust some parameters for the associated heating circuit (time program, heating curve etc) and to select special functions (over-ride/party etc). It is also possible to view maintenance and fault messages for the boiler. The VR 90 control is connected to the rest of the control system via 2-core eBUS cable to enable communication.



Other controls and electrical accessories

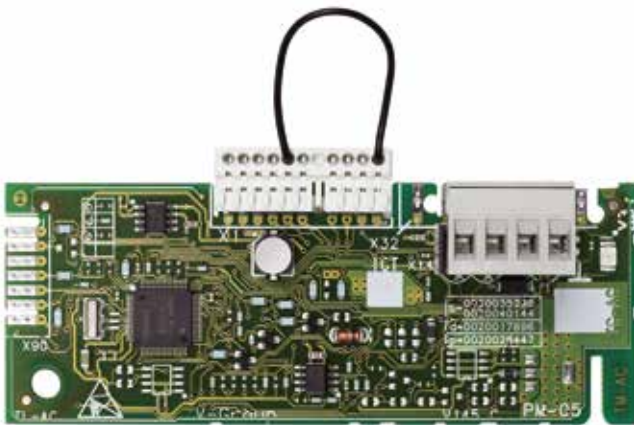


**VR 32/3 eBUS Coupler**

Article 0020139895

The VR 32 is a bus coupler for use with ecoTEC and ecoCRAFT boilers. It is needed for cascade installations and allows the VRC 630 controller to identify the boilers connected to it. The VR 32 sits alongside the boiler's main PCB and connects via an interface cable. A simple numbered rotary switch is used to set the address of the boiler. The VR 32 can then be connected to the VRC 630 controller using the eBUS terminals.

The complete system control range



**VR 34 0 - 10 volt adapter**

Article 0020017897

The VR 34 is a 0-10 Volt coupler for ecoTEC and ecoCRAFT that transfers a voltage input from the BEMS equipment into a temperature set point for the boiler. The VR 34 also has a 24 Volt fault signal output. In the event of a boiler failure, this will remain active until the fault is cleared and the boiler reset. The VR 34 also has an LED to indicate operation.



**VR 36 240V 3-4-5 Converter**

Article 0020117036

The VR 36 is a 230 Volt switching interface card for use with third party controls, for example, standard on/off controls.



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\* A charge may apply for this service.

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Vaillant is committed to ensuring spare parts can be supplied for any of boilers for up to 15 years. We have dedicated spare part distributors in over 680 outlets across the UK. Each stockist has been approved by us and commits to hold the majority of Vaillant spares at any one time; otherwise the products are only a phone call away.

**Full local support**

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## Installers

Vaillant products are available for installers to purchase from reputable heating merchants in the UK. To find contact details for your nearest Vaillant sales representative, call **0345 602 0262** or visit [www.vaillantcommercial.co.uk](http://www.vaillantcommercial.co.uk)  
For technical assistance call **0344 693 3133** or visit [www.vaillantcommercial.co.uk](http://www.vaillantcommercial.co.uk)  
To book or enquire about training courses and centres in your area call **0345 601 8885** or email [training@vaillant.co.uk](mailto:training@vaillant.co.uk)

## General Enquiries

If you are unsure of who you need to speak to or you have a general enquiry, our friendly reception staff will happily point you in the right direction. Call reception on **0345 602 2922**

## Sales Support

Installers wishing to purchase Vaillant Commercial Systems products can do so via one of our stockists. To find contact details for your nearest Vaillant sales representative:  
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**Website: [www.vaillantcommercial.co.uk](http://www.vaillantcommercial.co.uk)**

## Specifiers

We can provide you with bespoke solutions to accommodate a variety of different installations. To discuss your requirements please contact us using the details below. To find contact details for your nearest Vaillant sales representative call **0345 602 0262** or visit [www.vaillantcommercial.co.uk](http://www.vaillantcommercial.co.uk)  
To book or enquire about training courses and centres in your area call **0345 601 8885** or email [training@vaillant.co.uk](mailto:training@vaillant.co.uk)

## Technical Enquiries

For technical assistance:  
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**Email: [technical@vaillant.co.uk](mailto:technical@vaillant.co.uk)**

## Commercial Systems Service

For Commercial Systems servicing and commissioning:  
**Telephone: 0207 022 0927**

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