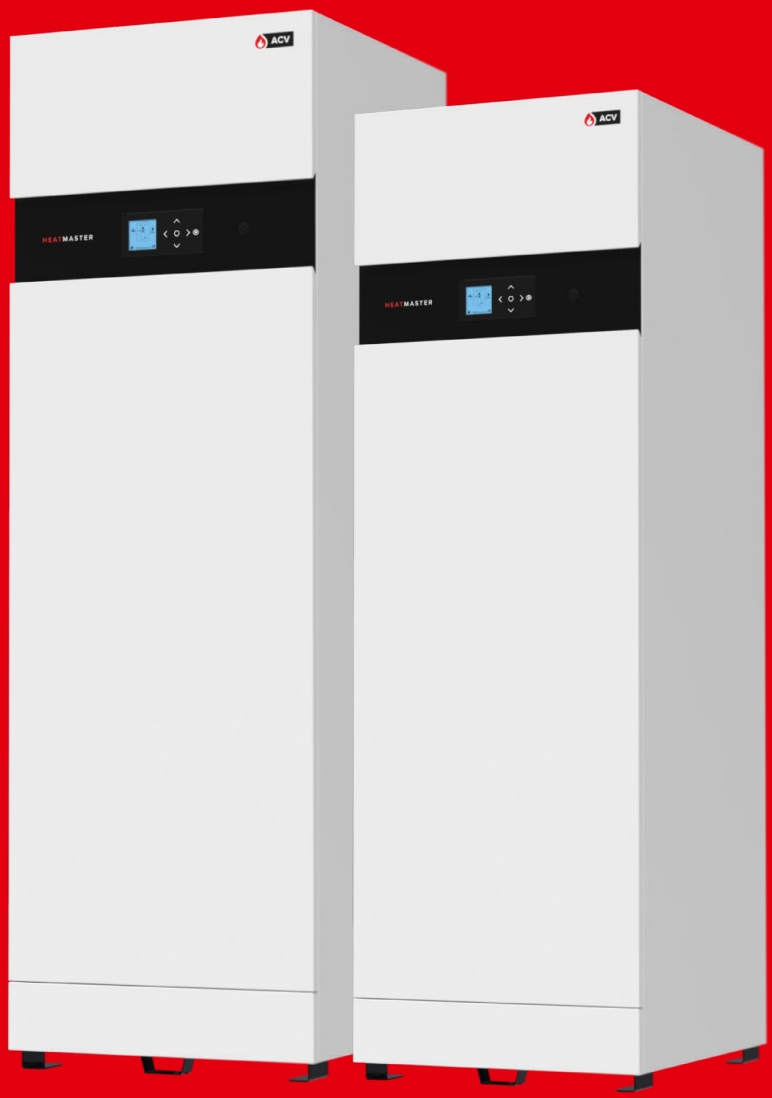
HEATMASTER EVO 2 PRODUCT & FLUE GUIDE

Commercial combi boiler with
stainless steel **tank-in-tank** technology



acv.com/gb |

WHO ARE WE?

ACV has been designing, manufacturing and distributing heating and hot water products for commercial and residential applications since 1922.

In the UK, we formed in 1991, providing and servicing the range of tank-in-tank products to the UK and ROI. Based in Dalgety Bay, Scotland, we supply and support ACV products across the country.

Specialists in stainless steel and home of the patented tank-in-tank concept, we've been developing and manufacturing our range of high performance heating and hot water products for 100 years.

WHAT MAKES OUR PRODUCTS DIFFERENT?

Stainless steel

This material, which resists corrosion in the most aggressive water, has given our products an exceptional service lifetime with minimal maintenance.

Tank-in-tank

The patented tank within a tank is a simple and effective concept that gives you a reliable DHW performance to match the largest of hot water demands.

Electric

Prepare for a carbon free future with electric. Low carbon electric solutions for domestic and commercial projects.

Excellence in hot water

Whilst heating requirements have decreased over the years, the demands of modern life have increased the need for a reliable but at the same time economical and environmentally friendly hot water supply.

Our mission is to use our experience to give you the best technology for generating the hot water you need.

Our motto 'Excellence in hot water' reflects the ambition of our team and partners to fulfil our mission and meet your expectations.

All our hot water products are KIWA approved demonstrating our compliance with UK Water Regulation 4 of the Water Supply (Water Fittings) Regulations 1999.

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WHY CHOOSE HEATMASTER EVO 2?

Our HeatMaster Evo 2 is a powerful commercial combi boiler designed to deliver both heating and high volumes of domestic hot water in one compact, highly efficient unit.

- Simultaneous heating and instant hot water from a single system - ideal for high-demand commercial environments.
- Our tank-in-tank technology ensures rapid recovery and consistent supply, even at peak usage.
- Advanced design maximises efficiency, helping reduce energy costs and carbon impact.
- Long-lasting, corrosion-resistant stainless steel provide reliability and reduced lifecycle costs.
- Space-saving footprint with straightforward installation for new projects or refurb works.
- Designed for minimal servicing and dependable day-to-day performance.

TANK-IN-TANK DESIGN

Most of our products feature the innovative tank-in-tank-concept.

What is it?

Tank-in-tank products comprise of an inner stainless steel tank (the DHW vessel) is surrounded by a steel outer tank containing primary heating water.

Tank-in-tank combines all of the benefits of stored hot water products and instantaneous hot water products to present an innovative semi-instantaneous solution.

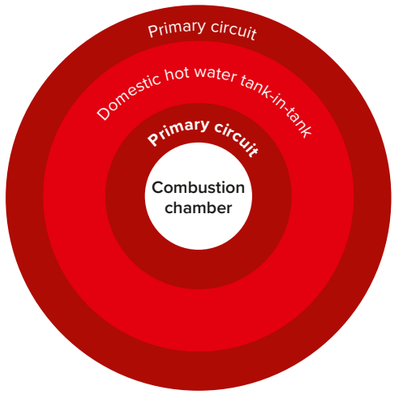
How does it work?

The wall separating the outer tank and inner tank functions as an indirect heat exchanger for generating DHW. Heat is absorbed from the hotter primary water, gradually heating the cold water of the inner DHW tank.

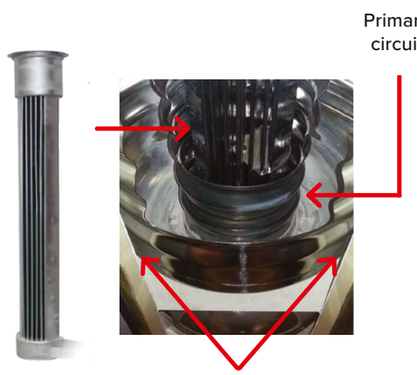
In a tank-in-tank boiler, the tanks are ring-shaped with flue piping running through the centre. The tanks are arranged so there is a primary outer tank either side of the DHW inner tank, so water is heated from both sides by the double primary circuit.

DOUBLE PRIMARY CIRCUIT

The HeatMaster® Evo 2 and WaterMaster Evo 2 products benefit from a double primary circuit.



Birds eye view of product



Heat exchanger

Cutaway view of side of product

WHAT ARE THE BENEFITS?

REDUCED SCALE BUILD-UP

The inner tank is made of stainless steel, which means no anode protection is needed there is a significantly reduced risk of corrosion, especially within soft water areas.

The corrugated design of the tank also reduces scale build up. How? Each DHW draw-off creates a brief under pressure in the tank (at the moment that the draw-off tap is opened), followed by a slight overpressure (upon closure of the draw-off tap). As the inner tank is free to move, its walls expand and contract very slightly under the influence of these pressure changes and prevent the formation of limescale on the inner tank surface.

LEGIONELLA PROTECTION

Legionella bacteria proliferate in warm water (from 20°C up to 45°C). The primary method used to eliminate legionella is water temperature control as the bacteria is unable to survive when the water temperature is raised above 50°C.

Tank-in-tank products prevent the formation of warm pockets because even the base of the inner tank is a heat exchanger that remains at the temperature of the boiler (typically from 60 to 80°C). When our water heater is operating at 60°C and above it ensures that the hot water remains free of legionella bacteria.

MINIMUM HOT WATER STORAGE, LOW HEAT LOSSES AND REDUCED FOOTPRINT

Thanks to the exceptional heat transfer and high storage temperature of the tank-in-tank system, the volume of hot water stored can be reduced.

This gives a more compact water heater design and reduces static heat losses via the exterior walls: both attributes combine to cut initial investment as you can choose a smaller cylinder and reduce operating expenses.

FAST HEAT UP AND RAPID RECOVERY

The larger surface area enables quick heat up and fast recovery, as well as providing a continuous flow of hot water under stable conditions. The large surface of the heat exchanger means that the full boiler power input is utilised to heat the domestic hot water very quickly. When this is combined with the low storage volume of hot water the result is fast heat up and recovery times alongside excellent and stable hot water flow rates.

HEATMASTER EVO 2

Commercial Combi Boiler

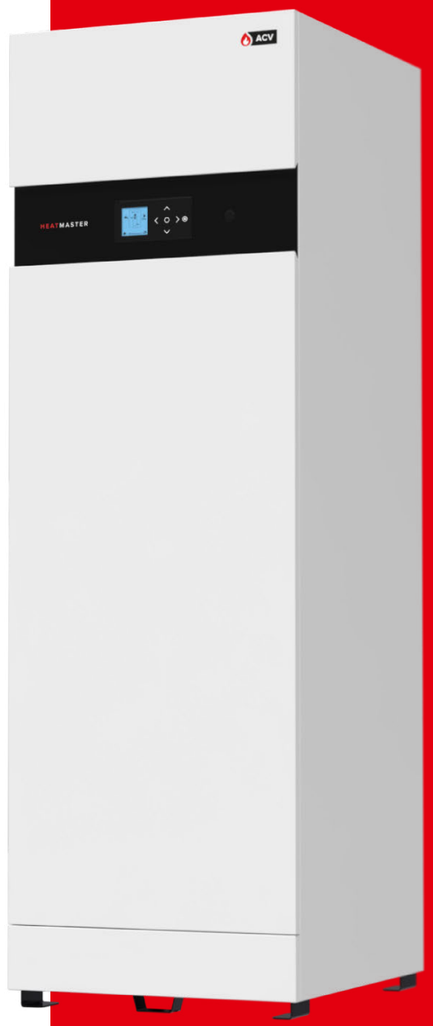
FEATURES

- Commercial combi boiler combining all the benefits of domestic combi boiler technology while comfortably meeting peak commercial DHW demands.
- ErP Class A, NOx levels significantly under 40 mg/kWh and operating efficiencies well above the minimum requirements of Part L ensure an energy efficient installation.
- Multiple controls options - On/Off, 0-10V power OR temperature control, BMS communication via Modbus.
- Suited to high demand and critical hot water premises such as hotels and hospitals
- Integrated legionella protection
- Space and time saving solution due to not needing to install separate boiler and hot water cylinders.
- **NEW** Internal time clock offers the capability to set up to 6 programmes within a 24 hour period to ensure that fuel usage is managed as efficiently as possible.
- Corrosion-resistant stainless steel heat exchanger and tank reduces maintenance and increases system lifespan
- Operates in most efficient mode (condensing) for both heating and hot water
- Supplied with LPG kit for simple on-site conversion

5 year warranty*

MODELS 6 **25 - 120kW**

SCAN ME



TANK-IN-TANK TECHNOLOGY

FAST HEAT UP

RAPID RECOVERY

REDUCED FOOTPRINT

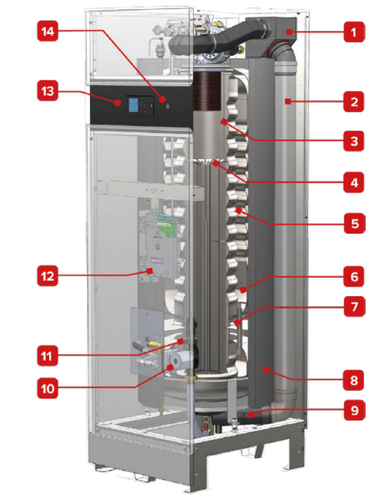
REDUCED SCALE

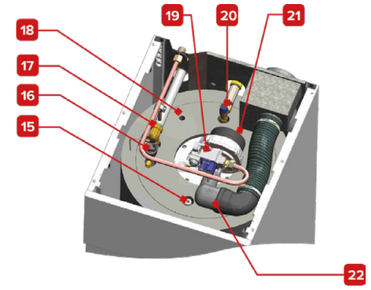
LOW STORAGE REQUIRED

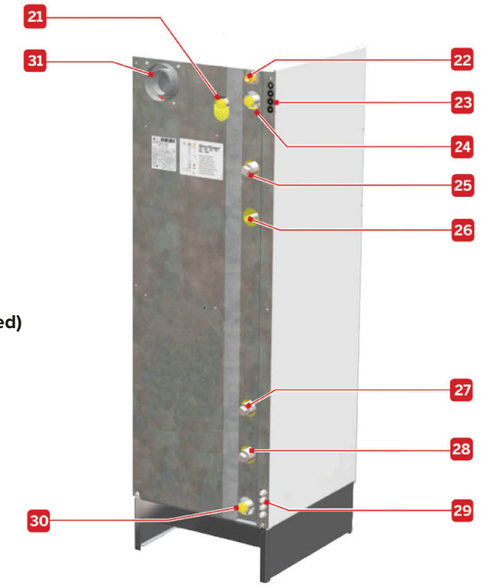
MINIMAL HEAT LOSS

ANATOMY

1. Concentric flue gas/air inlet box
2. Flue gas exhaust tube
3. Combustion chamber
4. Stainless steel heat exchanger
5. Stainless steel “Tank-in-Tank” hot water production tank
6. Primary circuit separation disc
7. Indirect water pre-heater
8. Insulation
9. Condensate recovery dish + NTC5 sensor (flue gas)
10. High efficiency circulator pump
11. NTC2 sensor (CH return)
12. Electrical panel (with spare fuses at the back)
13. ACVMax Touch Control panel
14. On-Off switch
15. DHW tank dry well (Dip tube with temperature sensor)
16. Automatic air vent
17. Gas pipe
18. NTC1 sensor (CH supply)
19. Gas valve
20. DHW safety valve / (T&P relief valve - UK only)
21. Modulating air/gas premix burner with fan
22. Air inlet
23. Grommets for electrical wires (low voltage control)
24. Domestic Hot Water outlet [M]
25. Heating supply connection [F]
26. Connection for provided heating safety valve (to be installed)
27. Heating return connection [F]
28. Heating return connection for low temp circuit [F]
29. Grommets for electrical wires (230 V)
30. Domestic Hot Water inlet [M]
31. Flue connection



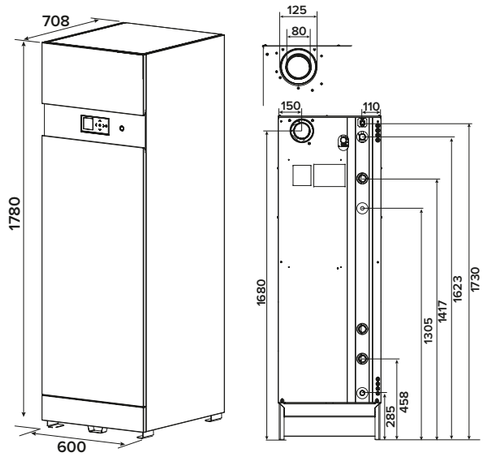




DIMENSIONS

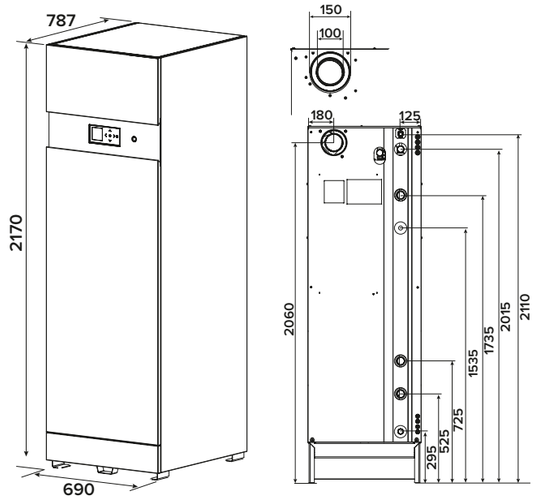
25 - 45 Evo 2

All dimensions in mm.



70 - 120 Evo 2

All dimensions in mm.

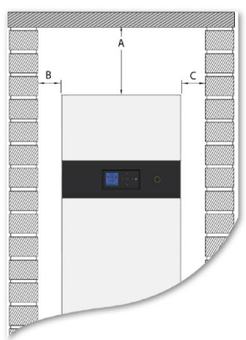


Dimensions			
Boiler	**Height (mm)**	**Width (mm)**	**Depth (mm)**
25 - 45 Evo 2	1780	600	708
70 - 120 Evo 2	2170	690	787

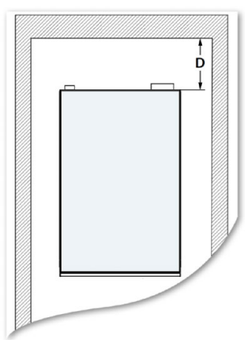
CLEARANCES

All dimensions in mm.

Minimum Clearances			
Top (A)	**Left side (B)**	**Right side (C)**	**Rear (D)**
300mm	600mm	250mm	400mm



Front view



View from the top

TECHNICAL DATA

MODEL			25	35	45	70	85	120
Performance	Maximum heat input NCV (GCV)	kW	25 (27.8)	34.9 (38.7)	45.6 (50.6)	69.9 (77.6)	85 (94.4)	115 (127.7)
	Minimum heat input	kW	5	7	9	21.5	21	23.2
	Maximum output (80/60)	kW	24.3	34.1	44.1	68	82.9	111.7
	Maximum output (50/30)	kW	26	36.4	46.8	74	89.9	121.7
	Efficiency at 100% load (80/60)	%	97.3	97.9	98	97.3	97	97
	Efficiency at 100% load (50/30)	%	103.9	103.9	103.9	105.8	105.8	105.8
	Efficiency at 30% load (EN 15502-1) nett	%	108.9	109.5	109	109	108	108
	Seasonal Efficiency Part L (Heating)	%	97.9	98.4	98.1	98	97.2	97.2
ErP	Water heating efficiency class	-	A	A	A	A	A	A
	Space heating energy efficiency class	-	A	A	A	A	A	A
	Seasonal space heating efficiency (ErP)	%	93	93	93	92	92	92
	Seasonal water heating efficiency (ErP)	%	93.2	93.2	93.1	90	90.1	89.3
	Standby loss DT 30K	W	79	79	79	110	110	110
	Standby loss DT 45K	W	124	124	124	164	164	164
	Declared load profile	-	XXL	XXL	XXL	XXL	XXL	XXL
	Sound power level indoors LWA (BSEN15036-1)	dB	60	60	59	60	61	62
Combustion	Gas Inlet Pressure (NG)	mbar	18-23	18-23	18-23	18-23	18-23	18-23
	Gas flow rate (max output)	m3/h	2.66	3.64	4.67	7.2	8.6	12
	Nox class (EN15502)	-	6	6	6	6	6	6
	Nox weighted (GCV) (EN15502)	mg/kWh	24.6	29.5	33.2	33.1	29.3	39.8
Flue	Flue connection	-	80/125	80/125	80/125	100/150	100/150	100/150
	Max allowed flue pressure drop	Pa	95	130	130	110	160	170
Hydraulic	Water pressure drop boiler at 20°C ΔT	mbar	3	6	10	9	14	27
	Primary flow rate at 20°C ΔT	l/h	1100	1500	1900	3000	3600	4900
	Primary flow rate at 20°C ΔT	l/s	0.31	0.42	0.53	0.83	1	1.36
Electrical	Voltage	V	230	230	230	230	230	230
	Fuse Rating	A	16	16	16	16	16	16
	Electrical power consumption Max	W	101	111	126	225	266	352
	Electrical power consumption Standby	W	3	3	3	3	3	4
General	Storage capacity (total)	L	196	196	196	315	315	315
	Storage capacity (domestic hot water)	L	96	96	96	190	190	190
	Connection - heating	-	1" F	1" F	1" F	1 1/2" F	1 1/2" F	1 1/2" F
	Connection - DHW	-	1" M	1" M	1" M	1" M	1" M	1" M
	Connection - gas	-	3/4" M	3/4" M	3/4" M	3/4" M	3/4" M	3/4" M
	Max operating temperature (primary)	°C	87	87	87	87	87	87
	Max operating temperature (DHW)	°C	75	75	75	75	75	75
	Max service pressure heating (primary)	bar	3	3	3	3	3	3
	Max service pressure (DHW)	bar	8.6	8.6	8.6	8.6	8.6	8.6
	Weight (empty)	kg	177	177	177	298	298	298
	Weight full	kg	373	373	373	613	613	613
DHW Performance Primary Temperature - 80°C	Peak 10 min flow @ 40°C (30°C ΔT)	L/10'	361	408	451	716	783	900
	Peak 1st hour flow @ 40°C (30°C ΔT)	L/60'	1018	1328	1610	2455	2895	3620
	Continuous flow @ 40°C (30°C ΔT)	L/h	788	1104	1390	2087	2534	3402
	Peak 10 min flow @ 45°C (35°C ΔT)	L/10'	301	339	373	592	646	676
	Peak 1st hour flow @ 45°C (35°C ΔT)	L/60'	865	1127	1366	2083	2456	3098
	Continuous flow @ 45°C (35°C ΔT)	L/h	676	946	1192	1789	2172	2928
	Peak 10 min flow @ 60°C (50°C ΔT)	L/10'	183	197	224	348	371	440
	Peak 1st hour flow @ 60°C (50°C ΔT)	L/60'	577	749	894	1391	1638	1847
	Continuous flow @ 60°C (50°C ΔT)	L/h	473	662	820	1252	1520	1754
	Heat up time (Primary: 10-80°C)	mins	35	26	23	27	24	23

FLUES

PP/Galvanised Steel 80/125mm

It is mandatory to fit the flue measuring tube which is supplied with the appliance.

Terminals (A)

537D6184	Vertical Terminal (C33)
537D6185	Horizontal Terminal with wall plates (C13)

Extension Pieces (B)

537D6187	500mm Extension Piece
537D6188	1000mm Extension Piece

Elbows (D)

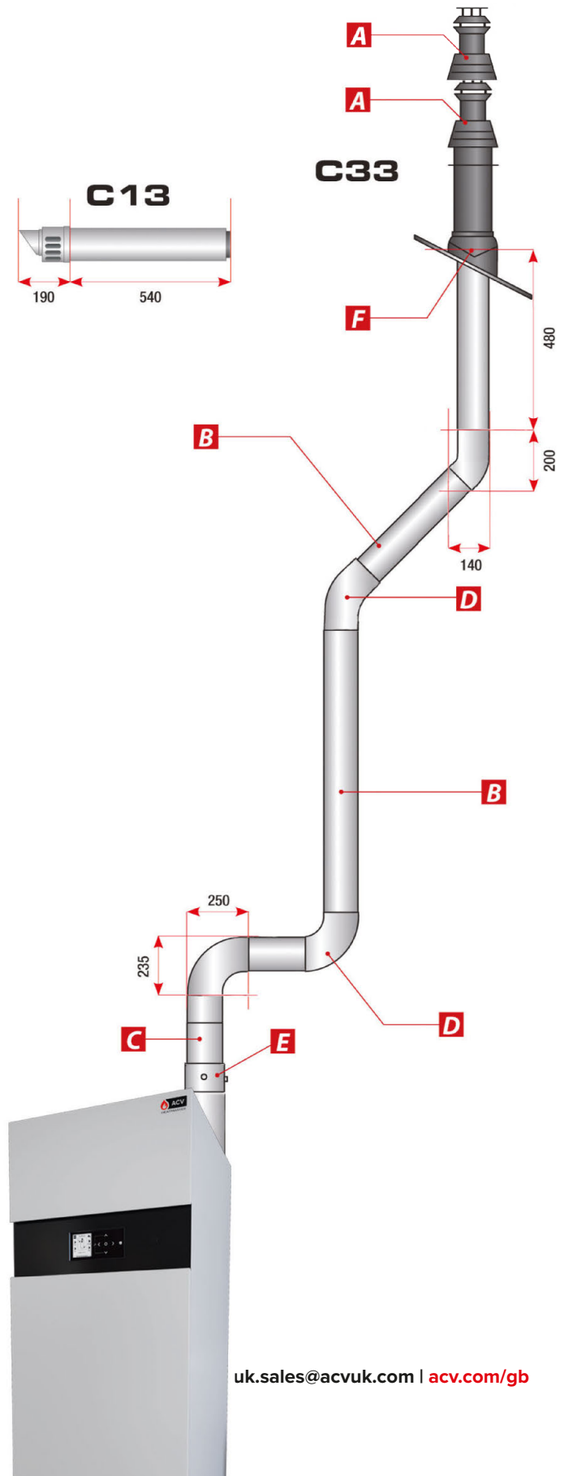
537D6190	45° Elbow
537D6191	90° Elbow

Measurement (Mandatory) (E)

537D6193	Test point (supplied FOC with appliance)
537D6229	T-piece with test point and inspection panel

Accessories (F)

537D6194	Flat Roof Collar
537D6182	Pitched Roof Collar
537D6183	Wall Bracket
100001470000	Plume Kit



PP/Galvanised Steel 100/150mm

It is mandatory to fit the flue measuring tube which is supplied with the appliance.

Terminals (A)

537D6300	Vertical Terminal (C33)
537D6301	Horizontal Terminal with wall plates (C13)

Extension Pieces (B)

537D6303	500mm Extension Piece
537D6304	1000mm Extension Piece

Elbows (D)

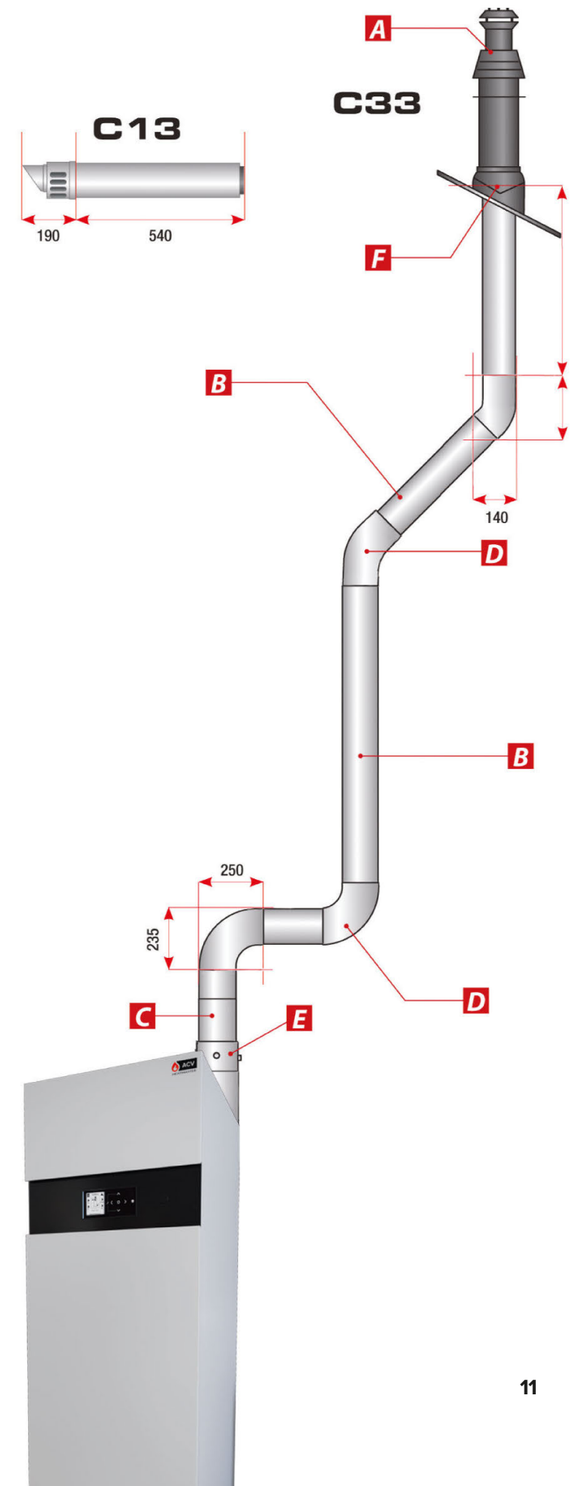
537D6306	45° Elbow
537D6307	90° Elbow

Measurement (Mandatory) (E)

537D6308	Test point (supplied FOC with appliance)
537D6310	T-piece with test point and inspection panel

Accessories (F)

537D6208	Flat Roof Collar
537D6209	Pitched Roof Collar
537D6210	Wall Bracket
00001470100	Plume Kit



FLUE RESISTANCES

Flue Systems

For concentric flue systems with elbows fitted, use the table to correct the maximum flue extension capability. Alternatively use the table to design the flue system, deducting the individual resistance of components from the maximum pressure drop allowed in the flue for that boiler.

Permissible Flue Length

The maximum permissible flue lengths for each model are shown in Table 1 below, these lengths are inclusive of the terminal resistance. The value shown is the maximum available length for extension. The equivalent length of elbows is shown in Table 2.

Table 1

Max permissible equivalent flue length (inc terminal resistance) metres		
Model	**Flue size**	
	80/125	**100/150**
Model		
25kW	60	
35kW	39	
45kW	22	
70kW		20
85kW		19
120kW		18

Table 2

Equivalent length of elbows (metres)		
Size	**80/125**	**100/150**
45°	1	1.3
90°	2	2.2

Use an equivalent length value of 1m for the flue test point which must be fitted to all HeatMaster and WaterMaster units.

Example of verification of the flue pipe length (L) in a concentric flue pipe system for HeatMaster 35 Evo 2 (80/125)

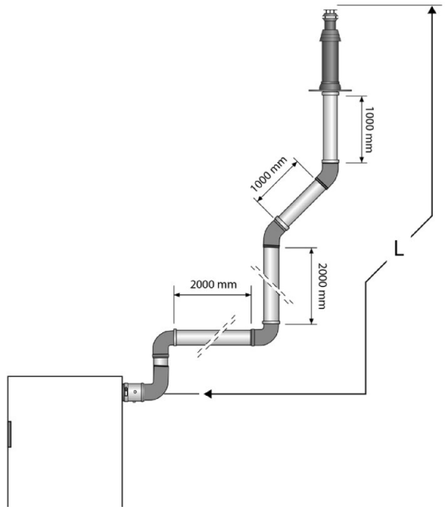
The figure right shows an assembly is comprised of:

- 1 pipe with a measurement unit
- 3 x 90° elbows
- 6 meters of straight pipes
- 2 x 45° elbows

a) Using the above table, calculate the length in meters of the whole flue pipe assembly:
1 + (3 x 2) + (6 x 1) + (2 x 1) = 15m

b) Compare the resulting value with the maximum length (39m).

This flue pipe length is within the recommended range.



FLUE AND VENTILATION GUIDANCE

FLUE INSTALLATION AND REGULATIONS

When should I use commercial flue requirement legislation and guidance?

BS5440 covers domestic installations up to 70kW net input, however if an appliance is to be installed in a factory location even if under 70kW then the commercial requirements of IGEM UP10 & BS6644 must be adopted.

Similarly if a cascade boiler installation is fitted and the total input exceeds 70kW then the commercial flues and ventilation should be adopted.

What is guidance and what is mandatory?

British Standards are a mandatory requirement. The approved documents offer guidance on how to comply and are not legally binding unless the manufacturer of the appliance stipulates them in the installation manual. It is prudent however to follow them because they would likely be used in a court of law as the minimum expected by a competent person to install a safe system.
Building Regs are a mandatory requirement as set out in Government legislation.

IGEM Documents offer guidance in the same way as British standards. However these have been set and adopted by a board of industry experts and represent current best practice and are aligned with National/ International legislation and standards.

Clean Air Act – This is a mandatory requirement as set out in Government legislation.

Gas Safety (Installation and Use) Regulations 1998 – These are mandatory and set out the requirements for safe installations.

CLEAN AIR ACT
THE FACTS

The Act applies to gas (and other fuels) fired appliance installations generally but with specific requirements for installations exceeding 333kW net heat input including approval of the height of the chimney by the Local Authority.

The essential requirements are that flue discharges are not to cause a nuisance to others or be a hazard to health.

In 1956 there was a clean air act memorandum that stated appliances with gross input of 150kW must terminate vertically. This has no foundation in law and was not written for modern high efficiency products. To this effect the current guidance suggests that all installations from 135kW net input that wish to terminate horizontally should be subject to a risk assessment which can be found in IGEM UP10.

All installations are subject to the clean air act requirements:

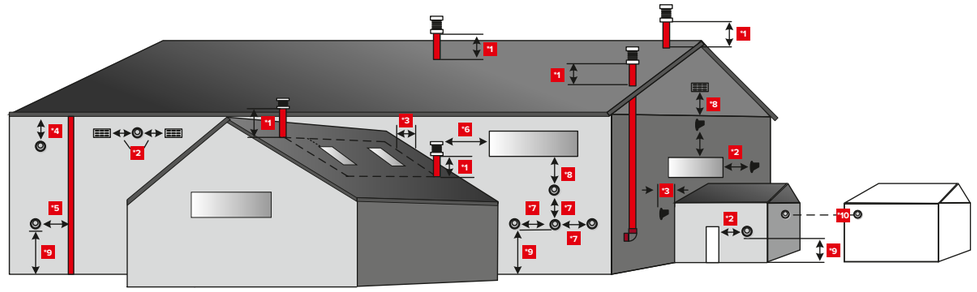
Installations below 333kW net heat input can terminate horizontally at low level subject to a risk assessment and complying with all other clearance distances as defined in IGEM UP10.

- Appliance inputs greater than 333kW net need prior approval from the Local Authority with position of flue termination agreed by them.
- No terminal fitted to natural draught flues should be less than 170mm.
- Terminal positions for fanned or natural draught flues shall be clear of obstructions and openings into buildings. Wall terminations shall be directed away from the building.
- Vertical outlets must be the minimum required above the roof level.
- Any horizontal outlet below 2m must be guarded and a minimum of 300mm above ground level.



TERMINATION
POSITIONS

Appliances Over 70kW Net Input



Key to diagram

*1 Minimum termination height for ridged and flat roofs, see clause 8.7.2 and Figures 10A and 10B.
*2 Minimum horizontal termination distance from openings i.e. doorways, windows, ventilation grilles, etc., see clause 8.7.1.3 and Figure 7.
*3 Minimum horizontal termination distance from adjacent walls or obstructions, see clause 8.7.2.7.
*4 Minimum distance to be 200mm for fan assisted appliances, 300mm for room sealed natural draught appliances, see BS 5440 and clause 8.7.3.3.
*5 Minimum distance to be 150mm, see BS 5440 and clause 8.7.3.3.
*6 Minimum termination distance from openings i.e. doorways, windows, ventilation grilles, etc., see clause 8.7.2.2.
*7 Minimum distance of centres of flue terminal, see manufacturer's instructions.
*8 Minimum distance below terminal or opening 2.5m, see Figure 7.
*9 See Sub-section 8.7.3.

See IGEM/UP/10 for further details

Calculated values provided as guidance only. IGEM/UP/10 must always be consulted.

1, 3 & 6 Minimum Height of Termination Located on a Roof									
	70kW	85kW	90kW	120kW	140kW	170kW	210kW	255kW	280kW
Fanned draught	300mm	340mm	353mm	433mm	487mm	566mm	673mm	793mm	860mm
Fig. 8, Dimension 'X', IGEM/UP/10.									
For all sloped roofs over 20 degree pitch the terminal must be 1.5m away									
Dimension 6 - Distance to openings into a building must be maintained									
Dimension 3 - If the distance to adjacent structure <2.5m then Dimension 1 applies.									

2 Minimum Horizontal Termination To Openings Into Buildings (side or above)									
	70kW	85kW	90kW	120kW	140kW	170kW	210kW	255kW	280kW
Open flue & fanned draught	1500mm	1643mm	1690mm	1976mm	2166mm	2452mm	2832mm	3260mm	3498mm
Fig. 7, Dimension 'V', IGEM/UP/10									
Room sealed fanned draught	600mm	708mm	745mm	962mm	1106mm	1323mm	1612mm	1938mm	2119mm
Fig. 7, Dimension 'Y', IGEM/UP/10									
Dimension 6 - Distance to openings into a building must be maintained									
Dimension 8 - Distance below openings must be maintained									

10 Room sealed fanned draught minimum horizontal termination to opposing walls / terminals									
	70kW	85kW	90kW	120kW	140kW	170kW	210kW	255kW	280kW
Opposing flat surface	1000mm	1347mm	1463mm	2156mm	2619mm	3312mm	4238mm	5278mm	5856mm
Fig. 12, Dimension 'F', IGEM/UP/10									
Opposing terminal	2000mm	2290mm	2386mm	2966mm	3352mm	3932mm	4705mm	5574mm	6057mm
Fig. 12, Dimension 'G', IGEM/UP/10									

VENTILATION REQUIREMENTS

Commercial Boilers Over 70kW Net Input

Room sealed appliances, Type C in plant rooms

FLUE TYPE	VENTILATION DIRECT TO OUTSIDE AIR (cm^2 PER kW NET HEAT INPUT)	
	HIGH	LOW
(TYPE C)	2	2

Open flued appliances, Type B in plant rooms (additional recommendations)

NATURAL VENTILATION cm^2 kW (NET) HEAT INPUT FOR OPEN FLUE BOILERS LOCATED IN A BOILER HOUSE				
	(A) BOILER HOUSE	(B) ENCLOSURE	SUMMER USAGE* GREATER THAN 0% UP TO 75%	SUMMER USAGE* GREATER THAN 75% UP TO 100%
High	2	5	+1	+2
Low	4	10	+1	+2
*for boilers in use for more than 50% of the time during the summer months, additional ventilation needs to be added to those in columns A and B				

Open flued appliances, Type C in plant rooms (additional recommendations)

NATURAL VENTILATION cm^2 kW (NET) HEAT INPUT FOR OPEN FLUE BOILERS LOCATED IN A BOILER HOUSE					
	(A) BOILER HOUSE	(B) ENCLOSURE		SUMMER USAGE* GREATER THAN 50% UP TO 75%	SUMMER USAGE* GREATER THAN 75% UP TO 100%
		TO A ROOM OR INTERNAL SPACE	DIRECT TO OUTSIDE AIR		
High	2	10	5	+1	+2
Low	2	10	5	+1	+2
*for boilers in use for more than 50% of the time during the summer months, additional ventilation needs to be added to those in columns A and B					

For further information, please refer to:

- Manufacturer's instructions
- IGEM UP10
- BS6644
- BS5440

- High level ventilation openings shall be located as high as is reasonably practicable and preferably within 15% of the building height from the ceiling.
- Low level ventilation openings shall be within 1m of the floor for Natural Gas and within 250mm of the floor for LPG.
- For LPG it is preferable that low level ventilation openings are located at floor level.
- Ventilation to an internal space is not generally recommended unless a Risk Assessment has been completed.
- The air supplied for boiler room ventilation shall be such that the maximum temperature within the boiler house is:
  - 25˚C at floor level (or 100mm above floor level)
  - 32˚C at mid level (1.5 m above floor level)
  - 40˚C at ceiling level (or 100mm below ceiling level)

Mechanical ventilation

- Mechanical ventilation can be a combination of mechanical inlet and outlet or mechanical inlet and natural ventilation outlet.
- The fans shall be selected and controlled so as to not cause a negative pressure (relative to the outside atmosphere) developing in the boiler room.
- Interlocked to the gas appliance.

Minimum quantity of mechanical ventilation

MECHANICAL VENTILATION m^3/hr PER kW NET HEAT INPUT				
	(A) MIN INLET AIR m^3/hr	(B) DIFFERENCE BETWEEN INLET AND EXTRACT AIR† m^3/hr	SUMMER USAGE GREATER THAN 50% UP TO 75%	SUMMER USAGE†† GREATER THAN 75% UP TO 100%
Boiler(s) with draught diverter	2.8	2.07 ±0.18	+0.72	+1.44
Boiler(s) without draught diverter†††	2.6	1.35 ±0.18	+0.72	+1.44

† inlet air minus ventilation 2.8 - 2.07 = 0.73m^3/hr

†† for boilers in use for more than 50% of the time during the summer months, additional mechanical ventilation needs to be added to those columns A and B

††† with or without draught stabilisers

DOMESTIC BOILERS

Boilers up to 70kW

BS5440

Flues and ventilation for gas appliances of rated input not exceeding 70kW net (1st, 2nd and 3rd family gases).
Specification for the installation and maintenance of ventilation provision for gas appliances.
In IE refer to I.S. 813.

Flue Termination Position

Due to the high efficiency of these boilers pluming will occur. For this reason vertical termination is recommended, and in any case, terminal positions which could cause problems should where possible be avoided.

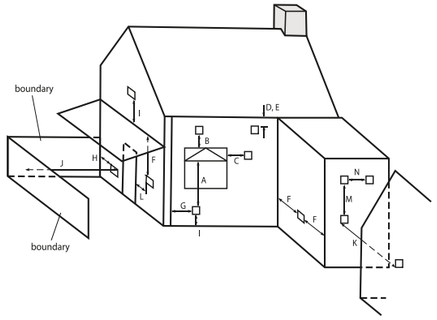
Particular care should be taken in the case of large multiple boiler installations, and complying with the requirements of the Clean Air Act. The information below is extracted from BS. 5440 Pt. 1 and is for boilers with heat inputs not exceeding 70kW nett, and the latest Building Regulation Part J. Detailed reference should still be made to these standards. In IE refer to I.S. 813:2002.

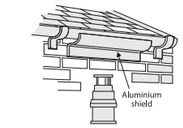
CONCENTRIC WALL TERMINAL POSITIONS	MINIMUM SPACING
A. Below an opening (1)	300mm
B. Above an opening (1)	300mm
C. Horizontally to an opening (1)	300mm
D. Below gutters, soil pipes or drain pipes	75mm
E. Below eves	200mm
F. Below balcony or car port roof	200mm
G. From a vertical drain pipe or soil pipe	150mm
H. From an internal or external corner or to a boundary alongside the terminal	300mm
I. Above ground, roof or balcony level	300mm
J. From a surface or a boundary facing the terminal	600mm
K. From a terminal facing the terminal	1200mm
L. From an opening in the car port into the building	1200mm
M. Vertically from a terminal on the same wall	1500mm
N. Horizontally from a terminal on the same wall	300mm

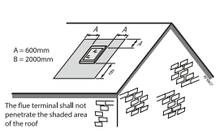
CONCENTRIC ROOF TERMINAL POSITIONS	MINIMUM SPACING
Directly below an opening, air brick, windows, etc.	300mm
Below plastic/painted gutters	500mm*
Below painted surface	500mm*
Below eaves or balcony	500mm
From wall	1000mm
Below Velux window	2000mm
Above or side of Velux window	600mm

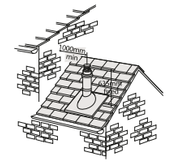
*May be reduced to 300mm if a shield fitted. (1) An opening here means an openable element, such as a openable window, or a fixed opening such as an air vent. However, in addition, the outlet should not be nearer than 150mm (fanned draught) to an opening into the building fabric formed for the purpose of accommodating a built in element, such as a window frame.

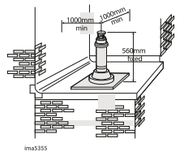
If the terminal is fitted less than 500mm below plastic gutters, painted eaves or any other painted surface then an aluminium shield at least 1m long should be fitted to protect the surface. For positioning of open flue terminals reference should be made to BS5440 Pt. 1. In IE refer to I.S. 813:2002.











Heat inputs in excess of 70kW nett.
For boiler installations with total heat inputs in excess of 70kW nett, reference should be made to BS6644.
In IE refer to I.S. 820:2000.

Ventilation

The ventilation requirements of these boilers is dependant on the type of flue system used, and their heat input. All vents must be permanent with no means of closing, and positioned to avoid accidental obstruction by blocking or flooding.

HeatMaster Evo 2 (25, 35, 45, 70kW)

Detail reference should be made to BS5440 Pt. 2. In IE refer to the current edition of I.S. 813.

The following notes are for general guidance only: If installed as a room sealed appliance in a room or internal space, then no purpose provided ventilation is required. If installed as an open flued appliance in a room or internal space then a permanent air vent is required. The sizes given below are for vents directly communicating with outside air. For other situations refer to BS5440 Pt. 2. In IE refer to the current edition of I.S. 813.

If installed in a compartment, then permanent air vents are required at high and low level. These vents may communicate direct to outside air, or to a room/internal space. If to a room/ internal space, it must itself be adequately ventilated as above.

HeatMaster Evo 2 ventilation requirements (not exceeding 70kw net input) when installed in a compartment

	ROOM SEALED APPLICATION - MIN VENT FREE AREA (cm^2)								OPEN FLUE APPLICATION - MIN VENT FREE AREA (cm^2)							
	TO A ROOM OR INTERNAL SPACE				TO OUTSIDE AIR				TO A ROOM OR INTERNAL SPACE				TO OUTSIDE AIR			
Boiler Size	**25**	**35**	**45**	**69.9**	**25**	**35**	**45**	**69.9**	**25**	**35**	**45**	**69.9**	**25**	**35**	**45**	**69.9**
High Level	250	350	450	699	125	175	225	349.5	250	350	450	699	125	175	225	349.5
Low level	250	350	450	699	125	175	225	349.5	500	700	900	1398	250	350	450	699

The temperature within the boiler room shall not exceed 25˚C within 100mm of the floor, 32˚C at mid height and 40˚C within 100mm of the ceiling.

CONTROL ACCESSORIES

Type of Control	Product Code	Product	Description	Positioning	Can be used with
Temperature Control	10800108	External air temperature sensor AF120	May be wired directly to the boiler to enable weather compensation functionality	External Kit	HeatMaster Evo 2
Temperature Control	537D3040	Strap on contact sensor	Strap on circuit temperature sensor which can be wired directly into the boiler	External Kit	HeatMaster Evo 2
Temperature Control	10510900	UFH safety sensor	RAM5109 External safety sensor, mandatory for all underfloor heating circuits	External Kit	HeatMaster Evo 2
External and/or Cascade Control	108000188	Theta Control Unit	Cascade up to 8 boilers per Theta unit. Kit comes with AF200 External air temperature sensor and immersed header sensor (which requires a pocket)	External Kit	HeatMaster / WaterMaster Evo 2
External and/or Cascade Control	10800121	MSK Wall Unit	Wall mounting for Theta control unit. Control unit not included.	External Kit	HeatMaster / WaterMaster Evo 2
External and/or Cascade Control	10800354	Theta Clip In Inter-face	Used for remote communication between a boiler and the Theta control unit.	Mounted within boiler	HeatMaster / WaterMaster Evo 2
External and/or Cascade Control	10800045	Theta strap on temperature sensor VF202	Strap on circuit temperature sensor, only works with Theta control unit	External Kit	HeatMaster / WaterMaster Evo 2
External and/or Cascade Control	10800044	Theta immersed temperature sensor KVT	Immersed drywell sensor, only works with Theta control unit	External Kit	HeatMaster / WaterMaster Evo 2
External and/or Cascade Control	10800120	Theta RFF room sensor	One required to be fitted for each heating circuit connected to Theta. Can also be used to control and change heating circuit requirements.	External Kit	HeatMaster Evo 2

INTEGRATED CONTROLS

The HeatMaster Evo 2 uses the ACV Max controls platform to control space heating and hot water systems

Featured operating functions include:

- DHW production at comfort and reduced setpoints
- DHW ECO mode which allows the boiler to run at maximum efficiency
- Full 7 day / 24 hour time and date settings to control comfort/reduced DHW mode activation
- Standby mode which will operate a frost protection programme if required
- Anti-legionella programme
- Holiday mode programming for periods of shutdown
- Programmable pump control function

Specific controls features:

- Heating setpoints can be adjusted up to 87°C, DHW setpoints can be adjusted up to 75°C
- 6 DHW schedules can be programmed to run within a single 24 hour period
- DHW priority function can ensure that calls for DHW can be satisfied first over calls for heating
- Adjustable frost protection setpoint between -30°C and 10°C

In addition to the standard controls a selected range of optional controls accessories are available for additional system temperature control, external control and cascade control.

UNVENTED SUPPLY KIT

Each unvented supply kit (Systempak) is pre-sized and comprises the following items:

- Monobloc inlet control comprising of a 3.5 bar pressure reducing valve, a check valve and a 6 bar safety relief valve.
- Tundish.
- 25L expansion vessel.

2 versions of the Systempak 3 are available:

- The Evo includes a standard 25 litre expansion vessel and mounting kit.
- The FT Evo includes a 25L flowthrough type expansion vessel, mounting bracket and 3/4” flowjet valve.



HYDRAULIC SEPARATION

Using Plate Heat Exchangers

Over time, heating systems naturally accumulate debris, dirt and other contaminants. When connecting a new boiler to an older system, allowing this 'dirty' water to pass through the new appliance can reduce efficiency and increase the risk of breakdowns.

Plate heat exchangers provide an effective solution by creating a clear hydraulic break between the old system water and the new boiler circuit, protecting equipment performance and ensuring long term reliability.

How plate heat exchangers work

Heat is transferred through **thin, corrugated plates** arranged to form channels for independent water flow.

Available in gasketed or brazed versions:

- **Gasketed** units feature plates sealed within a frame using elastomeric gaskets.
- **Brazed** units eliminate gaskets entirely, enabling **higher design pressures and temperatures** in a compact footprint.

Why choose a plate heat exchanger?

Plate heat exchangers offer more than system cleanliness - they enable **complete operational flexibility:**

- **Protect boiler equipment** from contaminants in older or lower quality system water.
- Allow the boiler and secondary circuits to run at **different temperature profiles.**
- Permit the two sides to operate at **different pressures.**
- Enable heating of **specialist fluids** in the secondary circuit, such as process or food grade fluids not suitable for direct boiler contact.

Identifying the right plate heat exchanger

To achieve optimal performance, correct sizing is essential. Key factors include:

- Required **heat transfer capacity**
- Temperature profiles on both sides of the plate
- Permit the two sides to operate at **different pressures.**

These determine how effectively the unit will perform, so accurate selection is crucial. ACV UK recommends consulting their team for guidance when selecting a plate heat exchanger.



BRAZED PLATE HEAT EXCHANGERS

ACV offer a range of brazed heat exchangers for installation on HeatMaster heating systems.

This method of complete system hydraulic separation ensures optimum heat transfer efficiency and low resistance within a compact footprint.

Features and benefits

- Compact design
- No gaskets
- Low maintenance and self-cleaning
- All units are pressure tested
- Ensures optimal heat transfer efficiency and pressure resistance
- Separates system water from the boiler
- Ensures the highest perfomance for longest possible service life



The range of pre-sized PHEXs are suitable for all HeatMaster Evo 2 models with primary operating temperatures of 85/65°C boiler side and 75/55°C secondary side. Please contact ACV to discuss other operating temperature profiles or larger cascade thermal inputs. Boiler pumps will need to be sized and sourced separately.

HeatMaster Evo 2 Model	Number boilers in cascade	Total Thermal Input (kW)	ACV PHEX UIN	PHEX Description
HM 25 Evo 2	1	25	XBACV108010	PHEX 1
	2	50	XBACV108010	PHEX 1
	3	75	XBACV108013	PHEX 2
HM 35 Evo 2	1	35	XBACV108010	PHEX 1
	2	70	XBACV108013	PHEX 2
	3	105	XBACV108013	PHEX 2
HM 45 Evo 2	1	45	XBACV108010	PHEX 1
	2	90	XBACV108013	PHEX 2
	3	135	XBACV108013	PHEX 2
HM 70 Evo 2	1	69.9	XBACV108013	PHEX 2
	2	139.8	XBACV108013	PHEX 2
	3	209.7	XBACV108016	PHEX 3
HM 85 Evo 2	1	85	XBACV108013	PHEX 2
	2	170	XBACV108016	PHEX 3
	3	255	XBACV108016	PHEX 3
HM 120 Evo 2	1	115	XBACV108013	PHEX 2
	2	230	XBACV108016	PHEX 3
	3	345	XBACV108019	PHEX 4

BALANCING AND SEDIMENTATION VESSELS

Providing an alternative approach to hydraulic separation, the ACV range of Balancing and Sedimentation Vessels are available in various sizes to suit the system thermal load.

Total Thermal Input (kW)	Diameter	ACV UIN	Product Description
Up to 80kW	100mm	XB030004	BSV 50
Up to 250kW	100mm	XB030001	BSV 100
251-400kW	150mm	XB030002	BSV 150
401-800kW	200mm	XB030003	BSV 200



NOTES

PRODUCT TRAINING AND CPD COURSES

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We have product training courses to suit all abilities and needs.

The product training covers our core product technologies:

- Commercial Domestic Hot Water
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- Electric Boilers

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We also have **Lunch and Learn** sessions available across a number of different topics. Speak to your local Business Development Manager for more information.

TRAINING AND SUPPORT

Here at ACV UK we understand installing a boiler and/or water heater represents a significant investment.

VISIT OUR WEBSITE
TO ENQUIRE FOR ANY TRAINING COURSES

We offer a range of services for our customers.

- A library of sales literature and technical documentation
- A series of training programmes covering all aspects of our business and products
- Local technical support
- Local assistance for more complex start-ups
- Site surveys available on request

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Contact your local sales representative for more information:

uk.sales@acvuk.com
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