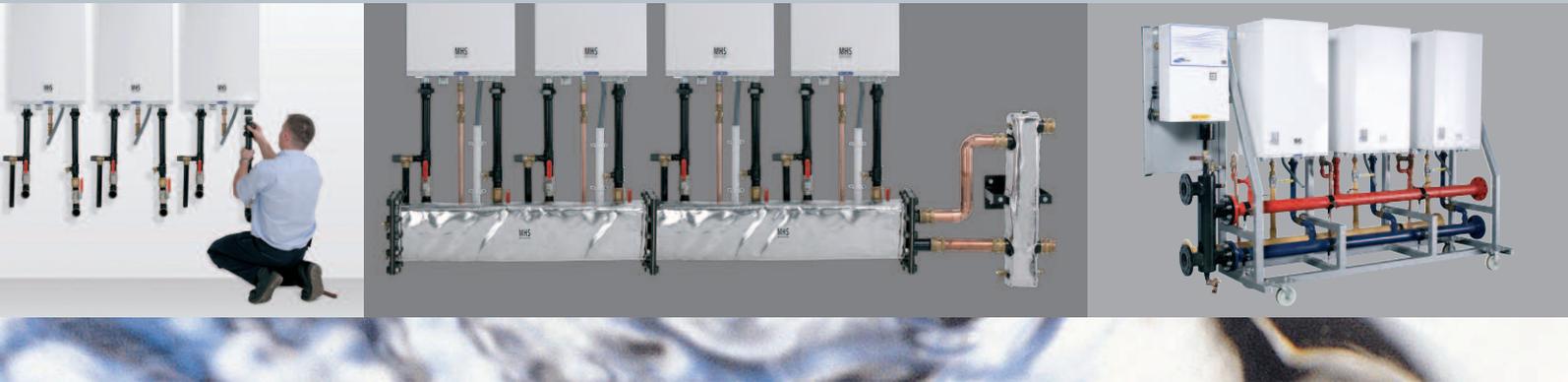


Ultramax WM

Wall mounted and free standing frame mounted cascade boiler systems



Prefabricated installation component systems to create cascade installations of Ultramax WM gas fired condensing boilers of up to 6 modules and 600kW output.

MHS
BOILERS

Simplifies Multiple Boiler Installation

The Ultramax WM Wall Mounted Cascade System and free standing Frame Mounted Systems are ranges of matched accessories and factory assembled units which have been designed to make life easier for all concerned in a project to install multiple Ultramax WM boilers.

Cascade System

Where a multiple wall mounted boiler installation is to be made, the Cascade System provides multi-boiler manifolds combined with prefabricated module flow and return pipe work connection sets, which not only reduce on-site installation time but they also simplify material ordering processes and culminate in a smart and optimally functional finalised modular boiler installation.

The use of these purpose made cascade components allow multiple boiler installations consisting of either, two, three, four or five of the well proven and popular MHS Ultramax WM wall mounted gas fired condensing boilers to be made with relative ease. High seasonal

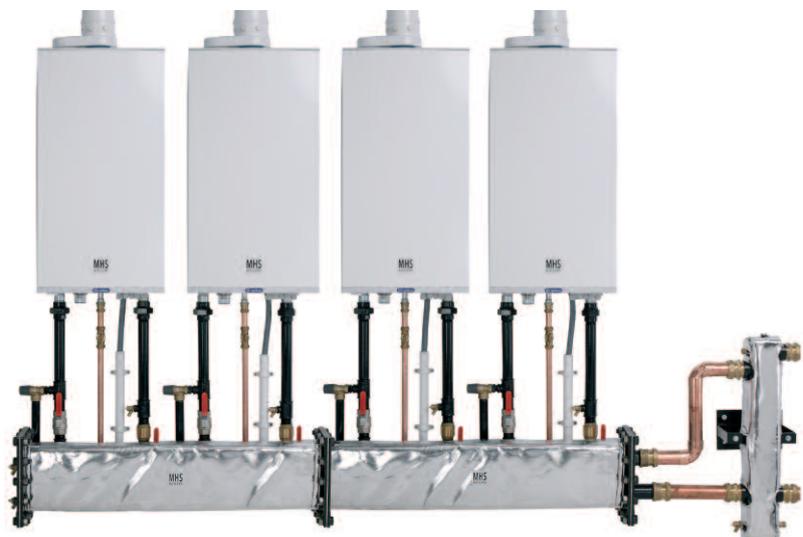
efficiency, reliability and optimum output to load matching are inherent features of a modern cascade arrangement.

Outputs from 90kW (2 x Ultramax WM45) to 600kW (5 x Ultramax WM120) are possible. To compliment the multiple boiler manifolds, a range of wall mounted compact vertical low loss headers are available. Smart easy-to-fit insulating jackets for both the boiler manifolds and low loss headers are also within the available component list. And to complete the package, a comprehensive boiler cascade manager is available to provide the control element.

This brochure should be read in conjunction with the technical sales literature for the Ultramax WM Boiler range.



Note
Interconnecting pipework and fittings between the boiler manifolds and the low loss header is the responsibility of the installer and is not included by MHS. Applies also to the gas supply pipework and condense waste fittings.



Standard features

Multiple Boiler Manifolds

Manifold sets are available to accommodate the connection of either two or three boiler modules. An installation of two boilers simply uses a two boiler manifold, whereas a five boiler installation (max capability) would use a two boiler manifold plus a three boiler manifold joined together using the simple bolted flange arrangement.

The manifolds are fabricated from boiler quality carbon steel square section tube with flanged connections, and comprise of a common flow and a common return tube mounted one above the other with an air gap separation to avoid direct heat exchange. Included also are the boiler-to-manifold flow and return connection pipe sets which have union couplings at either end, and are complete with quarter turn lever action ball valves, non return valve and safety relief valve. For boiler models WM100 and 120, a boiler primary circulation pump is included in the connection sets also.

Boiler models WM45, 65 and 85 have a pump included within the boiler as standard.

Each manifold is supplied with heavy duty wall mounting brackets.

The manifolds, connection pipe sets and brackets are finished in gloss black primer.



Connection and Blank Flange Sets

The cascade manifolds are uni-directional and may have the system connected at either the right hand end or the left hand end to suit the specific needs of the installation in hand. For use at the end chosen for the system connection, a mating flange with appropriately sized water connections (consistent with the mass flow rate required for Δt 20K) will be provided. And at the alternative end, a blanking flange with 2 x 1/2" BSP tappings for draincocks will be provided. Flange gaskets and bolt sets are included.

Vertical Low Loss Headers

A suitably sized compact wall mounted low loss header to compliment the cascade system and fabricated from square section boiler quality carbon steel tube to provide the interface between the cascade manifolds and the heating system will be provided. The headers are reversible to allow connection at either end of the boiler manifolds. As an option, the low loss header may be deleted from the scope of supply.

Insulating Jackets

Smart insulating jackets for the manifolds and headers are available to put the finishing touch to the cascade installation. Manufactured from 10mm thick continuous E-glass filament yarn fleece with an outer shell of Aluminiumised woven glass fibre fabric with Velcro fastenings.

Technical data

Density: 100kg/m³

Thermal Capacity: 0.8kJ/kg°C

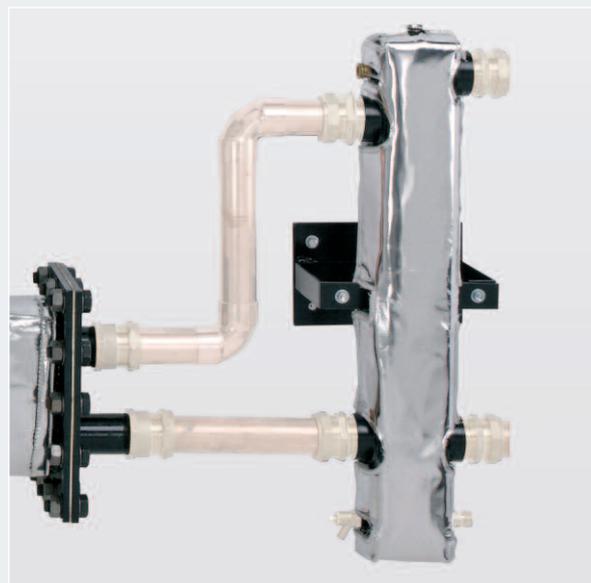
Thickness: 10mm

Max Temperature: 550°C

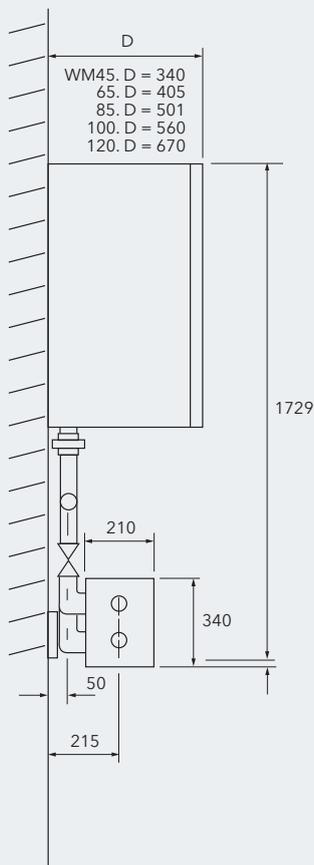
Tensile Strength: 92 Newtons/m²

Cold Face Temperature: 17-20°C

(with header at 100°C and 20°C ambient)

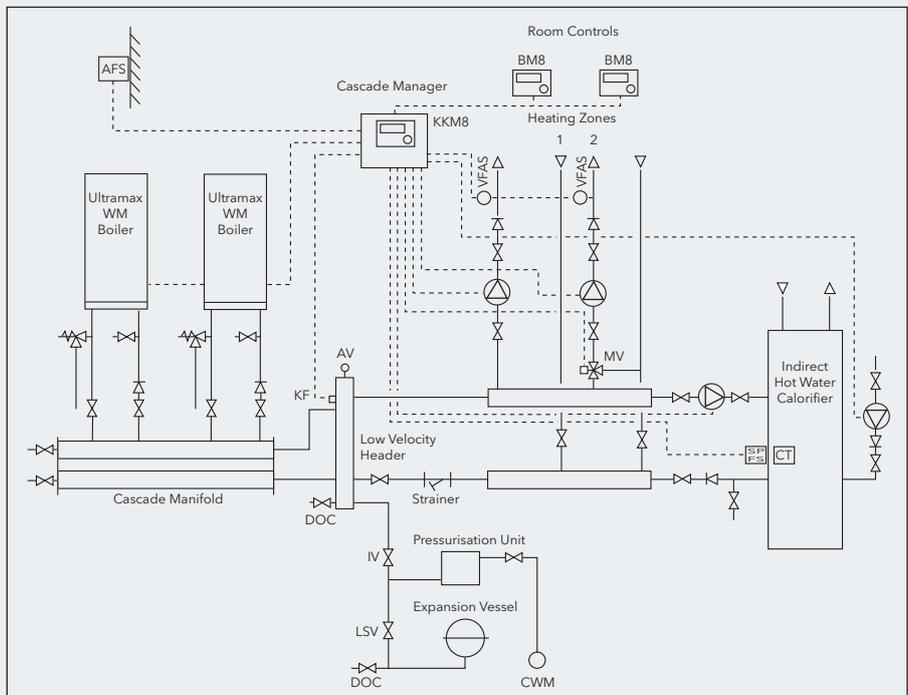


Side View



Vertical Low Velocity Headers						
Data		Type A	Type B	Type C	Type D	Type E
Tappings	a	1/2" BSP - F	1/2" BSP - F	1/2" BSP - F	1/2" BSP - F	1/2" BSP - F
Tappings	b	1 1/4" BSP - F	2" BSP - F	2" BSP - F	2 1/2" BSP - F	3" BSP - F
W	mm	50	60	100	120	150
Depth	mm	50	60	100	120	150
Distance from wall to ϕ of Tapping	mm	205	205	205	205	205
G	mm	285	280	470	470	470
H	mm	345	350	540	570	570
I	mm	44	44	44	66	66
J	mm	95	120	120	120	120
K	mm	44	44	44	44	44

Typical Cascade Installation System Schematic



For more information shown in the schematic diagram above, please refer to the Technical Sales Literature for the Ultramax WM range of boilers available from MHS Boilers Ltd or may be downloaded from MHS Boilers' web site: www.mhsboilers.com

Ease of Installation



1: Components supplied in kit form for on-site assembly.



2: Following the wall mounting of the Ultramax WM boiler modules; the prefabricated flow and return pipework legs are attached to the modules using the provided SA unions.



3: Secure the mounting brackets to the wall. Offer up and secure the manifolds and low loss header to brackets (having previously tightened all flanged joints - recommended tightening torque of M20 fixings - 200NM). Connect module flow and return pipework legs to the manifolds via the included SA unions.



4: Make local gas, condensate and manifold to low loss header pipework connections.



5: Apply easy-to-fit insulating jackets to manifolds and low loss header and secure using the applied velcro fastenings.

Selection of Components

Cascade Model (Boiler types & Qty)	Max Output kW	What's included					
		Manifolds			Flanges		Vertical Low Velocity Header
		2 Module	Joining Set	3 Module	Blank / Drain	Connection Flange	Type & (System Connection Size)
45/90 (WM45 x 2)	90	1	-	-	✓	1 1/4" BSP - M	A (1 1/4" BSP - F)
45/135 (WM45 x 3)	135	-	-	1	✓	2" BSP - M	B (2" BSP - F)
45/180 (WM45 x 4)	180	2	✓	-	✓	2" BSP - M	C (2" BSP - F)
45/225 (WM45 x 5)	225	1	✓	1	✓	2" BSP - M	C (2" BSP - F)
65/130 (WM65 x 2)	130	1	-	-	✓	2" BSP - M	B (2" BSP - F)
65/195 (WM65 x 3)	195	-	-	1	✓	2" BSP - M	C (2" BSP - F)
65/260 (WM65 x 4)	260	2	✓	-	✓	2" BSP - M	C (2" BSP - F)
65/325 (WM65 x 5)	325	1	✓	1	✓	2" BSP - M	C (2" BSP - F)
85/170 (WM85 x 2)	170	1	-	-	✓	2" BSP - M	C (2" BSP - F)
85/255 (WM85 x 3)	255	-	-	1	✓	2" BSP - M	C (2" BSP - F)
85/340 (WM85 x 4)	340	2	✓	-	✓	2" BSP - M	C (2" BSP - F)
85/425 (WM85 x 5)	425	1	✓	1	✓	2 1/2" BSP - M	D (2 1/2" BSP - F)
100/200 (WM100 x 2)	200	1	-	-	✓	2" BSP - M	C (2" BSP - F)
100/300 (WM100 x 3)	300	-	-	1	✓	2" BSP - M	C (2" BSP - F)
100/400 (WM100 x 4)	400	2	✓	-	✓	2 1/2" BSP - M	D (2 1/2" BSP - F)
100/500 (WM100 x 5)	500	1	✓	-	✓	2 1/2" BSP - M	D (2 1/2" BSP - F)
120/240 (WM120 x 2)	240	1	-	-	✓	2" BSP - M	C (2" BSP - F)
120/360 (WM120 x 3)	360	-	-	1	✓	2 1/2" BSP - M	D (2 1/2" BSP - F)
120/480 (WM120 x 4)	480	2	✓	-	✓	2 1/2" BSP - M	D (2 1/2" BSP - F)
120/600 (WM120 x 5)	600	1	✓	1	✓	3" BSP - M	E (3" BSP - F)

Technical data

Individual boiler modules

Boiler Model		WM/45	WM/65	WM/85	WM/100	WM/120		
Water details	Nominal heat output 80/60°C	kW	5.6 - 39.2	8.4 - 60.0	15.6 - 77.8	17.6 - 88.2	21.9 - 109.8	
	Nominal heat output 40/30°C	kW	6.3 - 43.0	9.4 - 65.0	17.0 - 85.0	19.2 - 96.3	24.0 - 120	
	Nominal heat input	Gross	kW	6.4 - 44.4	9.5 - 67.4	17.7 - 88.8	17.7 - 88.8	25.0 - 124.8
		Net	kW	5.8 - 40.0	8.6 - 60.7	16.0 - 80.0	18.0 - 90.0	22.5 - 112.4
	Max flow temperature	°C	90	90	90	90	90	
	Water content	ltrs	5.1	6.6	8.4	10.3	12.0	
	Design temperature rise (ΔT)	°C	20	20	20	20	20	
	Min/Max operating pressure @ 90°C	bar	1.5 / 6.0	1.5 / 6.0	1.5 / 6.0	1.5 / 6.0	1.5 / 6.0	
Gas details	Gas consumption Nat Gas (G20)	m³/h	3.7	5.6	7.3	8.3	10.3	
	Gas consumption LPG (G31)	kg/h	3.1	4.7	6.3	7.0	8.8	
	Gas inlet press nom. Nat Gas (G20)	mbar	17/20	17/20	17/20	17/20	17/20	
	Gas inlet press min/max LPG (G31)	mbar	30/50	30/50	30/50	30/50	30/50	
	Approx flue gas volume max	m³/hr	74.5	113.09	149	168	209	
	Max flue system resistance	Pa	140	140	140	140	200	
Connections	Approx flue gas temperature max	°C	70	70	70	70	70	
	Gas connection	BSP M	¾"	¾"	¾"	¾"	¾"	
	Air supply connection	mm	80	80	100	100	100	
	Flue connection	mm	80	80	100	100	100	
	Condensate waste connection (flexible hose)	mm	25 OD x 300 L					
	Nominal weight (dry)	kg	45	55	65	80	90	
Electrical supply (230V 50Hz)	Amps	6	6	6	6	6		

Gas Category II 2H3P
 Appliance Category B23, C13, C33, C43, C53, C63, C83
 CE Product Identification Number 0063B03192

Frame Mount System

If wall space is limited in the boiler plant room, or the layout / dimensions of the room prohibit the use of a wall mounted arrangement, then the prefabricated Frame Mount System can provide the optimum solution.

Designed to be completely free standing; the frame mounted arrangement allows a cascade installation of Ultramax WM gas fired condensing boilers with outputs from 86kW to 600kW to be made with the minimum of on-site operations.

As with the wall mounted system described earlier in this brochure; the free standing frame system covers numbers of boiler modules frame mounted 2 to 6 units and can be provided for application all-in-a-line (single bank) or a back-to-back configuration.

For ease of on-site handling and maneuvering, the frame arrangement is equipped with castors; and once the system is in its final location, the castors are disabled by the jack-down leveling feet to make a secure and rigid installation.

Upon receipt at site, the frame system is slim enough to pass through standard doors and light enough to be maneuvered by two people.

The boiler modules may be individually flued horizontally (where the situation permits), or vertically using either individual flue tubes or in a common arrangement.

The included low loss header also doubles up as a dosing pot for the addition of system additives.

The frame assembly is fabricated from 5mm gauge x 50mm square box section steel material, and is finished in two coats of epoxy zinc phosphate primer

and a top coat of grey polyurethane enamel.

A comprehensive cascade manager (KKM8) can be included optionally in the system and is factory pre-wired to further enhance the ease-of-installation features of the frame arrangement.

An optional sealed system pressurization manager may also be included in the componentry.

High seasonal efficiency, reliability and optimum output to load matching are inherent features of this modern condensing boiler cascade arrangement.

Note; Sealed system expansion vessels can be provided separately; and can be selected once system characteristics of water content, design flow temperature and static height are established.

This brochure should be read in conjunction with the technical sales literature for the Ultramax WM Boiler range.



Technical data

Single Bank Frame Mounted Models

Model		90S	130S	170S	200S	240S	255S	300S	360S	400S	425S	480S	600S	
Modules - Ultramax WM	Nr	2x45	2x65	2x85	2x100	2x120	3x85	3x100	3x120	4x100	5x85	4x120	5x120	
Nominal heat output max @ 80/60°C	kW	78.4	120	155.6	176.4	219.6	233.4	264.6	329.4	352.8	389	439.2	549	
Nominal heat output max @40/30°C	kW	86	130	170	192.6	240	255	288.9	360	385.2	425	480	600	
Nominal heat input	Gross	kW	88.4	134.8	177.6	199.7	249.6	295.6	299.5	374.4	399.4	444	499.2	624
	Net	kW	80	121.4	160	180	224.8	266.3	270	337.3	359.8	400	449.7	562.2
Max flow temperature	°C	90												
Nominal water content	litres	28.2	31.2	34.8	38.6	42	52.2	57.9	63	77.2	87	84	105	
Design temperature rise (Δt)	°C	20												
Min/max operating pressure @ 90°C	bar	1.5 / 6.0												
Gas consumption Nat Gas (G20)	m³/h	7.4	11.2	14.6	16.6	20.6	21.9	24.9	30.9	33.2	36.5	41.2	51.5	
Gas consumption LPG (G31)	kg/h	6.2	9.4	12.6	14	17.6	18.9	21	26.4	28	31.5	35.2	44	
Nom gas inlet pressure (G20)	mbar	17/20	17/20	17/20	17/20	17/20	17/20	17/20	17/20	17/20	17/20	17/20	17/20	
Nom gas inlet pressure (G31)	mbar	30/50	30/50	30/50	30/50	30/50	30/50	30/50	30/50	30/50	30/50	30/50	30/50	
Approx flue gas volume total	m³/h	149	226.2	298	336	418	447	504	627	672	745	836	1045	
Approx flue gas volume per module	m³/h	74.5	113.1	149	168	209	149	168	209	168	149	209	209	
Approx flue gas temperature max	°C	70												
Module flue connection	Ømm	80	80	100	100	100	100	100	100	100	100	100	100	
Module air supply connection	Ømm	80	80	100	100	100	100	100	100	100	100	100	100	
Condense waste connection	Ømm	Each boiler module has a 25mm OD x 300mm long, flexible condense waste outlet pipe												
Gas connection	Ømm	PN16/DN65												
Flow/return connections common size:	Ømm	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	
May be reduced to:	Ømm	32	40	50	50	50	50	65	65	65	NA	NA	NA	
Nominal weight dry	kg	290	310	330	360	380	445	490	520	720	775	760	900	
Electrical consumption (230V 50Hz)*	W	380	460	510	650	820	765	975	1230	1300	1275	1640	2050	

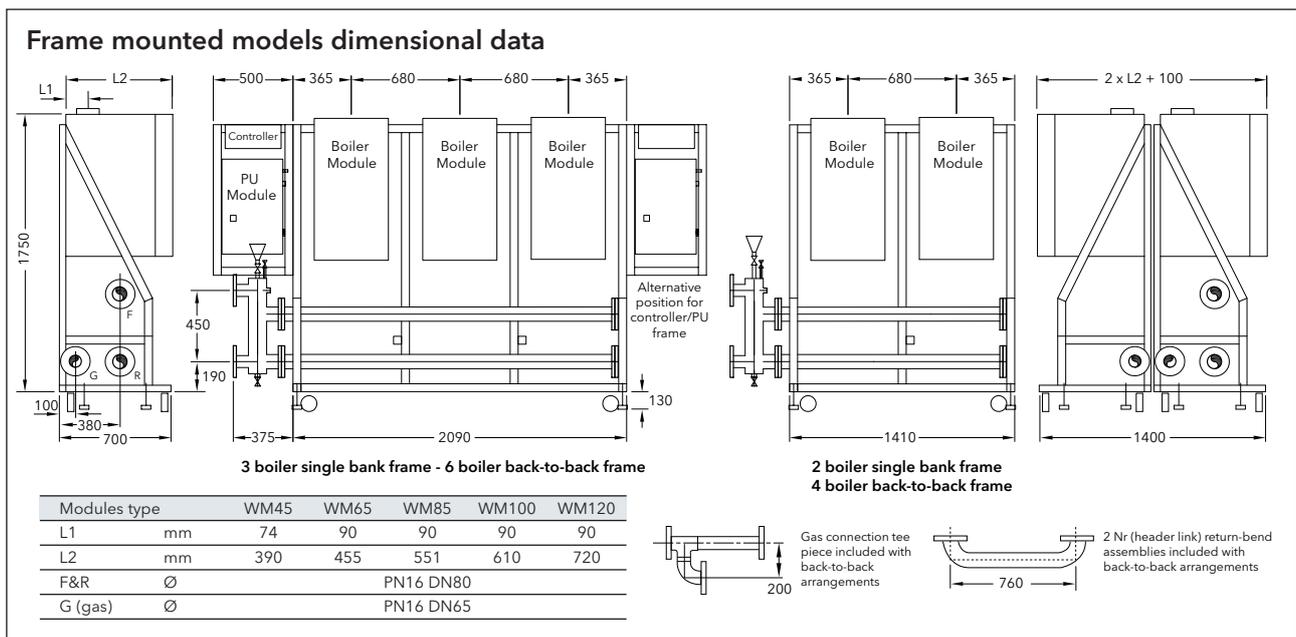
* Not including electrical consumption of optional pressurisation manager; see specific literature for details
 Gas category II 2H3P
 Appliance module category B₂₁, C₃₃, C₄₃, C₅₃, C₆₃, C₈₃

Technical data

Back-to-Back Frame Mounted Models

Model		260B	340B	400B	480B	510B	600B
Modules - Ultramax WM	Nr	4x65	4x85	4x100	4x120	6x85	6x100
Nominal heat output max @ 80/60	kW	240	311.2	352.8	439.2	466.8	529.2
Nominal heat output max @40/30	kW	260	340	385.2	480	513	577.8
Nominal heat input	Gross	kW	269.6	355.2	399.2	499.2	532.8
	Net	kW	242.8	320	360	449.6	480
Max flow temperature	°C	90					
Nominal water content	litres	62.4	69.6	78.0	84.0	105	116
Design temperature rise (Δt)	°C	20					
Min/max operating pressure @ 90°C	bar	1.5 / 6.0					
Gas consumption Nat Gas (G20)	m³/h	22.4	29.2	33.2	41.2	43.8	49.8
Gas consumption LPG (G31)	kg/h	18.8	25.2	28.0	35.2	37.8	42.0
Nom gas inlet pressure (G20)	mbar	17/20	17/20	17/20	17/20	17/20	17/20
Nom gas inlet pressure (G31)	mbar	30/50	30/50	30/50	30/50	30/50	30/50
Approx flue gas volume total	m³/h	452.3	596	298	336	418	447
Approx flue gas volume per module	m³/h	113.1	149	149	168	209	149
Approx flue gas temperature max	°C	70					
Module flue connection	Ømm	80	80	100	100	100	100
Module air supply connection	Ømm	80	80	100	100	100	100
Gas connection	Ømm	PN16 DN65					
Condense waste connection	Ømm	25 x 4					
Flow/return connections common size:	Ømm	PN16 / DN80					
May be reduced to:	Ømm	50	65	65	NA	NA	NA
Nominal weight dry	kg	430	670	730	770	900	990
Electrical consumption (230v 50Hz)*	W	920	1020	1300	1640	1530	1950

Note: * Not including electrical consumption of optional pressurisation manager; see specific literature for details. Appliance module category B₂₃, C₃₃, C₄₃, C₅₃, C₆₃, C₈₃



Put your mind at rest

It's easy to ignore your central heating boilers - until difficulties occur. A system failure, especially one caused by lack of maintenance, can be inconvenient and costly.

It isn't hard to imagine the difficulties that problems with your heating system can cause. And in some situations lack of heating and hot water can be critical. Similar to your car, a regularly maintained heating system will run more efficiently and any potential problems can be resolved before they develop into major system failure.

Financially, planned maintenance makes sense too. It avoids major capital outlay and the associated costs of system down time - plus it can keep your fuel costs down as well as ensuring you are minimising your emissions.

At MHS Boilers we provide a lifetime maintenance and service solution for your heating system - enabling you to rest safe in the knowledge that we'll take care of it.

Go to **www.mhsboilers.com** and download or request a copy of our **Maintenance and Service Solutions** brochure.



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