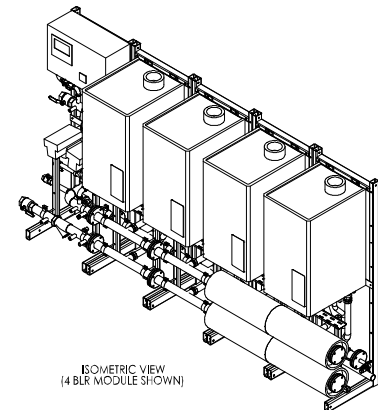
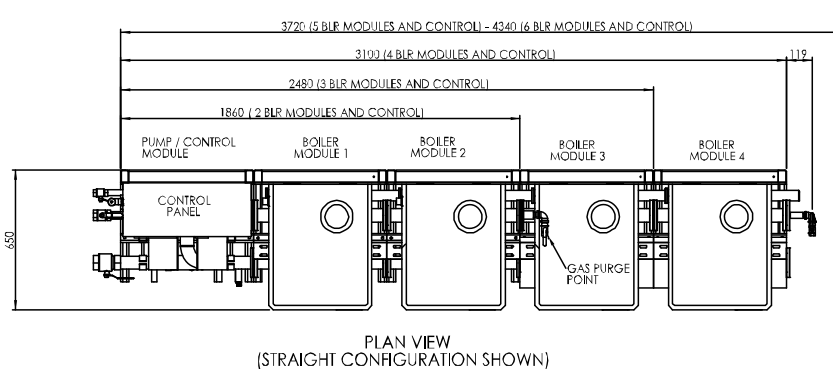
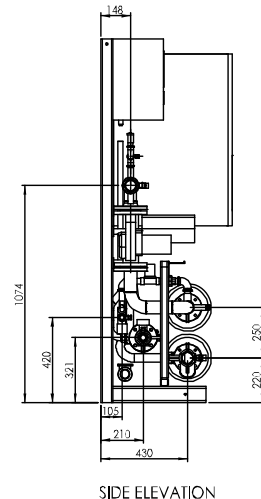
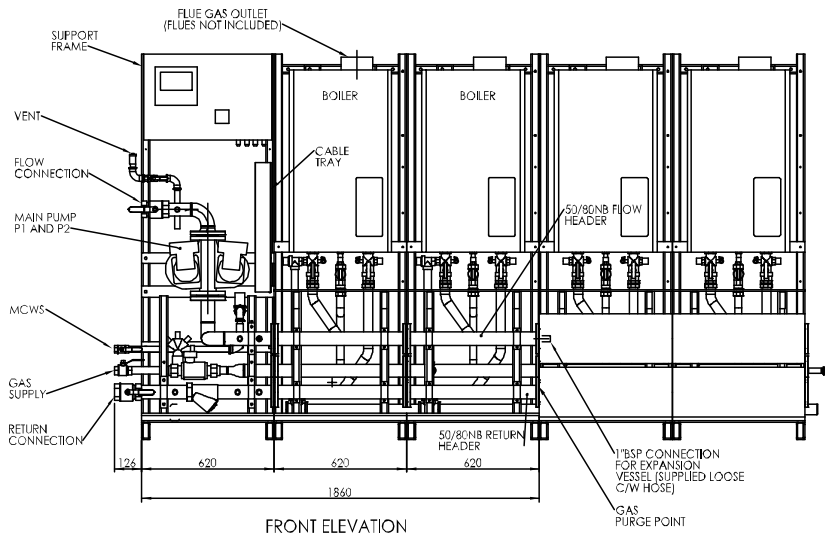


MBS - Integrated Heating Solution

SUBMITTAL

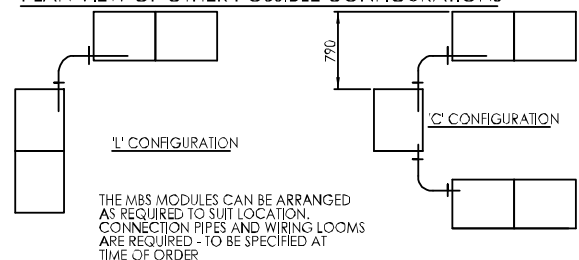
JOB: _____	REPRESENTATIVE: _____
ENGINEER: _____	ORDER NO: _____
CONTRACTOR: _____	SUBMITTED BY: _____
	APPROVED BY: _____
	DATE: _____



STANDARD FEATURES

- Integrated sub-systems - boilers, pump, and controller
- Fully modulating low NOx gas fired condensing boilers
- High overall seasonal efficiencies
- Integrated controller utilizing modulating load control
- Modular layout design
- Slim profile boiler and pump modules
- Variable speed twin head pump
- Pressure controlled fill unit
- Touch-screen panel
- Weather compensation
- Optimum start-up time of system
- BMS compatible using serial communication
- Plug-and-play configuration
- Pre-insulated pipework
- Integrated gas meter
- Built-in chemical dosing pot system

PLAN VIEW OF OTHER POSSIBLE CONFIGURATIONS



OPTIONAL FEATURES

A serial communications port for communication with a Building Automation System (BMS) (protocols included are Trend, BACnet, Modbus, LonWorks, TCP/IP and GSM modem)

Serial communication with BMS required? ☐ Yes ☐ No

Communication Protocol: _____

TECHNICAL DATA						
	MBS120	MBS160	MBS180	MBS190	MBS230	MBS240
Boiler Modules						
Number of boilers	2 x MB60	2 x MB80	3 x MB60	2 x MB95	2 x MB115	3 x MB80
CE registration number	0085BL0514					
Total nominal heat input range (net)	14 to 116 kW	20 to 154 kW	14 to 174 kW	20 to 190 kW	25 to 230 kW	20 to 231 kW
Total nominal heat output range 80/60°C	13.5 to 112.4 kW	19.2 to 149.2 kW	13.5 to 168.6 kW	19.4 to 184.4 kW	24.3 to 223.4 kW	19.2 to 223.8 kW
Total nominal heat output range 50/30°C	14.9 to 119 kW	21.3 to 158.2 kW	14.9 to 178.5 kW	21.4 to 196.6 kW	26.7 to 237.2 kW	21.3 to 237.3kW
Total gas consumption (NG)	12 m³/h	16 m³/h	18 m³/h	20.2 m³/h	24 m³/h	24.4 m³/h
Total gas consumption (LPG)	4.92 m³/h	6.42 m³/h	7.38 m³/h	7.72 m³/h	12.84 m³/h	
Flue gas temperature 80/60°C	64°C	66°C	64°C	73°C	77°C	66°C
Flue gas temperature 50/30°C	48°C	48°C	48°C	51°C	56°C	48°C
Nominal gas inlet pressure (NG)	20 mbar					
Nominal gas inlet pressure (LPG)	35 to 45 mbar					
CO ₂ (NG)	8.3 to 8.8%					
CO ₂ (LPG)	9.5 to 10.0%					
NO _x class 5	<20 mg/kWh					
Maximum pressure at flue outlets	1.1 mbar	1.1 mbar	1.1 mbar	1.5 mbar	1.8 mbar	1.1 mbar
Combustion air/flue connection size	150/110 mm	150/110 mm	150/110 mm	160/110 mm	160/110 mm	150/110 mm
Boiler module weight (each)	152 kg	165 kg	152 kg	190 kg	190 kg	165 kg
Pump/Control Module						
Design flow rate (20°C Δt)	1.42 L/s	1.88 L/s	2.13 L/s	2.35 L/s	2.82 L/s	2.83 L/s
Residual head	100 kPa	100 kPa	100 kPa	90 kPa	106 kPa	115 kPa
Minimum operating pressure	1 bar					
Cold fill pressure	1.5 bar					
Design working pressure	3 bar					
Safety valve set pressure	4 bar					
Expansion vessel size (supplied loose)	100 liters	200 liters	200 liters	200 liters	200 liters	200 liters
Maximum operating temperature	80°C					
Electric supply	415 V / 50 Hz / 10 A					
Full load current	2.5 A	2.5 A	2.5 A	2.5 A	3.4 A	3.4 A
LTHW flow and return connections	50 BSP mm					
Gas connection	50 BSP					
Condensate/RPZ drain connection	32 mm					
Boosted cold water/mains water connection	20 BSP mm					
Minimum cold water supply pressure	3 bar					
Pump module weight	210 kg					
General Information						
High and low level ventilation requirement	Refer to BS6644:2005					
Overall assembly dimensions length	1860 mm	1860 mm	2480 mm	1860 mm	1860 mm	2480 mm
depth	520 mm	520 mm	520 mm	585 mm	585 mm	520 mm
height	1800 mm					
Total weight (dry)	514 kg	540 kg	666 kg	590 kg	590 kg	705 kg
Total weight (wet)	532 kg	560 kg	691 kg	619 kg	691 kg	733 kg

TECHNICAL DATA						
	MBS285	MBS320	MBS345	MBS460	MBS575	MBS690
Boiler Modules						
Number of boilers	3 x MB95	4 x MB80	3 x MB115	4 x MB115	5 x MB115	6 x MB115
CE registration number	0085BL0514					
Total nominal heat input range (net)	20 to 285 kW	20 to 308 kW	25 to 345 kW	25 to 460 kW	25 to 575 kW	25 to 690 kW
Total nominal heat output range 80/60°C	19.4 to 276.6 kW	19.2 to 298.4 kW	24.3 to 335.1 kW	24.3 to 446.8 kW	24.3 to 558.5 kW	24.3 to 670.2 kW
Total nominal heat output range 50/30°C	21.4 to 294.9 kW	21.3 to 316.4 kW	26.7 to 355.8 kW	26.7 to 474.4 kW	26.7 to 593 kW	26.7 to 711.6 kW
Total gas consumption (NG)	30.3 m³/h	32 m³/h	36.6 m³/h	48.8 m³/h	61 m³/h	73.2 m³/h
Total gas consumption (LPG)	9.63 m³/h	12.84 m³/h	14.01 m³/h	18.68 m³/h	23.35 m³/h	28.02 m³/h
Flue gas temperature 80/60°C	73°C	66°C	77°C	77°C	77°C	77°C
Flue gas temperature 50/30°C	51°C	48°C	56°C	56°C	56°C	56°C
Nominal gas inlet pressure (NG)	20 mbar					
Nominal gas inlet pressure (LPG)	35 to 45 mbar					
CO ₂ (NG)	8.3 to 8.8%					
CO ₂ (LPG)	9.5 to 10.0%					
NO _x class 5	<20 mg/kWh					
Maximum pressure at flue outlets	1.5 mbar	1.1 mbar	1.8 mbar	1.8 mbar	1.8 mbar	1.8 mbar
Combustion air/flue connection size	160/110 mm	150/110 mm	160/110 mm	160/110 mm	160/110 mm	160/110 mm
Boiler module weight (each)	205 kg	165 kg	205 kg	205 kg	205 kg	205 kg
Pump/Control Module						
Design flow rate (20°C Δt)	3.51 L/s	3.77 L/s	4.24 L/s	5.64 L/s	7.06 L/s	8.47 L/s
Residual head	110 kPa	109 kPa	98 kPa	85 kPa	109 kPa	86 kPa
Minimum operating pressure	1 bar					
Cold fill pressure	1.5 bar					
Design working pressure	3 bar					
Safety valve set pressure	4 bar					
Expansion vessel size (supplied loose)	300 liters	300 liters	300 liters	500 liters	500 liters	500 liters
Maximum operating temperature	80°C					
Electric supply	415 V / 50 Hz / 10 A					
Full load current	3.4 A	3.4 A	3.4 A	3.4 A	4.65 A	4.65 A
LTHW flow and return connections	80 PN16 mm					
Gas connection	80 PN16 mm					
Condensate/RPZ drain connection	32 mm					
Boosted cold water/mains water connection	20 BSP mm					
Minimum cold water supply pressure	3 bar					
Pump module weight	210 kg					
General Information						
High and low level ventilation requirement	Refer to BS6644:2005					
Overall assembly dimensions length	2480 mm	3100 mm	2480 mm	3100 mm	3720 mm	4340 mm
depth	585 mm	520 mm	585 mm	585 mm	585 mm	585 mm
height	1800 mm					
Total weight (dry)	825 kg	870 kg	825 kg	1030 kg	1225 kg	1440 kg
Total weight (wet)	865 ka	904 ka	865 ka	1081 ka	1296 ka	1513 ka

Overall Seasonal Boiler Efficiency

Section 2.4 of the 1st edition of the "Non-Domestic Heating, Cooling and Ventilation Compliance Guide" provides details of the method for calculating Overall Seasonal Boiler Efficiency (OSBE).

A typical calculation for an MBS 240 with a design load of 200 kW would be:

Boiler efficiency at stated % of system output:

15% = 95.2
30% = 95.6
100% = 93.05

$$\text{OSBE} = (0.36 \times 95.2) + (0.45 \times 95.6) + (0.19 \times 93.05) = 94.79\%$$

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