



Cast Iron Boilers

G Series (320-1017kW)

Mikrotherm G Series Cast Iron Boilers

The Mikrotherm G Series of cast iron sectional boilers offer all the advantages of cast iron durability and longevity coupled with high efficiency and ease of operation. The range offers outputs of 320-1017 kW for oil or gas fired operation.



The Mikrotherm G Series incorporates a unique three pass design feature allowing the boiler to be operated at low return temperatures. The hinged front door allows for easy access for maintenance and cleaning tools are supplied as standard. The high levels of insulation ensure minimum heat loss and maximum noise reduction.

The standard control package includes illuminated on/off switch, high and low control thermostats, hours run meters and high limit thermostat with test switch. Higher levels of control specification are available as an optional extra.

The compact design and unique design features make the Mikrotherm G Series boiler a perfect choice for both new and retrofit applications.

Standard features

The Mikrotherm G Series includes thirteen boilers (with 8 to 20 sections) giving output from 320 to 1017kW. Oil, gas or dual fuel.

- Compliance with standards:
The boilers are CE marked in accordance with: Gas Appliances Directive (90/396/EEC), Boiler Efficiency Directive (92/42/EEC), Electromagnetic Compatibility Directive (89/336/EEC) and conform to EN 303/1, 303/2 and 303/3.
- Operation at low return water temperatures
All Mikrotherm G Series boilers utilises recirculation in the rear two sections of the boiler thereby instantly raising the incoming water temperature and allowing the boilers to be operated at continuous return temperatures of 30 and 40°C for oil and gas respectively without the formation of condensation. This feature also protects the boiler from thermal stresses affording long and dependable life.
- Simplified installation
The ability of the boiler to operate condensate free at continuous low return temperatures allows installations to be made without the need for 'back-end temperature protection'. A shunt pump therefore is not required.

Minimal flow rate must be observed – see technical data.

- Heat exchanger construction
The heat exchangers are constructed from cast iron sections and interconnected using bi-conical nipples, all held together with tie rods. Section to section gas tight sealing is afforded using woven ceramic rope bonded into place. The combustion chamber doors are heavily insulated with factory fitted ridged ceramic linings.
- Warranty against material or manufacturing defect:
Heat exchanger – 10 years
Burner – not less then 12 months but certain burners may have longer warranties
All other components – 12 months

Integral backend protection

A special connector positioned in the return connection port, induces recirculation in the rear two sections of the boiler which instantaneously raises the return water temperature, thereby allowing continuous operation at low return water temperatures (even when firing on oil) without condensation and thermal shocks. See technical data for minimum continuous return temperatures.

This feature affords simplified installations without backend temperature protection necessity and has the possibility for variable temperature installation to be made without mixing valves.

Note there is a requirement to observe minimum flow rate – see technical data.

Boiler door

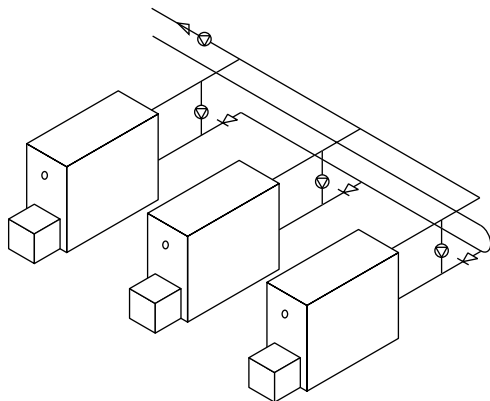
All boilers have double hinged full boiler sized front door, allowing unrestricted and easy access for cleaning and inspection of the combustion chamber and flueways.



Minimum water flow rate

A minimum water flow rate must be provided at all times either via the main system pump/s or via shunt pumps. The boiler and burner must be interlocked to the pumps and the burner must be prevented from firing in the event of water flow failure.

In case of multiple boilers with individual shunt pumps, it is important to install non-return valves upstream of the return connection to avoid parastatic flow between boilers. See diagram below.



Installation requirements

The Mikrotherm G Series boilers must be installed in accordance with (as appropriate) the requirements of the Building Regulations, Health and Safety Executive Regulation PM5, IEE Regulations, Gas Safety (Installations and Use) Regulation, National Water Byelaws, Clean Air Act Memorandum on Chimney Heights and any insurance company requirements.

Codes of practice

- BS6880 (Parts 1, 2 and 3. 1988) Code of Practice for low temperature hot water heating systems for output greater than 45kW.
- BS5410 (Part 2. 1978) Code of Practice for oil firing installation of output greater than 44kW for space heating, hot water supply and steam supply purposes,.
- BS6644 (1991) Specification for installation of gas fired hot water boilers of rated inouts between 60kW and 2MW.
- IGE/UP/2 Gas installation pipework, boosters and compressors on industrial and commercial premises.
- CIBSE Reference sections B7, B11 and B13
- LPG When boiler are fired with LPG, it is recommended that gas leakage detection equipment is installed at low level near the boiler/s.

System water quality

Mikrotherm G Series boilers must always be installed on closed systems, whether they are open vented or sealed and pressurised type. All systems should be thoroughly cleaned prior to installation of the boiler and the system water must be treated to prevent the deposition of scale or sludge in the waterways.

The system water be of sufficient quality to maintain the following requirements:

- pH between 7.5 and 8.5
- Maximum hardness of between 8 and 12 grams of calcium carbonate per 100 litres of water.

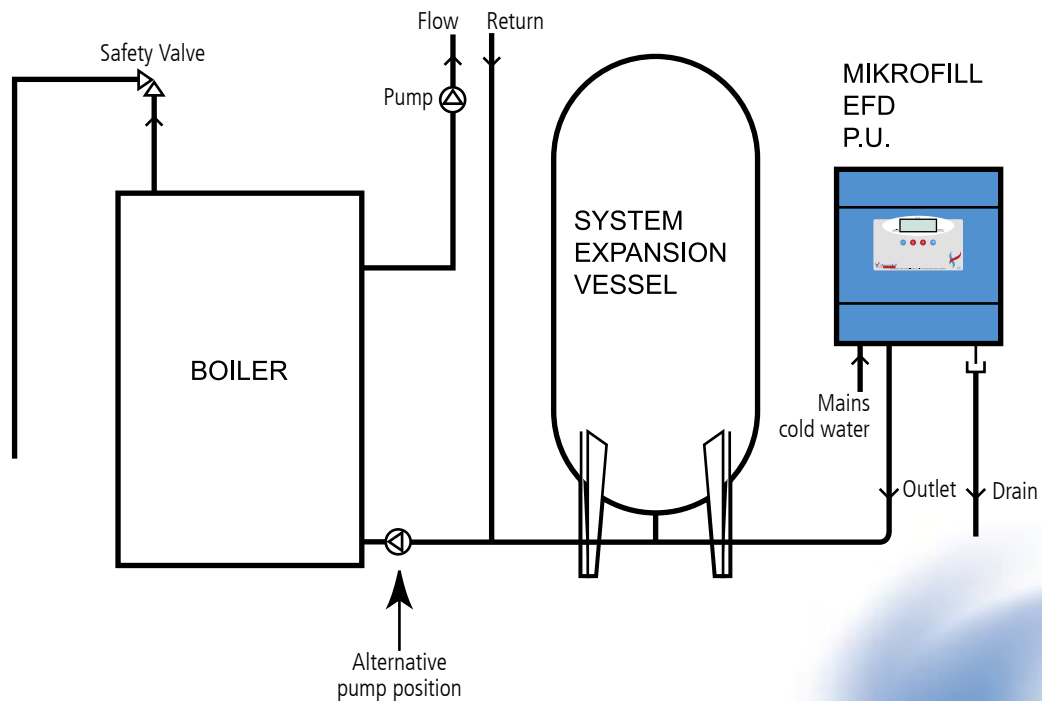
Filling the system

The system to which the boilers are connected may be open vented or sealed and pressurised (recommended). If the system is to be of the sealed type, then the initial filling of a sealed system and subsequent refilling, must be by a method that has been approved by the Water Regulation Advisory Scheme (WRAS) for the type of heating system i.e. Fluid Category 4 (commercial). We recommend the using a Mikrofill EFD, our patented sealed system filling device. See typical installation diagram.

Typical installation

For sealed systems Mikrofill recommends the use of the Mikrofill EFD sealed system filling device. The EFD is the most compact and advanced filling and pressurisation unit available. It is an approved

category 4 backflow preventor, can fill and pressurise your system from empty and provides microprocessor controlled pressure and leakage management.

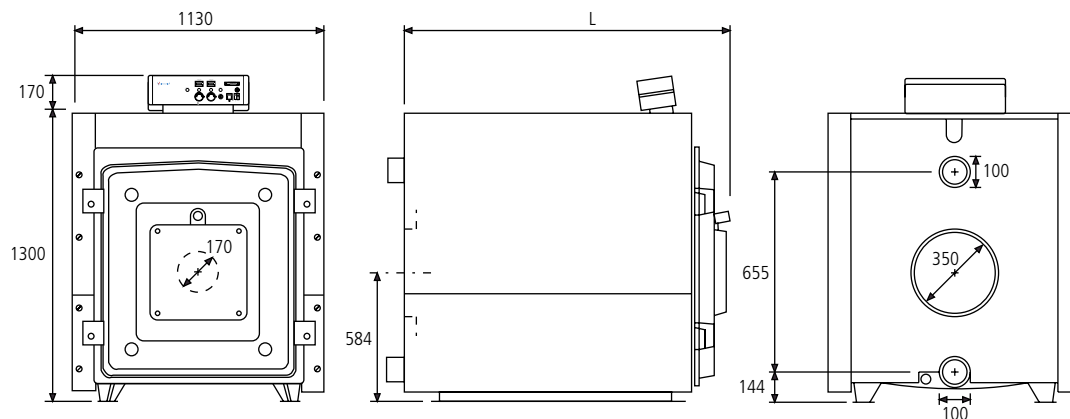


Technical data

Output													
Model	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
Output (kW)	320	378	436	494	552	611	669	727	785	843	901	959	1017
Nett input (kW)	351	415	479	543	607	671	735	799	863	926	990	1054	1118
No. Sections	8	9	10	11	12	13	14	15	16	17	18	19	20

Dimensions													
Model	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
Overcase length 'L' (mm)	1409	1537	1665	1784	1921	2049	2177	2305	2433	2561	2689	2817	2945
Overcase width (mm)	1300												
Overall height (mm)	1470												
Weight (kg)	1551	1710	1868	2049	2206	2365	2533	2702	2857	3015	3172	3331	3489

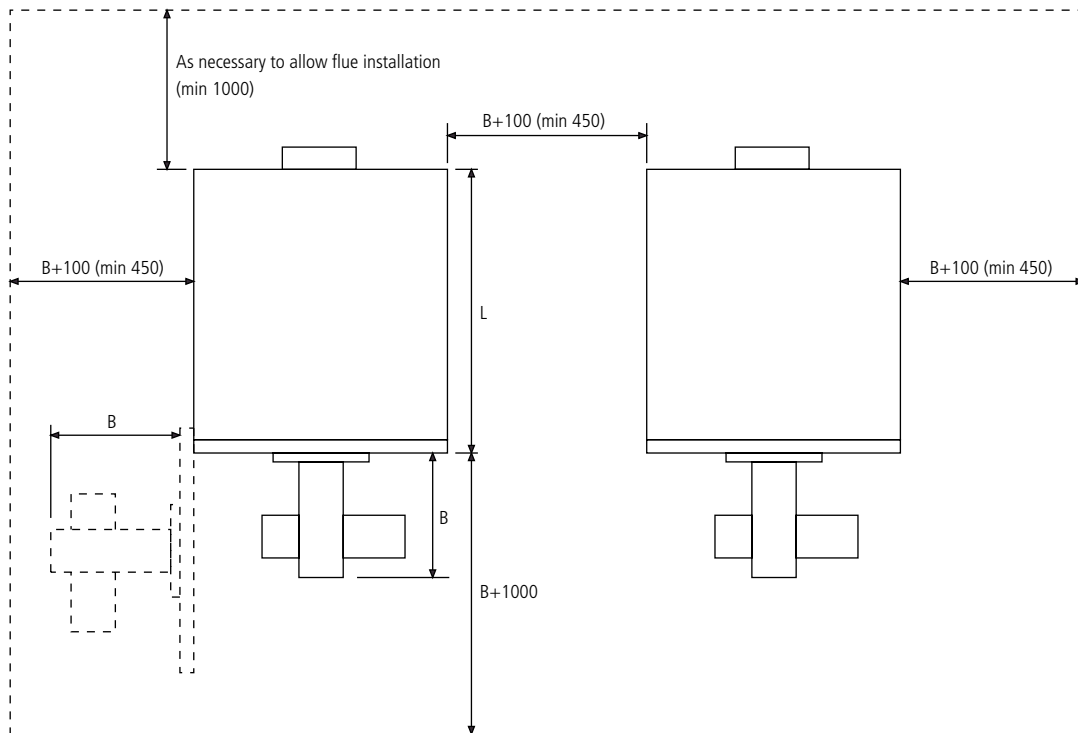
Dimensions diagram



Boiler base

Recommended dimensions of plinth (mm)													
Model	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
Width	1130												
Length	1410	1540	1665	1785	1925	2050	2180	2305	2435	2565	2690	2820	2945
Height	200												

Clearances



		Burner depth 'B' (mm)													
Model		G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20	
Riello	Oil	468								680					
	Gas	580								840					
NuWay	Oil	580								686					
	Gas	710			810					957					
EOGB	Oil	605	725	735	920		900			935		1040			
	Gas	875		1045						1040					



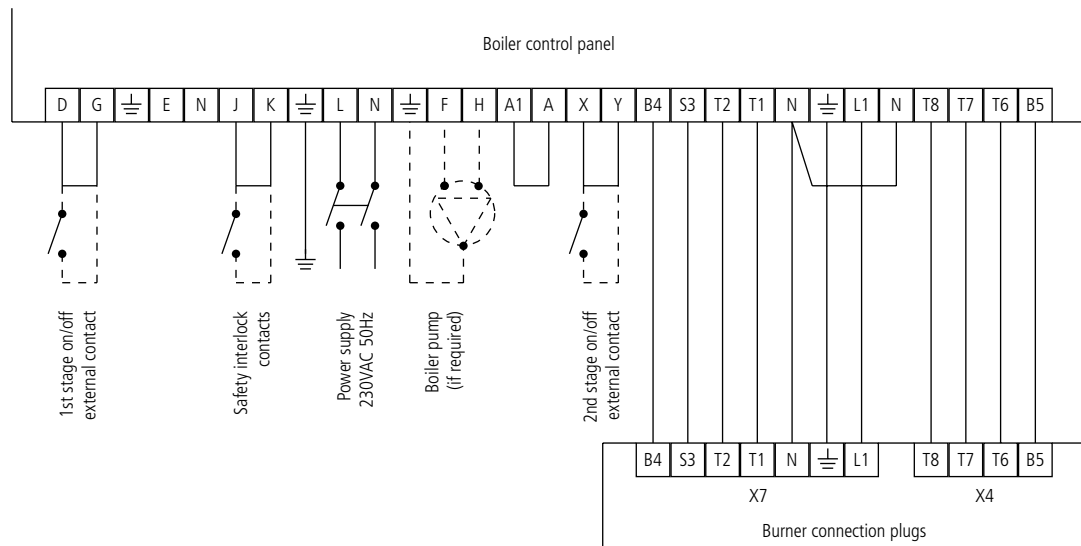
Technical data

Waterside Data													
Model	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
Minimum flow rate (litres/second)	1.27	1.5	1.75	2	2.2	2.45	2.66	2.88	3.13	3.36	3.58	3.83	4.05
Minimum return temp for gas (°C)	40												
Minimum return temp for oil (°C)	30												
Maximum working pressure (bar)	6												
Δt = 10°C													
Design flow (litres/second)	7.61	9	10.4	11.8	13.1	14.5	15.9	17.3	18.6	20.1	21.5	22.8	24.21
Resistance (kpa)	5.8	8.3	11.3	14.6	18.5	25	30.5	36.8	30.95	38.5	43.1	50.1	57.9
Δt = 15°C													
Design flow (litres/second)	5.07	6	6.9	7.8	8.8	9.7	10.6	11.5	12.5	13.4	14.3	15.2	16.2
Resistance (kpa)	2.6	3.7	5	6.5	8.3	11.1	13.6	16.4	13.7	16.31	18.3	21.1	24.5
Δt = 20°C													
Design flow (litres/second)	3.8	4.5	5.2	5.9	6.6	7.3	8	8.7	9.3	10	10.7	11.4	12.1
Resistance (kpa)	1.5	2.1	2.9	3.9	5.2	6.2	7.65	9.22	7.7	9.2	10.8	12.6	14.5

Flue gas data													
Model	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
Flue spigot outside diameter (mm)	????????????												
Flue spigot inside diameter (mm)	350												
Nominal flue gas temp (°C)	190												
Wet gas volume for gas (kg/hour)	564.1	666.4	768	871	973	1075	1180	1282	1384	1486	1588	1691	1793
Wet gas volume for oil (kg/hour)	573.3	634	732	830	927	1024	1123	1221	1318	1415	1513	1610	1708
Standing losses (Watts)	366	414	460	505	555	600	650	692	740	786	831	878	928
Maximum Draught (Pa)	30												

Fuel consumption													
Model	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
Output (kW)	320	378	436	494	552	661	669	727	785	843	901	959	1017
Nett input (kW)	351	418	479	543	607	671	735	799	863	926	990	1084	1118
Max gas rate (m³/hour)	36.6	43.3	50	56.6	63.3	70	76.6	83.3	90	96.6	103.3	110	116.5
Max LPG rate (m³/hour)	27	31.9	36.8	41.7	46.6	51.1	56.4	61.3	66.3	71.1	76.1	80.9	85.8
Max 35sec Oil rate (kg/hour)	29.6	35	40.4	45.8	51.2	56.6	62	67.3	72.8	78.1	83.5	88.8	94.3

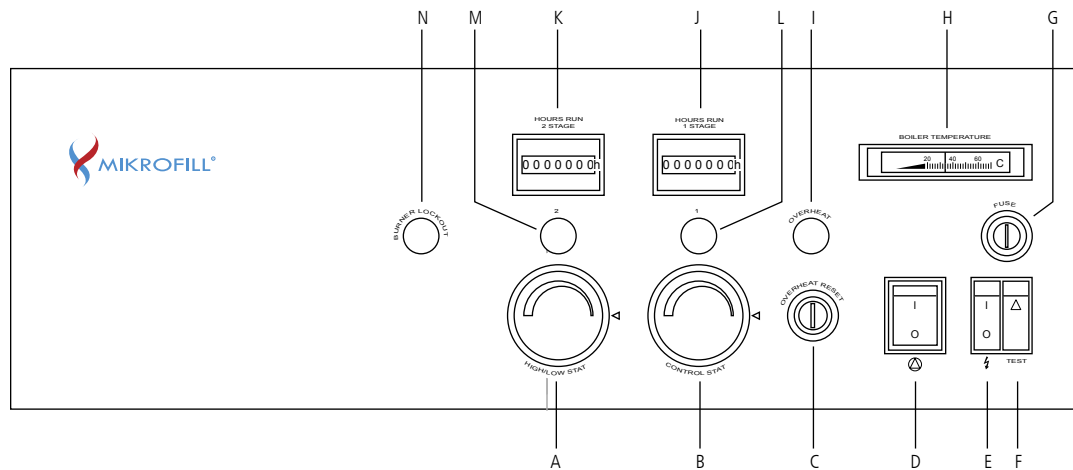
Electrical schematic



Notes

- Maximum current that can be switched per output is 2A. Provide a contactor for any output above that value.
- Remove link D-G and install a volt free contact to achieve remote external on/off control
- Remove links X-Y and install volt free contact to achieve remote high/low control (high/low burners only)

Boiler control panel



Key to components

A	2nd stage control thermostat	H	Water temperature thermometer
B	1st stage control thermostat	I	Overheat trip lamp
C	High limit thermostat	J	1st stage hours run
D	Pump control switch	K	2nd stage hours run
E	Burner on/off switch	L	1st stage operating lamp
F	High limit thermostat test switch	M	2nd stage operating lamp
G	Fuse holder	N	Burner lockout indicator lamp

Optional climate control panel

As an alternative, where installation utilizes a single Mikrotherm G Series boiler, the boiler may be equipped with an enhanced fully automatic control panel (at additional cost) which included a comprehensive controller (Siemens RVA53.280). This controller can provide control over two heating zones with weather compensation, plus control over an indirect water storage cylinder such as the Mikrofill Rapide.

The features of the 'P3' control panel are as follows:

- 2 separately controlled heating circuits without mixing valves
- Quick setback and boost facility
- Automatic summer/winter changeover
- Remote operation via digital room unit
- Self adaptive in line with thermal dynamics of the building
- Automatic adjustment of heating curve to type of building construction and the heat demand (provided a room unit is connected)
- Adjustable flow temperature boost with mixing heating circuit
- Protective boiler start-up
- Protection against boiler over temperature (pump overrun)
- Adjustable minimum and maximum limitation of boiler temperature (boiler flow temperature)



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