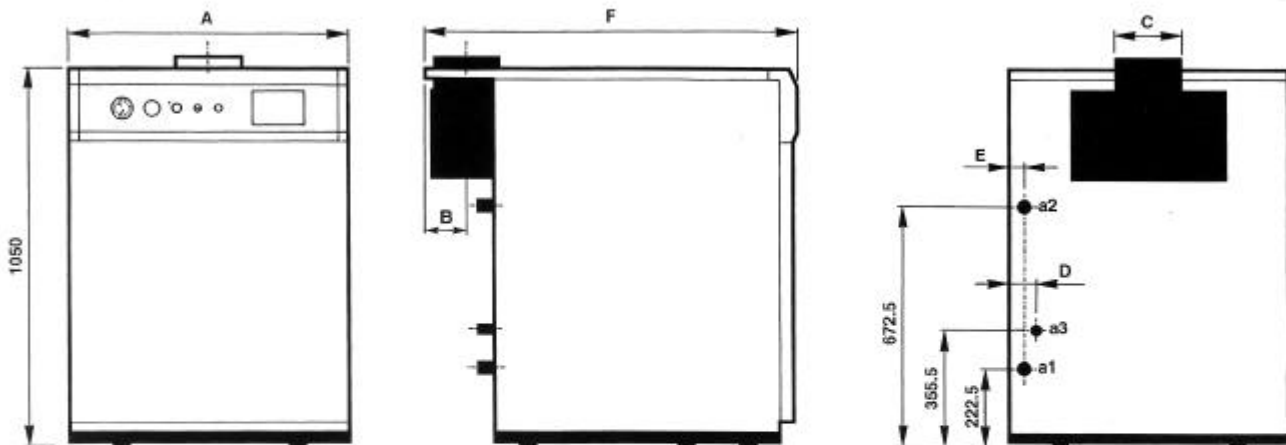


# MIKROTHERM GA SERIES BOILERS

## GENERAL DESCRIPTION



The GA Series of atmospheric natural gas-fired boilers are constructed of cast iron finned sections joined by steel nipples and tie rods. Each boiler includes an integral draught diverter giving all models a low profile silhouette. All boilers are designed for use with fully pumped indirect heating systems up to a maximum working pressure of 4 bar and flow temperature of 82°C. Standard controls and instruments include control thermostat, limit (manual reset) thermostat, lockout indicator lamp, ON/OFF switch, combined thermometer and altitude gauge. The Mikrotherm GA boiler is a fully automatic ignition version that provides flame rectification monitoring. All gas, flow and return connections are situated at the rear of the boiler. For ease of maintenance all cleaning of the flueways and burner servicing is carried out from the front of the boiler, which means that the side clearances are kept to a minimum making this boiler particularly suitable for modular installations. The system electrical and associated controls should be installed so that the boiler is never allowed to fire when there is no demand for heat. An LPG version is also available. The GA Series is normally supplied, fully assembled, however models from 185 to 290 may be ordered as a dismantled version. Please contact Mikrofill Sales Dept. for further information together with details of our on site assembly service.

## TECHNICAL DATA

GA Series	OUTPUT		No. of sections	DIMENSIONS (mm)						CONNECTIONS			WEIGHT kg	WATER Content lt
	kW	BTU/h		A	B	C	D	E	F	a1	a2	a3		
GA 120/F3.119	119	406,000	8	930	126	220	46	42	1050	2"	2"	1"	470	38
GA 135/F3.136	136	464,000	9	1020	141	250	49	45	1050	2"	2"	1"	530	42
GA 150/F3.153	153	522,000	10	1100	141	250	55	43	1050	2"	2"	1 1/2"	575	46
GA 170/F3.170	170	580,000	11	1190	166	300	58	46	1050	2"	2"	1 1/2"	625	50
GA 185/F3.187	187	638,000	12	1270	166	300	56	44	1050	2"	2"	1 1/2"	665	54
GA 220/F3.221	221	754,000	14	1440	166	300	57	45	1050	2"	2"	1 1/2"	760	62
GA 255/F3.255	255	870,000	16	1610	191	350	58	46	1100	2"	2"	1 1/2"	875	70
GA 290/F3.289	289	986,000	18	1780	191	350	59	47	1100	2"	2"	1 1/2"	945	78

## BASE REQUIREMENTS

The boiler should stand on a load bearing non-combustible level base. Any plinth constructed must exceed the boiler plan area by not less than 80 mm overall.

## MODULAR APPLICATIONS

This boiler series is particularly suited for modular applications since all servicing and flue cleaning is carried out from the front so that side clearances are kept to a minimum. For further details please contact Mikrofill Technical Department, or consult separate literature "Modular Boiler Applications".

## INSTALLATION REQUIREMENTS

The Mikrotherm boilers should be installed in accordance with the relevant requirements of the building Regulations, Health and Safety Executive Regulation PMS, IEE Regulations and the Byelaws of the Local Authority and the local water company. Only Corgi registered installers should fit the Mikrotherm boilers.

### British Standard Codes of Practice

**CP341.300-307:** Central heating by low pressure hot water.

**CP341.342:** Part 2 Centralised hot water supply.

**CIBSE Guide:** Reference sections B7 B11 & B13.

**IGE/UP/2:** Gas Installation pipework boosters and compressors on Industrial and Commercial premises.

**BS6644:** Installation of gas fired hot water boilers rated inputs above 60 kW but not greater than 2 Mw.

# MIKROTERM GA SERIES BOILERS

## WATER FLOW RATES

GA SERIES	FLOW RATE	FLOW RATE	PRESSURE DROP	*MIN. FLOW RATE	*MIN. FLOW RATE	PRESSURE DROP
	at $\Delta t$ 11° C l/sec	at $\Delta t$ 11° C m <sup>3</sup> /h	at $\Delta t$ 11° C at m/bar	at $\Delta t$ 20° C l/sec	at $\Delta t$ 20° C m <sup>3</sup> /h	at $\Delta t$ 20° C m/bar
GA 120	2.56	9.1	145	1.4	5.0	50
GA 135	2.9	11.2	200	1.6	5.8	60
GA 150	3.3	11.8	220	1.8	6.5	62
GA 170	3.67	13.0	234	2.0	7.1	68
GA 185	4.03	14.2	246	2.2	7.9	73
GA 220	4.76	17.0	270	2.6	9.2	85
GA 255	5.49	19.5	305	3.0	10.5	100
GA 290	6.23	22.0	360	3.4	12.0	108

\* In those installations where the minimum flow rate cannot be achieved then the fitting of a shunt pump is recommended.

## FLUE SYSTEMS

Flues should be designed and installed to effectively evacuate the products of combustion. For guidance consult B56644 and British Gas Publication No. IM11.

## GAS REQUIREMENTS

GA SERIES	MAIN BURNER INJECTOR		PILOT INJECTOR		GAS RATE		INLET PRESSURE mbar			BURNER PRESSURE mbar	
	Nat Gas	LPG	Nat Gas	LPG	Nat Gas m <sup>3</sup> /h	LPG kg/h	Nat gas		LPG	Nat gas	LPG
							Min	Max			
GA 120	3.5	2.15	0.4	0.24	13.8	10.2	15	23	37	13.3	36
GA 135	3.5	2.15	0.4	0.24	15.8	11.6	15	23	37	13.3	36
GA 150	3.5	2.15	0.4	0.24	17.9	13.1	15	23	37	13.3	36
GA 170	3.5	2.15	0.4	0.24	19.8	14.5	15	23	37	13.3	36
GA 185	3.5	2.15	0.4	0.24	21.8	16.0	15	23	37	13.3	36
GA 220	3.5	2.15	0.4	0.24	25.7	18.9	15	23	37	13.3	36
GA 255	3.5	2.15	0.4	0.24	29.6	21.8	15	23	37	13.3	36
GA 290	3.5	2.15	0.4	0.24	33.5	24.6	15	23	37	13.3	36

## VENTILATION

Safe efficient and trouble-free operation of conventionally flued gas boilers is vitally dependent on the provision of adequate supply of fresh air to the room in which the appliance is installed. Ventilation by grilles communicating directly with the outside air is required at both high and low levels. The minimum free areas of these grilles must be in accordance with the table shown. The use of an extractor fan in the same room as the boiler (or in an adjacent room in communication) can in certain conditions adversely effect the safe operation of the boiler. Where such a fan is already fitted or if an extractor fan is likely to be installed at a later date then advice of the gas supplier should be obtained. Tests for spillage of products from the draught diverter when the extractor fan is running and all doors and windows are shut should be carried out after installation. If spillage is detected the area of permanent ventilation must be increased. A flue spillage detector is fitted as standard on all GA boilers, in the event of spillage the boiler will not operate.

Total gross input rating of boilers	Position of Air vents	Air vent areas (Air direct from outside)
Up to 2MW	High Level	270 cm <sup>2</sup> plus 2.25 cm <sup>2</sup> per kW in excess of 60 kW total rated input
Up to 2MW	Low Level	540 cm <sup>2</sup> plus 4.5cm <sup>2</sup> per kW in excess of 60 kW total rated input

For further detailed recommendations consult B55440 PART 2 AND B56644

## WATER TREATMENT

Water contained in all heating and indirect hot water systems, particularly open vented systems, requires basic treatment. It is wrong to assume that because boilers are operating in conjunction with what is an apparently closed circuit, an open vented system will not under normal circumstances allow damage or loss of efficiency due to hardness salts and corrosion once the initial charge of water has been heated several times. One millimetre of lime reduces the heat conversion from flame via metal to water by 10%. In practice the accumulation of these salts is liable to cause noises from the boiler body or even premature boiler failure. Corrosion and the formation of black iron oxide sludge will ultimately result in premature radiator failure. Open vented systems are not completely sealed off from the atmosphere because it is necessary to provide a tank open to atmosphere if proper venting and expansion of system water is to be achieved. The same tank is used to fill the systems with water and it is through the cold feed pipe that system water expands into the tank when the boiler passes heat into the system. Conversely, when the system cools, water previously expanded is drawn back from the tank into the system together with a quantity of dissolved oxygen. Even if leakage from the heating and hot water system is eliminated there will be evaporation losses from the surface of the tank. Depending on ambient temperature these may be high enough to evaporate a large portion of the system water capacity over a full heating season. Corrosion will always occur within a heating/hot water system to a greater or lesser degree irrespective of water characteristics, unless the initial fill water from the mains is treated. Even the water in closed systems will promote corrosion unless treated.

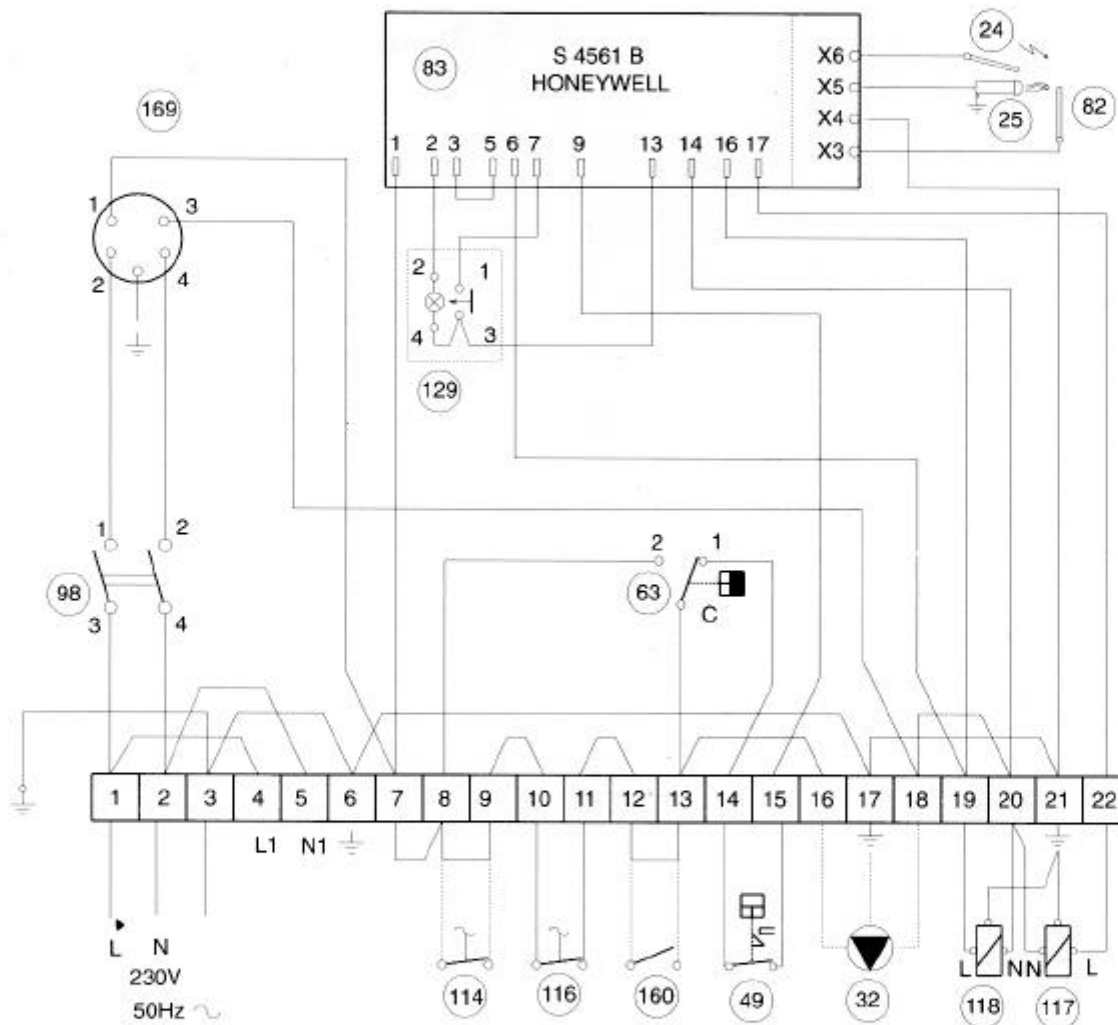
**ELECTRONIC IGNITION MODELS**

**WIRING AND CONNECTIONS DIAGRAM**

Electrical connections should be performed according to the diagrams shown here.

- Connect the boiler to a single-phase, phase neutral, 230V ~ 50Hz power supply through a standard terminal block or outlet with 2A max. fuses connected between the boiler and the power supply. Remember that the boiler should always be provided with a good earth.

Electrical connections



- |                                    |  |
|------------------------------------|--|
| 24 Spark electrode                 | 98 Boiler ON/OFF switch                  |
| 25 Pilot burner                    | 114 Water pressure switch (not provided) |
| 32 Pump                            | 116 Gas pressure switch                  |
| 49 Limit thermostat (manual reset) | 117 Pilot light gas valve                |
| 63 Boiler control thermostat       | 129 Ignition lockout reset button        |
| 82 Ionisation electrode            | 160 Auxiliary contact                    |
| 83 Ignition PCB                    | 169 Suppression filter                   |

**NOTE:** Dotted lines indicate connections to be performed during installation.  
Terminals L1, N1, 6 are reserved for connecting an electronic compensator (not available in UK).  
The pilot gas valve (part 118) also acts as a safety shut off valve.

The pump shown (32) should be switched via an intermediate relay particularly when the pump electrical characteristics exceeds 2 amp start current. In any event a pump over-run device is recommended to dissipate residual heat from the boiler.