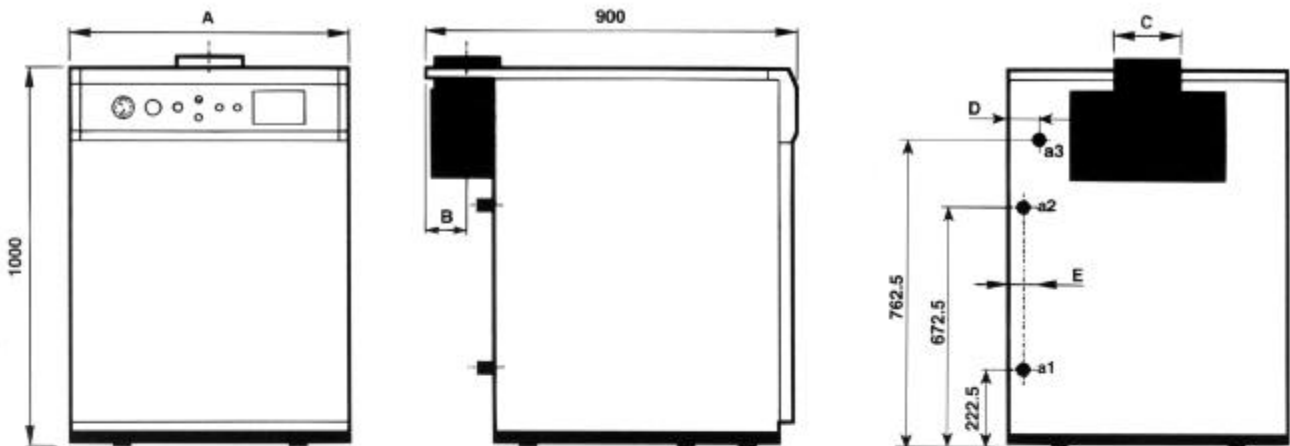


MIKROTHERM GA SERIES BOILERS

GENERAL DESCRIPTION



The Mikrotherm GA Series of atmospheric natural gas fired boilers are constructed of cast iron finned sections joined by steel nipples and tie rods. Boilers are delivered to site fully assembled and incorporate an integral draught diverter giving all models a low profile silhouette. Mikrotherm boilers are designed for use with fully pumped indirect heating systems up to a maximum working pressure of 4 bar and flow temperature of 90°C. The GA Series incorporates a permanent pilot with thermocouple flame failure device. Standard controls and instruments include control thermostat, limit thermostat, on/off switch, combined thermometer and altitude gauge, together with piezo ignition.

All gas, flow and return connections are situated at the rear of the boiler. The Mikrotherm Boiler is CE marked and conforms to all the relevant European Standards.

*Higher temperature range available on request.

TECHNICAL DATA

BOILER MODEL	OUTPUT		INPUT		DIMENSIONS (mm)						CONNECTIONS			WEIGHT	WATER
	kW	BTU/h	kW	BTU/hA	A	B	C	D	E	F	a1	a2	a3	kg	Content lt
GA 50/F2T51	51	174,000	62,2	212,000	550	96.5	180	43	35	900	1"1/2	1"1/2	3/4"	260	22
GA 70/F2T68	68	232,000	83,0	284,000	640	96.5	180	46	38	900	1"1/2	1"1/2	3/4"	305	26
GA 85/F2T85	85	290,000	103,8	354,100	720	160.5	200	44	36	900	1"1/2	1"1/2	3/4"	350	30
GA 100/F2T102	102	348,000	124,3	424,100	800	106.5	200	42	34	900	1"1/2	1"1/2	3/4"	395	34

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 Dept. See separate literature "Modular Boiler Applications".

INSTALLATION REQUIREMENTS

All 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 GA Series.

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.

BS5410: Part 2 oil-fired installation of 44 kW and above.

WATER FLOW RATES

The system design must ensure that adequate circulation takes place whilst the boiler is firing or during a pump over-run period.

MODEL	GA 50	GA 70	GA 85	GA 100
Flow Rate at $\Delta 11^{\circ}\text{C}$ l/sec	1.1	1.47	1.83	2.2
Flow Rate at $\Delta 20^{\circ}\text{C}$ l/sec	0.61	0.81	1.01	1.21

The use of shunt pump is recommended where the minimum flow rate at $\Delta 20^{\circ}\text{C}$ cannot be maintained together with the provision of a pump over-run device.

WATERSIDE PRESSURE DROPS

Waterside pressure drops, to assist with selection of pumps the table indicates the hydraulic resistance (mbar) at $\Delta 11^{\circ}\text{C}$.

MODEL	GA 50	GA 70	GA 85	GA 100
mbar	90	100	105	110

MIKROTHERM GA SERIES BOILERS

GAS REQUIREMENTS

BOILER MODEL	MAIN BURNER INJECTOR		PILOT INJECTOR		GAS RATE		INLET PRESSURE mbar			BURNER PRESSURE mbar	
	Nat Gas	LPG	Nat Gas	LPG	Nat Gas m ³ /h	LPG kg/h	Nat Gas		LPG	Nat Gas	LPG
							Min	Max			
GA 50	3.5	2.15	0.4	0.24	5.9	4.34	15	23	37	13.3	36
GA 70	3.5	2.15	0.4	0.24	7.9	5.79	15	23	37	13.3	36
GA 80	3.5	2.15	0.4	0.24	9.9	7.24	15	23	37	13.3	36
GA 100	3.5	2.15	0.4	0.24	11.8	8.68	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 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.

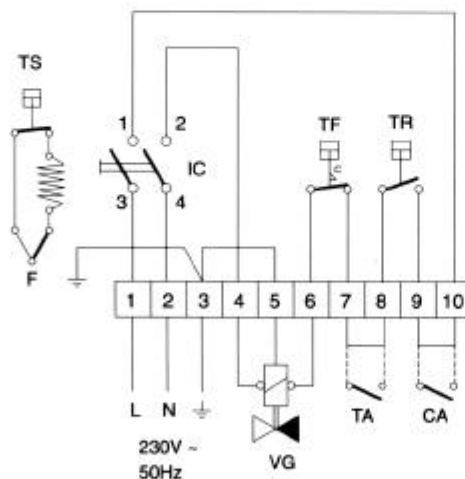
Total gross input rating of boilers	Position of Air vents	Air vent areas (Air direct from outside)
Up to 2MW	High Level	270 cm ² plus 2.25 cm ² per kW in excess of 60 kW total rated input
Up to 2MW	Low Level	540 cm ² plus 4.5cm ² per kW in excess of 60 kW total rated input

For further detailed recommendations consult BS5440 PART 2 AND BS6644

ELECTRICAL DIAGRAM

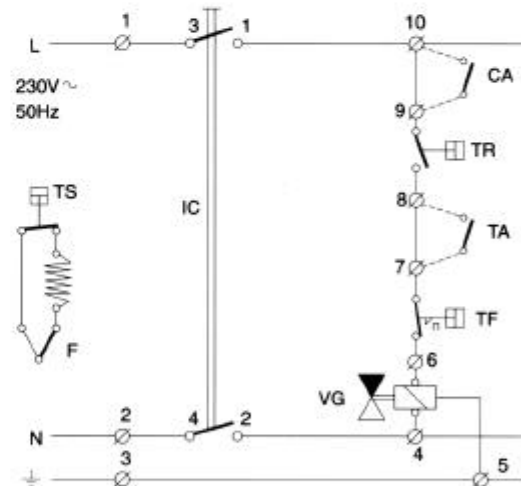
- Electrical connection should be performed according to the diagrams shown below.
- Connect the boiler to a single-phase, phase neutral, 230V-50Hz power supply through a standard terminal block or outlet with 2A max, fuses connected between the boiler and the power supply. Remember that the boiler should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

Electrical connections diagram



- IC** Boiler ON/OFF switch
- TA** Room thermostat
- TR** Control thermostat
- TF** Flue gas thermostat
- VG** Gas valve
- TS** Limit thermostat
- F** Thermocouple interruptor
- CA** Auxiliary contact

General wiring diagram



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 noise 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.

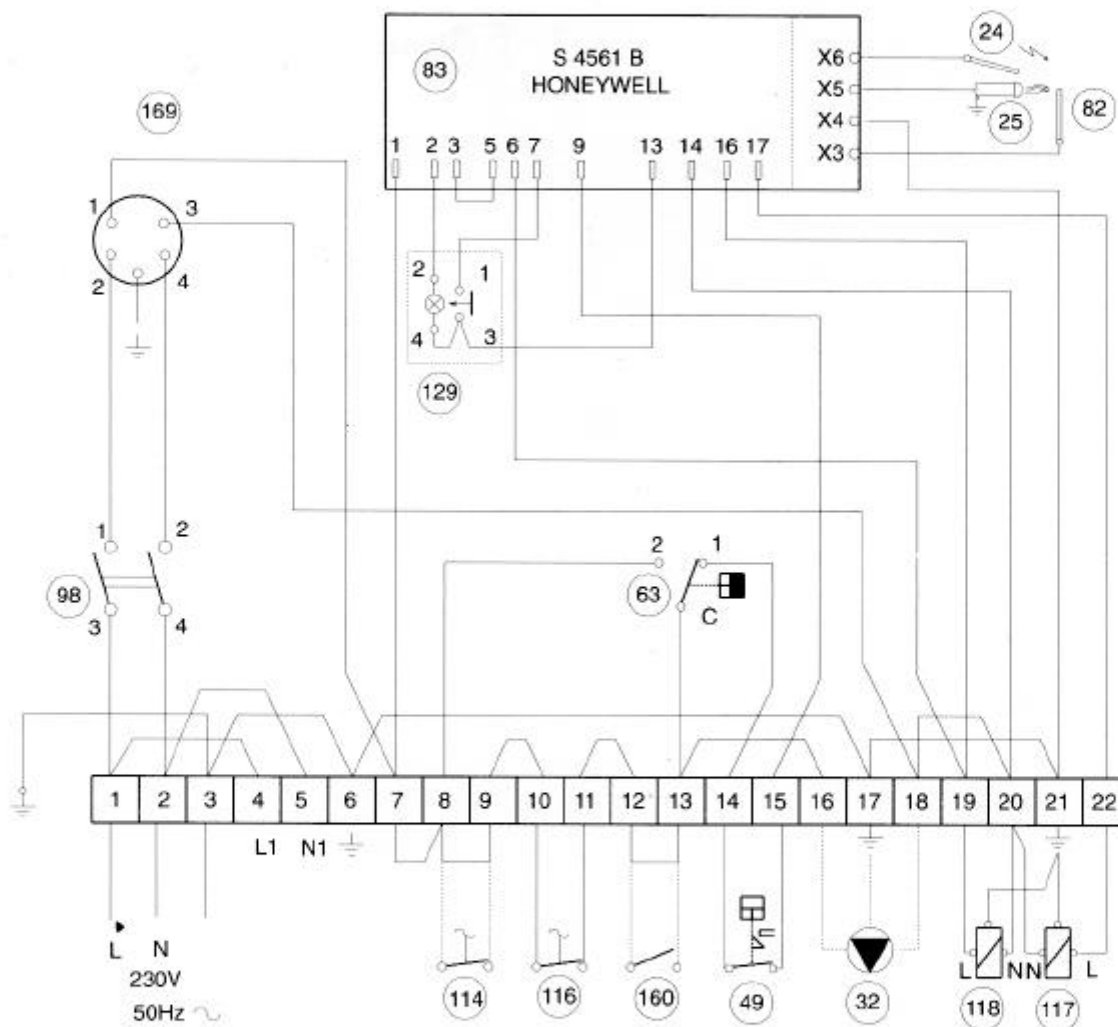
ELECTRONIC IGNITION MODELS

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 117) 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.