

# Canford & Parkstone series cast iron sectional boilers

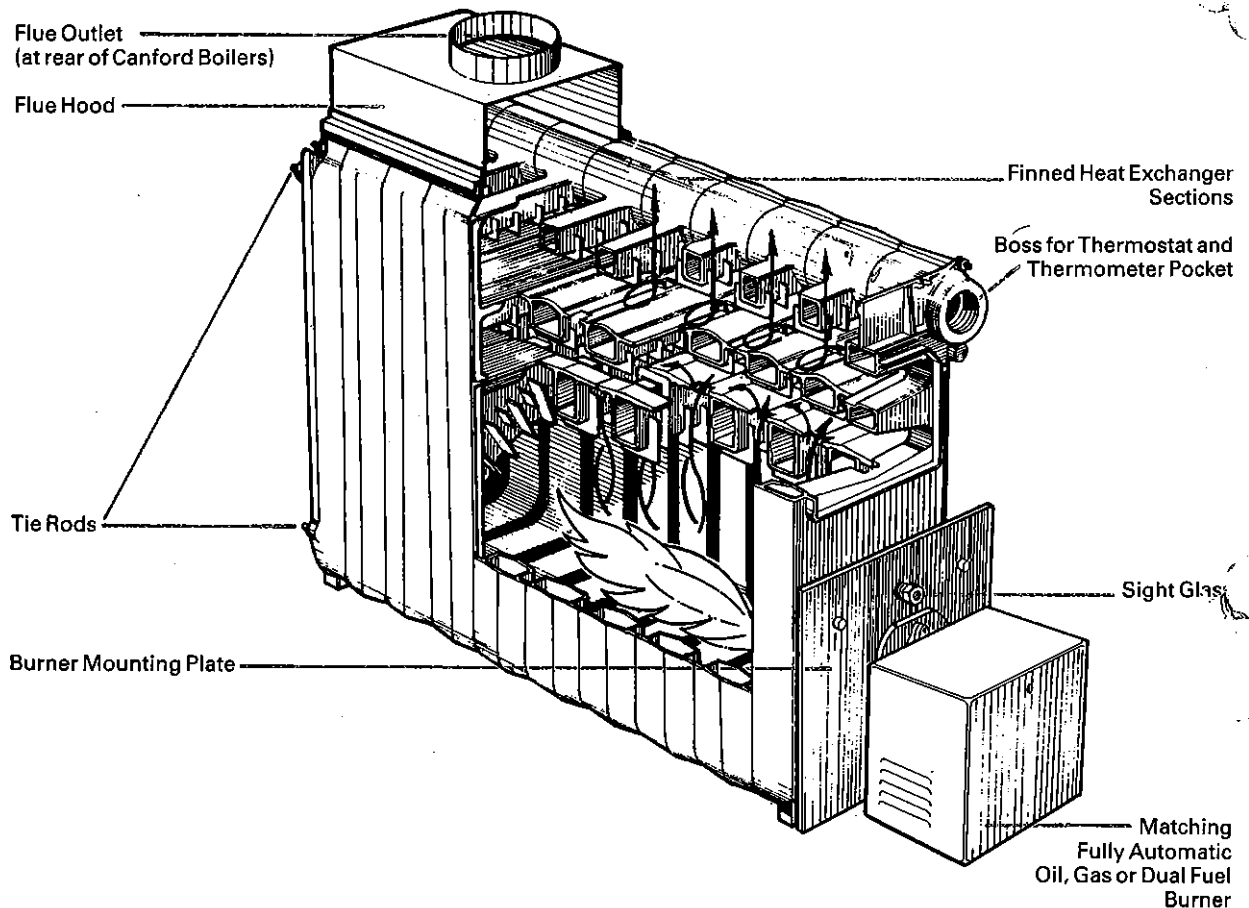
Hamworthy Engineering's Canford and Parkstone boilers provide system designer, installer and end user with a comprehensive range of efficient and flexible traditionally assembled cast iron sectional boilers.

All boilers are fitted with a matching power flame burner and outputs range from 40 kW (136,000 Btu/h) to 237 kW (809,000 Btu/h).

The five smaller Canford boilers with outputs between 40 kW (136,000 Btu/h) and 90 kW (307,000 Btu/h) are supplied as fully assembled units suitable for oil or gas firing.

The eight larger Parkstone boilers with outputs between 99 kW (336,000 Btu/h) and 237 kW (809,000 Btu/h) are suitable for oil, gas or dual fuel firing can be supplied either fully assembled or in kit form for site assembly.

Both Canford and Parkstone boilers are suitable for single or multi boiler applications.



## Boiler specification

Canford 33 output 40 kW  
(136,480 Btu/h)  
Canford 44 output 50 kW  
(170,600 Btu/h)  
Canford 55 output 64 kW  
(218,300 Btu/h)  
Canford 66 output 76 kW  
(259,800 Btu/h)  
Canford 77 output 90 kW  
(307,000 Btu/h)

Parkstone 6 output 98.9 kW  
(337,000)  
Parkstone 7 output 118.6 kW  
(404,000 Btu/h)  
Parkstone 8 output 138.4 kW  
(472,000 Btu/h)  
Parkstone 9 output 158.0 kW  
(539,000 Btu/h)  
Parkstone 10 output 178.0 kW  
(607,000 Btu/h)  
Parkstone 11 output 197.7 kW  
(674,000 Btu/h)  
Parkstone 12 output 216.0 kW  
(737,000 Btu/h)  
Parkstone 13 output 237.3 kW  
(809,000 Btu/h)

The Canford range of sectional boilers are constructed from vertical extended surface cast iron sections assembled with nipples and tie rods to form a compact works assembled and tested heat exchanger with a water cooled base. Each front section has a cleaning door and burner mounting plate fitted with a sight glass. The rear section has 2" BSP bosses for flow and return connections and a 1/2" BSP drain connection. The heat exchanger is enclosed in a fully insulated steel casing which incorporates a front mounted control panel housing pre wired control and limit thermostats, and a temperature indicator. An electrical terminal box, in circuit with the thermostats, is sited at the rear of the casing.

Canford boilers are suitable for operating on open-vented or pressurised systems with a maximum operating pressure of 3.5 bar. All Canford boilers are supplied with a matching fully automatic pressure jet burner suitable for firing class 'D' fuel oil or a fully automatic power gas burner suitable for firing natural gas or LPG.

In addition all Canford boilers can if required, be supplied with a matching fully automatic dual fuel burner.

Boilers are delivered fully assembled packed in a wooden crate with burners supplied in a separate package.

Parkstone cast iron sectional boilers are constructed from vertical extended surface sections assembled with nipples and tie rods to form a compact heat exchanger with a water cooled base. Boilers can be supplied as works assembled units or in kit form for site assembly by Hamworthy personnel.

Each boiler front section is fitted with a removable cleaning plate, a removable burner mounting plate fitted with a sight glass, and a 3 bulb sensor pocket for housing the sensor for control and unit thermostats and a temperature indicator. Each rear section has 2 1/2" BSP bosses for water flow and return connections, and a plugged 1 1/4" BSP tapping point for a safety valve. A water diffuser tube, fitted with 1 1/4" and 1/2" BSP sockets is supplied for fitting to the water flow connection. The diffuser terminates with a 2 1/2" BSP male connection.

The combustion chamber is gas tight and flue gases are collected in a full hood which is positioned on top of the boiler sections.

Insulation is supplied in the form of a universal wool blanket designed to drape over the top and side of the boiler castings within steel casings which are supplied in a separate package for site assembly. An electrical junction box is provided for fitting to the left hand side of the casing.

Parkstone boilers are suitable for operating on open-vented or pressurised systems with a maximum operating pressure of 3.5 bar.

All boilers are supplied with a matching fully automatic power flame boiler suitable for firing class E fuel oil or natural or LPG gases, or dual fuel firing (oil and nat gas).

## Layout

Canford and Parkstone boilers should be installed on a level fireproof plinth, minimum height 50 mm (2 in), capable of supporting the weight of the boiler when filled with water. The front edge of the plinth should be level with the boiler casing.

Both boilers require a clearance of 610mm (24in) front and back for maintenance purposes. Canford boilers have a rear flue exit and allowance should be made for flue connection.

On oil fired multi boiler installations a minimum gap of 50mm (2 in) is recommended between boilers.

For gas and dual fuel multi boiler installations provision must be made to suit the gas valve train arrangement of the selected burner. Allow a nominal 235mm (9.5 in) gap and refer to Hamworthy Technical Department.

## Delivery

(an installers guide is provided)

**Canford** boilers are delivered as completely assembled units, packed in a wooden crate. Burners are supplied packed in a separate carton.

**Parkstone** boilers are supplied either in kit form for on site assembly, or as works assembled and tested units.

Each Parkstone boiler kit will comprise:

- 1 - Pallet holding boiler sections, fluehood, diffuser tube, nipples, tie rods and burner mounting plate.
- 1 - Carton containing boiler casing complete with insulation, temperature gauge, control and unit thermostat, and the boiler junction box.
- 1 - Carton containing misc fittings.
- 1 - Carton containing the matching burner.

Each works assembled Parkstone boiler will comprise:

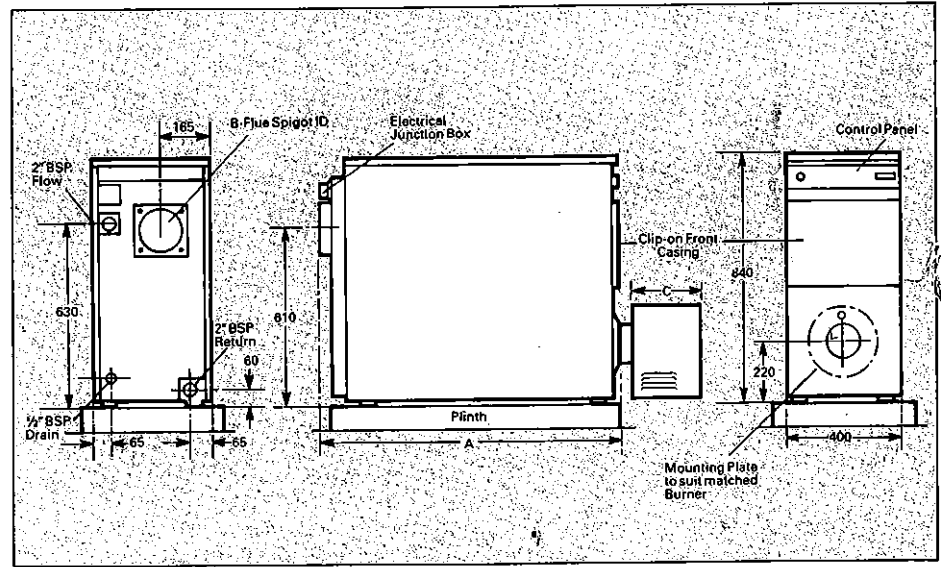
- 1 - Assembled boiler complete with fluehood, mounted on a wooden pallet.
- 1 - Carton containing the boiler casing complete with insulation temperature gauge, control and limit thermostat, and the boiler junction box.
- 1 - Carton containing the matching burner.

# Dimensions/specifications

## Canford

Model	Output to Water		Input oil		Input natural gas		Approx shipping weight	
	kW	Btu/h × 1000	l/h	UK gal/h	m <sup>3</sup> /h	ft <sup>3</sup> /h	kg	lb
33	40	136.4	4.77	1.05	4.6	164.8	202	92
44	50	170.6	5.96	1.31	5.7	206.0	202	92
55	64	218.3	7.36	1.62	7.2	275.1	202	92
66	76	259.3	8.86	1.95	8.5	306.6	230	105
77	90	307.0	10.36	2.28	10.0	359.3	257	117

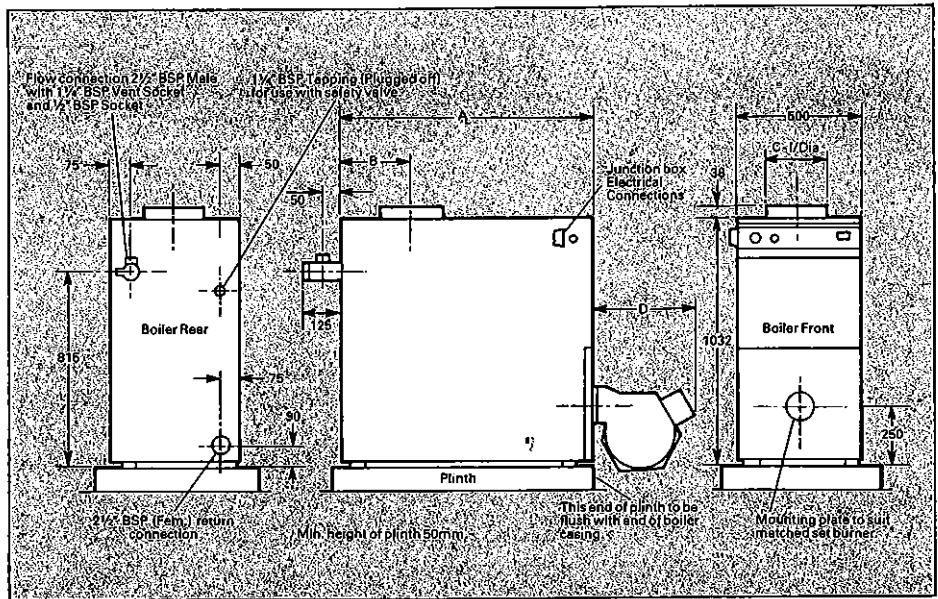
Dimensions in mm



Model	A		B		C			
	mm	in	mm	in	oil		gas	
					mm	in	mm	in
33	800	31.5	152	6.0	256	10.0	418	16.5
44	800	31.5	152	6.0	256	10.0	418	16.5
6 sec 55	800	31.5	152	6.0	256	10.0	418	16.5
66	900	35.4	152	6.0	256	10.0	418	16.5
77	1000	39.4	182	7.2	256	10.0	418	16.5

Model	Output to Water		Input oil		Input natural gas		Approx shipping weight	
	kW	Btu/h ×1000	l/h	UK gal/h	m <sup>3</sup> /h	ft <sup>3</sup> /h	kg	lb
6	98.9	337	11.8	2.6	11.6	412.1	348	765
7	118.6	404	14.1	3.1	14.0	494.9	415	913
8	138.4	472	16.5	3.6	16.3	577.5	482	1060
9	158.0	539	18.8	4.1	18.6	659.3	540	1188
10	178.0	607	21.2	4.7	21.0	742.6	607	1335
11	197.7	674	23.6	5.2	23.3	825.0	674	1482
12	216.0	737	25.8	5.7	25.3	901.4	741	1630
13	237.3	809	28.3	6.2	28.0	990.3	808	1770

Dimensions in mm



Model	A		B		C		oil		gas		dual fuel	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
6	760						290	11.4	418	16.5	400	15.7
7	880	34.6	210	8.3	220	8.66	290	11.4	418	16.5	400	15.7
8	1000	39.4	290	11.4	250	9.84	290	11.4	418	16.5	400	15.7
9	1120	44.1	290	11.4	250	9.84	290	11.4	418	16.5	427	16.8
10	1240	48.8	290	11.4	250	9.84	290	11.4	610	24.0	427	16.8
11	1360	53.5	380	15.0	300	11.81	290	11.4	610	24.0	427	16.8
12	1480	58.3	380	15.0	300	11.81	473	18.6	610	24.0	427	16.8
13	1600	63.0	380	15.0	300	11.81	473	18.6	610	24.0	427	16.8

## Technical Information – Canford Boilers

Boiler size		Canford 33	Canford 44	Canford 55	Canford 66	Canford 77
Water Content	l	29	29	29	34	38
	UK gal	6.4	6.4	6.4	7.5	8.4
Design Flow Rate at 11°C Δt	l/min	52.22	65.38	83.56	99.22	117.50
	UK gal/min	11.48	14.26	18.38	21.82	25.84
Waterside Pressure Drop at Δt 11°C	m head water	0.03	0.05	0.09	0.14	0.20
	in/wg	1.44	2.25	3.69	5.69	8.08
Minimum Flow Rate at any time	l/min	26.11	32.64	41.78	49.61	58.75
	UK gal/min	5.74	7.18	9.19	10.91	12.92
Maximum Water Pressure	bar	3.4	3.4	3.4	3.4	3.4
	psig	50	50	50	50	50
Water Flow/Return Connection BSP		2" BSP Rc	2" BSP Rc	2" BSP Rc	2" BSP Rc	2" BSP Rc
Input Rate – Oil	l/h	4.77	5.96	7.36	8.86	10.36
	UK gal/h	1.05	1.31	1.62	1.95	2.28
Oil Pump Pressure Approx	bar	12	12	12	12	12
	psig	174	174	174	174	174
Nozzle/Jet Size GPH×60° PLP (US)		1.00	1.20	1.50	1.75	2.00
Oil Connection BSP		3/8	3/8	3/8	3/8	3/8
Approx Flue Gas Volume at NTP – Oil	m <sup>3</sup> /h	65.0	81.2	100.7	120.8	141.2
	ft <sup>3</sup> /h	2333	2917	3617	4339	5072
Approx Flue Gas Temp – Oil	°C	270	270	270	270	270
	°F	518	518	518	518	518
Input Rate – Nat Gas	m <sup>3</sup> /h	4.588	5.735	7.158	8.536	10.003
	ft <sup>3</sup> /h	164.8	206.0	257.1	306.6	359.3
Min Inlet Pressure Required – Nat Gas	m/bar	15	15	15	15	15
	in/wg	6	6	6	6	6
Gas Connection BSP		3/4	3/4	1	1	1
Approx Flue Gas Volume at NTP – Nat Gas	m <sup>3</sup> /h	60.1	75.2	93.5	111.7	130.8
	ft <sup>3</sup> /h	2123	2654	3358	4012	4698
Approx Flue Gas Temp. – Nat Gas	°C	225	225	225	225	225
	°F	437	437	437	437	437
Flue Connection ID	mm	152	152	152	152	182
	in	6	6	6	6	7.2
Draught required at Boiler Outlet	mbar	0.3	0.3	0.3	0.3	0.3
	in/wg	0.12	0.12	0.12	0.12	0.12
Electrical Supply		240V 50 Hz Single Phase				

## Technical Information – Parkstone Boilers

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Boiler size		P6	P7	P8	P9	P10	P11	P12	P13
Water Content	l	59	67	75	83	91	98	106	116
	UK gal	13.0	14.7	16.5	18.3	20.0	21.6	23.3	25.5
Design Flow Rate at 11°C Δt	l/min	128	152	178	203	228	256	280	311
	UK gal/min	28.1	33.4	39.2	44.7	50.2	56.3	61.6	68.4
Waterside Pressure Drop at Δt 11°C	m head water	0.12	0.17	0.24	0.33	0.44	0.55	0.69	0.81
	in/wg	4.7	6.8	9.5	13.0	17.3	22.0	27.0	32.2
Minimum Flow Rate at any time	l/min	64	76	89	102	114	128	140	156
	UK gal/min	14.1	16.7	19.6	22.3	25.1	28.2	30.8	34.2
Maximum Water Pressure	bar	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	psig	50	50	50	50	50	50	50	50
Water Flow/Return Connection BSP	Flow	2½ R	2½ R	2½ R	2½ R	2½ R	2½ R	2½ R	2½ R
	Return	2½ Rc	2½ Rc	2½ Rc	2½ Rc	2½ Rc	2½ Rc	2½ Rc	2½ Rc
Input Rate – Oil	l/h	11.8	14.1	16.5	18.8	21.2	23.6	25.8	28.3
	UK gal/h	2.59	3.11	3.63	4.14	4.67	5.19	5.67	6.23
Oil Pump Pressure Approx	bar	7.38	7.93	8.27	8.55	8.75	8.96	8.96	9.24
	psig	108	115	120	124	127	130	130	134
No.22L6/Jet 8126 GPH		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5
		60° PLP	60° PLP	60° PLP	60° PLP	45° B	45° B	45° B	45° B
Oil Connection BSP		¾	¾	¾	¾	¾	¾	¾	¾
Approx Flue Gas Volume at NTP – Oil	m³/h	163	215	250	286	323	358	391	430
	ft³/h	5753	7588	8855	10109	11387	12649	13880	15180
Approx Flue Gas Temp – Oil	°C	270	270	270	270	270	270	270	270
	°F	518	518	518	518	518	518	518	518
Input Rate – Nat Gas	m³/h	11.6	14.0	16.3	18.6	21.0	23.3	25.5	28.0
	ft³/h	412.1	494.9	577.5	659.3	742.6	825.0	901.4	990.3
Min Inlet Pressure Nat Gas	m/bar	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
	in/wg	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Gas Connection BSP		1	1	1	1	1½	1½	1½	1½
Approx Flue Gas Volume at NTP – Nat Gas	m³/h	151.3	180.2	210.3	240.1	270.5	300.4	328.3	360.6
	ft³/h	5344	6364	7426	8478	9558	10609	11992	12735
Approx Flue Gas Temp. – Nat Gas	°C	220/250	220/250	220/250	220/250	220/250	220/250	220/250	220/250
	°F	428/482	428/482	428/482	428/482	428/482	428/482	428/482	428/482
Flue Connection ID	mm	203	203	229	229	229	279	279	279
	in	8	8	9	9	9	11	11	11
Draught required at Boiler Outlet	m/bar	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	in/wg	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Electrical Supply		240V 50-Hz Single Phase							

## Boiler flue

The chimney design must be in accordance with Local Authority Regulations and the recommendations of the Clean Air Act.

The boilers must be located so that the length of ducting to the chimney is kept to a minimum. An allowance of at least 610mm (24 in) of vertical flue offtake from the boiler should be made before any connection to the horizontal flue header. This vertical section must include a slip ring (gas tight) to enable the boiler to be removed from the flue system if necessary, and should also include a flue gas sampling point sized to take a probe in close proximity to the boiler.

The flue offtake from the boiler must fit *inside* the boiler spigot, where it is supported by an internal flange.

The length of flue ducting to the chimney must be as short as possible with no right angled bends, changes of direction must be minimal and swept bends used.

The flue system must be self-supporting and under no circumstances must the weight be taken by the boilers.

Provision must be made for cleaning the flue system assembly.

Canford and Parkstone boilers are designed to operate under forced draught conditions a minimum suction at the boiler outlet of 0.3 m/bar (0.12 in wg) must be provided.

The flue system must be sized to suit the anticipated flue gas volumes and temperature specified.

## Canford series oil firing

Model		33	44	55	66	77
Approx. Exhaust Gas Volume	m <sup>3</sup> /h	65	81	101	121	141
NTP	ft <sup>3</sup> /h	2333	2917	3617	4339	5072
Approx. Flue Gas Temp	°C	270	270	270	270	270
	°F	518	518	518	518	518
CO <sub>2</sub>		10%				

## Canford series gas firing

Model		33	44	55	66	77
Approx. Exhaust Gas Volume	m <sup>3</sup> /h	60	75	93	112	131
NTP	ft <sup>3</sup> /h	2123	2654	3358	4012	4698
Approx. Flue Gas Temp	°C	225	225	225	225	225
	°F	437	437	437	437	437
CO <sub>2</sub>		8.5-9%				

## Parkstone series oil firing

Model		P6	P7	P8	P9	P10	P11	P12	P13
Approx. Exhaust Gas Volume	m <sup>3</sup> /h	163	215	250	286	323	358	391	430
NTP	ft <sup>3</sup> /h	5763	7588	8855	10109	11389	12649	13880	15180
Approx. Flue Gas Temp	°C	270	270	270	270	270	270	270	270
	°F	518	518	518	518	518	518	518	518
CO <sub>2</sub>		10%							

## Parkstone series gas firing

Model		P6	P7	P8	P9	P10	P11	P12	P13
Approx. Exhaust Gas Volume	m <sup>3</sup> /h	151	180	210	240	270	300	328	361
NTP	ft <sup>3</sup> /h	5344	6364	7426	8478	9558	10609	11992	12735
Approx. Flue Gas Temp	°C	220/250	220/250	220/250	220/250	220/250	220/250	220/250	220/250
	°F	428/482	428/482	428/482	428/482	428/482	428/482	428/482	428/482
CO <sub>2</sub>		8.5-9%							

## Fan dilution systems (gas fired boilers)

An alternative method of flue gas removal which can be employed where conditions permit is fan dilution. Basically the flue gas from the boilers is diluted with fresh air to reduce the CO<sub>2</sub> concentration to less than 1%.

This mixture can then be discharged at low level. Further details are available from our Sales or Technical Departments.

Refer also to:

### British Gas Publications

'Flues for commercial and industrial gas fired boilers and air heaters' (MAY 1979) and 'Combustion and ventilation air - guidance notes for boiler installations in excess of 2,000,000 Btu/h (586 kW) output.'

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## Electrical details

A 220/240 volt single phase electrical supply is required, preferably via a 15 amp double pole fused switch box located in the boiler room.

All electric wiring should be in accordance with IEE Regulations, and to a minimum specification of heat resistant PVC insulated cable. Care should be taken to ensure that the cables to the burner will "flex".

Consideration should be given to fitting an additional control thermostat for each boiler positioned in the common flow header, with a differential setting for simple sequence control or alternatively use the Hamworthy step control panel.

All electrical conduit and cable tray should be run at high level where possible, to leave the front of the boiler clear for maintenance.

THE APPLIANCE MUST BE EARTHED, AND THE SUPPLY PROTECTED.

## Thermostats

Each Canford and Parkstone boiler is supplied with separate control and high limit thermostats. The control thermostat has an adjustable range 30° - 100° (86 - 212°F). The limit thermostat has a fixed setting of 100°C (212°F) and has a manual re-set push button.

## Time clock control

Where boilers and pumps are operated from time clocks provision should be made for 2-5 minute circulating pump over-run, after the last boiler has ceased firing. This will avoid local overheating and possible progressive calcium build-up that occurs with zero flow conditions.

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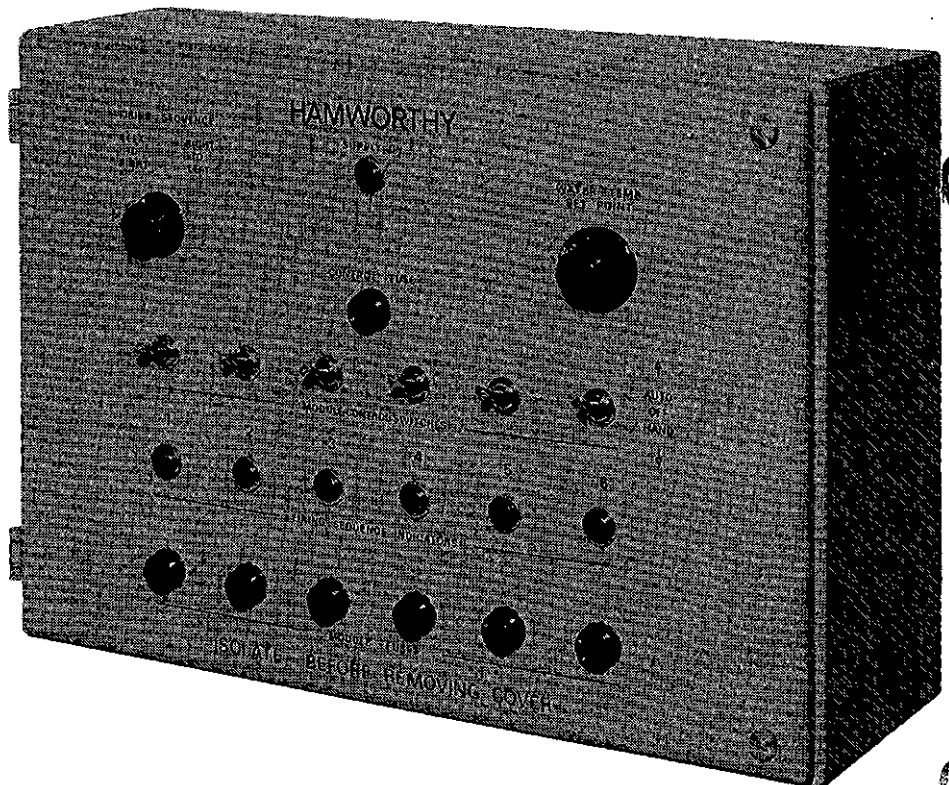
## Controls

Hamworthy have developed and market a solid state control panel to step firing multi-boiler installations - matching boilers firing to load demand thus giving maximum fuel economy.

Boilers are controlled by a water temperature sensor fitted in the hot water flow header downstream from the last boiler on the header.

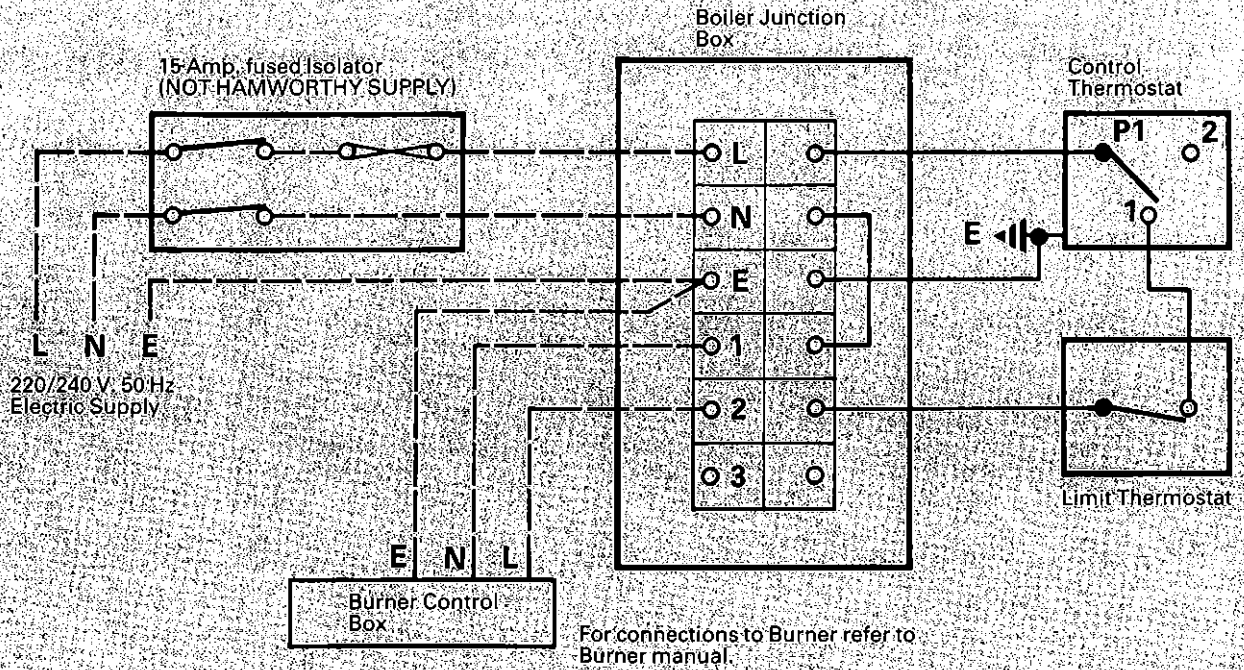
On gas only installations an outside air temperature sensor (supplied by Hamworthy) can be connected to the panel, allowing the system flow temperature to be compensated in response to changes in outside air temperature.

A night set back/morning boost add-on unit is also available to provide a depressed or elevated flow temperature for a set period of time.





# Schematic Wiring Diagram



For connections to Burner refer to Burner manual.

- - - - - Clients Wiring  
 ————— Hamworthy Wiring.  
 All appliances must be earthed.