



# **The Euromatic Range**

## **Installation and Servicing Instructions**

**WARNING: THIS APPLIANCE MUST BE EARTHED**

# CONTENTS

<i>Section</i>	<i>Title</i>	<i>Page</i>
<b>1.</b>	<b>Introduction</b>	<b>2</b>
<b>2.</b>	<b>Technical Data</b>	<b>3</b>
<b>3.</b>	<b>General Requirements</b>	<b>7</b>
<b>4.</b>	<b>Installation of Air Heater(s)</b>	<b>8</b>
<b>5.</b>	<b>Air Distribution System</b>	<b>11</b>
<b>6.</b>	<b>Commissioning &amp; Testing</b>	<b>11</b>
<b>7.</b>	<b>Servicing</b>	<b>13</b>
<b>8.</b>	<b>Connections to Powrmatic External Controls</b>	<b>17</b>
<b>9.</b>	<b>Fault Finding</b>	<b>18</b>
<b>10.</b>	<b>Short List of Parts</b>	<b>19</b>

<i>Tables</i>	<i>Title</i>	<i>Page</i>
<b>1a.</b>	<b>Dimensions (S.I. Units)</b>	<b>4</b>
<b>1b.</b>	<b>Dimensions (Imperial Units)</b>	<b>4</b>
<b>1c</b>	<b>Exhaust Fan Inlet Restrictor Ring</b>	<b>4</b>
<b>2a.</b>	<b>Specifications (S.I. Units)</b>	<b>4</b>
<b>2b.</b>	<b>Specifications (Imperial Units)</b>	<b>5</b>
<b>3.1</b>	<b>Injector Sizes &amp; Burner Pressures Natural Gas - Group H - G20</b>	<b>5</b>
<b>3.2</b>	<b>Injector Sizes &amp; Burner Pressures Natural Gas - Group L - G25</b>	<b>5</b>
<b>3.3</b>	<b>Injector Sizes &amp; Burner Pressures Propane - G31</b>	<b>6</b>
<b>4.</b>	<b>Electrical Loadings 1ph</b>	<b>6</b>
<b>5.</b>	<b>Damper Settings Euro 'C' Units</b>	<b>6</b>

<i>Figure</i>	<i>Title</i>	<i>Page</i>
<b>1a/b/c.</b>	<b>Flue/Combustion Air Duct Options</b>	<b>10</b>
<b>2.</b>	<b>Flue and Combustion Air Duct assembly</b>	<b>10</b>
<b>3.</b>	<b>Gas Control Valve Honeywell V4605C</b>	<b>12</b>
<b>4.</b>	<b>Gas Controls Schematics</b>	<b>12</b>
<b>5.</b>	<b>High/Lo and Modulating Heads</b>	<b>13</b>
<b>6.</b>	<b>Cross Lighting Assembly Detail</b>	<b>14</b>
<b>7.</b>	<b>Ignition Electrode Spark Gap</b>	<b>14</b>
<b>8a.</b>	<b>Controls Location Euro 50 - 200</b>	<b>15</b>
<b>8b.</b>	<b>Controls Location Euro 240</b>	<b>15</b>
<b>9a</b>	<b>Thermostat Phials - Euro 240</b>	<b>16</b>
<b>9b</b>	<b>Thermostats - Euro 240</b>	<b>16</b>

## 1. INTRODUCTION

The Euromatic range of gas fired, fanned circulation air heaters cover a heat output range of 14.6kW (50,000 Btu/h) to 70.3kW (240,000 Btu/h), have a closed combustion circuit and are supplied complete with a flue system. They are certified for use on Natural Gas, Group H - G20 and Group L - G25, and Propane -G31.

The heaters are designed to be suspended from suitable roof points or alternatively to be mounted on purpose designed brackets and are intended primarily for heating commercial or industrial premises. They may be used where the atmosphere inside the premises could be contaminated e.g. Dust, oil mist etc. but the heaters are not airtight and therefore may not be used in areas classified as hazardous as defined in BS 5345:Part 2 or areas subjected to significant negative pressures due to extract systems.

Euro /F heaters have an axial fan assembly fitted at the rear to circulate the air being heated through the clam-shell heat exchanger. A centrifugal fan variation is presented in the Euro /C range for use with ducted systems and the Euro /D range, in having no fan fitted, is for ducted systems where the air moving fan is by others.

Heaters are fitted as standard with atmospheric bar burners, a fully automatic control for ignition, flame sensing, gas supply control and safety functions, an internal exhaust fan, main air fan, fan thermostat and limit thermostat.

Options include High/Low or modulating burner controls, inlet duct connection/fan silencer, outlet duct connection, 45° head, 90° outlet bend, nozzle outlet and vertical/horizontal outlet louvre assembly.

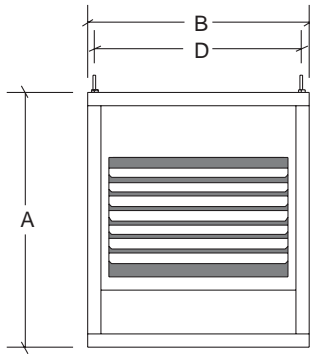
### **Gas Safety (Installation & Use) (Amendment) Regulations 1990**

It is law that all gas appliances are installed, adjusted and, if necessary, converted by qualified persons\* in accordance with the above regulations. Failure to install appliances correctly can lead to prosecution. It is in your own interests and that of safety to ensure that the law is complied with.

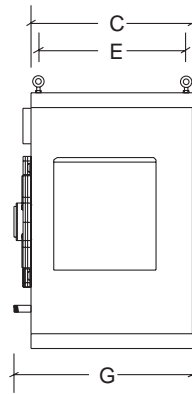
\* e.g. Corgi Registered

## 2 Technical Data

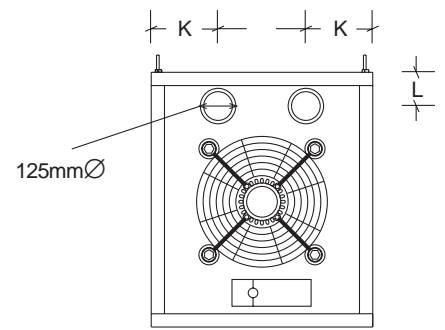
### Euro 50 - 200 'F' Version Shown



Front View

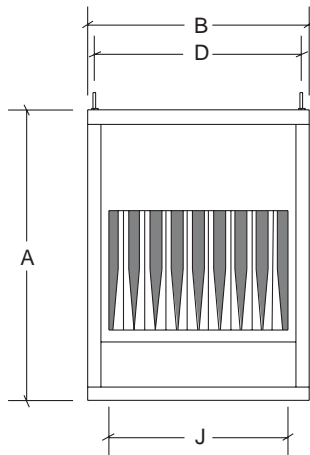


Side View

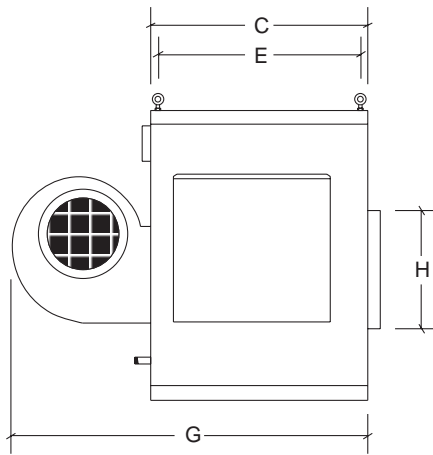


Rear View

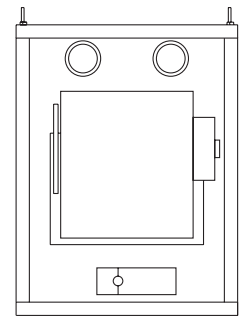
### Euro 50 - 200 'C' Version Shown



Front View



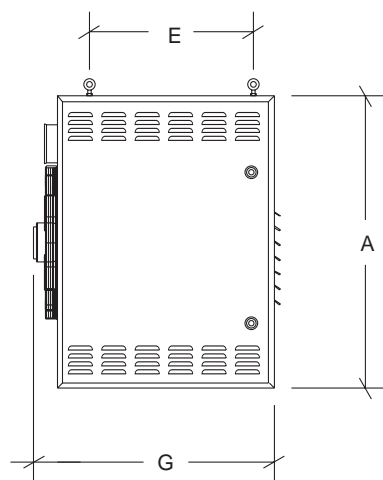
Side View



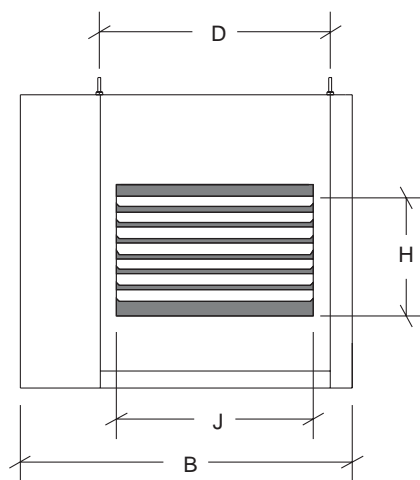
Rear View

### Euro 240

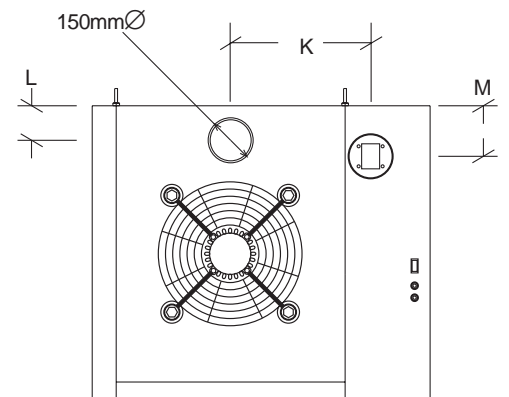
#### 'F' Version Shown



Side View



Front View



Rear View

**Table 1a  
Dimensions  
(S.I Units)**

	A	B	C	D	E	G #1	G #2	H	J	K	L	M
EURO 50	900	782	570	728	517	650	1207	418	636	236	120	N/A
EURO 75						640						
EURO 85						660						
EURO 100	1023	765	765	728	711	855	1257	418	636	236	120	N/A
EURO 115												
EURO 140												
EURO 170												
EURO 200	1200	765	765	825	463	910	1257	418	636	236	120	N/A
EURO 240												
EURO 240		1200		825	463	910			750	502.5	110	175

**Note:** G #1 refers to 'F' units.  
G #2 refers to 'C' units.  
Gas Inlet Size - All Units R $\frac{3}{4}$

**Table 1b  
Dimensions  
(Imperial Units)**

	A	B	C	D	E	G #1	G #2	H	J	K	L	M
EURO 50	35.4	30.8	22.45	28.6	20.3	25.6	47.5	16.4	25.0	9.4	4.7	N/A
EURO 75						25.2						
EURO 85						26.0						
EURO 100	40.3	30.1	30.1	28.6	28.0	33.7	49.5	16.4	25.0	9.4	4.7	N/A
EURO 115												
EURO 140												
EURO 170												
EURO 200	47.2	30.1	30.1	32.5	18.2	35.8	49.5	16.4	25.0	9.4	4.7	N/A
EURO 240												
EURO 240		47.2		32.5	18.2	35.8			29.5	19.8	4.3	6.8

**Note:** G #1 refers to 'F' units.  
G #2 refers to 'C' units.  
Gas Inlet Size - All Units  $\frac{3}{4}$ BSP

**Table 1c Exhaust Fan Inlet Restrictor Ring**

	EURO 50	EURO 75	EURO 85	EURO 100	EURO 115	EURO 140	EURO 170	EURO 200	EURO 240
Int. Diameter (mm)	30	45	45	50	50	50	50	50	N/A

**Table 2a - Specifications (S.I. Units)**

MODEL	HIGH FIRE		LOW FIRE		AIR VOLUME		MAXIMUM DUCT RESISTANCE MAX. PRESS		MAIN FAN MOTOR FAN MOTOR		EXHAUST FAN MOTOR	WEIGHT kg	
	INPUT (Nett)	OUTPUT	INPUT (Nett)	OUTPUT	Standard	High	Standard	High	Standard	High			
	kw		kw		m <sup>3</sup> /s		pa		kw		kw		
EURO 50	F	15.88	14.6	9.81	8.80	0.4219	0.5370	N/A	N/A	0.04	0.10	0.018	98
	C							194	170	0.355	0.55		110
EURO 75	F	25.20	22.0	15.81	13.19	0.6327	0.8060	N/A	N/A	0.10	0.18	0.018	98
	C							260	245	0.55	0.75		110
EURO 85	F	28.49	24.9	18.03	14.95	0.7172	0.9130	N/A	N/A	0.10	0.18	0.018	98
	C							250	240	0.55	0.75		110
EURO 100	F	33.33	29.3	20.93	17.58	0.8438	1.0740	N/A	N/A	0.10	0.25	0.018	98
	C							232	245	0.55	1.1		110
EURO 115	F	37.61	33.7	23.46	20.22	0.7152	0.9706	N/A	N/A	0.10	0.37	0.018	134
	C							218	150	0.56	0.75		155
EURO 140	F	45.00	41.0	27.98	24.62	0.8705	1.1813	N/A	N/A	0.10	0.37	0.018	134
	C							212	155	0.56	1.1		155
EURO 170	F	57.37	49.8	36.18	29.89	1.0569	1.4347	N/A	N/A	0.12	0.41	0.018	134
	C							145	165	0.56	1.5		155
EURO 200	F	66.06	58.6	41.28	35.17	1.2436	1.6877	N/A	N/A	0.37	0.5	0.018	134
	C							74	200	0.99	1.5		155
EURO 240	F	81.74	70.3	47.95	44.82	1.4925	2.0255	N/A	N/A	0.37	0.5	0.060	153
	C							120	40	0.75	1.5		185.3

**Table 2b - Specifications (Imperial Units)**

MODEL		HIGH FIRE		LOW FIRE		AIR VOLUME		MAXIMUM DUCT RESISTANCE		MAIN FAN MOTOR FAN MOTOR		EXHAUST FAN MOTOR	WEIGHT lbs
		INPUT (GROSS)	OUTPUT	INPUT (GROSS)	OUTPUT	Standard	High	Standard	High	Standard	High		
		Btu/h		Btu/h		ft <sup>3</sup> /m		in.wg		hp		hp	
EURO 50	F	60458	50000	37173	30000	894	1138	N/A	N/A	0.05	0.13	0.024	216
	C							0.78	0.70	0.45	0.75		243
EURO 75	F	95456	75000	59952	45000	1341	1708	N/A	N/A	0.13	0.25		216
	C							1.04	0.98	0.74	1.00		243
EURO 85	F	108060	85000	68355	51000	1520	1935	N/A	N/A	0.13	0.25		216
	C							1.00	0.96	0.74	1.0		243
EURO 100	F	126406	100000	79365	60000	1788	2276	N/A	N/A	0.13	0.33		216
	C							0.93	0.98	0.74	1.5		243
EURO 115	F	142609	115000	88940	69000	1516	2057	N/A	N/A	0.13	0.50		295
	C							0.88	0.60	0.75	1.01		342
EURO 140	F	170752	140000	106060	84000	1845	2503	N/A	N/A	0.13	0.50		295
	C							0.85	0.62	0.75	1.48		342
EURO 170	F	217614	170000	137207	102000	2240	3040	N/A	N/A	0.16	0.55	295	
	C							0.58	0.66	0.75	2.01	243	
EURO 200	F	250532	200000	156494	120000	2635	3576	N/A	N/A	0.50	0.67	295	
	C							0.30	0.80	1.33	2.01	243	
EURO 240	F	310077	240000	183869	144000	3163	4292	N/A	N/A	0.50	0.67	0.080	337
	C							0.48	0.16	1.01	2.01	409	

**Table 3.1  
Injector Sizes &  
Burner Pressures  
Natural Gas  
Group H - G20  
Net CV(H<sub>i</sub>) 34.02MJ/m<sup>3</sup>**

Inlet Pressure 20mb	INJECTORS			High Fire				Low Fire			
				Burner Pressure		Gas Rate		Burner Pressure		Gas Rate	
	MODEL	No.	Size mm	Marked	mbar	in.wg	m <sup>3</sup> /h	ft <sup>3</sup> /h	mbar	in.wg	m <sup>3</sup> /h
EURO 50	5	1.75	175	8.8	3.5	1.68	59.4	3.2	1.3	1.04	36.7
EURO 75	6	1.75	175	14.5	5.8	2.66	94.2	6.0	2.4	1.67	59.1
EURO 85	7	1.75	175	14.2	5.7	3.01	106.5	5.5	2.2	1.91	67.4
EURO 100	8	1.75	175	14.4	5.8	3.53	124.6	5.8	2.3	2.21	78.2
EURO 115	5	2.46	246	12.2	4.9	3.98	140.6	4.8	1.9	2.48	87.6
EURO 140	6	2.46	246	13.1	5.3	4.76	168.2	4.7	1.9	2.96	104.5
EURO 170	7	2.46	246	13.9	5.6	6.07	214.4	5.4	2.2	3.83	135.2
EURO 200	8	2.46	246	14.5	5.8	6.99	246.9	5.7	2.3	4.37	154.3
EURO 240	10	2.61	261	11.1	4.4	8.65	305.5	4.6	1.8	5.78	204.1

**Table 3.2  
Injector Sizes &  
Burner Pressures  
Natural Gas  
Group L - G25  
Net CV(H<sub>i</sub>) 29.25MJ/m<sup>3</sup>**

Inlet Pressure 25mb	INJECTORS			High Fire				Low Fire			
				Burner Pressure		Gas Rate		Burner Pressure		Gas Rate	
	MODEL	No.	Size mm	Marked	mbar	in.wg	m <sup>3</sup> /h	ft <sup>3</sup> /h	mbar	in.wg	m <sup>3</sup> /h
EURO 50	5	1.7	170	13.0	5.2	1.96	69.2	4.4	1.8	1.26	44.5
EURO 75	6	1.7	170	16.5	6.6	3.07	108.4	6.0	2.4	1.88	66.4
EURO 85	7	1.7	170	15.9	6.4	3.48	122.9	5.8	2.3	2.13	75.2
EURO 100	8	1.7	170	16.8	6.7	4.03	142.3	6.1	2.4	2.47	87.2
EURO 115	5	2.46	246	14.5	5.8	4.65	164.2	5.3	2.1	2.88	101.7
EURO 140	6	2.46	246	14.3	5.7	5.6	197.7	5.2	2.0	3.43	121.1
EURO 170	7	2.38	238	18.5	7.4	6.7	236.6	6.7	2.7	4.15	146.5
EURO 200	8	2.46	246	15.0	6.0	7.88	278.3	5.5	2.2	4.89	172.7
EURO 240	10	2.61	261	16.0	6.4	9.72	343.3	7.5	3.0	5.97	210.8

**Table 3.3  
Injector Sizes &  
Burner Pressures  
Propane G31  
Net CV (H.) 88.0MJ/m<sup>3</sup>**

Inlet Pressure 37mb	INJECTORS			High Fire				Low Fire			
				Burner Pressure		Gas Rate		Burner Pressure		Gas Rate	
MODEL	No.	Size mm	Marked	mbar	in.wg	m <sup>3</sup> /h	ft <sup>3</sup> /h	mbar	in.wg	m <sup>3</sup> /h	ft <sup>3</sup> /h
EURO 50	5	1.14	114	23.5	9.4	0.65	23.0	8.1	3.2	0.40	14.2
EURO 75	6	1.27	127	26.7	10.7	1.03	36.4	10.5	4.2	0.65	22.8
EURO 85	7	1.27	127	26.0	10.4	1.16	41.1	10.5	4.2	0.74	26.0
EURO 100	8	1.27	127	26.2	10.5	1.36	48.1	10.3	4.1	0.86	30.2
EURO 115	5	1.70	170	21.5	8.6	1.54	54.3	8.6	3.4	0.96	33.9
EURO 140	6	1.70	170	23.0	9.2	1.84	65.0	8.5	3.4	1.14	40.3
EURO 170	7	1.75	175	22.3	8.9	2.35	82.8	8.7	3.5	1.48	52.3
EURO 200	8	1.75	175	23.0	9.2	2.70	95.4	9.0	3.6	1.68	59.6
EURO 240	10	1.75	175	19.0	7.6	3.35	118.3	8.3	3.3	2.12	74.9

**Table 4  
Electrical Loadings 1ph**

Note: 3ph Data is supplied separately with units ordered to this specification.

MODEL	Standard Airflow					High Airflow						
	MOTOR R.P.M.	PLATE AMPS (A)	START AMPS (A)	RUN AMPS (A)	FUSE RATING (A)	MOTOR R.P.M.	PLATE AMPS (A)	START AMPS (A)	RUN AMPS (A)	FUSE RATING (A)		
EURO 50F	900	0.53	0.6	0.45	1	900	0.91	1.8	0.74	1		
EURO 75F		0.91	1.5	0.78	2	1500	1.60	3.5	1.70	2		
EURO 85F			1.8	0.94			1.61	5.4	1.75			
EURO 100F		0.87	1.6	1.23		1000	2.60	6.0	2.56	3		
EURO 115F			1.35	1.00			3.00	5.4	1.80	2		
EURO 140F		1.60	1.10	1500		2.57	8.9	2.70	3			
EURO 170F	1.00	1.80	1.33			4.00	5.2	3.87		5		
EURO 200F	1500	3.00	6.10	1.95	1500	4.00	8.5	3.90				
EURO 240F			5.50	2.50			3	8.5	3.90			
EURO 50C	915	2.60	6.0	1.9	3	1500	5.2	17.0	4.5	5		
EURO 75C	900	5.8	9.0	5.4	7		5.4	32.0	4.7		7	
EURO 85C			9.0	5.5					4.8			
EURO 100C			9.0	5.5					6.0			
EURO 115C	1000	4.10	10.0	3.00	5		5.40	19.0	4.12	5		
EURO 140C			9.80	3.20			7.40	32.0	6.40	7		
EURO 170C			7.40	11.0			3.80	7	9.50	32.0	8.60	10
EURO 200C				13.0			5.50			36.0	7.50	
EURO 240C			37.0	6.60				36.0	9.20			

**Table 5  
Damper Settings  
Euro 'C' Units  
Standard Airflow**

MODEL	DESIGN AIRFLOW		Distance of Damper Plate from Fan Casing							DUCT RESISTANCE
			20	30	40	50	60	70	80	
EURO 50C	894	ft <sup>3</sup> /m	0.54	0.64	0.71	0.74	0.77	0.78	0.78	ins.w.g
	0.4219	m <sup>3</sup> /s	134	160	178	185	192	194	194	Pa
EURO 75C	1341	ft <sup>3</sup> /m	0.77	0.84	0.96	0.98	1.00	1.02	1.04	ins.w.g
	0.6327	m <sup>3</sup> /s	192	210	240	245	250	255	260	Pa
EURO 85C	1520	ft <sup>3</sup> /m	0.36	0.72	0.92	0.94	0.96	0.98	1.00	ins.w.g
	0.7172	m <sup>3</sup> /s	90	180	230	235	240	245	250	Pa
EURO 100C	1788	ft <sup>3</sup> /m	0.44	0.64	0.79	0.84	0.92	0.92	0.93	ins.w.g
	0.8438	m <sup>3</sup> /s	110	160	196	210	228	230	232	Pa
EURO 115C	1515	ft <sup>3</sup> /m	0.66	0.73	0.79	0.84	0.86	0.88		ins.w.g
	0.7152	m <sup>3</sup> /s	164	183	198	208	214	218		Pa
EURO 140C	1845	ft <sup>3</sup> /m	0.55	0.63	0.71	0.78	0.81	0.85		ins.w.g
	0.8705	m <sup>3</sup> /s	136	158	176	194	202	212		Pa
EURO 170C	2240	ft <sup>3</sup> /m	0.16	0.34	0.43	0.49	0.56	0.58		ins.w.g
	1.0569	m <sup>3</sup> /s	40	84	108	122	140	145		Pa
EURO 200C	2635	ft <sup>3</sup> /m			0.09	0.18	0.24	0.30	0.31	ins.wg
	1.2436	m <sup>3</sup> /s			22	44	61	74	78	Pa
EURO 240C	3162	ft <sup>3</sup> /m								ins.w.g
	1.4925	m <sup>3</sup> /s								Pa

## 3. General Requirements

### 3.1 Related Documents

The installation of the air heater(s) must be in accordance with the rules in force and the relevant requirements of the Gas Safety Regulations, Building Regulations and the I.E.E. Regulations for Electrical Installations.

It should be in accordance also with any relevant requirements of the local gas region, local authority and fire authority and the relevant recommendations of the following documents.

#### British Gas Plc Publications

IM/16: 1988 Guidance notes for the installation of gas pipework, boosters and compressors in Customer's premises (excluding domestic installation of 25mm and below).

#### British Standards Code of Practice

BS 5588 Fire precautions in the design and construction of buildings.

Part 2 : 1985 Code of Practice for Shops

Part 3 : 1983 Code of Practice for Office Buildings

BS 6230: 1991 Installation of Gas Fired Forced Convection Air Heaters for Commercial and Industrial Space Heating.

Those appliances having an input rating not exceeding 60kW viz. Euro 50 to Euro 140 inclusive and installed so as to take their combustion air from within the building must be installed in accordance with the relevant recommendations of the following document.

BS 5440 Flues and Air Supply for gas appliances of rated input not exceeding 60kW (1st and 2nd family gases).

Part 2 - Air Supply

For Euro /D appliances of 50 - 140 size, reference should also be made to BS 5864. Code of Practice for installation of gas-fired ducted-air heaters of rated input not exceeding 60kW.

### 3.2 Location

The location chosen for the air heater must permit the provision of a satisfactory flue system and an adequate air supply. The location must also provide adequate space for servicing and air circulation around the air heater.

The heater(s) must not be installed in conditions for which it is not specifically designed e.g. where the atmosphere is corrosive or salty and they are not suitable for outdoor use.

Where the location of the air heater is such that it might suffer external mechanical damage e.g. from overhead cranes, fork lift trucks, it must be suitably protected.

Euromatic units are designed to operate in a maximum ambient temperature of 25 °C.

### 3.3 Gas Supply

#### 3.3.1 Service Pipes

The local gas undertaking should be consulted at the installation planning stage in order to establish the availability of an adequate supply of gas. An existing service pipe must not be used without prior consultation with the local gas undertaking.

#### 3.3.2 Meters

A gas meter is connected to the service pipe by the local gas undertaking or a local gas undertaking contractor. An existing

meter should be checked, preferably by the gas undertaking, to ensure that the meter is adequate to deal with the total rate of gas supply required.

#### 3.3.3. Installation Pipes

Installation pipes should be fitted in accordance with IM/16:1988. Pipework from the meter to the air heater must be of adequate size. Do not use pipes of a smaller size than the inlet gas connection of the heater. The complete installation must be tested for soundness as described in the above Code. The complete installation must be tested for soundness as described in BS 6230.

#### 3.3.4. Boosted Supplies

Where it is necessary to employ a gas pressure booster the controls must include a low pressure cut off switch at the booster inlet. The local gas undertaking must be consulted before a gas pressure booster is fitted.

### 3.4 Flue System

Euromatic units feature a closed combustion circuit and have an internal exhaust fan, mounted downstream of the heat exchanger, to both assist the evacuation of the products of combustion and to draw in air for combustion.

The air heater must be connected to the flue system that is provided by Powmatic Ltd. Several configurations of flue and combustion air ducts are available as shown diagrammatically (*See Page 10 Figs 1a - 1c*).

The flue should terminate in a freely exposed position and must be so situated as to prevent the products of combustion entering any opening in a building in such concentration as to be prejudicial to health or a nuisance.

### 3.5 Air Supply

When the air inlet duct is terminated within the space being heated then for buildings having a design air change rate of less than 0.5 /h, and where Euromatic units are to be installed in heated spaces having a volume less than 4.7 m<sup>3</sup>/kW of total rated heat input grilles shall be provide at low level as follows:-

(1) for heaters of heat input less than 60 kW, the total minimum free area shall not be less than

4.5 cm<sup>2</sup> per kilowatt of rated heat input.

(2) for heaters of heat input 60 kW or more, the total minimum free area shall not be less than 270cm<sup>2</sup> plus 2.25 cm<sup>2</sup> per kilowatt in excess of 60 kW rated heat input.

Where the air heaters(s) is to be installed in a plant room the the plant room must have permanent air vents communicating directly with the outside air, at high level and at low level. Where communication with the outside air is possible only by means of high level air vents, ducting down to floor level for the lower vents should be used.

All air vents should have negligible resistance and must not be sited in any position where they are likely to be easily blocked or flooded or in any position adjacent to an extraction system which is carrying flammable vapour.

Grilles or louvres should be so designed that high velocity air streams do not occur within the plant room.

The basic minimum effective area requirements of the air vents are as follows:

(a) **Low Level (inlet)**

(1) for heaters of total rated heat input less than 60 kW:



- 9 cm<sup>2</sup> per kilowatt of rated heat input
- (2) for heaters of total rated heat input 60 kW or more:  
540 cm<sup>2</sup> plus 4.5 cm<sup>2</sup> per kilowatt in excess of 60 kW total rated input.
- (b) High Level (outlet)**
- (1) for heaters of total rated heat input less than 60 kW:  
4.5 cm<sup>2</sup> per kilowatt of rated heat input;
- (2) for heaters of total rated heat input 60 kW or more:  
270 cm<sup>2</sup> plus 2.25 cm<sup>2</sup> per kilowatt in excess of 60kW total rated input.

### 3.6 Air Distribution System

The following notes are of particular importance.

For free-blowing units it must be taken into account that the buoyancy of the heated air leaving the heater and air patterns within the space being heated will modify the air throw pattern achieved. In buildings having a low heat loss where single units are required to cover a large floor area and in buildings with high roof or ceiling heights Calecon thermal economiser units should be fitted to ensure even heat distribution and minimise stratification respectively. Care should be taken to avoid impeding the air throw with racking, partitions, plant or machinery etc. Various outlet configurations are available as optional extras to modify the air throw pattern to suit particular site conditions.

For ducted units all delivery and return air ducts, including air filters, jointing and any insulation or lining must be constructed entirely of materials which will not contribute to a fire, are of adequate strength and dimensionally stable for the maximum internal and external temperatures to which they are to be exposed during commissioning and normal operation. In the selection of materials account must be taken of the working environment and the air temperatures which will result when the overheat limit thermostat is being commissioned. Where inter-joist spaces are used as duct routes they should be suitably lined with a fire-resisting material.

A full and unobstructed return air path to the air heater(s) must be provided.

If the air heater(s) is installed in a plant room the return air intake(s) and the warm air outlet(s) from the heater(s) must be fully ducted, into and out of the plant room to avoid interference with the operation of the heater.

The openings in the structure of the plant room through which the ducting passes must be fire stopped.

Care must be taken to ensure that return-air intakes are kept clear of sources of smells and fumes, and in special circumstances where there is any possibility of pollution of the air by dust, shavings etc., precautions must be taken by carefully positioning return air intakes and by the provision of screens to prevent contamination.

In addition, where there is a risk of combustible material being placed close to the warm air outlets, suitable barrier rails should be provided to prevent any combustible material being within 900mm (3ft) of the outlets.

### 3.7 Electrical Supply

Wiring external to the air heater must be installed in accordance with the I.E.E. Regulations for Electrical Installations and any local regulations which apply. Wiring should be completed in flexible conduit.

All standard heaters are supplied by 230V - 1ph, 50Hz. The method of connection to the main electricity supply must facilitate the complete electrical isolation of the air heater(s) and

the supply should serve only the air heater(s).

It must have a contact separation of at least 3mm in all poles. The method of connection should be provided adjacent to the air heater(s) in a readily accessible position.

See the accompanying wiring diagram for the heater electrical connections

Euromatic units can also be supplied for 400V 3N, 50Hz.

## 4. Installation of Air Heater(s)

### 4.1 General

**Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.**

The air heater must be installed in accordance with the rules in force and the relevant requirements of any fire regulations or insurance company's requirements appertaining to the area in which the heater is located, particularly where special risks are involved such as areas where petrol vehicles are housed, where cellulose spraying is carried out, in wood working departments etc.

Whichever method of mounting the air heater is used the following minimum clearances for installation and servicing must be observed.

RHS Clearance (looking at front of heater)	0.5m (1.6ft)
LHS Clearance (looking at front of heater)	1.00m (3.3ft)
Top of the heater to ceiling	0.6m (2.0ft)
Rear of heater to nearest wall	0.6m (2.0ft)

*(Depending on flue system used)*

For multi air heater installations the following minimum distances between units must be observed.

Between units, side to side	3.0m (9.9ft)
Between units, back to back	3 . 0 m (9.9ft)

Recommended mounting heights, floor level to the underside of the unit, are:-

#### **Euro 50F - 100F**

2.5m (8.2ft) - 3m (9.8ft)

#### **Euro 140F - 240F**

3m (9.8ft) - 5m (16.4ft)

#### **Euro 'C' and 'D' Models**

Recommended mounting heights not applicable

#### **All models**

Must not be installed at a height of less than 2.5m (8.2ft) to the base of the unit.

Any combustible material adjacent to the air heater and the flue system must be so placed or shielded as to ensure that its temperature does not exceed 65 °C (150 °F)

#### **IMPORTANT:**

1. Euro 50 - 200: To facilitate removal of the burner tray there must be no projection or fixture in front of the lower front panel. The distance forward of the air heater in which this is applicable is the same as the front to back dimension of the heater.
2. Euro 240: To facilitate removal of the burner tray there must be no projection or fixture in front of the left hand access door (when viewed from the front of the unit). The distance in which this is applicable is the same as the width of the heater.
3. Heaters shall not be installed in:-

- a) Those parts of spaces within buildings that have been classified as hazardous areas as defined in BS 5345 : Part 2.
- b) Where there is a foreseeable risk of flammable particles or gases or corrosion inducing gases or vapours being drawn into either the heated air stream or the air for combustion. In such cases installation may only proceed if the air to be heated is ducted to the heater from an uncontaminated source, preferably from outside the building, and the flue option shown in *Fig 1b* is not permitted. In certain situations where only airborne particles are present it may suffice to fit filters on the main air inlet duct of the heater. Advice in these instances may be obtained from Powrmatic Ltd.
- c) In areas subjected to significant negative pressures due to extract systems.

## 4.2 Fitting the Air Heater

The air heater may be installed either:

- a) suspended from suitable vertical drop rods, chains or straps.
- b) on specifically designed cantilever brackets from a non-combustible wall.
- c) on a level noncombustible surface providing the surface does not extend past the front edge of the heater

Whatever method of installation is used it must be capable of adequately supporting the weight of the unit (*See Tables 2a Page 4 and 2b, Page 5*) and allowance must be made for any ancillary equipment. Before installing the heater any existing trusses, walls, brackets etc., must be inspected to ensure they are suitable. All supports should be protected against the effects of rust or corrosion.

If noise levels are of particular importance the heater should be insulated from the structure of the building by installing it on suitable anti-vibration mountings. In all such cases and, in addition, when the heater is suspended it is essential that all gas, duct, and electrical connections to the heater are made with flexible connections to maintain continuity of connection.

## 4.3 Flue/Combustion Air Duct System

All models are provided with two sockets at the rear of the unit one for combustion air and the other for the products of combustion (*See Section 2 Page 3*). In all cases the flue outlet socket must be connected via the provided flue system to outside air. The combustion air socket need not be connected if site conditions permit (*see 4.1*). The maximum permitted length of combustion air duct and products of combustion duct is 10m i.e. 5m for each or 10m for the flue if the combustion air is not ducted. if an offset is required two sets of 45° bends may be used each set being equivalent to 0.5m of length. The minimum flue length (end of flue terminal to back or top of heater) shall not be less than 1.0m for the Euro50 - 200 and 1.3m for the Euro240. All outer joints must be finished with the provided locking bands. All flue and combustion air ducts must be supported independently of the air heater. The flue or flue/combustion air terminal must not be installed so as to be less than:-

- 300mm below an opening eg window, air brick etc.
- 200mm below eaves or gutter.
- 300mm from an internal or external corner.
- 1200mm from a surface facing the terminal.
- 1500mm vertically from another terminal on the same wall.
- 300mm horizontally from another terminal on the same wall.

2000mm from ground level.

## 4.3.1 Installation of Flue System

### 4.3.1.1 Horizontal System - Standard (*see Fig. 1a Page 10*)

1. Attach Y branch, and bends if required, to the rear of the heater and secure with locking bands.
2. Provide temporary support for the flue system if necessary during the assembly procedure. Complete the runs of the internal and external flue sections from the Y branch up to where the adjustable length is required, ensuring that the joint sealing rings are in place and that each socket and spigot are fully engaged. Into each segment fit the spacer which ensures that the inner flue remains central. Fit locking bands to the outer joints.
3. Push the inner adjustable length into position, drilling and securing with self tapping screws. This ensures that the mating socket and spigot remain engaged during final adjustment. Collapse the adjustable length to its minimum.
4. Push the outer adjustable length into position and fix with a locking band. Collapse the adjustable length to its minimum.
5. Cut a 220mm diameter hole, that is on the same centre line as the flue outlet on the heater, in the outer wall of the building
6. Offer up the terminal assembly to the outside face of the wall and mark the four fixing points. Drill the wall for suitable fixings.
4. Apply a weatherproof sealant to the back face of the terminal support plate and fix terminal to the wall.
5. The adjustable lengths can now be extended to engage in their respective socket and spigot of the wall terminal. When fitted ensure that a minimum overlap of 100mm is maintained between the adjustable length sections. Fix a locking band over the outer joint.

### 4.3.1.2 Horizontal System - Internal Combustion Air (*see Fig. 1b Page 10*)

1. Complete the run of flue sections from the terminal spigot to the flue outlet socket of the heater, ensuring that the joint sealing rings are in place and apply locking bands to each joint. The final section is adjustable to allow fitment and length adjustment. When fitted ensure that a minimum overlap of 100mm is achieved.
2. Fit the 90° bend to the combustion air inlet socket with the inlet facing to the right hand side of the unit (viewed from the front). Secure with a locking band.

### 4.3.1.3 Vertical System (*see Fig. 1c Page 10*)

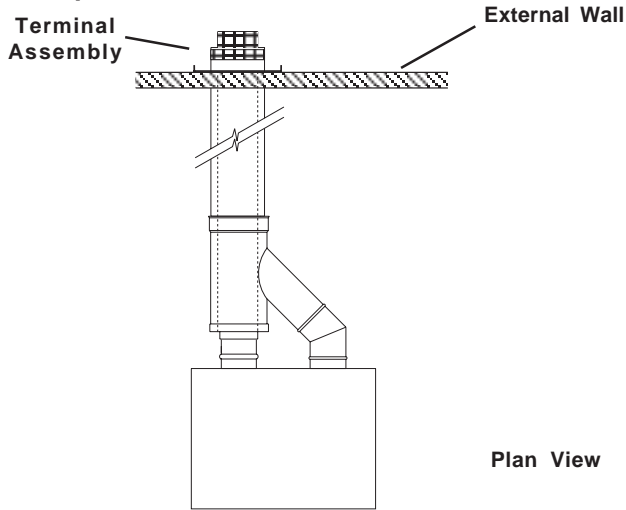
1. Cut a 220mm diameter hole, that is on the same centre line as the flue outlet on the heater, in the roof of the building
2. Fix an external flashing to suit the roof construction.
3. Attach the 90° bends to the rear of the heater, attach the manifold box and fit locking bands. The top plate of the manifold box may be removed to give access to the internal connection.
4. Provide temporary support for the flue system if necessary. Complete the runs of the internal and external flue sections from the Y branch to the roof (*See 4.3.1.1*), ensuring that the joint sealing rings are in place and apply locking bands to each outer joint. The final inner and outer sections are adjustable lengths to allow fitment and length adjustment. When fitted ensure that a minimum overlap of 100mm is achieved. Position the terminal section within the flashing so that the lower edge of the air inlet of the terminal is 500mm above the base of the flashing.

## 4.4 Gas Connection

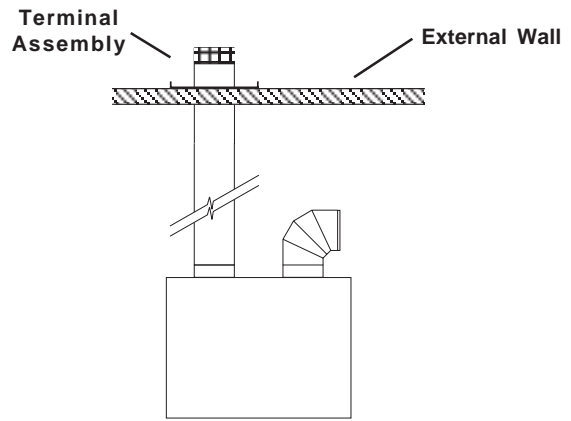
To facilitate removal of the burner tray for servicing purposes

# Euromatic Flue/Combustion Air Duct Options

**Fig. 1a Horizontal - Close Coupled Manifold**

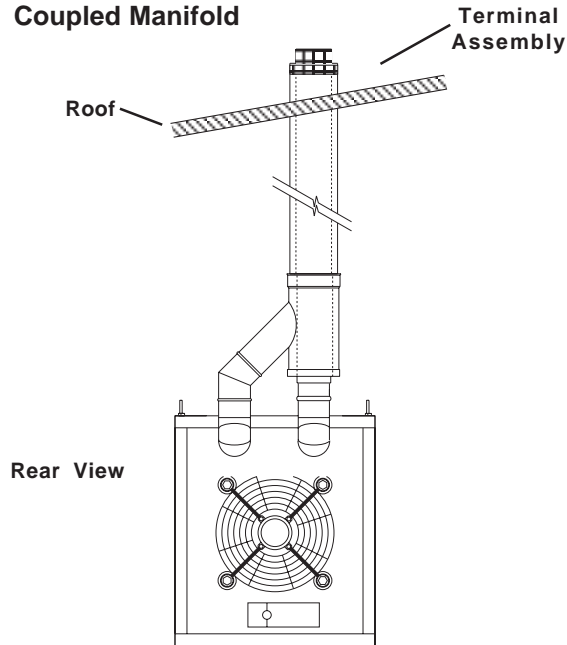


**Fig. 1b Horizontal - Internal Combustion Air**

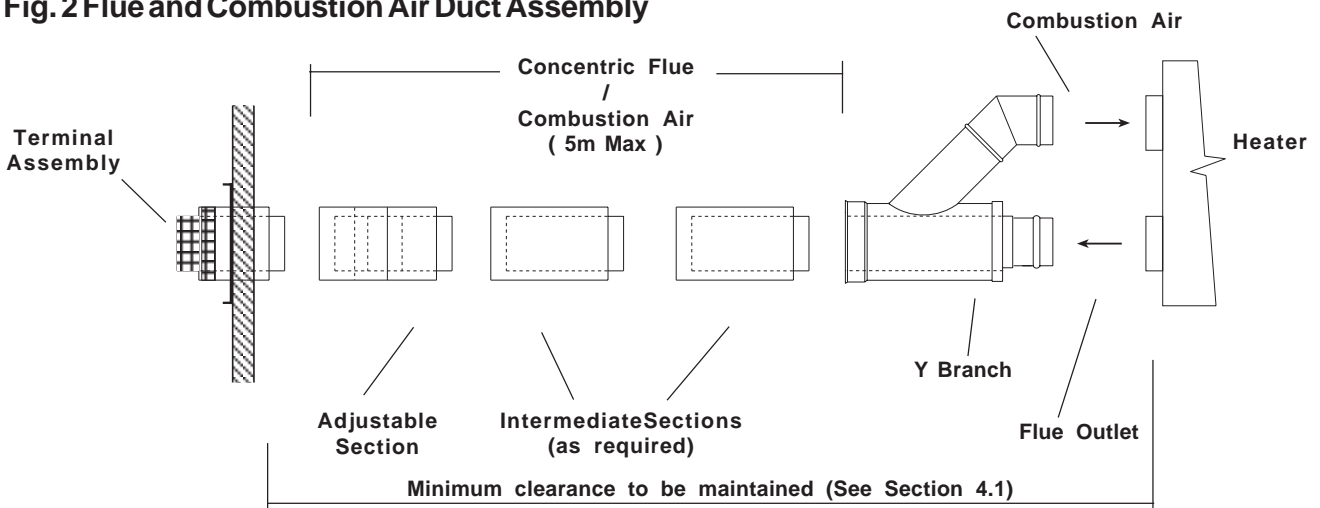


N.B. There are limitations on the use of this flue system. See Section 4.1

**Fig. 1c Vertical - Close Coupled Manifold**



**Fig. 2 Flue and Combustion Air Duct Assembly**



a servicing valve and downstream union must be fitted at the inlet to the air heater. The gas supply to the air heater must be completed in solid pipework and be adequately supported. Heaters suspended by drop rods, straps or chains must have a flexible connection as the final link between the gas supply pipework and the heater. Sufficient slack must be left in the connection to take account of normal movement of the heater.

#### **WARNING**

When completing the final gas connection to the heater do not place undue strain on the gas pipework of the heater.

### **4.5 Electrical Connections**

All units are fully prewired and only require final connections for the incoming mains supply and completion of the control circuit (230V) via a room thermostat, time clock etc. and the remote low level lockout reset. The electrical supply must be run to a point adjacent to the heater and be suitably terminated to provide an isolation point that will prevent remote activation of the unit during servicing. Reference must be made to Table 4 (*Page 6*) to ascertain the electrical loading of the air heater(s) being installed so that cables of adequate cross-sectional area are used for the electrical installation. The length of the conductors between the cord anchorage and the terminals must be such that the current carrying conductors become taut before the earth conductor if the cable or cord slips out of the cord anchorage. All external controls must be of an approved type.

*See the wiring diagram accompanying these instructions.*

Euro/D models must be electrically interlocked to the air movement system so that this is started in the same manner as the air heater fan would be.

A connection from heater terminal No 9 must be made to one side of the fan motor contactor coil, the other side of the coil being connected to Neutral. Under no circumstances must the fan motor electrical supply be taken direct from the internal wiring of the Euromatic heater.

### **5. Air Distribution System**

#### **5.1 General**

Euro /C and /D models are designed for use with duct work to more precisely define the point of air delivery, and /or provide ducted return air or ducted fresh air inlet. If inlet ductwork is used heaters must be ordered with fan inlet sections in order to maintain service access to the centrifugal fan(s). All ducting must be independently supported of the air heater.

Joints and seams of supply ducts and fittings must be securely fastened and made airtight.

#### **5.2 Noise Reduction**

It is recommended that ducting should be connected to the heater spigots via an airtight flexible coupling of noncombustible material. Before fitting coupling it must be ensured that a maximum clearance of 13mm (1/2") will be maintained between the ends of the ducting and the heater spigots.

If required sound attenuators may be fitted in inlet and outlet ducts to reduce airborne fan noise. Materials used in outlet sound attenuators must be capable of withstanding 100 °C air temperature without any deterioration.

#### **5.3 Room Thermostat Siting**

The room thermostat should be fitted at a point which will be

generally representative of the heated area as far as temperature is concerned. Draughty areas, areas subjected to direct heat e.g. from the sun, and areas where the air movement is relatively stagnant e.g. in recesses, are all positions to be avoided for siting the thermostat.

The thermostat should be mounted about 1.5m (5ft) from the floor.

Any room thermostat, frost thermostat, time clock etc. must be suitable for switching 230V, 5A and must be of the 'snap action' type to minimise contact bounce.

*For electrical connections of external controls see the accompanying wiring diagram.*

### **6. Commissioning & Testing**

#### **6.1 Electrical Installation**

Checks to ensure electrical safety must be carried out by a qualified person.

#### **6.2 Gas Installation**

The whole of the gas installation, including the meter, should be inspected and tested for soundness and purged in accordance with the recommendations of IM/16:1988.

#### **6.3 Air Distribution System**

The system should be checked to ensure that the installation work has been carried out in accordance with the design requirements.

Particular attention should be given to the correct arrangement of delivery ducts and registers, return air ducts and grills and general adequacy of return air paths.

For Euro /C standard airflow units refer to *Table 5 (Page 6)* to ascertain the fan damper setting to match the resistance of the ductwork. Euro /C high airflow units are matched to the duct resistance (*Table 2a, Page 4 and Table 2b, Page 5*) and the ductwork must be balanced accordingly.

#### **6.4 Checks before lighting the Air Heater**

The following preliminary checks should be made before lighting the heater(s)

- a) Ensure that the ELECTRICAL supply to the heater is switched OFF.
- b) Check that all warm air delivery outlets are open.
- c) Check that the thermostat is set at MAX.
- d) Check that the clock control is set to an ON period.
- e) Check that any other controls are calling for heat.
- f) Ensure that the Summer/Winter switch is in the Winter position.
- g) Check that the overheat reset button has not operated.

#### **6.5 Lighting the Air Heater**

##### **NOTES:**

1. On initial lighting of the heater(s), it may take some time to purge the internal pipework of air.

##### **IMPORTANT:**

The internal pipework of the appliance has been tested for soundness before leaving the factory. After establishing the main burners test round the gas inlet connection using a leak detection fluid e.g. soap solution.

##### **6.5.1 All Models**

1. Switch on the electrical supply at the isolator and the ignition

sequence will commence. After a delay of approximately 30 seconds the ignition spark will be generated and the main gas valves energized. The burners will then light.

2. If the burners fail to light the control box will go to lockout and the lockout light on the low level remote reset will be illuminated. To restart the ignition sequence depress the reset button on the low level reset.

### 3. SHUTOFF

Switch OFF the electrical supply to the heater or set the clock control to OFF or set the room thermostat to MIN.

## 6.6 Adjustments

### 6.6.1 Burner Gas Pressure

This is set for the required heat input before despatch. In the case of Hi/Lo and Modulating units both high and low pressures are set. Pressures should be checked in the following manner.

#### 6.6.1.1 Standard Units

1. Set external controls to ensure that the main burner is off. On Euro 50 - 200 units remove the escutcheon plate(s) covering the multifunctional control at the rear of the heater (*Fig. 8a - 1*). Connect a pressure gauge to the outlet pressure test point on the multifunctional control (Euro 240) or the burner pressure test point, to the left of the multifunctional control, that extends from the injector manifold (Euro 50 - 200).

2. Set external controls so as to turn on the main burner. Compare the measured burner gas pressure to that stated in Section 2. If necessary adjust the burner gas pressure by turning the regulator screw (*Fig 3-1*) anticlockwise to decrease the pressure, or clockwise to increase the pressure.

4. In addition it is advisable to check the gas rate using the gas

meter dial pointer. Ensure that no other appliances supplied through the meter are in operation.

5. Turn off the main burner as in 6.6.1.1. disconnect the pressure gauge and replace the sealing screw. Turn on the main burner as in 6.6.1.2. above and test for gas soundness around pressure test joint using a leak detection fluid e.g. soap solution. Replace escutcheon plates on Euro 50 - 200 units.

#### 6.6.1.2 High/Lo and Modulating Units

1. Set external controls to ensure that the main burner is off. On Euro 50 - 200 units remove the escutcheon plate(s) covering the multifunctional control(s) at the rear of the heater (*Fig. 8a - 1*). Connect a pressure gauge to the outlet pressure test point on the multifunctional control (Euro 240) or the burner pressure test point, to the left of the multifunctional control, that extends from the injector manifold (Euro 50 - 200).

2. Set external controls so as to turn on the main burner and maintain high fire. Compare the measured burner gas pressure to that stated in Section 2. In addition it is advisable to check the gas rate using the gas meter dial pointer. Ensure that no other appliances supplied through the meter are in operation.

3. Repeat 2 above with external controls set to maintain low fire.

5. If it is necessary to adjust the high pressure setting then proceed from step i). If it is only necessary to adjust the low fire pressure setting proceed from step vii). Refer to *Fig. 5*

i) Set external controls to turn main burner OFF.

ii) Pull back the clip *D* retaining the actuator coil to its mounting stem and remove the coil.

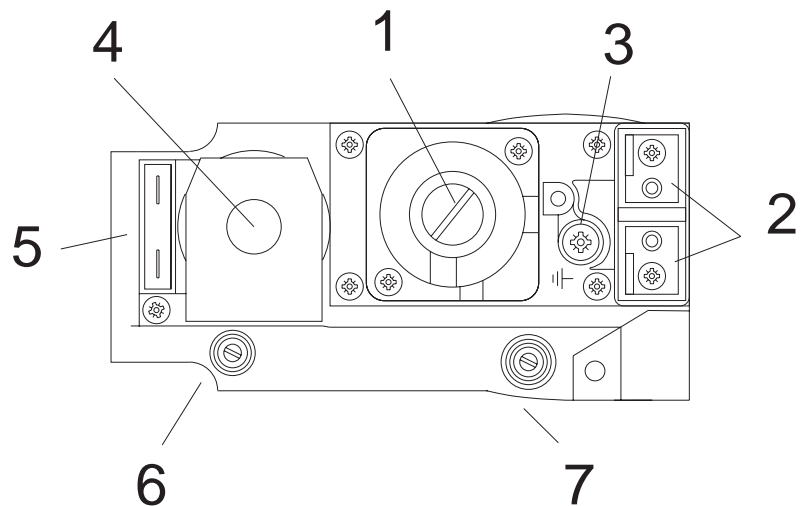
iii) Set external controls to turn main burner ON.

iv) Screw adjustment screw *A* fully clockwise.

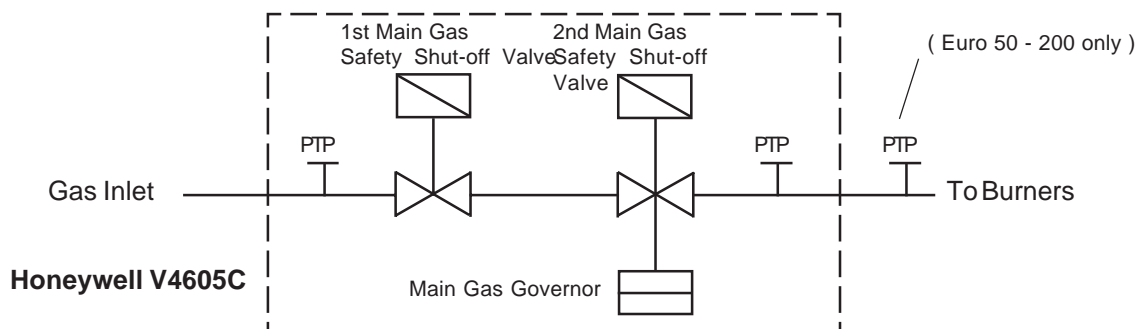
v) Release the M13 locknut *E* that secures the actuator stem *B* into the mfc governor pack and turn the actuator stem to set the

**Fig. 3 Gas Control Valve Honeywell V4605C**

1. Governor adjustment cover screw.
2. Electrical connections for main valve operator.
3. Earth connection.
4. Safety shut off valve.
5. Safety shut off valve electrical connections.
6. Inlet pressure test point.
7. Burner / outlet pressure test point.

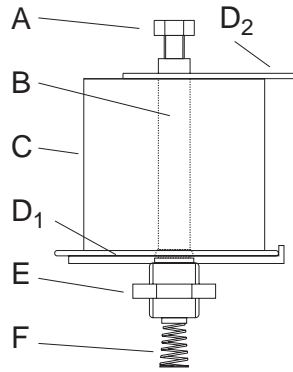


**Fig 4 Gas Controls Schematics**



**Fig. 5 High/Lo and Modulating Heads**

- A Low pressure setting screw
- B Valve stem
- C Valve body
- D<sub>1</sub> Locking spring (Modulating Head)
- D<sub>2</sub> Locking spring (Hi/Low Head)
- E Locknut
- F Spring



HIGH FIRE pressure (clockwise to increase pressure).

- vi) Tighten the locknut without further turning the actuator stem.
  - vii) Unscrew adjustment screw *A* to set the LOW FIRE pressure (anti clockwise to decrease pressure).
  - viii) Set external controls to turn burner OFF and replace valve body *F* onto the valve stem ensuring that it clips into position.
6. Turn off the main burner as in 6.6.1.1. disconnect the pressure gauge and replace the sealing screw. Turn on the main burner as in 6.6.1.2. above and test for gas soundness around pressure test joint using a leak detection fluid e.g. soap solution. Replace escutcheon plates.

### 6.6.2 Air Heater Controls

1. Close the gas service tap and ensure that the gas valve is heard to close within 1 second and that the lockout light is illuminated. Open the gas service tap and reset the unit from lockout.
2. Check that the room thermostat and all automatic controls are operating satisfactorily.

### 6.7 Handing over the Air Heater

Hand the Users Instructions to the user or purchaser for retention and instruct in the efficient and safe operation of the air heater and associated controls.

Adjust the automatic controls to those values required by the User.

Finally, advise the user or purchaser that, for continued efficient and safe operation of the air heater, it is important that servicing is carried out annually.

In the event that the premises are not yet occupied turn off the gas and electricity supplies and leave instructional literature adjacent to gas meter.

## 7. Servicing

**WARNING:** Always switch off and disconnect electricity supply and close the gas service valve before carrying out any servicing work or replacement of failed components.

**NOTE:**

1. If a suspended air heater is to be serviced do not lean ladders against the heater. Ensure that an access tower or equivalent is used.

### 7.1 General

Full maintenance should be undertaken not less than once per year by a qualified person. After any servicing work has been complete or any component replaced the air heater(s) must be

fully commissioned and tested for soundness as described in Section 6.

## 7.2 Main Burner Assembly Removal

### 7.2.1 Euro 50 - 200

1. Ensure that the gas service valve is turned OFF and then unscrew the union nut situated immediately down stream of it.
2. Remove the escutcheon plates covering the multifunctional control (*Fig. 8a - 7*).
3. Disconnect the electrical connections from the multifunctional control and disconnect the ignition and rectification leads.
4. Remove the access door to the electrical panel (*Fig. 8a - 8*).
5. Remove the lower front panel by releasing the two securing screws.
6. Remove the two M5 screws that secure the burner tray in position.
7. Remove the burner tray complete, from the front of the air heater, by pulling forwards. For suspended air heaters it is recommended that the burner assembly is taken down to floor level before proceeding.

10. Release the nuts securing the cross lighting strip assembly and remove the two strips (*see Fig 6, 1 & 2*)

11. Remove each burner by lifting up at the cross lighting strip end and then disengaging from its injector. Using a stiff brush, not a wire brush, brush the flame strips to dislodge accumulated deposits. Inspect the burners both internally and externally to ensure that they are clean. Examine the injectors and if damaged or deteriorated, replace with new ones of the correct size and marking (*see Section 2 tables 3.1, 3.2 and 3.3*).

If deemed necessary, clean the injectors. Do not broach out with wire. **NOTE:** If a full service is being undertaken then complete sections 7.3 and 7.4 before continuing.

14. Reassemble the injectors, burners and cross lighting assembly in reverse order to that above.

**CAUTION:** Ensure that the cross lighting strip is assembled as shown in *Fig. 6 - Item 2* locates under the rolled edge around the burner flame strip and Item 1 abuts onto the top of the burner.

### 7.2.2 Euro 240

1. Open the access door to the controls section.
2. Release the union upstream of the multifunctional control.
3. Disconnect the electrical connections from the multifunctional control.
4. Remove the two screws securing the electrode assembly and remove the assembly.
5. Remove the screws securing the burner assembly and withdraw the assembly. For suspended air heaters it is recommended that the burner assembly is taken down to floor level before proceeding.

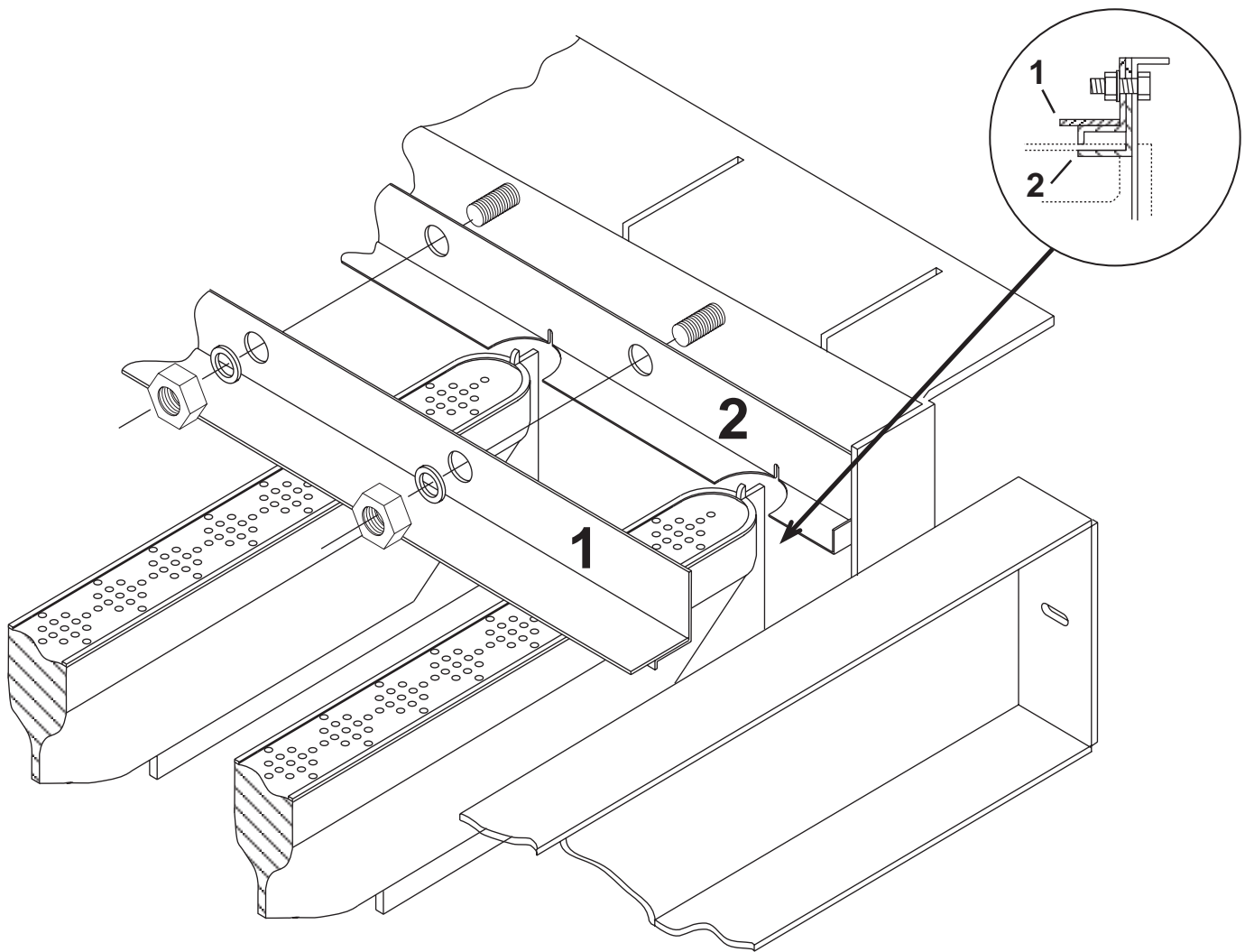
6. Release the nuts securing the cross lighting strip assembly and remove the two strips (*see Fig. 6, - 1 & 2*)

11. Remove each burner by lifting up at the cross lighting strip end and then disengaging from its injector. Using a stiff brush, not a wire brush, brush the flame strips to dislodge accumulated deposits. Inspect the burners both internally and externally to ensure that they are clean. Examine the injectors and if damaged or deteriorated, replace with new ones of the correct size and marking (*see Section 2 tables 3.1, 3.2 and 3.3*).

If deemed necessary, clean the injectors. Do not broach out with wire. **NOTE:** If a full service is being undertaken then complete sections 7.3 and 7.4 before continuing.

14. Reassemble the injectors, burners and cross lighting assembly

**Fig 6 Cross Lighting Assembly Detail Euromatic 50 - 240**



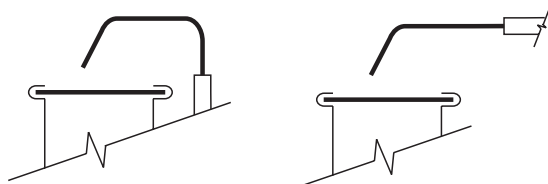
in reverse order to that above. If necessary fit anew gasket to the rear of the burner tray mounting plate.

**CAUTION:** Ensure that the cross lighting strip is assembled as shown in Fig. 6 - Item 2 locates under the rolled edge around the burner flame strip and Item 1 abuts onto the top of the burner.

### 7.3 Ignition and Rectification Electrodes

1. Inspect the electrodes, making sure that they are in a sound and clean condition. In particular check that the ignition electrode is clean, undamaged. Check that the spark gap is 3.0 - 4.0mm (See Fig. 7) and that the rectification probe is 10 - 12mm above the burner.

### Fig 7 Ignition Electrode Spark Gap



### 7.4 Flueways

Whilst the main burner assembly is removed from the appliance a mirror and torch should be used to check that the flueways and internal airways are clean.

### 7.5 Main Fan Assembly

Euro 50 - 200

Euro 240

#### 7.5.1 Euro 'F' Models

1. Inspect the fan blades to see that they are not damaged and that there is no excessive build up of deposits that could give rise to an imbalance. Should it be necessary to remove the assembly for cleaning proceed as follows.
2. Slacken the cable gland on the heater casing through which the fan electrical cable passes. (Fig. 8a - 4).
3. Open the controls section access door (Euro 240) or side access panel (Euro 50-200 Fig. 8a - 8) and disconnect the fan leads from the electrical terminals.
4. Withdraw cable through entry grommet.
5. Remove the fan and motor assembly complete by removing the four hexagon headed bolts that secure the fan to the rear panel.
6. Reassemble in reverse order.

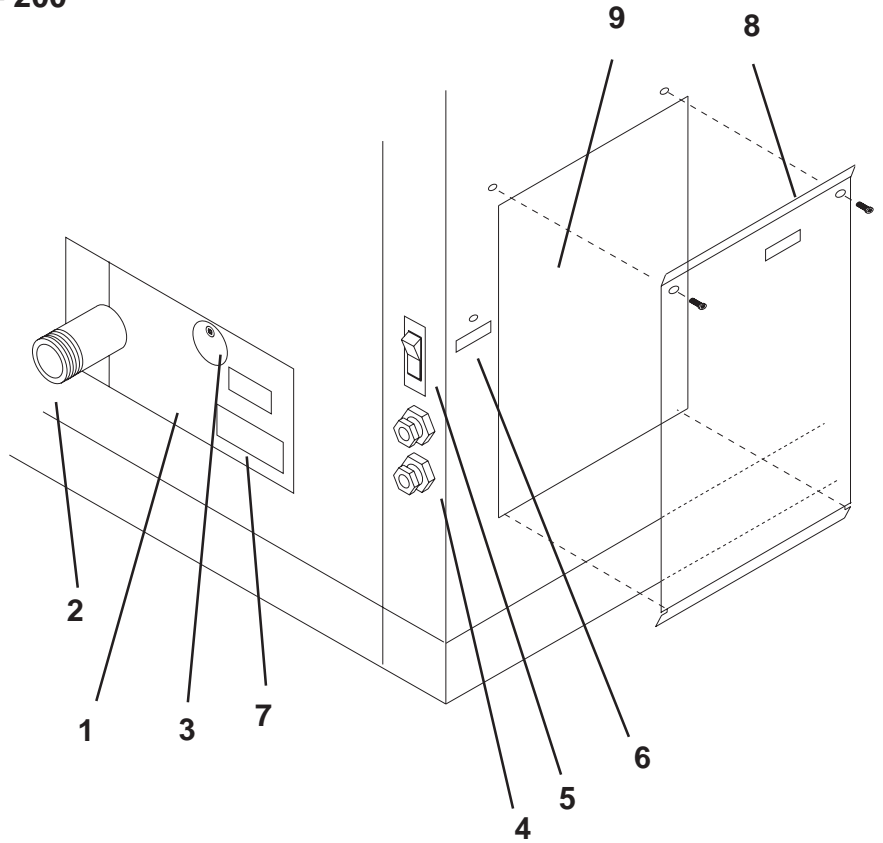
#### 7.5.2 Euro 'C' Models

1. Inspect the fan blades to see that they are not damaged and that there is no build up of excessive deposits that could give rise to an imbalance. Should it be necessary to remove the assembly for cleaning proceed as follows.
2. Slacken the cable gland on the heater casing through which the fan electrical cable passes (Fig. 8a - 4).
3. Open the controls section access door (Euro 240) or side access panel (Euro 50-200 Fig. 8a - 8) and disconnect the fan leads from the electrical terminals.
4. Withdraw cable through entry grommet.
5. Remove the complete fan assembly by removing the nuts

**Fig. 8a Controls Layout - Euro 50 - 200**

**Viewed from rear of unit**

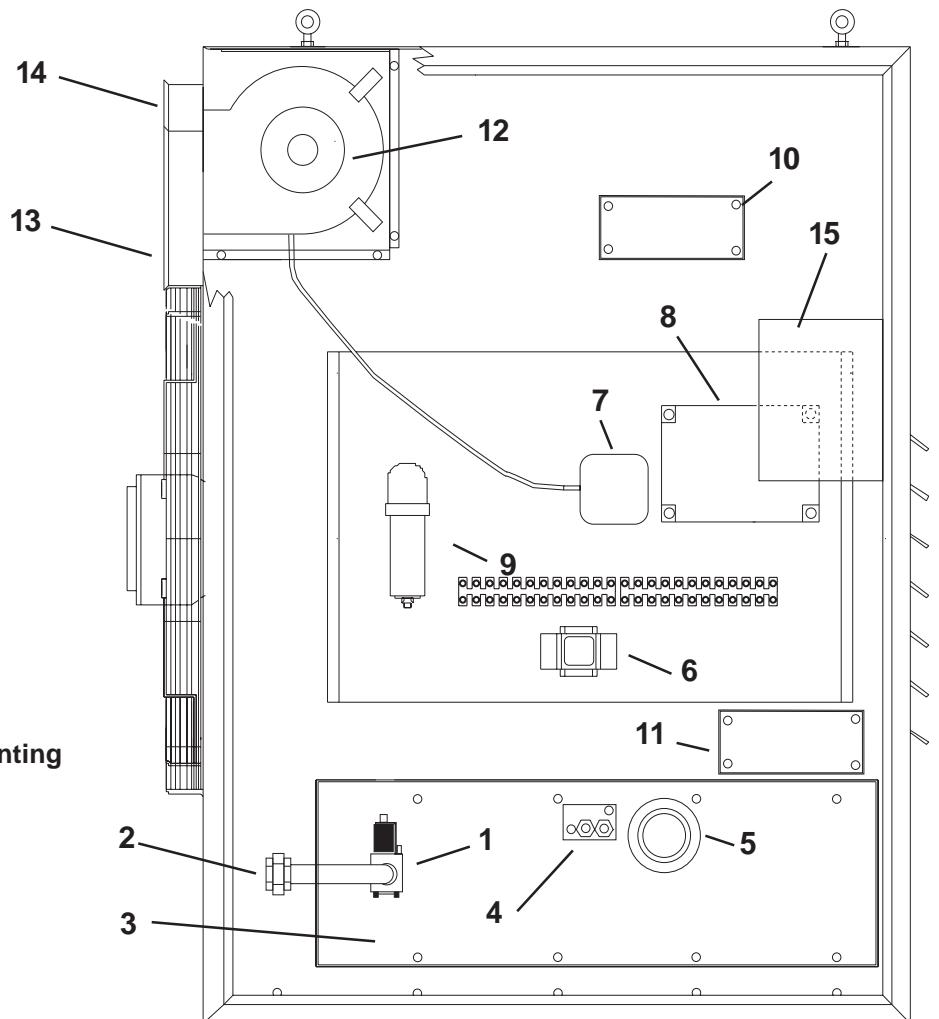
- 1) Honeywell M.F.C.V4605C (Behind cover plates)
- 2) Gas connection.
- 3) Viewing port.
- 4) Cable entry points.
- 5) Summer / Winter switch.
- 6) Limit Thermostat reset button.
- 7) Escutcheon plates.
- 8) Electrical section cover panel.
- 9) Electrical section.



**Fig. 8b Controls Layout - Euro 240**

**Viewed from side of unit (access door not shown)**

- 1) Honeywell MFC V4605C
- 2) Gas connection.
- 3) Burner front plate
- 4) Electrode assembly
- 5) Viewing port.
- 6) Relay
- 7) Air pressure switch
- 8) Full sequence control
- 9) Fan motor capacitor
- 10) Fan run on thermostat phial mounting plate.
- 11) Fan thermostat and limit thermostat phial mounting plate.
- 12) Exhaust fan
- 13) Flue socket
- 14) Combustion air socket
- 15) Thermostat mounting plate





securing the fan to the rear panel.

## 7.6 Replacement of Faulty Components

### 7.6.1 Multifunctional Control

#### 7.6.1.1 Euro 50 - 200

1. Remove the burner assembly as previously described in Section 7.2.1
2. Release the flanged elbows at the inlet and outlet of the multifunctional control by removing the M5 screws and remove the multifunctional control.
3. Reconnect the new valve in the reverse order to that above ensuring that the valve is correctly orientated. Renew the sealing gaskets.

#### 7.6.1.2 Euro 240

1. Open the access door to the controls section.
2. Release the union upstream of the multifunctional control.
3. Disconnect the electrical connections from the multifunctional control.
4. Disconnect the multifunctional control body from the downstream connection flange and remove control. Disconnect the upstream connection flange from the control.
5. Fit new control ensuring that an O ring is fitted in each connection flange and reassemble in reverse order.

### 7.6.2 Burner Bars

1. Remove the burner assembly and dismantle it as previously described in Sections 7.2.1 and 7.2.2
2. Exchange those burner bars as required and reassemble components in reverse order.
3. Re-commission the appliance as described in Section 6.

### 7.6.3 Electrode Assembly

#### 7.6.3.1 Euro 50 - 200

1. Remove the burner assembly as previously described in Sections 7.2.1.
2. Remove the two screws securing the electrode assembly to its mounting bracket and remove assembly.
3. Fit replacement assembly and reassemble in reverse order. Check that the spark gap is 3.0 - 4.0mm (See Fig. 7) and the rectification electrode is 10 - 12mm above the burner.

#### 7.6.3.2 Euro 240

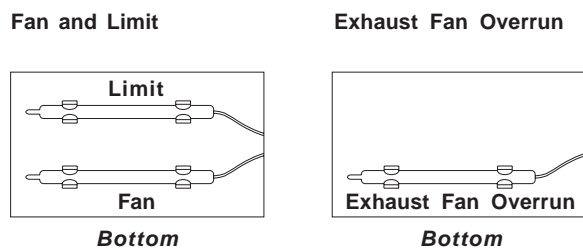
1. Disconnect the ignition lead from the control box and the rectification lead from the terminal strip.
2. Remove the two screws securing the electrode assembly to the burner front plate and withdraw the assembly.
3. Fit replacement and reassemble in reverse order. Check that the spark gap is 3.0 - 4.0mm (See Fig. 7) and the rectification electrode is 10 - 12mm above the burner.

### 7.6.4 Fan and Limit Thermostat

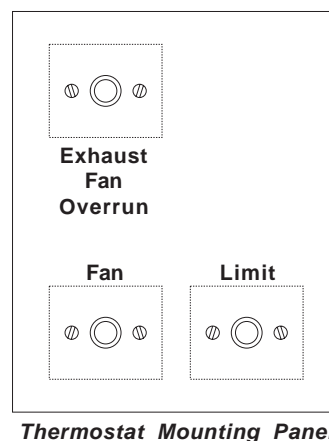
#### 7.6.4.1 Euro 50 - 200

1. Remove electrical section access panel.
2. Remove the appropriate phial from the bracket at the front of the heat exchanger. Note that on units fitted with outlet ducting or accessories the first section of ducting or outlet accessory will

**Fig. 9a Thermostat Phials - Euromatic 240**



**Fig. 9b Thermostats - Euromatic 240**



have to be removed. Remove the thermostat capillary cover plate from the inside of the side panel and withdraw the capillary and phial.

3. Disconnect the electrical leads from the thermostat by pulling off the connectors.

4. Remove the two screws securing the thermostat to the side panel.

5. Fit the new thermostat in reverse to the above steps.

**NB.** Ensure that the thermostats are set correctly before fitment  
Fan Thermostat - all units - 30° C

Limit Thermostat

<b>Euro 50 -85</b>	100° C
<b>Euro 100</b>	110° C
<b>Euro 115</b>	100° C
<b>Euro 140, 170</b>	90° C
<b>Euro 200</b>	80° C
<b>Euro 240</b>	90° C

#### 7.6.4.2 Euro 240

1. Remove the securing screws from the thermostat phial mounting plate, remove plate and unclip the appropriate phial (see Fig 8a).

2. Remove the securing screws of the appropriate thermostat (see Fig 8b) and remove thermostat from the back of the mounting panel. Remove the electrical connections.

3. Fit replacement thermostat in reverse order.

### 7.6.5 Exhaust Fan Run Thermostat and High Limit Thermostat

#### 7.6.5.1 Euro 50 - 200

1. Remove the top panel of the heater and locate the required thermostat. The exhaust fan run on thermostat is at the rear of the combustion products collector box, the high limit thermostat

at the front.

2. Pull of the electrical connections, unscrew securing screws and remove thermostat.
3. Fit new thermostat and reassemble in reverse order.

### 7.6.5.1 Euro 240 (High Limit Thermostat only)

1. Remove the securing screws from the thermostat phial mounting plate, remove plate and unclip the appropriate phial (see Fig. 8a).
2. Remove the securing screws of the appropriate thermostat (see Fig. 8b) and remove thermostat from the back of the mounting panel. Remove the electrical connections.
3. Fit replacement thermostat in reverse order.

## 7.6.6 Exhaust Fan

### 7.6.6.1 Euro 50 - 200

1. Remove the top panel of the heater
2. Release the clip securing the flexible duct to the outlet of the fan and pull of ducting.
3. Disconnect the fan electrical connections from the terminal block.
4. Release the locking band on the inlet socket to the fan and push forward onto the spigot of the combustion products collector box.
5. Remove exhaust fan by pulling it away from the combustion products collector box.
6. Ensure that replacement exhaust fan, if applicable, is fitted with the correct restrictor ring See Table 1c.
7. Fit replacement exhaust fan and reassemble in reverse order.

### 7.6.6.2 Euro 240

1. Disconnect exhaust fan electrical connections at the terminal strip.
2. Disconnect the first outlet flue section or remove the manifold box depending on the flue type.
3. Remove the four screws located within the flue outlet socket and then unclip the exhaust fan and remove.
4. Fit replacement exhaust fan and reassemble in reverse order.

## 7.6.7 Control Box

1. Unplug the electrical connections, remove the four retaining screws and remove the control box.
2. Fit replacement in reverse order.

## 7.6.8 Air Pressure Switch

1. Remove pressure switch cover and disconnect electrical connections.
2. Pull off the sensing tube from the air pressure switch.
3. Remove the screws fixing the air pressure switch and remove switch.
4. Fit replacement in reverse order refitting the sensing tube to the negative (-) tapping on the pressure switch.

## 7.6.9 Fan and Motor Assembly

**Note:** On 3ph heaters ensure that the fan direction of rotation corresponds with the direction of rotation arrow on the fan guard or case. If necessary reverse the direction of rotation by interchanging any two of the motor live leads at the terminal strip in the electrical panel.

### 7.6.9.1 Euro 'F' Models

1. Remove the complete axial fan assembly as previously described in Section 7.5.1.
2. Refit axial fan assembly to the heater in reverse order.

### 7.6.9.2 Euro 'C' Models

1. Remove the complete centrifugal fan assembly as previously described in Section 7.5.2.
2. Fit the new centrifugal fan assembly.

## 8. Connections to Powrmatic External Controls

### 8.1 Powrtrol

**Euromatic  
Powrtrol  
Terminals  
Terminals**



### 8.2 Eurotrol

**Euromatic  
Eurotrol  
Terminals  
Terminals**



## 9. Fault Finding

Fault	Cause	Action
Internal exhaust fan does not run	Electrical	<ol style="list-style-type: none"> <li>1. Check that there is an electrical supply to the unit and that external control circuit is made.</li> <li>2. Unit at lockout - reset.</li> <li>3. Limit thermostat tripped - reset.</li> <li>4. Faulty control box.</li> <li>5. Faulty fan relay.</li> <li>6. Faulty exhaust fan.</li> </ol>
Internal exhaust fan runs but ignition sequence does not start.	Electrical	<ol style="list-style-type: none"> <li>1. Check that air pressure switch is changing over as exhaust fan starts.</li> <li>2. Faulty control box.</li> </ol>
Internal exhaust fan runs, ignition spark is observed but burners do not light.	Electrical	<ol style="list-style-type: none"> <li>1. Ignition spark gap wrong or ignition electrode / lead shorting to earth.</li> <li>2. Faulty control box.</li> <li>3. Faulty gas control valve.</li> </ol>
Burners light but go out almost immediately.	Gas	<ol style="list-style-type: none"> <li>1. Check that gas is available to the unit.</li> </ol>
Burners light but go out after 2 - 3 minutes, main fan does not run.	Electrical	<ol style="list-style-type: none"> <li>1. Rectification electrode position wrong, electrode/lead damaged - check flame signal.</li> </ol>
Burners light but go out after 2 - 3 minutes, main fan does not run.	Electrical	<ol style="list-style-type: none"> <li>1. Fan thermostat faulty or set too high.</li> <li>2. Main air fan faulty - should run with Summer/Winter switch in Summer setting.</li> </ol>
Main fan runs continuously.	Electrical	<ol style="list-style-type: none"> <li>1. Summer/Winter switch (or external controls) set to Summer position.</li> <li>2. Faulty fan thermostat.</li> </ol>

## 10. Short List of Parts

Refer to Powmatic Ltd for the details of any parts not listed here.

<b>ITEM</b>	<b>APPLICATION</b>	<b>PART NUMBER</b>
MFC - Honeywell V4605C 1029B	All	142400431
Ignition / Rectification Electrodes - Johnson 27B2P6T0000CIW	All	142400625
Burner Bar - Bray AB 17510	115 - 240	142400212
Burner Bar - Bray AB 17509	50 - 100	142400234
Thermostat - Fan - Landis & Gyr Rak 20-7011-1	All	142403593
Thermostat - Limit - Landis & Gyr Rak 21-4-2926	All	142403597
Thermostat - High Limit - 150 °C	50-200	142403601
Thermostat - Exhaust Fan Overrun - 29T12F125 - 50°C	50 - 200	142403642
Contactator - Klockner Moeller DIL EM-10	115C-240C, All 3ph	
Full sequence control - Pectron D459G03A	All	142400413
Hi/Lo Governor Head - Anglo Nordic MD20003	All - /HL	142466410
Modulating Governor Head - Anglo Nordic MD1003/MD	All - /MOD	142466421
Amplifier board - Johnsons PIB-24	All - /MOD	142400304
Exhaust Fan - Sifan WFFB 0223-006	50 - 200	140210499
Exhaust Fan - Airflow Developments 52BTXR	240	140210498
8 Pin Relay 230V	All	143000813
Dungs Pressure Switch LGW3A2	All	145604642



HEATING DIVISION  
Winterhay Lane

Iminster, Somerset TA19 9PQ  
Tel: 01460 53535 Fax: 01460 52341

**BSI Registered Firm**

FM 414  
Ind & Comm. Air Heaters;  
Air Moving Equipment;  
Flues & Chimneys; Natural,  
Smoke & Heat Ventilators;  
Powered Supply & Extract  
Fans & Systems.

