

The Euromatic Range

Series 2

Installation and Servicing Instructions

WARNING: THIS APPLIANCE MUST BE EARTHED

BSI Registered Firm

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



HEATING DIVISION
Winterhay Lane
Ilminster, Somerset TA19 9PQ
Tel: 01460 53535 Fax: 01460 52341

£2.50 When supplied separately.

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1. INTRODUCTION

The Euromatic range of gas fired, fanned circulation air heaters cover a heat output range of 15kW to 75kW, have a closed combustion circuit and are supplied complete with a flue system. They are certified for use on Natural Gas, Group H - G20, Propane - G31 and Butane - G30. Appliance Categories are Cat II2H3+.

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, or air handling units, 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.

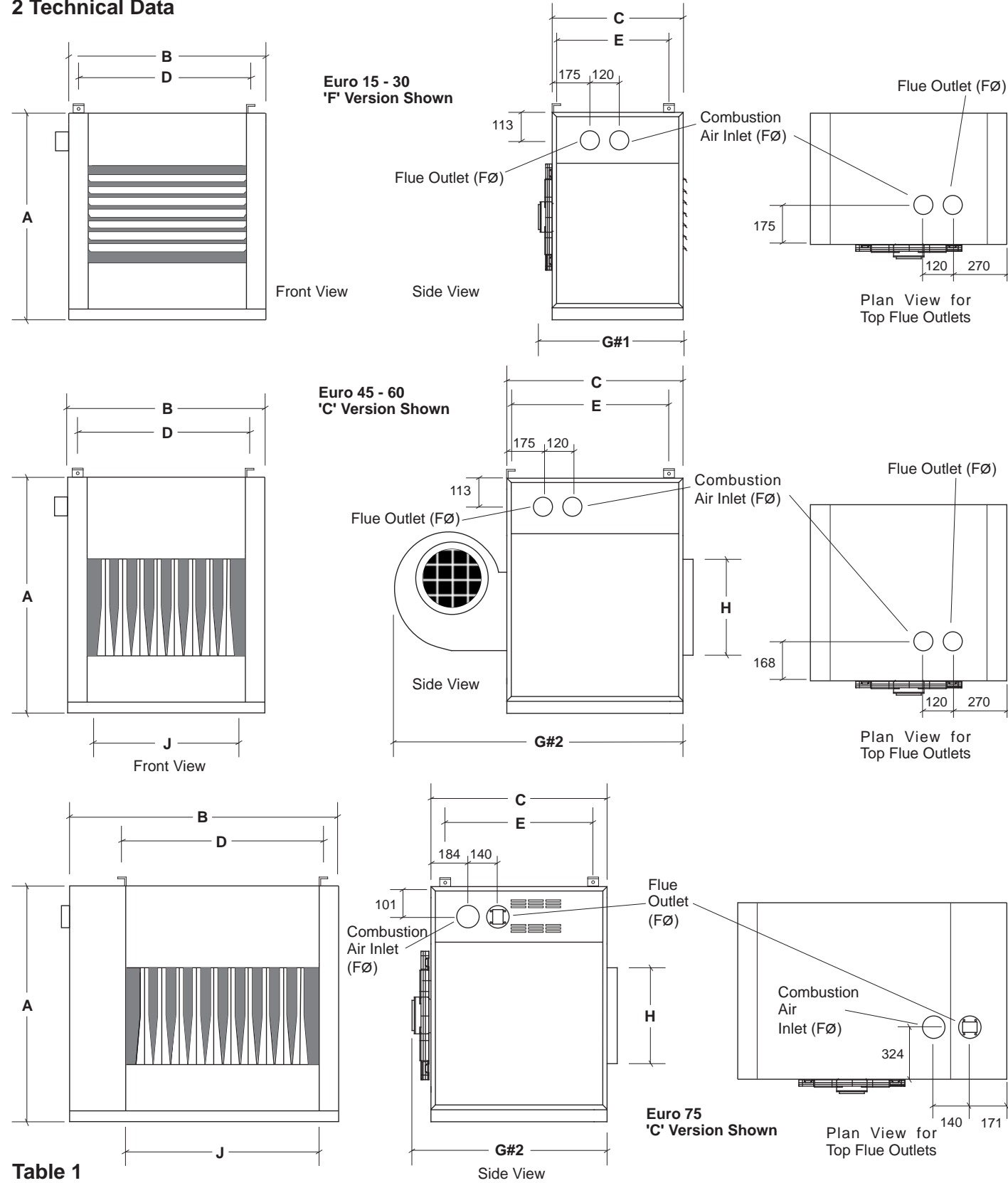
Options include High/Low or modulating burner controls, inlet duct connection/fan silencer, outlet duct connection, 45° head, 90° outlet bend, nozzle outlet and vertical/horizontal outlet louvre assembly.

Gas Safety (Installation & Use) Regulations 1994

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



**Table 1
Dimensions**

	A	B	C	D	E	F	G #1	G #2	H	J
Euro 15	960	875	595	737	464	80	680	1207	492	720
Euro 22							692	1020		
Euro 30							692	1207		
Euro 45	1083	875	795	737	664	100	895	1257	492	720
Euro 52							892	1257		
Euro 60							935	1295		
Euro 75	1122	1122	887	887	664	100	938	1257	492	870

10. Short List of Parts

Only originally specified parts may be fitted as service replacements.
Please refer to Powrmatic Ltd for parts not detailed in the listing below.

ITEM	APPLICATION	PART NUMBER
MFC - SIT Nova 822 (0.822.117)	All	142400431
Ignition / Rectification Electrodes - Johnson 27B2P6T0000CIW	All	142400625
Burner Bar - Bray AB 17510	45 - 75	142400212
Burner Bar - Bray AB 17509	15 - 30	142400234
Thermostat - Fan & Exhaust fan overrun - Cotherm GTLH3148 - 30°C	All	142403606
Thermostat - Limit - Cotherm SBSC0011 - 110°C	All	142403608
Contactors - Klockner Moeller DIL EM-10	45C-75C, All 3ph	
Full sequence control - Pactrol P16-FI(CE)	All	142400430
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	15 - 60	140210499
Exhaust Fan - Airflow Developments 52BTXR	75	140210498
8 Pin Relay 230V	All	143000813
Kromschroder Pressure Switch DL5K-3W302	All	145604643

9. Fault Finding

Fault	Cause	Action
Internal exhaust fan does not run	Electrical	<ol style="list-style-type: none"> 1. Check that there is an electrical supply to the unit and that external control circuit is made. 2. Unit at lockout - reset. 3. Limit thermostat tripped - reset. 4. Faulty control box. 5. Faulty fan relay. 6. Faulty exhaust fan.
Internal exhaust fan runs but ignition sequence does not start.	Electrical	<ol style="list-style-type: none"> 1. Check that air pressure switch is changing over as exhaust fan starts. 2. Faulty control box.
Internal exhaust fan runs, ignition spark is observed but burners do not light.	Electrical	<ol style="list-style-type: none"> 1. Ignition spark gap wrong or ignition electrode / lead shorting to earth. 2. Faulty control box. 3. Faulty gas control valve.
Burners light but go out almost immediately.	Gas	<ol style="list-style-type: none"> 1. Check that gas is available to the unit.
Burners light but go out after 2 - 3 minutes, main fan does not run.	Electrical	<ol style="list-style-type: none"> 1. Rectification electrode position wrong. electrode/lead damaged - check flame signal.
Main fan runs continuously	Electrical	<ol style="list-style-type: none"> 1. Fan thermostat faulty or set too high. 2. Main air fan faulty - If Summer/Winter switch fitted check that on Summer setting the fan runs.
Main fan fails to run	Electrical	<ol style="list-style-type: none"> 1. External controls (or Summer/Winter switch if fitted) set to Summer position. 2. Faulty fan thermostat - check setting <i>See Section 7.6.5.</i>
		<ol style="list-style-type: none"> 1. Fan motor or capacitor failed - replace. 2. Fan thermostat faulty - replace. 3. Fan contactor failed - replace (3ph units)

Table 1a - Exhaust Fan Mounting Plate Inlet Diameters

Euro 15	Euro 22	Euro 30	Euro 45	Euro 52	Euro 60	Euro 75
34	42	50	60	70	90	N/A

Note: Length, in mm, of oblong notch on plate side equals unit size.

Table 2 - Specifications

MODEL	HIGH FIRE		LOW FIRE		AIR VOLUME		MAXIMUM DUCT RESISTANCE		FAN MOTOR		WEIGHT kg	
	INPUT (Nett)	OUTPUT	INPUT (Nett)	OUTPUT	Standard	High	Standard	High	Standard	High		
	kw		kw		m³/s		pa		kw			
Euro 15	F	17.05	15.0	8.92	7.5	0.4219	0.5370	N/A	N/A	0.040	0.10	98
	C							194	170	0.355	0.55	110
Euro 22	F	25.57	22.5	13.39	11.25	0.6327	0.8060	N/A	N/A	0.100	0.18	98
	C							260	245	0.550	0.75	110
Euro 30	F	34.09	30.0	17.85	15.0	0.8438	1.0740	N/A	N/A	0.100	0.25	98
	C							232	245	0.550	1.10	110
Euro 45	F	51.14	45.0	26.78	22.5	0.8705	1.1813	N/A	N/A	0.100	0.37	134
	C							212	155	0.560	1.10	155
Euro 52	F	59.66	52.5	31.25	26.25	1.0569	1.4347	N/A	N/A	0.120	0.41	134
	C							145	165	0.560	1.50	155
Euro 60	F	68.18	60.0	35.71	30.0	1.2436	1.6877	N/A	N/A	0.370	0.50	134
	C							74	200	0.990	1.50	155
Euro 75	F	85.23	75.0	44.64	37.5	1.4925	2.0255	N/A	N/A	0.370	0.50	153
	C							120	40	0.750	1.50	185

Table 3.1

**Injector Sizes & Burner Pressures Natural Gas - Group H - G20 Net CV (Hi) = 34.02MJ/m³
Inlet pressure 20mbar**

Inlet Pressure 20mb	INJECTORS			High Fire		Low Fire	
				Burner Pressure	Gas Rate	Burner Pressure	Gas Rate
MODEL	No.	Size mm	Marked	mbar	m³/h	mbar	m³/h
Euro 15	5	1.51	151	18.2	1.8	4.5	0.94
Euro 22	6	1.7	170	15.5	2.7	4.5	1.41
Euro 30	8	1.7	170	15.5	3.6	4.5	1.89
Euro 45	6	2.46	246	15.5	5.41	4.5	2.83
Euro 52	7	2.46	246	15.5	6.31	4.5	3.30
Euro 60	8	2.46	246	15.5	7.21	4.5	3.77
Euro 75	10	2.46	246	15.5	9.01	4.5	4.72

Table 3.2

**Injector Sizes & Burner Pressures - Propane G31 - Net CV (Hi) = 88.00MJ/m³
Inlet Pressure 37mbar**

Inlet Pressure 37mb	INJECTORS			High Fire		Low Fire	
				Burner Pressure	Gas Rate	Burner Pressure	Gas Rate
MODEL	No.	Size mm	Marked	mbar	m³/h	mbar	m³/h
Euro 15	5	0.93	120	N/A	0.70	N/A	N/A
Euro 22	6	1.04	150	N/A	1.05	N/A	N/A
Euro 30	8	1.04	150	N/A	1.39	N/A	N/A
Euro 45	6	1.45	280	N/A	2.09	N/A	N/A
Euro 52	7	1.45	280	N/A	2.44	N/A	N/A
Euro 60	8	1.45	280	N/A	2.79	N/A	N/A
Euro 75	10	1.51	300	N/A	3.48	N/A	N/A

Table 3.3
Injector Sizes & Burner Pressures Butane G30 Net CV (Hi) = 116.09MJ/m³
 Inlet pressure 29mbar

Inlet Pressure 29mbar	INJECTORS			High Fire	
	MODEL	No.	Size mm	Burner Pressure mbar	Gas Rate m ³ /h
Euro 15	5	0.93	120	N/A	0.53
Euro 22	6	1.04	150	N/A	0.79
Euro 30	8	1.04	150	N/A	1.06
Euro 45	6	1.45	280	N/A	1.58
Euro 52	7	1.45	280	N/A	1.85
Euro 60	8	1.45	280	N/A	2.11
Euro 75	10	1.51	300	N/A	2.64

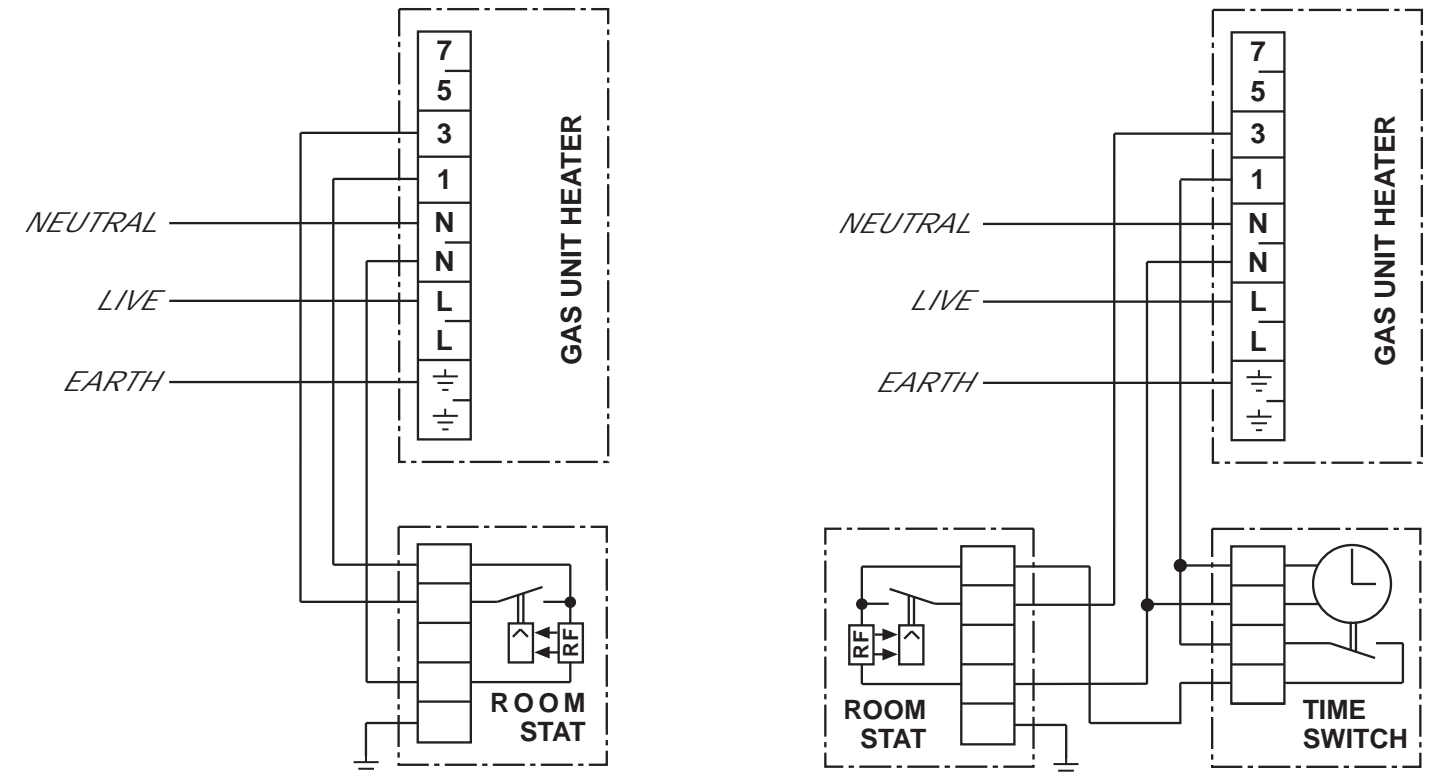
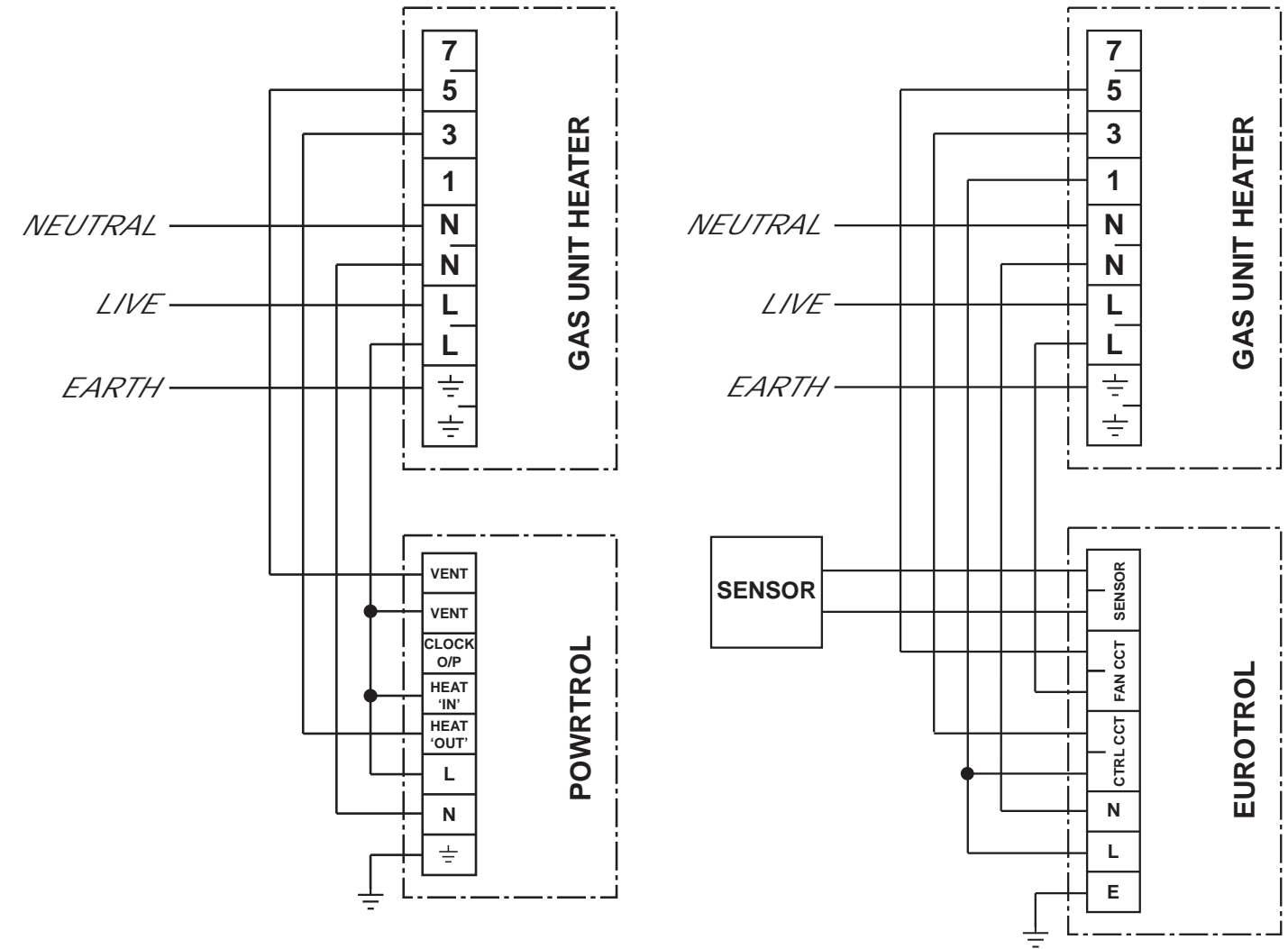
Table 4 - Electrical Loadings 1ph
 Note: 3ph Data is supplied separately with units ordered to this specification.

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)	
PGUH 15F	900	0.91	1.5	0.78	2	1500	1.60	3.5	1.70	2	
PGUH 22F			1.8	0.94			1.61	5.4	1.75		
PGUH 30F			1.6	1.23			2.60	5.3	2.56		
PGUH 45F	1500	0.87	1.60	1.10	3	1000	3.00	4.7	2.20	3	
PGUH 52F			1.00	1.80			1.33	2.57	8.9		2.70
PGUH 60F			3.00	6.10			1.95	4.00	5.2		3.87
PGUH 75F			5.50	2.50	3		8.5	3.90	5		
PGUH 15C	900	5.80	9.0	5.40	7	1500	5.4	32.0	4.70	5	
PGUH 22C			9.0	5.50			4.80				
PGUH 30C			9.0	5.50			6.00				
PGUH 45C	1000	4.10	9.80	3.20	5	7.40	32.0	6.40	7		
PGUH 52C			11.0	3.80			32.0	8.60			
PGUH 60C			13.0	5.50			36.0	7.50			
PGUH 75C			37.0	6.60	7		36.0	9.20	10		

Table 5 - Damper Settings Euromatic 'C' Units Standard Airflow

MODEL	DESIGN AIRFLOW	Distance of Damper Plate from Fan Casing (mm)								DUCT RESISTANCE
		20	30	40	50	60	70	80		
Euro 15C	0.6327 m ³ /s	192	210	240	245	250	255	260	Pa	
Euro 22C	0.7172 m ³ /s	90	180	230	235	240	245	250	Pa	
Euro 30C	0.8438 m ³ /s	110	160	196	210	228	230	232	Pa	
Euro 45C	0.8705 m ³ /s	136	158	176	194	202	212	Pa		
Euro 52C	1.0569 m ³ /s	40	84	108	122	140	145	Pa		
Euro 60C	1.2436 m ³ /s			22	44	61	74	78	Pa	
Euro 75C	1.4925 m ³ /s								Pa	

8. Connections to External Controls



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

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

NB. Ensure that the thermostats are set correctly before fitment
Fan Thermostat - all units - 30° C (preset)
Limit Thermostat - all units - 100° C (preset)

1. Remove the securing screws from the thermostat phial mounting plate, remove plate and unclip the appropriate phial.
2. Remove the securing screws of the appropriate thermostat 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 On Thermostat

1. Unclip the thermostat phial located adjacent the exhaust fan.
2. Remove the securing screws of the appropriate thermostat and remove thermostat. Remove the electrical connections.
3. Fit replacement thermostat in reverse order.

7.6.6 Exhaust Fan

7.6.6.1 Euro 15 - 60

1. a) Side flue connections - disconnect the flue system, remove the lower side access panel, and then release the panel above it. Pull this panel off bringing with it the connection pipe from the exhaust fan outlet.
- b). Top flue connections - disconnect the flue system and remove the flue connection from the top panel disengaging it from the exhaust fan outlet.
2. Disconnect the fan electrical connections from the terminal block.
3. Remove the two facing screws securing the exhaust fan mounting plate, move plate slightly to the rear of the unit and pull forward to disengage from rear location.
4. Fit replacement exhaust fan and reassemble in reverse order.

7.6.6.2 Euro 75

1. a) Side flue connections - disconnect the flue, remove the side access panel. Remove the fixings of the flue outlet socket and then remove the upper panel.
- b). Top flue connections - Remove the lower and upper side access panels. Disconnect the exhaust fan wiring and remove the fan motor and impeller by removing the three screws securing this assembly to the inside of the exhaust fan enclosure.

2. 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.

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 a gross input rating not exceeding 60kW viz. Euro 15 to Euro 45 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 15 - 45 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 Pages 7 & 8 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 m³ /kW of total rated heat input grilles shall be provided 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 cm² 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 270cm² plus 2.25 cm² 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 60kW: 9cm² per kilowatt of rated heat input.
 - (2) for heaters of total rated heat input 60 kW or more: 540 cm² plus 4.5 cm² 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: 4.5cm² per kilowatt of rated heat input.
 - (2) for heaters of total rated heat input 60 kW or more: 270 cm² plus 2.25 cm² 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 used in buildings having a low heat loss i.e. 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-joint 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 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
LHS Clearance (looking at front of heater)	1.00m
Top of the heater to ceiling	0.6m
Rear of heater to nearest wall	0.6m

(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
Between units, back to back	3.0m

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

Euro 15F - 30F

2.5m - 3m

Euro 45F - 75F

3m - 5m

Euro 'C' and 'D' Models

Recommended mounting heights not applicable

All models

Must not be installed at a height of less than 2.5m 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.

IMPORTANT:

- To facilitate removal of the burner tray there must be no projection or fixture in front of the left hand access panel (when viewed from the front of the unit). The distance in which this is applicable is the same as the width of the heater.
- Heaters shall not be installed in:-
 - Those parts of spaces within buildings that have been classified as hazardous areas as defined in BS 5345 : Part 2.
 - 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. The option of taking combustion air from the space 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 Powmatic Ltd.
 - In areas subjected to significant negative pressures due to extract systems.

4.2 Fitting the Air Heater

The air heater may be installed either:

- suspended from suitable vertical drop rods, chains or straps.
- on specifically designed cantilever brackets from a non-combustible wall.
- on a level noncombustible surface providing the surface does not extend past the front edge of the heater. Note that the hinged base facility will not be available in this situation.

Whatever method of installation is used it must be capable of adequately supporting the weight of the unit (See Table 2, Page 3) 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

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. Note that the heater may attempt one reignition before going to lockout. 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.

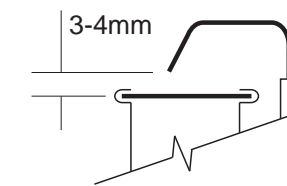
7.2 Main Burner Assembly Removal

- Ensure that the gas service valve is turned OFF and then unscrew the union nut situated immediately down stream of it.
- Open the side access door.
- Disconnect the electrical connections from the multifunctional control and disconnect the ignition and rectification leads from the full sequence control.
- Remove the inner burner securing plate by removing the securing screws.
- Pull the burner tray out. For suspended air heaters it is recommended that the burner assembly is taken down to floor level before proceeding.
- Release the nuts securing the cross lighting strip assembly and remove the two strips (see Fig 5, 1 & 2)
- 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.
- 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. 5 - 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

7.5.1 Euro 'F' Models

- 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.
- Slacken the cable gland on the heater casing through which the fan electrical cable passes.
- Open the controls section access door and disconnect the fan leads from the electrical terminals.
- Withdraw cable through entry grommet.
- Remove the fan and motor assembly complete by removing the four hexagon headed bolts that secure the fan to the rear panel.
- Reassemble in reverse order.

7.5.2 Euro 'C' Models

- 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.
- Slacken the cable gland on the heater casing through which the fan electrical cable passes.
- Open the controls section access door and disconnect the fan leads from the electrical terminals.
- Withdraw cable through entry grommet.
- Remove the complete fan assembly by removing the nuts securing the fan to the rear panel.

7.6 Replacement of Faulty Components

7.6.1 Multifunctional Control

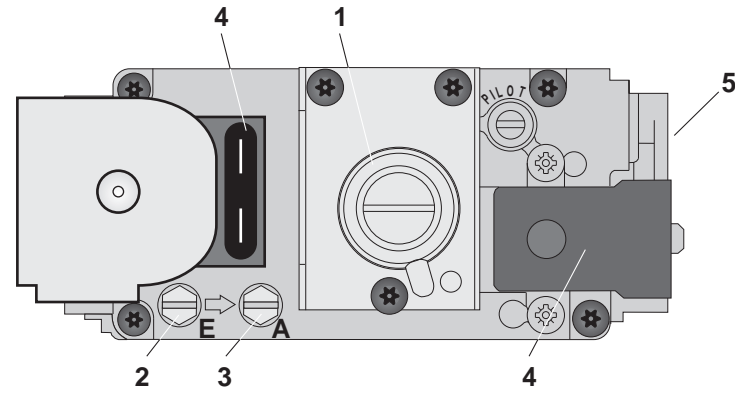
- Remove the burner assembly as previously described in Section 7.2
- Release the flanged elbows at the inlet and outlet of the multifunctional control by removing the M5 screws and remove the multifunctional control.
- Reconnect the new valve in the reverse order to that above ensuring that the valve is correctly orientated. Renew the sealing gaskets..

7.6.2 Burner Bars

- Remove the burner assembly and dismantle it as previously described in Sections 7.2

Fig. 3 - SIT 822 Nova

1. Pressure Regulator cap screw.
2. Inlet pressure test point.
3. Burner pressure test point.
4. Electrical connections for gas valve operators.



1. Set external controls to ensure that the main burner is off. Open the side access door. Connect a pressure gauge to the burner pressure test point on the multifunctional control.
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.

1. Set external controls to ensure that the main burner is off. Remove the side access panel. Connect a pressure gauge to the burner pressure test point on the multifunctional control.
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. 4
- 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 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 **C** 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 access panel.

6.6.1.2 High/Lo and Modulating Heads

Fig 4

- A Low pressure setting screw
- B Valve stem
- C Valve body
- D₁ Locking spring (Modulating Head)
- D₂ Locking spring (Hi/Low Head)
- E Locknut
- F Spring

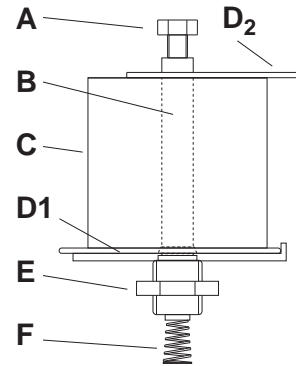
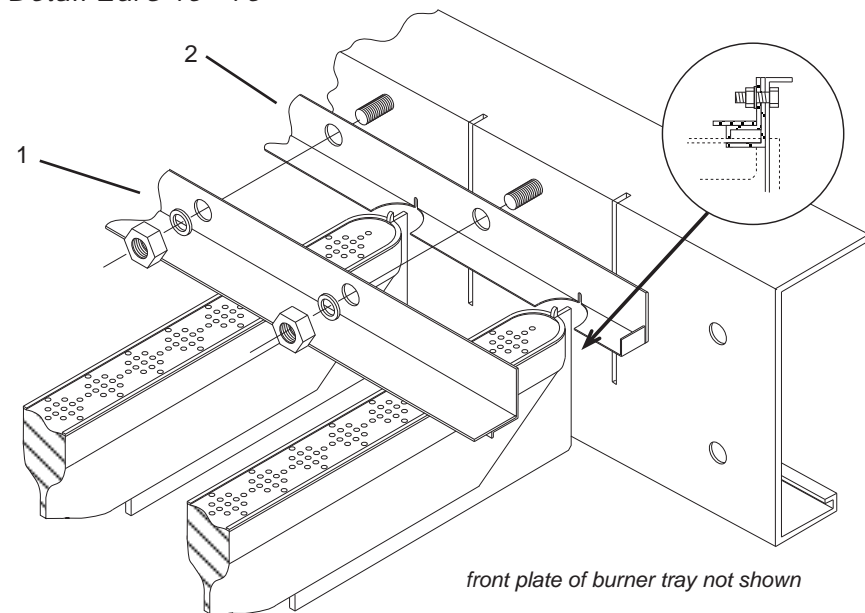


Fig 5 Cross Lighting Assembly Detail Euro 15 - 75



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, either at the side or the top of the unit as ordered, one for combustion air and the other for the products of combustion (See Section 2 Page 2). 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) and it is required to take the combustion air from the space being heated. In these instances a 90° bend with mesh inlet must be fitted to the air inlet socket.

The maximum permitted length of flue system is

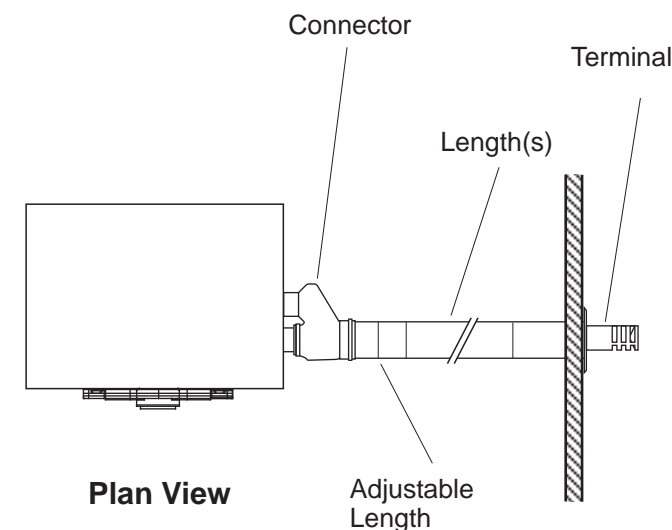
- i) for side outlet horizontal - 3m
- ii) for top outlet vertical - 4m
- iii) for top outlet horizontal (90° bends inc) - 3m

The maximum permitted length of flue outlet only is double the above lengths. If an offset is required two sets of 45° bends may be used each set being equivalent to 0.5m of flue length. The minimum flue length (end of flue terminal to back or top of heater) shall not be less than 1.0m for the Euro 15 - 60 and 1.3m for the Euro 75.

All outer joints must be finished with the provided locking bands. Application of a smear of silicon grease to the inside of sockets will assist in fitting components together. 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.

Euromatic Flue/Combustion Air Duct Options

Fig. 1a - Horizontal - Side Outlet



4.3.1 Installation of Flue System

4.3.1.1 Horizontal System - Standard (see Fig.1a and 1b)

1. Locate the position of the flue terminal, allowing for a slight gradient down to the heater (2° - 3°) and cut a hole to suit.
2. Fit the flue terminal, securing via the wall plate and weather with silicon sealant or similar.
3. Extend the concentric flue to the heater using straight lengths fitting an adjustable length prior to the connector, to facilitate flue disconnection for servicing. Fit connector to the heater inlet/outlet spigots ensuring that the connector spigot that is central to the concentric flue fits into the flue outlet socket. Extend the adjustable length to make the final connection. Do not exceed the maximum extended length so as to maintain joint integrity.
4. Ensure that internal silicon sealing rings are in place and that all tubes are pushed fully home. Secure concentric lengths with the locking band provided.

4.3.1.2 Horizontal System - Internal Combustion Air

1. Complete the run of flue sections from the terminal spigot to the flue outlet socket of the heater, ensuring that the internal silicon sealing rings are in place.
2. Fit a 90° bend to the combustion air inlet socket with the inlet facing to the front of the unit (top outlet) or downwards (side outlet).

4.3.1.3 Vertical System (see Fig.1c Page 8)

1. Locate the position of the flue terminal cut a hole in the roof to suit.
2. Fit the flashing and the the flue terminal so that the lower edge of the outer case is over the top of the flashing. Weather with silicon sealant or similar.
3. Extend the concentric flue to the heater using straight lengths fitting an adjustable length prior to the connector, to facilitate flue disconnection for servicing. Fit connector to the heater inlet/outlet spigots ensuring that the connector spigot that is central to the concentric flue fits into the flue outlet socket.

Fig. 1b - Horizontal - Top Outlet

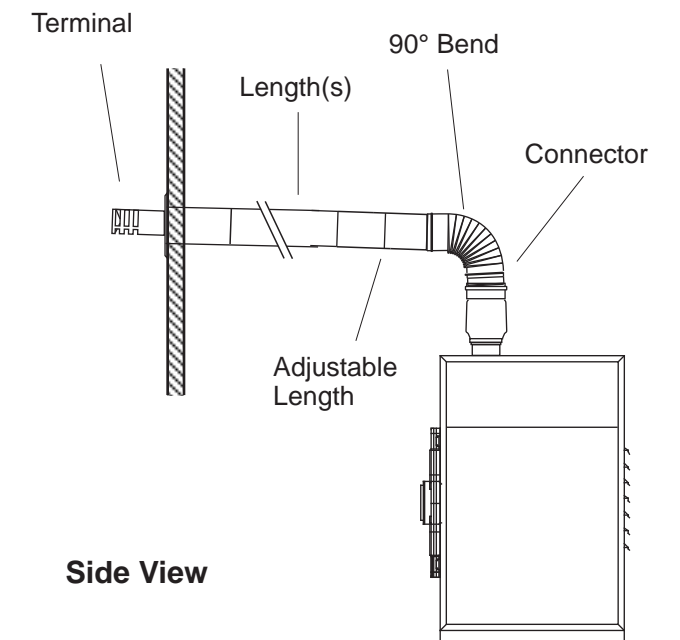
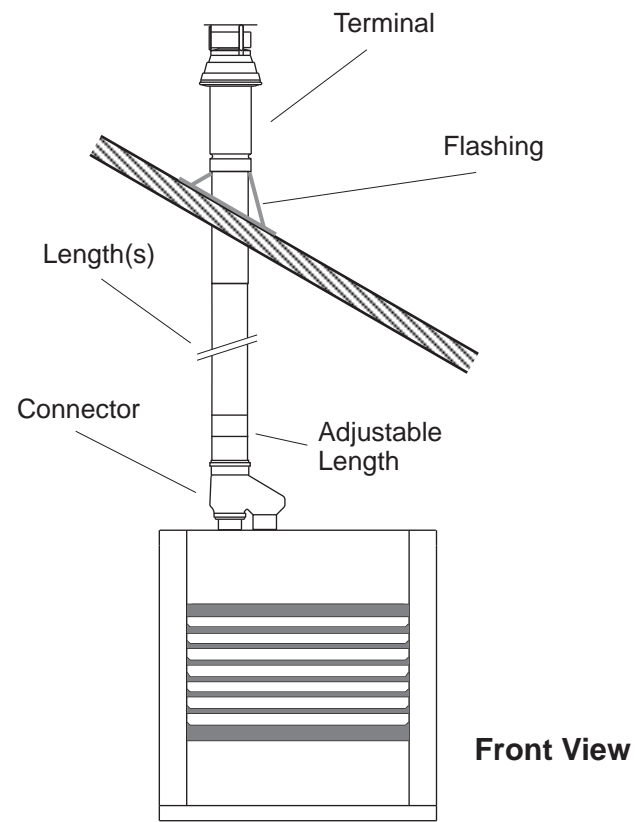


Fig. 1c - Vertical - Top Outlet



Extend the adjustable length to make the final connection. Do not exceed the maximum extended length so as to maintain joint integrity.

4. Ensure that internal silicon sealing rings are in place and that all tubes are pushed fully home. Secure concentric lengths with the locking band provided.

4.4 Gas Connection

To facilitate removal of the burner tray for servicing purposes 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 4) 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

Notes for all systems.

- i) Final overall length of adjustable disconnection piece must be between 360 - 415mm.
- ii) 45° offsets may be used if required. Each is equivalent to 0.5m of flue length.
- iii) Where Euromatic heaters are used in clean environments it is permissible to take the combustion air directly from the heated space. A 90° inlet bend, with mesh intake, must be fitted to the combustion air inlet.

movement system so that this is started in the same manner as the air heater fan would be.

A connection from heater terminal No 5 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 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 4) 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 2, (Page 3) 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) If a Eurotrol or Powtrol is being used 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. SHUT OFF

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

Fig. 2 Controls Location Euro 15 - 75

- 1) SIT 822 Nova M.F.C.
- 2) Gas connection (Rp $\frac{3}{4}$).
- 3) Viewing port.
- 4) Exhaust fan run on thermostat
- 5) Fan thermostat
- 6) Limit Thermostat reset button

