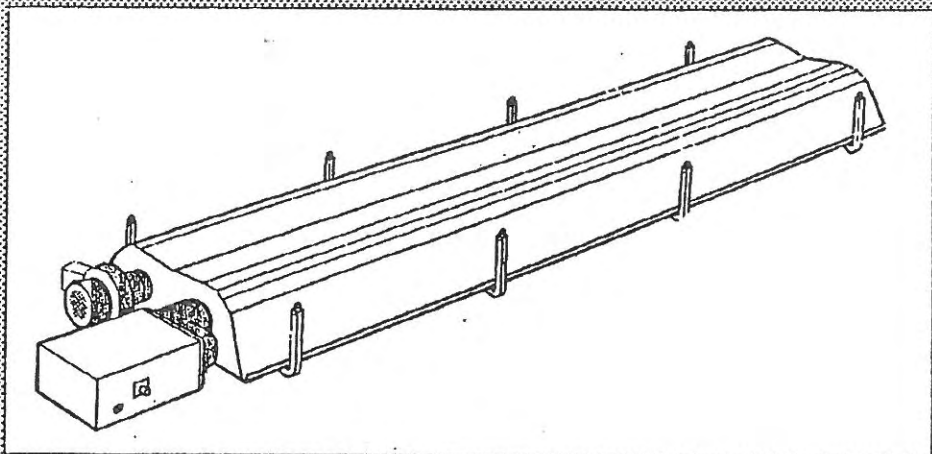


AMBI-RAD.
Energy Efficient Heating Systems



Sovereign

Model RB 18 & RB 30



Tested and Certified by British Gas for use on Natural Gas (G.C. No. 36 229 22) RB30,
and (GC No. 36 229 23) RB 18

USERS
|
INSTALLATION
|
AND
|
SERVICING
|
INSTRUCTIONS
|
MANUAL

IMPORTANT

This appliance is for use on Natural Gas or Propane as indicated on the Data Badge. It must be installed and serviced by a competent person as stated in the Gas Safety Installation and User Regulations 1984 (as amended).

Doc Ref: 133/2/94/01

INSTALLATION INSTRUCTIONS FOR AMBI-RAD MODEL RB 18 & RB 30 HEATERS

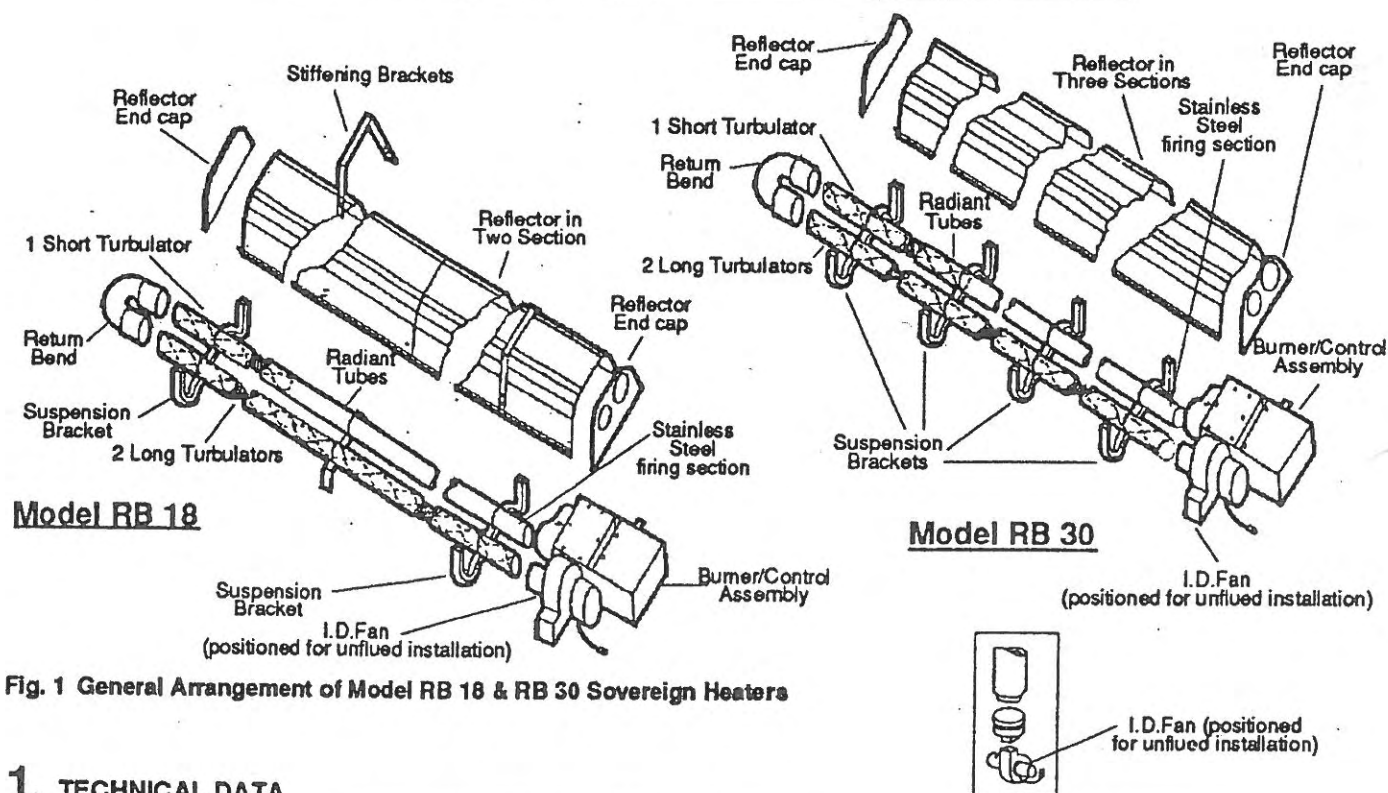


Fig. 1 General Arrangement of Model RB 18 & RB 30 Sovereign Heaters

1. TECHNICAL DATA

MODEL	RB 18		RB 30	
	Nat. Gas	Propane Gas	Nat. Gas	Propane Gas
Heat Input	19kW (61,420 Btu/h)	18 kW (61,420 Btu/h)	30.5 kW (104,070 Btu/h)	30.5 kW (104,070 Btu/h)
Nominal Gas Rate	1.69m³/h	0.70m³/h	2.86 m³/h	1.18m³/h
Gas Supply Connection	R ¹ / ₂ (¹ / ₂ in B.S.P. external)			
Electrical Supply	240v 1 phase 50 Hz			
Current Rating	0.55 amp max (inductive)			
Fuse Rating	Internal 1 amp		External 3 amp	
Ignition	Electronic programme start up with spark ignition			
Total Installed Weight	98 Kgs		107 Kgs	
Exhaust Flue (Optional)	125 mm (5 in.) Dia. Twin Wall			
Injector Size	3.8mm	2.4 mm	5.0mm	3.1mm
Electric Motor	Continuously Rated p.f. 0.6			
Fans	2550 rpm. Max. Permitted Flue Gas Temp. 280°C			

STANDARDS

The Ambi-Rad heater must be installed in accordance with the relevant provisions of the Gas Safety (Installations and Use) Regulations 1984 as amended. Due account should also be taken of any obligations arising from the Health and Safety at Work etc. Act 1974. In addition the installation must be carried out in accordance with the current I.E.E. Regulations, The Building Regulations, The Building Standards (Scotland) (Consolidation) Regulations, the requirements of BS. 5440:Part 1, BS.6891, BS. 6896 and any other relevant British Standards and Codes of Practice.

2. UNPACKING

Each radiant heater is supplied as follows:

MODEL	RB 18	RB 30
1 Stainless Steel composite firing tube	76mm (3 in.) outside dia. 4.63m (15 ft.2 / in.) long	100mm (4 in.) outside dia. 5.24m (17 ft - 2 / in.) long
1 return tube	76mm (3 in.) outside dia. 4.63m (15ft 2 / in.) long	100mm (4 in.) outside dia. 5.24 m (17 ft - 2 / in.) long
Short turbulator	1x1300 mm long	1x976 mm long
Long turbulators	2x2310 mm long	2x2600 mm long
Stainless steel reflectors	2 Only 2388mm (7ft 10in) long	3 Only 1855 mm (6ft - 1in) long
1 Carton containing	Burner control assembly. Induced draught fan. Return bend.	
1 Carton containing	Heater suspension brackets. 2 Reflector end caps and sundry components.	

3. ASSEMBLY

Support the emitter tubes on trestle preferably under the position of installation. Ensure tubes are clean internally and position tube weld away from reflector. The Stainless Steel burner section (marked with labels) to be positioned on the right hand side of the return tube when viewed from the burner end. Slip the suspension brackets onto the emitter tubes and position as per Fig. 2, for RB18 and Fig 3. for RB30, noting that bracket A as indicated to be assembled with an extra long threaded "U" bolt (see Fig. 4) to allow the stainless steel composite firing leg to expand. Tighten remaining "U" bolt nuts to secure the tubes within the brackets.

Before fitting the return bend locate the 3 turbulators into emitter tube, each flush with the end of the tube. If necessary bend the location stop to ensure a flush fit. Short turbulator - "U" bend end of firing tube. Long turbulators one either end of return tube. Slip return bend onto tubes with the two pinch screws facing downwards. Ensure that each emitter tube enters the bend fully.

Correct positioning of suspension brackets is **IMPORTANT** for satisfactory installation and operation of the heater. Incorrect positioning of the suspension bracket will give either too much or too little reflector overlap which is essential for linear thermal expansion of the heater. Tighten "U" bolts properly or excessive twisting force will be imposed causing damage to the heater.

NOTE: Brackets marked "A" see Fig 2. and Fig. 3 **MUST** be fitted with one standard "U" bolt and one extra long threaded "U" bolt. The extra long threaded "U" bolt to be located on the stainless steel firing tube as indicated and clamped in position by nuts either side of the bracket. See Fig. 4. A clearance **MUST** be provided around the tube to enable it to expand freely.

MODEL RB 18

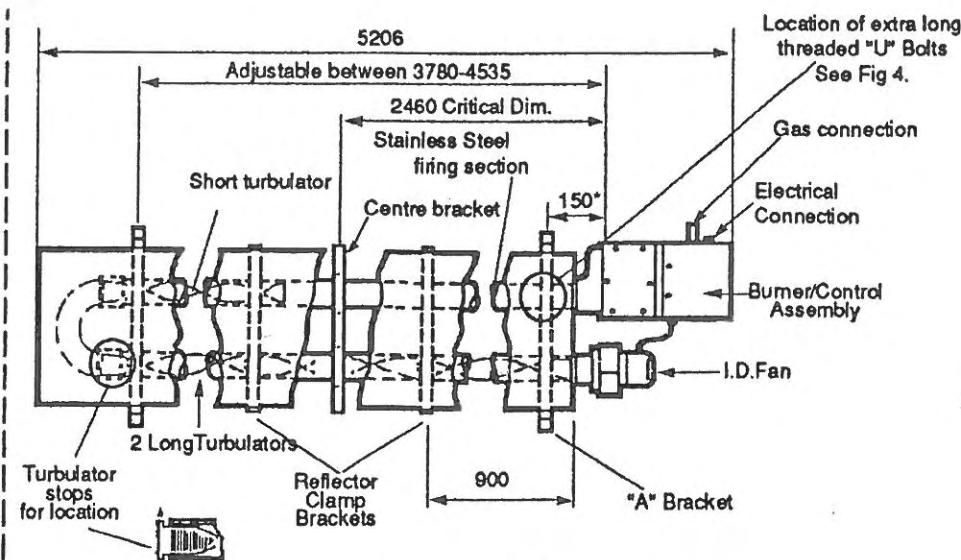


FIG. 2 Location of Suspension Brackets RB 18 (view from above)

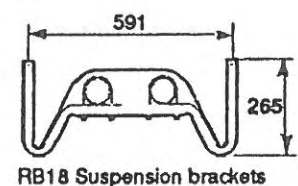


FIG 2.1

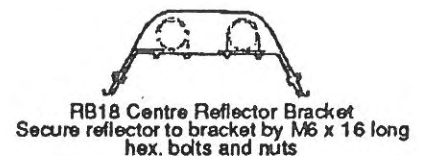


FIG 2.2

* This dimension from tube end, not burner

MODEL RB 30

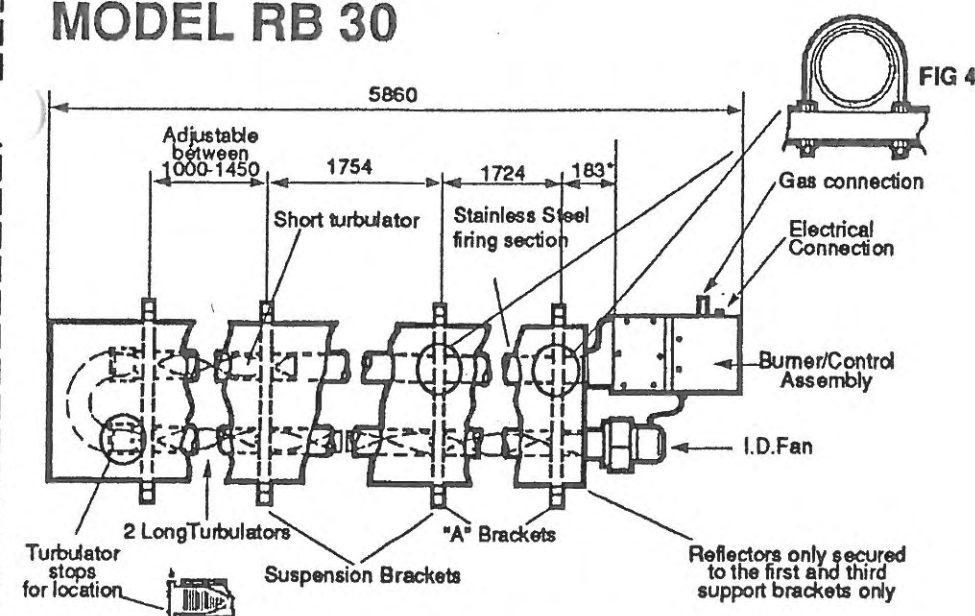


FIG. 3 Location of Suspension Brackets RB 30 (view from above)

* This dimension from tube end, not burner

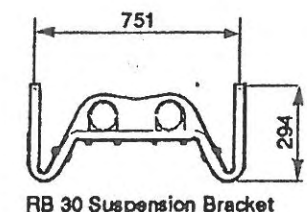
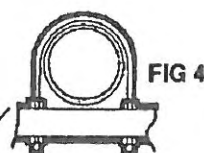


FIG 3.1



FIG 3.2 RB 30 ONLY

5mm Spacers to be located between reflector and support bracket and secured by M6 x 40mm long Hex. bolts and nuts on the first and third bracket ONLY

4. INSTALLATION

The hanging attachment to overhead steelwork etc. must be purpose made to good sound engineering practice or of a proprietary type fixing. They must be adequately fixed and designed to carry the whole weight of the heater and to permit free movement due to linear expansion. In the event of suitable roof steelwork not being available, additional steelwork should be fitted to enable vertical hangers to be used for suspending the heaters.

If there is any doubt as to the strength or suitability of roof steelwork to which heaters are to be suspended, please refer to Consultant/Architect/Client owner of the building.

MODEL	MOUNTING POSITION	RECOMMENDED MINIMUM MOUNTING HEIGHT	PREFERRED MOUNTING HEIGHT
RB 18	Horizontal Inclined/Wall Mounted	4.5 m (14 ft 9 in.))	4.8 m - 5.5 m (16 ft - 18 ft)* 4.2 m - 4.6 m (14 ft - 15 ft)
RB 30	Horizontal Inclined/Wall Mounted	5.2 m (17 ft) 4.3 m (14 ft)	6.1 m - 9.1 m (20 ft - 30 ft)* 4.6 m - 5.5 m (15 ft - 18 ft)

* Please refer to AMBI-RAD Design Office when mounting above these heights.

We recommend that at this stage the tube assembly is raised into position and suspended by its two end brackets only from previously fixed chains of 4 mm gauge galvanised welded link construction alternatively 10 mm diameter mild steel drop rods can be used. Although the heaters have been designed specifically for horizontal overhead mounting they may be inclined. The maximum angle of inclination from horizontal is 30°.

Note: Attachment to the heater bracket support lugs should be made by either a spring hook bolt and washers or in the case of drop rods, a formed hook and due allowance must be made for thermal expansion of the heater Model RB30 can be suspended by 1st and 4th brackets. It is recommended the heaters are installed with a slight fall to "U" bend end. Maximum 25mm (1 in.)

FIG. 4. TYPICAL & HANGING ARRANGEMENT

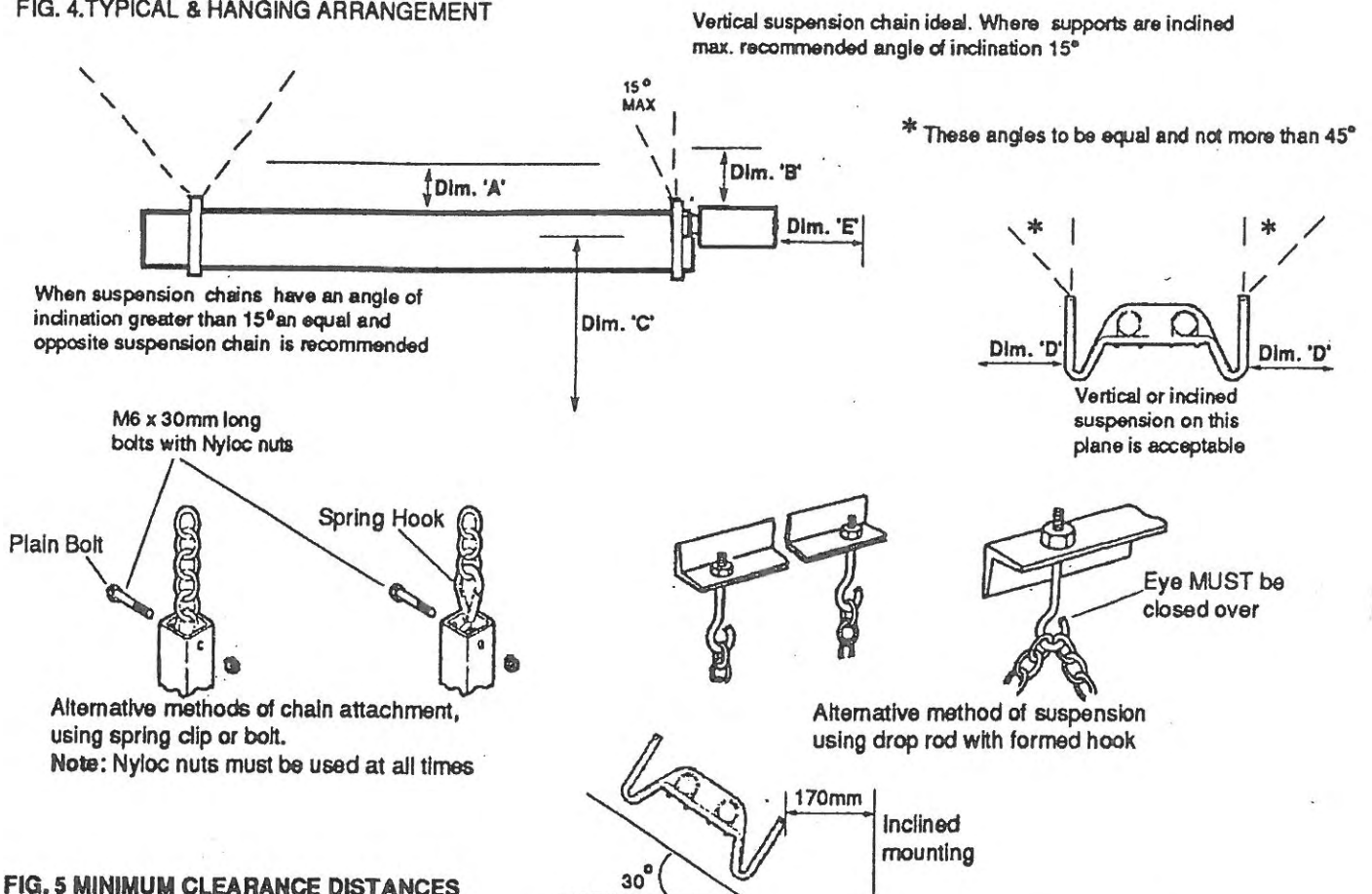


FIG. 5 MINIMUM CLEARANCE DISTANCES from combustible materials

MODEL (See Fig. 4)		RB18	RB30
ABOVE REFLECTOR	Dim 'A'	100mm	150mm
ABOVE BURNER/FAN ASSEMBLY	Dim 'B'	400mm	400mm
BENEATH EMITTER TUBES	Dim 'C'	2000mm	2100mm
TO THE SIDES OF HEATER	Dim 'D'	500mm	500mm
BACK OF BURNER ASSEMBLY	Dim 'E'	250mm	250mm

Remove the protective plastic film from the reflector surface. NOTE; When removing protective covering from reflector do not stand on the inside face of the reflector.

MODEL RB18

Place the reflector sections into the suspension brackets above the tube assembly with the punched holes to the centre of the heater. Align the punched holes with the holes in the centre reflector bracket and secure the two reflectors and bracket together with M6 x 16mm long bolts, nuts and washers. See Fig. 2.2. Place reflector stiffening brackets over reflector and secure with M6 x 16mm long bolts, nuts and washers through pre-punched holes. See Fig. 1

MODEL RB30

Each section of the reflector has two holes punched at one end. This end is to be firmly fixed by bolting to the suspension bracket. The other end of each reflector section is free floating in suspension bracket, thereby allowing for thermal expansion. Position the first reflector section and secure it with the M6 x 40mm long bolts, nuts and large washers provided to the suspension bracket nearest the burner with the square spacer between the reflector and bracket. See Fig.3.2. Position the second and third sections of the reflector so that they overlap with the punched holes in line with the holes provided in the third suspension bracket from the burner. Secure using M6 x 40mm long bolts, nuts and large washers passing through both reflector sections and square spacers.

MODELS RB18 & RB30

Fit reflector end caps and secure to reflectors using "U" clips and No. 8 x 3/8" long self tapping screws. Slide burner/control assembly onto the stainless steel section of the firing tube (right hand tube when viewed facing the open ends of the tubes) ensuring it is fully engaged on the burner tube and inside the reflector end cap by at least 50 mm and in the horizontal plane. Secure with pinch screws provided. Slide fan assembly onto left hand tube ensuring it is fully engaged and with fan discharge outlet facing vertically upwards if the heater is to be flued or horizontally away from the burner if unflued and secure with pinch screw provided. Insert three pin fan connection plug in socket on burner housing.

5. GAS CONNECTION

The gas connection on the AMBI-RAD heater is R¹/₂ (1/2in BSP external thread)

MODEL	RB 18		RB 30	
	Natural Gas	Propane Gas	Natural Gas	Propane Gas
Maximum supply pressure	30 mbar (12 in. wg.)	50 mbar (20 in. wg.)	30 mbar (12 in. wg.)	50 mbar (20 in. wg.)
Minimum supply pressure	16.5 mbar (6 in. wg.)	25 mbar (10 in. wg.)	16.5 mbar (6 in. wg.)	27 mbar (10.5 in. wg.)
Burner setting pressure	8.2 mbar (3.3 in. wg.)	23 mbar (9.2 in. wg.)	8.5 mbar (3.4 in. wg.)	24.8 mbar (9.9 in. wg.)

A gas meter is connected to the service pipe by the local Gas Region or local Gas Region contractor. An existing meter should be checked preferably by the Region to ensure that the meter is adequate to deal with the rate of gas supply required. Installation pipes should be fitted in accordance with BS6891: 1988 such that the minimum pressure at least as stated above will be achieved and any other British Standards and Codes of Practice. Pipes of a smaller size than the heater inlet gas connection should not be used. The complete installation must be tested for soundness as described in the above Standard.

It is recommended that installation pipes be blown out by compressed air before being installed or after installation but before heaters are connected.

The gas supply must not be in a position where it is subject to overheating.

As gas union service cock MUST be fitted in the gas supply close to the heater, but not onto the burner itself.

It is essential to provide some flexibility in the final gas connection by use of a tested and certified metallic hose to BS 6501: Part 1, 1984 (minimum acceptable quality Type B Class 1) or copper expansion loop. When stainless steel flexible hoses are used the hose should be connected in a 180 degrees bend without any strain or torsion. See Ambi-Rad leaflet Doc. Ref: 310.12.88

NOTE: Take care when making a gas connection to the heater not to apply excessive turning force to the internal controls.

6. ELECTRICAL CONNECTION

WARNING THIS APPLIANCE MUST BE EARTHED.

Supply 240 v 50 Hz Single Phase

Current Rating 0.55 amp max. (inductive)

Fuse: Internal 1 amp External 3 amp

All electrical work should be carried out to I.E.E. standard by a competent electrician.

The electrical connection to the heater is made by means of a three pin plug-in power connector.

Live Neutral and Earth connections should be made via a flexible supply cable to the power connector and routed clear of the heater or tubes. The flexible supply cable should be of 0.5mm² complying with BS 6500, 1975.

IMPORTANT

The wires in the mains lead are coloured in accordance with the following code:

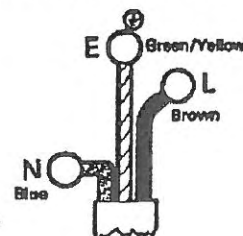
Green and Yellow - Earth
Blue - Neutral
Brown - Live

Instructions for connecting mains lead to plug:

Connect Green and Yellow to plug terminal marked E or Green or Green and Yellow.

Connect Blue wire to terminal marked N or Black or Blue

Connect Brown wire to terminal Marked L or Red or Brown.



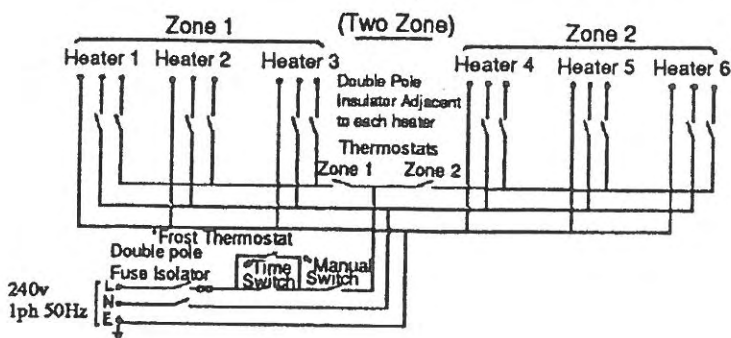
It is recommended that the electrical circuit controlling the heater or group of heaters incorporates thermostats, a time switch and if required manual control switches and a frost thermostat see Fig 5.

Important: All such controls and switchgear must be rated to handle the total inductive load of the circuit they control,

The inductive load per AMBI-RAD Model is given above. For large installations the use of relays or contractors should be considered. The method of connection the electricity supply must facilitate complete isolation and should be made via a fused double pole isolation having contact separation of a least 3mm in all poles and supplying the appliance only. Alternatively connection may be made via a fused three pin plug and unswitched shuttered socket both complying with the requirements of BS 1361.

Ensure that a copy of the lighting instructions plate is affixed adjacent to the electricity supply switch. Should this switch serve more than one heater it is only necessary to affix one copy per service switch.

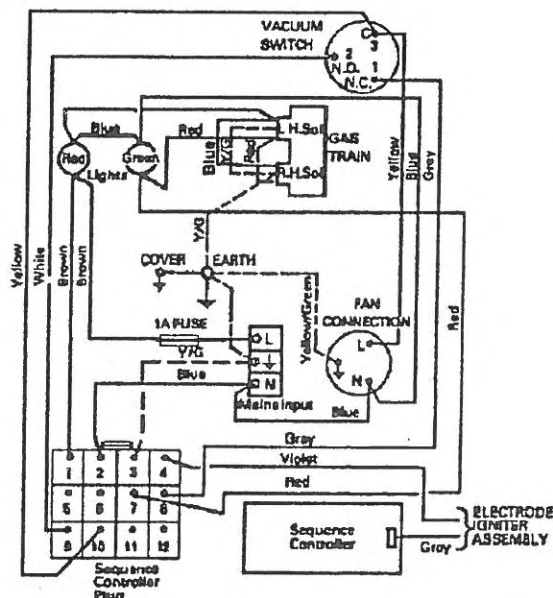
Fig. 5. Typical Wiring Diagram.



* Optional

Note for more comprehensive control arrangements see Ambi-Rad black bulb radiant thermostat and control panel leaflets

Fig. 6. Internal Wiring Diagram.



7. FLUE CONNECTION

7.1 Unflued Installation

The Ambi-Rad heater may be installed without flue to atmosphere providing the air supply and building ventilation requirements as stated in BS 6896: 1991 are complied with and providing due consideration is given to the possibilities of condensation forming on cold surfaces.

Permanent ventilation required is as follows:

Natural Ventilation (to be fitted at high and low level)

Low Level - When air change rate is less than $33 \text{ m}^3/\text{h}/\text{kW}$ of total rated input.

either 1.4 cm^2 for each $1 \text{ m}^3/\text{h}$ per kW
below $33 \text{ m}^3/\text{h}$ per kW
or $52 \text{ cm}^2/\text{kW}$ of total rated input

High Level - Above areas where personnel are working

- As above

Mechanical Ventilation

Minimum proven air flow

For detailed information please refer to AMBI-RAD Design Manual

If the heater is installed without a flue, ensure that combustion gases do not impinge on combustible materials. The maximum permitted temperature rise for such materials is 50°C (BS 7186)

- $33 \text{ m}^3/\text{h}/\text{kW}$ of total rated heated input

7.2 Flue Installation

The Ambi-Rad heater may be installed with a flue. A down-draught diverter (supplied as an optional extra by the manufacturer) must be fitted to the induced draught fan exit by means of the screws and clamp plates provided.

The diverter is designed to accept a 125mm (5in) nominal bore proprietary twin wall metal flue pipe complying with BS 715. The joint should be sealed with heat resistant caulking and faced off with fire cement. If single wall metal flue pipe complying with BS 715 is used then an adaptor will be required. A flue pipe should be adequately supported at regular intervals from the building structure and terminated externally with a British Gas Tested and Certificated terminal. The maximum flue length is 9m (30 ft) and maximum number of bends is two. All connections in the flue pipe must be properly sealed. Permanent ventilation is required as follows:-

Natural Ventilation (preferably at low level)

Upto and including 60 kW - $4.5 \text{ cm}^2/\text{kW}$

Over 60 kW - $270 \text{ cm}^2 + 2.25 \text{ cm}^2/\text{kW}$ in excess of 60 kW total rated input

Forced Ventilation

Minimum proven air flow - $2.35 \text{ m}^3/\text{h}/\text{kW}$ of total rated input

For detailed information please refer to AMBI-RAD Design Manual.

8. COMMISSIONING

Inspect installation and ensure that it has been carried out in accordance with these instructions. Ensure that electrical and gas supplies are isolated. The gas supply should be purged and tested for soundness in accordance with the BS 6891, BG IM/16 BGC Report IM/2 and any other British Standards and Codes of Practice.

Open Isolating gas valve.

Remove the combustion chamber cover plate by unscrewing 6 fixing screws. Take care not to damage the sealing gasket. Inspect the burner and electrode assemblies ensuring these are securely fixed and all electrical connections securely made. Replace the cover plate, ensuring that the sealing gasket is correctly positioned and the six screws are fully tightened. The heater will not operate until this plate is refitted.

Open the control housing cover door by unscrewing the 2 securing screws.

Ensure all internal components are securely fixed and all connections securely made.

Switch on the electrical supply to the heater and observe the correct start up sequence as follows.

The mains lamp will illuminate, the I.D. fan will start to run and the vacuum switch checking relay (inside flame electronic sequence control box) will pull in. Safe-start checks are carried out automatically and a purge period of approximately 9 seconds will commence. At the end of the purge period the ignition sequence will commence. The spark ignition will be energised producing a spark at the ignition electrode. The gas safety control valve will at the same time be energised.

If ignition is successful the flame is detected by the flame sensing probe and the ignition spark is switched off. The "burner on" (Amber) lamp indicates that the gas safety control valves are energised.

If ignition is unsuccessful the gas safety control valve is closed and the spark ignition de-energised after approximately 2 seconds. After an unsuccessful ignition attempt the electronic sequence controller will "lock-out" the "power" (Red) lamp only will remain illuminated and the fan will continue to run. To reset the "lock-out" condition switch off the power supply to the heater wait 15 seconds then restore it. If repeated lock-out occurs investigate cause. In the event of an electrical fault after installation of the appliance, preliminary electrical system checks should be carried out (re-earth continuity polarity and resistance to earth).

To shut down the heater, switch off the power supply to the heater. Automatic control of the heater or a series of heaters may be achieved by incorporating thermostats, time-switches, frost thermostats, manual over-ride switches etc. in the electrical supply to the heater(s) See Fig 6. It is essential to allow a delay of 15 seconds after switching off a heater before attempting to restart.

If at any time after completion of the start up sequences, loss of flame should occur the electronic sequence controller will attempt to re-ignite. If this is unsuccessful lock-out will occur.

Set burner gas pressure as follows: Isolate gas supply. Unplug mains input connector to heater. Remove pressure test point screw and connect a "U" tube manometer to the pressure test nipple located on the body of the gas valves. Remove the slotted cover from the pressure test regulator revealing the adjustable screw. Replace mains input connector, reconnect gas supply and start the heater. Using a suitable screwdriver adjust the pressure regulator, turning the screw clock-wise to increase the pressure or anti-clockwise to decrease the pressure. Set the burner pressure to the required figure given in Section 5. Switch off the heater by pulling out the mains input connector. Disconnect "U" Tube manometer and refit screw in pressure test nipple. Replace cover on pressure regulator. If heater is flued check that flue product do not spill from the draught diverter e.g. by means of a smoking taper when heater is running.

Check the operation of the flame safeguard equipment as follows: With the heater running normally switch off the gas supply at the appliance isolating valve. Observe that the "burner-on" lamp extinguishes within one second. After a purge period of approximately 9 seconds the heater should attempt to re-light and if the gas isolating valves have been left off lock-out should occur indicated by power light only being illuminated and fan running.

Check the operation of the vacuum proving switch as follows with the heater running normally pull out the three pin fan connection plug thus causing the fan to slow down and stop. Within 3 seconds the burner should shut off. Observe for at least 20 seconds that there is no attempt to re-ignite. Then replace the three pin plug and observe that the heater proceeds to ignite in the normal way.

Close the Safety Control housing lid which is secured with the 2 fixing screws.

Disconnect valve coils in turn and ensure heater does not ignite and goes to lockout.

Hand the Users Instructions to the user and explain how to operate the heater.

Leave the Installation and Servicing Instructions at the users meter or preferably with the service/maintenance engineer/manager for use on future service calls.

Note: It will be noted that the emitter tube has a tendency to bow when hot, this is normal and quite acceptable.

9. SERVICING INSTRUCTIONS

Under normal working conditions, it is recommended that the AMBI-RAD heater has a routine service once per year. In exceptionally dirty or dusty conditions such as may occur in a foundry more frequent servicing may be desirable. Servicing work should be carried out by a qualified gas servicing engineer.

IMPORTANT

1. Never rest anything, especially ladders against the heater
2. Isolate gas and electrical supplies before commencing any servicing work or component exchange.
3. Unless otherwise instructed, re-assemble parts in reverse order to the instructions given below.
4. Always test for gas soundness with a suitable leak detection fluid after completing any service or exchange of gas carrying components.

10 ROUTINE SERVICE

10.1 ID Fan

Remove ID fan by unplugging its electrical connection from the burner/control assembly and slackening the fan securing pinch screw. If a flue fitted this must also be disconnected. The fan will now slip off the emitter tube.

Inspect the main fan impeller and remove any dust by brushing with a soft brush. Similarly remove any dust from the finger guard covering the secondary (cooling) impeller and the mesh aperture in the motor cover. Ensure that the impeller turns freely and that there is not excessive play in the bearings. Do not replace fan until emitter tube inspection has been completed.

10.2 Emitter Tube Inspection

Brush away any dust on the exterior of the emitter tubes.

Inspect the emitter tube internally. If there is any appreciable build up of dust or deposits the tubes should be cleaned internally. Remove the burner/control assembly as directed in 10.4 below.

Detach return bend by releasing the 2 pinch screws and remove the turbulators. The two tubes can then be cleaned by passing rods and a suitable

10.3 Reflector

Although not considered part of an annual routine service, the condition of the reflector should be noted and the users attention drawn to any cleaning necessary. The reflectors can be simply withdrawn for cleaning by removing the M6 nuts and bolts and washers securing them and lifting them out of the suspension brackets once the reflector end caps have been removed. A mild non abrasive metal polish may be used in cases of extreme discolouration. The reflectors can be cleaned with a soft cloth and detergent in water. Dirty reflectors will increase the heat radiation upwards into the roof space by 3-4%.

10.4 Removal of Burner/Control Assembly

Remove the burner/control assembly by disconnecting the gas and electrical supply, and the fan electrical connection. Slacken the burner fixing pinch screw and draw the assembly off the emitter tube.

10.5 Burner/Electrode Assembly.

Remove the burner/control assembly as directed in 10.4 above. Remove the six M5. screws securing the combustion chamber plate on top of the combustion chamber. Taking care not to damage the sealing gasket. Remove the burner head by unscrewing it from the injector, taking care not to drop it onto the electrode assembly and leads.

Renew the electrode assembly if it is not in good condition.

The assembly is removed by removing two M4 screws which attach it to the floor of the combustion chamber. The assembly is then lifted out of the combustion chamber and the two connection cables disconnected.

If the electrode assembly is in good order check the spark electrode gap. This should be $3.5\text{mm} \pm 0.5\text{mm}$. Adjust the gap if necessary by bending the earth rod. Refit the electrode assembly in the reverse order of removal, ensuring that the electrical connections to the assembly are the correct way round and secure.

Inspect the injector and clean as necessary do not broach out. To remove or replace the injector with the burner head removed. Unscrew the injector from its carrier using a spanner on the hexagon portion of its body. When replacing the injector ensure that it is fully tightened in its carrier.

Replace the burner head. Replace the combustion chamber plate cover, renewing the sealing gasket. Part No.3465 if this is not in good condition. Inspect the air inlet and ensure this is not liable to obstruction.

Replace the burner/control and fan assemblies engaging them fully on their tubes and secure by tightening the pinch screws ensuring that both items are squarely and neatly positioned. The burner should be positioned horizontally and the fan discharge should face vertically upwards for flued heaters or horizontally away from the burner for unflued heaters as detailed in Fig 1. of these instructions.

Re-commission the heater by following the procedure for commissioning as per section 8. taking care to check that the burner gas pressure is correctly set to that indicated on the data badge and that the vacuum switch and flame safeguard equipment function correctly.

10.6 Auxiliary Controls

Check that auxiliary controls such as room thermostats, switches, frost thermostats, etc function correctly and set to operate at the desired temperatures. Ensure that the user is aware of the functions of the auxiliary control and their correct settings. For the most efficient operation of the heating system the time switch if fitted should be set to switch on normally between 1/4 hour and 1 hour before commencement of the occupation of the building, depending on local conditions. The correct setting of the room thermostat can only be determined by experience in cold weather when it should be set to shut off the heaters when a comfortable level of warmth has been achieved. This setting will normally be several degrees below that which would be required with a convective heating system.

11. REPLACEMENT OF COMPONENTS

Warning: Isolate gas and electrical supplies before carrying out any repair work. Always test for gas soundness with a suitable leak detection fluid.

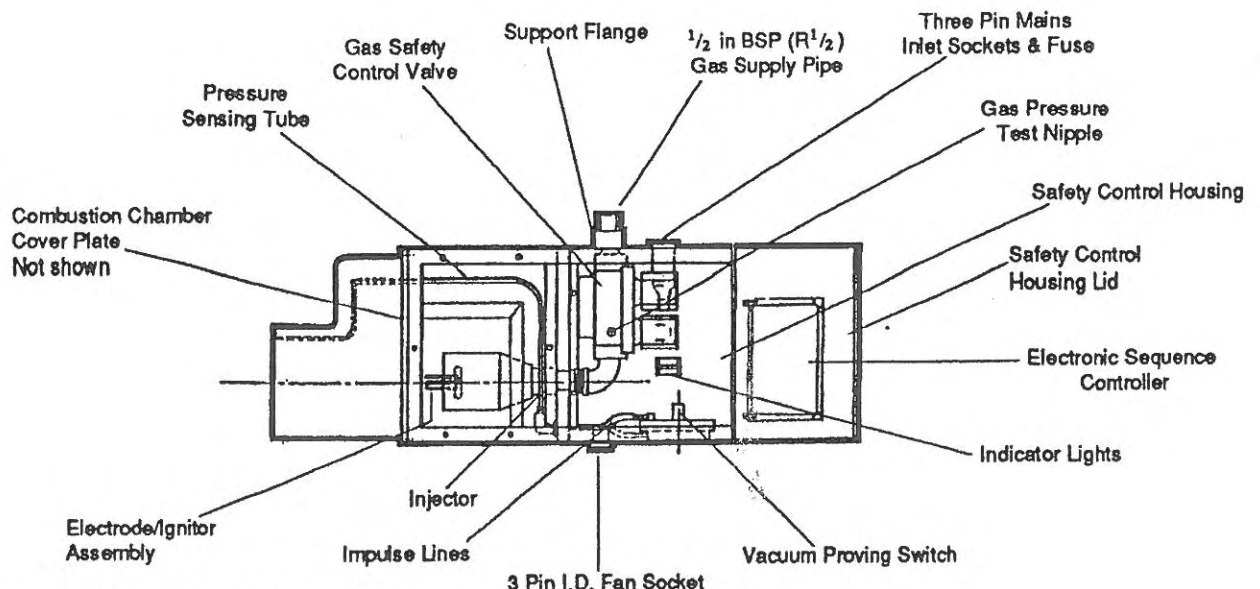


Fig. 7 Layout of Gas Controls (Viewed from Above Burner/Control Assembly)

11.1 To Replace ID Fan

Remove ID fan connecting plug from the burner control assembly. Disconnect flue if fitted. Slacken pinch screw securing fan to emitter tube. Draw fan off tube. Remove three M5 screws securing fan support to fan casing. Refit Support flange to new fan with the pinch bolt facing in the same direction as the fan outlet. Refit the fan to the heater ensuring that the fan discharge faces vertically upwards for flued heaters or horizontally away from the burner for unflued heaters as detailed in Fig 1 in these instructions.

11.2 To Replace Any Components In The Burner/Control Assembly

This assembly should be removed from the heater by first disconnecting the gas and electrical supplies, and the fan electrical connection. Slacken the securing pinch screw and draw the burner/control assembly off the emitter tube. When refitting the burner Assembly to the heater ensure the box is horizontal.

11.3 To Replace Electrode Assembly

Remove top cover of combustion chamber by removing the six dome headed fixing screws taking care not to damage the gasket. Remove the M4 screws securing the electrode assembly and pull off the two electrode cable connectors. Re-connect the cable connectors to the new electrode assembly (the two connectors are non interchangeable) and refit the electrode assembly (See 10.5) Refit the combustion chamber cover plate and sealing gasket. Replace the sealing gasket if this is damaged.

11.4 To Replace the Burner Head.

Remove combustion chamber cover as in paragraph 11.3 Unscrew burner head from injector taking care not to drop it onto the ignition leads. Refit new burner head and replace combustion chamber cover plate replacing the gasket if this is damaged.

11.5 To Replace the Injector

Remove burner heads as in paragraph 11.4 Unscrew injector from its carrier using a spanner on the hexagonal portion of its body. When replacing the injector is fully tightened in its carrier. See technical data for correct injector size.

11.6 To Replace Gas Safety Control Valve (double solenoid and governor Models Honeywell and Black/Teknigas)

Remove combustion chamber cover as in paragraph 11.3 Remove control housing cover by removing the two dome headed fixing screws. Remove burner head as in paragraph 11.4 Remove 2 screws holding inlet gas connection supply support plate and remove.

Disconnect the gas valve electrical connection marking each connection. The gas valve and injector can now be removed as an assembly. Using an approved pipe joining compound on pipe threads refit the pipe fittings onto the replacement control valve. Replace the control valve into the control housing. N.B. Refit burner onto injector holder before tightening inlet support plate screws. Carry out commissioning (section 8) setting the burner pressure to that indicated on the data badge. Note: Insulated in line connectors are used on Black/Teknigas control valve.

11.7 To Replace The Electronic Sequence Controller

Swing open the safety control housing cover by unscrewing 2 screws. Disconnect the electrical connector on the side of the electronic sequence controller. Unplug the single grey high tension lead from the electronic sequence controller. Remove the two bolts securing the sequence controller to the control housing door and replace the sequence controller using a high tension lead (grey) from an old controller unless its insulation is damaged. When refitting the Pactrol sequence controller take care that the rear flanges of the sequence controller is correctly located underneath the retaining lip in the door of the control housing (Pactrol P16DIA only). Refit the two bolts and electrical connector into the sequence controller and high tension leads into its connector

11.8 To Replace the Vacuum Proving Switch

Disconnect the 2 Silicon rubber tube connections at the vacuum switch. Disconnect the three push on connectors from the vacuum switch. Remove the two screws securing the vacuum switch and slip the vacuum switch out of the control housing. Refitting is a reversal of the above taking care to correctly re-connect the three cables See Fig. 9 & 10 below

11.9 Replace Fuse

Withdraw fuse carrier which is located directly underneath the main electrical input socket, slip the old fuse from the carrier and replace with a new fuse of 1 amp rating.

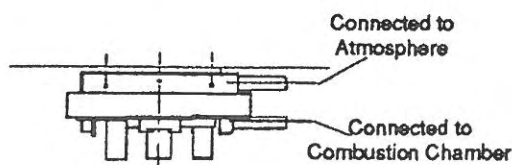
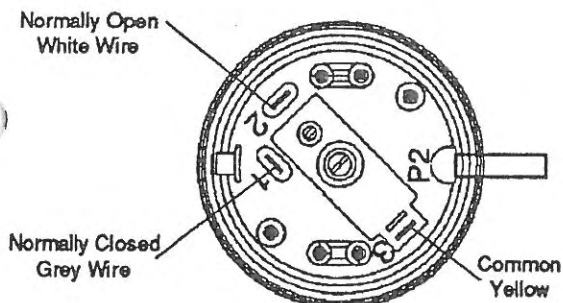
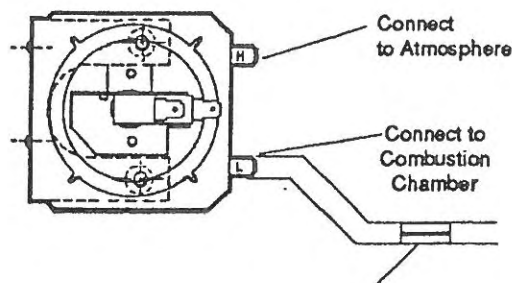


Fig 9. Beck Vacuum Proving Switch



Note: Additional Restrictor only fitted to Honeywell Switch

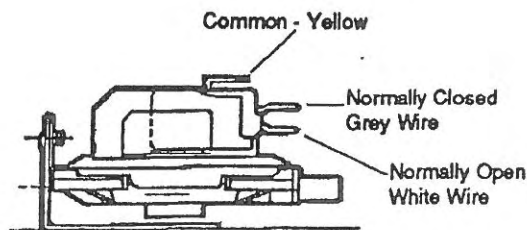


Fig 10. Honeywell Vacuum Proving Switch

SPARE PARTS LIST

RADIANT HEATER MODEL RB 18 & RB 30

Part No:	Description
1165	Emitter Tubes per length, Composite Tube, 76mm dia (3in) - Burner - RB 18 Emitter Tubes per length MS, 76mm dia (3in) - FAN - RB 18 Emitter Tubes per length SS. Composition 100mm dia. (4in) Burner RB 30
1175	Emitter tubes per length M.S. 100mm dia. (4in) Fan RB 30
1330	Reflector 7ft 10in section RB 18
1335	Reflector 6ft 1in section RB 30
FRB 18-UK	ID Fan Assembly RB 18
FRB 30-UK	ID Fan Assembly RB 30
FER-UK	ID Fan
2190	Honeywell Vacuum Proving Switch
2015	Beck Vacuum Proving Switch
2016	P16DIA Electronic Sequence Controller
2032	Vernitron 22508/005 Electronic Sequence Controller
2046	Black/Teknigas Twin Gas Safety Control Valve
2125	Honeywell Twin Gas Safety Control Valve - Natural Gas Honeywell Twin Gas Safety Control Valve - Propane Gas
2140	Mains Input Connector and Flexible Cable
3459	Fuse 1A Red and Amber Lamp 240/220v H.T. Lead Ignition Lead Rectification Lead
BRB 18 NUK	Burner Assembly RB 18 Natural Gas
BRB 30 NUK	Burner Assembly RB 30 Natural Gas
BRB 18 PUK	Burner Assembly RB 18 Propane Gas
BRB 30 PUK	Burner Assembly RB 30 Propane Gas
3175	Electrode Ignition/Assembly
3035	Open Port Burner Head RB 18 & RB 30
2290	Burner Injector 3.8 mm dia. RB 18 Natural Gas
2291	Burner Injector 5.0 mm dia. RB 30 Natural Gas
2281	Burner Injector 2.4 mm dia. RB 18 Propane Gas
2292	Burner Injector 3.4 mm dia. RB 30 Propane Gas
3480	Burner Injector Carrier
3465	Burner Gasket
6586	Impulse Line Assembly Suspension Brackets RB 18 Suspension Brackets RB 30
6587	Centre Bracket RB 18
6588	Stiffening Brackets RB 18
3036	"U" Bend 190 mm dia RB 18
3099	"U" Bend 300 mm dia. RB 30

NOTE

When ordering spare parts - please order replacement items identical to that item being replaced.

TROUBLE SHOOTING CHECK LIST

Symptoms	Possible Causes	Remedy
1 BURNER WILL NOT START		
1.1 Red "Mains On" light does not illuminate	a. External controls, thermostat, time switch etc, not calling for heat.	Adjust controls
	b. Fuse blown	Check for short circuit in wiring or individual electrical components.
1.2 Red light illuminates	a. Fan connector plug not fully engaged.	Engaged securely
	b. Loose electrical connection.	Check all connections.
	c. Fan siezed or burnt out.	Replace fan, re-commission heater especially checking gas pressure setting. Check 1.2e below if satisfactory replace sequence controller.
	e. Vacuum switch not returning to normal (switched off) position.	Replace vacuum switch.
1.3 Fan starts but burner does not attempt ignition.	a. Insufficient vacuum generated by fan	Clean fan blades with soft bristle brush.
	b. Blocked emitter tube	Clean emitter tube internally
	c. Combustion chamber cover permitting air inleakage.	Examine condition of gasket, tighten down lid securely.
	d. Vacuum impulse line between combustion chamber and vacuum switch insecure or defective.	Fix securely or replace.
	e. Vacuum switch does not "pull in"	Replace vacuum switch.
	f. Vacuum switch "pulls in" but electronic sequence controller does not proceed to programme ignition sequence.	Replace burner sequence controller unit but first check that the cause of failure is not a short on output circuit, by measuring resistance between pins 2 and 7 of burner control unit plug. A reading of less than about 10,000 OHMS indicates short circuit on gas valve burner indicator light or associated wiring.
1.4. Burner Control proceeds to ignition state (normally indicated by audible spark gas valve energised and "burner on" light illuminated) but burner does not light.	a. No Spark	Check electrode for cracks - replace if necessary. Check high tension - connections are secure. Check spark gap $3.5 \pm 0.5\text{mm}$. If no high tension output from electronic replace controller.
	b. One or both gas safety control valve coils burnt out or defective.	Replace solenoid operator section of gas valve.
	c. Insufficient gas pressure.	Set burner pressure to that indicated on the data badge.
	d. Burner injector blocked.	(see commissioning instructions). Clean burner injector.
2. BURNER LIGHTS BUT SHUTS DOWN AFTER A FEW SECONDS.	a. Indadequate flame signal. This can be verified by connecting a sensitive micrommeter in series with the pink wire which passes through the combustion chamber bulkhead. The correct reading should be $5\mu A \pm 1\mu A$.	Replace flame electrode. Check connections to electrodes and terminal 4 of electronic sequence controller plug. Replace the electronic sequence controller.
	b. Flame unstable	Check cleanliness of burner and set burner pressure as per section 5. C.
	c. Inadequate gas supply. Observe burner gas pressure with all heaters operating.	If gas pressure drops below that indicated on the data badge. Examine gas supply pipework for excessive pressure loss.
	d. Insufficient vacuum at combustion chamber causing vacuum switch to cut off.	Clean fan blades with soft bristle brush. Inspect tube internally and clean if necessary (see servicing instructions)
3. HEATER SHUTS DOWN AFTER OPERATING	Refer to 2a and 2d.	If problem persists, replace vacuum switch.

USERS INSTRUCTIONS FOR AMBI-RAD MODEL RB 18 & RB 30 SOVEREIGN HEATERS

AMBI-RAD is an overhead radiant heating system for industrial and commercial buildings. The AMBI-RAD heater is suspended horizontally overhead from the roof or inclined mounted up to 30° from the horizontal and heats by radiation in the same way as the sun.

IMPORTANT

1. This appliance must only be installed by a competent person in accordance with the requirements of the Gas Safety (Installation & Use) Regulations 1984 and The Health and Safety at Work etc. Act 1974.
2. **THIS APPLIANCE MUST BE EARTHED**
3. Never rest anything especially ladders, against the heater.

To Start the AMBI-RAD heater:

1. First ensure that the gas supply to the heater is turned on.
2. Ensure that the settings of any time-switch and thermostat are such that the heating system will be required to operate.
3. Switch on electrical supply to heater. Mains light, coloured red, will illuminate and ignition sequence will commence.
4. After completion of an air purge period, ignition of the burner will occur and burner light, orange will illuminate.
5. If ignition attempt fails, burner sequence controller will lock out with mains light only illuminated.
6. If lock out occurs switch off electrical supply, wait 15 seconds then switch on again. If lock out occurs again switch off heater and call service engineer.

N.B. Heater will have tendency to bow when hot, but this is quite acceptable.

To Switch off AMBI-RAD heater.

Switch off electrical supply to the heater. The burner will shut off and the fan will stop. If the heater is switched off for periods in excess of one week it is highly recommended that both gas and electrical supplies are turned off.

Servicing:

To ensure continued efficient and safe operation it is recommended that the heater is serviced regularly by a competent person eg. every year in normal working conditions but in exceptionally dusty or polluted conditions more frequent servicing may be required. The manufacturers whose address is given below offer a maintenance service, details available on request.

AMBI-RAD.
Energy Efficient Heating Systems

Fens Pool Avenue, Wallows Industrial Estate
Brierley Hill, West Midlands. DY5 1QA
Tel: 01384 489700 Fax: 01384 489707
Sales Office Fax: 01384 489717

Because of our policy of continuous development Ambi-Rad Limited reserve the right to vary the equipment specifications without notice