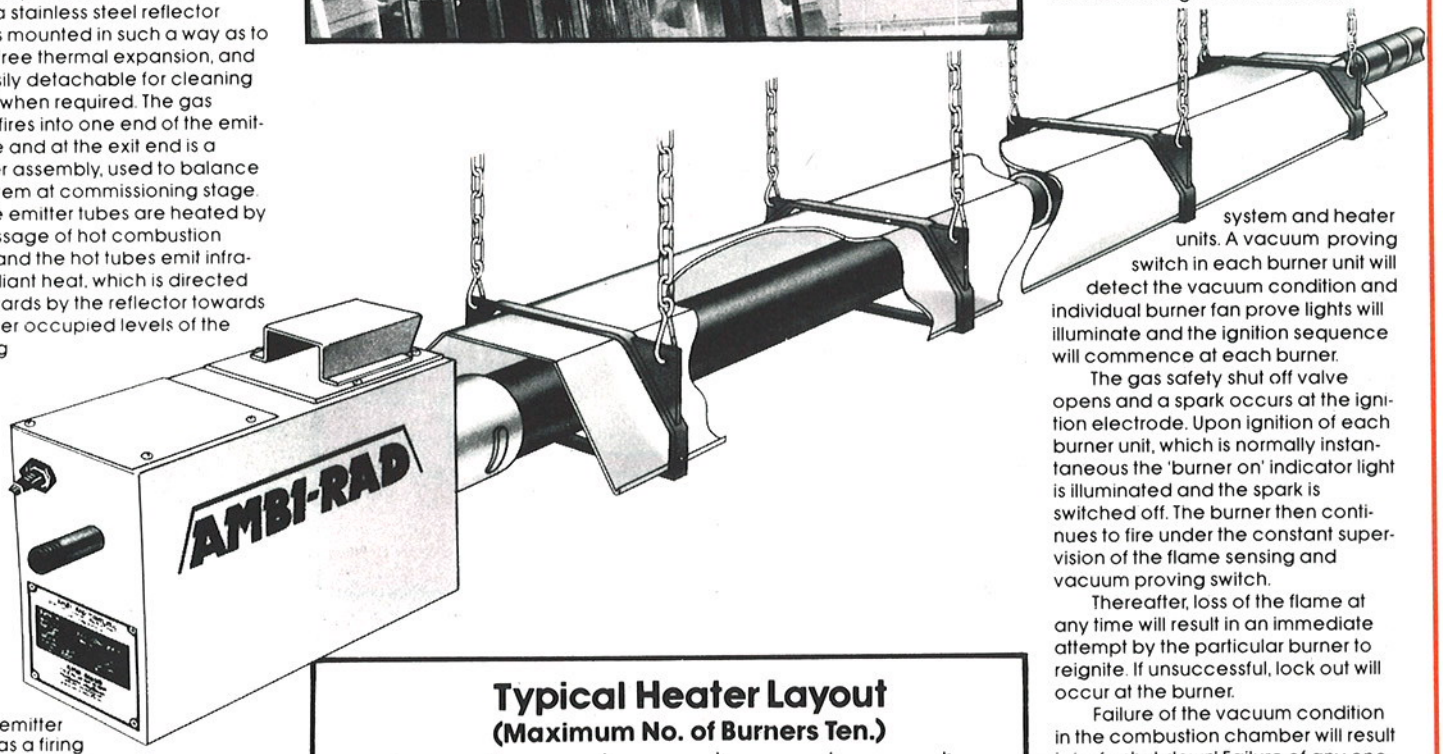
The Ambi-Rad Herringbone Heater

AMBI-RAD produces a range of overhead heating systems designed for industrial, commercial and other large buildings. Heaters are mounted at high level, suspended from chains or wall brackets and are available in various thermal ratings and configurations.

The AMBI-RAD 'Herringbone' system comprises a network of up to ten heater units, each having an automatic gas burner and each discharging its combustion gases into a common vacuum manifold system or heater. A single vacuum fan extracts the combustion gases from the manifold and discharges outside the building.

Each heater unit incorporates a single linear emitter tube supported in four suspension brackets and below a stainless steel reflector which is mounted in such a way as to permit free thermal expansion, and are easily detachable for cleaning as and when required. The gas burner fires into one end of the emitter tube and at the exit end is a damper assembly, used to balance the system at commissioning stage.

The emitter tubes are heated by the passage of hot combustion gases and the hot tubes emit infra-red radiant heat, which is directed downwards by the reflector towards the lower occupied levels of the building.



The emitter tube has a firing section in stainless steel with the remainder in mild steel and has a heat resistant black coating.

The burner assembly, mounted on the firing end of the heater incorporates two compartments. There is a combustion chamber in which are located the burner and the ignition and flame sensing electrode assembly. Attached to the combustion chamber is a totally enclosed housing which contains the burner control components including the gas safety shut off valve, gas pressure regulator, electronic sequence controller, vacuum proving switch and its checking relay. The vacuum switch monitors vacuum conditions via an impulse line from the combustion chamber.

The damper assembly is a robust aluminium casting with adjustable damper blade and is mounted on the outlet end of the emitter tube.

Upon commissioning the heater, the damper blade is adjusted to give correct vacuum levels in the combustion chamber and locked into position.

Any number from two to ten heaters can be incorporated in the Herringbone heating system.

The heaters are linked together by a lightweight easily installed and unobtrusive aluminium manifold system and connected to a central vacuum fan which is in turn vented to the outside either by a vertical 150mm (6in) flue pipe or horizontally through a wall via an adjustable wall louvre.

OPERATION

When an electrical supply is switched on to the system, either manually or via a time switch or thermostat. The vacuum fan will start and run up to speed and create a vacuum throughout the manifold system and heater units. A vacuum proving switch in each burner unit will detect the vacuum condition and individual burner fan prove lights will illuminate and the ignition sequence will commence at each burner.

The gas safety shut off valve opens and a spark occurs at the ignition electrode. Upon ignition of each burner unit, which is normally instantaneous the 'burner on' indicator light is illuminated and the spark is switched off. The burner then continues to fire under the constant supervision of the flame sensing and vacuum proving switch.

Thereafter, loss of the flame at any time will result in an immediate attempt by the particular burner to reignite. If unsuccessful, lock out will occur at the burner.

Failure of the vacuum condition in the combustion chamber will result in 'safe shut down'. Failure of any one burner will not normally affect the safe operation of the remaining system.

MOUNTING

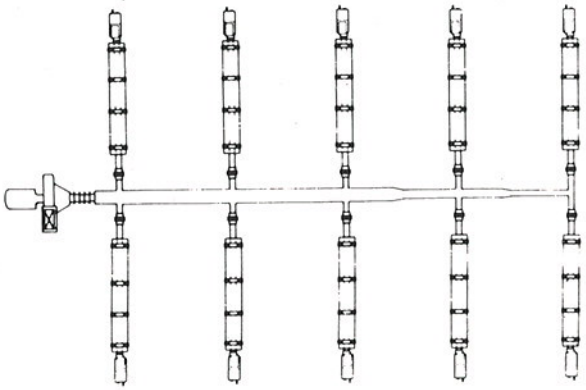
The heaters are designed for horizontal overhead mounting from either drop rods or chain or may be inclined on wall mounted brackets to give an angle of inclination of up to 55° from the horizontal.

Minimum ventilation in accordance with B.S. 5440 Pt. 2 must be provided as indicated overleaf.

When the heaters are to be installed in locations where there is airborne dust or polluted atmosphere a ducted fresh air supply may be provided to the combustion chamber. Maximum length of fresh air duct is 7m (23ft) with a maximum of two bends.

The 'Herringbone' combined flue heating system is supplied as a complete package and if required will be designed by AMBI-RAD to suit the heating application.

Typical Heater Layout
(Maximum No. of Burners Ten.)



MODEL HB22 Herringbone

doc ref 064/4/90

Technical Data and Specification

Heat input:
22kW (75,000 Btu/hr)

Combustion efficiency:
84-90%

Combustion air intake (optional)
100mm (4in.) dia.

Damper assembly outlet:
77mm ($3^{1}/_{16}$in.) dia.

Ignition:
Electronic programmed start up with spark ignition.

Emitter tube (outside dia.):
76mm (3in.) dia. burner end, stainless steel, gauge 1.6mm exhaust/damper end, mild steel, gauge 3.65mm

Reflectors:
22 swg, type 430 stainless steel.

Support brackets:
Mild steel

Total weight:
88 Kg (197lb.)

Exhaust manifold:
Pure aluminium gauge 1.2mm

Vacuum fan weight:
10.5Kg. (23lb.)

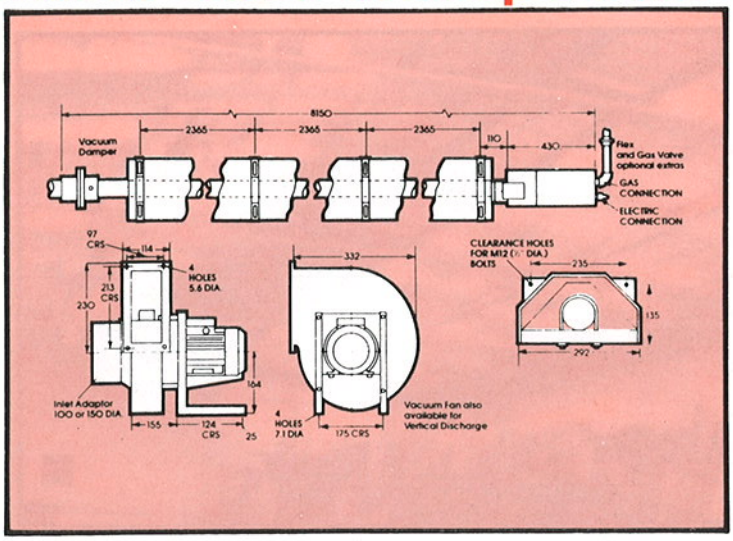
Exhaust flue outlet (round)
150mm (6in. dia.)

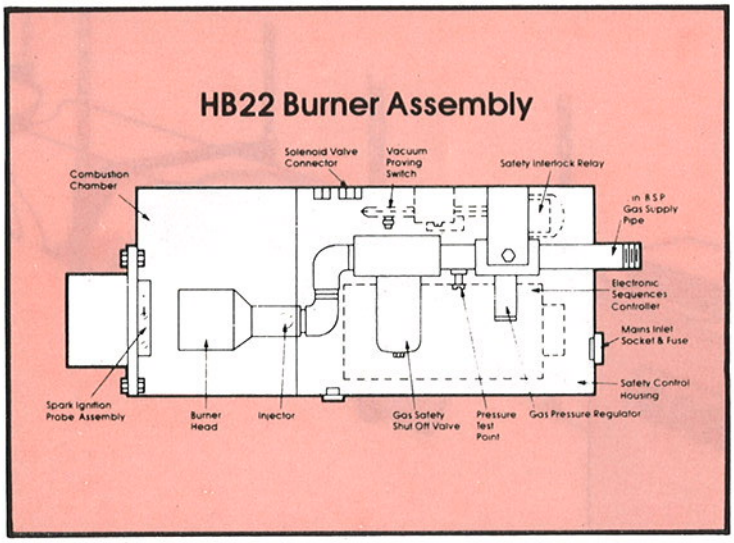
Exhaust flue — horizontal,
rectangular outlet available.

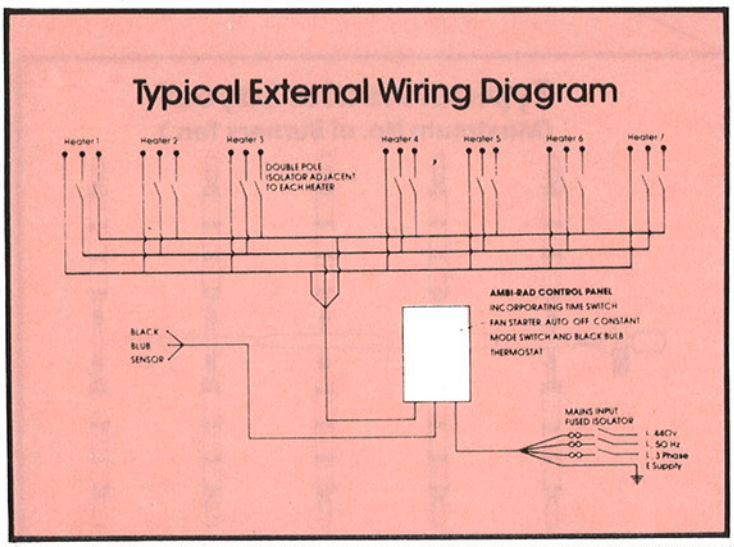
Natural ventilation requirements:
Ventilation openings shall be provided, preferably at low level as follows: Up to and including 60kW, 4.5cm²/kW, over 60kW, 270cm² plus 2.25cm²/kW in excess of 60kW total rated heat input.

Gas supply connection:
R½ (½in. B.S.P. external thread)

Electrical supply:
440v, 50Hz, 3 phase/240v single phase.







Current rating:
0.33 amp max. (inductive) per heater.

Internal fuse rating:
1 amp per heater.

Power consumption:
400w. (nominal).

Injector size:
Nat. Gas 4.1mm (0.161in.)
Propane 2.4mm (0.945in.)

Maximum supply pressure:
Nat. Gas 40mbar (16in. w.g.)
Propane 40mbar (16in. w.g.)

Minimum supply pressure:
Nat. Gas 13mbar (5in. w.g.)
Propane 30mbar (12in. w.g.)

Burner setting pressure:
Nat. Gas 10.6mbar (4.2in. w.g.)
Propane 28.75mbar (11.5in. w.g.)

Mounting heights:
Minimum 3.6m (12ft)
Recommended height range 4.2m (14ft) to 14m (46ft)
for mounting heights over 7m (23ft) contact AMBI-RAD

Inclined wall mounted:
Minimum 3.0m (10ft)
Recommended height range 3.3m (11ft) to 5.5m (18ft)

Minimum clearance: distances to combustible materials:
To sides: 500mm (1ft. 8in.)
Beneath tubes:
1250mm (4ft. 2in.)

In front of tubes inclined mounting:
1250mm (4ft. 2in.)

Above reflector:
100mm (4in.)

Above burner/damper assembly:
200mm (8in.)

Gas Council Approval No:
GC 36 229 02

For full assembly, installation and commissioning instructions please ask for our publication AR1083.

Because of our policy of continuous development Ambi-Rad Ltd. reserve the right to vary the equipment specification without notice.

AMBI-RAD®

radiant heating systems

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