**FURNACE DESCRIPTION**

The Mk V ‘R’ gas furnace provides the maximum economy in energy costs and is constructed using the most efficient low thermal mass materials for the lining.

By recycling part of the waste energy from the exhaust, a minimum of 25% can be saved and as high as 50% against many brick-lined furnaces.

Radiation losses are minimised by use of a well insulated swing-aside cover that can be sealed when no baling out is needed.

The superb insulation allows for excellent melting performance from the high performance compact gas burner. The burner facilitates improved heat circulation and transfer through convection, producing a more even heat distribution around the crucible. This promotes longer crucible life.

The advanced insulation materials used in the furnace lining result in low casing temperatures, providing comfortable working conditions.

Working conditions are also optimised by very low noise emissions. The exhaust recuperator also acts as an effective silencer, making the furnace much quieter than equivalent gas fired furnaces.

In addition to reduced carbon dioxide emissions, the advanced burner technology minimises Nitrous Oxide (NOx) and carbon monoxide, important health and environmental issues.

**FUEL TYPES**

The furnace is suitable for the following gaseous fuels:

- Natural Gas 9000 Kcal/m³
- Propane 22000 Kcal/m³
- Butane 28000 Kcal/m³
- Pressure 20-50 millibar

**RADIANT PANEL ASSEMBLIES**

Twelve high alumina radiant panels are arranged around the crucible and extend to the full depth of the furnace chamber. The self-supporting and interlocking design facilitates ease of removal in the unlikely event the panels need to be replaced. These panels efficiently convert gas energy to radiant energy.

**HIGH EFFICIENCY**

The combination of recuperation and effective conversion to radiant heat transfer and the use of advanced insulating materials provide a melting and holding furnace of exceptional efficiency and comfortable working conditions.

**SIZE RANGE**

The Recuperative Gas Fired Bale Out Furnace Mk V ‘R’ is available in the size range 85kg - 1327kg aluminium. Other crucible patterns than those shown in the performance table are available to provide the capacity span indicated for each size reference.

**SIGNIFICANT ENERGY SAVINGS (UP TO 50%)**

**IMPROVED CRUCIBLE LIFE**

**VERY LOW NOISE EMISSIONS**

**ENVIRONMENTALLY FRIENDLY EMISSIONS**
**RECIPEPATIVE GAS FIRED BALE OUT MK V ‘R’**

### ADVANCED DESIGN
The Mk V recuperative furnace retains all of the advantages bestowed on the standard radiant panel heated Mk V gas furnaces and, with the exception of the control panel, has no stand-alone components. High reliability is obtained by the avoidance of moving parts (such as air dampers).

### GAS BURNER
The furnace is equipped with a high performance, low NOx, fully proportioning, nozzle mix gas burner. Air is delivered to the burner from a compact regenerative blower, the volume of which is regulated by a solid state inverter, thus avoiding valves and linkages. Air and gas are mixed in proportion relative to air flow, retaining the correct air/gas ratio across the turn down range. The robust burner is designed to keep NOx emissions to a very low level, (less than 125ppm) throughout the air preheat range. The burner system conforms to the highest safety standards, to meet regulations world wide.

### RECIPEPATOR
The hot air recuperator, fitted to the furnace exhaust, is of a simple and robust design, delivering up to 250°C air preheat to the burner. It has dimensions similar to the standard MkIV Gas exhaust extension and further reduces the already very low noise levels.

### CONTROL PANEL
A modern high quality control panel provides the following features:

- Circuit breaker for isolation and protection
- Flame failure, sequencing controller
- Programmable time clock switching
- Fully proportional metal temperature controller
- Policeman lining controller to protect refractories
- Crucible operational hour meter
- Burner operational hour meter
- Radiant heater display during gas burner operation

### METAL TEMPERATURE CONTROL
Control may be derived from a floating pyrometer, fixed pyrometer or one housed in the crucible. The programmable temperature controller maintains metal temperature within very close limits by automatic adjustment to burner heat input, whether melting or holding.

The digital display shows both the required temperature and current metal temperature.

### PERFORMANCE DATA

<table>
<thead>
<tr>
<th>GAS FIRED BALE OUT RECIPEPATIVE MK V ‘R’</th>
<th>AIR TEMPERATURE 20°C / ALUMINIUM TO 720°C*</th>
</tr>
</thead>
<tbody>
<tr>
<td>MK V ‘R’ Furnace Reference</td>
<td>SIZE 1</td>
</tr>
<tr>
<td>Capacity Range kg, Aluminium</td>
<td>85-172</td>
</tr>
<tr>
<td>Example Crucible Patterns</td>
<td>168</td>
</tr>
<tr>
<td>Working Capacity kg</td>
<td>119</td>
</tr>
<tr>
<td>Maximum Power Ratings kWh/hour</td>
<td>103</td>
</tr>
<tr>
<td>Thermers</td>
<td>3.5</td>
</tr>
<tr>
<td>Power Consumption kWh/hour, Holding</td>
<td>9.5</td>
</tr>
<tr>
<td>Covered</td>
<td>21</td>
</tr>
<tr>
<td>Uncovered</td>
<td>115</td>
</tr>
<tr>
<td>Melting Time Minutes</td>
<td>75</td>
</tr>
<tr>
<td>Covered</td>
<td>125</td>
</tr>
<tr>
<td>Uncovered</td>
<td>110</td>
</tr>
</tbody>
</table>

Data based on optimum foundry conditions. For normal foundry operations a performance of 90% of these ratings is typical.

* Data for zinc and zinc alloys available on request.

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**TEMPERATURE DEPRESSION**
This energy conservation feature enables a lower holding temperature to be automatically selected during periods of non-use.

The control panel contains a real-time/date clock which can be programmed to select reduced temperature and to return to operational temperature when required. Similarly, the real-time clock can be programmed to start up and shut down the furnace a preset times and dates.

**OUTPUT LIMITED THERMOCOUPLE FAILURE PROTECTION (FULLY MODULATING VERSION)**
If the thermocouple sensor fails, this feature provides a programmed level of output power. Typically set to 10%, the proportioning power control provides sufficient heat output to maintain an aluminium charge within an acceptable temperature range.

**POLICEMAN CONTROL**
The furnace is equipped with a "policeman" control. This feature is designed to prevent overheating of the furnace refractories and radiant panels, thus avoiding reduction of their lifespan.

**PYROMETRY**
A variety of metal temperature pyrometry can be specified. This includes floating or fixed immersion types and thermocouples housed within the crucible for holding applications.