

RECUPERATIVE GAS FIRED BALE OUT MK V 'R'

- ✓ **SIGNIFICANT ENERGY SAVINGS (UP TO 50%)**
- ✓ **IMPROVED CRUCIBLE LIFE**

- ✓ **VERY LOW NOISE EMISSIONS**
- ✓ **ENVIRONMENTALLY FRIENDLY EMISSIONS**



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-side 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.

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.

FUEL TYPES

The furnace is suitable for the following gaseous fuels:

Natural Gas	9000 Kcal/m ³
Propane	22000 Kcal/m ³
Butane	28000 Kcal/m ³
Pressure	20-50 millibar



▲ General view of a typical Gas Burner.



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Morgan
Molten Metal System

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KEY FEATURES

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.

RECUPERATOR

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

GAS FIRED BALE OUT RECUPERATIVE MK V 'R'		AIR TEMPERATURE 20°C / ALUMINIUM TO 720°C*									
MK V 'R' Furnace Reference		SIZE 1		SIZE 2		SIZE 3		SIZE 4		SIZE 5	
Capacity Range ● kg, Aluminium		85-172		163-327		310-575		595-1135		762 - 1327	
Example Crucible Patterns		168	171	302	401	247	263	851	852	Data on Application	
Working Capacity	kg	119	165	233	271	444	575	815	1024		
Maximum Power Ratings kWh/hour	kWh	103	103	115	140	165	165	258	258		
	Therms	3.5	3.5	3.95	4.8	5.6	5.6	8.8	8.8		
Power Consumption kWh/hour, Holding	Covered	9.5	9.5	11	15	24	25	30	32		
	Uncovered	21	21	20	30	45	46	58	59		
Melting Time Minutes	First Heat	115	145	146	163	250	320	285	335		
	Subsequent Heat	75	100	105	113	160	205	185	230		
Maximum Melt Rate kg/hour	Covered	125	130	133	180	220	220	340	335		
	Uncovered	110	113	113	150	185	185	297	292		

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

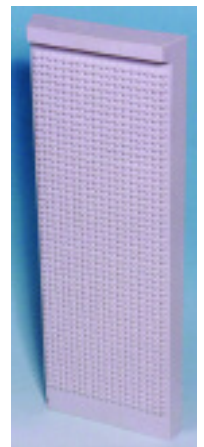
The furnace is equipped with a "policeman" control. This feature is designed to prevent overheating of the furnace refractories and radiant panels, thus avoiding reduction of their lifespan.

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.



Control panel. ►



Gas radiant panel. ►

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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SPECIFICATIONS

CAPACITY by CRUCIBLE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	
	Capacity Range kg AL 85–172	Capacity Range kg AL 163–327	Capacity Range kg AL 310–575	Capacity Range kg AL 595–1135	Capacity Range kg AL 762–1327	
	Pattern	Pattern	Pattern	Pattern	Pattern	
	kg	kg	kg	kg	kg	
	BX166 / BU100	BX202 / BU210	BX1264	BX850	52100	762
	BX167 / BU125	BX302 / BU250	BX847 / BN500	BX851	52330	1098
	BX168 / BU150	BX401 / BU300	BX247 / BU500	BX852 / BN1100	1024	
BX169 / BU175				60990*	1327	
BX171 / BU200	BX402 / BU350*	BX263 / BU600*	BX853*			
BX177 / BU202						
FURNACE DIMENSIONS (mm)	A	1190	1190	1420	1516	Available upon request.
	B	900	900 980*	1130 1270*	1330 1520*	
	C	1610	1610	1840	2020	
	D	2125	2125 2205*	2355 2500*	2560 2750*	
	E	433	510	660	735	
SHIPPING (approximate)						
NETT WEIGHT	kg	900	900	1300	2500	
GROSS WEIGHT	kg	1100	1100	1500	2750	
VOLUME	m ³	3.7	3.7	5.35	10	

*increased furnace height.

