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MOLTEN METAL PRODUCTS

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MORGAN MKV RECUPERATIVE TILTING FURNACE

FURNACE DESCRIPTION

The MK V Gas Fired Lip Axis Pouring Recuperative Basin Tilting Furnace suitable for temperatures up to 850°C, provides the maximum economy in energy costs so far, through the use of radiant panel technology, efficient low thermal mass materials in the lining and recuperation.

By recycling part of the waste energy from the exhaust products, typically 35% can be saved and can be as high as 50% over some conventional, side exhaust brick lined furnaces.

Radiation losses from the metal are minimised by the use of a well insulated swing aside cover that can cover the crucible when no charging is required.

The radiant panels and lining give excellent melting performance from the compact high efficiency burner. The burner also facilitates improved internal heat circulation and transfer through convection, producing a more even heat distribution around the crucible enhancing crucible life.

The insulation materials used in the furnace lining result in low casing temperatures, provide comfortable and safe working conditions.

Working conditions are also optimised by very low noise emissions, as the exhaust recuperator also acts as an effective silencer.

In addition to reduced carbon dioxide emissions through lowered heat input the advanced burner technology also minimises Nitrous Oxides and Carbon monoxide, important to health and the environment.

FUEL TYPES

The furnace is available for the following gaseous fuels:

Natural Gas:	9000 kcals/M ³
Propane:	22000 kcals/M ³
Butane:	28000 kcals/M ³
Dynamic Pressure:	20 - 35mbar
Note:	Pressures higher than 35mbar will require additional regulation
Electrical Supply:	400/415v/480v 3 Phase 50/60hz

RADIANT PANEL ASSEMBLIES

High alumina radiant panels surround the crucible and generally extend to the full depth of the furnace chamber. The self-supporting and interlocking design provides easy removal, should a panel require changing.

These panels efficiently convert gas energy into radiant energy.

CONSTRUCTION

The furnace is constructed from heavy duty steel plate and sections to provide a robust tilting furnace suited to foundry applications.

The body is tilted at the pouring lip axis, by twin hydraulic cylinders using non-flammable fluid. Optionally, the furnace can be supplied with a charging platform.



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SIZE RANGE

The MK V Recuperative Gas Fired Basin Tilting Furnace is available in the size range 213kg - 1500kg aluminium.

Other crucible types and patterns to those shown in the table are available.

- Significant Energy Savings (up to 50%)
- Improved Crucible Life • Very Low Noise Levels
- Environmentally Low Emissions

MORGAN MKV RECUPERATIVE TILTING FURNACE

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KEY FEATURES

ADVANCED DESIGN

The MK V Recuperative Basin Tilting Furnace is compact, of robust design and comes complete with control panel, interconnecting cables, hydraulic power pack and tilt controls. High reliability is obtained by the avoidance of moving parts such as motorised dampers and use of high reliability components.

GAS BURNER

The furnace is equipped with a high performance, medium velocity, low Nox., fully proportioning, nozzle mix gas burner, that tilts with the furnace. Air is delivered to the burner via a recuperator, from a compact speed controlled blower, regulated by a solid state inverter, avoiding valves and linkages. Air and gas are mixed in proportion relative to cold air flows, maintaining ratio across the turn down range. The robust burner is designed to minimise Nox. emissions up to the highest preheat values and conforms to European safety standard EN746 and other world standards.

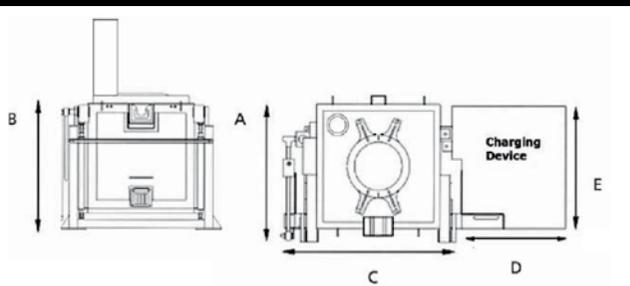
RECUPERATOR

The fitted hot air recuperator is of simple robust design, delivering up to 250°C air preheat to the burner. Having dimensions similar to normal exhaust extensions, it also reduces the already low noise values to less than 75dBa.

CONTROL PANEL

A modern high quality control panel provides the following features:

- Protective circuit breaker, door interlocked
- Fully approved, flame failure controller
- Programmable timeclock
- Fully proportional digital temperature controller
- Policeman lining protection pyrometry
- Crucible and burner operational hour meters
- Gas burner operation display
- Hydraulic pump stop/start controls



HYDRAULIC TILTING

The furnace is tilted at its lip axis by twin enclosed hydraulic cylinders. The tilt speed is pre-set and is actuated by a manual control lever mounted to the furnace tilting frame. Optionally push button controls can be specified. Pressure is supplied from a free-standing hydraulic power pack, ready filled with water glycol and non-flammable fluid. The cylinders are fitted with flow checks to control the descent speed, even in the event of pipe or hose failure.

OUTPUT THERMOCOUPLE FAILURE PROTECTION

If the metal thermocouple fails, the feature provides a programmed level of output power, rather than switch the furnace off. Typically set to 10% the proportioned burner power is sufficient to keep the metal within acceptable temperature range until exchange can be facilitated.

POLICEMAN CONTROL

The furnace is equipped with a 'policeman' control system which is designed to prevent overheating of refractories, radiant panels and crucible, thus avoiding a reduction in life span.

PYROMETRY

A variety of metal temperature pyrometry can be specified.

This includes fixed immersion types and for holding applications, crucible wall or pocket versions.

METAL TEMPERATURE CONTROL

The temperature can be sensed from a fixed pyrometer. The dual display programmable digital controller maintains close control, by regulating the heat input to the burner, relative to actual metal temperature and set value.

Data based on optimum foundry conditions and practices. For typical foundry operations a performance factor of 90% of performance ratings should be assumed. Data for zinc alloys available on request.



Radiant Panel



Control Panel

GAS FIRED RECUPERATIVE BASIN TILTING FURNACE		AIR TEMP 20C				ALUMINIUM TO 720c		
Furnace Size Reference		BT 500	BT 700	BT 1300	BT 1500	BT 1700	BT 1800	BT 3300
Working Capacity Kg Aluminium		213	310	530	600	700	930	1500
Max. Power (Gas)	kWh	233	260	380	410	415	440	520
Melt Time (Mins)	1st Heat	80	105	105	130	150	152	210
	Subsequent Heats	55	80	75	93	107	115	156
Gas Requirement @20 - 35mBar	M ³ /Hour (Cold)	22	24	39	42	43	45	54

Specific energy consumption, subsequent heats, 0.9kWh/kg. *Variances subject to crucible pattern.

Model	BT500	BT700	BT1300	BT1500	BT1700	BT1800	BT3300
Crucible	TBN387	TBN412	TBN587	TBN690	TBN750	TBN1100	BU1800ALU
Capacity Kg Al.	213	315	550	600	700	930	1500
Furnace Dimensions (mm)	A	1480	1480	1780	1780	1815	2100
	B	1560	1560	1630	1630	1850	2250
	C	2310	2310	2500	2500	2500	3000
	D	1370	1370	1410	1410	1650	1800
	E	1460	1460	1460	1460	1460	2000
Shipping (approx) Net Weight	Kg	3500	3800	4200	4200	4500	8000
Gross Weight	Kg	3700	4000	4500	4500	4800	8500
Volume	M3	5.4	5.5	7.3	7.3	8	15