MMP
MOLTEN METAL PRODUCTS

MORGAN MKV
DUAL ENERGY TILTING FURNACE

FURNACE DESCRIPTION

The MK V Dual Energy Lip Axis Pouring Basin Tilting Furnace provides economy in energy costs, over comparable brick lined furnaces, through the use of radiant panel technology for gas melting, electric resistance heating for holding supported by efficient low thermal mass materials in the lining.

The selection of energy source is generally automatic with respect to temperature, but gas or electric only can also be selected if required.

Energy losses by radiation and convection from the metal are minimised by the use of a well insulated swing aside cover arranged to cover the crucible when no charging is required, thus improving efficiency, particularly whilst holding.

The radiant gas and resistance heater panels and efficient lining give excellent melting and holding performance from the compact gas burner and electric panels. The gas burner is arranged to tilt with the furnace and therefore can continue firing during the pouring cycle, if required, in the gas only operation. In the Dual mode, PID electric heating is permitted during tilting, if required.

The insulation material used in the furnace lining results in low casing temperatures, providing comfortable and safe working conditions. **Suitable for metal temperatures up to 850ºc.**

FUEL TYPES

The furnace is available for the following gaseous fuels:

Natural Gas:	9000 kcals/M³
Propane:	22000 kcals/M³
Butane:	28000 kcals/M³
Dynamic Pressure:	20 - 35mbar
Note:	Pressures higher than 35mbar will require additional regulation
Electrical Supply:	*All Except* **400/415v/480v 3 Phase 50/60hz** *Available*

HEATER PANEL ASSEMBLIES

Six high alumina gas radiant panels and six electric heaters 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.

The radiant panels efficiently convert gas energy into radiant energy to compliment the radiant electrical heaters.

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.

SIZE RANGE

The MK V Dual Energy Basin Tilting Furnace is available in the size range 213kg - 1000kg aluminium. Differing crucible types / patterns to those shown in the table are also available.

- Dual Energy Source • Gas Melt / Electric Hold
- Energy Efficient • Environmentally Low Emissions
- Low Noise Levels • Low Casing Temperatures

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KEY **FEATURES**

ADVANCED DESIGN
The MK V Dual Energy Basin Tilting Furnace is compact, of robust design and comes complete with control panel, interconnecting cables, hydraulic power pack and tilt controls. The furnace is suitable for the melting of metals from zinc through to aluminium alloys with temperatures up to a maximum of 850ºc.

BURNER
The furnace is equipped with a high performance nozzle mix burner with integral fan. The burner tilts with the furnace and has fully modulating temperature control. Controls and safeguards conform to European safety standard EN746 and other world standards.

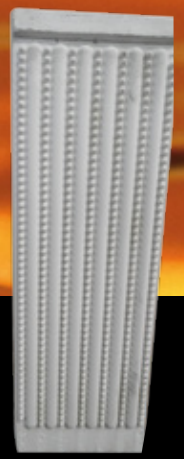
ELECTRICAL HEATERS
The Dual Energy BT Furnace has six semi-embedded heater panels, designed to give a holding PID heat input, with metal temperatures up to 850c. These panels also have a gas radiant surface to compliment the gas radiance used during melting.

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

- Protective circuit breaker, door interlocked
- Fully approved, flame failure controller
- Programmable time clock
- Earth leakage detection (RCD)
- Fully proportional digital temperature controller
- Policeman lining protection pyrometry
- Crucible and burner operational hour meters
- A mimic display for heaters and burner operation
- 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. Optional 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.


Radiant Panel


Electrical Panel


Control Panel

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.

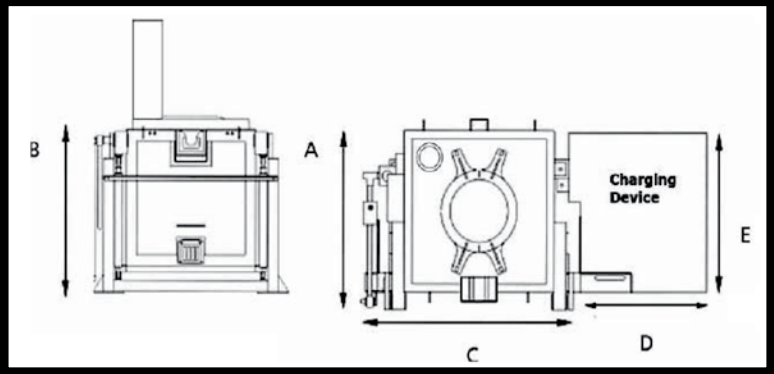
POLICEMAN CONTROL
The furnace is equipped with a 'policeman' control system which is designed to prevent overheating of electric heaters, refractories, radiant panels and crucible, thus avoiding a reduction in life span.

PYROMETRY
A variety of metal temperature pyrometry can be specified. This includes fixed immersion types and for holding applications, crucible wall or pocket versions can be specified.

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 from the burner and electric heaters, relative to actual metal temperature and set value.

Data based on optimum foundry conditions and practices at 720c. For typical foundry operations a performance factor of 90% of performance ratings should be assumed.

Data for zinc alloys available on request.



DUAL ENERGY TILTING FURNACE							
Furnace Size Reference		DEBT 500	DEBT 700	DEBT 1300	DEBT 1500	DEBT 1700	DEBT 1800
Working Capacity Kg Aluminium		213	310	530	600	700	930
Power Gas	kWh	220	220	350	350	350	350
Max Power Electric	kWh	24	24	36	36	36	36
Holding Covered	KWh/hr	5.5	6	9	10	11	12
Holding Uncovered	KWh/hr	11.5	12	18	20	21	22
Melt Time (Mins)	1st Heat	110	150	195	210	230	310
	Subsequent Heats	76	110	125	140	160	220
Gas Requirement @20 - 35m Bar M³/Hour		23	23	36	36	36	36
Specific energy consumption, subsequent heats, 1.3kWh/kg. Variances subject to crucible pattern.							

Model		DEBT500	DEBT 700	DEBT 1300	DEBT 1500	DEBT 1700	DEBT 1800
Crucible		TBN387	TBN412	TBN587	TBN690	TBN750	TBN1100
Capacity Kg Al.		213	315	550	600	700	930
Furnace Dimensions (mm)	A	1480	1480	1780	1780	1815	1815
	B	1560	1560	1630	1630	1850	1850
	C	2310	2310	2500	2500	2500	2500
	D	1370	1370	1410	1410	1650	1650
	E	1460	1460	1460	1460	1460	1460
Shipping (approx) Net Weight	Kg	3500	3800	4200	4200	4500	4500
Gross Weight	Kg	3700	4000	4500	4500	4800	4800
Volume	M3	5.4	5.5	7.3	7.3	8	8

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