



ENCON

**Payback**  
period as  
short as  
**90 days**

# REGEN<sup>®</sup> BURNER SERIES

... Answer to the continued need for "Energy Conservation"



## REGEN® SERIES

REGEN® is a series of LOW NOx Regenerative burners designed by ENCON. Regenerative Burner is a combustion heating system designed for extremely high recovery of heat from flue gases to preheat combustion air in an industrial furnace.

With REGEN® Series of Burners we can preheat the combustion air very close to the process temperature. When the process temperature is around 1250°C, we can achieve a preheat temperature of around 1000°C. As a result we are able to achieve additional fuel saving of 25-30% compared to conventional combustion system with metallic recuperators.

These systems have been specifically adopted and popularized in high temperature furnaces as a superb means for savings in energy cost and reduction in CO<sub>2</sub> emission.



## APPLICATION FEATURES



REGEN® Burner Series have rugged construction which are able to handle the harsh working environment prevalent in heavy industrial applications such as:

- Steel Reheating Furnaces
- Steel Heat Treatment Furnaces
- Steel Forging Furnaces
- Aluminium Melting Furnaces
- Copper Melting Furnaces
- Ladle Preheaters
- Kilns

Since the products which are processed in these furnaces may be dirty or contaminated (i.e. by lubricants) or may have significant amount of dust which result in a dirty furnace environment, we have selected High Alumina Ceramic Balls as the heat recovery media for REGEN® Burner Series. Ceramic Balls have been chosen as they minimise the time required for cleaning and maintenance as compared to a Honeycomb structure.

## STANDARD DESIGN FEATURES

### Type of Fuel:

- Natural Gas
- Liquefied Petroleum Gas
- Coke Oven Gas (LHV @4,000 kcal/Nm<sup>3</sup>)
- Mixed Gas (LHV > @1,800 kcal/Nm<sup>3</sup>)
- LDO (Light Diesel Oil)

### Required Feeding pressure at valve skid:

- Gaseous Fuel P> 100 mbar
- Blown Combustion Air P> 60 mbar
- Suction AIR P< 60 mbar

The REGEN® Burner Series comes in a range of sizes and covers most of the conventional furnace requirements. However, we also offer non-standard sizes of REGEN® Burners which are customised as per the Process requirement, Fuel and Space availability.

### Burner Operation:

Burner Control	: operated by certified BMS
Burner Ignition	: AIR-LPG or AIR-NG pilot burner
Flame detection	: UV Sensor
High Temperature mode	: bypass available in case of T > Self Ignition T

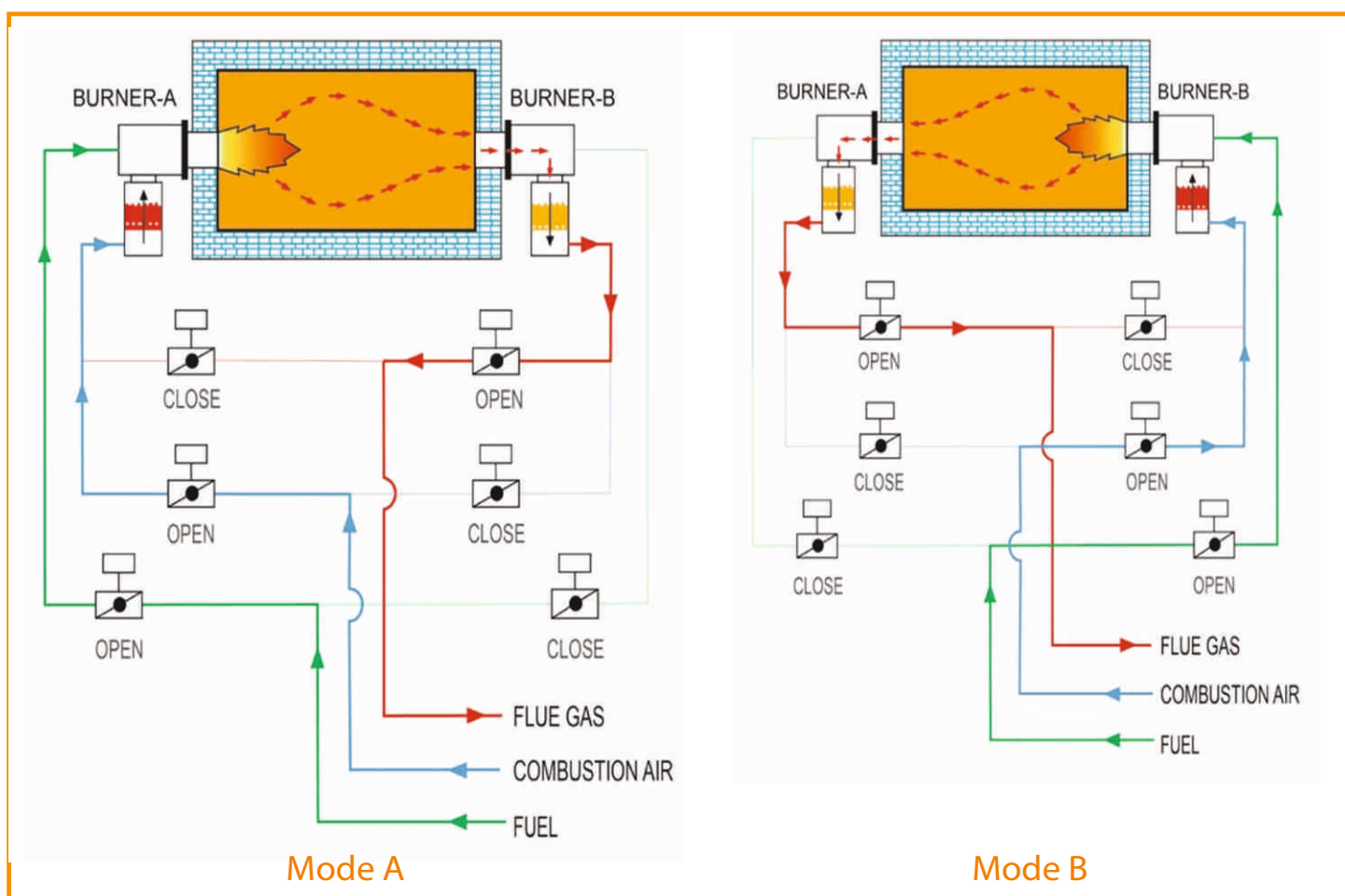
<b>Maximum Furnace Temperature</b>	<b>: 1500°C</b>
<b>Standard Firing Rate</b>	<b>: From 500kW up to 6000kW</b>
<b>Standard Range (turn down)</b>	<b>: 4 to 1</b>

Designed for Low CO and NOx generation (diluted flame combustion.) Flameless Kit for Ultra Low NOx application available.

## WORKING OF REGENERATIVE BURNER

Regenerative burners work in pairs. In Mode A, Burner A fires and Burner B acts as a regenerator or heat sink. The flue gases are sucked by Burner B, then the flue gases travel through the media box of Burner B, to the chimney. The Media box is filled with Ceramic balls which absorb the heat of the flue gases.

In Mode B, the process is reversed and Burner A acts as the regenerator while Burner B fires. In this case combustion air passes through the hot media and we are able to achieve a combustion air temperature which is approximately 200 to 300°C below the process temperature depending on the process parameters. For example, if the process temperature is 1200 °C we will be able to achieve a temperature of 900 to 1000 °C for the combustion air.



## LOW NOx FLAMELESS COMBUSTION (OPTIONAL)

In order to minimize the formation of NOx, a staged combustion solution has been applied, so that a flameless condition can be obtained once the furnace has achieved a certain temperature.

All burners of the REGEN® series have been equipped with a system of separate gaseous fuel injection, through dedicated high speed lances, that promote the internal re-circulation of the furnace atmosphere, diluting the combustion area and reducing the peak flame temperature. The injection of fuel through lances at high speed also improves the homogeneity of the chamber temperature.

The flameless condition of burning should be activated only when the chamber temperature is minimum 200°C above the self-ignition temperature of the fuel.

## NATIONAL ENERGY EFFICIENCY INNOVATION AWARD



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