

FIRING SYSTEMS FOR THE CEMENT AND LIME INDUSTRY



FIRING TECHNOLOGY  
FOR THE FUTURE

Unitherm Cemcon · Feuerungsanlagen Gesellschaft m.b.H.

**unitherm**  
CEMCON

# M.A.S. ROTARY KILN BURNER

The M.A.S. rotary kiln burner offers the user essential advantages compared with conventional burner systems.

#### The innovative solution

is to bring the complete primary air flow to an adjustable swirl intensity during operation.

#### Patented flexible swirl device:

The flexible swirl setting device is located in the annular primary air channel, approximately 0,3 m from the burner nozzle head. The swirl intensity of primary air is determined by the angle of deflection of the hose nozzles, which are easily as well as steplessly adjustable from the cold end of the burner, during operation.

#### Flameshape:

M.A.S. burners offer a complete smut round defined flame shape, easy adjustment as well as high reproducibility of flameshape. Due to the flexible swirl device the shape of flame can be adjusted to the kiln-conditions to reach an optimum heat transfer to the clinker.

#### Improved burner cooling:

In contrast to conventional burners the complete primary air stream of M.A.S. burners flows about the outer air duct thereby reaching an optimum nozzle cooling. High nozzle life-time is the benefit of our solution.



Burner with disassembled outer jacket tube  
(flexible swirl device)

#### Less primary air rate:

Due to a high impulse of primary air an efficient mixing of secondary air is gained allowing a very low primary air rate of around 5 %.

#### Divertable outer jacket tube:

The front part of the outer jacket tube is constructed in a divertable design. The internal fastening device does not contain any flanges in the hot zone making revision work much easier. Therby the process of replacing insulation is made easier.

#### Reduction of NOx formation:

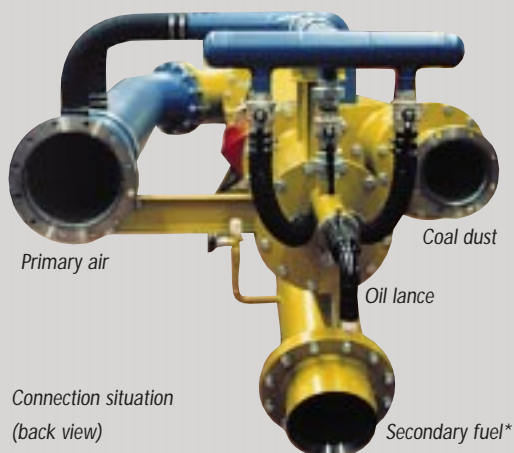
According to a richer fuel/air ratio in the centre of the flame as well as a higher O<sub>2</sub> content around the fuel a stepped combustion is reached reducing the NOx formation to an essential amount.

#### Available for following fuels:

- pulverized coal
- fuel oil
- fuel gas
- each combination with secondary fuels\*

## M.A.S.

### Mono Airduct System FLEXIBLE FOR ANY FUEL



Connection situation  
(back view)

#### Accessories:

##### ■ Burner trolley

Available design: Either rail trolley on the ground or hanging trolley moveable in any direction of the burner axis, both manual or motor driven.

##### ■ Fuel processing stations

##### ■ Burner management system

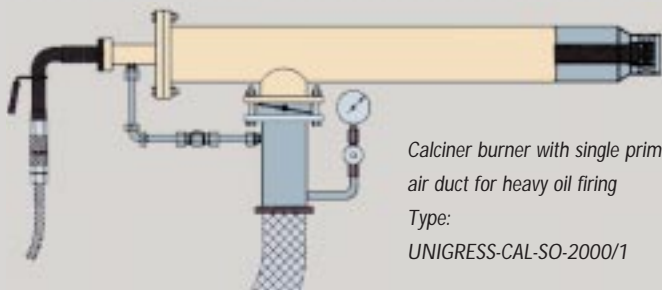
##### ■ Telescopic pipe

A polydimensional telescopic pipe with a movable connection for coal-dust and secondary fuels.

\*) Please do not hesitate to ask for our special brochure »Kiln burner for secondary fuels«!

## CALCINER BURNER

Calciner burner with low primary air consumption of about 3 – 4 %. All calciner burners are individually designed according to the specific type of calciner.



Calciner burner with single primary air duct for heavy oil firing

Type:  
UNIGRESS-CAL-SO-2000/1

### Accessories:

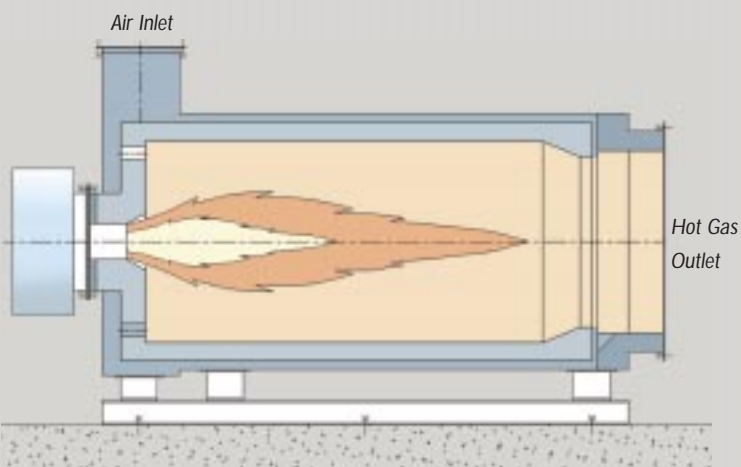
- burner trolley with pneumatic drive
- fuel processing stations
- burner management system (BMS)

### Available for following fuels:

- pulverized coal
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## HOT GAS GENERATOR

Fuel oil, gas or coal fired hot gas generator for direct heating of process air, with refractory brick at the burner mouth and internal air mixing system. Special constructions are available!



Hot gas generator, type: HG



Hot gas generator with combined oil/gas burner

### Type: HG

Combustion chamber with refractory lining  
Performance: 700 – 60.000 kW  
Outlet-temperature: 400° C to 1300° C

### Type: HR

Like HG, without refractory lining  
Performance: 700 – 12.000 kW  
Outlet-temperature: 150° C to 350° C

## AIR HEATER

Air heater in three pass execution for the indirect heating of fresh air from ambient or from duct system. Available with fuel-oil or gas firing system.

### Type: DG

Performance: up to 5.000 kW  
Outlet-temperature: up to 150° C

### Type: DR

Performance: up to 5.000 kW  
Outlet-temperature: up to 100° C

## SHAFT KILN BURNER

Fuel oil or fuel gas firing equipment for shaft kilns (lime, magnesite, dolomite). Burner execution with or without pre-combustion chamber and with or without flue gas recirculation for energy optimizing.

## FUEL PROCESSING STATIONS

Fuel processing stations for liquid and gaseous fuels are manufactured individually according to the clients' requirements.

The fully equipped stations are ready for a connection to the clients' piping systems. All stations are assembled on a base frame (with oil pan at oil stations) and contain the following main equipment: Strainers, pumps, heaters, shut off valves, safety quick shut off valves, pressure gauges, thermometers, pressure switches, control valves and control devices. All stations are wired up to a terminal box.

### Liquid fuels:

- filling pump station
- suction heater station
- low pressure-circulation pump station
- high pressure-filter/pump-station
- high pressure preheater-station
- burner operating valve train
- special execution for oil-water emulsion (Orimulsion®)

### Gaseous fuels:

- according to DVGW and international safety standards
- complete stations out of the high pressure supply system
- gas pressure reducing station
- gas distribution station
- burner operating valve train



*Burner operating valve train for natural gas*



*High pressure-filter/pump/preheater-station for Bunker C oil. Heating medium: thermo oil*



*Low pressure-circulation pump station for Bunker C oil*

## BURNER MANAGEMENT SYSTEMS

### Burner management systems for complete firing systems:

A control cabinet made from plastic-covered steelwalls, protection class IP 54, with complete inner wiring, main switch, emergency switch, operating- and fault-indication lamps and visualisation. The burner control is performed by a free-programmable SPS-control system (TÜV approved if required) for local operation or by a connection to the clients' main control system.

## MANUFACTURING ACCORDING ISO 9002 STANDARD



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