



## Regenerative burner system

- ➔ For gas, oil and pulverised coal
- ➔ Also for corrosive and dusty furnace atmospheres
- ➔ High energy savings (heat recovery)
- ➔ Easy maintenance (solid and proven)

# PulsReg®

## Regenerative burner system



1 PulsReg® 1500  
2 PulsReg® 3000  
3 PulsReg® 3600

PulsReg® has proven its value as a classic pulsed regenerator. The pulsed regenerative burner system is suitable for gas, oil and coal dust, and can also be used for corrosive and dusty furnace atmospheres.

### Advantages:

- > An extremely high level of efficiency
- > High productivity
- > Less consumption
- > Perfected and solid technology
- > CO<sub>2</sub> reduction of up to 60%
- > NO<sub>x</sub> < 350 mg/Nm<sup>3</sup>
- > Air preheating up to 1,250 °C
- > Ratings from 200 kW to 6 MW

### Versatility

Installation is possible in simple bath, hearth and casting furnaces and also in converters, and naturally the system can be retrofitted in existing plants provided that sufficient space is available for two regenerators.

### Function

#### Pulsed regenerative burner system

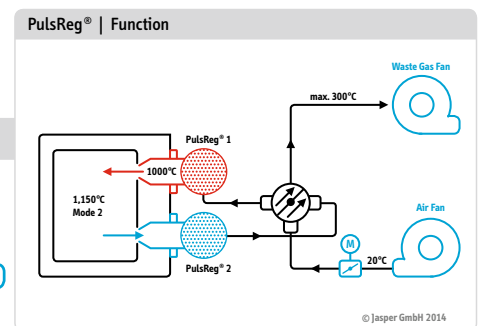
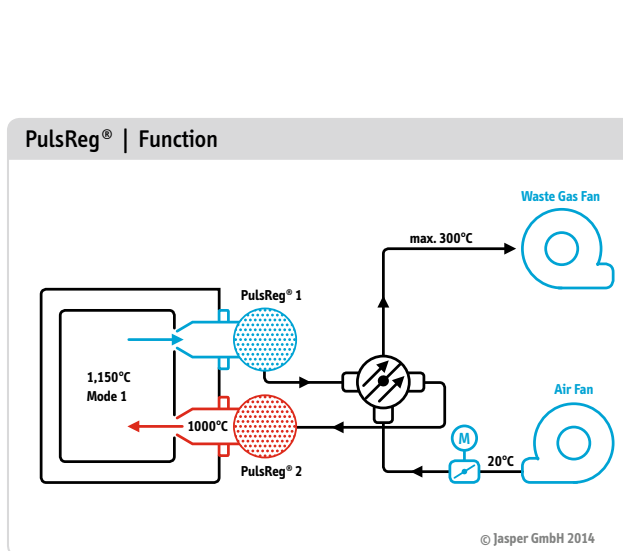
PulsReg® consists of a pair of burners each of which is provided with a regenerator (heat exchanger). This type of regenerator consists of a refractory lined vessel containing a heat storage filling.

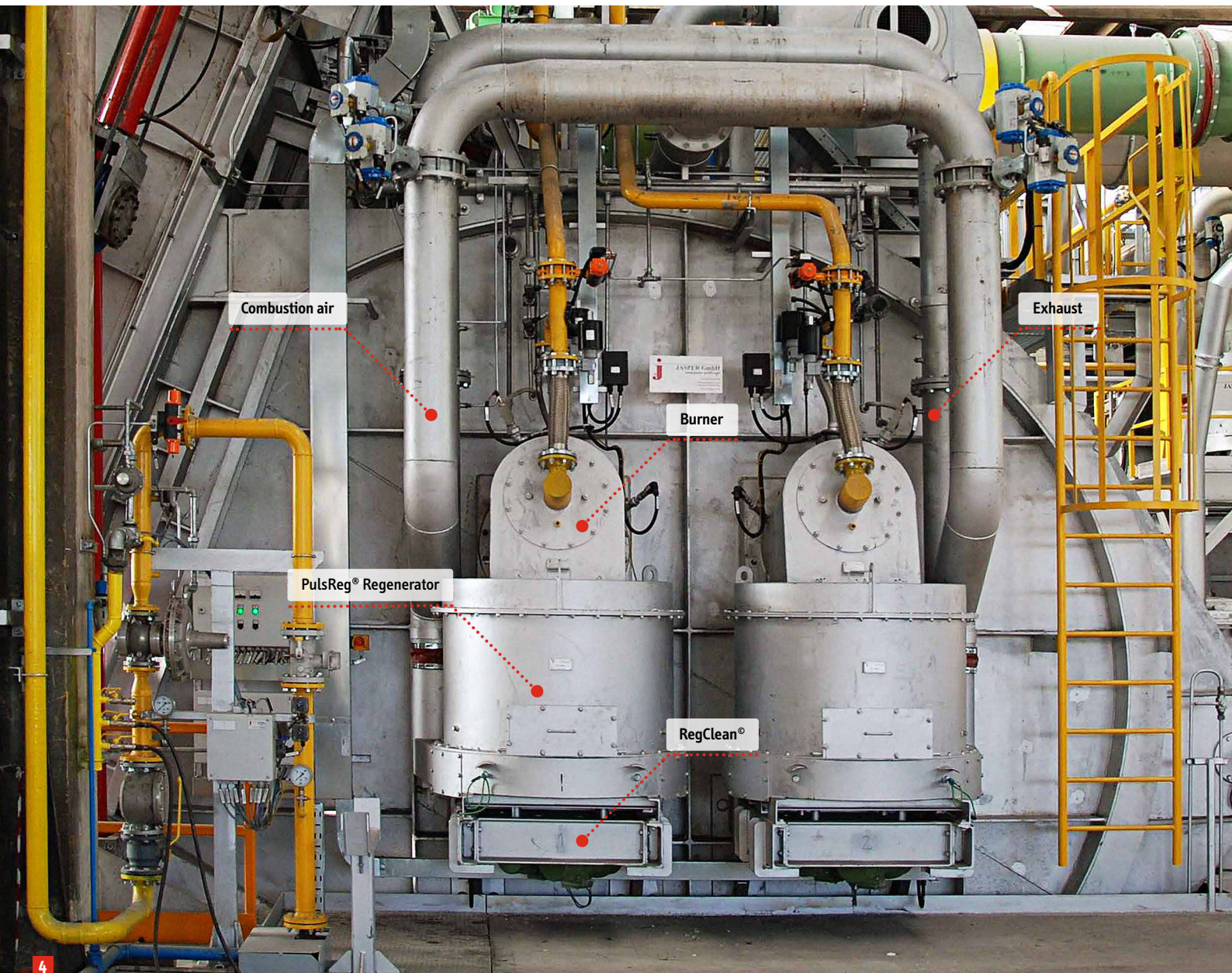
While one of the two regenerators is heated by the furnace exhaust gas, the other is cooled by the cold-combustion air counter flow. The combustion air heats up during this process, is mixed with fuel in the burner, ignites and then heats the furnace.

Once one of the two regenerators is sufficiently heated, the flow direction is reversed and the regenerator that has been heated with furnace exhaust gas is cooled with air. And vice versa: The regenerator that was previously cooled with air is now heated with the exhaust furnace gas. This pulsating reversal in flow direction through the regenerators is controlled by valves (four-way control). Each burner is equipped in this respect with its own ignition and flame monitor pursuant to DIN/DVGW regulations.

### Availability > 98%

A separate exhaust connection is required to ensure the thermal equilibrium of the regenerators. This performs two functions: on one hand, it discharges part of the hot furnace exhaust gas; and on the other, it enables the regenerative burner to be operated with cold air for maintenance. This allows the second burner to be safely maintained and cleaned, increasing availability of the furnace to over 98%.





#### Safe handling

The shape of the burner and the flame is precisely matched to the furnace geometry. This enables the achievement of controllable burner capacities of up to 6,000 kW per pair.

#### Energy and cost savings

The PulsReg® generally achieves energy savings of 25–45% (at furnace temperatures of 900–1,050 °C). The installation of a regenerator burner also has a beneficial effect on smelting technology – particularly in the secondary aluminium industry. Furnaces

equipped with regenerative burners (collector, converter, casting furnaces) are – together with molten salt furnaces – the most cost-effective melting units for coarse, compact scrap.

#### Fuel/air ratio control

To minimise metal losses (burn-off), a control of the fuel/air ratio based on the volume flow must be provided. There is almost nowhere else where it is possible to make greater savings than with this one measure.



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### Low NO<sub>x</sub> formation

High air temperature promotes the formation of NO<sub>x</sub>. This problem has been solved by the design of the burner head and through the possibility to

bring procedural additions to the system (e.g. flue gas recirculation or water injection into the flame). In this way, half-hourly average NO<sub>x</sub> values of <350 mg/Nm<sup>3</sup> (dry) can be achieved.



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### Technical data PulsReg® PR 400, values measured on a test burner (example)

Furnace temperature	1,000 °C	1,100 °C	1,200 °C	1,300 °C	1,400 °C
Air preheating	926 °C	990 °C	1,082 °C	1,171 °C	1,198 °C
Exhaust gas temperature	155 °C	160 °C	180 °C	200 °C	220 °C
Exhaust gas loss in the regenerator	45.6 kW	46.2 kW	49.1 kW	53.2 kW	53.9 kW
Reduction in fuel consumption	42 %	47 %	52 %	58 %	65 %

Firing with Lambda 1.08; fuel: Natural Gas H;  
Furnace pressure + 2 mm WS; HMM NO<sub>x</sub> 350 mg/Nm<sup>3</sup> tr;  
HMM CO = 6 mg/Nm<sup>3</sup> tr.

- 5 PulsReg® 4500
- 6 PulsReg® 1200

### An overview of our regenerators:



EcoReg®  
Rotary bed regenerator



PulsReg®  
Regenerator burner



PulsReg®-Zentral  
Pulsed regenerative burner system



PulsReg®-Medusa  
Pulsed regenerative burner system



RegClean® (option)  
Cleaning system for regenerators

More information at:  
[www.jasper-gmbh.de](http://www.jasper-gmbh.de)

