



**SORG**

**SDB Gas Burners**

*Perfect Solutions for the Glass Industry*





## NO<sub>x</sub> reduction

Efforts to reduce the NO<sub>x</sub> emissions of glass melting furnaces have been going on for more than 20 years. During this time period typical emission values have actually been reduced by more than 60% from 1800–2400 to less than 800 mg/Nm<sup>3</sup>.

It is well known that there is no single factor that can be used to reduce NO<sub>x</sub> emissions. Parts of the furnace superstructure must be designed correctly, and particular functions are needed in the control system. But, limitation of NO<sub>x</sub> production during combustion is basically a question of much better control over the complete combustion process, and the burner technology is obviously central to this.

The main source of NO<sub>x</sub> is the flame core, where the highest temperatures are found, and the aim of the NO<sub>x</sub> reduction strategy is to reduce the amount of oxygen available for combustion in the area of the flame core whilst maintaining flame stability.

In common with many other items of equipment for our furnaces, we have developed our own low-NO<sub>x</sub> burners, and the second generation – designated the SGB – has now been in use for 10 years.

**The third generation – carrying the name SDB – is now available and features even more advantages than its predecessor.**



## SORG® SDG low NO<sub>x</sub> burners

In order to achieve reductions in NO<sub>x</sub> emissions it is necessary to be able to influence the mixing of fuel and combustion air. The SORG® SDB200 series gas burner offers two important adjustments that support this function.

The body of the burner consists of two concentric tubes. At the front end of these tubes the inside of the outer tube and the outside of the inner tube are profiled to create the main outlet nozzle. The inner tube can be moved backwards and forwards relative to the outer tube, which effectively changes the size of this nozzle. This adjustment is made by means of a hand

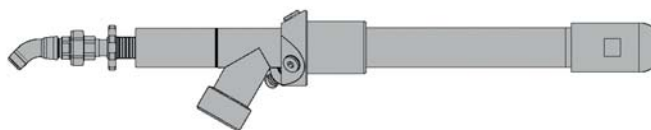
wheel located at the rear of the burner, and can be made at any time, also during operation.

The second important adjustment concerns the gas supply through the burner, which is split into two streams. The larger stream passes through the main burner tube and emerges from the burner nozzle at a medium velocity, whilst the smaller passes through the small diameter inner tube and emerges from the nozzle with a much higher velocity.

The gas which passes through the inner tube and exits with a higher velocity provides a stable core flame. The gas from the outer tube that has a lower exit velocity provides a flame with a

lower linear momentum around the core flame. This delays the mixing of the gas and air, and reduces peak flame temperatures, which leads to an important reduction on NO<sub>x</sub> production at the flame core.

The gas supply for the smaller stream is taken from a branch pipe off the main gas supply line. This branch line is provided with a shut-off valve, a manual control valve to vary the proportion of gas that is being passed through the inner tube, and an orifice plate for measurement of the gas flow. A simple differential pressure manometer can be used to provide a flow value for future reference.



**SORG® SDB series Low NO<sub>x</sub> Burner showing main gas connection (bottom) and secondary gas connection (left hand side)**

## Applications

The SORG® SGB200 series gas burners are suitable for

- Regenerative end-fired and cross-fired furnaces
- All furnace sizes
- Underport installation

## Gas types

The SORG® SGB200 series gas burners can be used with the following types of gas:

- Natural gas
- LPG
- Sasol gas

## Cooling air

A small amount of compressed air is applied to the burner during the waste gas phase to provide cooling.

## Operating environment

The operating environment can also influence burner operation. The design of the port neck and the burner block are particularly important. SORG® has extensive experience of all aspects of furnace engineering, and is therefore uniquely able to co-ordinate the design of the burner and that of its operating environment.

## Accessories

The following parts are included in the burner package:

- **Holder**  
A simple but effective holder allows easy and exact adjustment of burner position and angle.
- **Sealing plate**  
The metal sealing plate closes the gap between the burner and the burner block and prevents the uncontrolled ingress of cold air.
- **Flow meter**  
Displays the gas quantity.
- **Non-return valve**  
Prevents air or waste gases from entering the gas supply pipe.
- **Gas hose**  
Flexible steel hose.
- **Fittings**  
Gas-tight ball valve with gas certification.

## Options

The gas flow meter can be provided with a sensor and transmitter to supply a signal suitable for a SCADA system.

## Compatibility

The SORG® third generation SDG series burners have the same outside dimensions as the equivalent second generation SORG® SGB designs. Therefore, the new burners can be used to replace the older type using the same holder and connections. The only change required is the provision of the additional branch gas supply for the inner burner pipe.



*Auxiliary gas connection for inner tube*



## Technical details

	SDG 211	SDG 221	SDG 231
Gas throughput range	80 – 200 Nm <sup>3</sup> /h	200 – 600 Nm <sup>3</sup> /h	300 – 800 Nm <sup>3</sup> /h
Gas pressure at burner	300 – 800 mbar	300 – 800 mbar	300 – 800 mbar
Main gas connection	DN 40	DN 65	DN 80
Secondary gas connection	3/4"	3/4"	1"
Cooling air connection	3/8"	3/8"	3/8"
Cooling air quantity	1 Nm <sup>3</sup> /h	1 Nm <sup>3</sup> /h	2 Nm <sup>3</sup> /h

## Advantages

The third generation SDB series burners offer

- Low NO<sub>x</sub> emission
- Simple on-the-run adjustment
- Adjustment easily reproduced





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