

Solutions for Technology in Glass

## Calorific Value / Wobbe measurement & automatic control



Control of calorific value for constant application of energy

Energy content of gas fuel is a major process parameter for stable process-operation of industrial furnaces.

Changes of source area or the evident expanding of admixing with other types of fuel (e.g. H<sub>2</sub>, biogas, liquid gases as LPG or LNG) result in substantial variations of calorific value.

As such changes of gas composition often come discontinuously, but without any information for the customer, impact of "hidden" gas quality changes will not be recognized as the origin of typical problems with an instable process. Therefore STG has available a conception in order to counter such variations – by a continuous measurement of calorific value and a sophisticated control strategy for compensation.

### Why to control energy content?

- Gas suppliers deliver fuels with varying compositions due to frequent changes of sources of supply
- Mixtures of NG with e.g. H<sub>2</sub>, Biogas, LPG or LNG affect fuel characteristics
- Impact on energy content of gas
- Impact on burner's flame characteristics
- Impact on Air / Oxygen demand

Target: Ensure a constant application of energy for a stable process!

### Solution for compensation

- Reliable online calorific value Measurement (thermal method)
- Control actual application of energy for the process
- STG Energy based Lambda Control compensates gas quality variations by modification of gas flow **and** combustion air/oxygen setpoints
- STG Lambda Control compensates variations of combustion air demand
- Automatic control possible even with short-term variations

### Benefits

- Direct measurement Wobbe index and density
- All components of natural gas considered (incl. H<sub>2</sub>)
- Low cost purchase
- User-optimized and robust design
- Low maintenance costs
- Only one calibration gas needed with low consumption

### Scope of supply

- Technical consulting
- Delivery and installation of complete measurement system
- Signal processing as integrated DCS solution
- Adapted control solution (STG Energy Control, STG Lambda Control)  
*Patent WO 2012/038488 A1 and PCT EP2016/054715*
- Regular maintenance of the system

### Customer cooperation

- Process connection main gas- and waste gas pipe
- Providing calibration gas CH<sub>4</sub> 3.5 incl. connections
- Providing pressure regulator CH<sub>4</sub>



CWD: Calorimeter f<0,5% precision



STG: Solution Partner of Union Instruments



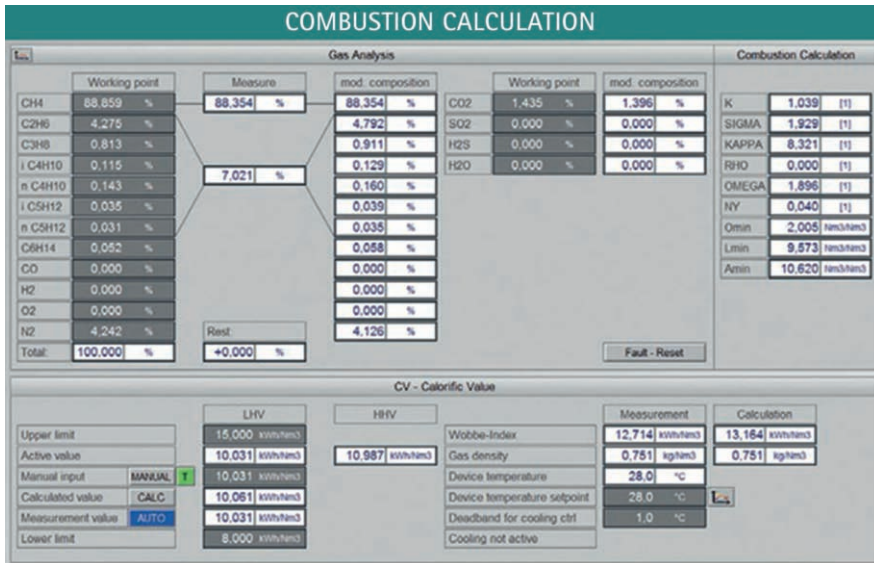
Solutions for Technology in Glass

STG Combustion Control GmbH & Co KG

Kiekebuscher Weg 14 · 03050 Cottbus/Deutschland

Telefon: +49 (0) 355 -5 90 20-0 · Telefax: +49 (0) 355 -54 11 24

E-Mail: stg@stg-cottbus.de · Internet: www.stg-cottbus.de



PLC integrated online combustion calculation for varying gas composition, including:

- Net Calorific value NCV (or: Lower Heating Value LHV)
- Gross Calorific Value GCV (or: Higher Heating Value HHV)
- Wobbe Index
- Stoichiometric air and waste gas flow
- Dimensionless figures of fuel, acc. to Boie

At a variation of gas composition STG Software function blocks „Energy Control" and "Lambda Control" automatically compensate the appropriate gas / air demand.

