INNOVATIVE GAS ANALYSIS TECHNOLOGY

Customized compact analysis systems

EMISSIONS MONITORING
PROCESS GAS OPTIMIZATION
PRECISE POWERFUL EFFICIENT
The multi-component gas analyzer SWG 300\textsuperscript{-1} is based on extractive, cold-dry method and uses NDIR modules, which measure continuously, selectively and highly exactly within the ppm range. NO\textsubscript{2} is catalytically converted into NO for true NO\textsubscript{x} measurements. Oxygen analysis is based on zirconium cell, paramagnetic cell or „long-life“ electrochemical cell.

The complete flue gas conditioning system is processor-controlled and continuously monitored. It uses an electric gas cooler with automatic condensate draining pump; sample gas filtration with sample flow monitoring and alarm; auto-zero calibration, RS 485 for data communication and 8 channel analog outputs 4…20 mA.

The SWG 300\textsuperscript{-1} is easy to swing-open. All important parts are readily accessible and easily serviced.
**Application:** Incineration

Measured flue gas components:
- \( \text{SO}_2 \)
- \( \text{NO}_x \)
- \( \text{CO} \)
- \( \text{CO}_2 \)
- \( \text{O}_2 \)

**Application:** Boiler monitoring, 3 sampling point switching

Measured flue gas components:
- \( \text{NO}_x \)
- \( \text{CO} \)
- \( \text{CO}_2 \)
- \( \text{O}_2 \)

**Gas sampling probes and -lines**

MRU offers industrial probes for high and low dust content, for gas temperatures up to 650 °C (stainless steel), up to 1,100 °C (Inconel steel) and up to 1,700 °C (ceramic). Probes with and without heated filter element and probe tubes in several lengths.

- **Probe HD-GW (high dust)**
  - For flue gases with sticky, oily, tar like dirt
  - With electrical heated and +150 °C temperature regulated, external, not back-purgeable quartz glass wool filter
  - With stainless steel protection cover
  - With stainless steel flange DN65PN6

**Individual applications**

- Ex-zone2 (special model)
- Up to simultaneous 7 gas components
- Up to 5 automatic sampling point switching
- Weather proof enclosure IP 65
- Complete / partial air conditioning
- Automatic calibration with test gases
- Sample gas conditioning, also directly after the sampling point
- Easy to service and maintain
- Customized solutions on request

**Example: Gas sampling probe for low dust flue gas**

Stainless steel probe up to 900 °C with flange DN 65 PN 6 with sintered metal filter 3 \( \mu \)

**Application:** Petro-Chemie

Measured flue gas components:
- \( \text{CH}_4 \)
- \( \text{SO}_2 \)
- \( \text{NO}_x \)
- \( \text{CO} \)
- \( \text{CO}_2 \)
- \( \text{O}_2 \)

**Application:** Incineration

Measured flue gas components:
- \( \text{SO}_2 \)
- \( \text{NO}_x \)
- \( \text{CO} \)
- \( \text{CO}_2 \)
- \( \text{O}_2 \)

**Application:** Boiler monitoring, 3 sampling point switching
Technical specifications

<table>
<thead>
<tr>
<th>Measured components</th>
<th>measuring range</th>
<th>accuracy</th>
<th>measuring cell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen O₂</td>
<td>0… 25 %</td>
<td>0,2 Vol.-% ± abs.</td>
<td>paramagnetic</td>
</tr>
<tr>
<td>Oxygen O₂</td>
<td>0… 25 %</td>
<td>0,2 Vol.-% ± abs.</td>
<td>zirconium</td>
</tr>
<tr>
<td>Oxygen O₂</td>
<td>0… 25 %</td>
<td>0,2 Vol.-% ± abs.</td>
<td>electrochemical</td>
</tr>
<tr>
<td>Nitric dioxide NO₂</td>
<td>catalytic conversion in NO min. 90% conversion efficiency (option)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1-gas infrared bench

<table>
<thead>
<tr>
<th>Carbon monoxide CO</th>
<th>min. measuring range</th>
<th>max. measuring range</th>
<th>linearity error</th>
</tr>
</thead>
<tbody>
<tr>
<td>0… 100 ppm</td>
<td>0… 500 ppm</td>
<td>2 % of full scale</td>
<td></td>
</tr>
<tr>
<td>Nitric oxide NO</td>
<td>0… 200 ppm</td>
<td>0… 1.000 ppm</td>
<td>2 % of full scale</td>
</tr>
<tr>
<td>Sulfur dioxide SO₂</td>
<td>0… 100 ppm</td>
<td>0… 500 ppm</td>
<td>2 % of full scale</td>
</tr>
</tbody>
</table>

2-gas infrared bench

<table>
<thead>
<tr>
<th>Nitric oxide NO</th>
<th>min. measuring range</th>
<th>max. measuring range</th>
<th>linearity error</th>
</tr>
</thead>
<tbody>
<tr>
<td>0… 2.500 ppm</td>
<td>0… 5.000 ppm</td>
<td>3 % of full scale</td>
<td></td>
</tr>
<tr>
<td>Nitric dioxide NO₂</td>
<td>0… 500 ppm</td>
<td>0… 1.000 ppm</td>
<td>3 % of full scale</td>
</tr>
</tbody>
</table>

3-gas infrared bench

<table>
<thead>
<tr>
<th>Carbon monoxide CO</th>
<th>min. measuring range</th>
<th>max. measuring range</th>
<th>linearity error</th>
</tr>
</thead>
<tbody>
<tr>
<td>0… 1.000 ppm</td>
<td>0… 30.000 ppm</td>
<td>3 % of full scale</td>
<td></td>
</tr>
<tr>
<td>Carbon dioxide CO₂</td>
<td>0… 3 %</td>
<td>0… 30 %</td>
<td>3 % of full scale</td>
</tr>
<tr>
<td>Sulfur dioxide SO₂</td>
<td>0… 1.000 ppm</td>
<td>0… 5.000 ppm</td>
<td>3 % of full scale</td>
</tr>
</tbody>
</table>

4-gas infrared bench

<table>
<thead>
<tr>
<th>Carbon monoxide CO</th>
<th>min. measuring range</th>
<th>max. measuring range</th>
<th>linearity error</th>
</tr>
</thead>
<tbody>
<tr>
<td>0… 200 ppm</td>
<td>0… 1.000 ppm</td>
<td>2 % of full scale</td>
<td></td>
</tr>
<tr>
<td>Carbon dioxide CO₂</td>
<td>0… 4 %</td>
<td>0… 20 %</td>
<td>2 % of full scale</td>
</tr>
<tr>
<td>Nitric oxide NO</td>
<td>0… 200 ppm</td>
<td>0… 1.000 ppm</td>
<td>2 % of full scale</td>
</tr>
<tr>
<td>Sulfur dioxide SO₂</td>
<td>0… 200 ppm</td>
<td>0… 1.000 ppm</td>
<td>2 % of full scale</td>
</tr>
<tr>
<td>or Methane CH₄ (instead of SO₂)</td>
<td>0… 200 ppm</td>
<td>0… 1.000 ppm</td>
<td>2 % of full scale</td>
</tr>
</tbody>
</table>

### Calculated values

- mg/Nm³, reference to O₂, NOx als mg/m³NO₂

### Repeatability

- 1 % of smallest measuring range

### Response time T90

- approx. 30 seconds of the analyzer sample gas inlet port

### Detection limit

- 1% of current measuring range

### Zero drift

- with AUTOZERO: neglectable

### Span drift

- without AUTOCAL(option): <2% of measuring range / 2 weeks

### Temperature influence

- max 2% of measuring range per 10°C

### Measured value stability

- The aforementioned data are valid provided that ambient conditions (e.g. sample flow, air temperature and pressure) are constant.

### General specification

#### Warm-up time

- 1h minimum

#### Sample gas conditioning

- integrated gas cooler with dew point = +3 °C

#### Sample gas filtration

- filtering particle size < 1µ

#### Sample gas monitoring

- flow regulation and supervision, 30… 50 l/h

#### Calibration

- By software, calibration gases for every gas required, instrument air or clean ambient air for auto-zero

#### Operating temperature

- +5 °C … +40 °C, max. 90 % rh, not condensing

#### Storage temperature

- -20 °C … +50 °C

#### Ambient conditions

- use in aggressive, corrosive or very high dust atmosphere (on request) hazardous area use only with special equipment (on request).

#### Display

- full graphic, backlit LCD display

#### Resolution

- depends on range selection, ppm or %

#### Data transfer

- 8 channel analog output 4… 20 mA, RS 485 digital (modbus RTU)

#### Alarm relays

- 3x potential free NO contacts

#### Power supply

- 110 … 230 Vac / 50 … 60 Hz / 500 … 750 W, with heated hose control (option) add 100 W/meter

#### Internal main fuse

- 10 … 32 A (dependent upon length of the heated gas sampling line)

#### Protection class

- IP 52 (IP 65 for outdoor mounting cabinet)

#### Weight

- approx. 40 … 120 kg, depending on system configuration and construction

#### Dimensions

- (H x W x D) 1.012 x 600 x 575 mm = steel enclosure for indoor mounting
- (H x W x D) 1.300 x 800 x 600 mm = fiber glass enclosure for outdoor mounting

MRU – sustainable analysing technology for more than 30 years!