



NO<sub>x</sub> | NO | NO<sub>2</sub> | CO | CO<sub>2</sub> | SO<sub>2</sub> | N<sub>2</sub>O | CH<sub>4</sub> | HC as C<sub>3</sub>H<sub>8</sub> | O<sub>2</sub>

## SWG 200 CEM

Stationary  
gas analysis system.



For continuous flue gas  
and emission monitoring.



# SWG 200 CEM

## Optimal gas analysis around the clock

With **SWG 200 CEM (Continuous Emission Monitoring)** we offer you a cost-effective, reliable system for emission and combustion monitoring.

### Suitable for various industrial sectors:

Diesel engines, methane/natural gas boilers, landfill gas/biogas CHPs, bagasse and biomass boilers and others

With **SWG 200 CEM**, simultaneous infrared analysis of up to 8 flue gas components is possible:

Gas measurement (NDIR)	Measuring range min./max.	Resolution	Repeatability
Nitric monoxide (NO)	0 ... 200/4,000 ppm	0.1 ppm	2 ppm or 1 % reading
Nitric dioxide (NO <sub>2</sub> )	0 ... 150/500 ppm	0.1 ppm	1 ppm or 1 % reading
Sulphur dioxide (SO <sub>2</sub> )	0 ... 200/4,000 ppm	0.1 ppm	2 ppm or 1 % reading
Carbon dioxide (CO <sub>2</sub> )	0 ... 40 %	0.01 Vol%	0.2% or 1 % reading
Carbon monoxide (CO)	0 ... 200/10,000 ppm	0.1 ppm	2 ppm or 1 % reading
Nitrous oxide (N <sub>2</sub> O)	0 ... 100/500 ppm	0.1 ppm	2 ppm or 1 % reading
Methane (CH <sub>4</sub> )	0 ... 500/10,000 ppm	0.1 ppm	10 ppm or 1 % reading
Propane (C <sub>3</sub> H <sub>8</sub> )	0 ... 200/5,000 ppm	0.1 ppm	2 ppm or 1 % reading

### We offer you these special advantages:

- Use of optimized NDIR technology with improved accuracy and without zero offset
- O<sub>2</sub> measurement with an electrochemical or a paramagnetic sensor
- Automatic zero point using clean ambient air
- Automatic calibration for up to 4 gas cylinders
- Double stage Peltier gas cooler with 2 automatic condensate pumps
- Cold/dry gas sampling with low sample flow volume of only 1 l/min.



# The device in detail

## An overview of the special features



### Cabinet

- Stainless steel cabinet for industrial environment
- 3.5" TFT color display, incl. keypad and standard RS 485 interface (Modbus RTU)
- Indoor installation, preferably air-conditioned
- Outdoor installation with sun and rain protection and low dust site



### Gas conditioning

- Different probes, depending on the condition the gases to be analyzed (lowdust, highdust and compact probe with heating hose)
- Heated (and unheated) gas sampling lines up to 80 m length for up to 2 measuring points
- Efficient gas filtration by sintered PTFE particle filters
- Int. flow monitoring with alarm indication on the display
- Filtering of the gas to protect the internal flow sensor



### Measurement technology

- Choice of 4-gas, 6-gas or 8-gas infrared (NDIR) measurement modules
- Electrochemical or paramagnetic O<sub>2</sub> sensor
- Direct and continuous measurement with pressure and temperature compensation
- Electrochemical H<sub>2</sub> and H<sub>2</sub>S measurement
- Controlled dosage and injection of 10% phosphoric acid for reliable, precise measurement of SO<sub>2</sub> and NO<sub>2</sub>



### Data communication

- I/O module with 4-channel analog output 4 ... 20 mA and 2 relays (NO contacts) incl. external control via 4 contacts and 4-channel analog input 4 ... 20 mA
- Profibus, Ethernet, USB, SD card
- PC software "MRU4Win": visualize measurement data, manage, export and print

# SWG 200 CEM

## Technical data

Gas measurement (NDIR)	Measuring range min./max.	Resolution	Repeatability*	8h-Drift*	Linearity
Nitric monoxide (NO)	0 ... 200/4,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
Nitric dioxide (NO <sub>2</sub> )	0 ... 150/1,000 ppm	0.1 ppm	1 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
Sulphur dioxide (SO <sub>2</sub> )	0 ... 150/4,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
Carbon dioxide (CO <sub>2</sub> )	0 ... 40 %	0.01 Vol%	0.2 % or 1 % reading	0.2 % or 1 % reading	1 % m. r.
Carbon monoxide (CO)	0 ... 175/10,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
Nitrous oxide (N <sub>2</sub> O)	0 ... 100/500 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
Methane (CH <sub>4</sub> )	0 ... 500/10,000 ppm	0.1 ppm	10 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
Propane (C <sub>3</sub> H <sub>8</sub> )	0 ... 200/5,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.

Gas measurement (EC/PM)	Method <sup>1</sup>	Measuring range min./max.	Resolution	Accuracy*
Oxygen (O <sub>2</sub> ) (long life)	EC	0 ... 25 %	0.01 %	± 0.25 % abs.
Oxygen (O <sub>2</sub> )	PM	0 ... 25 %	0.01 %	0.1 % abs.

General technical data	
Zero offset	negligible due to automatic zeroing
Span offset	less than 0.2 % of the measuring range per month
Calculated components	NO <sub>x</sub> : NO + NO <sub>2</sub> , calculated ppm or mg/m <sup>3</sup> , user-selectable O <sub>2</sub> reference combustion calculations (efficiency, heat loss) on special request
Operation/interfaces	<ul style="list-style-type: none"><li>■ Backlit 3.5" TFT color display</li><li>■ Backlit keyboard, password-protected operation</li><li>■ 4 analog outputs 4 ... 20 mA, galvanically isolated, max. load: 500 R</li><li>■ 2 alarm relays, potential-free contacts: 24 Vdc, 5 A</li><li>■ Data storage and data logger on SD card</li><li>■ RS 485 digital interface (Modbus RTU)</li><li>■ DIN rail RS 485, to Profibus converter or to Ethernet converter</li></ul>
Gas conditioning	<ul style="list-style-type: none"><li>■ HD gas sampling probe, heated ceramic filter with backpurge, or gas sampling probe HD-GW, heated glass wool filter, or LD gas sampling probe, unheated with in-situ sintered metal filter, heated or unheated gas sampling line, PTFE DN 4/6 mm</li><li>■ Thermoelectric gas cooler (Peltier) with constant +4 °C dew point</li><li>■ Teflon particle filter, internal Viton tubing</li><li>■ Monitored and regulated gas sampling pump</li><li>■ Constant gas flow of 50 l/h</li><li>■ Gas inlet pressure: -200 ... +20 mbar (hPa)</li><li>■ Sample gas outlet: atmospheric pressure</li></ul>
Housing	Stainless steel cabinet, continuously monitored cabinet ventilation with alarm, Antifreeze heater 200 W (option)
Operating conditions	+5 ... +45 °C or -10 ... +45 °C with cabinet heating
Power supply	Universal: 90 ... 240 Vac, 47 ... 63 Hz, 120 W (420 W with heating)
Protection class	IP54
Dimensions (W x H x D)	700 x 600 x 210 mm, suitable for wall mounting
Weight	50 kg

MRU – Competence in gas analysis. Since 1984.



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