



# SWG 200 CEM

Stationary gas analysis system

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



for continuous flue gas and  
emission monitoring



# SWG 200 CEM

HIGH END 24/7 gas analysis

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/bio-gas CHPs, bagasse and biomass boilers and others

## Simultaneous infrared analysis of up to 8 flue gas components is possible:

Gas measurement	NDIR	Measuring range min/max	Resolution	Repeatability
NO	Nitric oxide	0 ... 200 / 4,000 ppm	0.1 ppm	± 2 ppm or 1 % reading
NO2	Nitric dioxide	0 ... 150 / 500 ppm	0.1 ppm	± 1 ppm or 1 % reading
SO2	Sulfur dioxide	0 ... 200 / 4,000 ppm	0.1 ppm	± 2 ppm or 1 % reading
CO2	Carbon dioxide	0 ... 40 %	0.01 Vol%	± 0.2 % or 1 % reading
CO	Carbon monoxide	0 ... 200 / 10,000 ppm	0.1 ppm	± 2 ppm or 1 % reading
N2O	Nitrous oxide	0 ... 100 / 500 ppm	0.1 ppm	± 2 ppm or 1 % reading
CH4	Methane	0 ... 500 / 10,000 ppm	0.1 ppm	± 10 ppm or 1 % reading
C3H8	Propane	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 zeroing 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 (low-dust, high-dust and compact probe with heating hose)
- Heated (and unheated) gas sampling lines
- up to 262 foot (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



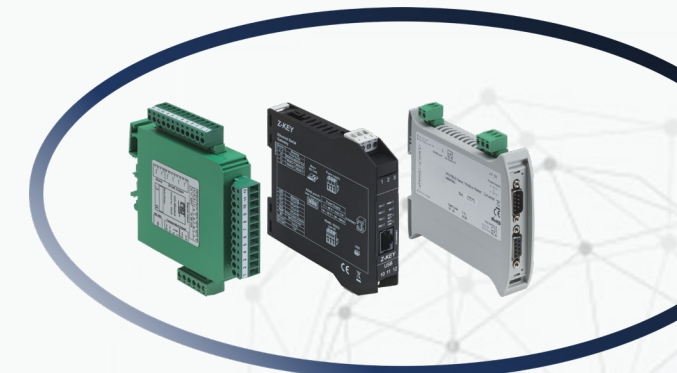
## Measurement technology

- 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



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## TECHNICAL SPECIFICATIONS

Gas measurement (NDIR)		Measuring range min./max.	Resolution	Repeatability	8h-Drift	Linearity
NO	Nitric oxide	0 ... 200 / 4,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
NO <sub>2</sub>	Nitric dioxide	0 ... 150 / 1,000 ppm	0.1 ppm	1 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
SO <sub>2</sub>	Sulfur dioxide	0 ... 150 / 4,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
CO <sub>2</sub>	Carbon dioxide	0 ... 40%	0.01%	0.2 % or 1 % reading	0.2 % or 1 % reading	1 % m. r.
CO	Carbon monoxide	0 ... 175 / 10,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
N <sub>2</sub> O	Nitrous dioxide	0 ... 100 / 500 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
CH <sub>4</sub>	Methane	0 ... 500 / 10,000 ppm	0.1 ppm	10 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.
C <sub>3</sub> H <sub>8</sub>	Propane	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	Measuring range min./max.	Resolution	Accuracy
O <sub>2</sub>	Oxygen (Long Life)	EC	0 ... 25 %	0.01%	0.25%
O <sub>2</sub>	Oxygen	PM	0 ... 25 %	0.01%	0.1%
H <sub>2</sub> S	Hydrogen sulfide	EC	0 ... 2,000/5,000 ppm	1 ppm	+/- 5 ppm or 5 % reading
H <sub>2</sub>	Hydrogen	EC	0 ... 1,000/2,000 ppm	1 ppm	+/- 5 ppm or 5 % reading

### General technical data

Zero offset	negligible due to automatic zeroing
Span offset	less than 0.2 % of the measuring range per month
Calculated components	NOx: 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>■ Back lit 3.5" TFT color display</li> <li>■ Back lit 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 back purge, 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: -80"H<sub>2</sub>O ... 80"H<sub>2</sub>O (-200 ... +200 mbar (hPa))</li> <li>■ Sample gas outlet: atmospheric pressure</li> </ul>
Enclosure	Stainless steel cabinet, continuously monitored cabinet ventilation with alarm, Antifreeze heater 200 W (option)
Operating conditions	41 ... 113 °F (+5 ... +45 °C) or 14 ... 113 °F (-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)	27.55" x 12.61" x 8.26" (700 x 600 x 210 mm), suitable for wall mounting
Weight	110 lbs. (50 kg)

Data subject to change without notice. | 1 EC = electrochemical sensor, PM = paramagnetic sensor, NDIR = non-dispersive infrared spectroscopy | \* which ever is larger | N-12746EN-K1-0.5M-821



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