# SWG 200 CEMS

# STATIONARY CONTINUOUS EMISSION ANALYZER


- **Up to 9 gases**
  **CO-$CO_2$-NO-$NO_2$-$N_2O$-$SO_2$-$CH_4$-$C_3H_8$ (NDIR)**
  **$O_2$ via electrochemical of paramagnetic**
- **Advanced NDIR technology provides great performance, accuracy and stability**
- **Affordable with low cost of ownership**

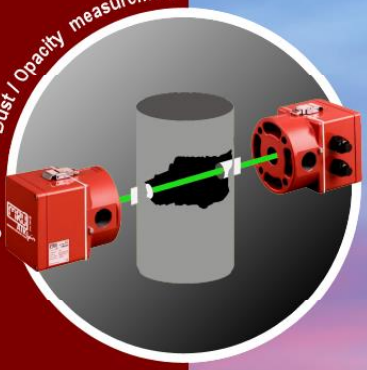
MRU AIR fair since 1984 ®
EMISSION MONITORING SYSTEMS

Over 30 years of innovative gas analysis!

# SWG 200 *CEM*

## 24/7 Gas analysis





The SWG 200 CEM (Continuous Emission Monitoring) is a cost-effective, reliable system for emission and combustion monitoring.

Suitable for various industries such as:
Diesel engines, methane/natural gas boilers, landfill gas/biogas CHPs, bagasse, biomass boilers and others

Simultaneous infrared analysis of up to 8 flue gas components is possible
NO, $NO_2$, $SO_2$, $CO_2$, CO, $N_2O$, $CH_4$ and $C_3H_8$

### Outstanding features:

- Optimized NDIR technology with improved accuracy and without zero offset
- O2 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 (only 1 l/min.)

# SYSTEM DETAILS

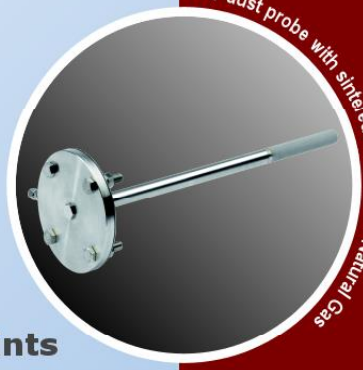
### Cabinet
- Aluminum housing with corrosion-resistant, red structural lacquer
- 3.5" TFT color display, incl. keypad and standard RS 485 interface (Modbus RTU)
- Indoor installation, preferably air-conditioned
- Outdoor installation with sun and rain protection and low dust site

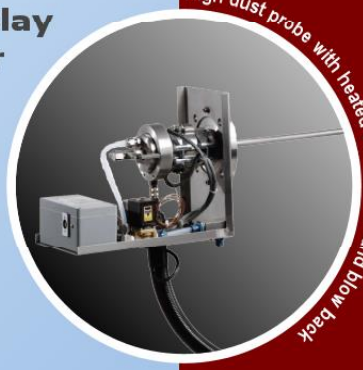
### Gas conditioning
- Different probes, depending on the condition the gases to be analyzed (low-dust, high-dust and compact probe with heating hose)
- Heated and unheated gas sampling lines up to 262 feet (80m) length for up to 3 measuring points
- Efficient gas filtration by sintered PTFE particle filters
- Int. flow monitoring with alarm indication on the display
- Filtering of the gas to protect the internal flow sensor

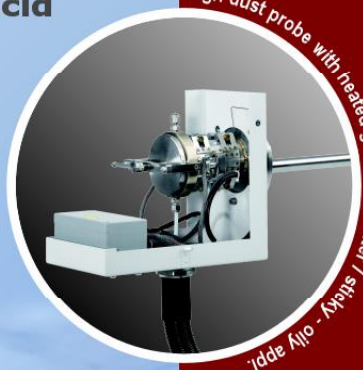
### Measurement technology
- Choice of 4-gas, 6-gas or 8-gas infrared (NDIR) measurement modules
- Electrochemical or paramagnetic $O_2$ sensor
- Direct and continuous measurement with pressure and temperature compensation
- Electrochemical $H_2$ and $H_2S$ measurement
- Controlled dosage and injection of 10 % phosphoric acid for reliable, precise measurement of $SO_2$ and $NO_2$

### 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


Heated probe for small diameter flue stacks


Low dust probe with sintered metal filter / Natural Gas


High dust probe with heated ceramic filer and blow back


High dust probe with heated glass wool filter / sticky - oily appl.


Industrial heated sampling line with exchangeable hoses

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## TECHNICAL SPECIFICATIONS

### SWG 200 CEM

| Measurement components | | Method[1] | Meas. range (min / max) | Resolution | Repeatability* | 8 hour drift* | Linearity |
|---|---|---|---|---|---|---|---|
| NO | Nitric oxide | NDIR | 0 … 200 / 4,000 ppm | 0.1 ppm | 2 ppm or 1 % reading | 2 ppm or 1 % reading | 1 % m. r. |
| $NO_2$ | Nitrogen dioxide | NDIR | 0 … 150 / 500 ppm | 0.1 ppm | 1 ppm or 1 % reading | 2 ppm or 1 % reading | 1 % m. r. |
| $SO_2$ | Sulfur dioxide | NDIR | 0 … 200 / 4,000 ppm | 0.1 ppm | 2 ppm or 1 % reading | 2 ppm or 1 % reading | 1 % m. r. |
| $CO_2$ | Carbon dioxide | NDIR | 0 … 40% | 0.01 Vol% | 0.2 % or 1 % reading | 0.2 % or 1 % reading | 1 % m. r. |
| CO | Carbon monoxide | NDIR | 0 … 200 / 10,000 ppm | 0.1 ppm | 2 ppm or 1 % reading | 2 ppm or 1 % reading | 1 % m. r. |
| $N_2O$ | Nitrous oxide | NDIR | 0 … 100 / 500 ppm | 0.1 ppm | 2 ppm or 1 % reading | 2 ppm or 1 % reading | 1 % m. r. |
| HC | Hydrocarbons ($CH_4$) | NDIR | 0 … 500 / 10,000 ppm | 0.1 ppm | 10 ppm or 1 % reading | 2 ppm or 1 % reading | 1 % m. r. |
| HC | Hydrocarbons ($C_3H_8$) | NDIR | 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[1] | Meas. range (min / max) | Resolution | Accuracy* |
|---|---|---|---|---|---|
| $O_2$ | Oxygen (long-Life) | EC | 0 … 25 % | 0.01% | 0.2% |
| $O_2$ | Oxygen | PM | 0 … 25 % | 0.01% | 0.1% |
| $H_2S$ | Hydrogen sulphide | EC | 0 … 2,000/5,000 ppm | 1 ppm | ± 5 ppm or 5 % reading |
| $H_2$ | Hydrogen | EC | 0 … 1,000 2,000 ppm | 1 ppm | ± 5 ppm or 5 % reading |

1 EC = elektrochemical sensor, PM = paramagnetic sensor, NDIR = non-dispersive infrared spectroscopy | * which ever is larger | N-12746-K0-10-620-SDE

### 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 + $NO_2$, calculated ppm or mg/m3, user-selectable $O_2$<br>combustion calculations (efficiency, heat loss) on special request |
| **Operation/interfaces** | • Backlit 3.5" TFT color display<br>• Backlit keyboard, password-protected operation<br>• 4 analog outputs 4 … 20 mA, galvanically isolated, max. load: 500 R<br>• 2 alarm relays, potential-free contacts: 24 Vdc, 5 A<br>• Data storage and data logger on SD card<br>• RS 485 digital interface (Modbus RTU)<br>• DIN rail RS 485, to ProfiBus converter or to Ethernet converter |
| **Gas conditioning** | • HD gas sampling probe, heated ceramic filter with backpurge<br>or gas sampling probe HD-GW, heated glass wool filter,<br>or LD gas sampling probe, unheated with in-situ sintered metal filter,<br>heated or unheated gas sampling line, PTFE DN 4/6 mm<br>• Thermoelectric gas cooler (Peltier) with constant +4 °C dew point<br>• Teflon particle filter, internal Viton tubing<br>• Monitored and regulated gas sampling pump<br>• Constant gas flow of 50 l/h<br>• Gas inlet pressure: -80 inH2O … 8 inH2O (-200 … +20 mbar) (hPa)<br>• Sample gas outlet: atmospheric pressure |
| **Enclosure** | Aluminum housing with red textured paint, continuously monitored cabinet ventilation with<br>Antifreeze heater 200 W (option) |
| **Operating conditions** | 41°F … 113°F or 14°F … 113°F with cabinet heating (+5 … +45 °C or -10 … +45 °C with cabinet heating) |
| **Power supply** | Universal: 90 … 240 Vac, 47 … 63 Hz, 90 W (300 W with heating) |
| **Protection class** | IP54 |
| **Dimensions (W x H x D)** | 27.55" x 31.48" x 11.02" (700 x 800 x 280 mm) suitable for wall mounting |
| **Weight** | 55 lbs. (25kg) |

**Data subject to change without notice**

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