



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 ₂)	0 150/500 ppm	0.1 ppm	1 ppm or 1 % reading
Sulphur dioxide (SO ₂)	0 200/4,000 ppm	0.1 ppm	2 ppm or 1 % reading
Carbon dioxide (CO ₂)	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 ₂ O)	0 100/500 ppm	0.1 ppm	2 ppm or 1 % reading
Methane (CH₄)	0 500/10,000 ppm	0.1 ppm	10 ppm or 1 % reading
Propane (C₃H ₈)	0 200/5,000 ppm	0.1 ppm	2 ppm or 1 % reading



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 O₂ sensor
- Direct and continuous measurement with pressure and temperature compensation
- Electrochemical H₂ and H₂S measurement
- Controlled dosage and injection of 10% phosphoric acid for reliable, precise measurement of SO₂ and NO₂



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

Nitric monoxide (NO)	Gas measurement (NDIR)	Measuring range min./max.	Resolution	Repeatability*	8h-Drift*	Linearity			
Sulphur dioxide (SO ₂)	Nitric monoxide (NO)	0 200/4,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.			
Carbon monoxide (CO)	Nitric dioxide (NO ₂)	0 150/1,000 ppm	0.1 ppm	1 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.			
Carbon monoxide (CO) 0175/10.000 ppm 0.1 ppm 2 ppm or 1 % reading 2 ppm or 1 % reading 1 % m.r. Nitrous oxide (N ₂ O) 0100/500 ppm 0.1 ppm 2 ppm or 1 % reading 2 ppm or 1 % reading 2 ppm or 1 % reading 1 % m.r. Propane (C ₂ H ₂) 02007/5000 ppm 0.1 ppm 2 ppm or 1 % reading 2 ppm or 1 % reading 2 ppm or 1 % reading 1 % m.r. Gas measurement (EC/PM) Method! Measuring range min / max Resolution Accouncy* Oxygen (O ₂) PM 025% 0.01 % ± 0.25% Oxygen (O ₂) PM 025% 0.01 % ± 0.25% Hydrogen sulphide (H ₂ S) EC 02007/5000 ppm 1 ppm ± 5 ppm or 5 % reading Hydrogen sulphide (H ₂ S) EC 02007/5000 ppm 1 ppm ± 5 ppm or 5 % reading Hydrogen sulphide (H ₂ S) EC 02000/5000 ppm 1 ppm ± 5 ppm or 5 % reading General technical data 2 ppm or 1 % reading 2 ppm or 1 % reading 2 ppm or 1 % reading Span offset 1 ppm or 1 % reading 2 ppm or 1 % reading 2	Sulphur dioxide (SO ₂)	0 150/4,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.			
Nitrous oxide (N,O) 0100/500 ppm 0.1 ppm 2 ppm or 1 % reading of 19 mor 1 % reading of 19 mor 1. 2 ppm or 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 2 ppm or 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 2 ppm or 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor 1. 19 mor 1 % reading of 19 mor	Carbon dioxide (CO ₂)	0 40 %	0.01 Vol%	0.2% or 1% reading	0.2 % or 1 % reading	1 % m. r.			
Methane (CH₄) 0 _ 500/10,000 ppm 0.1 ppm 10 ppm or 1 % reading 2 ppm or 1 % reading 1 % m.r. Propane (C,H₄) 0 _ 200/5,000 ppm 0.1 ppm 2 ppm or 1 % reading 1 % m.r. Gas measurement (EC/PM) Method! Measuring ranger m/max Resolution Accuracy* Oxygen (O₂) PM 0 _ 2.5 % 0.01 % ± 0.25 % Oxygen (O₂) PM 0 _ 2.5 % 0.01 % ± 5 ppm or 5 % reading Hydrogen sulphide (H₂5) EC 0 _ 2,000/5,000 ppm 1 ppm ± 5 ppm or 5 % reading General technical data Ferror offset 1 ppm ± 5 ppm or 5 % reading Span offset less than 0.2% of the measuring range per month Ferror offset Ferror offset Calculated components negligible due to automatic zeroing 1 ppm ± 5 ppm or 5 % reading Span offset less than 0.2% of the measuring range per month Less than 0.2% of the measuring range per month Calculated components negligible due to automatic zeroing 1 ppm vision zeroing 1 ppm vision zeroing 1 ppm vision zeroing 1 ppm vision z	Carbon monoxide (CO)	0 175/10,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.			
Propame (C,H _n) 0 - 2007/5,000 ppm 0.1 ppm 2 ppm or 1% reading 2 ppm or 1% reading 1 % m.r. Gas measurement (EC/PM) Method¹ Measuring range min/max Resolution Accuracy* Oxygen (O ₂) (Ing) life) C 0 - 25% 0.01% 0.1% 1 Bydrogen sulphide (H ₂ S) E 0 - 2,000/5,000 ppm 1 ppm ± 5 ppm or 5% reading Hydrogen (H ₃) EC 0 - 2,000/5,000 ppm 1 ppm ± 5 ppm or 5% reading General technical data 2 0 - 1,000/2,000 ppm 1 ppm ± 5 ppm or 5% reading Span offset less than 0.2% of the measuring range per month 1 ppm ± 5 ppm or 5% reading Calculated components less than 0.2% of the measuring range per month 2 per ference 1 ppm ± 5 ppm or 5% reading Calculated Components less than 0.2% of the measuring range per month 2 ppm or 15% reading 1 ppm or 15% reading Span offset less than 0.2% of the measuring range per month 2 ppm or 15% reading 2 ppm or 15% reading Calculated Components 3 less ackils 3.5°TET color display 3 ppm or 15% reading 3 ppm or 15% reading	Nitrous oxide (N ₂ O)	0 100/500 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* Oxygen (O₂) (long life) EC 025 % 0.01 % ± 0.25 % Oxygen (O₂) PM 025 % 0.01 % 0.1 % Hydrogen sulphide (H₂5) EC 02,000/5,000 ppm 1 ppm ± 5 ppm or 5% reading Hydrogen (H₂) EC 01,000/2,000 ppm 1 ppm ± 5 ppm or 5% reading General technical data Ear offset Span offset less than 0.2% of the measuring range per month Calculated components No.2, NO + NO, calculated ppm or mg/m², user-selectable O₂ reference combustion calculations (efficiency, heat loss) on special request Operation/interfaces ■ Backlit a5°T TFT color display ■ Backlit abdound, password-protected operation 4 analog outputs 4 20 mA, galvanically isolated, max. load: 500 R 2 alarm relays, potential-free contacts; 24 Wdr., 5 A 2 alarm relays, potential-free contacts; 24 Wdr., 5 A 2 alarm relays, potential-free contacts; 24 Wdr., 5 A 2 alarm relays, potential-free contacts; 24 Wdr., 5 A 2 alarm relays, potential-free contacts; 24 Wdr., 5 A 2 alarm relays, potential-free contacts; 24 Wdr., 5 A 2 alarm relays, potential-free c	Methane (CH ₄)	0 500/10,000 ppm	0.1 ppm	10 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.			
Oxygen (O₂) (long life) EC 0 25 % 0.01 % ± 0.25 % Oxygen (O₂) PM 0 25 % 0.01 % 0.1 % Hydrogen (H₂) EC 0 2,000/5,000 ppm 1 ppm ± 5 ppm or 5 % reading Hydrogen (H₂) EC 0 1,000/2,000 ppm 1 ppm ± 5 ppm or 5 % reading Hydrogen (H₂) EC 0 1,000/2,000 ppm 1 ppm ± 5 ppm or 5 % reading General technical data Feature (H₂) 1 ppm ± 5 ppm or 5 % reading Face offset less than 0.2 % of the measuring range per month Feature (H₂) Feature (H₂) Calculated components NO₂; NO + NO₂, calculated ppm or mg/m², user-selectable O₃ reference combustion calculations (efficiency, heat loss) on special request Operation/interfaces Backlit keyboard, password-protected operation 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 2 alam relays, bettall fee contacts: 24 Vid., 5 A 2 alam relays, bettall-fee contacts: 24 Vid., 5 A 2 alam relays, bettall-fee contacts: 24 Vid., 5 A 2 alam relays, bettall-fee (Modbus RTU) 3 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 2 alam relays, bettall-fee (Modbus RTU) 3 analog pote pote (Modbus RTU) 3 analog pote pote (Modbus RTU) <th>Propane (C₃H₈)</th> <th>0 200/5,000 ppm</th> <th>0.1 ppm</th> <th>2 ppm or 1 % reading</th> <th>2 ppm or 1 % reading</th> <th>1 % m. r.</th>	Propane (C ₃ H ₈)	0 200/5,000 ppm	0.1 ppm	2 ppm or 1 % reading	2 ppm or 1 % reading	1 % m. r.			
Oxygen (O₂) PM 0 25 % 0.01 % 0.1 % Hydrogen sulphide (H₂S) EC 0 2,000/5,000 ppm 1 ppm ± 5 ppm or 5% reading Hydrogen (H₂) EC 0 1,000/2,000 ppm 1 ppm ± 5 ppm or 5% reading General technical data Zero offset negligible due to automatic zeroing 1 ppm ± 5 ppm or 5% reading Span offset less than 0.2 % of the measuring range per month 1 ppm ± 5 ppm or 5% reading Calculated components NO₂: NO + NO₂, calculated ppm or mg/m², user-selectable O₂ reference combustion calculations (efficiency, heat loss) on special request Operation/interfaces Backlit keyboard, password-protected operation 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 4 analog outputs 4 20 mÅ, galvanically isolated, max. load: 500 R 4 analog outputs 4	Gas measurement (EC/PM)	Method ¹	Measuring rang	e min./max. Resolution	Accuracy*				
Hydrogen sulphide (H ₂ S) EC 0	Oxygen (O ₂) (long life)	EC	0 25 %	0.01 %	± 0.25 %				
Hydrogen (H₂) 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 NO _x : NO + NO _x calculated ppm or mg/m³, user-selectable O₂ reference combustion calculations (efficiency, heat loss) on special request Operation/interfaces ■ Backlit keyboard, password-protected operation ■ A salog outputs 4 20 m A₂, galvanically isolated, max. load: 500 R ■ 2 alarm relays, potential-free contacts: 24 Vdc, 5 A Data storage and data logger on 5D card \$ 485 digital interface (Modbus RTU) ■ DIN rail RS 485, to ProfiBus converter or to Ethernet converter Gas conditioning ■ HD gas sampling probe, heated ceramic filter with backpurge, or gas sampling probe the D-GW, heated glass wool filter, heated or unheated gas sampling in probe, which constant +4 °C dew point ■ Telmonelectric gas cooler (Pellier) with constant +4 °C dew point ■ Telmonelectric gas cooler (Pellier) with constant +4 °C dew point ■ Telmone particle filter, internal Viton tubing Monitored and regulated gas sampling pump ■ Constant gas flow of 50 l/h Gas inlet pressure -200 +20 mbar (hPa) Sample gas outlet: atmospheric pressure Housing Stainless steel cabinet	Oxygen (O₂)	PM	0 25 %	0.01 %	0.1 %				
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;. NO.4 NO., calculated ppm or mg/m², user-selectable O₂ reference combustion calculations (efficiency, heat loss) on special request Operation/interfaces ■ Backlit seyboard, password-protected operation ■ 4 analog outputs 4 20 mA, galvanically isolated, max. load: 500 R ■ 2 alarm relays, potential-free contacts: 24 Vdc, 5 A ■ Data storage and data logger on SD card RS 485 digital interface (Modbus RTU) ■ DIN rail RS 485, to ProfiBus converter or to Ethernet converter Gas conditioning ■ HD gas sampling probe, heated ceramic filter with backpurge, or gas sampling probe, heated ed with in-situ sintered metal filter, heated or unheated gas sampling line, PTFE DN 4/6 mm ■ Thermoelectric gas cooler (Petiter) with constant +4 °C dew point ■ Tefhon particle filter, internal Viton tubing ■ Monitored and regulated gas sampling pump ■ Constant gas flow of 50 Vh ■ Gas inlet pressure - 200 +20 mbar (hPa) ■ Sample gas outlet atmospheric pressure Housing Stainless steel cabinet, continuously monitored cabinet ventilation with alarm, Antifreeze heater 200 W (option) Operating conditions +5 +45 °C or -10 +45 °	Hydrogen sulphide (H₂S)	EC	0 2,000/5,000	ppm 1 ppm	± 5 ppm o	r 5% reading			
Zero offset negligible due to automatic zeroing Span offset less than 0.2% of the measuring range per month Calculated components NO _x : NO + NO ₂ , calculated ppm or mg/m³, user-selectable O₂ reference combustion calculations (efficiency, heat loss) on special request Operation/interfaces ■ Backlit keyboard, password-protected operation ■ 4 analog outputs 4 20 mA, galvanically isolated, max. load: 500 R ■ 2 alarm relays, potential-free contacts: 24 Vdc, 5 A ■ Data storage and data logger on SD card ■ Pass sampling probe probe represented (Modbus RTU) ■ DIN rail RS 485, to ProfiBus converter or to Ethernet converter Gas conditioning 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 probe, unheated with in-situ sintered metal filter, heated or unheated gas sampling probe, unheated with in-situ sintered metal filter, heated or unheated gas sampling probe you have a divident in situ sintered metal filter, heated or unheated gas sampling promp ■ Constant gas flow of 50 l/h ■ Gas inlet pressure: 200 +20 mbar (Pra) ■ Sample gas outlet: atmospheric pressure 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 IPS4	Hydrogen (H₂)	EC	0 1,000/2,000	ppm 1 ppm	± 5 ppm o	r 5% reading			
Span offset less than 0.2% of the measuring range per month	General technical data								
Calculated components NO₂: NO + NO₂, calculated ppm or mg/m³, user-selectable O₂ reference combustion calculations (efficiency, heat loss) on special request Operation/interfaces ■ Backlit x5.* TFT color display ■ Backlit keyboard, password-protected operation ■ 4 analog outputs 4 20 mA, galvanically isolated, max. load: 500 R ■ 2 alarm relays, potential-free contacts: 24 Vdc, 5 A ■ Data storage and data logger on SD card ■ RS 485 digital interface (Modbus RTU) ■ DIN rail RS 485, to ProfiBus converter or to Ethernet converter Gas conditioning 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, PTE DN 4/6 mm ■ Thermoelectric gas cooler (Peltier) with constant +4 °C dew point ■ Teflon particle filter, internal Viton tubing ■ Monitored and regulated gas sampling pump ■ Constant gas flow of 50 I/h ■ Gas inlet pressure: 200 +20 mbar (hPa) ■ Sample gas outlet: atmospheric pressure 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	Zero offset	negligible due to automatic zeroing							
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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 Thermoelectric gas cooler (Peltier) with constant +4 °C dew point Teflon particle filter, internal Viton tubing Monitored and regulated gas sampling pump Constant gas flow of 50 l/h Gas inlet pressure: -200 +20 mbar (hPa) Sample gas outlet: atmospheric pressure 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	Operation/interfaces	 Backlit keyboard, password-protected operation 4 analog outputs 4 20 mA, galvanically isolated, max. load: 500 R 2 alarm relays, potential-free contacts: 24 Vdc, 5 A Data storage and data logger on SD card RS 485 digital interface (Modbus RTU) 							
Operating conditions+5 +45 °C or -10 +45 °C with cabinet heatingPower supplyUniversal: 90 240 Vac, 47 63 Hz, 120 W (420 W with heating)Protection classIP54Dimensions (W x H x D)700 x 600 x 210 mm, suitable for wall mounting	Gas conditioning	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 Thermoelectric gas cooler (Peltier) with constant +4 °C dew point Teflon particle filter, internal Viton tubing Monitored and regulated gas sampling pump Constant gas flow of 50 l/h Gas inlet pressure: -200 +20 mbar (hPa)							
Power supplyUniversal: 90 240 Vac, 47 63 Hz, 120 W (420 W with heating)Protection classIP54Dimensions (W x H x D)700 x 600 x 210 mm, suitable for wall mounting	Housing	Stainless steel cabinet, continuously monitored cabinet ventilation with alarm. Antifreeze heater 200 W (ontion)							
Power supplyUniversal: 90 240 Vac, 47 63 Hz, 120 W (420 W with heating)Protection classIP54Dimensions (W x H x D)700 x 600 x 210 mm, suitable for wall mounting	Operating conditions	,							
Protection class IP54 Dimensions (W x H x D) 700 x 600 x 210 mm, suitable for wall mounting		J							
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MRU - Competence in gas analysis. For over 35 years.



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