

## Gasmeter™ CEMS EX

The GASMET CEMS Ex is especially designed for continuous emissions monitoring measurements (CEM) and for continuous process monitoring in hazardous environments. Typical application for CEM is H<sub>2</sub>O, CO<sub>2</sub>, CO, N<sub>2</sub>O, NO, NO<sub>2</sub>, SO<sub>2</sub>, HCl, HF, NH<sub>3</sub>, CH<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, C<sub>3</sub>H<sub>8</sub>, C<sub>2</sub>H<sub>4</sub>. The GASMET CEMS can be easily to configure for the new set of compounds. Measured components and calibration ranges can be changed according to application. This technical data describes one example of the system.

The GASMET CEMS Ex is used for on-line measurements. It is an ideal tool to use for measuring trace concentrations of pollutants in wet, corrosive gas streams. All parts of the GASMET CEMS Ex are heated up to 180 °C. It can be used for undiluted gases and the sample gases do not need drying beforehand.

The GASMET CEMS Ex consists of GASMET FTIR Gas Analyzer, GASMET PC, GASMET Sampling System. As an option the system can be equipped with GASMET Oxygen analyser and/or with total hydrocarbon analyser (FID). All parts of the system are 19" rack mounted and are installed on the pull-out shelves. The GASMET CEMS includes all power connections and temperature controllers for heated lines and heated sample probe. The operation of the system is fully automatic and controlled by the Calcmet software. Additionally all functions of the GASMET CEMS Ex can also be used manually.

GASMET PC and Calcmet application software controls the CEMS Ex. The measuring data can be transferred from the PC to the Control room with digital outputs (ModBus) or with analog outputs 4-20 mA. The alarms are transferred with relay contact. The GASMET CEMS Ex provides different alarm functions such as Function alarm, Service alarm, System alarm from purge unit. Function and service alarms are associated with the GASMET FTIR Gas Analyzer and with the Calcmet analysis software. A system alarm comes from GASMET Sampling System and it includes temperature alarms (from sample probe, heated lines, sampling unit), flow alarm and pressure alarm for zero gas (option). If any of the critical alarms is activated, instrument air starts to flow automatically into the system to prevent condensation. Standard CEMS is equipped also with a one span gas valve to allow automated span checks as required by the new legislation.

GASMET CEMS is air conditioned with Vortex cooling and cabin is equipped with Ex-purge unit. GASMET CEMS Ex is also supported by full remote control.



### General parameters

<b>Measuring principle:</b>	FTIR (Fourier Transform Infrared)
<b>Performance:</b>	Simultaneous analysis of up to 50 gas components
<b>Operating temperature:</b>	20 ± 20 °C, non condensing, dust free ambient air.
<b>Storage temperature:</b>	-20 - +60 °C
<b>Response time, T<sub>90</sub>:</b>	< 120 s, depending on the gas flow and measurement time
<b>Gas cell temperature:</b>	50-180 °C
<b>Sample gas:</b>	non-condensing, particle free
<b>Flow rate:</b>	~ 4 l/min
<b>Sample gas pressure:</b>	ambient

### Measuring Parameters

<b>Zero point calibration:</b>	24 hours, calibration with nitrogen (5.0 or higher N <sub>2</sub> recommended)
<b>Zero point drift:</b>	< 2 % of measuring range per zero point calibration interval
<b>Sensitivity drift:</b>	none
<b>Linearity deviation:</b>	< 2 % of measuring range
<b>Temperature drifts:</b>	< 2 % of measuring range per 10 K temperature change
<b>Pressure influence:</b>	1 % change of measuring value for 1 % sample pressure change. Ambient pressure changes measured and compensated

### Alarm Outputs

<b>Function Alarm:</b>	GASMET FTIR Gas Analyzer and Calcmeter application software.
<b>Service Alarm:</b>	GASMET FTIR Gas Analyzer and Calcmeter application software.
<b>System Alarm:</b>	Probe temperature low/high Heated module temp. low/high Line 1 temperature low/high Line 2 temperature low/high Line 3 temperature low/high Flow alarm low Zero gas pressure low Cabinet Temperature high A/C Unit
<b>Concentration Alarm:</b>	Measured values low/high
<b>Cooling Alarm:</b>	Cabinet Temperature low/high A/C Unit
<b>Service switch:</b>	Service & Maintenance
<b>Purge Alarm:</b>	Ex-purge unit function

### Measuring Data Outputs

GASMET Measuring System is equipped with analog or digital outputs. GASMET PC controls the measuring outputs.

**Digital Output:** ModBus, ASCII, COMLI, DDE link  
Other protocols on request

**Analog Output:**

- **Output range:** 4-20 mA, isolated
- **Channels:** 8 or 16 (1 or 32 bit PCI board)

### Air Conditioning

GASMET CEMS Ex is equipped with explosion proof air conditioner.

<b>Cooling capacity:</b>	2000W
<b>Explosion protection:</b>	II 2G EEx-pdem [ia] IIB+H2 T3/T4

### Ex Purge

Ex Purge unit is used to overpressurize the cabin.

<b>Air consumption:</b>	300 NI/min, max.
<b>Air quality:</b>	pressure 7-10 bar temperature + 43 °C, max.

### Heated Line

<b>Tube size:</b>	4/6 mm
<b>Core material:</b>	Teflon core
<b>Operating pressure:</b>	max. 400 kPa
<b>Temperature:</b>	max. 200 °C
<b>Fittings:</b>	6 mm Swagelok

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**Power supply:** 230 VAC or 115 VAC

**Power density:** 120 Watts /meter

The maximum length for the heated line is 30 m with 230 VAC and 15 m with 115 VAC power supply. All analysers are connected together with 1 m heated lines. Other lengths over 30 m (230 VAC) and temperatures on request.

### Sample Probe

**Sample Probe:** SP2000H / Ex-1/1/TA

- **Power consumption:** 800 Watts
- **Operating temperature:** 0 – 180 °C
- **Filter element:** S-2K 150 2µm, ceramic
- **Dust loadings:** < 2 g/m<sup>3</sup>

**Probe Material:** SS 316 Viton

- **Probe length:** 1 m
- **Sample temperature:** 600 °C max.
- **Sample pressure:** 0.4 to 6 bar

**Mounting flange:** DN65PN6

Other probes for high temperatures and for high dust loadings on request

### Electrical connections

**Main supply:** 3 x 16 A, 3 x L+N+PE

**Power consumption:** The full GASMET CEMS including GASMET FTIR Gas Analyzer, GASMET PC, GASMET Sampling Unit, GASMET O<sub>2</sub> Analyzer, Sample Probe and heated lines 21 m, ~7,5 kW

### Enclosure

The size of the enclosure depends on the cooling system

<b>Material:</b>	Bake painted steel
<b>Dimensions (mm):</b>	2200 * 800 * 800 (Vortex cooling)
<b>Weight:</b>	~550 kg (Full System)
<b>Protection:</b>	IP 54

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