

Rosemount™ XE10

Continuous Emissions Monitoring System (CEMS)



The Rosemount XE10 Continuous Emissions Monitoring System (CEMS) is a standardized solution certified to the European emissions directives EN 14181 and EN 15267-3 (QAL1) to help industrial plants prove compliance with environmental regulations and reporting requirements. The system uses the cold extractive measurement technique, eliminating the need to correct for moisture content. It is equipped with robust non-dispersive photometer and paramagnetic oxygen sensors for reliable analysis of emissions. Automated calibration and validation features help facilitate the zero and span gas drift checks required for (QAL3) procedures, minimizing maintenance and ensuring ongoing emissions reporting compliance.

Overview

The Rosemount XE10 Continuous Emissions Monitoring System (CEMS) is designed for the measurement of emissions from boilers, fired heaters and other large combustion plants. The system provides continuous, extractive measurement of CO, NO_x, SO₂, CO₂ and O₂. It is expandable and can also measure NO₂, N₂O, total hydrocarbons and low-level NO_x⁽¹⁾. Compact and pre-engineered, the modular Rosemount XE10 CEMS is an integrated solution complete with heated sample probe, sample line, sample conditioning and gas analyzers.

The Rosemount XE10 CEMS is fully compliant with the requirements of the European emissions directives EN14181 and the U.S. EPA regulations for automated measurement systems of stationary source emissions. The system is certified for QAL1 applications in accordance to the EN15267-1/EN15267-2/EN15267-3, TUV and MCERTS quality assurance standards.

Features

- Continuous, extractive measurement of up to five gas components (CO, NO_x, SO₂, CO₂ and O₂) in one analyzer
- Expandable and can be configured with up to 3 analyzer modules to accommodate different measurement ranges
- Compact, modular solution with a small footprint in a IP55 steel sheet cabinet
- Fully automated calibration facilitates zero and span checks and ensures system's mandated availability and data quality
- Operation at 41 to 104 °F (5 to 40 °C) without the need for an HVAC or a temperature-controlled analyzer room
- Different sample gas probes with weather protection, blow back or for installation in hazardous area
- NO₂ converter for reliable NO_x measurements
- Low temperature interlocks for the sample gas probe and a heated line to avoid condensation in the sample gas lines
- Two-stage sample gas cooler with peristaltic pumps. No need for H₃PO₄ injection to avoid cooler loss of SO₂
- Secure, remote access through web browser simplifies operation and configuration

Options

- Swing Frame for easy front side access to cabinet
- Junction Boxes for direct wiring at cabinet
- Condensate vessel with level switch
- Introduction of calibration gases at the sample probe for system verification

Applications

- Large combustion plants (LCP) according to Industrial Emissions Directive (IED) 2010/75/EC Annex V with solid, liquid and gaseous fuels.
- Medium combustion plants according to Directive (EU) 2015/2193 (MCPD)
- Co-incineration of waste according to Industrial Emissions Directive (IED) 2010/75/EC Annex VI
- Pulp & Paper industry
- CO₂ measurements for EU Emissions Trading System (EU ETS)

(1) These additional measurements are not currently available with QAL1 certification.

Performance specifications

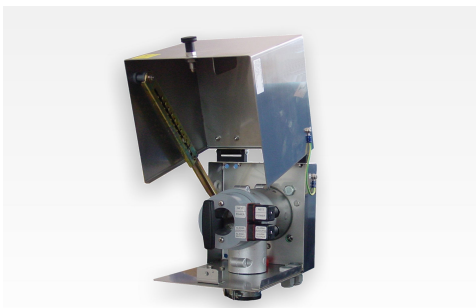
Rosemount X-STREAM Enhanced XEGP Continuous Gas Analyzer

- CO: 0 – 75⁽²⁾ mg/m³ to 3000 mg/m³
- NO_x or NO⁽³⁾: 0 – 150 mg/m³ to 2000 mg/m³
- SO₂: 0 – 150 mg/m³ to 2500 mg/m³
- CO₂: 0 – 25 %
- O₂: 0 – 25 %

Up to 4 photometers and 1 oxygen channel in one analyzer.

Functional specifications

Sample probes



- Buhler® Technologies sample gas probe – GAS 222.17
- Probe with or without weather protection
- Material: 1.4571 DIN DN65 PN6 flange
- Ambient temperature: –20 to 70 °C heated at 180 °C
- Max. dust: 2 g/m³
- Internal ceramic filter 3 µm pore size
- General purpose area only
- Optional probes with blowback for high dust loadings or ATEX Zone 1 and Zone 2 certified probes are available.

Heated line

- Self-regulating at 180 °C
- Sample tube: PTFE, 6 mm
- For hazardous area an ATEX version of heated line is available.

(2) 0-150 mg/m³ for German QAL1 certificate

(3) NO_x when XE10 CEMS is equipped with NO₂ converter

NO₂ to NO converter

- For NO_x measurements a NO₂ converter is integrated into the XE10 CEMS.
- Metal based converter cartridge working at 400 °C
- NO₂ conversion efficiency > 95%

Sample gas pump

Regulated to 1 lpm with pump bypass and needle valve

Sample gas cooler

- Two stage compressor cooler with glass heat exchangers working at 5 °C
- Two peristaltic pumps for condensate removal
- Condensate vessel with level alarm as option
- 2 μm PTFE filter for sample gas and ambient air

Calibration valves

- Standard operation with ambient air and one additional calibration gas cylinder
- Separation of calibration valves from sample gas path by 3/2-way valve
- Automatic calibration: Fully automatic with daily zero calibration utilizing ambient air and weekly full system calibration
- Optional injection of calibration gas at sample probe for system integrity check

Cabinet

- Dimensions
 - Width: 31.5 in. (800 mm)
 - Height: 78.74 in. (2000 mm)
 - Depth: 31.5 in. (800 mm)
- Swing Frame as option
- Sheet steel IP55 with internal fans
- Color: RAL 7035
- Weight: Approximately 1058 lbs. (480 kg)

Power connection

16 A 3-phase connector, 400 Vac, 50 Hz

Power

3170 W, 5.1 A

Area classification

Safe area

Ambient temperature

- Operation: 41 to 104 °F (5 to 40 °C)
- Storage: -4 to 158 °F (-20 to 70 °C)

Humidity (non-condensing)

- < 90% relative humidity at 68 °F (20 °C)
- < 70% relative humidity at 104 °F (40 °C)

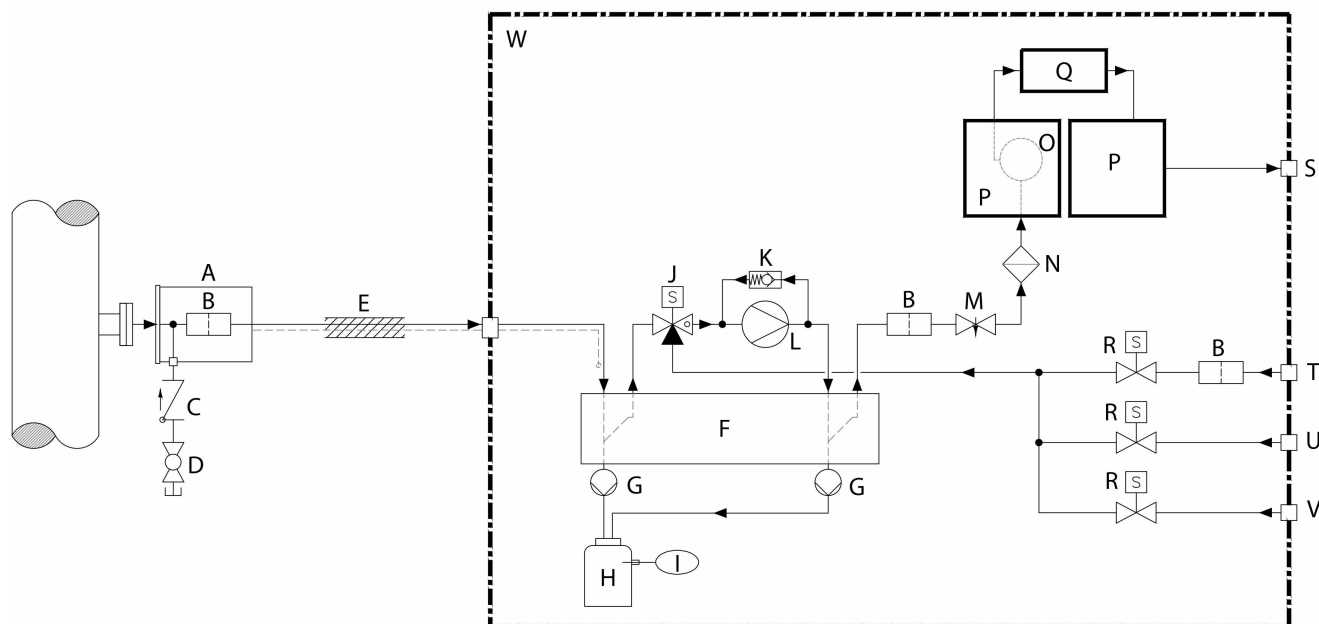
Elevation

0-2000 m above sea level

Gas connections

- 6 mm tube fitting for calibration gas inlet
- 12 mm tube fitting for cabinet exhaust

Sample flow schematic



A.	Sample probe	M.	Needle valve
B.	Filter	N.	Water trap
C.	Check valve	O.	Flow sensor
D.	Ball valve	P.	Analyzer
E.	Heated line	Q.	NO ₂ / NO converter
F.	Sample cooler	R.	Solenoid valve
G.	Peristaltic pump	S.	Vent
H.	Condensate vessel	T.	Ambient air
I.	Level switch	U.	Calibration gas
J.	3-way solenoid valve	V.	Reserve
K.	Over pressure valve	W.	Analyzer cabinet
L.	Pump		

Signal inputs, outputs and interface

Analog signal outputs

- 1 to 5, individually optically isolated
- 4 (0)–20 mA ($R_B \leq 500 \Omega$)
- NAMUR NE 43 and NE 44 compliance
- Screw terminals (max. $0.1 \text{ in}^2 / 1.5 \text{ mm}^2$)
- Junction box 0.75 mm^2 shielded as option

Digital signal outputs

- 4 NAMUR NE107 signals
- Dry contacts: 1 A, 30 V
- Screw terminals (max. $0.1 \text{ in}^2 / 1.5 \text{ mm}^2$)

Additional communication interface option⁽⁴⁾

Ethernet with Modbus TCP and Web browser

Approvals and certifications

CE Mark

- Electromagnetic Compatibility Directive (EMC) 2014/30/EU
- Low Voltage Directive (LVD) 2014/35/EU
- Pressure Equipment Directive (PED) 2014/68/EU Art. 4.3

Type approval

Certified for Continuous Emissions Monitoring (CEMS) according to:

- EN15267-1
- EN15267-2
- EN15267-3
- EN14181 (QAL1)

MCERTS certificate number

MC200367/00

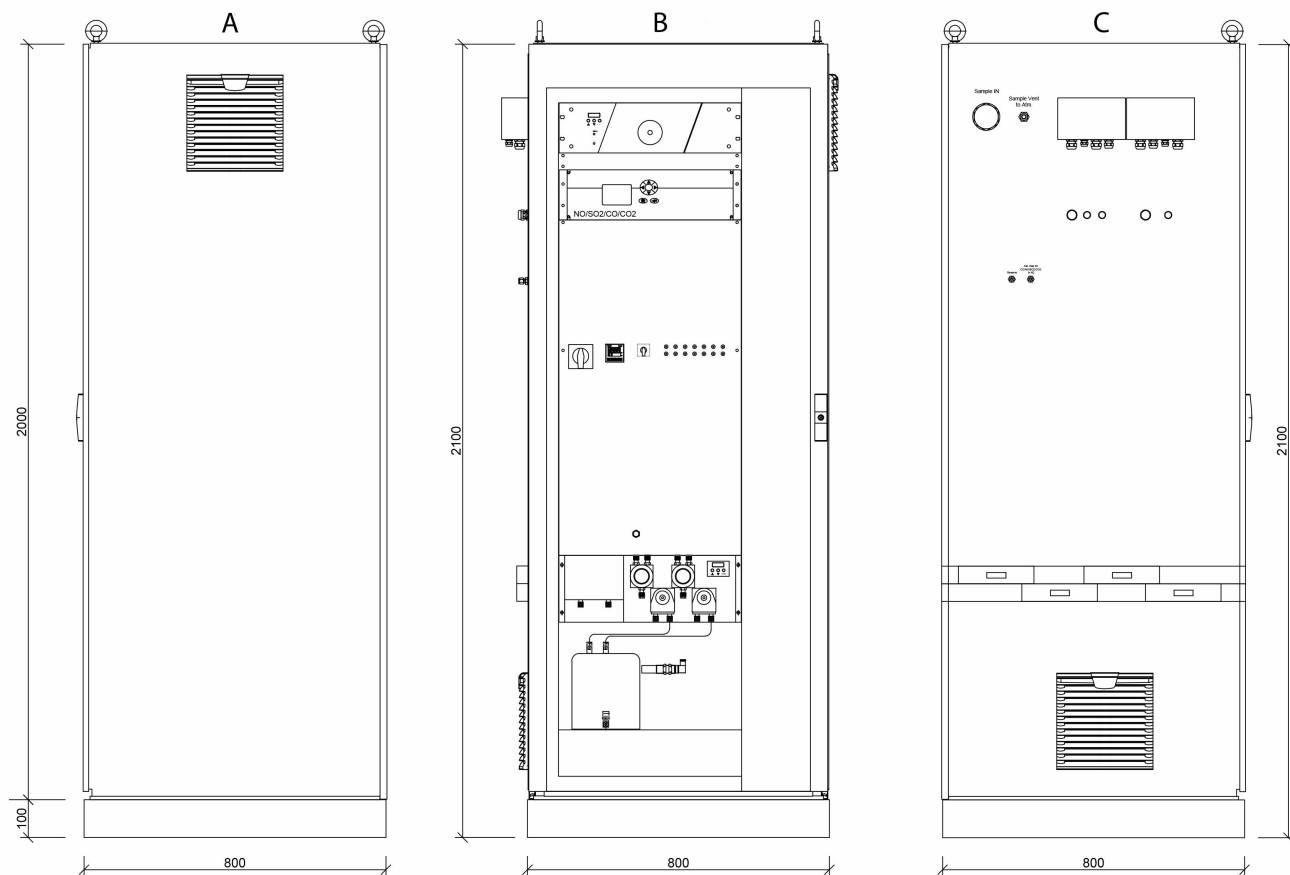
TUV/LAI test report number

Pending

U.S. EPA 40 CFR Part 60 and 40 CFR Part 75 compliant

(4) Not QAL1 Certified

Dimensional drawings



- A. Left view
- B. Front view
- C. Right view

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