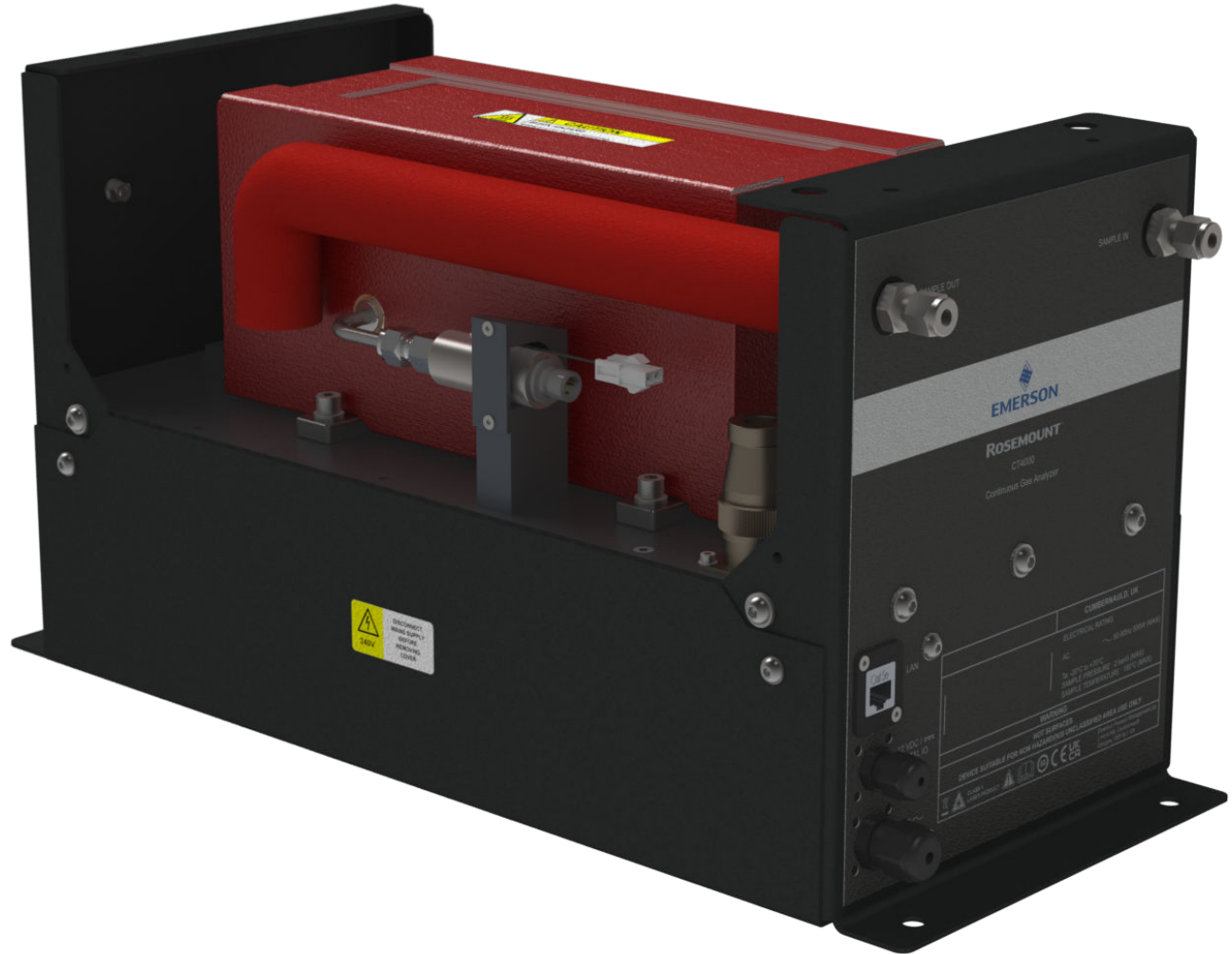


Rosemount™ CT4000 OEM

Continuous Gas Analyzer



The Rosemount CT4000 OEM is a multi-component Quantum Cascade Laser (QCL) gas analyzer designed for continuous emissions monitoring systems (CEMS) in harsh environments. Versatile and configurable, the OEM module can be integrated into a larger emissions monitoring system to measure and report on gas emissions to demonstrate compliance with legislation. It can be used in a range of applications, including marine CEMS, where emissions must be monitored and comply with strict legislation due to the potential influence on air quality, global warming, and acid rain. The Rosemount CT4000 OEM gas analyzer can hold up to four lasers and monitor NO, NO₂, SO₂, CH₄, H₂O, CO, and CO₂ levels in exhaust gases up to 374 °F (190 °C) and in ambient temperatures up to 158 °F (70 °C). It is ideally suited for applications including ship emissions monitoring, power plant emissions, engine management, and combustion.

The OEM module requires a sample handling system to draw gas through the measurement cell and has a range of data outputs to transmit data to the customer's data acquisition system.

Features and benefits

High performance Quantum Cascade Laser (QCL) Rosemount CT4000 OEM Gas Analyzer

- Multi-component: up to eight gases
- Ambient temperature: -4 to +158 °F (-20 to +70 °C)
- Gas temperature up to 374 °F (190 °C)
- Field serviceable and field configurable
- Interchangeable modular configuration for up to four QCL lasers
- Low maintenance and low lifetime cost
- Robust all solid state device
- Compact footprint for easy system integration
- Wide dynamic range from sub ppm to percentage

Typical applications

Sample cell and components are configurable to suit your application needs.

- Marine continuous emissions monitoring systems (CEMS)
- Land-based CEMS
- On board engine test
- DeNOx/SCR process analytics

Other applications available on request.

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Specifications

Table 1: General specifications

Application	Ruggedized OEM gas analyzer
Measurement technique	Infrared (IR) absorption spectroscopy
IR source	Up to four quantum cascade lasers (QCLs)
Product laser classification	Class 1 BS-EN: 60825-1: 2014 safety of laser products equipment classification and requirements (identical to IEC 60825-1: 2014)

Table 2: Performance specifications

Repeatability	±2%
Accuracy	±2%
Linearity	$R^2 > 0.999$
Measurement rate	1 Hz typical

Table 3: Environmental specifications

Ambient temperature	-4 to +158 °F (-20 to +70 °C)
Sample gas temperature range	158 to 374 °F (70 to 190 °C)
Humidity range	10 to 95%, non-condensing
Protection class	IP20
Hazardous area classification	Not applicable
Maximum sample gas pressure	29 psig (2 barg)
Operational sample test pressure	0.25 to 1 bar absolute (factory set)
Maximum operating altitude	6562 ft (2000 m)

Table 4: Communication specifications

Communication protocol	Ethernet
Inlet gas port connector	¼-in. (6 mm) Swagelok® type (specify on order)
Outlet gas port connector	¼-in. (6 mm) Swagelok type (specify on order)

Table 5: Electrical rating

AC power supply required	230 Vac, 50/60 Hz (110 Vac on request)
DC power supply required	12 Vdc

Table 6: Mechanical specifications

Size (height x width x depth)	10.24 x 8.91 x 19.61 in. (260 x 226 x 498 mm)
Weight	30.9 lb (14.0 kg)
Installation	For incorporation in third party enclosure. Sample handling system not included.

Table 7: Wetted materials

Cell mirror	Protected gold
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Table 7: Wetted materials (continued)

Sample inlet/outlet tubing and connectors	Stainless steel 316
Sample cell	PFA-coated aluminum
Seals	PTFE
Cell windows	BaF2
O-rings	FFKM and FKM

Typical gas ranges

Table 8: Measurement performance - Continuous Emissions Monitoring

Other measurement ranges available on request. The ranges and detection limits provided indicate typical analyzer performance but may change depending on your application. Contact Emerson for more information.

Component name	Measurement specifications					
	Symbol	Range	LOD	Range	LOD	Repeatability ⁽¹⁾
Nitric oxide	NO	0-2000 ppmv	5 ppmv	0-2455 mg/Nm ³	6 mg/Nm ³	±1%
Nitrogen dioxide	NO ₂	0-500 ppmv	1 ppmv	0-940 mg/Nm ³	2 mg/Nm ³	±1%
Carbon monoxide	CO	0-3000 ppmv	5 ppmv	0-3440 mg/Nm ³	6 mg/Nm ³	±1%
Carbon dioxide	CO ₂	0-15%	0.1%	0-15%	0.1%	±1%
Sulfur dioxide	SO ₂	0-1000 ppmv	3 ppmv	0-2620 mg/Nm ³	8 mg/Nm ³	±1%
Methane	CH ₄	0-3000 ppmv	5 ppmv	0-1970 mg/Nm ³	3.5 mg/Nm ³	±1%
Water	H ₂ O	0-20%	0.1%	0-20%	0.1%	±1%

(1) Repeatability is ±1% of reading or the limit of detection (LOD), whichever is greater.

Life cycle services and support

Our team of trained and certified field experts know and understand the requirements needed to develop a customized service program to suit your application. We provide complete turn key services and problem solving to assist you in every step of the way. From pre-installation services to ongoing maintenance and support long after commissioning, we have the expertise to ensure your analyzer runs at ideal operating conditions during its life cycle.

Field services include, but are not limited to, the following:

- Start-up and commissioning
- Scheduled maintenance
- On-site support
- Field retrofits
- Training

Training services

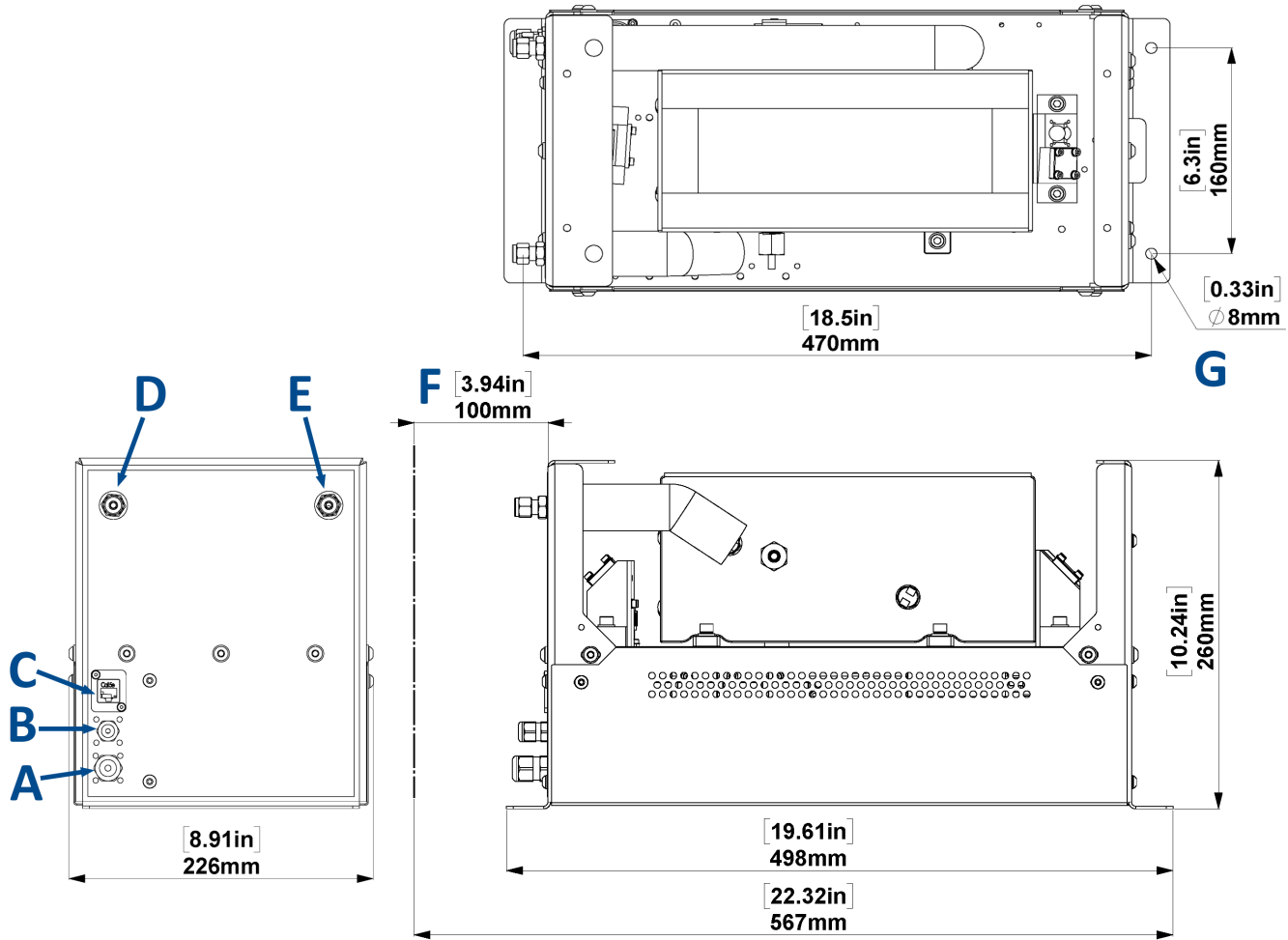
Whether your goal is to reduce maintenance costs or maximize up-time, Emerson offers a complete list of training courses and continuous support programs to ensure your technicians know how to properly operate and maintain the analyzer during its life cycle.

All training courses are taught by Emerson-certified instructors who work with each student to provide the necessary hands-on training, theory, and conceptual knowledge needed to perform on the job functions safely and accurately.

Recommended installation

Figure 1 represents the minimum recommended installation guidelines for the Rosemount CT4000 OEM Gas Analyzer. Consult Emerson for detailed installation recommendations for your application.

Figure 1: Rosemount CT4000 OEM Gas Analyzer dimensional drawings



- A. Main power supply
- B. 12 Vdc power supply
- C. Ethernet connection
- D. Gas sample outlet connection point: ¼-in. (M6) Swagelok®
- E. Gas sample inlet connection point: ¼-in. (M6) Swagelok
- F. Additional allowance for customer tubing runs and electrical connections
- G. Four installation mounting points

For more information: [Emerson.com/global](https://emerson.com/global)

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