Product Data Sheet
MS-00813-0200-5450, Rev AA
November 2025

Rosemount™ CT5450 Continuous Gas Analyzer



- The Rosemount CT5450 is a multi-component quantum cascade laser/tunable diode laser (QCL/TDL) analyzer designed for gas processing applications. Extremely versatile and configurable, the analyzer can hold up to six laser modules and measure up to ten components simultaneously with an enhanced dynamic range from sub ppm to % levels.
- This measurement platform is ideal for environmental monitoring applications with the capability to detect NO_x, SO_2, CO, CO_2, CH_4, NH_3, O_2, HCl, and HF, as well as other combustion gases identified as pollutants, ozone-depleting, or responsible for global warming.
- With increasing legislation from the US Environmental Protection Agency (EPA) and the European Union (EU), as well as other international regulatory agencies, large industrial facilities, incinerators, combustion plants, and other industrial gas emitting facilities will have to monitor their emissions more actively. The CT5450 can handle a myriad of applications, including process analysis monitoring, continuous emissions monitoring systems (CEMS), continuous ambient monitoring systems (CAMS), $DeNO_x$/SCR, and ammonium nitrate precursor analysis. With a large suite of analysis capabilities, the CT5450 has cross-platform applications, including propulsion emissions and industrial process monitoring.
- The analyzer is available in two variants: one for cold/dry applications and one which has additional heated components to eliminate cold spots in the gas path and make it suitable for hot/wet analysis.

Features and benefits

Multi-component quantum cascade laser/tunable diode laser (QCL/TDL) analyzer

- Measures up to ten components simultaneously
- Available in hot/wet and cold/dry variants
- Field serviceable modular configurations for up to six lasers
- Embedded ARM processor for fully autonomous intelligent operation
- Enhanced dynamic range from sub ppm to %

Field serviceable and field configurable

Interchangeable modular configuration for up to six lasers

Hazardous certification

- Not certified
- For hazardous applications, use the Rosemount CT5100(Ex) or CT5800 Analyzers.

Applications

Sample cell and sample handing configurable to suit your application needs:

- Process monitoring
- Continuous emissions monitoring system (CEMS)
- Continuous ambient monitoring system (CAMS)
- DeNo$_x$/SCR
- Ammonium nitrate precursors
- Other applications available on request

Contents

Features and benefits 2
Applications 2
Specifications 3
Lifecycle service and support 5
Training services 5
Recommended installation 5

Specifications

Specification	Value
Application	Continuous gas analyzer
Measurement technique	Infrared (IR) absorption spectroscopy
Near IR source	Quantum cascade laser/tunable diode laser (QCL/TDL), up to 6
Laser classification	Class 1 BS En 60825-1: 2007 Safety of laser products Equipment classification and requirements (identical to IEC 60825-1 2007)

Performance specifications

Specification	Value
Repeatability	±1% of measurement or limit of detection (LOD), whichever is greater
Linearity	R2 > 0.999
Measurement rate	1 Hz (up to 10 Hz on request)

Environmental specifications

Specification	Value
Ambient temperature	+32 to +113 °F (0 to +45 °C)
Sample gas temperature range	Cold/dry applications: 68 to 140 °F (20 to 60 °C) Hot/wet applications: 140 to 374 °F (60 to 190 °C)
Humidity range	Maximum 95% relative humidity (RH)
Protection class	IP20
Hazardous area classification	Safe area/general purpose analyzer
Pollution degree	2

Communication specifications

Specification	Value
Analog signal out	4-20 mA (1 per measurement, maximum 12)
Analog signal in	4-20 mA signal input (option)
Digital signal out	Modbus® over Transmission Control Protocol/Internet Protocol (TCP/IP)
Communication interface	Modbus over TCP, remote terminal unit (RTU) (option) 10/100 base-T Ethernet fiber (option)
Inlet gas port connector	¼-in. or 6 mm Swagelok® type (specify on order)
Outlet gas port connector	¼-in. or 6 mm Swagelok type (specify on order)

Electrical rating

Specification	Value
Power supply	110 to 120 Vac, 50 to 60 Hz or 220 to 240 Vac, 50 to 60 Hz (factory set)

Mechanical specifications

Specification	Value
Size (width x length x height)	Cold/dry applications: 19 x 25.51 x 8.74 in. (483 x 623 x 222 mm) Hot/wet applications: 19 x 26.03 x 8.74 in. (483 x 661 x 222 mm)
Weight	68.34 lb. (31 kg)
Installation	19-in. (483 mm) rack mount

Measurement performance

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

Table 1: Hot Wet Continuous Emissions Monitoring

Component name	Measurement specification					
	Symbol	Range (ppm)	Limit of detection (LOD) (ppm)	Range (mg/Nm^3)	LOD (mg/Nm^3)	Repeatability(1)
Nitric oxide	NO	0 - 300 ppm	0.3 ppm	0 - 379 mg/Nm^3	0.4 mg/Nm^3	±1%
Nitrogen dioxide	NO_2	0 - 100 ppm	0.2 ppm	0 - 190 mg/Nm^3	0.4 mg/Nm^3	±1%
Oxygen	O_2	0 - 25%	0.1%	0 - 25%	0.1%	±1%
Carbon monoxide	CO	0 - 50 ppm	0.05 ppm	0 - 60 mg/Nm^3	0.06 mg/Nm^3	±1%
Carbon dioxide	CO_2	0 - 12%	0.01%	0 - 12%	0.01%	±1%
Sulfur dioxide	SO_2	0 - 300 ppm	0.5 ppm	0 - 790 mg/Nm3	1.3 mg/Nm3	±1%

(1) *Repeatability is ±1 percent of reading or the LOD, whichever is greater.*

Table 2: Cold Dry Continuous Emissions Monitoring

Component name	Measurement specification					
	Symbol	Range (ppmv)	LOD (ppmV)	Range (mg/Nm^3)	LOD (mg/Nm^3)	Repeatability(1)
Nitric oxide	NO	0 - 200 ppmv	0.3 ppmv	0 - 250 mg/Nm^3	0.4 mg/Nm^3	±1%
Nitrogen dioxide	NO_2	0 - 80 ppmv	0.1 ppmv	0 - 150 mg/Nm^3	0.2 mg/Nm^3	±1%
Oxygen	O_2	0 - 25%	0.1%	0 - 25%	0.1%	±1%
Carbon monoxide	CO	0 - 40 ppmv	0.05 ppmv	0 - 50 mg/Nm^3	0.06 mg/Nm^3	±1%
Carbon dioxide	CO_2	0 - 10%	0.01%	0 - 10%	0.01%	±1%

Table 3: Hot Wet Fertilizer/Ammonia Slip

Component name	Measurement specification					
	Symbol	Range (ppm)	Limit of detection (LOD) (ppm)	Range (mg/Nm^3)	LOD (mg/Nm^3)	Repeatability[(1)]
Nitric oxide	NO	0 - 300 ppm	0.3 ppm	0 - 379 mg/Nm^3	0.4 mg/Nm^3	±1%
Nitrogen dioxide	NO_2	0 - 100 ppm	0.2 ppm	0 - 190 mg/Nm^3	0.4 mg/Nm^3	±1%
Ammonia	NH_3	0 - 150 ppm	0.5 ppm	0 - 100 mg/Nm^3	0.4 mg/Nm^3	±1%

Lifecycle service and support

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

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 uptime, 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 lifecycle.

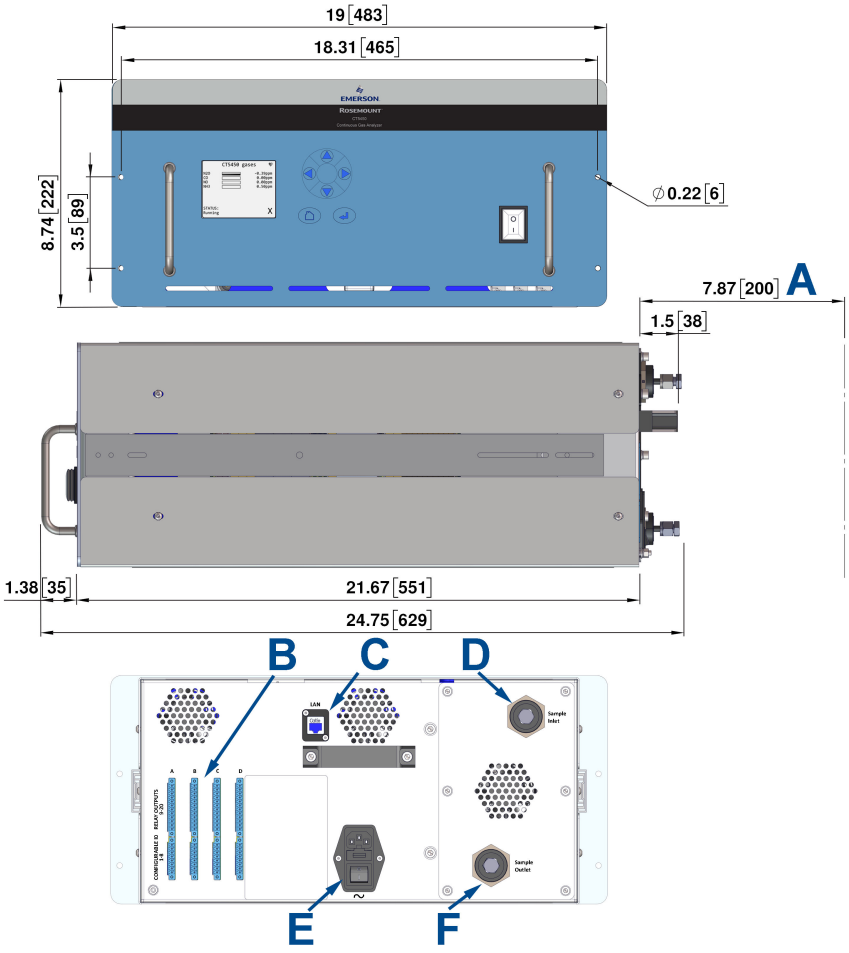
All training courses are taught by Emerson-certified instructors who provide the necessary hands-on training, theory, and conceptual knowledge needed to perform on-the-job functions safely and accurately.

Recommended installation

Figure 1 represents the minimum recommended installation guidelines for your Rosemount CT5450 Continuous Gas Analyzer.

Consult Emerson for detailed installation recommendations for your application.

Figure 1: CT5450 Continuous Gas Analyzer Dimensional Drawings (Non-Certified Version)



Dimensions are in inches [millimeters].

A. *Additional allowance for customer tubing runs and connections*
B. *Digital input/output (IO) connections*
C. *Ethernet connections (for service use only)*
D. *Sample inlet connection*
E. *Mains power connection*
F. *Sample outlet connection*

MS-00813-0200-5450
Rev. AA
November 2025

For more information: **Emerson.com/global**

©2025 Emerson. All rights reserved.

Emerson Terms and Conditions of Sale are available upon request. The Emerson logo is a trademark and service mark of Emerson Electric Co. Rosemount is a mark of one of the Emerson family of companies. All other marks are the property of their respective owners.

ROSEMOUNT™

EMERSON™