**Product Data Sheet**
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# Rosemount™ X-STREAM Enhanced Continuous Gas Analyzers


## Reliable and flexible multi-component, multi-method gas analysis

The versatile design of the Rosemount X-STREAM *Enhanced* Series of Continuous Gas Analyzers enables multi-component and multi-method gas analysis. It is built on a platform that accommodates combining different sensor technologies such as non-dispersive infrared (NDIR), non-dispersive ultraviolet (NDUV) photometer, paramagnetic ($pO_2$) detector, electrochemical hydrogen sulfide ($eH_2S$), and electrochemical oxygen ($eO_2$) cells, thermal conductivity (TCD) detector, as well as trace oxygen ($tO_2$) and trace moisture ($tH_2O$) sensors to deliver a cost-effective and reliable, precise measurement of more than 60 different gases.

# Overview

## Rosemount X-STREAM *Enhanced* Continuous Gas Analyzer series

The Rosemount X-STREAM *Enhanced* Continuous Gas Analyzer series is the process gas analyzer of choice for many companies who require long-term stability and accuracy in the most demanding of industrial, environmental, and process gas applications.

- Offers the lowest total cost of ownership with best-in-class operating specifications
- Broadest total operating temperature range and lowest temperature dependency for a more stable measurement; outdoor housings of the Rosemount X-STREAM Enhanced XEXF and XEFD are tested to perform between -20 and 50 °C (-4 and 122 °F)
- Rosemount X-STREAM Enhanced XEXF and XEFD outdoor housings are equipped with the highest protection classes and are proven to withstand offshore, wet, and heavy dust conditions, as well as temperature swings
- Available in four housing options: half 19-inch and 19-inch general purpose, flame proof housing for outdoor installation including hazardous areas, and field housing

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# Housing selection guide

**Rosemount X-STREAM *Enhanced* XEGP**

The 19-inch General Purpose Housing with three rack units height can be installed in cabinets or used as tabletop. It allows up to five measurements featuring NDIR/UV photometer, paramagnetic and electrochemical $O_2$, thermal conductivity, electrochemical $H_2S$, and moisture sensors. The front panel features a large LCD display and six soft keys to navigate the menu structure. The backside gives access to the gas and electrical connections which are available as submin sockets or screw terminals. The Rosemount XEGP has a thermostat control option to handle sample gas dew points up 122 °F (50 °C).

**Rosemount X-STREAM *Enhanced* XEGK**

The half 19-inch housing with three rack units height can be installed in cabinets or used as tabletop with a handle. It allows up to three measurements featuring NDIR/UV photometer, paramagnetic and electrochemical $O_2$, thermal conductivity, electrochemical $H_2S$, and moisture sensors. The front side features a large LCD display and six soft keys to navigate the menu structure. The backside gives access to the gas and electrical connections which are available as submin sockets or external screw terminals.

**Rosemount X-STREAM *Enhanced* XEXF Stainless Steel Field Housing**

The stainless steel housing is for wall-mount installation in shelter or outdoors (extended ambient temperature range from -4 to 122 °F (-20 to 50 °C). It features IP66/NEMA4X protection class and allows up to five measurements featuring NDIR/UV photometer, paramagnetic and electrochemical $O_2$, thermal conductivity, electrochemical $H_2S$, and moisture sensors. The front door has a large LCD display and six soft keys to navigate the menu structure. The LCD display and key pad can be flipped back so that it is also accessible while the front door is open. Internal screw terminal are available for electrical connections. For special applications, a dual-compartment version is available. The XEXF has a thermostat control option to handle sample gas dew points up 122 °F (50 °C).

**Rosemount X-STREAM *Enhanced* XEFD Flameproof Housing**

The cast aluminum housing allows installation in hazardous area (Zone 1 and Zone 2, as well as Class I Div.2). It features IP66/NEMA4X protection class and allows up to five measurements featuring NDIR/UV photometer, paramagnetic and electrochemical O2, thermal conductivity, electrochemical $H_2S$, and moisture sensors. The front cover has a large LCD display and six soft keys to navigate the menu structure. It gives a wide access to all internal components for easy maintenance. The LCD display and key pad can be flipped back so that it is also accessible while the front cover is open. Internal screw terminal are available for electrical connections. Sample gas dew points are limited to 10 K below lowest ambient temperature at installation site.

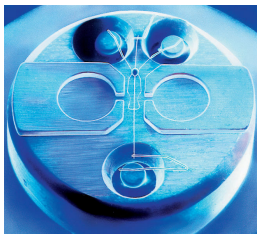
# Features

Rosemount X-STREAM *Enhanced* Series of Continuous Gas Analyzers combines powerful analytical technology with modern communication functionality to help you address your toughest analytical challenges.

## Analytical flexibility

Get more out of your process gas analyzer with the Rosemount X-STREAM *Enhanced* platform which enables the combination of up to five channels of non-dispersive infrared, ultraviolet photometers (NDIR/UV), paramagnetic and electrochemical oxygen ($pO_2$/$eO_2$) detectors, a thermal conductivity detector (TCD), electrochemical hydrogen sulfide ($eH_2S$), trace moisture ($tH_2O$), and trace oxygen ($tH_2O$) sensors. The NDIR and NDUV photometer can be combined on one chopper, resulting in a compact design and cost savings. For each channel, up to four cross compensations are available to handle cross interferences in complex sample gas compositions and ensure reliable, selective detection and monitoring of gases.

## Enhanced performance



Rosemount NDIR gas detectors are equipped with proprietary micro-flow sensors, the smallest gas-filled sensors on the market to facilitate measurement frequencies of up to 154 Hz with proven vibration resistance. These micro-flow sensors ensure high target gas selectivity and exceptional long term stability (lifetime) of the NDIR gas detector due to a unique glass-soldering technology that provides a gas-tight seal of the detector.

With Emerson's patented X-STREAM IntrinzX photometer technology that operates at 30 Hz, the Rosemount X-STREAM *Enhanced* Continuous Gas Analyzers ensure repeatable, accurate measurement for enhanced process control, product quality, and plant safety. IntrinzX photometer technology also reduces total cost of ownership by delivering:

- Large dynamic ranges to allow measurement in front of and behind adsorber with one photometer, as well as measurement of the magnitude of an adsorber breaktrough
- Very low temperature dependency to allow field installation close to the process down to -4 °F (-20 °C) ambient temperature
- High resistance to vibrations produced by utilities such as large compressors to reduce measurement uncertainty
- Outstanding long-term stability
- Simplified calibration

## Process approved cells

Stainless steel process cells with Pd/Rh or TiN coating are available for toxic and corrosive sample gases. Glass soldering technology provides exceptional leak tightness. The process cells are also available with purged cell heads for applications with higher safety requirements. Solvent-resistant and corrosion-resistant paramagnetic sensors are also available.

## Modern communication

Rosemount X-STREAM *Enhanced* Continuous Gas Analyzers offer a unique integrated web interface that features:

- Configuration and monitoring capabilities without the need to install additional software
- Email notification or daily reports of alarms and events

**Figure 1: Analyzer Measured Concentration and Secondaries**


Rosemount X-STREAM *Enhanced* Continuous Gas Analyzers provide four status signal relay outputs (according to NAMUR NE 107), Modbus® TCP protocol over Ethernet (RJ45), and optional Modbus RTU over serial (RS-232/RS-485) communication. Onboard SD card, USB ports, and FTP client enable storage of:

- Measurement data, calibration, and event logger files
- Analyzer configuration files
- PLC and calculator programs

The Rosemount XEGP, XEXF, and XEFD can have up to two IO boards, the XEGK only one. IO boards to integrate are: DIO board with nine outputs and seven outputs and AIN board with two analog inputs.

## Easy-to-use tools

The software of the Rosemount X-STREAM *Enhanced* Continuous Gas Analyzers provides several tools that make complex process analyzer systems easier and help eliminate additional expenses for third-party equipment:

- Time controlled routines for auto-calibration and auto-validation using external valves
- Automated valve assignment verification to avoid miscalibration
- Programmable Logic Controller (PLC) for things such as sample handling control/sample gas line switching or programming of customized alarms. (PLC can also switch between NO and $NO_x$ mode.)
- Calculator for heating values, reference to certain oxygen content, $NO_x$ as sum of NO and $NO_2$, etc.
- Limit alarms with reports for concentrations and secondary measurements, such as temperature and pressure
- Clear text messages (available in several languages) and industry-standard symbols provide information about the measurement and analyzer status on the front panel of the analyzer
- Optional pre-engineered DeltaV™ module helps integrate into an existing DeltaV environment via serial Modbus RTU

# Applications

**Chemical/Petrochemical**
- Ammonia, urea, and fertilizer production
- Ethylene, Propylene, VCM, PTA production
- Inert gas blanketing control and safety measurements for flammable mixtures

**Environmental**
- Continuous Emission Monitoring Systems (CEMS)
- Greenhouse gas reduction
- Automotive emissions (ICE)

**Metallurgical/Glass**
- Metallurgical manufacturing, hardening
- Heat treatment processes
- Blast furnaces
- Direct ore reduction (MIDREX)

**Power**
- Hydrogen cooling of generators
- Exhaust measurements for burner efficiency
- Fuel cells
- Fast fuel gas analysis for turbine control

**Gas Processing**
- Natural gas and LNG production and distribution
- Air separation units
- Industrial gases, Hydrogen production, Pressure Swing Adsorption (PSA)
- Coal or wood gasification

**Refining**
- Hydrotreater
- BTX reforming and Fluid Catalyst Cracking (FCC)
- Hydrogen recycling streams

**Biotechnologies**
- Biogas/landfill
- Fermenter

# Specifications

## Measurement performance specifications

### Lowest and highest ranges available for different gases (excerpt)

In total, the Rosemount X-STREAM family of Process Gas Analyzers can detect more than 60 gases. The following table is an example of the most commonly used gases. Contact your Emerson Customer Care representative for information on configurations or gases that are not listed.

Depending on range, the measurement specifications of the Rosemount X-STREAM Enhanced Process Gas Analyzer vary. For some components, special specifications or conditions apply at the lowest ranges while standard specifications are valid for others. Starting from the lowest range for enhanced specifications to the highest possible concentration ranges, enhanced specifications apply. Table 2 and Table 3 list standard and enhanced specifications for Photometer, TCD, and Oxygen measurements.

**Table 1: Gas Components and Measuring Ranges, Examples**

| | | | Special specs or conditions | Standard specs (Table 2 and Table 3) | Enhanced specs (Table 2 and Table 3) | |
|---|---|---|---|---|---|---|
| **Gas component** | | **Principle** | **Lowest range** | **Lowest range** | **Lowest range** | **Highest range** |
| Acetone[1] | $CH_3COCH_3$ | UV | N/A | 0–400 ppm | 0–800 ppm | 0–3% |
| Acetone[1] | $CH_3COCH_3$ | IR | N/A | 0–500 ppm | 0–1,000 ppm | 0–3% |
| Acetylene | $C_2H_2$ | IR | N/A | 0–3% | 0–6% | 0–100% |
| Ammonia | $NH_3$ | IR | N/A | 0–100 ppm | 0–200 ppm | 0–100% |
| Argon | Ar | TCD | N/A | 0–50% | 0–100% | 0–100% |
| Carbon dioxide | $CO_2$ | IR | 0–5 ppm[2] | 0–50 ppm | 0–100 ppm | 0–100% |
| Carbon monoxide | CO | IR | 0–10 ppm[2] | 0–50 ppm | 0–100 ppm | 0–100% |
| Chlorine | $Cl_2$ | UV | N/A | 0–300 ppm | 0–600 ppm | 0–100% |
| Ethane | $C_2H_6$ | IR | N/A | 0–1,000 ppm | 0–2000 ppm | 0–100% |
| Ethanol[1] | $C_2H_5OH$ | IR | N/A | 0–1,000 ppm | 0–2,000 ppm | 0–10% |
| Ethylene | $C_2H_4$ | IR | N/A | 0–400 ppm | 0–800 ppm | 0–100% |
| Helium | He | TCD | N/A | 0–10% | 0–20% | 0–100% |
| Hexane[1] | $C_6H_{14}$ | IR | N/A | 0–100 ppm | 0–200 ppm | 0–10% |
| Hydrogen[3] | $H_2$ | TCD | 0–2,000 ppm[2] | 0–1% | 0–2% | 0–100% |
| Hydrogen sulfide | $H_2S$ | UV | N/A | 0–2% | 0–4% | 0–10% |
| Hydrogen sulfide | $H_2S$ | IR | N/A | 0–10% | 0–20% | 0–100% |
| Hydrogen sulfide | $H_2S$ | E-chem | N/A | 0–50 ppm[4] | – | 0–2,000 ppm[4] |
| Methane | $CH_4$ | IR | N/A | 0–100 ppm | 0–200 ppm | 0–100% |
| Methanol[1] | $CH_3OH$ | IR | N/A | 0–1,000 ppm | 0–2,000 ppm | 0–10% |
| n–Butane | $C_4H_{10}$ | IR | N/A | 0–800 ppm | 0–1,600 ppm | 0–100% |
| Nitrogen dioxide[1] | $NO_2$ | UV | 0–25 ppm[5] | 0–100 ppm | 0–200 ppm | 0–10% |
| Nitrogen monoxide | NO | IR | 0–100 ppm[5] | 0–250 ppm | 0–500 ppm | 0–100% |
| Nitrous oxide | $N_2O$ | IR | N/A | 0–100 ppm | 0–200 ppm | 0–100% |
| Oxygen | $O_2$ | E-chem | N/A | 0–5% | – | 0–25%[6][7] |

**Table 1: Gas Components and Measuring Ranges, Examples *(continued)***

| | | | Special specs or conditions | Standard specs (Table 2 and Table 3) | Enhanced specs (Table 2 and Table 3) | |
|---|---|---|---|---|---|---|
| **Gas component** | | **Principle** | **Lowest range** | **Lowest range** | **Lowest range** | **Highest range** |
| Oxygen | $O_2$ | PMD | N/A | 0–1% | 0–2% | 0–100% |
| Oxygen, trace | $O_2$ | E-chem | N/A | 0–10 ppm | – | 0–10,000 ppm(7) |
| Propane | $C_3H_8$ | IR | N/A | 0–1,000 ppm | 0–2,000 ppm | 0–100% |
| Propylene | $C_3H_6$ | IR | N/A | 0–400 ppm | 0–800 ppm | 0–100% |
| Sulfur dioxide | $SO_2$ | UV | 0–25 ppm(5) | 0–130 ppm | 0–200 ppm | 0–1% |
| Sulfur dioxide | $SO_2$ | IR | N/A | 0–1% | 0–2 % | 0–100% |
| Sulfur hexafluoride | $SF_6$ | IR | 0–5 ppm(5) | 0–20 ppm | 0–50 ppm | 0–2% |
| Toluene(1) | $C_7H_8$ | UV | N/A | 0–300 ppm | 0–600 ppm | 0–5% |
| Vinyl chloride | $C_2H_3Cl$ | IR | N/A | 0–1,000 ppm | 0–2,000 ppm | 0–2% |
| Water vapor(1) | $H_2O$ | IR | N/A | 0–1,000 ppm | 0–2,000 ppm | 0–8% |
| Water vapor, trace(1) | $H_2O$ | Capacitive | N/A | 0–100 ppm(8) | – | 0–3,000 ppm(7)(8) |

(1) *Dew point below ambient temperature.*
(2) *See Table 6 Special Performance Specifications for Gas Purity Measurements*
(3) *Special "refinery" application with 0–1 % $H_2$ in $N_2$ available.*
(4) *See Table 5 Hydrogen Sulfide (eH2S) Measurements for Landfill, Biogas, and Ambient Applications.*
(5) *Daily zero calibration: Required for ranges below lowest standard specs range.*
(6) *Higher concentrations decrease sensor lifetime.*
(7) *Standard specs only.*
(8) *See Table 4 Trace Moisture Measurements.*

## Standard and enhanced performance specifications

**Table 2: NDIR/UV/Photometer and TCD Measurements**

| Measurement parameters | NDIR/UV/Photometer | | Thermal conductivity (TCD) | |
|---|---|---|---|---|
| | **Standard spec** | **Enhanced spec** | **Standard spec** | **Enhanced spec** |
| Detection limit (4σ)[1][2] | ≤ 1% | ≤ 0.5% | ≤ 1% | ≤ 0.5% |
| Linearity[1][2] | ≤ 1% | | ≤ 1% | |
| Zero-point drift[1][2] | ≤ 2% per week | ≤ 1% per week | ≤ 2% per week | ≤ 1% per week |
| Span (sensitivity) drift[1][2] | ≤ 0.5% per week | ≤ 1% per month | ≤ 1% per week | |
| Repeatability[1][2] | ≤ 0.5% | | ≤ 0.5% | |
| Response time ($t_{90}$)[3] | 4 s ≤ $t_{90}$ ≤ 7 s[4] | | 15 s ≤ $t_{90}$ ≤ 30 s[5] | |
| Permissible gas flow | 0.2–1.5 l/min. | | 0.2–1.5 l/min.[6] | |
| Influence of gas flow[1][2] | ≤ 0.5% | | ≤ 1% [6] | |
| Maximum gas pressure[7] | ≤ 1500 hPa abs. (≤ 7 psig) | | ≤ 1500 hPa abs. (≤ 7 psig) | |
| **Influence of pressure[8]** | | | | |
| At constant temperature | ≤ 0.10% per hPa | | 0.01% per hPa | |
| With pressure compensation[9] | ≤ 0.01% per hPa | | N/A | |
| **Permissible ambient temperature** | | | | |
| Rosemount XEGP and XEGK Analyzer | 0 to +50 °C (32 to 122 °F) | | | |
| Rosemount XEXF and XEFD Analyzer[10] | -20 to +50 °C (-4 to 122 °F) | | | |
| **Influence of temperature (at constant pressure)[1][11]** | | | | |
| On zero point | ≤ 1% per 10 K | ≤ 0.5% per 10 K | ≤ 1% per 10 K | ≤ 0.5% per 10 K |
| On span (sensitivity) | ≤ 5 % (0 to +50 °C / 32 to 122 °F) | | ≤ 1 % per 10 K | |
| Thermostat control | none or 140 °F (60 °C)[4] | | none or 140 °F (60 °C)[12] | |
| Warm-up time[5] | 15 to 50 minutes[4] | | approx. 50 minutes | |

(1) *Related to full scale.*
(2) *Constant pressure and temperature.*
(3) *From gas analyzer inlet at gas flow of 1.0 l/min (electronic damping = 0 s).*
(4) *Dependent on integrated photometer bench.*
(5) *Depending on measuring range.*
(6) *Flow variation within ± 0.1 l/min.*
(7) *Limited to atmospheric with internal sample pump.*
(8) *Related to measuring value.*
(9) *Pressure sensor is required.*
(10) *Temperatures below 32 °F (0 °C) with thermostat control only.*
(11) *Temperature variation: ≤10 K per hour.*
(12) *Thermostat controlled sensor: 75 °C (167 °F).*

**Note**
For NDIR/UV measurements, take into account that sample gas may diffuse or be released by leakages into the analyzer enclosure. If existent in the analyzer surroundings, the component to be measured may enter the enclosure. Concentrations then may increase inside the enclosure. High concentrations of the component to be measured inside the enclosure may influence the measurement by unintended absorption, which could cause drift of the measurement. A remedy for this issue is to purge the housing with gas not containing the component of interest.

**Table 3: Oxygen Measurements**

| Measurement parameters | Paramagnetic ($pO_2$) | | Electrochemical ($eO_2$) | Trace ($tO_2$) |
|---|---|---|---|---|
| | Standard spec | Enhanced spec | | |
| Detection limit (4 σ)[1][2] | ≤ 1% | ≤ 0.5% | ≤ 1% | |
| Linearity[1][2] | ≤ 1% | | | |
| Zero-point drift [1][2] | ≤ 2% per week | ≤ 1% per week | ≤ 2% per week | ≤ 1% per week |
| Span (sensitivity) drift[1][2] | ≤ 1% per week | ≤ 0.5% per week | ≤ 1% per week | |
| Repeatability[1][2] | ≤ 0.5% | | ≤ 1% | |
| Response time ($t_{90}$)[3] | < 5 s | | approx. 12 s | 20 to 80 s |
| Permissible gas flow | 0.2–1.5 l/min | | | |
| Influence of gas flow[1][2] | ≤ 2%[4] | | ≤ 2% | |
| Maximum gas pressure[5] | ≤ 1,500 hPa abs. (≤ 7 psig)[6] | | ≤ 1,500 hPa abs. (≤ 7 psig) | |
| **Influence of pressure[7]** | | | | |
| At constant temperature | ≤ 0.10% per hPa | | | |
| With pressure compensation[8] | ≤ 0.01% per hPa | | | |
| **Permissible ambient temperature** | | | | |
| Rosemount XEGP and XEGK Analyzer | 0 to +50 °C (32 to 122 °F) | | 5 to +45 °C (41 to 113 °F) | |
| Rosemount XEXF and XEFD Analyzer[9] | -20 to +50 °C (-4 to 122 °F) | | | |
| **Influence of temperature (at constant pressure)[1][10]** | | | | |
| On zero point | ≤ 1% per 10 K | ≤ 0.5% per 10 K | ≤ 1% per 10 K[11] | |
| On span (sensitivity) | ≤ 1% per 10 K | | ≤ 1% per 10 K[11] | |
| Thermostat control | none or 60 °C (140 °F) | | none | none[12] |
| Warm-up time | Approx. 50 minutes | | none | Approx. 50 minutes |

(1) *Related to full scale.*
(2) *Constant pressure and temperature.*
(3) *From gas analyzer inlet at gas flow of 1.0 l/min (electronic damping = 0 s).*
(4) *For ranges 0–5...100% and flow 0.5...1.5 l/min.*
(5) *Limited to atmospheric with internal sample pump.*
(6) *No sudden pressure surge allowed.*
(7) *Related to measuring value.*
(8) *Pressure sensor is required.*
(9) *Temperatures below 0 °C (32 °F) with thermostat control only.*
(10) *Temperature variation: ≤10 K per hour.*
(11) *For trace $O_2$ ranges 0-10...200 ppm: < 5% (5 to 45 °C / 41 to 113 °F)*
(12) *Thermostat controlled sensor: 95 °F (35 °C).*

**Table 4: Trace Moisture Measurements**

| Measurement parameters | Trace moisture ($tH_2O$) |
|---|---|
| Measurement range | -100 to -10 °C (-148 to 14 °F) dew point (0–100...3,000 ppm) |
| Measurement accuracy | 3.6 °F (± 2 °C) dew point |
| Repeatability | 0.9 °F (0.5 °C) dew point |
| Response time ($t_{95}$) | 5 min (dry to wet) |
| Operating humidity | 0 to 100 % relative humidity (r.h.). |
| Sensor operating temperature | -40 to +60 °C (-40 to 160 °F) |
| Temperature coefficient<br>Operating pressure | Temperature compensated across operating temperature range.<br>Depending on sequential measurement system, see analyzer specification(1)<br>max. 1,500 hPa abs / 7 psig |
| Flow rate | Depending on sequential measurement system, see analyzer specification.<br>0.2 to 1.5 l/min |

(1) *If installed in series to another measurement system, (e.g. IR channel).*

**Table 5: Hydrogen Sulfide ($eH_2S$) Measurements for Landfill, Biogas, and Ambient Applications**

| Measurement parameters | Hydrogen Sulfide ($eH_2S$) | | |
|---|---|---|---|
| Measurement range (sensor dependent) | 0 to 50 ppm | 0 to 200 ppm | 0 to 2,000 ppm |
| Overgas limit | 200 ppm | 500 ppm | 10,000 ppm |
| Detection limit(1) | < 0.2% | | |
| Repeatability(1) | < 2% | | |
| Drift(1) | < 1% per month | | |
| Response time ($t_{90}$) | < 35 s | | |
| Operating life | > 24 months | | |
| Sensor operating temperature | -30 to +50 °C (-22 to 122 °F) | | |
| Gas pressure range | 800 to 1,200 hPa (-3.1 to 2.7 psig) | | |
| Gas humidity range (relative humidity) | 15 to 90% | | |
| Thermostat control | none | | |

(1) *Related to full scale*

**Note**
The $H_2S$ sensors require oxygen and moisture to work properly.

## Special performance specifications for gas purity measurements

**Table 6: Special Performance Specifications for ULCO, ULCO2, and UltraLow TCD**

| Measurement parameters | ULCO and ULCO2<br>CO 0-10 ... < 50 ppm<br>$CO_2$ 0-5 ... < 50 ppm | UltraLow TCD<br>$N_2$ in $H_2$ : 0-2,000 to 10,000 ppm<br>$H_2$ in $N_2$ : 0-2,000 to 10,000 ppm |
|---|---|---|
| Detection limit (4 σ)[1][2] | ≤ 2% | |
| Linearity[1][2] | ≤ 1% | |
| Zero-point drift[1][2][3] | ≤ 2% resp. ≤ 0.2 ppm[4] | |
| Span (sensitivity) drift [1][2][3] | ≤ 2% resp. ≤ 0.2 ppm[4] | |
| Repeatability [1][2] | ≤ 2% resp. ≤ 0.2 ppm[4] | |
| Response time ($t_{90}$)[5] | ≤ 10 seconds | ≤ 30 seconds |
| Permissible gas flow | 0.2-1.5 l/min | Defined by constant pressure at inlet |
| Influence of gas flow[1][2] | ≤ 2% | |
| Maximum gas pressure | ≤1500 hPa abs. (≤ 7 psig) | 1400 hPa (5.8 psig) – 1600 hPa (8.7 psig) |
| **Influence of pressure[6]** | | |
| At constant temperature | ≤ 0.10% per hPa | ≤0.01% per hPa |
| With pressure compensation[7] | ≤ 0.01% per hPa | N/A |
| **Permissible ambient temperature** | | |
| | 15 to 35 °C (59 to 95 °F)<br>5 to 40 °C (41 to 104 °F) with Tstat | 15 to 35 °C (59 to 95 °F) |
| **Influence of temperature (at constant pressure)[8]** | | |
| On zero point | ≤ 2% per 10 K resp. ≤ 0.2 ppm per 10 K[4] | |
| On span (sensitivity) | | |
| Thermostat control | None or 60 °C (140 °F) | 60 °C (140 °F) |
| Warm-up time | Approx. 2 hours | |
| **Purge/open reference gas flow** | | |
| | 0.2 l/min – 1 l/min[9] | 0.1 – 0.2 l/min |

(1) *Related to full scale.*
(2) *Constant pressure and temperature.*
(3) *Within 24 hours; daily calibration requested.*
(4) *Whichever value is higher.*
(5) *From gas analyzer inlet with a gas flow of 1.0 l/min.*
(6) *Related to measured value.*
(7) *Barometric pressure sensor required.*
(8) *Temperature variation ≤ 10 K per hour.*
(9) *Purge gas required for $CO_2$ only.*

## Special performance specifications for gas purity measurements

**Table 7: Special Performance Specifications for Gas Purity Measurements (Suppressed Ranges $O_2$, $N_2O$, $CO_2$, $CH_4$, and $H_2$)**

| **Measurement parameters** | **$CH_4$: 90-100%<br>$H_2$: 90-100% / 95-100% / 98-100%** | **$CO_2$: 90-100% / 95-100% / 98-100%<br>$O_2$: 20-22% / 90-100% / 95-100% / 98-100%<br>$N_2O$: 90-100 % / 95-100% / 98-100%** |
|---|---|---|
| Detection limit (4 σ)[1][2] | ≤ 2% | |
| Linearity[1][2] | ≤ 1% | |
| Zero-point drift[1][2][3] | ≤ 2% | |
| Span (sensitivity) drift [1][2][4] | ≤ 2% | |
| Repeatability[1][2] | ≤ 2% | |
| Response time ($t_{90}$)[5] | ≤ 30 s | |
| Permissible gas flow | 0.2 – 1.5 l/min | Defined by constant pressure at inlet |
| Permissible gas flow variation | 0.05 l/min | |
| Influence of gas flow[1][2] | ≤ 2% | |
| Maximum gas pressure | 950 to 1050 hPa | 1400 hPa (5.8 psig) – 1600 hPa (8.7 psig) |
| **Influence of pressure[6]** | | |
| | ≤ 2% | |
| **Permissible ambient temperature[7]** | | |
| | 15 to 35 °C (59 to 95 °F) | |
| **Influence of temperature (at constant pressure)[1]** | | |
| On zero point | ≤ 1% per 10 K | |
| On span (sensitivity) | ≤ 2% (+15 to +35 °C / 59 to 95 °F) | |
| Thermostat control | 60 °C (140 °F) | |
| Warm-up time | Approx. 2 h | |
| **Purge gas flow[8]** | | |
| | N/A | 0.1 – 0.2 l/min |

(1) *Related to suppressed scale.*
(2) *Constant pressure and temperature.*
(3) *Daily zero calibration requested.*
(4) *Daily span calibration recommended.*
(5) *From gas analyzer inlet with a gas flow of 1.0 l/min.*
(6) *Related to measured value.*
(7) *Temperature variation ≤ 10 K per hour.*
(8) *Purge gas required for suppressed $CO_2$ only.*

# Functional specifications

**Rosemount X-STREAM *Enhanced* Continuous Gas Analyzers**

| Parameters | XEGP | XEGK | XEXF | XEFD |
|---|---|---|---|---|
| Gas connections | PVDF compression fitting: 6/4 mm<br>Stainless steel compression fitting 6/4 mm or ¼-in. | | | Stainless steel compression fitting 6/4 mm or ¼-in. |
| Rated voltage | 100–240 V ~ 50/60 Hz, ±10% | | | |
| Rated voltage 24 V option | N/A | DC 24 V ±10% | N/A | DC 24 V ±10% |
| Rated input current (depending on configuration) | 3-1.5 A | 2-1 A<br>2.5 A (24 V) | 3-1.5 A | |
| Power input | IEC C14 mains appliance | IEC C14 mains appliance<br>3 pin XLR connector (24 V) | Internal screw terminals | |
| Signal connections | Submin-D connectors or screw terminals (max. 1.5 $mm^2$), RJ45 | | Internal screw terminals (max. 1.5 $mm^2$), RJ45 | |
| Enclosure | 19-in. table-top or rack-mount | ½ 19in. table-top, rack-mount or portable with handle | Wall-mountable stainless steel housing | Wall-mountable aluminum cast housing |
| Enclosure protection | IP 20 acc. EN 60529 for indoor installation, for pollution degree 2, protected against direct sunlight | | NEMA 4X/ IP 66 acc. EN 60529 for outdoor installation, protected against direct sunlight | |
| Humidity (non-condensing) | < 90 % r.h. @ 20 °C (68 °F)<br>< 70 % r.h. @ 40 °C (104 °F) | | | |
| Ambient temperature | Storage : -20 to 70 °C (-4 to 158 °F)<br>Operation: 0 to 50 °C (32 to 122 °F), restriction by configuration might apply<br>Allow 1 HU (44.5 mm; 1¾-in.) distance to other equipment in a cabinet | | Storage : -20 to 70 °C (-4 to 158 °F)<br>Operation: 0 (-20) to 50 °C (32 (4) to 122 °F), restriction by configuration might apply<br>XEFD hazardous area safe for: -20 to 55 °C (32 to 131 °F) | |
| Elevation | 0 – 2,000 m (6560 ft) above sea level | | | |
| Weight (depending on configuration) | Approx. 12–16 kg (26.5–35.3 lb) | Approx. 8–12 kg (7.6–26.5 lb) | Up to 25 kg (55.1 lb) (up to 45 kg (99.2 lb) for dual compartment) | Up to 63 kg (139 lb) |
| Options (availability depending on configuration) | Integrated flow measurement(s) with alarm(s)Barometric pressure sensor<br>Thermostatically controlled box for physical components (60 °C / 140 °F); not for Rosemount XEGK<br>Case purge; not for Rosemount XEGK<br>Sampling pump(s)<br>Solenoid valve block(s) for autocalibration<br>Only for Rosemount XEGK: external 24 V power supply | | | |

## Signal inputs, outputs, and interfaces

| Signal type | Description |
|---|---|
| Analog signal outputs | 1–5, Individually optically isolated (Rosemount XEGP, XEXF, XEFD)<br>1–4, Individually optically isolated (Rosemount XEGK)<br>4 (0)–20 mA (RB ≤ 500 Ω)<br>1 as standard, 2-5 as option<br>NAMUR NE 43 and NE 44 compliance |
| Relay outputs | Four status relays acc. NAMUR NE 107 or e.g., concentration thresholds, valve status notification dry contacts: 1A, 30 V |
| Communication interface | Ethernet with Modbus® TCP<br>RS-485 / RS-232C with Modbus RTU<br>Two USB ports |
| **Optional I/O boards for extension slots** | |
| Digital in/out (I/O) | Seven digital inputs (for remote control); max. 30 Vdc, 2.3 mA, common ground<br>Nine additional relay outputs (e.g. concentration thresholds, valve status notification, flow alarm, range ID) dry contacts: 1A, 30 V |
| Analog signal inputs | Two analog inputs<br>0–1(10) V ($R_{in}$ - 100 kΩ) or<br>4 (0)–20 mA ($R_{in}$ - 50 Ω) |

**Note**
All signal lines need appropriate shielding and grounding as described in the Rosemount XECLD Reference Manual.

**Note**
The Rosemount X-STREAM *Enhanced* XEGP, XEXF and XEFD can be upgraded with two additional I/O boards, whereas the Rosemount X-STREAM *Enhanced* XEGK has only one extension slot.

## Requirements for sample gas

The sample gas into the analyzer must be conditioned by a sample handling system, especially for upset process conditions.

- Sample gas dew point more than 10 K below coldest spot in the analyzer (depending on configuration).
- To protect the analyzer from droplets, a coalescence filter in front of the analyzer is highly recommended.
- Install a particulate filter with 2 µm pore size (coalescence filter will also protect from particulates).
- Maintain constant flow and pressure within the specification of the respective measurement technology.
- The analyzer is not recommended for the measurement of explosive gases or gas mixtures.
- Flammable gases can be measured in general purpose area if stainless steel tubing and fittings are used. As an option, the analyzer can be equipped with a safe analyzer case purge to avoid explosive gas concentrations inside the analyzer housing (for more details, refer to the Analyzer Manual).
- For toxic gases, Emerson also recommends stainless steel tubing and fittings, and for highly toxic gases, additional safety features such as case purge (with vent to safe area), and process cells with purged windows should be taken into consideration.

# Approvals and certifications

**General compliance certifications for Rosemount X-STREAM *Enhanced* XEGP, XEGK, and XEXF Continuous Gas Analyzers**

| | |
|---|---|
| **European Union/CE** | EMC 2014/30/EU: EN 61326-1, EN 55011 Class B<br>LV 2014/35/EU: EN 61010-1<br>ROHS 2011/65/EU: EN 50581 |
| **Canada/USA** | CSA US/C: according to 61010-1 for general purpose analyzer |
| **EAC** | EMC TP TC 020/2011 |
| **Korea** | Registered under Claus 3, Article 58-2 of Radio Waves Act |

**General compliance certifications for the Rosemount X-STREAM *Enhanced* XEFD Continuous Gas Analyzer**

Worldwide type approvals (including ATEX, CSA-C/US, and IECEx) allow global installation of X-STREAM flameproof analyzers in Zone 1, Zone 2, and Class I Division 2 hazardous areas without the need for pressurization systems. For flammable gases, the gas path is equipped with specially tested components ensuring leak rates clearly below the limits given in the respective norms.

**Hazardous area compliance**

| | |
|---|---|
| **European Union/CE/ IECEx** | ATEX 2014/34/EU |
| **Canada/USA** | CSA US/C: Class 2258-02, 2258-82, 8721-05, 8721-85 |
| **EAC** | According to TR ZU 012/2011 |
| **Korea** | Article 34 of Occupational safety and health act |

**Hazardous area compliance**

**European Union/CE/IECEx**

| | |
|---|---|
| **Standards** | ATEX 2014/34/EU |
| **Markings** | FTZU 08 ATEX 0028X<br>IECEx FTZU 08.00044X<br>Ex db IIB+H2, T4 Gb |

**Canada/USA**

| | |
|---|---|
| **Standards** | CSA US/C: Class 2258-02, 2258-82, 8721-05, 8721-85 |
| **Markings** | CSA US/C: Class 1 Zone 1<br>AEx d IIB+H2, T4<br>Ex d IIB+H2, T4<br>Class 1, Division 2<br>Groups BCD T4 |

**EAC/TC/RU**

| | |
|---|---|
| **Standards** | According to TR ZU 012/2011 |
| **Markings** | № TC RU<br>C-DE.МЮ62.B.01259/19 |

| | |
|---|---|
| | ООО «ПРОММАШ ТЕСТ»<br>1 Ex d IIB+H2 T4 Gb X |

**Korea**

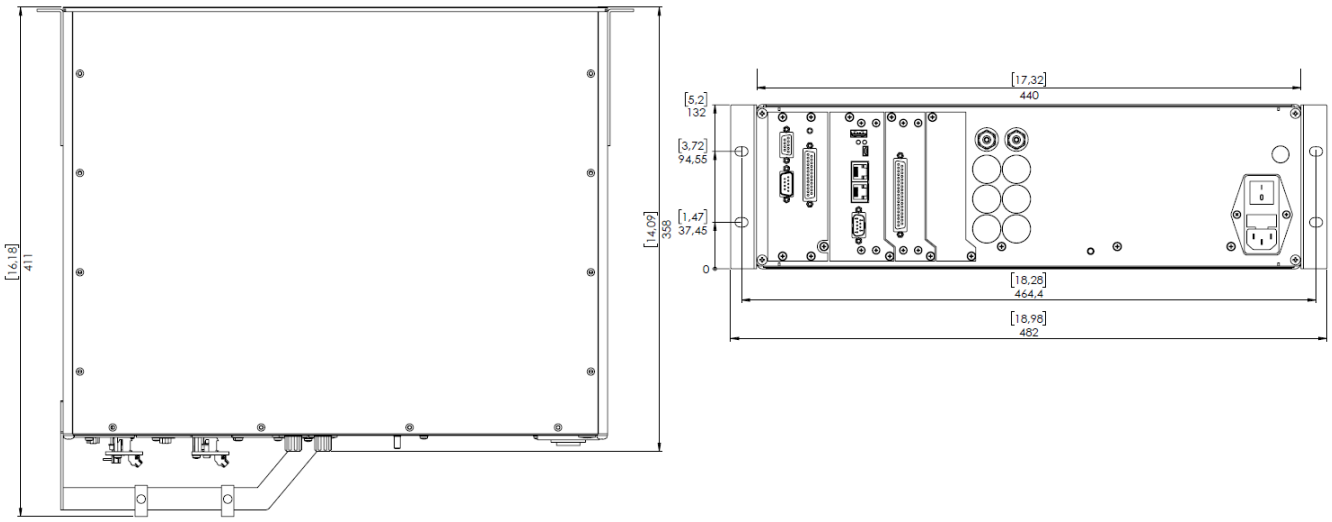
| | |
|---|---|
| **Standards** | Article 34 of Occupational Safety and Health Act |
| **Markings** | 13-GA4BO-0648X |

**Note**

Other hazardous area certificates for China, India, Brazil, and United Arab Emirates are available.
Rosemount X-STREAM Enhanced Analyzer CEMS are certified according to EN14181 and EN15267-3 (QAL1).

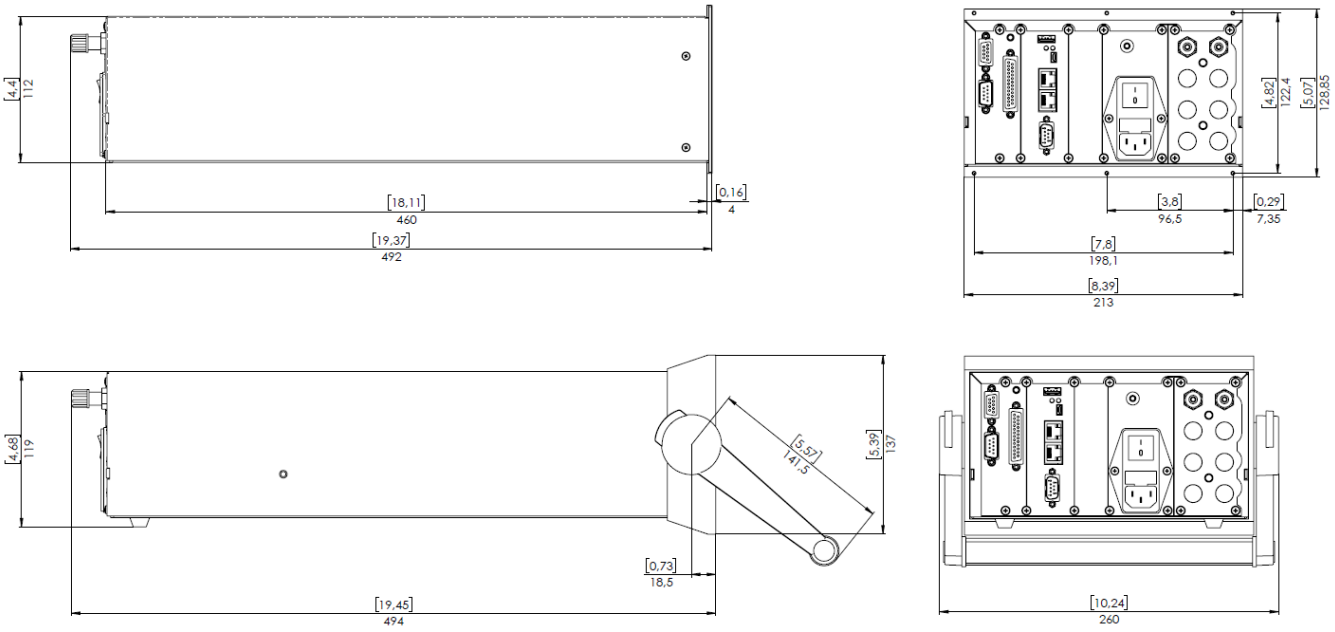
# Dimensional drawings

**Figure 2: Rosemount XEGP X-STREAM *Enhanced* Continuous Gas Analyzer**




**Note**
All dimensions in mm [inches].

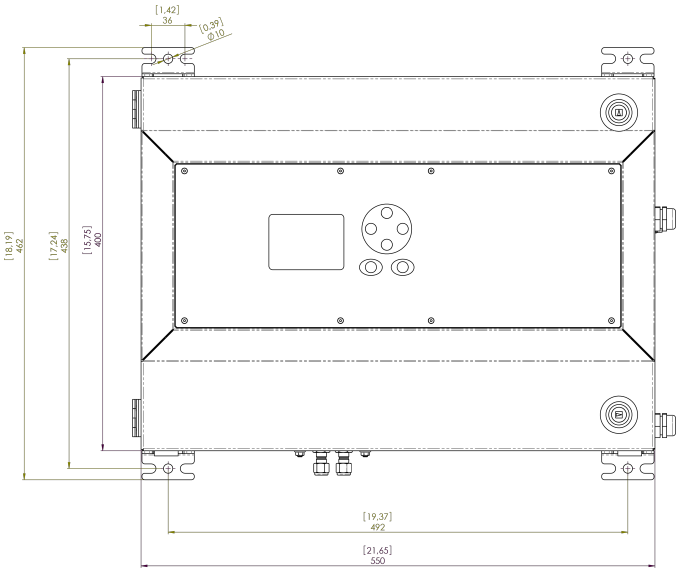
**Figure 3: Rosemount XEGK X-STREAM *Enhanced* Continuous Gas Analyzer**



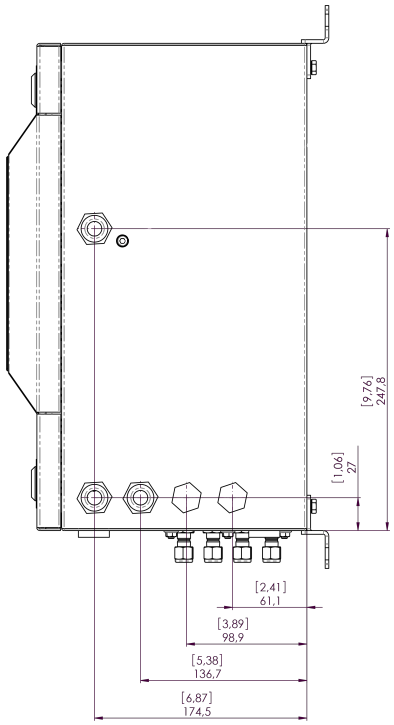

**Note**
All dimensions in mm [inches].

**Rosemount XEXF X-STREAM *Enhanced* Continuous Gas Analyzer (Single Compartment)**

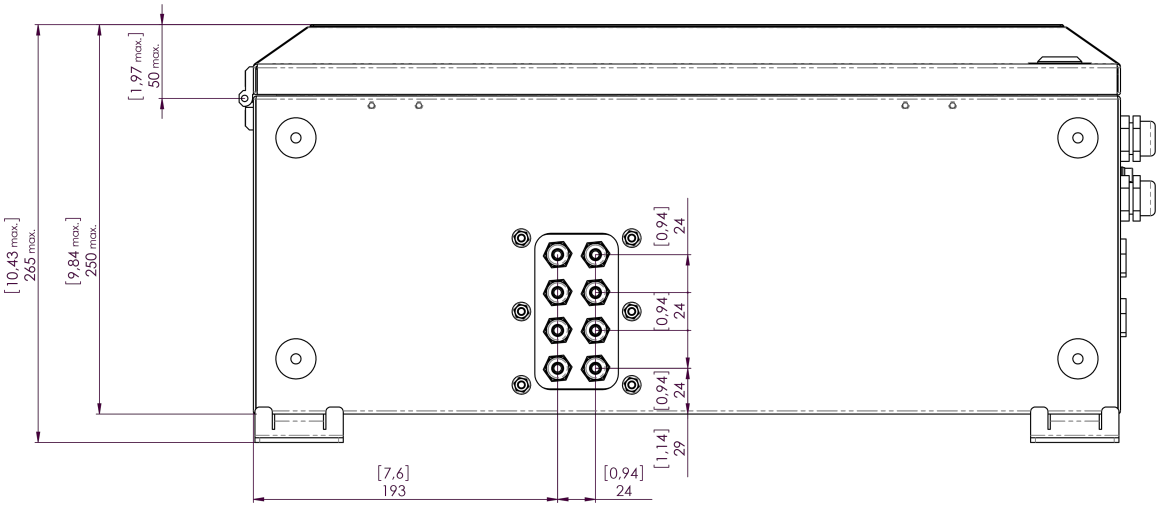
Panel mount (front)




Panel mount (side)



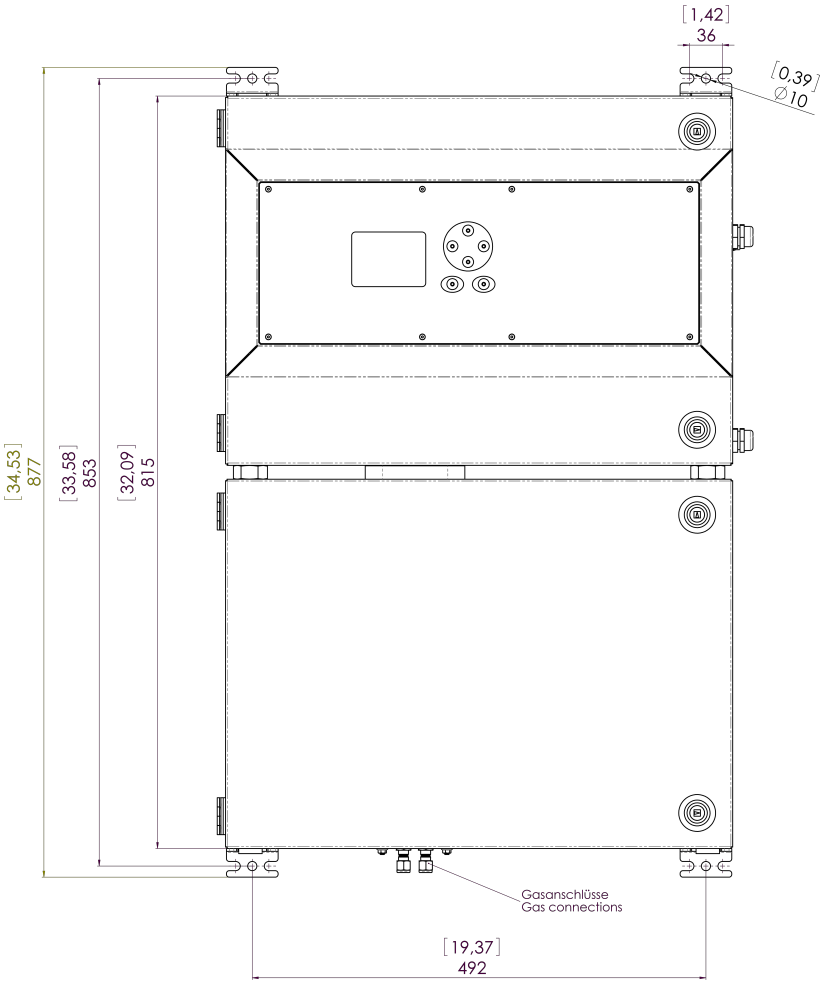

Panel mount (bottom)



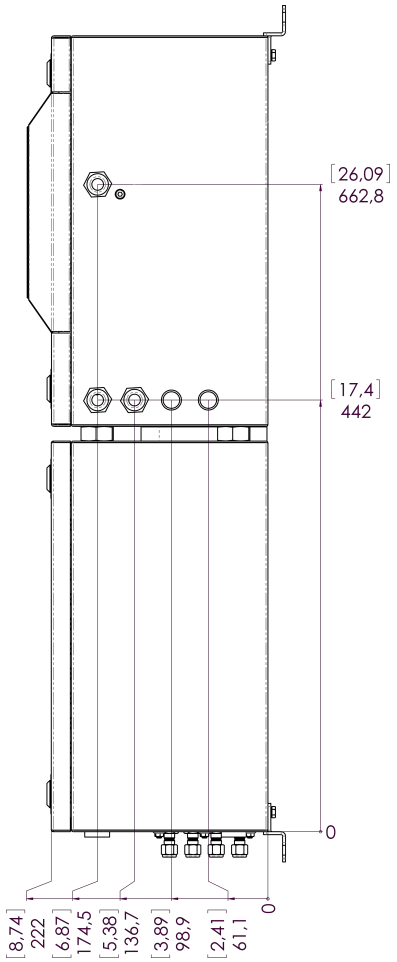

**Note**
All dimensions in mm [inches].

**Rosemount XEXF X-STREAM *Enhanced* Continuous Gas Analyzer (Dual Compartment)**

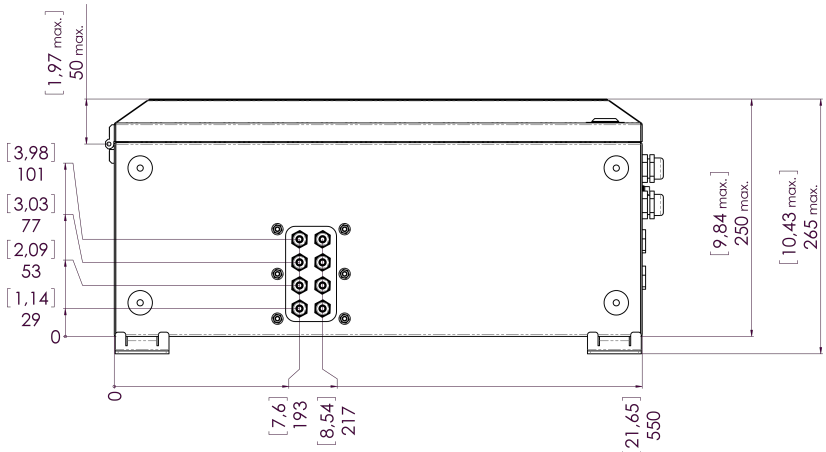
Panel mount (front)




Panel mount (side)

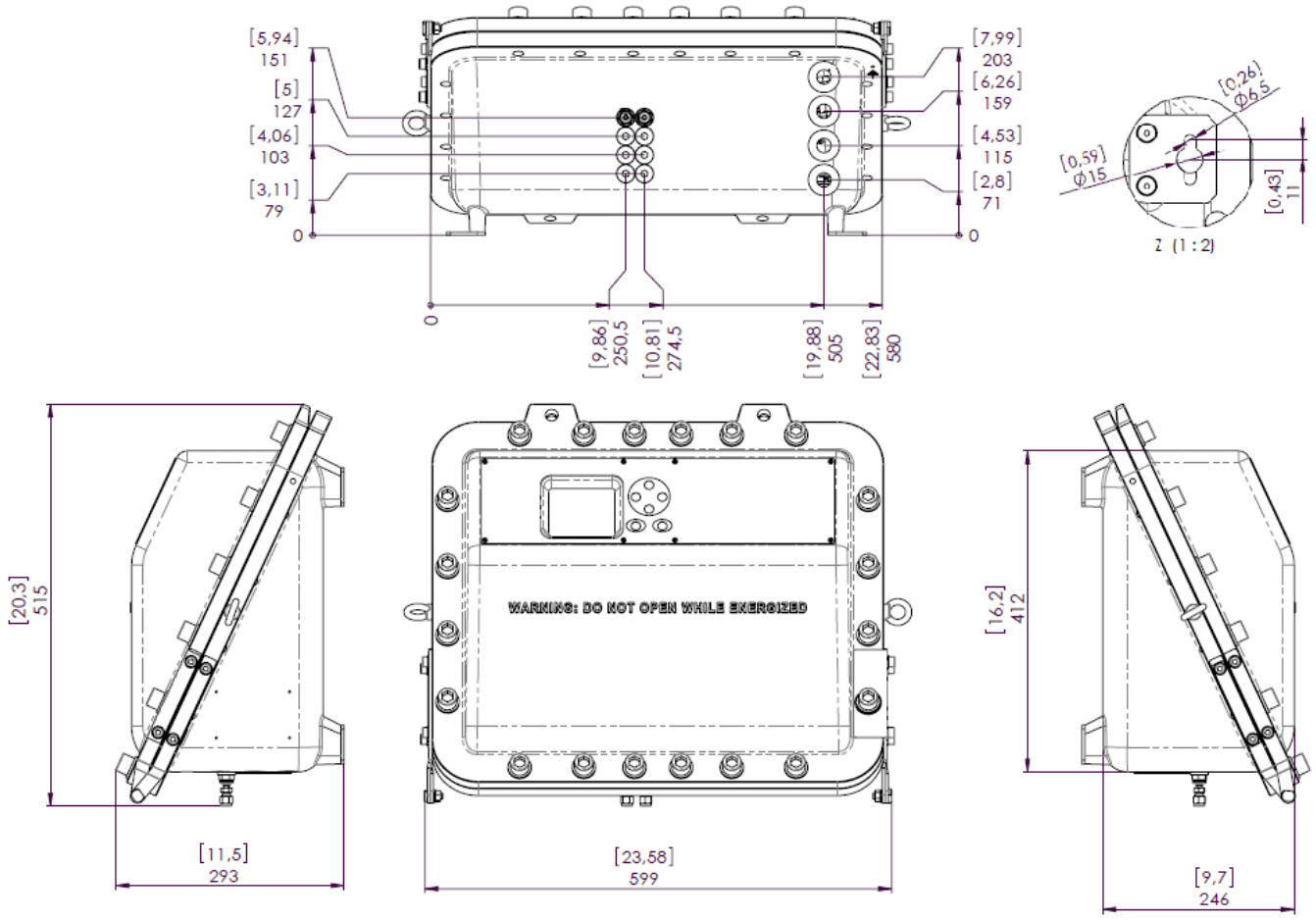



Panel mount (bottom)




**Note**
All dimensions in mm [inches].

**Figure 4: Rosemount XEFD X-STREAM *Enhanced* Continuous Gas Analyzer**




**Note**
All dimensions in mm [inches].

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



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