

X-STREAM General Purpose Gas Analyzer

APPLICATIONS

- Chemical process analysis and control
- Metallurgical production, hardening and heat treatment processes
- Monitoring fermentation gases in biotechnology
- Quality control of natural gas production and distribution
- Exhaust gas measurement for burner efficiency control
- Flue gas analysis of boilers, power plants and incinerators
- Monitoring biogas for landfill applications

FEATURES

- Single or dual channel analyzer
- Supports NDIR, UV, VIS, paramagnetic and electrochemical O₂, and thermal conductivity detectors
- NDIR: robust microflow and solid-state detectors
- NDUV/VIS: vacuum diode detector for stability and long life
- O₂: fast response paramagnetic and electrochemical oxygen sensor with long-term stability
- TC: aluminum and quartz-coated stainless steel thermal conductivity cells
- Solvent-resistant, corrosion-resistant and intrinsically safe measuring cells and stainless steel tubing are available
- Easy access for maintenance and repair
- Analog and digital I/O and serial interface with Modbus communication
- Status signal relay outputs according to NAMUR
- Integrated thermostatically controlled compartment for physical components
- Separation of physics and electronics with purge enables measurement of corrosive and toxic gases
- Autocalibration via internal or external valve block
- Barometric pressure compensation, internal sampling pump and flow sensor



DESCRIPTION

The X-STREAM series of gas analyzers offers single and dual channel analysis utilizing infrared, ultraviolet and visible (NDIR/UV/VIS) photometry, paramagnetic and electrochemical oxygen, and thermal conductivity sensor technologies.

X-STREAM analyzers can measure up to 2 components and the measuring principles may be combined in any combination. The physical benches are installed in their own compartment separated from the electronics. Optional thermostatic control enables measuring lower sample gas concentrations and higher dew points. A purge can be added for handling corrosive and toxic gases to protect the electronics and to provide operator safety.

The instrument has an alphanumeric LCD which is operated by 6 keys. Clear text messages (available in 5 languages) and front panel LEDs provide information about the measurement and analyzer status. The analyzer is supplied as a rack mount version, but an accessory kit is available to modify the analyzer to a tabletop version.

X-STREAM analyzers, equipped with an internal wide range power supply for all world areas, offer analog outputs, status signal relay outputs (according to NAMUR NE 44) and Modbus communication over a serial interface. Digital inputs and outputs are optionally available. The analyzers can be ordered with either screw terminals or connectors for electrical connections.

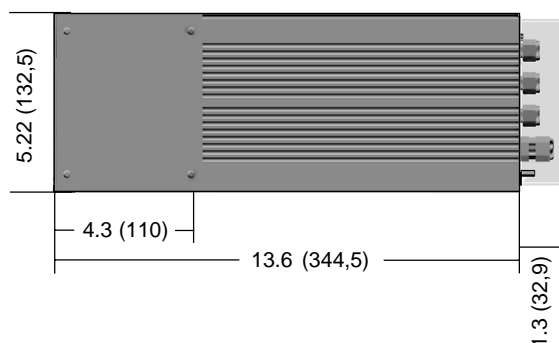
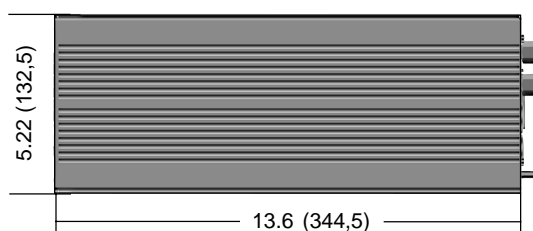
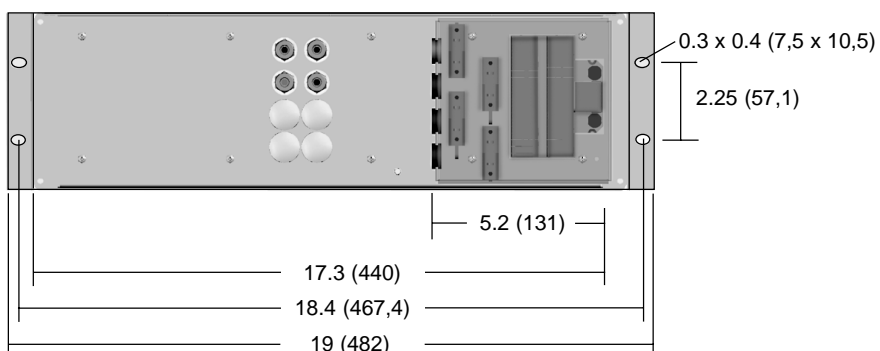
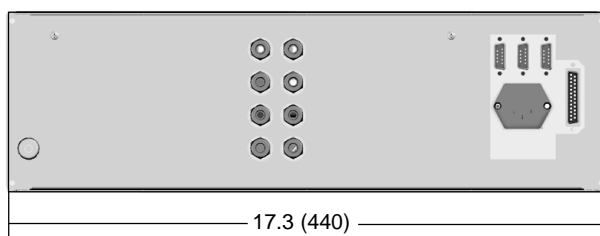
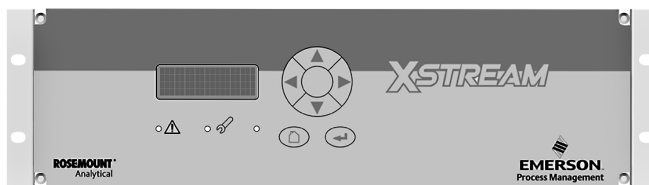
A wall mountable IP66/NEMA 4X variation is also available; see product datasheet 103-910F.A01 for detailed information.

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DIMENSIONS



All dimensions in inches
(mm in parentheses)

SAMPLE GAS COMPONENTS AND MEASURING RANGES (standard configurations*)


Gas component *		Lowest measuring range	Highest measuring range
Acetylene	C ₂ H ₂	0 - 3%	0 - 100%
Acetone	CH ₃ COCH ₃	0 - 1,000 ppm	0 - 3%
Ammonia	NH ₃	0 - 300 ppm	0 - 100%
Argon	Ar	0 - 50%	0 - 100%
Carbon dioxide	CO ₂	0 - 100 ppm	0 - 100%
Carbon monoxide	CO	0 - 100 ppm	0 - 100%
Ethylene	C ₂ H ₄	0 - 400 ppm	0 - 100%
Helium	He	0 - 10%	0 - 100%
Hexane	C ₆ H ₁₄	0 - 500 ppm	0 - 9,000 ppm
Hydrogen	H ₂	0 - 2%	0 - 100%
Methane	CH ₄	0 - 1,000 ppm	0 - 100%
n - Butane	C ₄ H ₁₀	0 - 800 ppm	0 - 100%
Nitrogen monoxide	NO	0 - 250 ppm	0 - 100%
Nitrogen dioxide	NO ₂	0 - 250 ppm	0 - 1,000 ppm
Oxygen (electrochemical)	O ₂	0 - 5%	0 - 25% ***
Oxygen (paramagnetic)	O ₂	0 - 1% ****	0 - 100%
Propylene	C ₃ H ₆	0 - 4,000 ppm	0 - 100%
Propane	C ₃ H ₈	0 - 1,000 ppm	0 - 100%
Sulfur dioxide	SO ₂	0 - 100 ppm	0 - 80%
Sulfur hexafluoride	SF ₆	0 - 1,000 ppm	0 - 5,000 ppm
Toluene	C ₇ H ₈	0 - 5,000 ppm	0 - 1.2%
Vinyl chloride	C ₂ H ₃ Cl	0 - 2%	0 - 2%
Water vapor**	H ₂ O	0 - 1%	0 - 5%

- * Other components and configurations on request
 ** Dew point below ambient temperature
 *** Higher concentrations decrease sensor lifetime
 **** Specification for lowest range to be verified

ELECTRICAL SPECIFICATIONS

Input		Rated voltage	100 - 240 V \sim , 50/60 Hz
Terminals version	Covered terminals with strain relief	Input voltage	85 - 264 V \sim , 47 - 63 Hz
Sockets version	IEC mains appliance	Input current	2 - 1 A

SPECIFIC DATA

Compliances 	CSA-C/US, EN61326, EN 61010-1, NAMUR, C-Tick
Measuring components	More than 60 gases are detectable, e.g.: NO, NO ₂ , SO ₂ , CO, CO ₂ , CH ₄ , C ₆ H ₁₄ , SF ₆ , H ₂ O, N ₂ O, O ₂ , NH ₃ , R134a, H ₂ , etc.
Gas Connections	6/4 mm PVDF Option: stainless steel 6/4 mm, 1/4"; for more options c.f.
Enclosure Protection	IP 20 acc. EN 60529 for indoor installation, protected against direct sunlight
Humidity (non-condensing)	< 90% r.h. @ 20°C (68°F) < 70% r.h. @ 40°C (104°F)
Weight	Approx. 12 - 16 kg (26.5 to 35.3 lbs) depending on configuration
Options	Integrated flow sensor, barometric pressure sensor, thermostated box for physical components (60°C / 140°F), sampling pump and/or solenoid valve blocks for autocalibration

SIGNAL OUTPUTS, INTERFACES

2 analog signal outputs

(optically isolated):

- 4 - 20 mA (R_B ≤ 500 Ω), or
- 0 - 20 mA (R_B ≤ 500 Ω)

3 status relays (NAMUR NE 44):

- Dry contact ratings: 1 A, 30 V

1 serial interface:

- Modbus protocol
- RS 485 or RS 232 C

Digital I/O (optional)

- 7 digital inputs (for remote control)
max. 30 VDC, 2.3 mA, common ground
- 8 digital outputs (e.g. concentration thresholds, valve status notification)
max. 30 VDC, 30 mA, "open collector", common ground

PERFORMANCE SPECIFICATIONS

	NDIR/UV/VIS	Oxygen Sensor (PO ₂ and EO ₂)	Thermal Conductivity
Detection limit	≤ 1% ^{1 4}	≤ 1% ^{1 4}	≤ 2% ^{1 4}
Linearity	≤ 1% ^{1 4}	≤ 1% ^{1 4}	≤ 1% ^{1 4}
Zero-point drift	≤ 2% per week ^{1 4}	≤ 2% per week ^{1 4}	≤ 2% per week ^{1 4}
Span (sensitivity) drift	≤ 1% per week ^{1 4}	≤ 1% per week ¹	≤ 1% per week ^{1 4}
Repeatability	≤ 1% ^{1 4}	≤ 1% ^{1 4}	≤ 1% ^{1 4}
Response time (t ₉₀)	4 s ≤ t ₉₀ ≤ 7 s ^{3 5}	< 5 s ^{3 6} / approx. 12 s ^{3 9}	5 s ≤ t ₉₀ ≤ 20 s ^{3 7}
Permissible gas flow	0.2 - 1.5 l/min.	0.2 - 1.0 l/min ⁶ / 0.2 - 1.5 l/min. ⁹	0.2 - 1.5 l/min. (± 0.1 l/min)
Influence of gas flow	≤ 0.5% ^{1 4}	≤ 2% ^{1 4}	≤ 1% ^{1 4 13}
Maximum gas pressure	≤ 1,500 hPa abs. (≤ 7 psig)	Atm. pressure ⁶ / ≤ 1,500 hPa abs. ⁹ (≤ 7 psig)	≤ 1,500 hPa abs. (≤ 7 psig)
Influence of pressure – At constant pressure – With pressure compensation ⁸	≤ 0.10% per hPa ² ≤ 0.01% per hPa ²	≤ 0.10% per hPa ² ≤ 0.01% per hPa ²	≤ 0.10% per hPa ² ≤ 0.01% per hPa ²
Permissible ambient temperature	0 to +50°C (32 to 122°F)	0 to +50°C (32 to 122°F) ¹⁰	0 to +50°C (32 to 122°F)
Influence of temperature (at constant pressure) – On zero point – On span (sensitivity)	≤ 1% per 10 K ¹ ≤ 5% (0 to +50°C) ^{1 11 15}	≤ 1% per 10 K ¹ ≤ 1% per 10 K ^{1 15}	≤ 1% per 10 K ^{1 15} ≤ 1% per 10 K ^{1 15}
Thermostat control ^{12 14}	Optionally 60°C (140°F) ⁵	55/60°C (131/140°F) ⁶ / None ⁹	75°C (167°F) ¹²
Warm-up time ^{12 14}	15 to 50 minutes ⁵	Approx. 50 minutes ⁶	Approx. 15 minutes

¹ Related to full scale

² Related to measuring value;
1 psi = 68.95 hPa

³ From gas analyzer inlet at 1.0 l/min gas flow
(electronic damping = 2 s)

⁴ Constant pressure and temperature

⁵ Dependent on integrated photometer bench

⁶ Paramagnetic oxygen measurement (PO₂)

⁷ Depending on measuring range

⁸ Pressure sensor is required

⁹ Electrochemical oxygen measurement (EO₂),
not for use with sample gas containing FCHC's

¹⁰ Electrochemical oxygen measurement (EO₂):
+5 to +40°C (41 to 104°F)

¹¹ Starting from +20°C (68°F) to 0°C (32 °F) to
+50°C (122°F) to +20°C (68°F)

¹² Sensor / cell only

¹³ Flow variation within ± 0.1 l/min

¹⁴ Optional "thermostated box" with temperature
60°C (140°F)

¹⁵ Temperature variation: 10 K in 1 hour

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