X-STREAM Field Housing Gas Analyzer

APPLICATIONS

- Petrochemical and chemical process analysis and control
- Metallurgical production, hardening and heat treatment processes
- Quality control of natural gas production and distribution
- Safety measurement for flammable mixtures
- Exhaust gas measurement for scrubber and activated carbon filter efficiency control
- Flue gas analysis of recovery boilers and process furnaces

FEATURES

- Wall mountable NEMA 4X/IP66 painted stainless steel housing
- Single or dual channel analyzer
- Supports NDIR, UV, VIS, paramagnetic and electrochemical O_2, and thermal conductivity detectors
- NDIR: robust microflow and solid-state detectors
- NDUV/VIS: vacuum diode detector for stability and long life
- O_2: fast response paramagnetic and electro-chemical 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 stain-less steel tubing are available
- Easy access for maintenance and repair
- Extended ambient temperature range: -20 to +50 °C (-4 to +122 °F)
- 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.

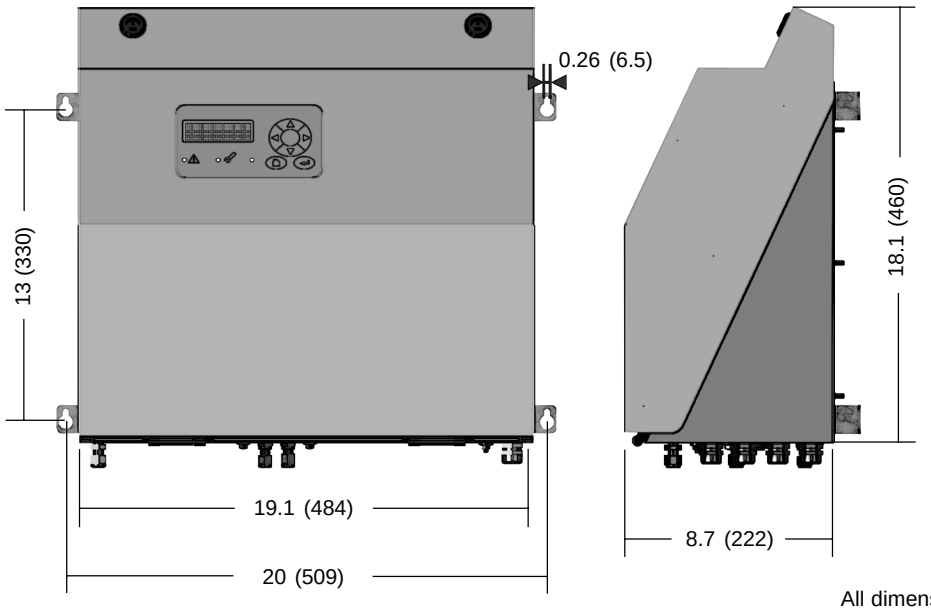
The instrument has an alphanumeric LCD protected by impact-tested safety glass and is operated by 6 keys without the need to open the enclosure. Clear text messages (available in 5 languages) and front panel LEDs provide information about the measurement and analyzer status.

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 NEMA 4X/IP66 design allows operation in harsh industrial environments. Upgraded with a CSA-C/US approved z-purge pressurization system X-STREAM analyzers can be installed in Zone 2 hazardous areas in North America. ATEX-approved pressurization systems are available for installation in European hazardous areas classified Zone 1 or 2.

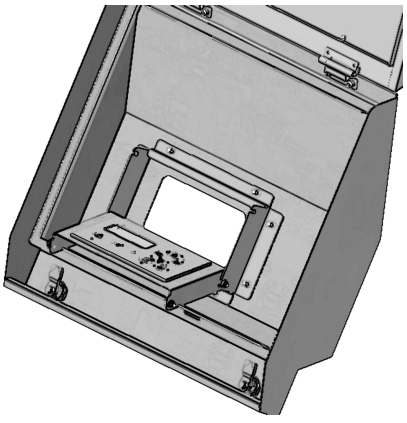
Rack mountable and tabletop variations are also available; see product datasheet 103-910.A01 for detailed information.

DIMENSIONS

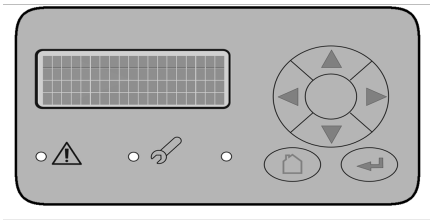


All dimensions in inches
(mm in parentheses)

USER INTERFACE REMAINS OPERABLE WITH DOOR OPEN



FRONT PANEL



SAMPLE GAS COMPONENTS AND MEASURING RANGES (standard configurations*)

Gas component *		Lowest measuring range	Highest measuring range
Acetylene	C_2H_2	0 - 3%	0 - 100%
Acetone	CH_3COCH_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_2H_4	0 - 400 ppm	0 - 100%
Helium	He	0 - 10%	0 - 100%
Hexane	C_6H_{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_4H_{10}	0 - 800 ppm	0 - 100%
Nitogen 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_3H_6	0 - 4,000 ppm	0 - 100%
Propane	C_3H_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_7H_8	0 - 5,000 ppm	0 - 1.2%
Vinyl chloride	C_2H_3Cl	0 - 2%	0 - 2%
Water vapor **	H_2O	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	Cable glands (conduit adapters available), internal terminals	**Input voltage**	85 - 264 V~, 47 - 63 Hz
		Input current	2 - 1 A
Rated voltage	100 - 240 V~, 50/60 Hz		

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_6H_{14}, SF_6, H_2O, N_2O, 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	NEMA 4X, IP66 acc. EN 60529 for outdoor installation, protected against direct sunlight
Humidity (non-condensing)	< 90% r.h. @ 20°C (68°F) < 70% r.h. @ 40°C (104°F)
Weight	Up to 26 kg (57.3 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 ($R_B \leq 500\ \Omega$), or
- 0 - 20 mA ($R_B \leq 500\ \Omega$)

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 temperature	≤ 0.10% per hPa [2]	≤ 0.10% per hPa [2]	≤ 0.10% per hPa [2]
– With pressure compensation [8]	≤ 0.01% per hPa [2]	≤ 0.01% per hPa [2]	≤ 0.01% per hPa [2]
Permissible ambient temperature	-20 to +50°C (-4 to +122°F)	-20 to +50°C (-4 to +122°F) [10]	-20 to +50°C (-4 to +122°F)
Influence of temperature			
(at constant pressure)			
– On zero point	≤ 1% per 10 K [1]	≤ 1% per 10 K [1]	≤ 1% per 10 K [1] [15]
– On span (sensitivity)	≤ 5% (0 to +50°C) [1] [11] [15]	≤ 1% per 10 K [1] [15]	≤ 1% per 10 K [1] [15]
Thermostat control [12] [14]	Optionally 60°C (140°F)	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 (PO_2)
[7] Depending on measuring range
[8] Pressure sensor is required
[9] Electrochemical oxygen measurement (EO_2), not for use with sample gas containing FCHC´s
[10] Electrochemical oxygen measurement (EO_2): +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] Option "thermostated box" with temperature 60°C (140°F)
[15] Temperature variation: 10 K in 1 h

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