

Net Safety™ ST3 XChem Toxic Gas Sensor

Millennium II Series Sensors



Overview

The Net Safety ST3 XChem series of electrochemical toxic gas sensors provide high specificity, fast response, and long life. All Net Safety ST3 XChem Toxic Gas Sensors are part of the universal Millennium II Gas Detection platform and are compatible with Net Safety M21, M22, and M2B Transmitters. These sensors employ SimpleClick sensor element design.

- Low power consumption.
- Sensor end-of life diagnostic.
- Two-year sensor warranty.
- Field-selectable gas ranges.
- Plug-and-play sensor design: the transmitter automatically recognizes sensor configuration.
- Long range (over 2,000 ft./600 m) sensor separation through digital communication between transmitter and sensor.
- Designed to perform in the most extreme industrial environments.

Contents

Overview.....	2
Features.....	3
Ordering information.....	4
Specifications.....	5
Dimensional drawing.....	9
Product certifications.....	10

Features

Sensor end-of-life diagnostic

As part of their normal lifecycle, electrochemical sensors must be monitored and replaced regularly. The end-of-life diagnostic automatically determines the health of the sensor cell and provides a fault condition alert when the sensor needs to be replaced.

Single or dual channel transmitter

You can use one or two toxic gas sensors, combustible gas sensors, or both with a single Net Safety Millennium II Transmitter to mix and match sensor types. This option offers greater flexibility and eliminates the need to purchase multiple gas-specific detectors.

Plug and play design

Emerson calibrates the sensors at the factory. Net Safety Millennium II Transmitters automatically recognize a newly installed sensor and upload its specific configuration profile.

Improved triple electrode design

The sensor's sensing element uses robust materials on sensing, reference, and counter electrodes to ensure long life and enhanced performance.

Advanced environmental immunity

Each sensor is temperature compensated to its target gas and to its field-selected gas concentration range to provide accurate and stable gas concentration readings. An advanced diffusion process controls humidity as gases pass through a specialized hydrophobic barrier.

Ordering information

Typical model number: Net Safety ST320A-100-ASSY

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Model	Product description	
ST320A-100-ASSY	Aluminum, hydrogen sulfide (H ₂ S), 0-20/50/100 ppm field-selectable	★
ST341A-25-ASSY	Aluminum, oxygen (O ₂) deficiency, 0-25% by volume	★
ST360A-1000-ASSY	Aluminum, carbon monoxide (CO), 0-500/1000 ppm field selectable	★

Specifications

Hydrogen sulfide (H₂S) electrochemical sensor

Part number: ST320(A/S)-100-ASSY

Performance specifications

Response time

T20: 10 seconds

T50: 15 seconds

T90: 36 seconds

Accuracy

±3 ppm or 10 percent of reading, whichever is greater

Detection range

0-20/50/100 ppm (field-selectable)

Zero drift

<5 percent full scale annually

Repeatability

<1 percent full scale

Calibration frequency

Six months

Electromagnetic compatibility (EMC)

EN 50270: 2006

Physical specifications

Enclosure material

- AL6061 aluminum
- SS316 stainless steel

Environmental

Operating temperature limits	-40 to +140 °F (-40 to +60 °C)
Storage temperature limits	-40 to +140 °F (-40 to 60 °C)
Humidity limits	15 - 90 percent relative humidity, non-condensing
Ingress protection rating	IP64

Functional specifications

Sensor separation

Up to 2,000 ft. (600 m) with 18 AWG cabling

Required transmitters

- Net Safety Millennium II M2B
- Net Safety Millennium II M21
- Net Safety Millennium II M22

Warranty

Two years

Carbon monoxide (CO) electrochemical sensor

Part number: ST360(A/S)-1000-ASSY

Performance specifications**Response time (without accessories)**

T20: 10 seconds

T50: 15 seconds

T90: 30 seconds

Accuracy

32 °F to 122 °F (0 °C to 50 °C): ±13 ppm or 5 percent of reading, whichever is greater
-4 °F to 32 °F (-20 °C to 0 °C): ±32 ppm or 17 percent of reading, whichever is greater

Detection range

0 - 500/1000 ppm (field-selectable)

Zero drift

< 5 percent full scale annually

Repeatability

< 3 percent full scale

Calibration frequency

Three months

Electromagnetic compatibility (EMC) compliance

EN 50270: 2006

Physical specifications**Enclosure**

Weight	Stainless steel: 3.5 lb. (1.4 kg) Aluminum: 1 lb. (0.4 kg)
Enclosure material	AL6061 aluminum SS316 stainless steel

Environmental specifications

Operating temperature limits	-4 to 122 °F (-20 to 50 °C)
Storage temperature limits	37 to 68 °F (3 to 30 °C)
Humidity limits	15 - 90 percent relative humidity, non-condensing
Ingress protection rating	IP64

Functional specifications

Sensor separation

Up to 2,000 ft. (600 m) with 18 AWG cabling

Required transmitters

- Net Safety Millennium II M2B
- Net Safety Millennium II M21
- Net Safety Millennium II M22

Warranty

Two years

Oxygen (O₂) deficiency electrochemical sensor

Part number: ST341(A/S)-25-ASSY

Performance specifications

Response time (without accessories)

T20: 7 seconds

T50: 10 seconds

T90: 20 seconds

Accuracy

±0.5 percent volume

Detection range

0-25 percent volume

Zero drift

< 5 percent full scale annually

Repeatability

< 3 percent full scale

Calibration frequency

Three months

Electromagnetic compatibility (EMC) compliance

EN 50270:2006

Physical specifications**Enclosure**

Weight	Stainless steel: 3.5 lb. (1.4 kg) Aluminum: 1 lb. (0.4 kg)
Enclosure material	AL6061 aluminum SS316 stainless steel

Environmental specifications

Operating temperature limits	-4 to 122 °F (-20 to 50 °C)
Storage temperature limits	32 to 68 °F (0 to 20 °C)
Humidity limits	15-90 percent relative humidity, non-condensing
Ingress protection rating	IP64

Functional specifications**Sensor separation**

Up to 2,000 ft. (600 m) with 18 AWG cabling

Required transmitters

Use only the following transmitters:

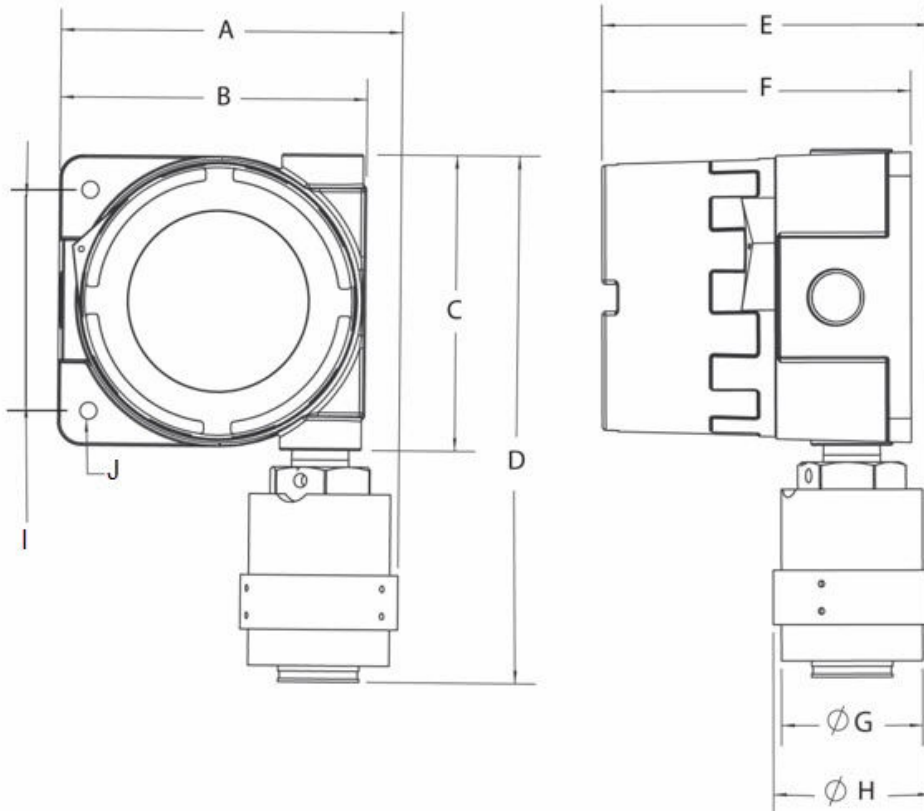
- Net Safety Millennium II M21-AH-A/S
- Net Safety Millennium II M21-AHR-A/S

Warranty

Two years

Dimensional drawing

Figure 1: Net Safety ST3⁽¹⁾



1. Aluminum shown

Table 1: Dimensions in Inches (Millimeters)

Letter	Aluminum housings	Stainless steel housings
A	6.3 (160)	5.9 (150)
B	5.6 (142)	5.1 (130)
C	5.4 (137)	4.6 (117)
D	9.7 (246)	8.9 (226)
E	6.0 (152)	6.0 (152)
F	5.7 (145)	5.8 (147)
G	2.6 (66)	2.6 (66)
H	2.9 (74)	2.9 (74)
I	4.1 (103)	3.9 (100)
J	0.157 (4)	0.157 (4)

Product certifications

Installing in North America

The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division-marked equipment in Zones and Zone-marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

North America

**Markings**

Class 1, Division 1, Groups BCD T5
Ex d IIB+H₂ T5
Class 1, Zone 1, AEx d IIB+H₂ T5 Gb
Type 4X, IP64

IECEX

Markings

Ex db IIB+H₂ T5 Gb
-40 °C ≤ Tamb ≤ +75 °C

Special Condition of Use:

Flameproof joints are not intended to be repaired.

EMERSON AUTOMATION SOLUTIONS

6021 Innovation Blvd.
Shakopee, MN 55379

+1 866 347 3427

+1 952 949 7001

safety.csc@emerson.com

EUROPE

Emerson Automation Solutions
Neuhofstrasse 19a PO Box 1046
CH-6340 Baar
Switzerland

+41 (0) 41 768 6111

+41 (0) 41 768 6300

safety.csc@emerson.com

MIDDLE EAST AND AFRICA

Emerson Automation Solutions
Emerson FZE
Jebel Ali Free Zone
Dubai, United Arab Emirates, P.O. Box 17033

+971 4 811 8100

+971 4 886 5465

safety.csc@emerson.com


ASIA-PACIFIC


Emerson Automation Solutions
1 Pandan Crescent
Singapore 128461
Republic of Singapore

+65 6 777 8211


+65 6 777 0947

safety.csc@emerson.com

 [LinkedIn.com/company/Emerson-Automation-Solutions](https://www.linkedin.com/company/Emerson-Automation-Solutions)

 [Twitter.com/rosemount_news](https://twitter.com/rosemount_news)

 [Facebook.com/Rosemount](https://www.facebook.com/Rosemount)

 [Youtube.com/RosemountMeasurement](https://www.youtube.com/RosemountMeasurement)

©2020 Emerson. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. Net Safety is a mark of one of the Emerson family of companies. All other marks are the property of their respective owners.