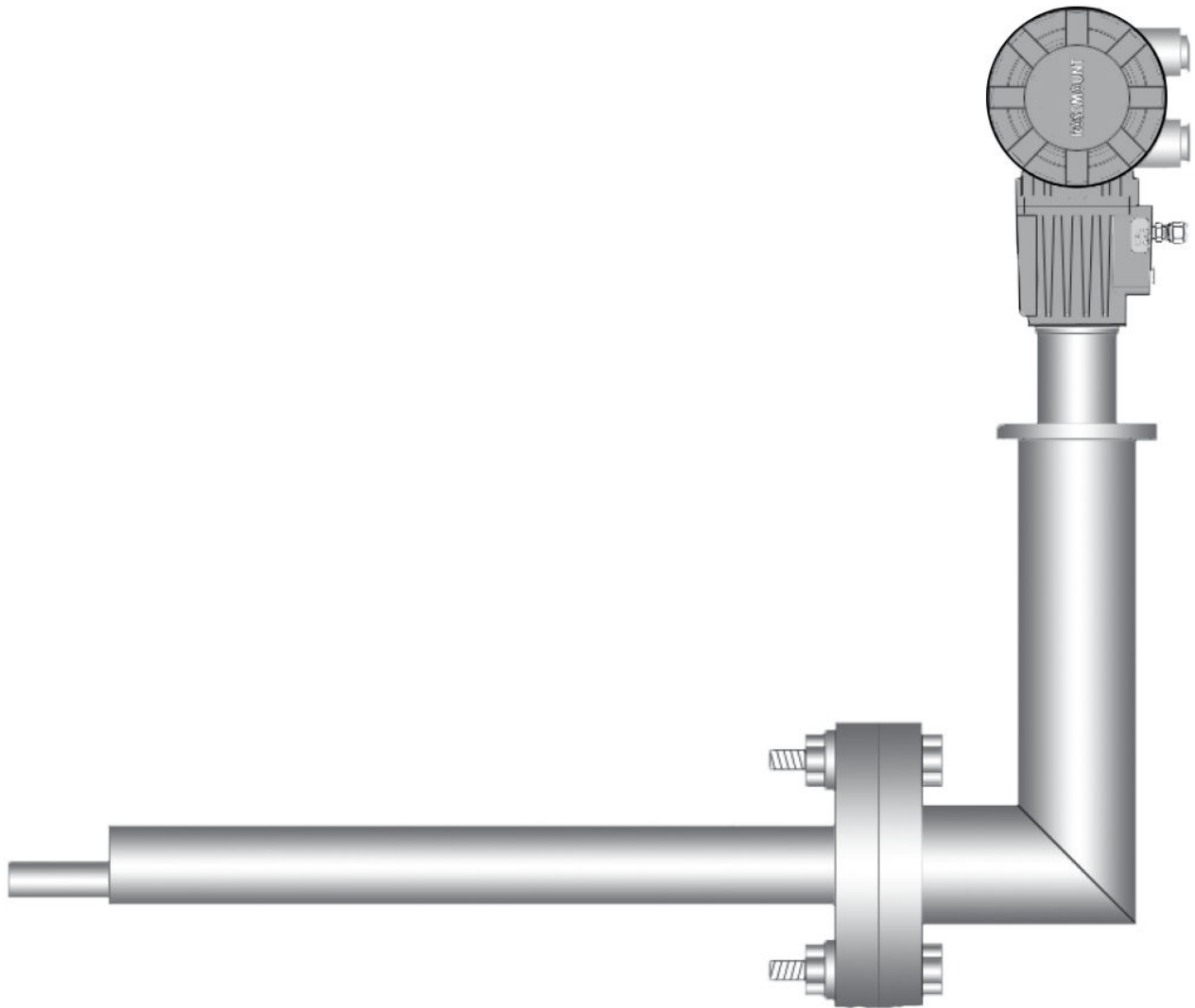


Rosemount™ Bypass Oxygen Analyzer Package



- Provides the same accurate, reliable measurement of excess oxygen in combustion flue gas as standard in situ, industrial oxygen analyzer
- Alloy steel tubes provide effective resistance to corrosion
- Utilizes no moving parts, air pumps, or other components common to sampling systems that require frequent maintenance to remain on-line
- Simple installation provides flexibility to meet various application and space requirements
- Analyzer output ideal for input to automatic combustion trim control

Overview

The Rosemount Bypass Oxygen Analyzer Package consists of a one inch alloy tube; a two inches alloy tube; a Rosemount industrial quality oxygen analyzer and an external stainless steel housing. Mounting angles of the external analyzer can vary according to application requirements.

Process heaters found in refineries and other chemical processing industries present high-temperature problems for in situ (located directly within the boiler flue) flue gas oxygen sensors.

Emerson’s Rosemount Analytical in situ, Zirconium Oxide Probe-Type Oxygen Analyzer has long been established as the standard of the industry. The package has been proven to withstand the high temperatures in process heaters while providing the same advantages offered by the in situ sensor.

The in situ, zirconium oxide oxygen flue gas sensor employs a solid electrolyte sensor inserted directly within the flue, using no moving parts or troublesome sample lines that often experience maintenance problems.

Emerson’s Rosemount Analytical Oxygen Analyzer is a highly reliable flue gas sensor that provides accurate measurements of excess oxygen in combustion flue gas. This measurement can then be incorporated into a combustion trim control program for improving combustion efficiency. The improved efficiency often reduces combustion fuel bills by thousands of dollars, offering returns on the investment in very short time periods.

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Application

While the atmospheres within process heater flues are relatively clean because the burners are fired in most cases with natural gas or refinery fuel gas, temperatures within the stacks vary from 1200 to 2000 °F (650 to 1050 °C). Industrial oxygen analyzers typically use an in situ sensor capable of withstanding flue gas temperatures as high as 1300 °F (700 °C)

The Rosemount Bypass Oxygen Analyzer Package was developed to meet process heater application requirements. The package employs a standard Emerson industrial-type excess oxygen flue gas analyzer, along with two alloy steel tubes to measure excess oxygen content within the combustion flue gas of the process heater. An alloy tube directs the flue gas to the flue gas analyzer mounted outside the stack. The other alloy tube directs the flue gas back inside the stack. The oxygen analyzer then outputs a fast, highly accurate oxygen measurement ideal for use as an input to closed-loop combustion trim control.

Principles of operation

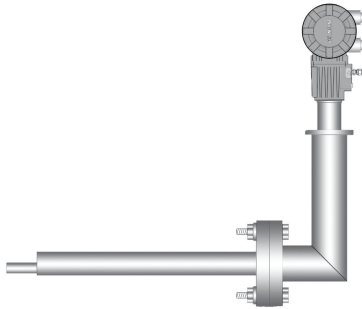
The package extends the alloy tubes into the flue gas stream. The one inch tube directs the flue gas to the oxygen sensor. The two inch pipe then directs the flue gas back into the flue.

The oxygen analyzer is mounted outside the stack with the external stainless steel housing. The sensor housing is insulated from the ambient temperature outside the stack at the time of installation. This feature prevents the flue gas from reaching the dew point, eliminating the threat of condensation inside the pipes.

The package utilizes a natural ram-air effect to direct the sample gas past the oxygen sensor. Thus, no sample pumps (which require moving parts that often break down), air supplies or aspirators are needed to extract a flue gas sample. This feature eliminates the unreliability and maintenance problems inherent to sampling methods. Applications with heavy particulate loading should utilize a high temperature probe mounting jacket (see [Emerson.com/Rosemount](https://www.emerson.com/Rosemount)).

The flue gas travels through the alloy pipes by means of natural pressure differential across the inlet and discharge openings. While traveling to the oxygen sensor, the flue gas cools to a temperature suitable to the situ oxygen sensor.

Ordering information



- Provides the same accurate, reliable measurement of excess oxygen
- Alloy steel tubes provide effective resistance to corrosion
- Utilizes no moving parts, air pumps, or other components
- Simple installation provides flexibility to meet various application and space requirements
- Analyzer output ideal for input to automatic combustion trim control

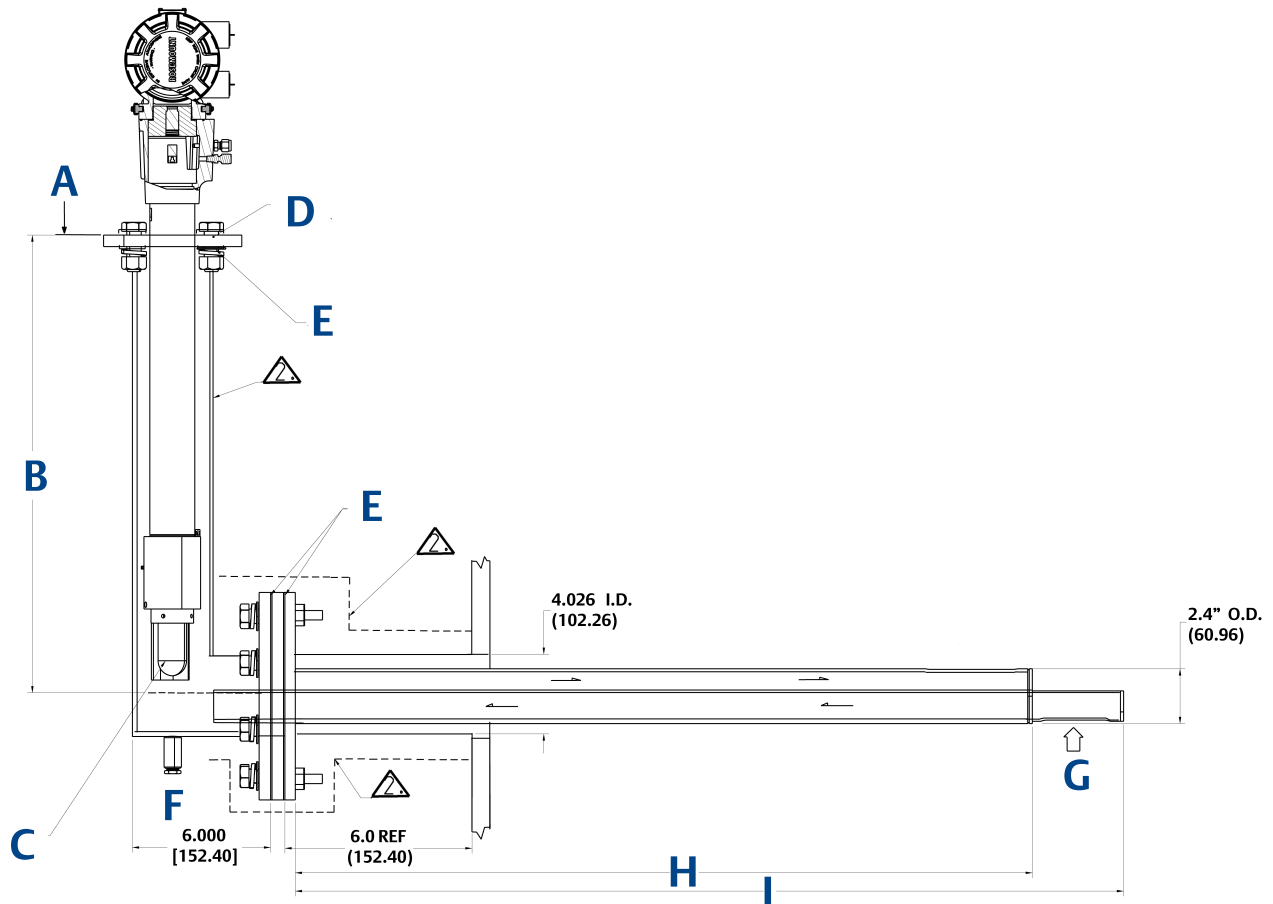
Part number	Bypass packages up to 1050 °C (2000 °F)
3D39004G01	3 ft. (0.92 m), (ANSI)
3D39004G02	6 ft. (1.83 m), (ANSI)
3D39004G03	9 ft. (2.75 m), (ANSI)
3D39004G04	3 ft. (0.92 m), (JIS)
3D39004G05	6 ft. (1.83 m), (JIS)
3D39004G06	9 ft. (2.75 m), (JIS)
3D39004G07	3 ft. (0.92 m), (DIN)
3D39004G08	6 ft. (1.83 m), (DIN)
3D39004G09	9 ft. (2.75 m), (DIN)
3D39004G012	3 ft. (0.92 m), (ANSI) for hazardous area Oxymitter probes
3D39004G013	6 ft. (1.83 m), (ANSI) for hazardous area Oxymitter probes
3D39004G014	9 ft. (2.75 m), (ANSI) for hazardous area Oxymitter probes
3D39004G015	3 ft. (0.92 m), (DIN) for hazardous area Oxymitter probes
3D39004G016	6 ft. (1.83 m), (DIN) for hazardous area Oxymitter probes
3D39004G017	9 ft. (2.75 m), (DIN) for hazardous area Oxymitter probes
3D39004G018	3 ft. (0.92 m), (JIS) for hazardous area Oxymitter probes
3D39004G019	6 ft. (1.83 m), (JIS) for hazardous area Oxymitter probes
3D39004G020	9 ft. (2.75 m), (JIS) for hazardous area Oxymitter probes

Note

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To find the local Emerson specialist near you, go to: [Emerson.com/Rosemount/Contact-Us](https://www.emerson.com/Rosemount/Contact-Us).

Dimensional drawing



- A. 27.31 (693.67) Clearance req for probe insertion and removal
- B. 20.00 (508) GP bypass or 24.25 (615.95) Hazardous probe
- C. Oxygen sensor and internal heater at 1358.6 °F (736 °C)
- D. 2-in. (50.8 mm) Class 150 bolt circle or 3-in. (76.2 mm) class 150 for hazardous
- E. Gasket and hardware
- F. Drain
- G. Direction of flow
- H. Dimension A (see [Table 1](#))
- I. Dimension B (see [Table 1](#))

Note

1. Flue gas operating temperature range to 2000 °F (1050 °C).
2. △ Insulate to ensure flue gas temperature does not go below dew point or exceed 2000 °F (1050 °C). Recommend two inch thick insulation thermal conductivity K equals 0.5 for insulation.
3. All dimensions are in inches with millimeters in parenthesis unless indicated otherwise.
4. Dimension drawing subject to change without notification.

Table 1: Dimensions

Part number	Dim "A"	Dim "B"	Flange	Zone
3D39004G01	32.0 (813)	36.0 (913)	ANSI	Non-hazardous
3D39004G02	32.0 (813)	72.0 (1829)	ANSI	Non-hazardous
3D39004G03	68.0 (1727)	108.0 (2743)	ANSI	Non-hazardous
3D39004G07	32.0 (813)	36.0 (913)	DIN	Non-hazardous
3D39004G08	32.0 (813)	72.0 (1829)	DIN	Non-hazardous
3D39004G09	68.0 (1727)	108.0 (2743)	DIN	Non-hazardous
3D39004G10	32.0 (813)	36.0 (913)	ANSI	Non-hazardous
3D39004G11	14.0 (356)	18.0 (457)	ANSI	Non-hazardous
3D39004G12	32.0 (813)	36.0 (913)	ANSI	Hazardous
3D39004G13	32.0 (813)	72.0 (1829)	ANSI	Hazardous
3D39004G14	68.0 (1727)	108.0 (2743)	ANSI	Hazardous
3D39004G15	32.0 (813)	36.0 (913)	DIN	Hazardous
3D39004G16	32.0 (813)	72.0 (1829)	DIN	Hazardous
3D39004G17	68.0 (1727)	108.0 (2743)	DIN	Hazardous

GLOBAL HEADQUARTERS

Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN 55379, USA

+1 800 999 9307 or +1 952 906 8888

+1 952 949 7001

gas.csc@emerson.com

NORTH AMERICA

Rosemount
8200 Market Boulevard
Chanhassen, MN 55317

+1 800 999 9307

+1 952 949 7001

gas.csc@emerson.com

EUROPE

Emerson Automation Solutions
Neuhofstrasse 19a P.O. Box 1046
CH-6340 Baar
Switzerland

+ 41 (0) 41 768 6111

+ 41 (0) 41 768 6300

gas.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

gas.csc@emerson.com

ASIA-PACIFIC


Emerson Automation Solutions
1 Pandan Crescent
Singapore 128461
Singapore

+65 777 8211


+65 777 0947

gas.csc@emerson.com

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

 twitter.com/rosemount_news

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