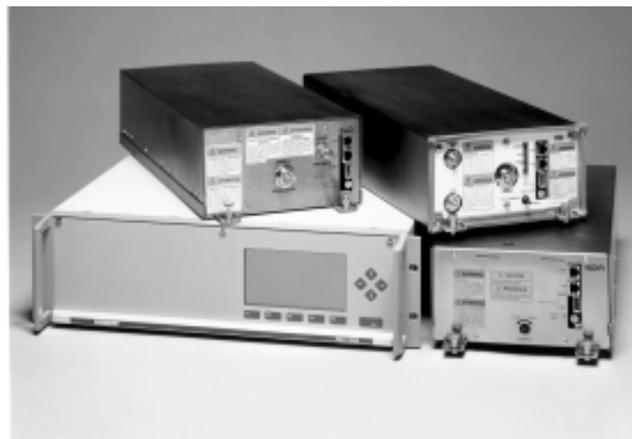


Non-Dispersive Infrared Analyzer (NDIR) Module

- Advanced chopper assembly design
- Improved energy source
- Improved signal-to-noise ratio and stability
- Modular design allows custom mounting near sample source
- Barometric pressure compensation for improved accuracy
- Advanced diagnostic capability
- Sample flow measurement included as standard



Designed for continuous measurement of heteroatomic gases (e.g., CO, CO₂, SO₂, NO, HC and NH₃), the NGA 2000 Next Generation Analysis Non-Dispersive Infrared (NDIR) Analyzer Module delivers unmatched measurement accuracy, reliability, ease-of-use, simplified maintenance, advanced communication capability and enough flexibility to reach well into the next century.

Key to the performance attributes is the highly sensitive Luft detector design. This methodology allows for a wide range of measurements. From 10 ppm CO₂ fullscale to 100% CO fullscale, the NDIR Analyzer Module family gives you the versatility you need. (Please see configuration parameters for standard NDIR components and ranges.)

The NGA 2000 Analyzer Module is the industry's first modular infrared analyzer. It is a self-contained unit complete with detector and microprocessor-based electronics. The NGA Analyzer System's expandability allows for simple system integration. The NDIR Analyzer Module can be part of a sophisticated network or a "stand alone" analysis instrument when combined with the NGA Platform and Input/Output (I/O) Modules.

The NGA 2000 Series is unique because of its advanced communication network which allows identification of and interaction with other modules in the analytical system. Because of this distinctive feature, the NDIR Analyzer Module may be either incorporated into a panel/rack or placed near the sample source up to a mile away, thereby reducing sample handling requirements.

FEATURES

In a continuing effort to improve technology, Rosemount Analytical has achieved superior NDIR design. In the NGA 2000 NDIR Analyzer Module, the homogeneous energy source pattern improves source stability while the digitally controlled chopper assembly reduces electromechanical noise and improves chopper reliability. The shutter adjustment for the source assembly, located at the front of the Analyzer Module, improves serviceability along with accessibility. Available as an option is barometric pressure compensation which helps attain superior accuracy and stability for applications where changes in atmospheric pressure are critical.

The Rosemount Analytical NGA 2000 Series represents the future of process gas analysis, providing the highest level of expandability and state-of-the-art communications.

PRINCIPLE OF OPERATION

Inside the NDIR Analyzer Module, two equal-energy infrared beams are directed through two parallel optical cells: a flow-through sample cell and a reference cell. The reference cell may be sealed or may contain a continuously flowing reference gas.

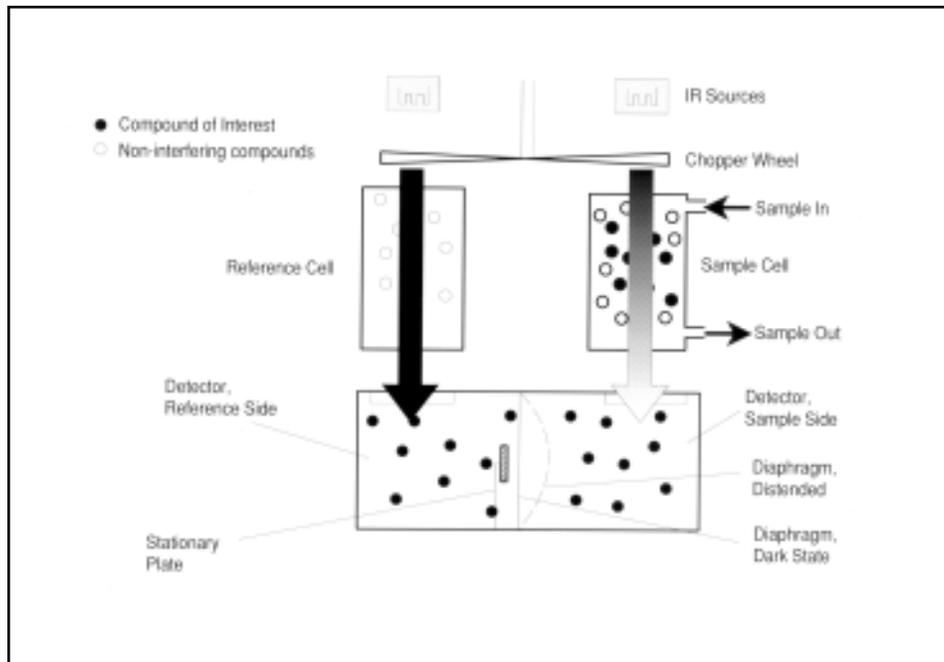
The infrared radiation is interrupted by a chopper at a frequency of 5 Hz. Depending on the application, the radiation may then be optically filtered to reduce background interference from other infrared-absorbing components.

During analysis, a portion of the infrared radiation is absorbed by the component of interest in the sample. The quantity infrared radiation that is absorbed is proportional to the component concentration.

The detector is a "gas microphone" based on the Luft principle. It converts the difference in energy between sample and reference cells to a capacitance change. This change, which is related to component concentration is processed and expressed as the primary variable on the network.

Other modules within an NGA 2000 system may use this variable for a variety of purposes (e.g. expressing the gas concentration on the Front Panel Display or sending it to external data acquisition devices).

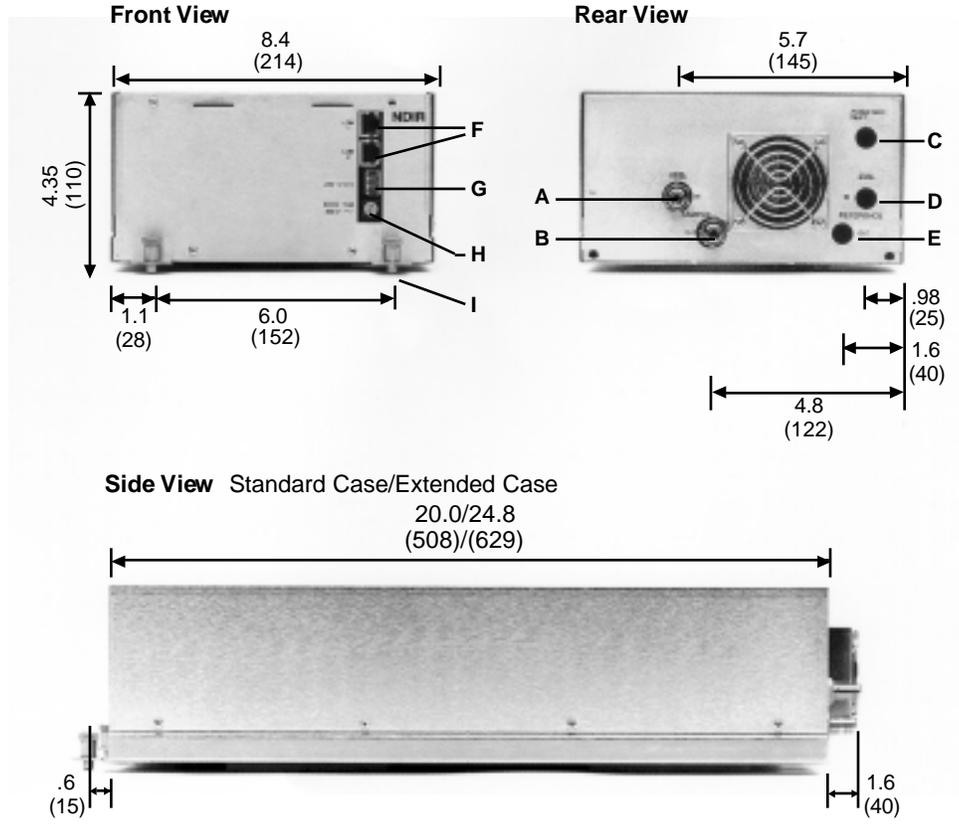
NDIR PRINCIPLE OF OPERATION



* Analyzers sampling flammable gas must be protected by a continuous dilution purge system in accordance with standard ANSI/NFPA 496-1993 chapter 6. Consult factory for recommendations.

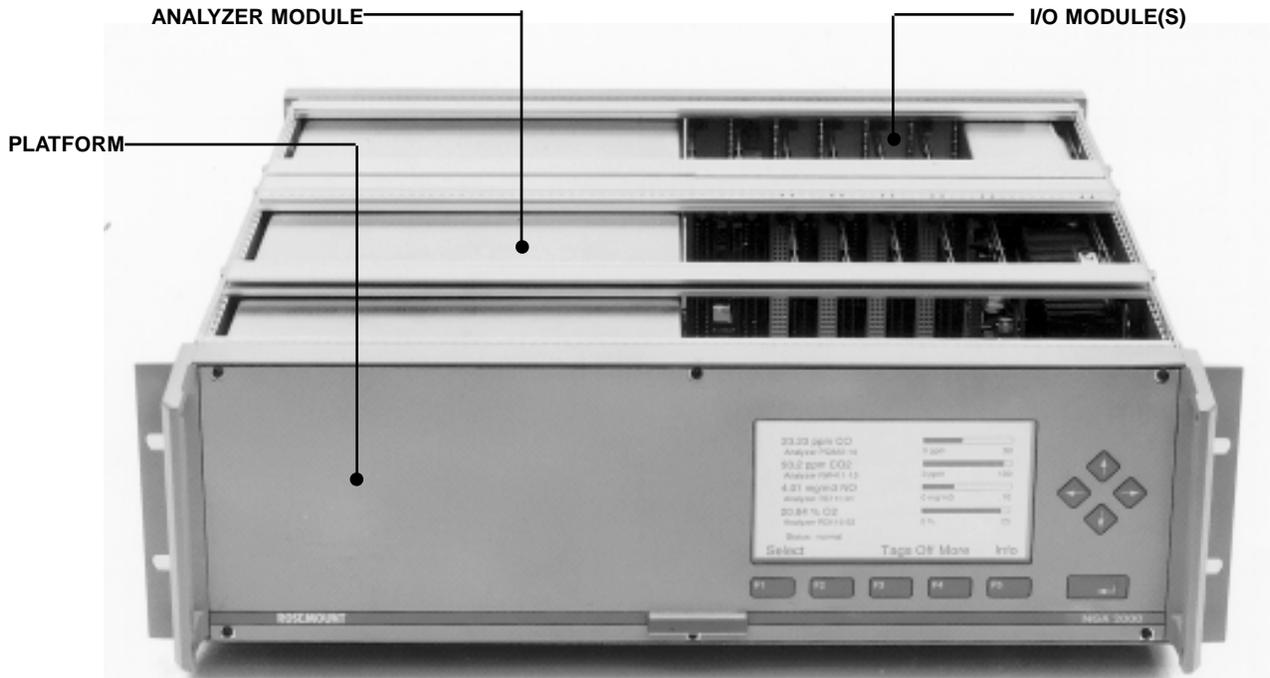
OUTLINE AND MOUNTING DIMENSIONS

- A. Sample In: 1/4" Tube Fitting
- B. Sample Out: 1/4" Tube Fitting
- C. Purge Gas In: 1/4" Tube Fitting (optional)
- D. Reference In: 1/4" Tube Fitting
- E. Reference Out: 1/4" Tube Fitting
- F. Network Cable Connections to Platform
- G. 24 VDC Power Cable to Platform
- H. Fuse
- I. Mounting Pins



Dimensions = Inches
(Millimeters)

Platform with Internal Analyzer Module Several Analyzer Modules may be integrated with a single Platform, either mounted inside or located externally. (Platform shown here with top removed.) See Platform Bulletin for more details.



GENERAL SPECIFICATIONS*

Measurement Species: Standard configurations to include options for analysis of the following species as listed in Configuration Parameters

Ranges: See Configuration Parameters

Repeatability: 0.5% of reading of +/- 1% of fullscale, whichever is greater (at constant temp.)

Minimum Detectable Level: 1 % if fullscale

Noise: <1% of fullscale, peak to peak

Linearity: +/- 1% of fullscale with 4th Order Polynomial Linearization

Response Time: 0.5 seconds to 30 seconds (selectable) for 90% of fullscale

Drift:

Zero and Span:

< +/- 1% of fullscale/24 hours (at constant temp.)

< +/- 2% of fullscale/week (at constant temp.)

Effect of Temperature Change on Drift: < +/- 1% of fullscale over any 10°C change, max. rate of change 10°C/hour

Ambient Operating Temperature: 0°C to 45°C (32°F to 113°F)

Barometric Pressure Compensation: NDIR readout will be automatically corrected for normal atmospheric pressure variations

*Drift values may vary dependent on special applications.

ELECTRICAL SPECIFICATIONS

Supply Voltage and Frequency:

AC: 85 to 264 VAC, 47 to 63 Hz, 150 Watts max. via Platform or

DC: 24 VDC +/- 5%, 100 Watts max., direct to Analyzer Module

Ripple and Noise: < 100 mVpp

Line and Load Regulations: < +/- 1%

Output: User selectable (Refer to I/O Bulletin and Analyzer Module Matrix)

SAMPLE REQUIREMENTS

Sample Temperature: 0°C to 55°C (32°F to 138°F)

Sample Flow Rate: 500 ml/min to 2,000 ml/min

Sample Pressure: Maximum 690 hPa (10 psig): Higher pressures can be used in pressurized cell applications

Particulates: Filtered to <2 microns

Materials in Contact with Sample: Viton A¹, 316 Stainless Steel, FEP (Teflon¹), gold-plated Pyrex², sapphire, quartz, Intran³

PHYSICAL SPECIFICATIONS

Case Classification: General purpose for installation in weather-protected area

Compliance: FM, CSA

Maximum Separation: 1600 m (5280 ft.) (Analyzer Module to Platform)

Gas Connections:

Sample: 1/4" O.D. tube fitting

Reference: 1/4" O.D. tube fitting

Purge Gas: 1/4" O.D. tube fitting

Weight:

Analyzer Module: Standard: 11.0 kg (24.2 lbs.)

Extended: 12.5 kg (27.5 lbs.)

Analyzer with Platform: Standard: 21.0 kg (46.2 lbs.)

Extended: 22.5 kg (49.5 lbs.)

Dimensions:

Analyzer Module:

Standard: 110.5 mm x 213.6 mm x 508.0 mm (4.35" x 8.41" x 20.0") HWD

Extended: 110.5 mm x 213.6 mm x 628.7 mm (4.35" x 8.41" x 24.75") HWD

Analyzer with Platform:

Standard: 133.3 mm x 482.6 mm x 508.6 mm (5.25" x 19.0" x 20.0") HWD

Extended: 133.3 mm x 482.6 mm x 628.7 mm (5.25" x 19.0" x 24.75") HWD

Mounting: Inside a Platform (19.0" rack mountable) or custom installed in a panel

TYPICAL APPLICATIONS

The NGA 2000 NDIR Analyzer Module is designed for many process, stack gas and emissions applications in which a component of a gaseous stream must be continuously monitored. Typical applications* include:

Chemical and Petroleum

- Carbon Dioxide: manufacture of ethylene oxide, phthalic anhydride and ammonia; nitrogen generation; and producer gas monitoring
- Carbon Monoxide: continuous emission monitoring system (CEMS)
- Methane: manufacture of acetylene, acrylonitrile and vinyl chloride
- Sulfur Dioxide: sulfuric acid stack gas monitoring and CEMS

Food and Agriculture

- Carbon Dioxide and Water Vapor: blanketing of perishables, fermentation process, photosynthesis studies and personal protection

Aerospace and Oceanography

- Carbon Dioxide, Carbon Monoxide and Water Vapor: diving and space chambers

Metals and Ceramics

- Carbon Dioxide: monitoring of producer gas, steel converting, manufacture of cement, soaking pit and heat treating
- Carbon Monoxide: inert gas generation producer gas monitoring, rotary kiln roasting, tin plant annealing, steel converting, aluminum powder processing, porcelain kilns and tunnels
- Water Vapor: heat treating, hydrogen brazing and nickel and chrome plating
- Sulphur Dioxide: flash smelting
- Ammonia: ammonia dissociation

CONFIGURATION PARAMETERS

Species	Configuration Identifier	Minimum Range	Maximum Range
Ammonia (NH ₃)	J	0 to 300 ppm	0 to 100 %
Carbon Monoxide (CO)	A	0 to 50 ppm	0 to 100 %
Carbon Dioxide (CO ₂)	B	0 to 10 ppm	0 to 100 %
CO + CO ₂	K	0 to 50 ppm	0 to 100 %
Ethylene (C ₂ H ₄)	G	0 to 1%	0 to 100 %
Methane (CH ₄)	C	0 to 250 ppm	0 to 100 %
Hexane (C ₆ H ₁₄)	D	0 to 100 ppm	0 to 25 %
Nitric Oxide (NO)	E	0 to 500 ppm	0 to 100 %
Sulfur Dioxide (SO ₂)	F	0 to 200 ppm	0 to 100 %
Water (H ₂ O)	H	0 to 1700 ppm	0 to 10 %

- 1) Teflon and Viton are registered trademarks of E.I. duPont de Nemours and Co., Inc.
- 2) Pyrex is a registered trademark of Corning Glass Works
- 3) Irtan is a registered trademark of Eastman Kodak Co.

ORDERING INFORMATION

I	SINGLE CHANNEL INFRARED MEASUREMENT (ANALYZER MODULE)								
	Product is not suitable for Flammable Samples. For Flammable Samples, contact factory.								
	Code	Language							
	A	English							
	X	Special							
	Code Configuration Identifier [] Configurations utilize EXTENDED housings								
	A09, A10, A12, A20, B22, B23, B29, B30, B36, B38 (For B22, B23, B29, B30, & B38, see Note 1)								
	[A06], A07, A08, A11, B21, [B24], B26, B76, F63 (For B26 & B76, see Note 1)								
	[A16], [A28], B19, [B25], [B27], C31, [C37], C39, D41, [D44] (For B25 SEE Note 2. For A14 see Note 3. For B27 see Note 4.)								
	[A14], [A15], [B46], E54, F64, F65, [F66], F67, H73 (For B46 see Note 2. For A14 see Note 3. For A15 see Note 4)								
[E56], H74, [H75], J83, J84, [J85], J88									
[L99]	SPECIAL extended length								
[S99]	SPECIAL standard length								
Z00	No Selection								
Code Linearized Non-Standard Range Selection⁽⁶⁾									
A	Four Standard Ranges ⁽⁷⁾								
B	One Non-Standard Range ⁽⁸⁾								
C	Two Non-Standard Ranges ⁽⁸⁾								
D	Three Non-Standard Ranges ⁽⁸⁾								
F	Four Non-Standard Ranges ⁽⁸⁾								
X	Special ⁽⁸⁾								
Code No Selection									
Z	None								
Code Software Version									
Z	Standard								
9	Special (Earlier Version)								
Z	No Selection								
I	A	A10	Z00	A	Z	Z	Z		(Example)

NOTES:

- (1) Includes source purge.
- (2) Includes flowing reference.
- (3) Requires Auto-Cal I/O Module or System Auto-Cal to meet Analyzer Module Performance Specifications.
- (4) High Pressure Application - Please specify controlled sample pressure value (maximum 150 psig).
- (5) Selected for applications where high and/or low ranges exceed configuration range capabilities.
- (6) Customer must specify all required ranges (four ranges max).
- (7) See "NGA Configuration for NDIR Analyzer" in Price Book for Std. Range Values.
- (8) Specify non-standard ranges.

IF THE CONFIGURATION IS NOT LISTED, PLEASE CONTACT OUR APPLICATION ENGINEERING DEPT.

ACCESSORIES

Part No.	Description
748332	Manual IR
748273	Manual for SN below 1000300

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