

PRODUCT BROCHURE

MAX300-RTG

REAL-TIME Gas Analyzer



**Continuous,
real-time analysis**

**Full, speciated
composition**

**High sensitivity
and wide
dynamic range**

- Fast analysis for better process control and increased manufacturing production
- Complete quantitative stream composition: total application coverage with fewer analyzers required
- Multi-port stream selector for up to 160+ samples
- Low maintenance, and easy to operate
- Unparalleled customer service and support

Reliable Data, Optimized Performance

With over four decades of excellence in industrial automation and thousands of installations worldwide, Extrel process mass spectrometers provide the rugged stability and ease-of-use necessary for continuous operation in demanding manufacturing environments.



Hydrocarbon Processing

- Flare Gas Analysis
- Ethylene Cracker Control
- Polyethylene
- Fuel Gas BTU
- Ethylene Oxide
- LNG
- PVC and EDC
- Benzene



Syngas Manufacturing

- Ammonia
- Methanol
- Hydrogen
- Gasification
- Acetic Acid
- Low-Sulfur Diesel



Metals Manufacturing

- Steel Carbon Content
- Blast Furnace Off Gas
- Coke Making
- EAF Monitoring



Gas Purity

- Trace Contamination
- Pharmaceutical Solvents
- Semiconductor Manufacturing
- Scrubber Efficiency
- Food and Beverage Gas

Introducing the MAX300-RTG

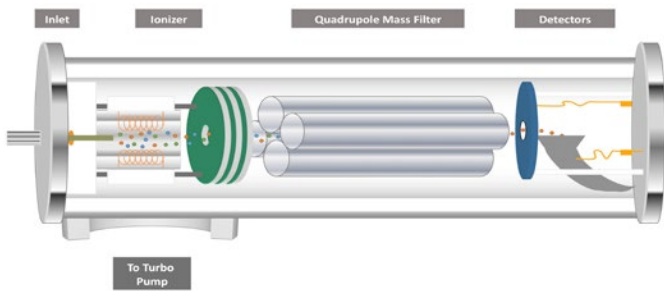
Optimize Your Manufacturing

Mass spectrometry is a powerful tool for process automation. Rapid, accurate gas analysis enables high-precision reactor control and increased production efficiency.

The MAX300-RTG™ uses cutting-edge quadrupole mass spectrometer technology to deliver continuous online gas monitoring for industrial process control.

Easily Measure Multiple Process Points or Production Lines With One Analyzer

It has the speed necessary to analyze the total composition of a sample in seconds, and can be fully automated to measure several points in a process, or multiple production lines, with a single analyzer.



The mass spectrometer uses an ionizer to break sample molecules into charged fragment ions that are then separated based on their mass-to-charge ratio as they move through the electric fields generated by the quadrupole mass filter. The ions register a current at the detector, creating a set of peaks called a mass filter.

Extrel's industry-leading 19mm quadrupole mass filter, combined with state of the art electronics, delivers real optimized performance and more:

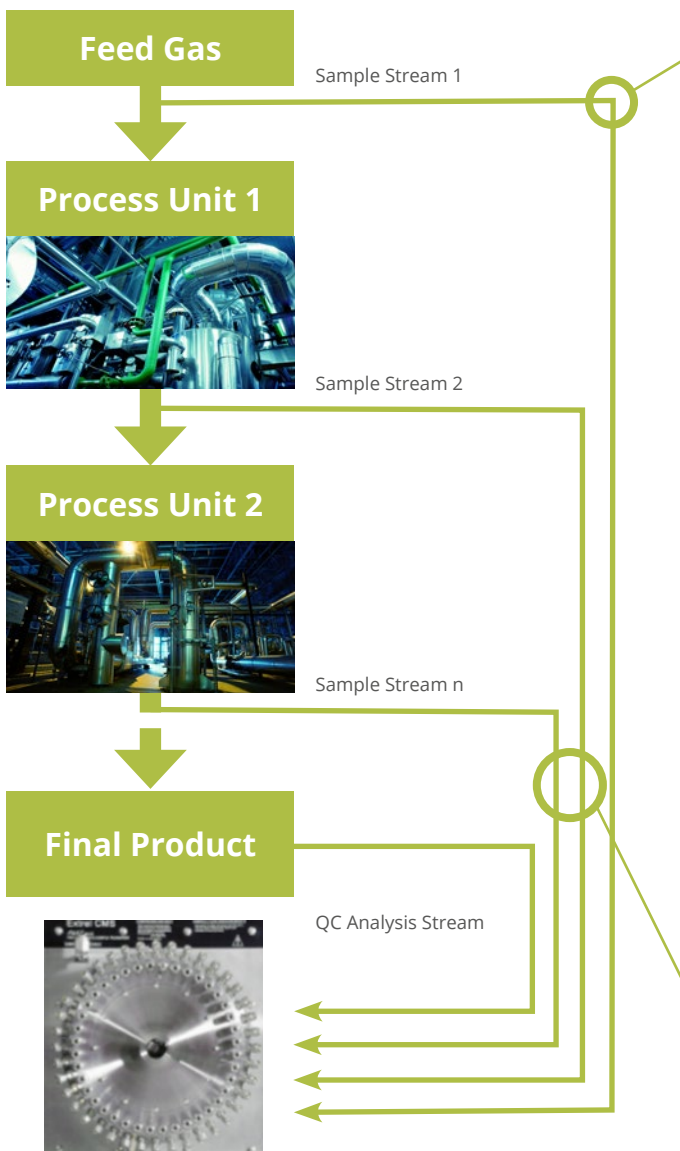
- Near-zero mass scale drift for outstanding measurement precision and stability
- Uniform resolution across the entire mass range for ultra-high sensitivity to all compounds
- Extreme resistance to corrosion and contamination
- Performance specifications superior to other mass spectrometers and commercial process technologies



MAX300-RTG Industrial Gas Analyzer

The ions register a current at the detector, creating a set of peaks called a mass spectrum. Each compound has a unique spectrum, making mass spectrometry a highly selective, flexible technique.

Rapid Online Analysis to Maximize Your Production



The 80 Port FASTvalve Sample Selector
 The inlet system of the MAX300-RTG can be configured with any number of zero-dead-volume sample selector options.

Consistent Ongoing ROI

- Fast online gas analysis for increased manufacturing efficiency, product yield, and equipment uptime
- Full stream composition provides additional information necessary for advanced process control
- Lower capital cost compared to other technologies
- Reduced operation costs due to low maintenance and utility requirements
- By monitoring the operation of several process units, the MAX300-RTG is often used to replace multiple gas chromatograph (GC) systems

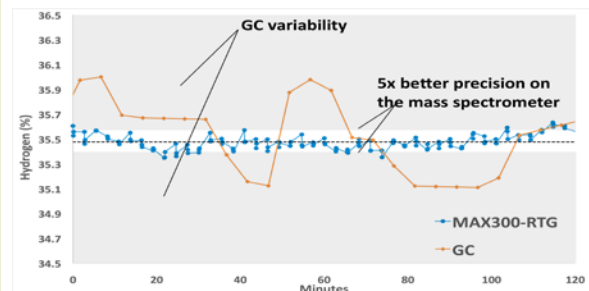
Accuracy and Flexibility

Component	% Molecular Concentration	Precision % Absolute
Hydrogen	16.5	0.006
Methane	77.9	0.007
Nitrogen	0.38	0.002
Propane	0.9	0.001
Ethane	2.35	0.002
N-pentane	0.16	0.001
Isobutane	0.27	0.001
Carbon dioxide	0.95	0.001
Isopentane	0.15	0.001
N-Butane	0.45	0.001
Hexane	0.01	0.0002
Hydrogen sulfide	0.001	0.00001

Example 1. Process Feed Gas

The MAX300-RTG measures all of the hydrocarbons in the feed gas stream as well as ppm contaminants, like H₂S. Control parameters, such as BTU value, Specific Gravity, and Wobbe Index, are instantly calculated and transmitted for use by the plant's process control system.

Precision and Control



Example 2. Polyethylene Reactor Control

Fast, high-precision data allows the plant to operate process units closer to optimum conditions. This data was collected running a mass spectrometer side-by-side with a Gas Chromatograph (GC) at a polyethylene plant.

Superior Process Control with Extrel

	GC	MAX300-RTG
Cycle time	5 min	29 sec
Measurements	3 components	10 components
# of samples monitored	1 reactor only	4 reactors

System Specifications

Detectable compounds:

Any gas or vapor sample

Detection range:

- Faraday detector: 100% – 5 ppm
- Electron multiplier: 100% – 5 ppb*
- Membrane inlet: 100% – 10 ppt*

Number of sample streams:

16, 31, 40, 80, 120, 160+

Analysis rate:

0.1 – 16 seconds per component

- User selectable

Number of components: Unlimited

Number of analysis routines: Unlimited

Number of user configurable data tags:

Unlimited

Precision: <0.05% RSD over 24 hours**

Stability: <0.5% RSD over 30 days**

Filaments:

Two, one active and one spare with automatic switchover

Analyzer maintenance: 1-3 years[†]

Roughing pump: 6-12 months[†]

Manual or fully automated calibration and validation: 3-12 month calibration intervals

Mass range options: 1-250, 300, 500 amu

* Matrix dependent. Documented on trace air components and benzene.

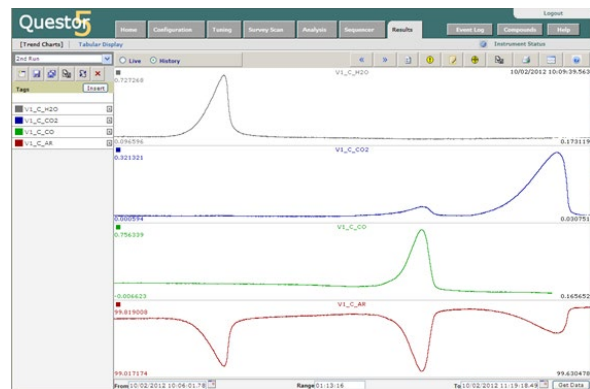
** Based on the analysis of 1% argon, scan speed 1 second per analysis.

[†] Application dependent.

Low Maintenance, Easy to Use

The Questor5 control software that drives the MAX300-RTG measures all sample points in a fully customizable sequence for site-specific, automated production control. The intuitive web-based interface allows the user to check instrument status, review data, or run a validation sequence from anywhere on the plant network, while maintaining government and industry security standards for login and electronic record keeping (21 CFR 11).

The MAX300-RTG is a 24-7 online gas analyzer with a documented uptime >99%.



Simultaneously trend high precision measurements of bulk components and ppm-level contaminants with the easy-to-use Questor5 control software

Extrel



Comparison: Extrel 19 mm quadrupole next to a common 6 mm filter. The larger (Extrel) device provides greater ion transmission for unparalleled sensitivity and signal stability.



The MAX300 disposable, plug-and-play ionizer eliminates the cleaning requirement, and includes dual filaments, one active and one spare.

MAX300-RTG System Specifications

Power Supply Options:

- 110 VAC, 50/60 Hz, Two 15 Amp circuits
- 230 VAC, 50/60 Hz, One 20 Amp circuit

Power Consumption:

- Nominal 2740 Watts
- Heat Load: 2700 Watts (9215 BTU/h)

Weight:

- Standard Enclosure: 450 lbs (205 kg)
- Optional cart: 40 lbs (18 kg)

Ambient Requirements:

- Temperature: -4°F to 120°F (-20°C to 49°C)
- With A/C, cold start $\geq 54^\circ\text{F}$ (12°C)
- Area Classification Options:
 - General Purpose
 - Class 1, Division 1 or 2, Groups B, C, D, T4
 - IEC/ATEX, Zone 1 or 2, Group IIC or IIB +H2*, T4

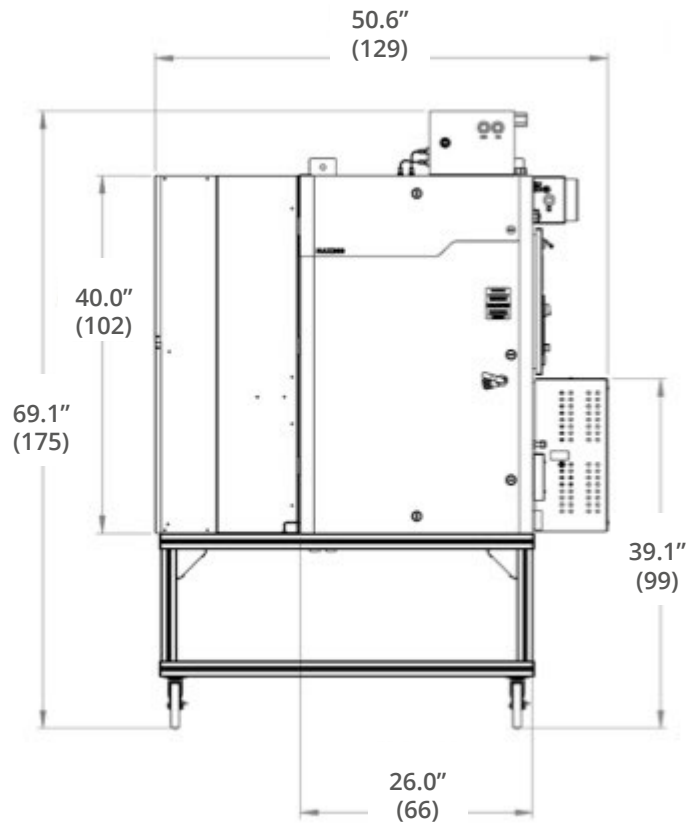
Additional Utilities:

- Purge gas (for hazardous area installations)
- Base calibration requirement: 2 gas bottles

Data System and Communications:

- System control interface options: Ethernet, RS-422 4-wire
- Login security levels: Administrator, User, Viewer
- External communications: – Ethernet, Modbus serial, digital I/O, analog I/O, OPC

*Configuration dependent



MAX300-RTG enclosure with A/C, Cart and X Purge Options. Dimensions shown in inches [cm]

Exceptional Worldwide Service and Support

For over 50 years, Extrel has been committed to providing the highest quality support services for the thousands of instruments installed worldwide. Factory trained and certified personnel offer industry-leading support to Extrel customers at every stage of process development and manufacturing.

PREMIUM INSIGHTS – GAIN REAL-TIME INSIGHT INTO YOUR PROCESS

Process Insights' products and solutions deliver innovative and differentiated analysis and measurement solutions and technologies that add high value to our customers and protect the environment.

Our commitment is to deliver smart and affordable innovation that optimizes process, improves safety, and transforms our world.

CENTERS OF EXCELLENCE

PROVIDING PROVEN SOLUTIONS FROM A GLOBAL TECHNOLOGY LEADER

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OUR PREMIUM GLOBAL BRANDS

