

MAX100-BTU

Real-Time Heating Value Gas Analyzer



PRODUCT NOTE



- Real-Time Heating Value Analysis
- Speciated Gas Composition
- Combustion Control Optimization
- EPA Flare Compliance

Introducing the MAX100-BTU

Heating Value and Speciated Hydrogen in Seconds

The MAX100-BTU provides a rapid, high precision measurement of heating value and gas composition for optimal combustion control and environmental compliance.

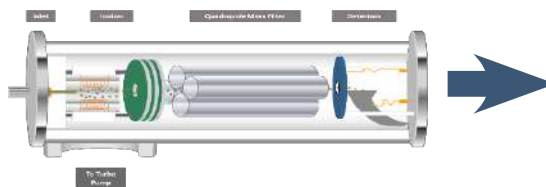
Variable composition gas streams, like refinery flare vent gas or coke oven off-gas, make efficient combustion control a challenge. Fast, accurate gas analysis is essential to allow operators to maintain critical set points by adding the right amount of supplemental gas or steam.

The MAX100-BTU™ uses cutting-edge quadrupole mass spectrometer technology to deliver a continuous online analysis of fuel gas and vent streams containing hydrocarbons, H₂, CO, CO₂, H₂O, H₂S, and other gases. It has the speed necessary to analyze the total composition of the sample and report the Heating Value in seconds.

Heating Value Analyzer Applications

- Combustion control optimization
- Refinery flare RSR compliance
- Fuel gas analysis
- Cogeneration
- Gas turbine efficiency
- Natural gas processing and distribution
- Gas mixing/recapture
- Coke oven and blast furnace off-gas
- Landfill vent gas
- Glass plant gas blending

The mass spectrometer uses an ionizer to break sample molecules into charged fragment ions. They 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 spectrum. Each compound has a unique spectrum, making mass spectrometry a highly selective, flexible technique.

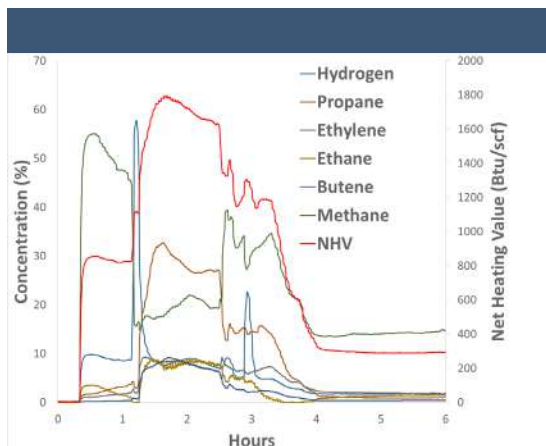


For rapid Heating Value analysis and real-time combustion control, the MAX100-BTU offers an impressive list of **Extrel Advantages**:

- Heating Value reported in seconds
- Speciated analysis of: H₂, C1-C6+ hydrocarbons, CO, CO₂, N₂, O₂, H₂O, H₂S, and other gases
- Extreme resistance to corrosion from H₂S
- Additional parameters available: Wobbe Index, CARI, Specific Gravity, Density, etc.
- Multiport sample selector for up to 46 sample streams
- Low maintenance, utility, and calibration requirements

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Net Heating Value (NHV) changes rapidly as regulated material is sent to a refinery flare. Of the 14 hydrocarbons being measured, the five primary contributors to NHV are shown along with hydrogen. The MAX100-BTU analysis provides the refinery with the NHV required by the regulation, as well as speciated component concentrations for use by operations, or for effective root cause analysis.

Component	Concentration (%)	Precision (% absolute)
Hydrogen	5.07	0.01
Methane	5.05	0.006
Ethylene	17.03	0.026
Nitrogen	56.35	0.033
Ethane	9.99	0.017
Propylene	2.99	0.008
Propane	3.00	0.012
Butane	0.51	0.021
Net Heating Value	665.51 BTU/scf	0.53 BTU/scf

A speciated MAX100-BTU analysis of a certified gas mixture containing hydrocarbons and hydrogen to simulate refinery vent gas. The high precision of the concentration data transfers through the calculation to produce a highly repeatable Net Heating Value (NHV). Recent RSR updates permit the use of 1212 BTU/scf for calculating hydrogen's NHV contribution. This makes hydrogen speciation a critical component of accurate NHV reporting.

Performance Specifications:

- Detectable compounds: H₂, C1-C6+ hydrocarbons, CO, CO₂, N₂, O₂, H₂O, H₂S, and other gases
- Detection range: 100%-100 ppm*
- Number of sample streams: 16, 31, 46
- Analysis rate: ~1 second per component
- Number of components: Unlimited
- Number of analysis routines: Unlimited
- Number of user configurable data tags: Unlimited
- Precision: <0.75% RSD**
- Dual Filaments
- Analyzer maintenance: 1-3 years†
- Roughing pump: 6-12 months†
- Manual or fully automated calibration and validation - 3-12 month calibration intervals
- Mass range: 1-100 amu

* Matrix dependent.

** 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 MAX100-BTU measures all fuel or flare gas streams in a fully customizable sequence for site-specific, automated combustion 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 MAX100-BTU is a 24-7 online gas analyzer for combustion control and environmental compliance.

MAX100-BTU 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:

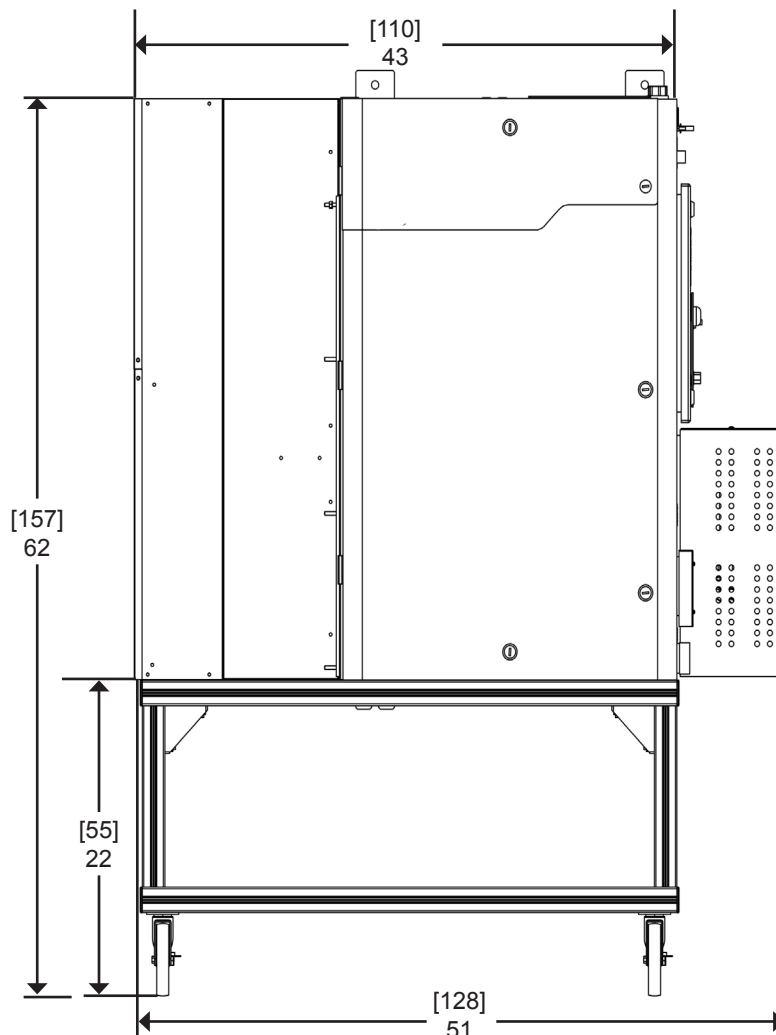
- Temperature: -4°F to 120°F (-20°C to 49°C)
- With A/C, cold start $\geq 54^{\circ}\text{F}$ (12°C)
- Area Classification Options:
 - General Purpose
 - Class 1, Division 2, Groups B, C, D, T4

Additional Utilities:

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

Data System and Communications:

- Login security levels: Administrator, User, Viewer
- External communications:
 - Ethernet, Modbus serial, digital I/O, analog I/O, OPC



Dimensions: [cm]
inches

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 the combustion control application.



Equipamientos Analíticos S.A

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