

PRODUCT DATASHEET

MAX100-BTU™

Real-Time Heating Value Gas Analyzer



Precise

Fast

Reliable

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

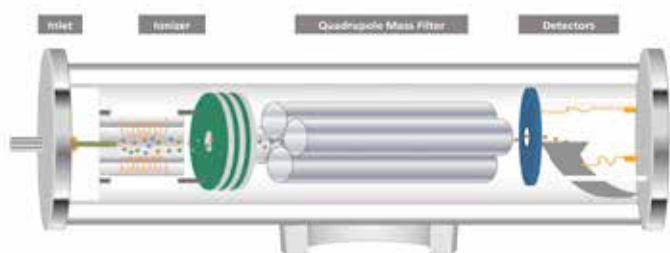
Introducing the MAX100-BTU

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.

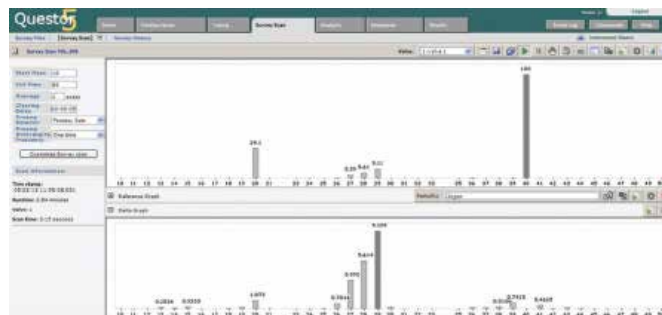
The MAX100-BTU uses cutting-edge quadrupole mass spectrometer technology to deliver a continuous online analysis of fuel gas and vent streams containing hydrocarbons, H_2 , CO , CO_2 , H_2O , H_2S , and other gases. It has the speed necessary to analyze the total composition of the sample and report the Heating Value in seconds.



Heating Value Analyzer Applications

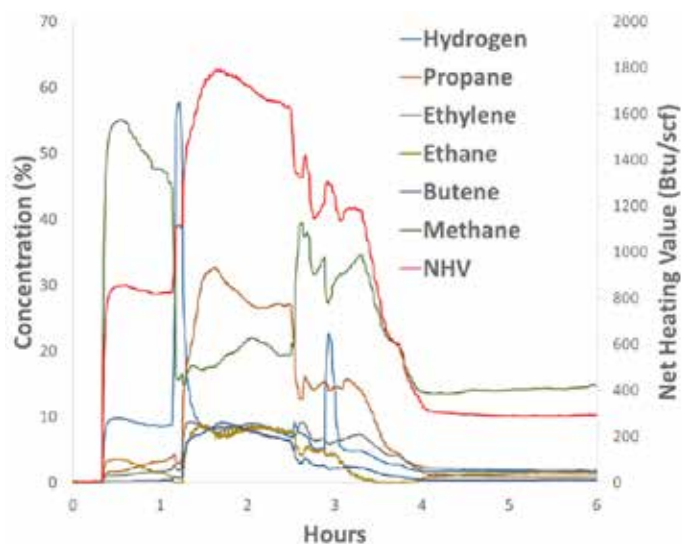
- Combustion control optimization
- Refinery flare RSR compliance
- Fuel gas analysis
- Cogeneration
- Gas turbine efficiency
- Natural gas processing and distribution
- Gas mixing/recapture
- Coke oven and blast furnace off-gas
- Landfill vent gas
- Glass plant gas blending

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 Advantages:

- Heating Value reported in seconds
- Speciated analysis of: H_2 , C1-C6+ hydrocarbons, CO , CO_2 , N_2 , O_2 , H_2O , H_2S , and other gases
- Extreme resistance to corrosion from H_2S
- 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



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.

Specifications:	
Detectable Compounds	H ₂ , C1-C6+ hydrocarbons, CO, CO ₂ , N ₂ , O ₂ , H ₂ O, H ₂ S, 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**
Analyzer Maintenance	1-3 years†
Roughing Pump	6-12 months†
Mass Range	<1% relative over 2 decades of measurement (typical, application dependent)
Dual Filaments	
Manual or fully automated calibration and validation – 3-12 month calibration intervals	

* 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:

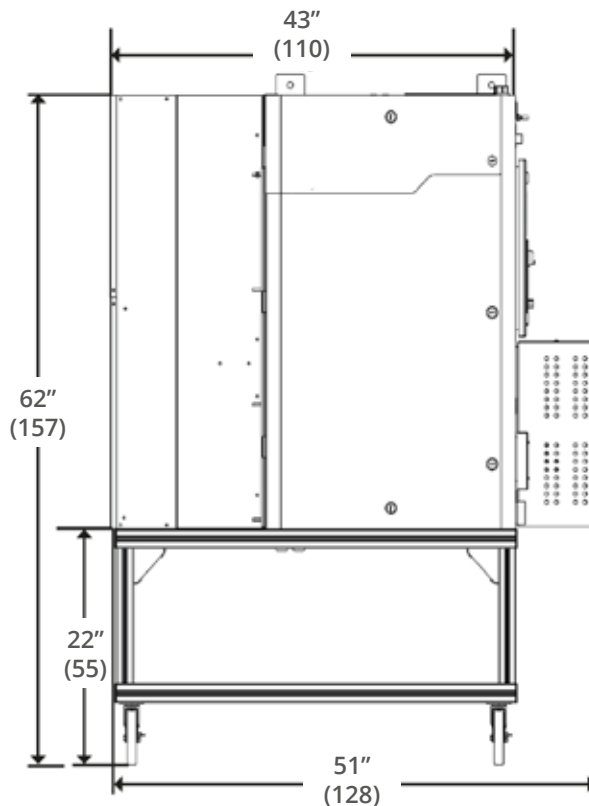
- Temperature: -4°F to 120°F (-20°C to 49°C)
- With A/C, cold start $\geq 54^{\circ}\text{F}$ (12°C)
- Area Classification Options:
 - General Purpose
 - Class 1, Division 2, Groups B, C, D, T4

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 shown in inches [cm]



MAX100-BTU
Real-Time Heating Value Gas Analyzer

Exceptional Worldwide Service and Support

For over 50 years, we have 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 our customers at every stage of the combustion control application.

GAIN REAL-TIME INSIGHT INTO YOUR PROCESS

Process Insights manufactures and delivers premium sensors, monitors, detectors, analyzers, instrumentation, and software that are mission-critical to keep your operations, personnel, and the environment safe – every day across the globe.

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REVOLUTIONIZING MEASUREMENT

EVERYWHERE