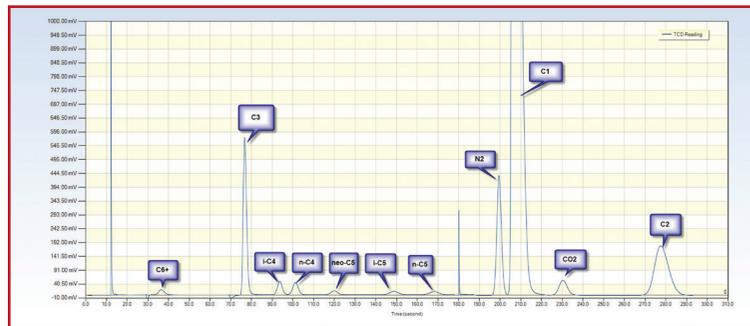


ACCUCROME GC SELECTED SPECIFICATIONS

Analysis Components	C6+ or C7+ configurations available C1, C2, C3, I-C4, C4, I-C5, C5, C6, C7, N2, CO, CO ₂ , O ₂ (remaining C6+ or C7+)
Repeatability	±0.25 Btu/scf per 1,000 Btu (±0.0093 MJ/m ³ per 37.3 MJ/m ³)
Linearity	1%
Measurement Range	800 to 1,500 Btu/scf (29.8 MJ/m ³ to 55.9 MJ/m ³)
Oven Temperature Range	-4° to 140° F (-20° to 60° C)
I/O Capabilities Output	3 – Modbus serial ports (up to 8 serial ports optional) 2 – Ethernet (one for local GUI, one for Modbus TCP) 4 – Replaceable SPDT 8A relays (3 alarm, 1 fault) 4 – 4 to 20 ma loop or self-powered (optional additional 32 isolated 4 to 20 ma) 1 – Single PID controller with PWM control
Inputs	1 – MMI external keypad 3 – Universal analog with programmable gain 2 – Isolated digital (wet) 2 – Digital (dry)
I/O Protocol	Modicon 16, Modicon 32, Enron/Daniel, user-configured SCADA lists available
Area Classification	Class 1, Division 1, Groups B, C & D Class 1, Division 2, Groups B, C & D
Power Requirements	100 watts start up, 50 watts continuous 24 VDC or 90 to 240 VAC 50/60 Hz (Optional)

Please note: we work continuously to improve the performance of our products – all specifications are subject to change without notice.



Typical
Chromatogram
for Natural Gas

Galvanic assures flexible, headache-free installation and operation

Galvanic Applied Sciences' expert support team will work with you to determine the best, most cost-effective way for your facility to meet your Btu-measurement needs. Galvanic's high-performance analyzers are calibrated to your exact specifications and custom-configured at the factory to integrate seamlessly into your existing infrastructure. Galvanic can also supply other key components and services for a total integrated solution – from custom designs and field commissioning for your systems – to analyzer shelters and sample-conditioning panels.

GALVANIC
APPLIED SCIENCES



ISO 9001-2008

Application Insight: AccuChrome™ GC Btu & Hydrocarbon Analyzer

Precision Energy
Content (Btu)
Analysis for Custody
Transfer & Natural
Gas Blending Process
Optimization

NATURAL GAS
PIPELINES &
TRANSMISSION
6

When it comes to Btu analysis for custody transfer and natural gas blending optimization, the slightest inaccuracy in measurement can have a significant effect on a company's bottom line.

The new AccuChrome GC from Galvanic Applied Sciences offers superior accuracy in a compact, rugged package. A high-performance, low-maintenance gas chromatograph, the AccuChrome GC can integrate seamlessly into your existing infrastructure. That, and its economical cost of operation, make the AccuChrome GC one of the highest-value Btu analyzers on the market.

Custody Transfer

Natural gas transport involves the sending and receiving of the energy content of natural gas (NG). The Btu content determines the monetary value of the NG and the price paid or received at custody-transfer points. Because of this, a precise determination of the NG Btu content is critical to meet contractual or regulatory specifications. Companies need to meet the minimum Btu content required – without transferring any more energy they are obligated to.

Custody transfer can take place at many points in the NG transportation and storage infrastructure: from well head to gathering points, gathering points to main transport pipelines, into and out of processing, storage, or LNG facilities – and finally, into commercial power plants and consumer-distribution systems. Therefore, minute miscalculations of Btu content can add up rapidly to millions of dollar in loss or gains, which can make or break a company in today's low-margin, highly competitive market.

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Blending stations

Many times companies will need to increase or reduce the Btu content of the natural gas to meet specifications. They also don't want to hand off more value than needed. This Btu adjustment is usually performed at blending stations, where operators mix in lower-energy gases, such as nitrogen, to reduce the Btu content, or conversely add higher energy-content gas to enrich Btu content and bring it up to acceptable levels. Blending stations are also used to mix natural gases with differing energy content from multiple sources, while ensuring a constant Btu value of the combined stream.

Accuracy Matters!

The effects of an instrument's inaccuracy due to repeatability factor can have a significant impact in dollars on the natural gas industry. Typical process gas chromatographs deliver a repeatability factor of ± 0.5 Btu @1,000 Btu – double that of Galvanic's AccuChrome GC analyzer, which delivers repeatability performance of ± 0.25 Btu @1,000 Btu. That difference in error rates matters, as the table below demonstrates.

Further, Galvanic's AccuChrome GC can maintain its high-performance repeatability standard across the whole operating-temperature range of 0° to 130° F (-18° to 55° C). Competing GCs require that the temperature be held constant to meet reported repeatability specifications.

The accuracy of the chromatograph not only effects the heating value used in the energy calculation, but also the volume calculation by virtue of the impact of composition on the super compressibility of the gas as required in the AGA-8 standard for compressibility.

Potential Impact of GC Repeatability Performance on a Major Pipeline and its Customers

Customer or Major Export	Deliveries at 1,000 Btu per Scf in MMBtu	Dollar impact of error rate of ± 0.5 per 1,000 Btu @ \$4.0 MMBtu	Dollar impact of error rate of ± 0.25 per 1,000 Btu @ \$4.0 MMBtu
1	599,800,000	\pm \$1,199,600,000	\pm \$575,808,000
2	520,000,000	\pm \$1,040,000,000	\pm \$499,200,000
3	269,300,000	\pm \$538,600,000	\pm \$258,528,000
4	215,200,000	\pm \$430,400,000	\pm \$206,592,000
5	203,000,000	\pm \$406,000,000	\pm \$194,880,000
6	164,800,000	\pm \$329,600,000	\pm \$158,208,000
others	247,900,000	\pm \$495,800,000	\pm \$237,984,000
total system	2,220,000,000	\pm \$4,440,000,000	\pm \$2,131,200,000

Designed and built to optimize performance in the harshest monitoring environments, Galvanic's AccuChrome GC analyzer with auto calibration and validation capabilities enables fully hands-off operation. It delivers the utmost in ease-of-operation, precise measurements, consistent, field-proven performance – and value.

AccuChrome GC Btu & Hydrocarbon Analyzer

The AccuChrome GC is Galvanic's third generation of gas chromatographs for the natural gas industry, designed to meet your toughest analytical challenge. We know what it takes to keep your analyzer up and running. We have extensive sample-conditioning experience and our service and support are second to none.

The enhanced capabilities of the AccuChrome GC make it an ideal economical choice for all your Btu determinations. With excellent repeatability across a wide operating temperature range, the analyzer delivers ± 0.25 Btu/scf per Btu.

The AccuChrome GC's Ethernet connectivity provides a safe, user-friendly local interface, and the analyzer also features remote-access PC software. Whether you're on site or around the globe, you can gather all the Btu measurement information you need. Expansive storage capacity means you can log large amounts of data to decrease the frequency of data downloads. This frees your operations staff to concentrate on completing other critical tasks.

Galvanic's applications-savvy development engineers designed PLGC 3's rugged construction with operator serviceability in mind, allowing easy access to all sections for field servicing.

The AccuChrome GC thermal conductivity detector is less susceptible to fouling than micro-machined technology and will not fail due to loss of carrier gas. It is also resistant to the corrosive characteristics of H₂S.

Generate standard modbus protocol or multiple modbus lists for access by SCADA – the PLGC 3's fully featured I/O capability (including up to eight serial ports and Ethernet modbus) makes it possible.

Multi-stream capability (up to 8) simplifies your analytical system; one high-performance analyzer can perform sequential measurement of multiple-analysis points.



The AccuChrome GC delivers all you need for fast, accurate Btu analysis and remote monitoring:

- Rugged field-proven construction
- Designed for easy serviceability throughout
- TCD will not burn out with loss of carrier gas and can withstand corrosive H₂S
- 32 GB expansion storage capacity
- High-resolution local display
- Airless heat sink oven
- Industry-leading low-maintenance injection valves
- Standard or customized reports
- Auto calibration & validation for complete standalone operation
- User friendly interface with-Windows®-based software