Gas Watch™ Analyzer

Innovative hydrocarbon gas analysis

The Gas Watch Analyzer is the oil and gas industry's most innovative, versatile, and easy to use gas detection system capable of detecting total gas (TG), methane (C_1), ethane (C_2), propane (C_3), butane (C_4), and pentane (C_5).

Canadian Standard Association (CSA)
Class 1, Div. 2 groups C&D approved
Wireless Gas Watch Analyzer

Use Gas Watch Analyzer for total gas detection and full analysis

Internally, the Gas Watch Analyzer (GWA) always isolates C_1-C_5 from the gas sample. The Total Gas Data value is the sum of this C_1-C_5 data thus providing a more accurate Total Gas value compared to other Total Gas Detector technologies.

From spud to sample point when only total gas data is needed the GWA detects total gas in units and exports via WITS protocol to any EDR in one-second intervals.

At sample point the GWA can export full compositional C_1-C_5 in parts per million (ppm) every second, much quicker than any gas chromatograph providing more gas data intervals per GC cycle.

Gas ratios

With the C_1-C_5 values properly isolated, industry derived gas ratio formulas are useful in characterization of the hydrocarbons and in identifying oil and water contact points. The GWA exports wetness, balance, and character ratios in real time.

Features and Benefits

Total gas or full C_1-C_5 composition capability
- Operate as a regular total gas detector and can be selected to export C_1 through C_5.

Patented infrared spectrometry
- Using a state of the art infrared spectrometer calibrated for real life gas mixtures, the Gas Watch Analyzer isolates each hydrocarbon type out of a mixture with the accuracy of a Gas Chromatograph every second.

Fastest C_1-C_5 gas data with real-time gas ratio calculations
- Wetness, balance, and character ratio formulas are processed and exported every second providing ratio values and ratio signatures in real-time while drilling.

Geosteering
- Gas ratio profiles can be a valuable tool when geosteering directional wells, assisting in pinpointing the target hydrocarbon fluid state and maximizing production.

Wireless unit advantage
- Wireless data is encrypted and secure.
- Reduces risk to personnel by removing sample poly line from shaker to geologist/Mudlogger shack.

Rig safe and tough
- Engineered in a rig tough explosion proof approved enclosure.

Easy rig-up
- Wireless connections, elimination of gas sample tubing and a rugged yet lightweight unit (35 lbs) significantly reduce rig-up time.

Local and remote monitoring
- Status lights let rig personnel know when the unit is initializing, operating properly, or in need of service.
- Internal diagnostics monitor and send alarms when any operational issues are detected. Units are remotely monitored daily to ensure maximum uptime.

Low maintenance
- Gas Watch Analyzer is reliable and gas data repeatable.
- Calibrations are good for over one year.

$$\text{Wetness Ratio} = \frac{C2+C3+C4+C5}{C1+C2+C3+C4+C5} \times 100 \qquad \text{Balance Ratio} = \frac{C1+C2}{C3+C4+C5} \qquad \text{Character Ratio} = \frac{C4+C5}{C3}$$

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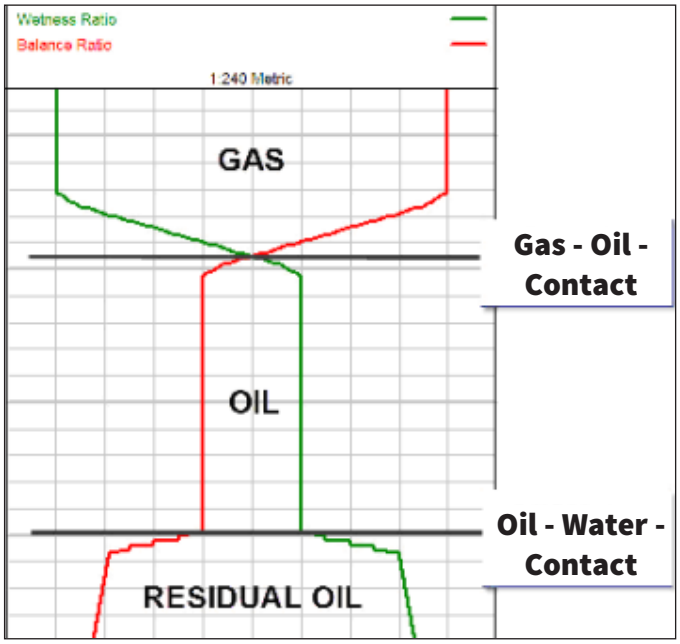
Gas Watch™ Analyzer



Fluid characterization using Wetness and Balance

If the Balance Ratio is greater than the Wetness Ratio, gas is predicted. The closer the curves converge the denser the gas and more likely to be productive.

The Gas - Oil - Contact (GOC) is defined by the cross over point of the two ratio curves.

When the Wetness Ratio is greater than the Balance Ratio, oil is predicted. The closer the curves converge the lighter the oil. The greater the separation of the curves then the heavier the oil and the more likely it is to be unproductive or residual.

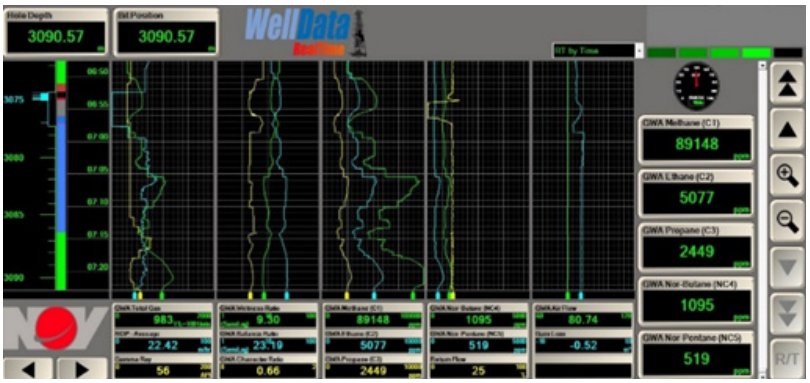
The Oil - Water - Contact (OWC) point is classified by a sharp increase in the Wetness Ratio accompanied by a greater separation of the two curves. The OWC point reflects a greater proportion of heavier hydrocarbons typically associated with residual oil.

Low maintenance gas trap

The Gas Watch Analyzer System agitates its sample gas with an industry standard quantitative gas measurement gas trap. As a result of the extended time between calibrations of the Gas Watch Analyzer, the Gas Watch gas trap has been equipped with a stainless- steel beater bar assembly in order to reduce maintenance between calibrations. M/D Totco is deploying a new and improved heated gas sample dryer system that can run for 30+ days between filter changes, reducing the requirement to change the calcium flakes and glycol regularly.

The Gas Watch Analyzer package is equipped with Gas Analyzer, wireless link to the electronic drilling recorder (EDR), laptop with GEOstrip Systems Striplog and Gas Watch gas trap. The GEOstrip Systems Striplog provides the Wellsite Information Transfer Standard (WITS) link capability to view all Gas Watch Analyzer and EDR data, Gas Ratio calculations, and ability to export LAS files. NOV WellData RT and mobile App can provide Time & Depth EDR view options with all Gas Data and Gas Ratio Data.

GRI design-compliant gas trap



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