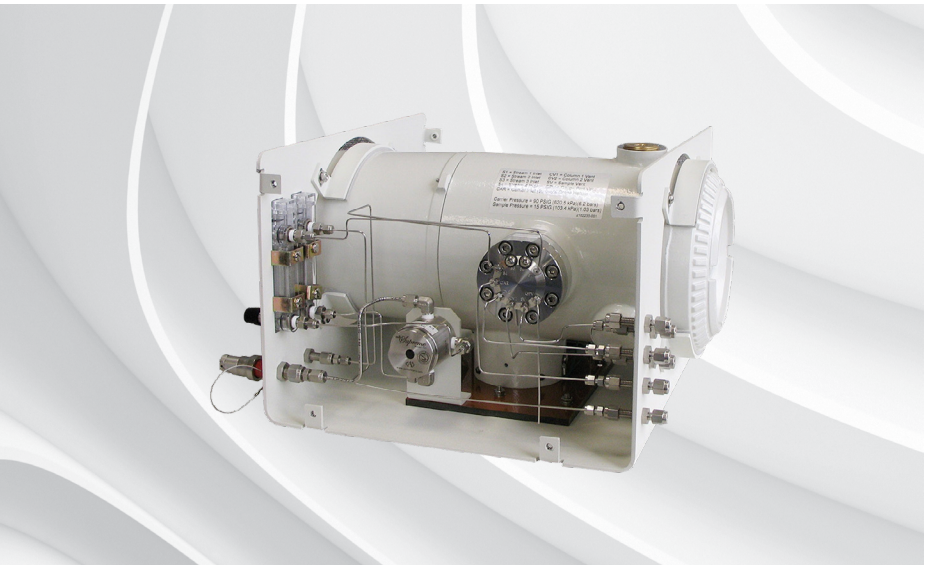
ABB MEASUREMENT & ANALYTICS | APPLICATION DESCRIPTION

LNG gas quality testing
Analytical applications



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Measurement made easy

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Introduction

The portable NGC8206 is a natural gas chromatograph designed for installation in a vehicle or mounted in a building for connection to a fixed sample point. The NGC is easily powered, either from the vehicle's 12Vdc system or from an AC power supply. Its low power operation means you can maintain continuous power on the unit, thus keeping it at operating temperature and assuring it is ready for immediate use on site. The standard Model 8206 can be used for station mounted applications.

Features

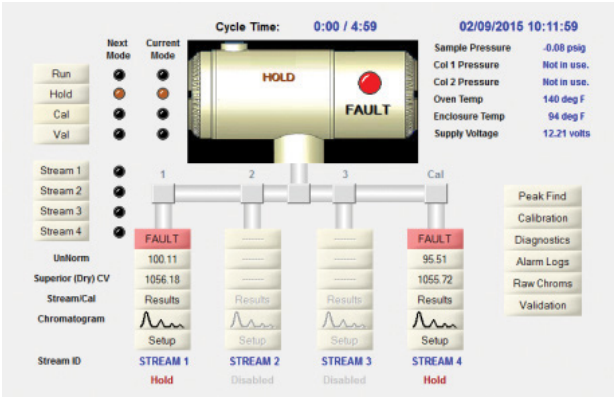
- Five minute cycle time
- Reliable and easy to operate
- Alarming on component concentrations
- Analysis report before unloading

From the spot analysis the following are calculated:

- Relative density
- Heating value
- VOS (velocity of sound)
- GPM (gallons of liquid per thousand cubic feet)
- Wobbe index

Modular design includes

- Portable GC interface allows user analysis customization
- Modular software – application based plug in software modules
- Manifold module (internal tubing now replaced by manifold)
- Analysis section contains stream selection solenoids, pressure regulation, 32 bit digital detector electronics and a dual-train chromatograph in a single, replaceable module
- 32 bit digital, low-power controlling electronics, using Windows CE® (internal to GC unit)
- Microsoft® Windows® 2000 or XP based man-machine interface software (PCCU 32)
- USB MMI port connectivity
- Ethernet connectivity
- Lithium battery-backed RAM
- Two remote serial digital communications ports; one local port
- Comprehensive diagnostics and wizards available to users
- Audit-quality historical data; date and time stamped
- Operational fault/warn alarms available
- Detectors – constant temperature, glass encapsulated thermistor beads for rugged service and long life. Will not burn out on loss of carrier.
- Dual 10 port valves have no moving metal parts.
- Low utility usage – low-power, low-carrier, no instrument air required
- On demand or scheduled automatic calibration and diagnostics



Description

The truck is moved as close to the sample point as is practical. The Operator will initiate the cycle to start when the process is connected and the piping is purged. The Sample System on the NGC ensures that the sample from the truck is representative of the process and that the NGC is ready to run samples. Reports will be printed at the end of the analysis cycles and alarming will occur should the sample not meet the load requirements.

The NGC8200 analyzes each sample utilizing established chromatographic techniques. The resulting information consists of mole percent values for the following:

- Air (Contains N2, Ar, CO and O2 but not CO2), C1, CO2, C2, C3, IC4, NC4, NeoC5, IC5, NC5, C6+

The NGC8206 measures a C6+ (back flushed) peak. Users may input the results of a comprehensive lab analysis that reflects the split or ratio of C6 through C10 components. This ratio can be used in subsequent analyses and energy calculations.

Calculated values include:

- Relative density (specific gravity)
- Btu/CV (heating) value
- GPM (gallons of liquid per thousand cubic feet)
- Wobbe index

Historical data

The NGC8206 is designed to retain historical data. This data can be used for custody transfer needs, verify transmitter operation over time, and provide a limited data backup for communication link reliability. In addition, various CSV file outputs are available to download the analysis data into spreadsheet based company specific data sheets, and outputs to 3rd party gas accounting packages.

The default[1] memory configuration provides the most recent 480 analysis cycles containing:
- Normalized components
- Un-normalized components
- Ideal Btu/CV
- Real Btu (wet and dry) / CV (superior and inferior)
- Relative density (specific gravity)
- Density
- GPM
- Wobbe index
- Alarms

	Status	Alarm Description	Alarm Enable	Input Register	Type	Alarm Threshold	Severity	User Code
38.121.0	Normal	Pressure Regulator 1	Yes	38.62.130	GT	0	Fault	0
38.121.1	Normal	Pressure Regulator 2	Yes	38.62.1	GT	0	Fault	1
38.121.2	Normal	Sample Pressure Low	Yes	28.0.0	LT	0	Fault	2
38.121.3	Normal	Sample Pressure High	Yes	28.0.0	GT	0	Fault	2
38.121.4	Normal	Oven Temperature Error	Yes	38.62.2	GT	0	System Fault	3
38.121.5	Normal	No Stream Valve Selected	Yes	38.62.6	GT	0	System Fault	4
38.121.6	Normal	Analog-Digital Comm Error	Yes	38.62.7	GT	0	System Fault	5
38.121.7	Normal	Calculation Error	Yes	38.62.4	GT	0	Fault	6
38.121.8	Normal	Calibration Un-Normalized Total	Yes	38.62.5	GT	0	Warning	7
38.121.9	Normal	Stream Sequence Error	Yes	38.62.11	GT	0	Fault	8
38.121.10	Normal	Calibration CV Percent Error	Yes	38.62.15	GT	0	Warning	9
38.121.11	Normal	Calibration RF Percent Error	Yes	38.62.14	GT	0	Warning	10
38.121.12	Normal	Enclosure Temperature	Yes	38.62.12	GT	0	Warning	11
38.121.13	Normal	Power Supply Voltage	Yes	38.62.13	GT	0	Warning	12

Stream averages for the (default[1]) 840 last hours, 35 last days and the most recent last month analyses. Operational Parameters for the (default[1]) last 480 cycles (Diagnostics Report):
- Selected peak times
- Selected peak areas
- Ideal Btu/CV
- Carrier regulator pressure
- Oven temperature
- Ambient temperature
- Sample pressure
- Detector noise values
- Detector balance values

Audit logs (Default[1])
- Last 480 alarms
- Last 480 events

Data retained by the NGC8206 can be collected via a remote communication link or by the laptop PC local operator interface PCCU 32.

Equipment

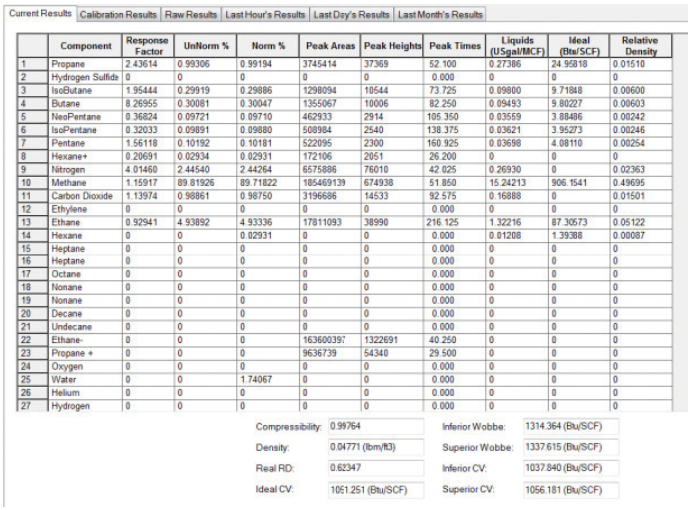
The equipment used for this analysis consists of the standard Model 8206 mounted either as a Mobil mount or standard two in pipe mount enclosure. All the valves, gauges and sample conditioning modules will be provided with the equipment, depending on the options

Default[1] The default memory configuration will provide for the data storage above. User may reallocate the memory that is available.

Available options

- Sample and GC Rotometers
- 120/240 VAC / 24 VDC to 12 VDC power supply
- Modular Sample System for Non-pipeline quality
- Natural gas and Sample transport lag-time needs:
- Type 4 w/ liquid shut-off
- Temperature Compensation Probes:
- Fixed
- Retractable
- Regulators, carrier and calibration blend
- Start up/calibration/validation gas sample (+2% Cal Blend)
- Export crating
- Tool kit
- Various maintenance kits
- On board digital 1/4 VGA display with multiple screen access
- USB (Host and Client) and Ethernet ports
- SD memory cards
- Feed-Through heater
- Heat trace internal and external tubing

Reports

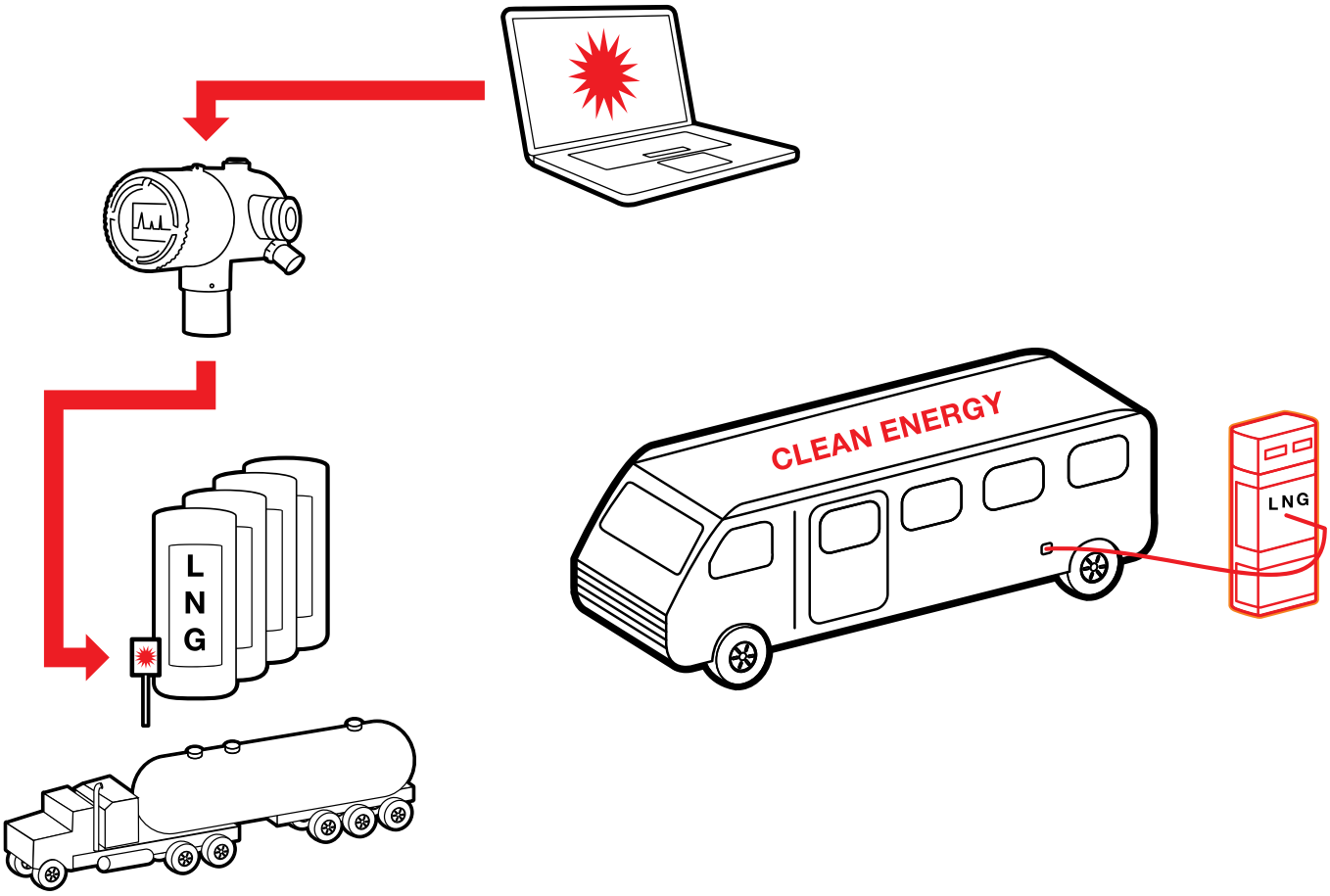

Current Results | Calibration Results | Raw Results | Last Hour's Results | Last Day's Results | Last Month's Results

	Component	Response Factor	UnNorm %	Norm %	Peak Areas	Peak Heights	Peak Times	Liquids (USgal/MCF)	Ideal (Btu/SCF)	Relative Density
1	Propane	2.43614	0.99306	0.99194	3745414	37369	52.100	0.27386	24.95818	0.01510
2	Hydrogen Sulfide	0	0	0	0	0	0.000	0	0	0
3	IsoButane	1.95444	0.29919	0.29886	1298094	10544	73.725	0.09800	9.71848	0.00600
4	Butane	8.26955	0.30081	0.30047	1355067	10006	82.250	0.09493	9.80227	0.00603
5	NeoPentane	0.36824	0.09721	0.09710	462933	2914	105.350	0.03559	3.88486	0.00242
6	IsoPentane	0.32033	0.09891	0.09880	508984	2540	138.375	0.03621	3.95273	0.00246
7	Pentane	1.56118	0.10192	0.10181	522095	2300	160.925	0.03698	4.08110	0.00254
8	Hexane+	0.20691	0.02934	0.02931	172106	2051	26.200	0	0	0
9	Nitrogen	4.01460	2.44540	2.44264	6575886	76010	42.025	0.26930	0	0.02363
10	Methane	1.15917	89.81926	89.71822	18546913	674938	51.850	15.24213	906.1541	0.49695
11	Carbon Dioxide	1.13974	0.98861	0.98750	3196686	14533	92.575	0.16888	0	0.01501
12	Ethylene	0	0	0	0	0	0.000	0	0	0
13	Ethane	0.92941	4.93892	4.93336	17811093	38990	216.125	1.32216	87.30573	0.05122
14	Hexane	0	0	0.02931	0	0	0.000	0.81208	1.39388	0.00087
15	Heptane	0	0	0	0	0	0.000	0	0	0
16	Heptane	0	0	0	0	0	0.000	0	0	0
17	Octane	0	0	0	0	0	0.000	0	0	0
18	Nonane	0	0	0	0	0	0.000	0	0	0
19	Nonane	0	0	0	0	0	0.000	0	0	0
20	Decane	0	0	0	0	0	0.000	0	0	0
21	Undecane	0	0	0	0	0	0.000	0	0	0
22	Ethane-	0	0	0	163600397	1322691	40.250	0	0	0
23	Propane +	0	0	0	9636739	54340	29.500	0	0	0
24	Oxygen	0	0	0	0	0	0.000	0	0	0
25	Water	0	0	1.74067	0	0	0.000	0	0	0
26	Helium	0	0	0	0	0	0.000	0	0	0
27	Hydrogen	0	0	0	0	0	0.000	0	0	0

Compressibility:	0.99764	Inferior Wobbe:	1314.364 (Btu/SCF)
Density:	0.04771 (lbm/ft3)	Superior Wobbe:	1337.615 (Btu/SCF)
Real RD:	0.62347	Inferior CV:	1037.840 (Btu/SCF)
Ideal CV:	1051.251 (Btu/SCF)	Superior CV:	1056.181 (Btu/SCF)

Specifications

Item description	Specification
Dimensions	9.5" high x 14.3" wide x 16" deep (24.13 cm x 36.32 cm x 40.64 cm)
Weight	Approximately 38 lb. (17 Kg) Shipping Weight: 45 lb. (20.4 Kg)
Weatherproof construction	No classification
Carrier gas	Helium (consumption rate < 20 cc/minute during analysis cycle
Analysis time	Approximately five (5) minutes; cycles may be scheduled by user
Repeatability	± 0.125 Btu @ 1,000 Btu; (± 0.0125%) @ ambient; ± 0.25 Btu @ 1,000 Btu (± 0.025%) over temperature range of 0 to 131°F
Temperature range (storage)	22°F to +140°F (-30°C to 60°C)
Temperature range (normal)	0°F to 130°F (-18°C to 55°C)
Moisture	95% relative humidity non-condensing
Supply voltage	110 V AC, 60 Hz or 250 V AC, 50 Hz, 24 V DC (16-28 V DC) or 12 V DC (10.5 - 15 V DC)
Power consumption	Nominal operation @ 0°F (–18°C) = 7 Watts; (650 mA); Start up @ less than 3 amps (45 Watts @ 15 V DC)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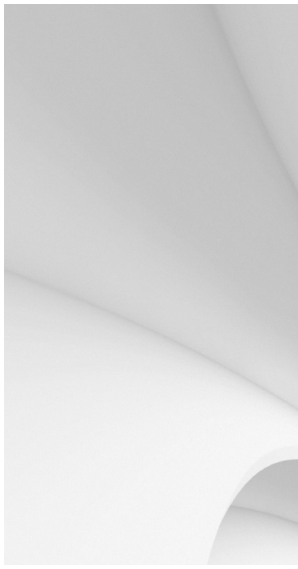

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