Data sheet DS/2101183-EN

PGC1000
Process gas chromatograph

The PGC1000 is a shelterless field-mounted GC capable of measurements of C1 through C9+, inerts, and H2S in various Hydrocarbon Processing Industry (HPI) streams.

Introduction

The PGC1000 is ideal for measuring light hydrocarbon gases in locations where minimal space is available and a simple, reliable, low cost measurement is required. The analyzer is an excellent choice for most gas processing industry applications. It is an equally exceptional choice for monitoring fuel gases such as natural gas, synthetic gas, methane, and/or bio-gas required for the efficient operation of process equipment and plant-wide systems in the hydrocarbon processing industry (HPI).

Servicing the PGC1000 requires minimal effort. The modular analytical hardware is easily removed by loosening one bolt. PGC1000 innovations include:

- Compact footprint - 16 inches, front to back, 28 pounds
- Conventional analytical components, not a GC on a chip
- Windows CE® operating system
- Interactive; a graphical display actuated by magnet contact
- Low cost-of-ownership - low carrier usage, and power and no instrument air

Simple, reliable, easy to service, low cost measurement!

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Standard features

Modular design includes

- Modular software – application-based, plug-in software modules
- Manifold module
- Analysis section contains stream selection solenoids, pressure regulators, 32-bit digital detector electronics and a dual-train chromatograph in a single, replaceable module
- 32-bit digital, low power, controlling electronics. Uses Windows CE® (internal to GC unit)
- Microsoft® Windows® XP or Windows® 7, remote user interface software (PGC1000 RUI)
- Lithium battery-backed RAM
- Two remote serial digital communications ports; one local port
- Comprehensive diagnostics and wizards available to users
- Pre-defined applications – Trains are pre-engineered to measure components at the ranges and performance required
- Explosion-proof – designed for hazardous environments
- Solar power option
- Custody transfer for gases entering the plant
- Two-level security for user access control
- Audit-quality historical data; date and time stamped
- Operational alarms available with each analysis cycle
- Detectors - constant temperature, glass encapsulated thermistor beads for rugged service and long life. Will not burn out on loss of carrier
- TCD requiring no reference bead for reduced noise, allowing greater sensitivity. Detectable limit as low as 1 ppm
- Dual, ten port valves with no moving metal parts – millions of cycles between failure
- Low utility usage - low-power, low-carrier, and no instrument air required
- On demand or scheduled automatic calibration and diagnostics
- Four types of pre-engineered sample conditioning systems, Custom sample systems available
- Onboard, digital 1/4" VGA display with multiple screen access
- USB (host and client) and Ethernet ports
- SD memory cards for storiing up to chromatograms
- Feed-through heater

(Default1) The default memory configuration will provide for the historical data storage above. Users may reallocate the memory that is available.

Operator interface

Functional set up and operation of the PGC1000 is accomplished by using a graphical user interface software package called PCCU (supplied with each unit). PCCU operates on a laptop or workstation PC. The Windows® utilities, combined with software designed specifically for the PGC1000, provide a powerful tool for operations, diagnostics, and downstream data handling. The PC can be directly connected to the PGC1000 via an RS-232, RS-422, RS-485, USB, or Ethernet connection. The Ethernet connection allows seamless integration onto the VistaNET Analyzer Network and VistaSTAR server.

The user is prompted through PCCU push-buttons, drop-down boxes, wizards, and dialog boxes for setup, operations, data collection, and monitoring.

In addition, the unit has a standard ¼" VGA interactive display screen allowing the user access to basic analysis data. The user can also accomplish most of the “operator” functions from the front panel display without the use of a laptop or workstation PC. The Run-Hold-Calibrate functions can be performed via a magnet interface through the explosion-proof glass in the display.

Maintenance

The PGC1000 was designed from the ground up to be maintained by personnel with little or no prior knowledge of process gas chromatography. Both hardware and software are designed to provide low maintenance through easily replaceable electro-mechanical modules such as:

- PGC1000 termination panel
- PGC1000 analytical module, an easily removable chromatograph subassembly, containing: PGC1000 manifold, stream selector solenoid valves, GC valve assembly, dual electronic carrier pressure regulator valves, chromatograph pilot valve, and the PGC1000 analytical processor.
- Heated PGC1000 feed-through
- Sample conditioning module (SCM)
- PGC1000 controller (32-bit Processor)

Other maintenance support features

- Intuitive local operator interface (PGC1000 RUI) running Microsoft® Windows®
- Diagnostic software and wizards for maintenance
- Digitized detector output (chromatogram) to PGC1000 RUI
- Remote or local operation of PGC1000 RUI
- Calibration and validation reports (pending)
- Quick Start Guide, Start-Up Manual, and Start Up Video

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Historical data

The PGC1000 is designed to retain historical data. This data can be used for audit trails, maintenance, and troubleshooting to verify chromatograph operation over time and provide a limited data backup for communication link reliability.

The user is allowed to configure the period of the data retained by the PGC1000 via the Operator Interface. The default1 memory configuration provides the most recent 480 analysis cycles containing:

- Normalized components
- Un-normalized components
- Alarms

Stream averages are provided for the (default1) last 840 hours, or 35 last days and the most recent month's analyses. Operational parameters for the (default1) last 480 cycles (Diagnostics Report) include:

- Selected peak times
- Selected peak areas
- Carrier regulator pressure
- Oven temperature
- Ambient temperature
- Sample pressure
- Detector noise values
- Detector balance values

Audit logs (default1)

- Last 500 alarms
- Last 500 events

The SD memory card retains chromatograms for evaluation of previous analysis results. Number of chromatograms configurable per stream are based on SD card size.

Data retained by the PGC1000 can be collected via a remote communication link (PGC1000 RUI), by the laptop, or by a PC local operator interface.

Available accessories

- 120/240 Vac to 12Vdc GP and exp power supplies
- Wall, pole or pipeline mounting kits
- Cold weather enclosure (also available in pipe mount configuration) - large and small
- Regulators (carrier and calibration blend)
- SD memory card - recommend 1 gigabyte
- Export crating
- Tool kit
- Various maintenance kits
- Helium to hydrogen conversion carrier gas kit

Portable PGC1000

A portable PGC1000 is offered for single analyzers (up to two trains) using helium or nitrogen carrier gas. Hydrogen carrier and/or dual units are not available as a portable PGC1000 option.

Specifications

- The PGC1000 is designed for clean/dry gas streams where:
  - Clean is defined as having no particles larger than 1 micron and no more than 1 milligram of solids per cubic meter of gas
  - Dry is defined as no more than 7 pounds of water per million cubic feet of gas
  - Dry is also defined as having less than 0.1 ppm of liquid at the coldest ambient condition expected at the coldest point in the system (the liquid can be water, oil, synthetic lubricant, glycol, condensed sample, or any other non-vapor contaminate)
  - Stable gas is defined as a vapor containing less than 0.1 ppm of liquid when the vapor is cooled to 10°C below the coldest ambient temperature possible at any point in the system
- Four stream capability is available - Manual calibration is required with four sample streams
- Capable of single auto calibration stream and three sample streams or two auto calibration streams and two sample streams
- One less stream is available for hydrogen carrier units

Dimensions	6.75" diameter x 16" long x 9.00" tall (17.1 cm x 40.6 cm x 22.9 cm)
Weight	Approximately 28 lb. (12.7 Kg) Shipping Weight: 47 lb. (21.3 Kg)
Weatherproof construction	CSA TYPE 4x, IECEx IP56, ATEX TYPE 4X (IP66 Equivalent)
Carrier gas	Helium, hydrogen and nitrogen consumption rate typically <20 cc/minute during cycle analysis
Analysis time	Determined by application
Repeatability	Defined by application. Typically ±1% of the measured value
Temperature range (storage)	-22°F to +140°F (-30°C to 60°C)
Temperature range (normal)	0°F to 131°F (-18°C to 55°C)
with cold weather enclosure	-40°F to 131°F (-40°C to 55°C)
Supply voltage	12Vdc (10.5 to 16 Vdc capable) 24Vdc (21 to 28 Vdc capable)
Power consumption	@ 0°F (–18°C): Nominal: 7 Watts (no Aux. Heater) Up to 64 watts (with Auxiliary Heater) (Maximum instantaneious current requirements are application dependent. See user manual for details.)

Certifications	CSA – Explosion-proof: NEC & CEC Class I, Div 1, Grp BCD, T6 ATEX – Flameproof: II 2G Ex d IIB+H2, T6 Gb IECEx – Flameproof: Ex d IIB+H2, T6 TIIS – Flameproof: Ex d IIB+H2, T6 KOGAS – Flameproof: Ex d IIB+H2, T6 GOST-R – Flameproof: IExdIIBT6/H2X INMETRO – Flameproof: Ex d IIB+H2, T6 Gb (pending) China Pattern Approval
Electromagnetic compatibility	FCC – CFR 47, Part 15, Subpart B, Class B IECES-003 – CAN CISPR 22, Class B AS/NZS CISPR 22, Class B EMC – EN61000-6-3, (Radiated and Conducted Emissions, Class B) EMC – EN61000-6-1, (Immunity, Light Industrial) EN61000-4-2, ESD 8kV Air, 4kV Contact EN61000-4-3, RF Immunity, 10V/m EN61000-4-4, EFT, 2kV EN61000-4-6, Conducted Susceptibility, 10Vrms EN61000-4-8m Magnetic Field, 10A/m
Communications	Two serial digital ports, software selectable for RS-232, RS-485, or RS-422. One USB MMI. USB hub (host and client), Ethernet (TCP/IP) ports and VistaNet/VistaSTAR server
Protocols supported	OPC MODBUS ASCII or RTU MODBUS / TCP Server MODBUS / TCP Client
Standard calculations	BTU, Wobbe, specific gravity and hydrocarbon dewpoint (upon request)
Inputs/Outputs	2 Digital inputs (DI) 2 Digital outputs (DO) Analog outputs externally and project-based
ASTM Standards and Gas Compositions	Designed to meet: ASTMD 2145-03; ASTMD 3588; ASTMD 1945 (additional ASTM standards may be applicable) ISO 6974, ISO 6976 Flat, ISO 10723, ISO 12231, GPA 2172, GPA 2261, GPA 2145-09

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Targeted applications

App category	App description	Cycle time/ carrier	Train
H2	Hydrogen - 0.1-100%	75 N2	BCJ
O2	Trace oxygen - 30-2000 ppm	330 H2/He	BBP
	% Level oxygen - 0.2-21%	330 He	BBH
H2O	Trace Moisture - H2O 0.002-2%	90 He	BCR
CO	Carbon monoxide - 0.2-100%	330 H2/He	BBH
H2S	H2S in fuel gas - 0-300 ppm	180/150 He/H2	BBR/BCM
H2S	Low level ppm H2S	660 sec	BDB
HRVOC	Highly reactive volatile organic compounds	420 He	BBC/BBJ/BBH
Permanent gasses	H2/O2/N2/CO	330 H2/He	BBH
Light hydrocarbons	C3+ w/N2/O2 split - Landfill	360 He	BBH/BCB
Light hydrocarbons	C3+ w/N2/O2 split - Landfill	345 He	BDG
Hydrocarbons (Gas quality)	Std C6+Btu application	315 H2/He	BBK/BBF
	Fast C6+ Btu app (H2 carrier)	90 H2	BCD/BCF
	Fast C6+ Btu app (He carrier)	180 He	BCC/BCG
	C6+ Btu application up to 1200 ppm H2S	315 H2/He	BBF/BBM
	C7+ Btu application	360 H2/He	BBF/BBS
	C7+ Btu application up to 1200 ppm H2S	540 H2/He	BBF/BCH
	C9+ Btu application w/ HCDP available	360 He	BBK/BBF/BBT
	C6+ with trace H2S	360 He	BBK/BBF/BBR
	C6+ with N2/O2 split	330 He	BBK/BBF/BBH
Process control	Demethanizer (tops & bottoms)	60 He	BCT/BCS
	Deethanizer (tops & bottoms)	60 He	BCT/BCS
	Depropanizer (tops & bottoms)	60 He	BCT/BCS
	Debutanizer (tops & bottoms)	420 H2/He	BBK/BBJ
	Debutamer (tops & bottoms)	420 H2/He	BBK/BBJ
	Depentanizer (tops only)	420 H2/He	BBK/BBJ
	C4 Parafins/Olefins	420 H2/He	BBJ
	Propane/Propylene split	420 H2/He	BBJ

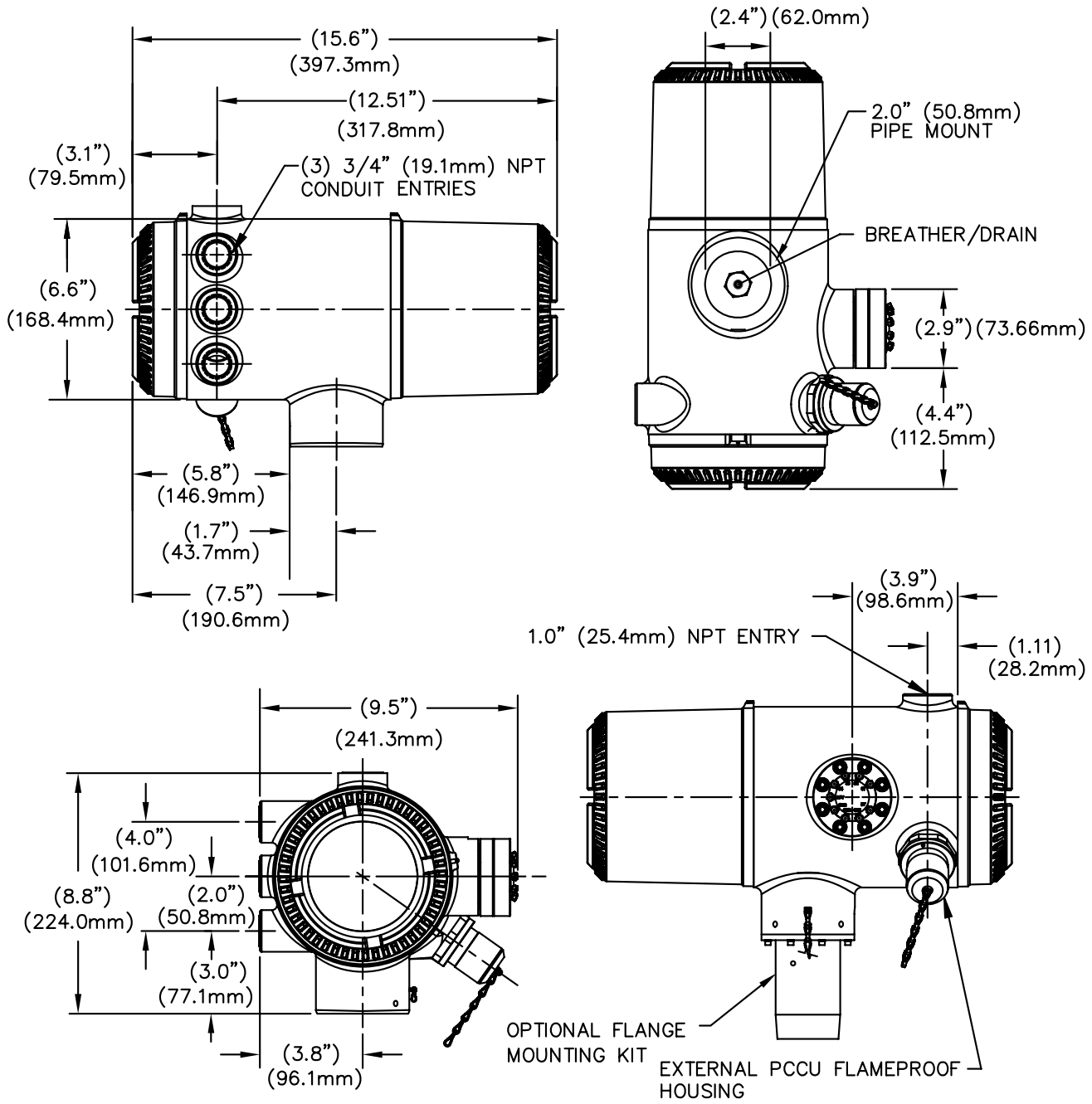
NOTE: The application tables above provide the user with an overview of ABB's Totalflow line of analytical products. Also included are the Totalflow line of predefined solutions/ applications which illustrate how the table may be used to combine trains to satisfy a particular analysis requirement.

Defined column trains

Column train designator	Measured components	Carrier
BBC	C3+/He/N2/C1/CO2/C2=/C2/C2/H2	H2/He
BBF	C3+/N2/C1/CO2/C2=/C2	H2/He
BBG	C3+/N2/C1/CO2/C2=/C2/H2S/H2O	H2/He
BBH	C1+/He/O2/N2/CO/H2	H2/He
BBJ	C5+/C3/C3=/IC4/NC4/B-1 & IC4=/TB-2/CB-2/1,3-BD	H2/He
BBK	C6+/C3/IC4/NC4/NeoC5/IC5/NC5	H2/He
BBM	C6+/C3/H2S/IC4/NC4/NeoC5/IC5/NC5	H2/He
BBP	O2/N2	H2/He
BBR	H2S	H2/He
BBS	C7+/C3/IC4/NC4/NeoC5/IC5/NC5/C6's	H2/He
BBT	C9+/C6's/C7's/C8's	He
BBW	O2	He
BBX	C4+/CYC3/PD/MA	H2/He
BCB	C3+/H2/N2/C1/CO2/C2=/C2/H2S	H2/He
BCC	C6+/C3/IC4/NC4/NeoC5/IC5/NC5	He
BCD	C6+/C3/IC4/NC4/NeoC5/IC5/NC5	H2
BCF	C3+/N2/C1/CO2/C2=/C2	H2
BCG	C3+/N2/C1/CO2/C2=/C2	He
BCH	C7+/C3/H2S/IC4/NC4/NeoC5/IC5/NC5/C6's	H2/He
BCJ	H2 15 uL	N2
BCK	CO2+/He/O2/N2/CO/C1/H2	H2/He
BCM	H2S	H2/He
BCN	C4+/CYC3/PD/MA	H2/He
BCP	H2 30 uL	N2
BCR	H2O	H2/He
BCS	C3+/N2/C1/CO2/C2=/C2	He
BCT	C6+/C3/IC4/NC4/NeoC5/IC5/NC5	He
BCW	H2	N2
BCX	TMB	He
BCZ	THT	He
BDB	H2S	He
BDC	C3+/N2/C2=/H2/C1/CO2/C2H4/C2	H2/He
BDD	C6+/C3/IC4/NC4/NeoC5/IC5/NC5	He
BDF	C3+/N2/C1/CO2/C2=	He
BDG	C3+/H2/N2/C1/CO2/H2S/C2=	H2/He

The guidelines or technical limits allowed for combining trains are as follows:
1. Up to two trains per enclosure
2. Up to two enclosures
3. Limited to a total of four trains per analyzer system.
The three letter combinations appearing in the far left column headed "Column train designator" correspond to the various sections outlined in the PGC1000 Applications Manual.

Installation dimensions



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