GreenLine 6000
GreenLine 8000

Portable Industrial Combustion & Emissions Analyzers

The Most Powerful and Advanced instrument with Built-In Gas Chiller System and Heater for Sampling Hose & Probe

- **Up to 9 Sensors (Temperature Compensated)**
- **Remote Control Unit with Built-In Printer**
- **Full Compliance to EPA Protocols**
- **CO, CO_2 and C_xH_y with NDIR Dedicated Sensors**
- **Built-in Peltier Gas Chiller**
- **CO Sensor Automatic Protection with Dilution Pump**
- **Long Term Monitoring with Automatic Water Condensation Drain**
- **Electronic Flow-Meter**
- **Aux 4-20mA Inputs**
- **Graphic Display with Menu**
- **Easy Maintenance**
- **9000 Full Analysis Memory**
- **PC Software Package with Real-Time Data Logging + Graphing**

Designed to meet BS7927, TUV, ISO, Gastec QA Criteria, GOST, Qualigaz, and UNI 10389

All descriptions are related to a fully optioned instrument. See last page for the different configurations.

GreenLine 6000
GreenLine 8000

Portable Flue Gas Laboratory

Gas Analysis Main Control Unit (MCU) and Remote Control Unit (RCU).

Hand-Held Wireless Remote Control Unit with Reporting Printout Capability, Test Memory and PC Communication.

Measurement capability for O_2, CO, CO_2, NO, NO_2, SO_2, H_2S, C_xH_y with Electrochemical Sensors.

Full Compliance to EPA (Environmental Protection Agency) Protocols CTM-030 and CTM-034.

Built-In Peltier Gas Chiller and Automatic Water Condensation Drain.

The Most Advanced Portable Emissions Analyzers with Stack Velocity Measurement.

GreenLine 8000 only:

Optional Industrial Sampling Probe Including Heated Probe Head and Heated Hose.

Direct Measurements of CO, CO_2, C_xH_y with Internal NDIR Sensors.

E Instruments portable flue gas analyzers **GreenLine 6000** & **GreenLine 8000** represent the most powerful and advanced instruments on the market.
The two units are designed using the new concept of split architecture. The gas analyzer consists of two sections: the gas analysis Main Control Unit (MCU) and the Remote Control Unit (RCU). The communication between the two sections uses Bluetooth wireless technology with the GreenLine 8000.

The MCU is a true, portable, complete flue gas laboratory. The unit includes an aspiration pump, filters, condensation drain with peristaltic pump, gas sensors and the electronics. It can be positioned near the stack sampling point and works as an independent instrument (black-box).
The **GreenLine 8000** comes standard with an internal Peltier gas cooler and the option to add NDIR sensors and heated industrial gas probe connection capability. The operator can easily survey the overall operation at a distance from the unit using either the Remote Control Unit or Laptop. The RCU is used to display the measured data, store the analysis in the unit's memory, printout any data, and to transfer data to your PC.
DBGas 2004 software package allows the operator to easily manage all of the data & analysis information.

The "Clean Air Act", originated in the USA in 1970. It was the first federal law that regulates air emissions from certain areas, either by stationary or mobile sources. The EPA (Environmental Protection Agency) and other Federal or State Agencies verify affordable and reasonable methods of achieving environmental compliance under the set emissions limits.
A number of "Protocols" have been created to verify industrial emissions using portable gas analyzers to ensure air quality compliance. These "Protocols" are the set guidelines that prescribe the technical performances of electrochemical sensor-based analyzers to be used, as well as calibration and testing procedures which should be followed to completely assure correct emissions data.
The instrument shows technical specifications and performance in compliance with the necessary protocols and therefore can be used in periodic testing in many different countries, states and regions. The **GreenLine** analyzers are designed to meet the specific requirements, mainly related to gas sample conditioning, flow, and temperature control.
Other operative modes allow the user to test, view, store, and print draft measurement, differential pressure, data logging, various other performance tests, and PC interface.
The built-in impact-type printer uses common, inexpensive, non-thermal, standard paper rolls. This allows the user to generate a full, comprehensive, & LONG LASTING data report.
The internal memory can store up to 9000 COMPLETE analysis data points (1000 data points on the GreenLine 6000).
The digital interface allows for communication between the instrument and your Laptop or PC, for instrument configurations, data transferring, and data logging.

GreenLine 6000
GreenLine 8000

Portability and Operative Flexibility

Split Architecture
A New Concept in Measurement and Analysis Systems

DBGas 2004
Gas Analysis Data Manager

	GreenLine 6000	GreenLine 8000
Peltier Chiller	Optional	Standard
Industrial Heated Probe	—	Optional
NDIR Sensors	—	Optional
Internal Memory	1000	9000
Sensors	Up to 6	Up to 9
Built-in Impact Printer	Standard	Standard

- **Easy Programming & Data Transferring**
- **Plant, Customer, Boiler, Generator Registration & Management**
- **Compatible with Windows 98/2000/XP**
- **Easy to use**
- **The Ideal Tool to Manage Data Quickly & Efficiently**
- **Graph & Report ANY Stored data**
- **Logman Module for On-Line Data Logging for Long-Term Data Records Driven by a PC with a Large Display & Bar Graph**

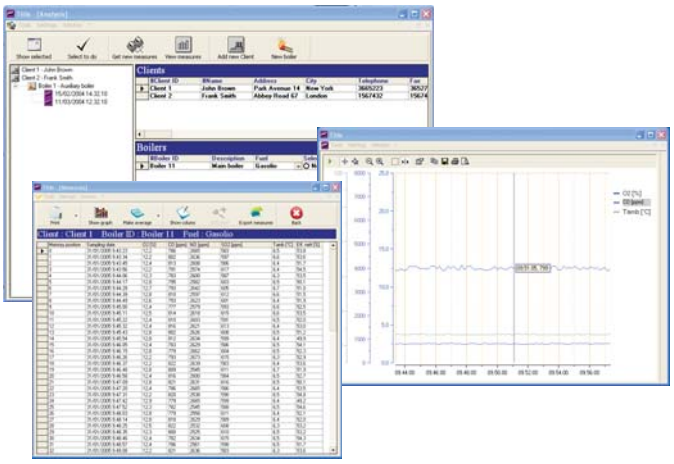
The GreenLine 8000 uses a wireless communication between RCU and MCU.

The DBGas 2004 software is designed to allow complete & efficient data management of all measurements, activities, inspections, and analysis completed by GreenLine gas analyzers. It allows the user to maintain an **UNLIMITED** customer base filed on their PC or Laptop, which contains ALL customer, plant & boiler information.

After any completed analysis, the user can transfer the stored data from their analyzer to their PC, which are automatically assigned and stored for quick & easy data recall.

The DBGas 2004 software package includes the GasConfig Windows program, which allows you to easily modify the configuration, reports, fuels, and more on the instrument itself.

Large Accessory Compartment



GreenLine 8000
GreenLine 6000

Sensor Technology
GreenLine flue gas analyzers use long life temperature compensated EC (electrochemical) sensors.
CO sensor is protected against saturation by an automatic dilution system.

NDIR Sensor
The GreenLine 8000 only uses a non-dispersive Infrared (NDIR) dual wavelength ratioing to get long term stable response sensitivity. Compensation of ambient temperature and pressure is automatic.

Easy Access Sensors and Filters
These analyzers are easy to maintain. A quick access compartment allows the operator to easily view and change ALL of the sensors, filters, and pneumatic parts. This allows the user the ability to effortlessly change the unit's sensors or filters in the field if necessary.

Calibration
A built-in procedure allows easy and automatic span sensor calibration using standard gas cylinder. Periodic zero calibration doesn't require the removal of the probe from stack. An internal electrovalve switches to an auxiliary pneumatic circuit for fresh air during the periodic zero calibration. A pneumatic connector for remote zero air is also available.

Electronic Flow Meter
An automatic built-in system measures a flow of sampling gas and adjusts the pump to obtain a constant sampling volume. A visual and acoustic alarm indicates a low flow rate.

Multi Fuel Selection
The flue gas analyzer provides up to 10 fuels for calculating combustion values. The most used fuels for your country are pre-loaded at the factory. Others fuels can be added using the GasConfig PC software.

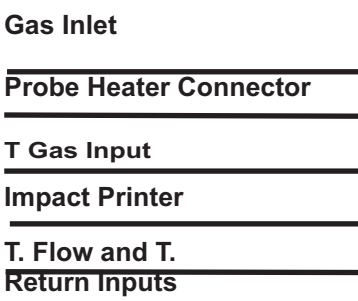
Gas Probe & Sampling System
Flue gas sampling probes with different lengths, shapes and maximum operating temperatures (from 1470°F to 2190°F) are available to match the various requirements of different applications. A stainless steel sintered pre-filter is suggested for severe and heavy applications.
The built-in chiller removes condensation moisture automatically and periodically from the system with a peristatic pump. A dual filtering system will clean the gas sample before the analysis.

Industrial Probe & Heated Hose
For the GreenLine 8000 only, a heated sampling probe is available for industrial high temperature applications. A heated hose allows flue gas sampling without condensation. The internal chiller dries the flue gas and avoids dilution of NO_2 and SO_2 into the condensate.

Semi-Continuous Monitoring
The industrial design and the advanced technology applied to the unit allows it to perform long term gas analysis. The procedure acquires and logs the data after a programmable period of time. A "smart" procedure allows the unit to maximize the sensor life by switching the pump off, during the sleep phase.

Keyboard & Display
The RCU Keypad allows the operator to enter all operative modes following easy menu driven instructions.
A high contrast graphic LCD (1.8" x 2.5") is equipped with a automatic backlight device. It displays the measured and the calculated parameters in your preferred format (Zoom function 3, 6 or 12 lines). Parameters can be also displayed in a bar graph mode.

Built-In Impact Printer
The RCU is equipped with a built-in, rugged impact printer. It uses a low cost common roll of paper (2.3" wide, 59' long) that is certainly more readable, longer lasting and heat resistant than a thermal printout on chemical paper.



Pressure & Draft
The instrument is equipped with an internal differential sensor to measure pressure and stack draft. Differential pressure can also be used for stack gas velocity measurement by using a Pitot tube.

Auxiliary Inputs
Two scalable 4-20mA are available to measure and store process parameters.

Ambient CO Probe
An optional probe to monitor ambient CO concentration to keep the operator in a safe environment can be used with the analyzer. The instrument gives acoustic and visual alarms if the set limits (according to the OSHA recommendation) are exceeded.

A Powerful Test Engine with Full Compliance to EPA's and Other "Protocols"

Fast Maintenance

APPLICATIONS

Boilers
- Utility & Power Plants
- Industrial Boilers

Heaters & Dryers
- Paint, Textile, Food, Paper, Rubber
- Process Heaters

Kilns / Furnaces
- Cement, Lime, Glass, Ceramic

Stationary Internal Combustion Engines
- UPS Power Cogeneration
- Gas Compression
- Oil Fired Pumping Station

Turbines

Chemical Analysis Laboratory
- Fuel Additive

CEM Backup & Maintenance

ISO 14000
- Auditing, Compliance

GreenLine 6000
GreenLine 8000

Portable Flue Gas Laboratory

Specifications

Gas Sniffer Probe
This probe is used to detect and locate the precise position of a gas leak in a pipe network.

Smoke Index
Smoke index measurement can be obtained using a special heated probe, supplied on request, and through a dedicated internal procedure that computes the required volume of gas sample flowing into the specific filter. The results can be obtained by comparison with the Smoke Index Table and memory stored to be printed in the report.

Gas Velocity
An internal procedure allows gas velocity measurements using the differential pressure inlet combined with a pitot tube.

True Mass Emission Model
The GreenLine 8000 LBH is an Industrial True Mass Emissions Gas Analyzer. The instrument allows the mass emissions measurement in LB/H or Kg/H using the special design gas sampling probe combined with a type 'S' Pitot tube (included as standard).

Wireless Bluetooth™ Model
The GreenLine 8000 WL includes wireless communication capability between the MCU and RCU.

Report of Calibration
Each instrument is factory calibrated and certified against standards that are periodically certified by an internationally recognized laboratory to ensure traceability. Each analyzer is shipped with a Report of Calibration stating the nominal and actual values, the acceptable error and the deviation error.

Quality System
Research, development, production, inspection and certification activities are defined by methods and procedures of the E Instruments GreenLine Quality System inspected for compliance and certified ISO9001 by GASTEC.

Parameter	Sensor	Range	Res.	Accuracy
O_2	Electrochemical	0 - 25%	0.1%	±0.1% vol
CO	Electrochemical	0 - 8000 ppm	1 ppm	<300 ppm=±10 ppm up to 2000 ppm=±4% >2000 ppm=±10%
CO **Auto Range**	Electrochemical	0.80 - 10.00 %	0.05%	±10% rdg.
CO	NDIR	0-2500ppm	1ppm	±2%. F.S.
CO	NDIR	0-15.00%	0.01%	±3% rdg or ±0.3%
LOW CO	Electrochemical	0 - 500 ppm	0.1 ppm	<40 ppm=±2 ppm up to 500 ppm=±5%
NO	Electrochemical	0 - 4000 ppm	1 ppm	<100 ppm=±5 ppm up to 3000 ppm=±4%
LOW NO	Electrochemical	0 - 500 ppm	0.1 ppm	<40 ppm=±2 ppm up to 500 ppm=±5%
NO_2	Electrochemical	0 - 1000 ppm	1 ppm	<100 ppm=±5 ppm up to 800 ppm=±4%
LOW NO_2	Electrochemical	0 - 500 ppm	0.1 ppm	<40 ppm=±2 ppm up to 500 ppm=±5%
NO_x	Calculated	0 - 5000 ppm	1 ppm	
SO_2	Electrochemical	0 - 4000 ppm	1 ppm	<100 ppm=±5 ppm up to 2000 ppm=±4%
LOW SO_2	Electrochemical	0 - 500 ppm	0.1 ppm	<40 ppm=±2 ppm up to 500 ppm=±5%
CO_2	Calculated	0 - 99.9%	0.1%	
CO_2	NDIR	0 - 40.00%	0.01%	±3% rdg or ±0.3%
C_xH_y	Pellistor	0 - 5.00%	0.01%	±5% F.S.
C_xH_y	NDIR	0 - 50000 ppm	1 ppm	±3% rdg or ±10ppm *
H_2S	Electrochemical	0 - 1000 ppm	1 ppm	±5 ppm <100 ppm ±4% rdg or 1000 ppm
Tair	Pt100	-10 - 99.9°C *14.0 - 212.0°F*	0.1°C *0.2°F*	±(0.2% rdg + 0.15°C) *±(0.2% rdg + 0.3°F)*
Tgas	Tc K	0 - 999.9°C *32.0 - 1830°F*	0.1°C *0.2°F*	±(0.3% rdg + 0.3°C) *±(0.3% rdg + 0.6°F)*
ΔT	Calculated	0 - 999.9°C *32.0 - 1830°F*	0.1°C *0.2°F*	
T_{flow}/ T_{return}	Tc K	-10 - 99.9°C *14.0 - 212.0°F*	0.1°C *0.2°F*	±(0.3% rdg + 0.3°C) *±(0.3% rdg + 0.6°F)*
Pressure/Draft	Bridge	±40inH_2O	0.004inH_2O	±0.12inH_2O < 1.2inH_2O ±1% rdg. >1.2inH_2O
Excess Air	Calculated	1.00 - infinity	0.01	
Gas Velocity	Calculated	0 - 99.9 m/s *0 - 330 ft/s*	0.1 m/s *0.1 ft/s*	
Efficiency	Calculated	1 - 99.9%	0.1%	
Smoke Index		0 - 9		
Auxiliary Inputs	2 channels	4-20 mA		

Relative Accuracy limits are stated as absolute or % of reading with reference to the ambient temperature range from -5°C to 40°C. Additional ± 1 digit error has to be considered.
Measuring reading can be directly converted from ppm to mg/Nm^3, mg/kWh, from hPa to mmH_2O, mbar, inH_2O and from °C to °F.
The pressure relative accuracy shown is valid only after the autozero procedure.

** based on hexane.*

Ordering Code

GreenLine 6000
7846 -A-B-C-D-E-F-L-M-N-P

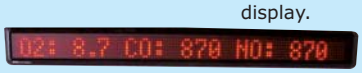
***GreenLine 6000 basic unit includes**:*
O_2 and CO sensors, internal 1000 analysis data memory, Remote Control Unit, built-in impact printer, DBGas and GasConfig PC Software, Report of Calibration and instruction manual.

GreenLine 8000WL
7848 WL-A-B-C-D-E-F-G-H-L-M-N-P

***GreenLine 8000WL basic configuration includes**:*
O_2 CO and NO sensors, internal gas chiller, internal 9000 analysis data memory, Remote Wireless Control Unit, built-in impact printer, DBGas 2004 and GasConfig PC software, Report of Calibration and instruction manual.

GreenLine 8000LBH
7848 LBH-A-B-C-D-E-F-G-H-L-M-N-P

***GreenLine 8000WL basic configuration includes**:*
O_2 CO and NO sensors, type "S" Pitot tube with sampling probe, mass emissions calculations, internal gas chiller, internal 9000 analysis data memory, Remote Wireless Control Unit, built-in impact printer, DBGas 2004 and GasConfig PC software, Report of Calibration and instruction manual.



7860
Remote Large LED display.

BB610058
ϕ0.32" / 12" length (Temperature + Gas + Draft) sampling probe

BB830006
Pt100 remote air sensor with positioning cone

BB830009
Ambient CO probe

BB830010
Gas sniffer probe

BB610032
12" Pitot tube
BB610033
30" Pitot Tube
BB610034
40" Pitot Tube

BB650095
Sintered filter for ϕ8 shaft

BB650097
Sintered filter for ϕ10 shaft

Cat. 7848 -A-B-C-D-E-F-G-H-L-M-N-P

Table A Sensor n.1
1 O_2 (0-25%)

Table B Sensor n.2
2 CO (0-8000 ppm) with Auto-Range to 10%
2LO CO (0-500 ppm - 0.1 ppm)

Table C Sensor n.3
0 None
4 NO & NOx (0-4000 ppm)
4LO NO & NOx (0-500 ppm - 0.1 ppm)

Table D Sensor n.4
0 None
5 NO_2 (0-1000 ppm)
5LO NO_2 (0-500 ppm - 0.1ppm)
8 C_xH_y (0-5%)

Table E Sensor n.5
0 None
6 SO_2 (0-4000 ppm)
6LO SO_2 (0-500 ppm - 0.1 ppm)
8 C_xH_y (0-5%)

Table F Sensor n.6
0 None
8 C_xH_y (0-5%)
9 H_2S (0-1000ppm)

Table G Sensor n.7 (TABLE NOT AVAILABLE ON GREENLINE 6000)
0 None
A CO_2 (0-40%) NDIR

Table H Sensor n.8 & 9 (TABLE NOT AVAILABLE ON GREENLINE 6000)
0 None
B C_xH_y (0-50,000ppm) NDIR
E CO (0-15%) NDIR
F CO (0-2500ppm) NDIR

Table L Gas Sampling Probe
0 None (see industrial probe on next page)
1 ϕ(0.3"/12") gas probe + draft (dual hose) BB610058 (1470°F)
2 ϕ(0.3"/30") gas probe or draft (single hose) BB610064 w/ removable shaft (1470°F)
3 ϕ(0.3"/60") gas probe or draft (single hose) BB610065 w/ removable shaft (1470°F)
2P ϕ(0.4"/30") gas probe +draft (dual hose) BB610066 w/ removable shaft (1830°F)
3P ϕ(0.4"/60") gas probe +draft (dual hose) BB610067 w/ removable shaft (1830°F)
2SP ϕ(0.4"/30") heated gas probe+draft+smoke (dual hose) BB610068 w/ remov. Shaft (1830°F)
3SP ϕ(0.4"/60") heated gas probe+draft+smoke (dual hose) BB610069 w/ remov. Shaft (1830°F)
F Sintered filter mounted on end of probe

Table M Line Charger Plug
1 115 Vac with USA plug
2 230 Vac with Schuko plug
3 230 Vac with UK plug
4 230 Vac with European plug
5 100 Vac with USA/Japan plug

Table N Accessory
0 None
2 300mm(12") Pitot tube (BB610032)
3 750mm(30") Pitot tube (BB610033)
4 Remote combustion air temperature probe (L=6.5ft)
8 External probe for CO operator safety
9 External probe for gas leak detector

Table P Report of Calibration
1 E Instruments report

CONSUMABLE PARTS	
EE340005	Paper Roll
EE490002	Printer Ribbon
EE650072	Autozero / Line Filter
EE650073	Interferential Filter
EE650091	Condenser Filter (for GL6000 only)
EE650011	40 pcs. Filters for Smoke Index Measurements

GreenLine 6000
GreenLine 8000

Specifications

Portable Flue Gas Laboratory

Industrial Probe

Main Control Unit

Models:

GreenLine 6000: up to 6 sensors portable flue gas analyzer.

GreenLine 8000: up to 9 sensors portable flue gas analyzer.

Zero Calibration: automatic calibration procedure at instrument power-on. Fresh air inlet with electrovalve and separate pneumatic circuit.

Self-Diagnosis: Sensor efficiency test with diagnostic page.

Gas Level Alarms: programmable from PC with GasConfig software.

Sampling Pump: 2.2 l/min - 88 in H_2O with electronic flow controller

Battery Life: 8h continuous operation (without heating probe)

Power Supply: 110/240 Vac 50/60Hz, 7.2Ah capacity rechargeable battery.

Internal Test Memory: Up to 9000 (1000 on GreenLine 6000) complete analysis data structured by tags.

Smoke Measurement: Using the heated probe or the optional external manual pump. Index memory store and printout capability as standard.

Optional Probes: ambient CO, explosive gas leakage sniffer, remote temperature.

Working Temperature: from 23°F to 113°F - up to 122°F for short time.

Storage Temperature: from -4°F to 140°F (3 months max. at temperatures exceeding the operational limits).

Carrying Case: Aluminum with shoulder strap

Dimensions: 18"x9"x15" (45x23x38 cm)

Weight: 26 lbs (12 Kg)

Hand-Held Remote Control Unit

Standard MCU-RCU Communication:

GreenLine 6000 - Bidirectional RS232 Cable

GreenLine 8000 - Bluetooth wireless

Integrated Printer: Impact type 24 columns with 2.3" wide and 59 ft long paper roll.

Power Supply: Rechargeable battery pack with charger plug.

Print Autonomy: up to 40 reports.

Fuel Types: Up to 10 totally programmable.

Service and User Data: 3 programmable lines for each Tag using a PC and DBGas Software.

Report Header: 4 rows x 16 characters programmable from keyboard

Display: Large (1.6" x 2.2") graphic LCD display with automatic backlight device. Bar graph capability.

Dimensions: 13"x4"x3" (33x10x8 cm)

Remote Control Unit

The internal gas conditioning system with chiller (available standard on GreenLine 8000 and optional on GreenLine 6000) may not be enough if you need long term measurement of NO_2 and SO_2. The drop of temperature between the stack and the ambient could generate water condensation along the hose, diluting NO_2 & SO_2 gases and resulting in significantly less accurate readings and measurements. To prevent the water condensation, an industrial heated probe and hose can be used with the GreenLine 8000. The hose temperature is controlled from the MCU in order to maintain the correct gas temperature above the dew point.

Probe Vinyl Case

Industrial Probe

Ordering Code

7852 -A-B-C-D-E

Table A Model

1	Basic probe handle with pneumatic connector
2	Heated probe handle with pneumatic connector

Table B Tip

1	ϕ8 mm/300 mm (0.3"/12") tip max 1470°F
2	ϕ8 mm/750 mm (0.3"/29.5") tip max 1470°F
3	ϕ8 mm/1500 mm (0.3"/59") tip max 1470°F
6	ϕ8 mm/1000 mm (0.3"/39.4") tip max 2190°F inconel
F	Sintered filter on end of the probe

Table C Hose

4	Heated hose 2 mt (6.5 ft)
5	Heated hose 3 mt (9.8 ft)
6	Heated hose 6 mt (19.7 ft)

Table D Power Supply

1	110VAC 50/60 Hz
2	220VAC 50/60 Hz

Table E Accessories

0	None
2	Flange for carrying/mounting

E INSTRUMENTS GROUP, LLC
Innovative Instrumentation Solutions
www.einstrumentsgroup.com

E Instruments Group LLC
172 Middletown Blvd
Suite B 201
Langhorne, PA 19047
Tel: 215 750 1212
Fax: 215 750 1399
www.einstrumentsgroup.com
Eurotron GreenLine is a member of E Instruments Group LLC

Distributed by:

Bulletin 06-47.4a US