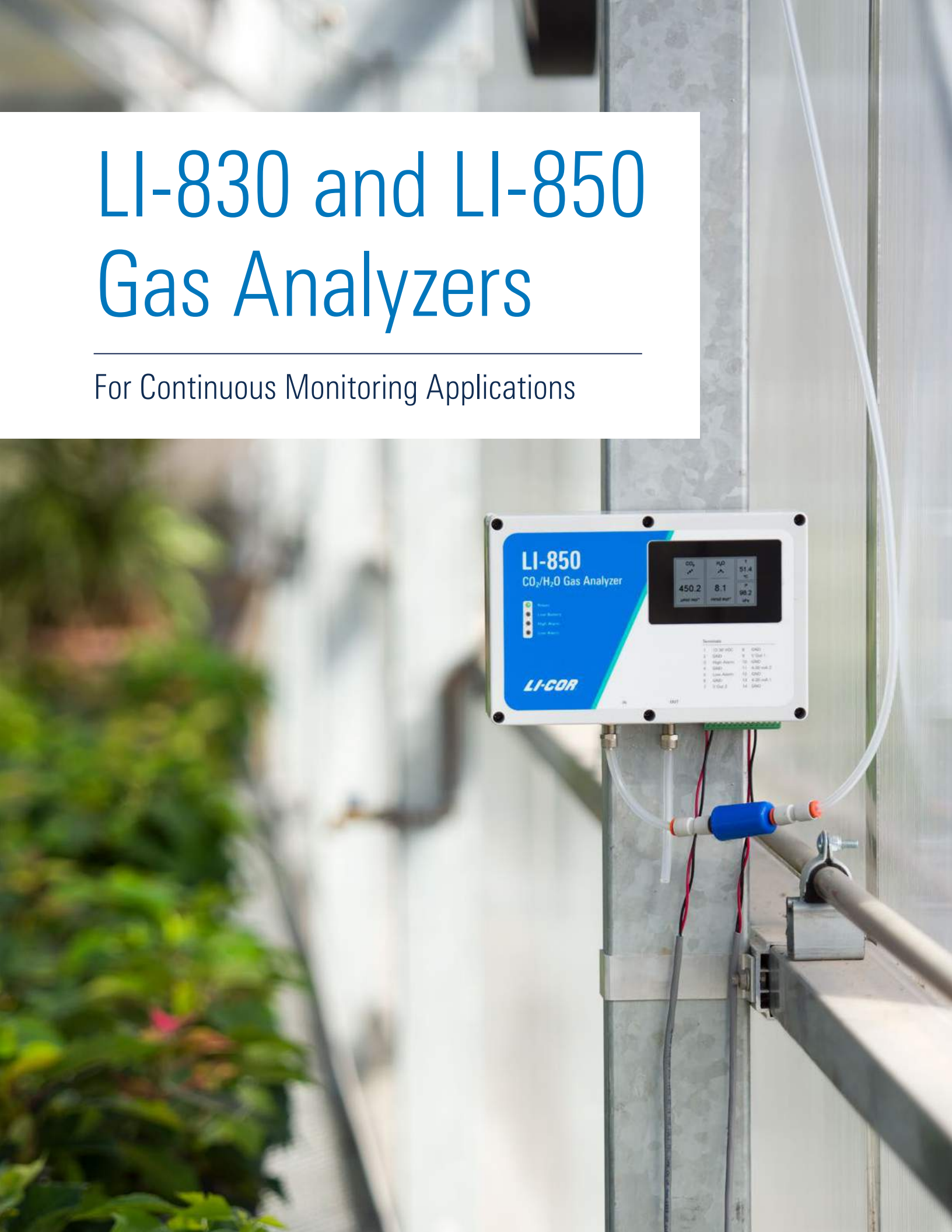
LI-830 and LI-850 Gas Analyzers

For Continuous Monitoring Applications



Easy Operation

The LI-830 CO_2 and LI-850 CO_2/H_2O Analyzers are high-performance monitoring solutions that give accurate, stable readings. Easy-to-use software and minimal maintenance provide hassle-free measurements for a wide range of applications and system integration options.

Just plug it in and you're ready to go

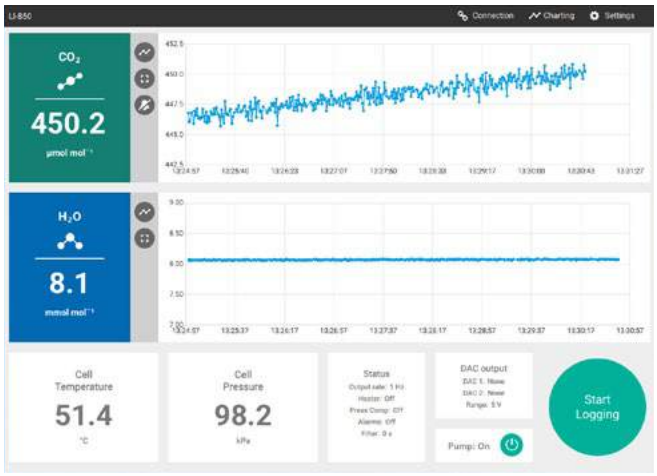
With the new optional pump and display, just power the instrument on, and measurements appear immediately. View real-time measurements, configure graphs, or set up logging options with easy-to-use software.

Keep it simple with minimal maintenance

Ensure continuous operation and minimize downtime with a user-cleanable optical bench, and no need for factory recalibration.

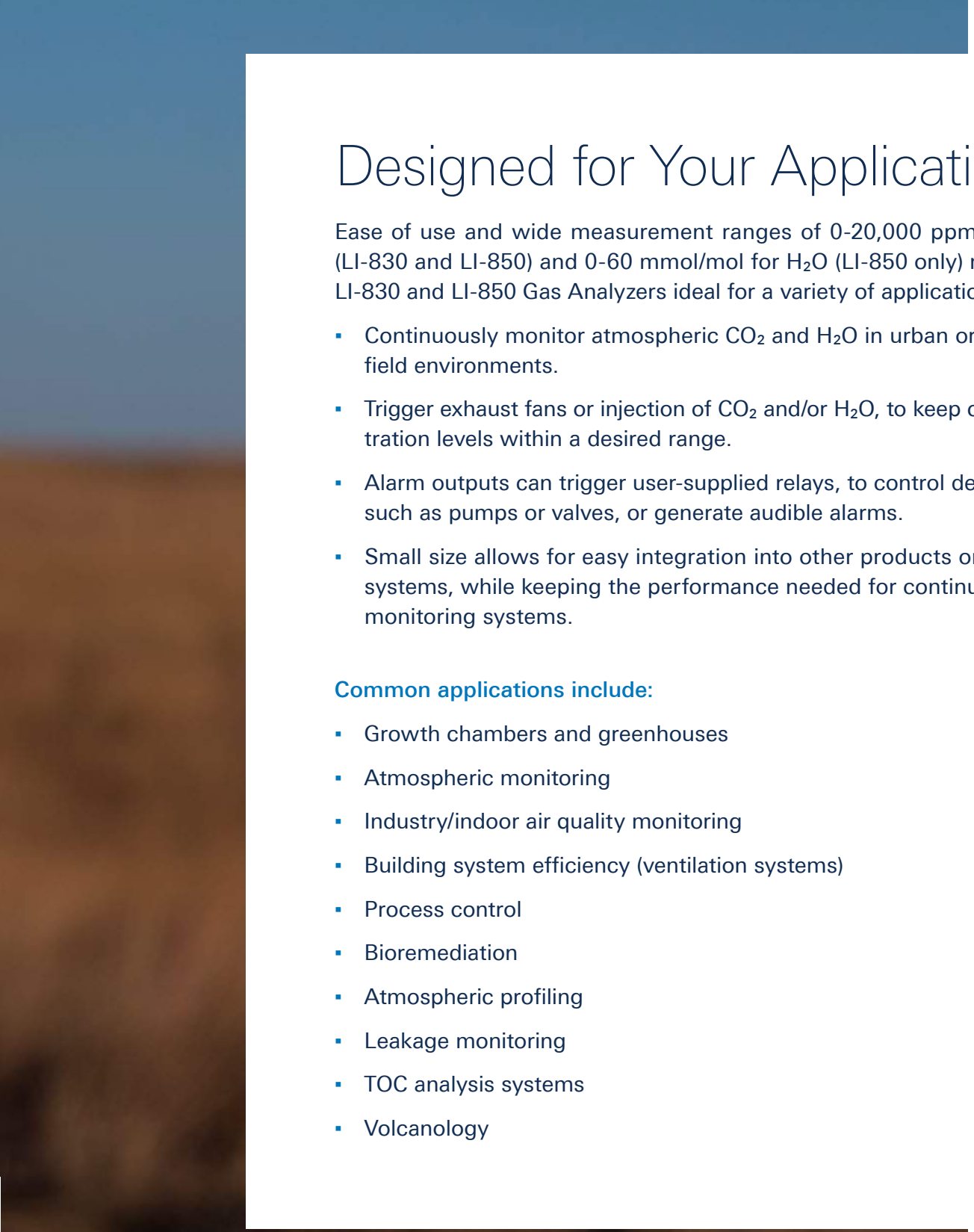
Easily analyze measurements

Windows® and Mac® interface software display real-time concentrations and graphs. Easily set up operational parameters and logging options, and view analyzer diagnostics.



LI-850
CO_2/H_2O Gas Analyzer
LI-COR

LI-850
CO_2/H_2O Gas Analyzer
LI-COR
Terminals
1 12-30 VDC
2 GND
3 High Alarm
4 GND
5 Low Alarm
6 GND
7 V Out 2
8 GND
9 V Out 1
10 GND
11 4-20 mA 2
12 GND
13 4-20 mA 1
14 GND
IN
OUT
daq



Designed for Your Application

Ease of use and wide measurement ranges of 0-20,000 ppm for CO_2 (LI-830 and LI-850) and 0-60 mmol/mol for H_2O (LI-850 only) make the LI-830 and LI-850 Gas Analyzers ideal for a variety of applications.

- Continuously monitor atmospheric CO_2 and H_2O in urban or field environments.
- Trigger exhaust fans or injection of CO_2 and/or H_2O, to keep concentration levels within a desired range.
- Alarm outputs can trigger user-supplied relays, to control devices such as pumps or valves, or generate audible alarms.
- Small size allows for easy integration into other products or systems, while keeping the performance needed for continuous monitoring systems.

Common applications include:

- Growth chambers and greenhouses
- Atmospheric monitoring
- Industry/indoor air quality monitoring
- Building system efficiency (ventilation systems)
- Process control
- Bioremediation
- Atmospheric profiling
- Leakage monitoring
- TOC analysis systems
- Volcanology

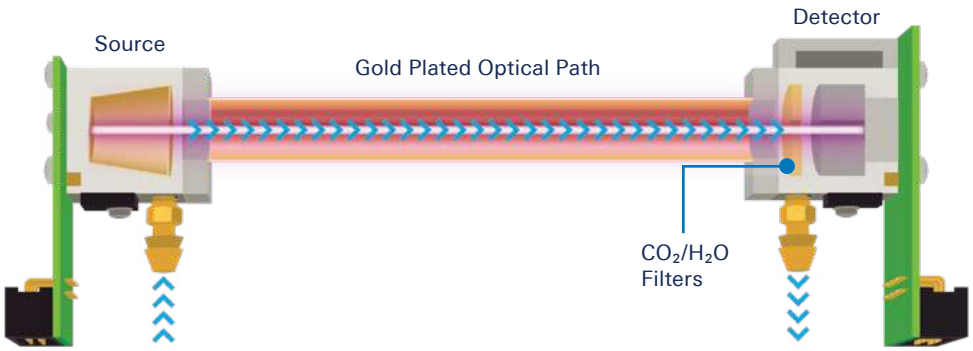
Advanced Technology for Excellent Performance

For nearly 30 years, we've been designing and building high-speed CO_2 analyzers for research applications. We've improved upon our proven platform, to bring you better analyzers with the performance and reliability you've come to trust. The LI-830 and LI-850 now feature a longer lasting source – further minimizing routine maintenance requirements.

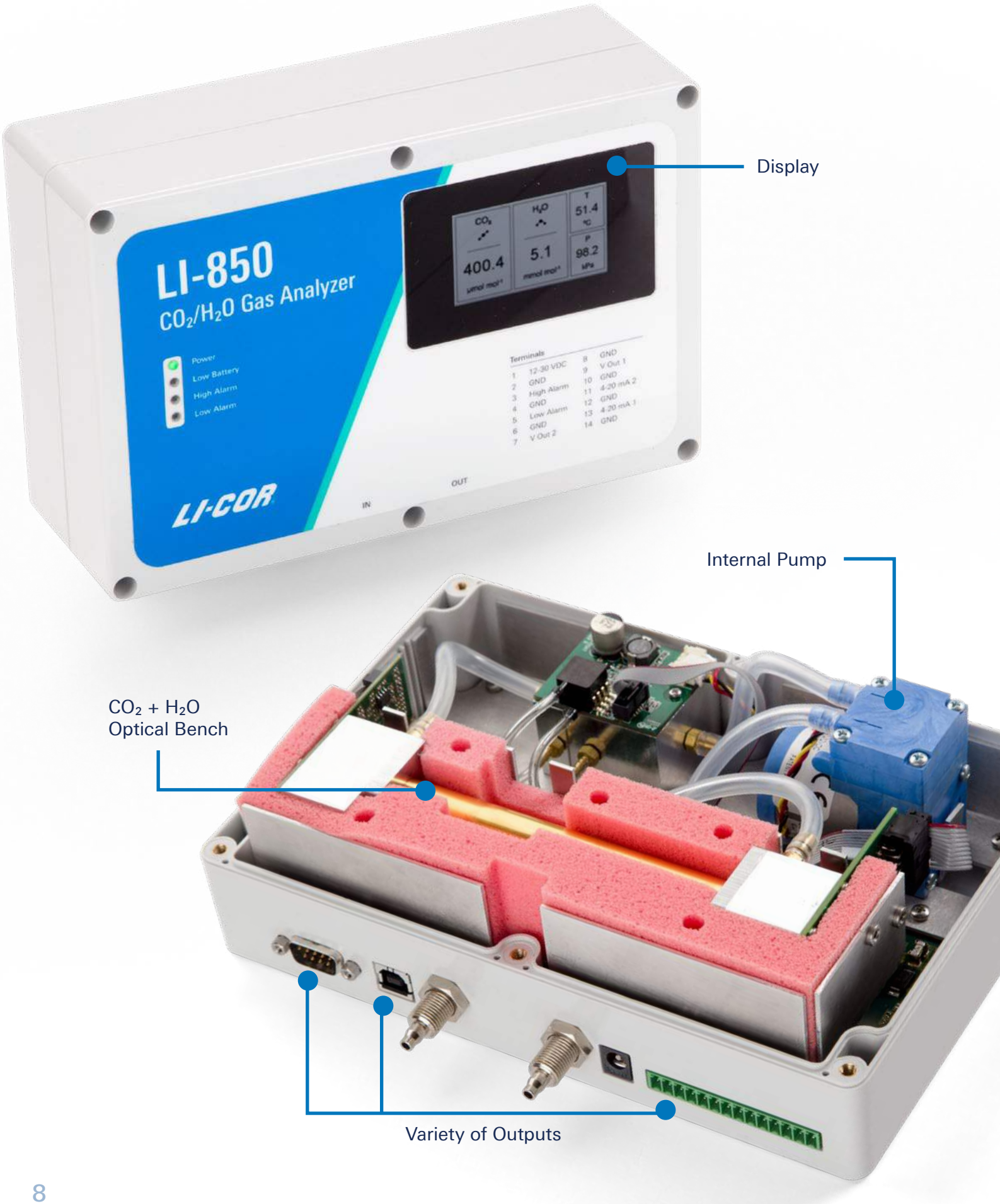
Proven Design

The analyzers' optical path is a thermostatically controlled IR detection system that provides excellent stability. Integrated thermistors and a pressure transducer provide for high accuracy in the concentration calculation over the entire measurement range.

The pressure transducer within the gas flow path minimizes variability due to changes in barometric pressure. The optical path is protected by a foam enclosure that helps maintain a controlled thermal environment and protects the bench from mechanical shock and vibrations.



LI-850
CO_2/H_2O Gas Analyzer
LI-COR


LI-850
CO2/H2O Gas Analyzer
Power
Low Battery
High Alarm
Low Alarm
LI-COR
IN
OUT
Terminals
1 12-30 VDC
2 GND
3 High Alarm
4 GND
5 Low Alarm
6 GND
7 V Out 2
8 GND
9 V Out 1
10 GND
11 4-20 mA 2
12 GND
13 4-20 mA 1
14 GND
CO2
400.4
H2O
5.1
T
51.4
°C
P
98.2
kPa
Display
Internal Pump
CO2 + H2O
Optical Bench
Variety of Outputs

Flexible to Fit Your Needs

Multiple configuration options allow you to select the analyzer that's right for you, without compromise.

CO_2 + H_2O

Add water vapor measurements to the standard CO_2 measurement (0-20,000 ppm) for expanded applications and increased accuracy of your measurements.

Internal Pump

An integrated pump provides a constant flow rate. Or, choose an analyzer without a pump and incorporate your own.

Analyzer Display

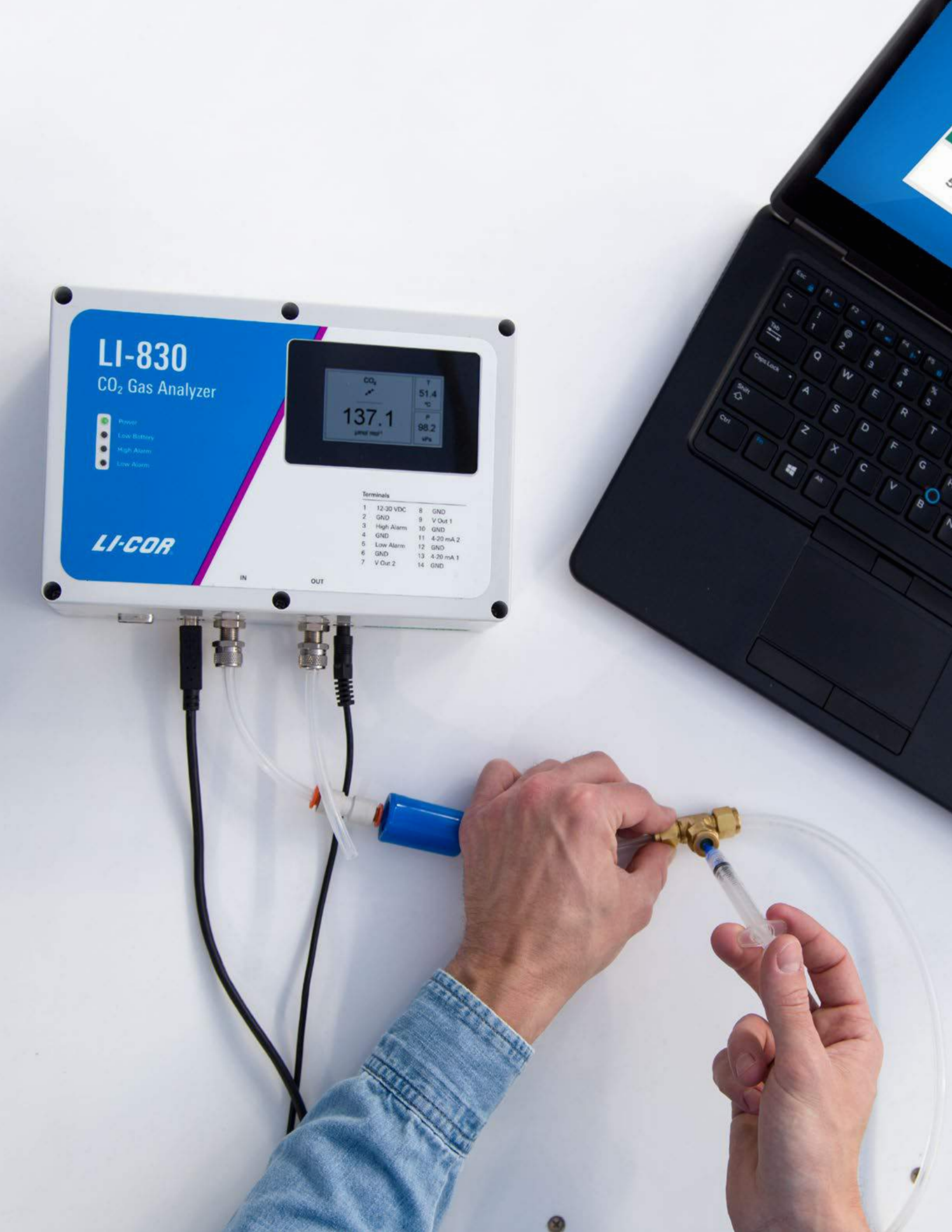
Add a display to view real-time gas concentrations, pressure, and temperature readings.

Variety of Outputs

All analyzer configurations feature a variety of outputs, including: Analog (voltage or current), Digital alarms (TTL or Open Collector), Serial (RS-232 and USB), XML Communications Protocol, and software compatible with Windows® and Mac®.

OEM and System Integration

LI-COR can work with you to integrate the LI-830/LI-850 Analyzers into your product or system. Modified configurations are available. Contact LI-COR for more details.


LI-830
CO_2 Gas Analyzer
Power
Low Battery
High Alarm
Low Alarm
137.1
T
51.4
°C
P
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kPa
LI-COR
IN
OUT
Terminals
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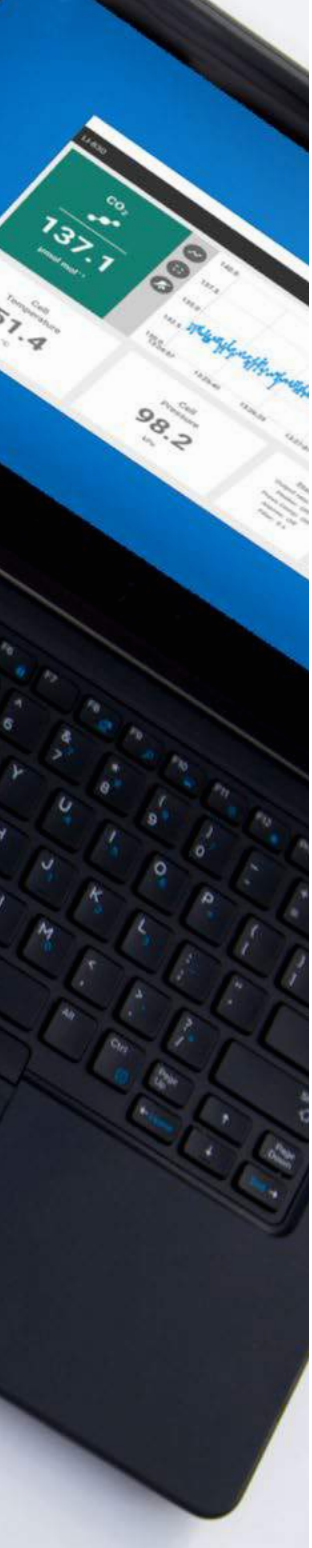

Specifications

CO_2 Measurements

Measurement range: 0-20,000 ppm

Accuracy:

- **LI-850:** Within 1.5% of reading
- **LI-830:** Within 3% of reading

Calibration drift:

- **Zero drift[1]:** <0.15 ppm/°C
- **Span drift[2]:** <0.03%/°C
- **Total drift at 370 ppm[3]:** <0.4 ppm/°C

RMS noise at 370 ppm with 1 sec signal filtering: <1 ppm

Sensitivity to water vapor (LI-850 only): <0.1 ppm CO_2 / mmol mol^{-1} H_2O

Lower limit of detection: 1.5 ppm

H_2O Measurements (LI-850 only)

Measurement range: 0-60 mmol mol^{-1}

Accuracy: Better than 1.5% of reading

Calibration drift:

- **Drift at 0 mmol mol^{-1}:** <0.003 mmol mol^{-1}/°C
- **Span drift at 10 mmol mol^{-1}:** <0.03% mmol mol^{-1}/°C
- **Total drift at 10 mmol mol^{-1}:** <0.009 mmol mol^{-1}/°C

RMS noise at 10 mmol mol with 1 sec signal filtering: <0.01 mmol mol^{-1}

Sensitivity to CO_2: <0.0001 mmol mol^{-1} H_2O / ppm CO_2

Pump (optional)

Operating temperature range: 5 to 45 °C

Storage temperature range: -20 to 60 °C

Operating humidity range: 0 to 80% RH

Nominal flow rate: 0.75 liters $minute^{-1}$

Power consumption: 1 W (nominally)

Expected life span: 8,000 hrs in standard conditions with a normal load

Display (optional)

Dimensions: 6.7 cm corner-to-corner

Resolution: 400 x 200 px; monochrome

Power consumption: <200 µW

Displayed variables: CO_2 reading, H_2O reading (LI-850 only), optical bench temperature, and pressure.

General

Output rate: Up to 2 measurements per sec

Response time (T90):

- **CO_2:** <3.5 seconds from 0-375 ppm
- **H_2O:** <3.5 seconds from 0-21 mmol mol^{-1}

Measurement principle: Non-Dispersive Infrared

Traceability:

- **CO_2:** Traceable gases to WMO standards from 0-3,000 ppm; traceable gases to EPA protocol gases from 3,000-20,000 ppm
- **H_2O (LI-850 only):** NIST traceable LI-610 Portable Dew Point Generator

Pressure compensation range: 50-110 kPa

Maximum gas flow rate: 1 liter min^{-1}

Output signals: Two analog voltage (0-2.5 V or 0-5 V) and two current (4-20 mA)

Digital outputs: TTL (0-5 V) or Open Collector

DAC resolution: 16-bits across user specified range

Power requirements:

- **Input voltage:** 12-30 VDC
- **After warmup:** 0.3 A @ 12 VDC (3.6 W) average
- **During warmup:** 1.2 A @ 12 VDC (14 W) maximum

Operating temperature range: -20 to 45 °C

Relative humidity range: 0-95% RH, Non-condensing

Dimensions: 22.23 cm W x 15.25 cm D x 7.62 cm H

Weight:

- **No pump, no display:** 1.0 kg
- **No pump, with display:** 1.02 kg
- **With pump, no display:** 1.3 kg
- **With pump, with display:** 1.32 kg

Internal optical cell volume: 14.5 mL

[1]Zero drift is the change with temperature at 0 concentration.

[2]Span drift is the residual error after re-zeroing following a temperature change.

[3]Total drift is the change with temperature without re-zeroing or re-spanning.

Specifications subject to change without notice.

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The LI-COR board of directors would like to take this opportunity to return thanks to God for His merciful providence in allowing LI-COR to develop and commercialize products, through the collective effort of dedicated employees, that enable the examination of the wonders of His works.

"Trust in the LORD with all your heart and do not lean on your own understanding. In all your ways acknowledge Him, and He will make your paths straight."

– Proverbs 3:5,6