

Carbo2Detek

PST
PROCESS SENSING
TECHNOLOGIES

LDetek
A PST BRAND

CO2 QUALITY CONTROL FOR BEVERAGES AND CARBON CAPTURE APPLICATIONS

CARBO2DETEK ►

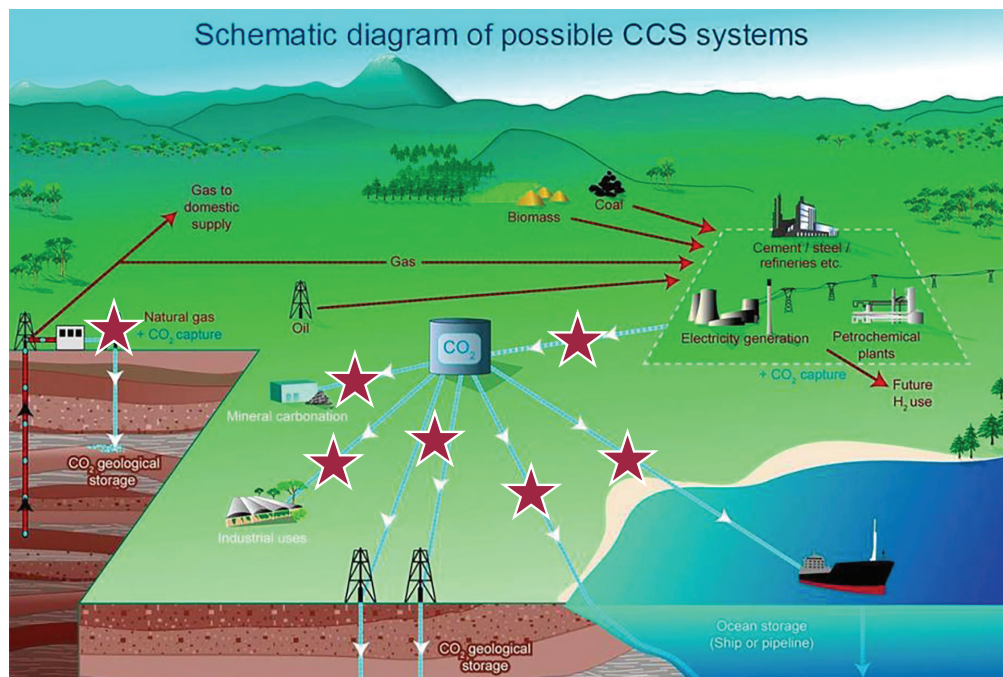
Turnkey gas analysis
solution that meets the
requirements of the
carbonated beverage
and the captured carbon
markets



APPLICATIONS

The CO₂ is generally produced by the combustion of hydrocarbon-containing products, fermentation or by the production of different chemical processes. One of these solution is to extract the CO₂ from off-gas streams that would otherwise be vented to the atmosphere. This is referred to as carbon capture. Once captured, the CO₂ can be purified and liquefied, and then supplied to a huge diversity of applications like horticulture, welding, cryogenic cleaning and to the most popular which is for carbonated drinks. Carbon recycling not only contributes to climate and environmental protection, but it also has the bonus of low supply costs and immediate availability of the gas. Alternatively, the carbon dioxide storage can be sequestered – in other words, stored underground – to mitigate the climate impact of industrial processes that rely on the combustion of fossil fuels. Most of the CO₂ produced worldwide is managed by the well-known main gas suppliers.

To give a general overview of the CO₂ production and usage points, the schematic below shows multiple installation points where are required a CO₂ quality monitoring system like the Carbo2Detek (identified with ★).



Being the biggest consumer of CO₂, the beverage and bottlers industry requirements for using ultra high purity CO₂ are very high. This is why, a monitoring and quality system offering a high-quality assurance is required. This is where the robust, automatic, and pre-calibrated Carbo2Detek turnkey system comes a requirement.

SOLUTION

The Carbo2Detek turnkey system offers all the features required by the CO₂ industry. Using the combination of the plasma emission detector (PED) and its flame ionisation detector (FID) in the MultiDetek3 industrial gas chromatograph, it offers all the performances to go in low concentrations. With its patented design and a series of selective bandpass optical filters, the PED technology offers the ability to measure down to sub ppb without interference from the CO₂ background gas.

Under the same roof, the LDMOX unit can be added to measure trace moisture and oxygen. The LDMOX combines quartz crystal or ceramic oxide sensors for moisture while it uses electrochemical or zirconia sensor for the oxygen.

The system comes in a temperature-controlled cabinet and a multi-stream selector system (LDGSS) to allow multiple streams to get connected to the analytical instruments. The streams can be controlled from the analytical system with the possibility to configure multiple analytical sequences. Working in parallel, all the instruments measure multiple impurities simultaneously to give a quick analysis report of the CO₂ quality. The system comes with all the industrial standard communication protocols. The system comes with a large touchscreen local interface that can also be remotely controlled as required by the industry standards.

REFERENCES & RESULTS

- App Note LD23-02 Analysis of trace impurities in carbon dioxide
- App Note LD17-04 Trace impurities in carbon dioxide
- App Note LD16-12 Trace impurities in carbon dioxide

CONFIGURATION

SULFURS

Impurities	Range	Detection limit	Instrument model (unit #)	Detector (technology)
Hydrogen sulfide (H ₂ S)	0-10ppm	10ppb	MultiDetek3 (GC1)	PED
Carbonyl sulfide (COS)	0-10ppm	10ppb	MultiDetek3 (GC1)	PED
Sulfur dioxide (SO ₂)	0-10ppm	50ppb	MultiDetek3 (GC1)	PED

AROMATICS

Impurities	Range	Detection limit	Instrument model (unit #)	Detector (technology)
Benzene (C ₆ H ₆)	0-5ppm	5ppb	MultiDetek3 (GC1)	PED
Toluene (C ₇ H ₈)	0-5ppm	5ppb	MultiDetek3 (GC1)	PED
Xylene(ethylbenzene) (C ₈ H ₁₀)	0-5ppm	5ppb	MultiDetek3 (GC1)	PED

HYDROCARBONS

Impurities	Range	Detection limit	Instrument model (unit #)	Detector (technology)
Methane (CH ₄)	0-50ppm	100ppb	MultiDetek3 (GC1)	PED
Ethane (C ₂ H ₆)	0-100ppm	1ppm	MultiDetek3 (GC2)	PED
Propane (C ₃ H ₈)	0-100ppm	1ppm	MultiDetek3 (GC2)	PED
Methanol (CH ₃ OH)	0-100ppm	1ppm	MultiDetek3 (GC2)	PED
Ethanol (C ₂ H ₆ O)	0-100ppm	1ppm	MultiDetek3 (GC2)	PED
Total VOC	0-100ppm	1ppm	MultiDetek3	FID

PERMANENT GASES & OTHERS

Impurities	Range	Detection limit	Instrument model (unit #)	Detector (technology)
Acetaldehyde (CH ₃ CHO)	0-10ppm	30ppb	MultiDetek3 (GC2)	PED
Ammonia (NH ₃)	0-10ppm	30ppb	MultiDetek3 (GC2)	PED
Carbon monoxide (CO)	0-10ppm	500ppb	MultiDetek3 (GC1)	PED
Phosphine (PH ₃)	0-5ppm	50ppb	MultiDetek3 (GC2)	PED
Oxygen (O ₂)**	0-100ppm	0.5ppm	LDMOX	Electrochemical (EC)
Moisture (H ₂ O)*	0-100ppm	0.5ppm	LDMOX	Dew Point (Ceramic)

*Quartz Crystal detector mounted in the LDMOX unit can be used for lower ldl requirements.

**PED mounted in the MultiDetek3 unit can be used for lower ldl requirements or to measure Argon impurity as well.

NOX

Impurities	Range	Detection limit	Instrument model (unit #)	Detector (technology)
Nitrous Oxide (N ₂ O)	0-100ppm	500ppb	MultiDetek3 (GC2)	PED
NOX (NO/NO ₂)	0-100ppm	100ppb	third party analyser	Chemiluminescence

Other impurities, other ranges and other detection limits are available on request.

SPECIFICATIONS

AMBIENT OPERATING TEMPERATURE RANGE	10-45 Celsius
DIMENSIONS (H X W X D)	79 x 24 x 40 inches 2000 x 600 x 1000 mm
WEIGHT	750 lbs
INLET FITTINGS	1/8" or 1/4" compression or VCR
OUTLET FITTINGS	1/8" or 1/4" or 1/2" compression or VCR
SUPPLY	120VAC/240VAC 50/60Hz
POWER CONSUMPTION	Max 4 kW



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