

# **TELEDYNE** **ANALYTICAL INSTRUMENTS**



## **CDQC ANALYSIS SYSTEM** *Carbon Dioxide Quality Control System*

Carbon dioxide is routinely used within the food and beverage industry for the purposes of preserving the quality of food products and the carbonization of beverages.

With the increasing demand for improvements in the purity of CO<sub>2</sub>, manufacturers of highly sensitive gas analyzers are being challenged to detect several contaminants in CO<sub>2</sub> on a continuous basis. In response to this market demand, Teledyne has

designed the Carbon Dioxide Quality Control (CDQC) System. The CDQC Analysis System provides manufacturers of high purity carbon dioxide with the ability to accurately detect desired impurities in a single, cost effective, integrated system.

### **TELEDYNE PRODUCT SCOPE**

The CDQC System can be designed with any combination of the following analyzers to ensure the CO<sub>2</sub> used in a process meets industry standards:

- Trace levels of Total Sulphides as SO<sub>2</sub> via UV Fluorescence (0-50 ppb to 0-20 ppm)
- Trace levels of Total Hydrocarbons via FID (0-1 ppm to 0-1000 ppm)
- Trace levels of Moisture via Al<sub>2</sub>O<sub>3</sub> sensor (-100°C to +20°C)
- Trace levels of Oxygen via Micro-fuel Cell sensor (0-10 ppm to 0-1%)
- CO<sub>2</sub> Purity Analysis via NDIR (98-100%)

### **SYSTEM CONFIGURATION**

The analyzers can be mounted in either a NEMA-12 or NEMA-4/4X system enclosure with dual door access to facilitate analyzer / sample system adjustments. The system can be designed for either stationary installation or with casters allowing the system to be moved within the plant. If required, the system can be winterized allowing the system to be mounted in an outdoor environment.

By designing the CDQC System on a "plug and play" basis, the addition or subtraction of analyzers has little impact on the redesign cost of the system required for a particular application.

### **SAMPLE SYSTEM**

The CDQC System also includes an integral sample handling system providing pressure regulation, individual flow control,

and calibration valving for each analyzer. Any liquefied CO<sub>2</sub> sample streams must be vaporized at the sample take-off point prior to being introduced to the CDQC system.

### **FEATURES**

- Single, integrated system design
- "Plug and Play", cost effective modular configuration
- RS-232C serial interface capabilities
- Integral sample conditioning system
- Continuous analyzer performance - all units
- Optional PLC to interface report generation devices for load reporting

### **TOTAL SULFIDES**

Model 6200A Total Sulfides Analyzer utilizes the field-proven UV Fluorescence method to continuously detect total sulphides such as SO<sub>2</sub> as low as 0-50 ppb full-scale. A quartz converter (PID controlled to 1000°C) converts the sulfides, when mixed with scrubbed ambient air, into SO<sub>2</sub> via high temperature oxidation. An internal vacuum pump draws both the sample and ambient air into the converter module.

The 6200A can utilize either certified calibration gases in association with the PRC-6000 Calibration Module (for ppb H<sub>2</sub>S span gas generation) or a certified ppb H<sub>2</sub>S permeation tube with the IZS (internal zero / span valves) option.

### **TOTAL HYDROCARBONS**

Model 402REU Trace Hydrocarbons Analyzer uses a Flame Ionization Detector (FID) to continuously detect as low as 0.1 ppm total hydrocarbons (methane equivalent basis) in CO<sub>2</sub>. The 402REU incorporates a sample selector module to control the flow of the sample and support gases to ensure an accurate THC analysis.

### **TRACE MOISTURE**

Model 8800A, utilizing Hyper Thin Film (HTF)<sup>™</sup> Al<sub>2</sub>O<sub>3</sub> sensing technology, can detect the dewpoint of CO<sub>2</sub> from -100°C to +20°C. The 8800A controller can be programmed to read on either a ppm or dewpoint basis. The HTF sensor provides the user with quicker response time, lower drift over a wide ambient temperature range, and a greater signal to noise ratio than conventional Al<sub>2</sub>O<sub>3</sub> sensors. The uniformity in HTF manufactured sensors allows them to be freely interchanged without having to reprogram the controller when replacing sensors.

### **TRACE OXYGEN**

Model 3190, utilizing the A-2C electrochemical Micro-fuel oxygen sensor, can detect O<sub>2</sub> as low as 0.1 ppm. The A-2C sensor, utilizing a buffered electrolyte to contend with the CO<sub>2</sub> sample gas, is a low cost, disposable, zero maintenance sensor requiring only span gas for accurate calibration.

### **CO<sub>2</sub> PURITY**

The Model 7100 CO<sub>2</sub> Purity Analyzer employs NDIR technology to continuously detect on a 98-100% suppressed range basis. The 7100 eliminates having to invest lab personnel time to periodically conduct grab sample analysis to determine the purity levels of the CO<sub>2</sub> being produced.

# CARBON DIOXIDE QUALITY CONTROL SYSTEM

## SPECIFICATIONS:

### Model 6200A Total Sulphides Analyzer

Ranges: 0-50 ppb to 0-20,000 ppb full scale (user selectable)

Output: 10V, 5V, 1V, 100mV (selectable); 4-20mADC iso (optional)

RS232 (I/O): Standard

Operating temp range: 5 to 40°C

Power: 100-240 VAC, 50/60 Hz (user specified)

Readout: 2-line alphanumeric vacuum fluorescent display (VFD)

Converter: High temp (1000°C) quartz converter

Calibration: Option 1: PRC-6000 calibrator module (requires user supplied 5-6 ppm H<sub>2</sub>S in CO<sub>2</sub> standard)

Option 2: Built-in certified H<sub>2</sub>S permeation device (100-200 ppb) with auto-cal valves

### Model 402REU Trace Hydrocarbon Analyzer

Ranges: 0-1 ppm up to 0-1000 ppm CH<sub>4</sub> equivalents (switch selectable)

Method: Flame Ionization Detector (FID)

Output: 0-1 VDC & 4-20 mADC isolated

Power: 100-240 VAC, 50/60 Hz (user specified)

Accuracy: ±1% of full scale

Readout: Digital display

Alarms: 2 x fully adjustable alarms

Sample selector module: Integral - Standard (to control flow of sample and support gases)

Operating temp range: 0-50°C

Calibration gases required: N<sub>2</sub>/H<sub>2</sub> fuel mix, HC-free air, HC-free zero gas and 80 ppm CH<sub>4</sub> in N<sub>2</sub> for span

### Model 8800 Trace Moisture Analyzer

Range: -100 to +20°C

Accuracy: ±3°C

Sensor type: Hyper Thin Film (HTF)<sup>TM</sup> Al<sub>2</sub>O<sub>3</sub>

Output: 4-20 mADC isolated; RS-232C (optional)

Power: 100-240 VAC, 50/60 Hz

Readout: LCD (on a Deg F, Deg C or ppm basis)

Operating temp range: -10 to 50°C

Calibration gas: None required; factory calibrated

### Model 7110 CO<sub>2</sub> Purity Analyzer

Range: 98-100% CO<sub>2</sub>

Sensor type: NDIR

Accuracy: ±2% of full scale at constant temperature

Output: 4-20 mADC; isolated & RS-232C

Power: 100-240 VAc, 50/60 Hz (specify)

Readout: 2-line alphanumeric vacuum fluorescent display (VFD)

Operating temp range: 5 - 45°C

Calibration gases: Zero, span, and flowing reference (30cc/min high purity CO<sub>2</sub>)

### Model 3190 Trace O<sub>2</sub> Analyzer

Ranges: 0-10, 0-100 ppm O<sub>2</sub>

Sensor type: Electrochemical, Class A-2C (for CO<sub>2</sub> service)

Accuracy: ±2% at full scale

Output: 4-20 mADC

Power: 85-240 VDC, 50/60 Hz

Operating temp range: 0-50°C

Calibration gas: Span mixture only (80-90 ppm O<sub>2</sub> in CO<sub>2</sub>)

## TELEDYNE ANALYTICAL INSTRUMENTS

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## Warranty

Instrument is warranted for 1 year against defects in material or workmanship

NOTE: Specifications and features will vary with application. The above are established and validated during design, but are not to be construed as test criteria for every product. All specifications and features are subject to change without notice.

