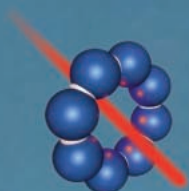


# QUANTUM GROUP

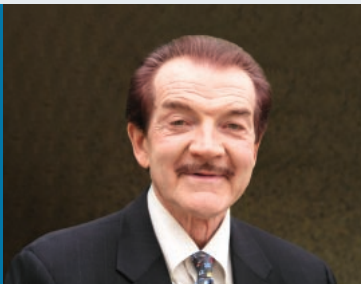


QUANTUM GROUP INC.



Makers of  
**COSTAR**<sup>®</sup>  
Carbon Monoxide Detectors

Quantum Group Inc. is a multi-faceted environmental health company whose primary business is the development and production of carbon monoxide (CO) detection products including, but not exclusive to, CO sensors, CO detectors and controls. Quantum Group Inc. is the technology leader in this field via the use of Solid-state Infrared (SIR) detection technology. These products and systems are suitable for use in automobiles, homes, RVs and water craft for CO detection and alarm. Quantum Group Inc. products provide the only low-power technology that is stable for long term use (years) and can function over a full range of temperature and humidity. As the technology leader in CO sensors and detection, Quantum Group Inc. has developed collateral proprietary technology in support of its core products.



**DR. MARK GOLDSTEIN** is one of the Company's founders as well as Chairman, President and Chief Executive Officer. Dr. Goldstein has been with Quantum since 1982. He has 30 years of business management, technology and market development experience. He directed Quantum's expansion plans, assembled its personnel, and developed the Company's strategic alliances. He is the inventor or co-inventor of many of the advanced sensors, catalysts and emitter technologies now being developed, manufactured and sold by Quantum. Dr. Goldstein has a Ph.D. in Chemistry from the University of Miami in Coral Gables, Florida. He is the author of numerous papers and holds over 28 patents.



**ROBERT BANACH** is Vice President and Chief Operating Officer. He has been with the Company for more than 11 years. With over 25 years of engineering and operations experience, he has held positions ranging from Vice President/Manufacturing Manager and Director of Operations to a variety of other technical management positions in high-volume manufacturing firms. He spent seven years in Asian management positions, successfully implementing plant operations for Philips, Harris and Honeywell. Mr. Banach has a B.S. in Engineering from Michigan State University.



**MICHELLE OUM**, Director of Sensor and Catalyst Research and Development, has over 15 years of experience with Quantum bringing products from concepts through research, development, optimization, scale-ups, to manufacturing. She oversees development of advanced sensors and catalysts, and directs research activities for improving CO sensing technology. Ms. Oum has authored or co-authored over 10 U.S. patents and co-authored several publications. Her department is also in charge of our CO removal catalyst project. She has a bachelor's degree in Chemistry from the University of California, San Diego.



**DR. WILLIAM TOLLEY** is the Manager of the Substrate Porous Silica Department, which manufactures all of the company's sensor substrates. He has been with Quantum for over 7 years. He brings more than 15 years of experience in chemistry, metallurgy and materials. He is the team leader on the MicroSIR project and serves as chairman of the safety committee. Dr. Tolley graduated from University of Utah in 1975 with a Master of Science in Metallurgical Engineering, and received his Ph.D. in Chemistry from Brigham Young University in 1995. He has published over 70 papers in the scientific literature and holds several patents.

## A Unique Technology with Life Saving Advantages

Scientists at the Quantum Group have successfully combined biotechnology with infrared engineering to produce reliable and false alarm-free carbon monoxide sensing elements. The Company is the first to commercialize a biotechnology-based gas sensor.

Two CO sensing elements (one red and one yellow) are at the heart of the Quantum's Solid-state Infrared (SIR) sensor. Each patented sensing element is made from a porous transparent disk coated with a monolayer of a supramolecular complex, which is a catalyst. A self-assembly process is used to construct the fast regenerating sensing elements. Upon exposure to CO, one or both of the sensing elements changes its spectral character and absorbs photons at a rate dependent on the concentration of CO in the surrounding environment. Thus by monitoring the sensing elements with patented electronics a linear response is produced. The sensing elements reverse their spectral shift by a self-regeneration process whose rate is dependent upon the decrease of CO in the environment. By monitoring the rate of change in the amount of light transmitted through the sensing elements, the concentration of CO in the surrounding environment can be determined accurately and displayed digitally.

The CO response characteristics of a particular sensor can be designed to meet specific standards or applications by controlling the formulation process. Sensing elements can be designed to satisfy customer's needs.

A SIR sensor housing is shown in Figure 1. The system

housing protects the sensing elements from physical damage and harm. A filter (getter) and retainer clip hold the sensing elements in place and prevent dust, smoke particles, liquid water, and other chemicals from entering the sensor chamber. The SIR sensing elements are held in optical alignment by the sensor housing placed between an infrared light emitting diode (LED) and a photodiode. The new MicroSIR sensor housing, shown in Figure 2, is similar in design to the SIR.

Only COSTAR® carbon monoxide detectors give reliable protection without false alarms. Liquid electrochemical CO sensors — used in most competitors' detectors — are sensitive to many common household gases, particularly from cleaning products and air fresheners. Their frequent false alarms can lead people to ignore valid alerts, with fatal results. COSTAR® detectors, on the other hand, react only to CO gas, and will not react to gases found in household products. In a Lawrence Berkeley National Laboratory study, COSTAR® was the only detector that did not false alarm.

COSTAR® has other vital benefits as well. All CO detectors have a finite lifespan. As liquid electrochemical sensors age, they simply stop responding, with no indication that they've become ineffective. COSTAR® SIR detectors have a built-in fail-safe feature that indicates when it is time to replace the alarm. And since the solid-state COSTAR® sensor uses no liquid, it can be mounted anywhere in the room, including the ceiling. This can be a critical advantage, because carbon monoxide is hot when emitted and rises rapidly.

Figure 1 Inside the SIR System

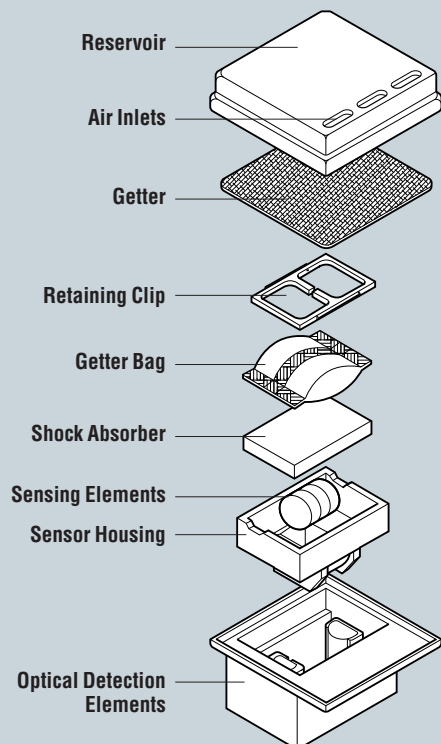
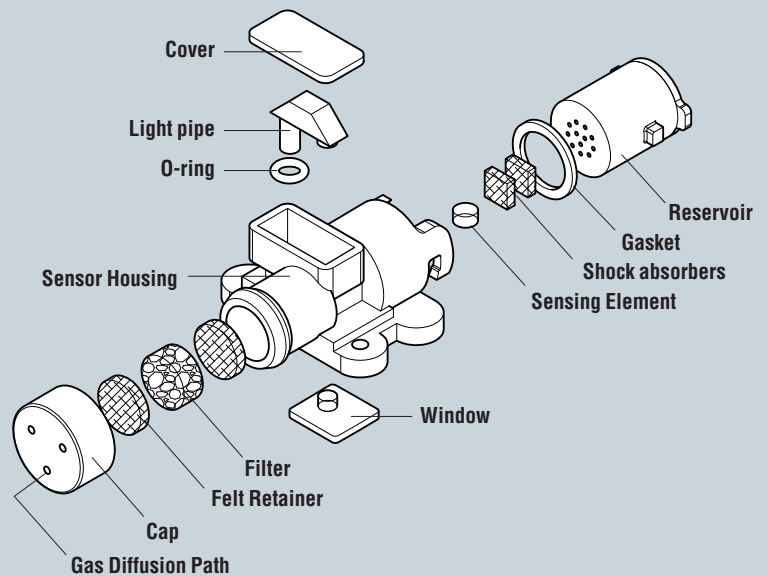


Figure 2 The MicroSIR System

*The MicroSIR system is a miniaturized SIR and uses a surface mount LED and a photodiode.*



The **COSTAR®** Product Line *Your Guardian Angel Against Carbon Monoxide*

Application	Model	Power Supply	Features	Certification
 <p>CO Alarm for Recreational Vehicles</p>	<p><b>Model 9RV</b> <b>Model 12RV-DB</b></p>	<p>9-volt Battery (included) 12V Dual Supply Hardwired, with 9V Battery Backup</p>	<ul style="list-style-type: none"> <li>Operates from -40°F to 151°F 15% RH to 95% RH</li> <li>6-year limited warranty</li> </ul>	<p>Listed to UL 2034 RV requirements Listed to CSA 6.19-01</p>
 <p>Residential CO Alarm</p>	<b>Model 9SIR</b>	9-volt Battery (included)	<ul style="list-style-type: none"> <li>No false alarms with biotech-based IR sensor</li> <li>Operates from 32°F to 120°F, 15%RH to 95%RH</li> <li>6-year limited warranty</li> </ul>	Listed to UL 2034 Residential requirements
 <p>Residential Alarm Unconditioned Spaces</p>	<b>Model QG100</b>	9-volt Battery (included)	<p>Operates from -40°F to 151°F 15% RH to 95% RH 6-Year limited warranty</p>	Listed to UL 2034
 <p>CO Alarm for Security and Fire Systems</p>	<b>Model 12-24SIR</b>	12 or 24VDC	<ul style="list-style-type: none"> <li>Low current draw: Standby 60 µAmp</li> <li>Non-latching alarm; Auto-reset with dual relays</li> <li>Operates from 32°F to 120°F, 15%RH to 95%RH</li> <li>6-year limited warranty</li> </ul>	Listed to UL 2075 Residential and Commercial use
 <p>Portable CO Detector</p>	<b>Model P-1</b>	9-volt Battery (included)	<ul style="list-style-type: none"> <li>Small size: 3¾" x 2⅝" x 1"</li> <li>Light weight: Only 5 ounces</li> <li>Clips to a car's sunvisor, or can be worn on belt</li> <li>5-year limited warranty</li> </ul>	
 <p>Passive Multi-Level CO Detector Card</p>	<b>Quantum Eye®</b>	(None Required)	<ul style="list-style-type: none"> <li>Minimum 18-month product life in U.S. and Canada</li> <li>Multi-level detection: Normal, Caution, and Danger</li> <li>Perfect for cockpit, car, or the fridge</li> <li>Unique packaging protects sensor from contamination</li> <li>This visual detector is about the size of a credit card</li> <li>Custom/Private label version available</li> </ul>	
 <p>24VAC Ventilation Fan Controller</p>	<b>Model 24VC</b>	24VAC	<ul style="list-style-type: none"> <li>Saves money by running garage fans only when necessary</li> <li>City of Los Angeles approved for electrical safety</li> <li>Set to comply with the OSHA standards in your area</li> <li>Operates from 41°F to 125°F, 10%RH to 90%RH</li> <li>2.5-year replaceable sensor</li> <li>5-year limited warranty on controller</li> </ul>	
 <p>120VAC Ventilation Fan Controller</p>	<b>Model 120VC</b>	120VAC	<ul style="list-style-type: none"> <li>Saves money by running garage fans only when necessary</li> <li>Set to comply with the OSHA standards in your area</li> <li>Operates from 41°F to 125°F, 10%RH to 90%RH</li> <li>2.5-year replaceable sensor</li> <li>5-year limited warranty on controller</li> </ul>	



QUANTUM GROUP INC.

6827 Nancy Ridge Dr. **1 800 432 5599**  
San Diego CA 92121-2233 Email: cs@QGinc.com

For more information, please visit [www.QGinc.com](http://www.QGinc.com)