



Operating Instructions  
Carbon Monoxide Monitor  
(Part Number: 380008)

**Introduction**

Carbon monoxide is a colorless, odorless gas. It is the only commonly used industrial gas which is both highly toxic and odorless. Symptoms of exposure to carbon monoxide include headaches, palpitations, dizziness, weakness and nausea. Low levels of carbon monoxide in air, which is not immediately hazardous to life, may impair reaction time or sensory perception. Chronic exposure to low levels of carbon monoxide may adversely affect the cardiovascular system. Loss of consciousness and death may result from continued or more intense exposure. OSHA PEL (permissible exposure limit) for carbon monoxide is 50 ppm (TWA). NIOSH REL (recommended exposure limit) for carbon monoxide is 35 ppm (TWA).

Carbon monoxide is a widely spread air pollutant. It is a byproduct in the combustion of gasoline, diesel, kerosene and coal fuel; therefore, carbon monoxide may exist in different industries, residential areas and highways.

**Principle of Operation**

The ChromAir passive monitor is a patented direct-read autogenic exposimeter. The device is constructed from six cells attached on one side to a flat indicator layer and on the other side to a series of different diffusive resistances. Carbon monoxide gas diffuses to the cells through the different diffusive resistances and reacts with the indicator layer, producing color change from light brown to brown to black. The color produced on the indicator layer is a direct measure of the exposure dose. Visual color comparison is achieved by observing the formation of the brown threshold color on the individual cell and reading the corresponding exposure dose.

**Physical Specifications:**

Dimensions	10.5 cm x 5.5 cm x 0.25 cm
Weight	11 g
Refrigerated shelf life	1 year
Color change	light brown to dark brown/black

**Sampling Parameters:**

Exposure range for:	
Badge	10 - 525 ppm•hr
Badge used with color comparator	10 - 630 ppm•hr
Maximum recommended sampling time	48 hours
Minimum recommended sampling time	5 minutes
Relative humidity range	19% - 85%
Face velocity range	10 - 165 cm/sec
Temperature range	10°C - 45°C (50°F - 113°F)
Mean coefficient of variation	±10.5
Bias at ambient conditions	-2.3%
Light effect - UV (direct sunlight)	no effect
Light effect - visible	no effect
Known Interferences	alkenes, hydrogen sulfide, and hydrogen

**Operating Instructions**

1. Allow the badge to warm to room temperature prior to removing the badge from its protective pouch.
2. Enter all pertinent information on the label before monitoring is started (i.e. name, location, date and start time).
3. Prior to exposure, remove the protective strip from the first cell on the front of the badge.
4. For personnel monitoring, attach the badge near the user's breathing zone (i.e. collar) with the front side exposed to the surrounding atmosphere.
5. For area monitoring, attach the badge to a stand and mount in a centralized area with the front side exposed to the surrounding atmosphere.
6. Check the back side of the badge periodically to determine the exposure dose (ppm•hr).
7. To read the badge, locate the highest level cell with brown threshold color.
8. To obtain the average concentration (ppm) in the surrounding atmosphere, divide the exposure dose (ppm•hr) by the exposure time in hours. EXAMPLE: If the sampling time is 2 hours and the badge reads 10 ppm•hr, the average concentration is determined by:  

$$\frac{10 \text{ ppm}\cdot\text{hr}}{2 \text{ hr}}$$
Therefore the average concentration is 5 ppm.

**WARRANTY EXCLUSIONS AND LIMITATION OF LIABILITY**

IF THE USER DOES NOT ACCEPT THE FOLLOWING TERMS, THE USER SHOULD NOT USE THE CHROMAIR BADGES AND COLOR COMPARATORS.

Seller warrants that, for the lesser of one (1) year or the shelf-life provided on the Seller's product, its packaging or its literature, its products shall conform to the description of such products as provided on the Seller's product, its packaging or its literature. **THIS WARRANTY IS EXCLUSIVE, AND SELLER MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.** Seller's warranties made in connection with this sale shall not be effective if Seller has determined, in its sole discretion, that Buyer has misused the products in any manner, has failed to use the products in accordance with safe industry standards and practices, or has failed to use the products in accordance with Seller's written operating instructions, or other instructions furnished by Seller to Buyer.

Seller's sole and exclusive liability and Buyer's exclusive remedy with respect to products to Seller's satisfaction to be defective or nonconforming shall be replacement of such products without charge or refund of the purchase price, in Seller's sole discretion, upon the return of such products in accordance with Seller's instructions. All claims must be brought within one (1) year of shipment, regardless of their nature.

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Warning: Keep out of reach of children, if ingested seek medical attention immediately.



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