



Respiratory Safety

The Breather Box® Portable Grade-D Breathing Air Filtration

Issue: Breathing air quality standards for Type C/CE airline respirators have been developed by ANSI/Compressed Gas Association (CGA) G-7.1 - 1989, and adopted by OSHA under their respiratory standard 29 CFR, 1910.134. The standard requires airline respirator wearers must be supplied with Grade-D air quality while working in a hazardous or potentially hazardous location.

Application: The Breather Box® provides portable Grade-D filtered air to operate airline respirators. The Breather Box® is available to serve 1 to 8 workers. The standard Breather Box® is designed for use in non-hazardous locations. Intrinsically safe versions are available for hazardous locations.

Recommendation: Connected to a mobile or plant compressor, the Breather Box® is a portable filtration system designed to provide Grade-D breathing air for a specific number of workers and to monitor for Carbon Monoxide (CO). Air Systems' portable and fixed breathing air filtration systems meet or exceed OSHA 1910.134, Canadian Z180.1 Breathing Air Standards and British Standard BS-EN 12021:1999 "Respiratory Protective Devices" for Grade-D air. Sizing of the filtration system, determining what size Breather Box® or panel to order, is based on the total flow (CFM) requirements of the airline respirators being worn and the number of workers.



**BB50-CO
Breather Box®**

Air quality must meet or exceed the following requirements as stated in ANSI/Compressed Gas Association (CGA) G-7.1 - 1989, and adopted by OSHA under their respiratory standard 29 CFR, 1910.134.

Air Quality Must Meet the Following Requirements:

- Oxygen: 19.5%-23.5% (20%-22% Canada)
- Hydrocarbon (condensed oil): 5 mg/m³ maximum (<1 mg/m³ in Canada)
- Carbon Monoxide (CO): 10 ppm maximum (5 ppm in Canada)
- Carbon Dioxide (CO₂): 1000 ppm maximum (500 ppm in Canada)
- Odor: No noticeable odors, tastes, or smells
- Water Content:
 - High pressure cylinder air** must have a dew point of at least -50°F (-45.6°C) at 1 atmosphere (14.7 psi).
 - Low pressure breathing air** must have a dew point of at least 10°F (5.56°C) below the ambient temperature at 1 atmosphere (14.7 psi)
 - Canada:** 5°C below lowest temperature, 27 ppm maximum water vapor
- Total Volatile Hydrocarbons (Canada): 5 ppm maximum

Sizing the Breather Box® Grade-D Air Filtration Unit

Sizing of the filtration system, determining what size Breather Box® or panel to order, is based on the air flow (CFM) of the respirators being worn, and the number of workers. Air Consumption (CFM) and Pressure (PSI) ranges for representative types of airline respirators are listed below:

Pressure Demand	4-15 cfm @ 60-120 psi
Constant Flow Half/Full Mask	4-15 cfm @ 4-30 psi
Constant Flow Hood (Low Pressure)	6-15 cfm @ 3-15 psi
Constant Flow Hood (High Pressure)	6-15 cfm @ 25-110 psi
Vortex Cooling Tube*	15-25 cfm @ 60-110 psi

**If a vortex cooling or heating tube is used by the worker, the total air consumed is calculated by the air consumption of the vortex device.*

Once the total number of workers are established and the type of respirator to be used is selected, multiply the number of workers by the respirator flow rate required per worker to determine total flow requirements:

Example: 4 workers using 4 hood style respirators 4 x 15 cfm = 60 cfm required

Filtration recommended: Air Systems' BB50-CO Breather Box® for 4-workers, with CO monitor (maximum flow capacity of 79 cfm). User must have enough compressor flow (cfm) capacity to supply the above respirators, plus additional air needs placed on the system, i.e. air tools, spray nozzles, sandblasting, painting, etc.

All Air Systems' filtration products are designed to flow the maximum amount of air a worker's respirator could demand. NEVER undersize a filtration system.





Respiratory Safety

The Breather Box® Portable Grade-D Air Filtration

Product Features:

- **1ST Stage Filter** - Filter change indicator, automatic drain, removes liquids and particulate to 5.0 micron particle size
- **2ND Stage Filter** - Filter change indicator, automatic drain, provides oil coalescing and ultra-fine particulate filtration that is 99.99% efficient at 0.01 micron particle size
- **3RD Stage Filter** - Filter change indicator, manual drain, charcoal removes organic vapors and objectionable odors
- In-Line Carbon Monoxide (CO) monitor - optional CO/O₂ monitor
- 2-year warranty on sensor and entire CO monitor
- **Three standard power options:** dual 9VDC battery, 8-16VDC, and/or 115VAC, 60 Hz (50 Hz optional)
- AC output supplied standard on all panel mount units (optional intrinsically safe monitors supplied with 9VDC only)
- All portable and fixed units are available with CSA certified intrinsically safe monitor for work in hazardous locations
- External mounted CO warning LED lights and audible alarm (95 dBA)
- Remote DC alarm jack with cover cap are standard on most portable units
- All Breather Box® filtration units are designed for use in the closed and upright position to prevent internal contamination
- Filter change indicator provided on all 3 filters
- Safety visual flowmeter to verify air flow to monitor, adjustable flow rate: 50-100 cc
- Safety relief valve set at 125 psi for outlet pressure
- All respirator couplings provided with safety lock feature
- 0-160 psi pressure gauge
- Maximum Inlet Pressure - 150 psi



The Breather Box® portable air filtration system is designed to filter incoming air from a compressor to provide airline respirator users Grade-D quality air while monitoring for CO and/or O₂.



Portable Grade-D Breathing Air Filtration with CO Monitor

Item No.	Description
BB15-CO	15 cfm Breather Box®, 48 cfm flow capacity, 1 coupling
BB30-CO	30 cfm Breather Box®, 48 cfm flow capacity, 2 couplings
BB50-CO	50 cfm Breather Box®, 79 cfm flow capacity, 4 couplings
BB75-CO	75 cfm Breather Box®, 97 cfm flow capacity, 6 couplings
BB100-CO	100 cfm Breather Box®, 123 cfm flow capacity, 4 couplings
BB100-CO8	100 cfm Breather Box®, 123 cfm flow capacity, 8 couplings
BB150-CO	150 cfm Breather Box®, 203 cfm flow capacity, three ½" industrial interchange couplings. Requires use of a Point of Attachment



CO Monitor Calibration Kit - Small Cylinders

Item No.	Description
BBK-20	Calibration kit for CO monitor - 20 ppm CO, zero air, regulator, tubing, and hard case, 17 liter size disposable cylinders
BBK-10	Calibration kit for CO monitor - 10 ppm CO, zero air, regulator, tubing, and hard case, 17 liter size disposable cylinders, for Canadian CO monitor settings

**All Breather Box® Units
Are Designed To Flow The
NIOSH Maximum Capacity
Per Worker, 15 CFM**

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