

Occupational Health & Safety

Portable Grade-D Filtration

The Breather Box™

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 that 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 in for models to serve 1 to 4 workers. This standard Breather Box™ is used in non-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 flow (CFM) and pressure requirements (PSI) of the respirators being worn and the number of workers.



2AG30

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 or Exceed the Following Requirements:

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

Sizing the Breather Box™ Grade-D Filtration Unit

Sizing of the Breather Box™ filtration system, is based on the flow (CFM) and pressure requirements (PSI) of the respirators being worn and the number of workers.

Air Consumption (CFM) and Pressure (PSI) ranges for representative types of 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 (Option)*	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' 2AG30 (BB50-CO) Breather Box™, 4-workers, with CO monitor (maximum flow capacity of 79cfm). 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.

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



Occupational Health & Safety Portable Grade-D Filtration The Breather Box™

Product Features:

- **1ST Stage Filter** w/ Filter Change Indicator, Automatic Drain, Removes Liquids and Particulate to 5.0 micron Particle Size
- **2ND Stage Filter** w/ Filter Change Indicator, Automatic Drain, Provides Oil Coalescing and Ultra-fine Particulate Filtration to .01 micron particle size
- **3RD Stage Filter** w/ Filter Change Indicator, Manual Drain contains Charcoal and Removes Organic Vapors and Objectionable Odors, .03 micron filtration
- In-Line Carbon Monoxide (CO) Monitor (Optional CO/O₂ Monitor)
- All portable units CSA approved
- Intrinsically safe monitor for work in hazardous locations
- 2-year Warranty on Sensor and Entire CO Monitor
- Filter Change Indicator provided on all 3 filters (5CFL6 series has Filter Change Indicator installed (second stage only)
- Three Standard Power Options: Dual 9-Volt Battery, 8-16 VDC and/or 115 Volt AC, 60Hz (220 VAC/50Hz Optional)
- Safety Relief Valve set at 125 psi on outlet pressure
- Solid Anodized Aluminum Block Manifold with manual drain
- 0 - 160 psi Pressure Gauge
- Visual Flowmeter to Verify Air Flow to Monitor, adjustable flow rate, 50 -100 cc
- External Mounted CO Warning LED Lights and Audible Alarm
- Remote DC Alarm Jack with Cover Cap are standard on portable units (Optional on Model 5CFL6)
- Maximum Inlet Pressure - 150 psi
- All respirator couplings provided with safety lock feature



All filtration units are designed to flow the NIOSH maximum capacity per worker



Breather Box™ Portable Grade-D Filtration Unit

Description	ASI Part #	Grainger Item #
15cfm Breather Box™, CO monitor - (30cfm flow capacity) -1 coupling	BB15-CO	5CFL6
30cfm Breather Box™, CO monitor - (48cfm flow capacity) - 2 couplings	BB30-CO	1XEN5
50cfm Breather Box™, CO monitor - (79cfm flow capacity) - 4 couplings	BB50-CO	2AG30
100cfm Breather Box™, CO monitor - (123cfm flow capacity) - 4 couplings	BB100-CO	5CFL7

Calibration Kit

Description	ASI Part #	Grainger Item #
Calibration kit for CO monitor - 20ppm CO, zero air, regulator, pressure gauge, tubing, and hard case- 17 liter size disposable cylinders	BBK-20	2AM39