



# *Respiratory Training*

## Fundamentals Of Respiratory Protection



### *Respiratory Protection*



### *Do It Right The First Time*



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# Understanding Breathing Air Systems

To understand breathing air you MUST first understand the various types of NIOSH approved respirators available to meet respiratory hazards.

All respirators are classified as either Negative Pressure or Positive Pressure Respirators.



## Negative Pressure Disposable Mask Respirator

The respirator wearer must inhale through the mask. Approved for dusts, mists, vapors and fumes.

**Not approved for use in IDLH atmospheres  
(Immediately Dangerous to Life or Health)**

## Negative Pressure Disposable Cartridge Respirator

This style of respirator has replaceable cartridges or filters and comes in half mask or full face. Powered Air Purifying Respirators (PAPR) are a type of cartridge filtering respirator with a battery powered blower. They are approved for use where a filter cartridge is approved for the contaminant.

*Note: Users must be fit tested to assure a proper face seal is achieved.*

**Not approved for use in IDLH atmospheres**



## Positive Pressure (Type-C or CE) Airline Respirator Constant Flow Hood Style

All constant flow respirators supply air continuously to maintain positive pressure inside the face piece or hood.

All airline respirators are classified by NIOSH as Type-C or Type-CE (approved for sandblasting).

Hood Style airline respirators are required by NIOSH to flow 6 - 15 cfm air flow per person.

Hoods are available in low pressure style for use with ambient air pumps, requiring 3 - 15 psi.

High pressure hoods, 25 - 110 psi, would require Grade-D breathing air provided by a Breather Box®.

*Note: No fit test is required with a hood style respirator.*

**Not approved for use in IDLH atmospheres**



## Positive Pressure (Type-C) Airline Respirator - Constant Flow Mask

Positive Pressure respirators are available in half mask or full face and are required by NIOSH to flow 4-15 cfm per mask, and available in low pressure style for ambient air pumps, requiring 3 - 15 psi. High pressure style, 25 - 110 psi, would require Grade-D breathing air provided by a Breather Box®. Constant flow respirators provide higher protection factors than air-purifying negative pressure respirators and are not recommended for use with high pressure bottled air systems due to their high air consumption.

**Not approved for use in IDLH atmospheres**



## Positive Pressure (Type-C) Airline Respirator Pressure Demand Style

Pressure Demand (PD) respirators supply air "on demand" and maintain a minimum positive pressure in the face piece at all times. PD respirators are required by NIOSH to flow 4 - 15 cfm to the mask like a constant flow style respirator. Pressure demand respirators provide a high protection factor and can be used on high pressure cylinder air or low pressure filtration systems such as a Breather Box®.

All PD respirators operate between 60 - 110 psi and require the use of Grade-D breathing air provided by a Breather Box® or Grade-E cylinder air.

**Pressure demand respirators with a five minute escape cylinder can be used in IDLH atmospheres**



# Elements of a Type-C/CE Supplied Air System

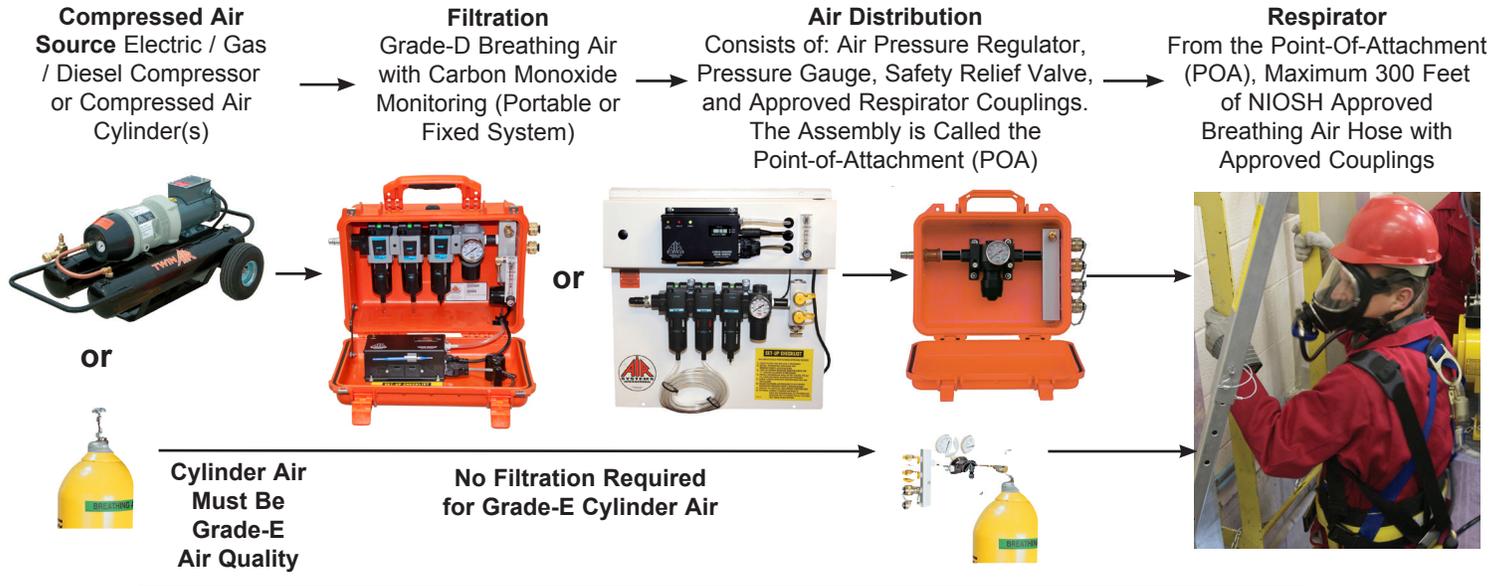


*Note: Type-C/CE is a NIOSH designation for an air supplied breathing air respirator system.*

*All airline respirators are Type-C or Type-CE.*

**CE designates an airline respirator approved for abrasive blasting.**

## A Type-C/CE system consists of the following components:



## Sizing a Type-C/CE Airline Filtration System

Sizing of the filtration system, determining what size Breather Box® or panel to order, is based on the air 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 is established and the type of respirator selected, multiply the number of workers by the respirator's maximum 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®, 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.

When ordering a Breather Box®, the customer **MUST** specify the fittings used on the respirator(s) selected. The Breather Box® fittings must be the same type as the respirator hose fittings to maintain NIOSH approval on the respirator and hose assembly.

**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.**

# Air Filtration Products

## The Breather Box®



BB50-CO

## Portable CO Monitor



CO91-14LAC



## Breathing Air Compressor System



COMP-3

## Ambient Air Pump



BAC-10

For a more comprehensive overview of our respiratory product line, please see our Master Catalog.



## Blast-Air™ Cart



BA-100

## MULTI-PAK™ Air Cylinder Carts



For Use in Hazardous Locations



Cylinders Not Included

Full Line Catalog Available at [www.airsystems.com](http://www.airsystems.com)