

## Reference Guide for 3M Continuous Flow Supplied Air Respirators

### Introduction

Atmosphere-Supplying Respirators provide the wearer with breathing air from an independent source. There are three types of supplied air respirators:

1. Supplied air (airline) respirators (SARs)
2. Self-contained breathing apparatus (SCBAs)
3. Combination SARs/SCBAs

Only SCBAs and Combination SARs/SCBAs may be considered for use in Immediately Dangerous to Life or Health (IDLH) atmospheres.

Supplied air respirators (SARs) are commonly referred to as airline respirators because the breathing air is provided to the wearer via an airline. The source of the breathing air may be a compressor (referred to as high pressure), ambient air pump (referred to as low pressure) or a cylinder. All atmosphere-supplying respirators must be NIOSH approved, and the quality of the breathing air must meet Grade D requirements in the USA or CSA Z180.1 in Canada.

While continuous flow SARs (airline respirators) exist in both pressure-demand and continuous flow modes, only the 3M continuous flow options will be discussed in guide.

A NIOSH Approved Type C, continuous flow supplied air respirator commonly includes the following components: air line/hose with couplings; valve/regulator; belt; breathing tube and facepiece/hood/helmet.



Since supplied air respirators are approved as a complete system, any modification to a system must be submitted to NIOSH for approval.

Each person using a supplied air respirator must read and understand the information in the User Instructions. Use of equipment by untrained or unqualified persons or use that is not in accordance with the User Instructions, may adversely affect product performance and result in sickness or death. Use of respirators must be in accordance with applicable health and safety regulations and standards. A written respirator program must be in place in accordance with the OSHA respiratory protection standard 29 CFR 1910.134. In Canada, follow CSA Standard Z94.4 or the requirements of the authority having jurisdiction in your region.

## Considerations before Implementing a Continuous Flow Supplied Air Respirator

**Compressor Capacity:** A compressor is required to supply air to an air filtration and regulator panel. Before considering this option check the current compressor specifications:

Compressor Rating	3M Supplied Air Respirator Requirements
PSIG (pounds per square inch gauge)	<p>The pressure (PSIG) requirements for each 3M SAR are indicated in the <a href="#">User Manual for the V-Series Air Control Devices</a>.</p> <p>Remember to account for the pressure drop that will occur as the air passes through the air filtration panel (this is discussed later in this document).</p> <p>The line pressure must be kept within safe limits (125 PSIG maximum).</p>
CFM (cubic feet per minute)	<p>Each 3M V-Series supplied air valve requires 20 CFM.</p> <p>Ensure the compressor has adequate capacity to supply the respirators and other sources (ex. pneumatic tools, etc.).</p> <p>If the compressor capacity is expressed in terms of horsepower, you can estimate it. CFM = 4 x horsepower.</p>

**Air Quality:** The employer must ensure that the compressed breathing air quality meets the requirements of the authority having jurisdiction. As a result, they may wish to test the compressor's air quality before considering an air filtration panel to determine:

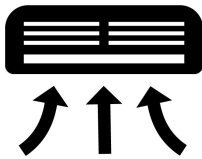


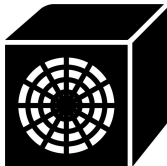


If an air filtration panel may be effective.

- Depending on the jurisdiction, compressed breathing air quality testing may include the following components: oxygen, nitrogen, carbon monoxide, carbon dioxide, methane, volatile organic compounds, particulates, oil, odour and moisture content
- While air filtration panels are intended to filter compressed air to be used with supplied air respiratory protection systems, there is no assurance that the filtered compressed air will meet the air quality requirements.
- Certain contaminants (i.e. carbon dioxide, methane) are not removed or removed efficiently using an air filtration panel
- High concentrations of certain contaminants may necessitate higher than average filter replacement frequencies. The filter cartridges have an average life expectancy of one (1) to two (2) months (or approximately 160-320 hours, depending on the quality of the air in your compressed airlines) under normal conditions. The frequency of filter change will depend on the quality of the incoming compressed air and how much the panel is used. All three (3) filters should be changed at the same time.
- Oil mist from the compressor lubricating oil must not be present when the air reaches the air control device. Excessive amounts of water vapor and any particulate matter should also be removed as they may affect performance of the air control devices. Where large amounts of aerosols of oil, water and other liquids are present, an optional coalescing should be installed on the input side of the 3M filter and regulator panel

Which model of air filtration panel may be appropriate.

- Certain models can convert approximately 60% of carbon monoxide to carbon dioxide
- CO amounts above 10ppm (in the USA) or 5ppm (in Canada) can lead to unconverted CO and trigger the CO alarm

## Standard Continuous Flow Supplied Air Respirator Components (High Pressure)

Air Intake	Compressor	Storage	Dryer	Compressed Air Piping	3M Filter and Regulator Panel	
						3M NIOSH Approved SAR
Air (and humidity) are drawn into the compressor. →	The air is compressed (temp ↑, humidity ↓). →	Air is stored until needed. →	Air is commonly dried (humidity ↓). →	Compressed air is then distributed throughout the facility. →	SERVICE OUTLET → Air filtration Pressure regulation CO Monitor	
<b>Remember:</b> these items are not part of the NIOSH approval						

### Compressor Air Intake

The location of the air intake is very important and can have a significant impact on the quality of the compressed air. Contamination from the environment can be drawn into the compressed air system and negatively affect the compressed air quality. A risk assessment should be conducted when selecting the location of the air intake. The intake should be placed in a contamination free area and designed to minimize the entry of contaminants. Consider proximity of local exhaust ventilation outlets and of equipment/ automobile/truck exhausts or adjacent industrial activity, etc.

Check for the following:

- Where is the compressor intake? Is it outside, within the compressor room or elsewhere within the facility? Does this change from one season to the next? Is there a potential for contaminated air to be drawn into the compressor?
- Additional Canadian specific requirements for an air intake per CSA Z180.1 include the following: Identified and labeled as a source for breathing air; located in an area free from potential sources of contaminants; should be outside, and must be at least 3m above grade and at least 15 m upwind from potential sources of contamination; protected so as not to allow entry by pests or vermin; periodically inspected; equipped with a wind direction indicator.

### Compressor

- The compressor draws in ambient air to produce compressed air. The resulting compressed air may be used for both manufacturing processes (spray painting, pneumatic tools, hoists, cylinders, etc.) and eventually compressed breathing air.
- There are three major types of air compressors: reciprocating (piston), rotary screw, and centrifugal. Any type of compressor can be used for compressed breathing air. Compressors may be portable or stationary.
- Compressors used for breathing air must be properly installed and maintained according to the manufacturer's directions and appropriate records must be kept.
- Oil-free compressors do not use oil for internal "air side" lubrication.
- Compressors that require oil for internal lubrication are commonly referred to as "oil lubricated." Additional requirements for oil-lubricated compressors include the following: oils must be selected per manufacturer's instructions; automatic shut-down and alarms for high temperature, low oil pressure, and high air pressure; and continuous carbon monoxide (CO) monitoring and CO alarm.
- According to OSHA regulation [29 CFR (1910.134)(i)], periodic CO monitoring, rather than continuous CO monitoring with an alarm, is acceptable if the oil lubricated compressor is equipped with a high temperature alarm and automatic shut-down. In Canada, follow CSA Z180.1 regarding oil lubricated compressors.

## Service Outlet (Point of Connection)

- The employer must provide breathing air that meets at least the requirements of the specification for Grade D breathing air, as described in the Compressed Gas Association Commodity Specification G-7.1-1997 in the United States. In Canada, refer to CSA standard Z180.1, table for the quality of compressed breathing air.
- Must supply air that meets the pressure (psig) and volume (CFM) requirements for the specific respirator (as indicated in the user manual)
- Location where the NIOSH approved supplied air respirator is connected
- Location where the compressed breathing air quality testing is conducted
- Commonly consists of:
  - Quick disconnect fittings. OSHA and CSA Z180.1 require that fittings be selected to prevent accidental connection to non-respirable sources. 3M valves and airlines are commonly shipped with Industrial Interchange (Hansen/Parker). Fittings are components of the NIOSH approval. Only alternate approved fittings listed in the UI may be used.
  - Manifold
  - Pressure regulator and gauge (to ensure the pressure requirements indicated in the respirator user manual are met)
- Labelled and used for compressed breathing air only
- A 3M™ Portable Compressed Air Filter and Regulator Panel may serve as the SERVICE OUTLET
- An alternate SERVICE OUTLET may be considered when the work area is of considerable distance from the filtration panel provided it satisfies the above requirements

## NIOSH Approved Supplied Air Respirator

A NIOSH Approved Type C, continuous flow supplied air respirator commonly includes the following components:

1. Air line/hose with couplings
2. Valve/regulator
3. Belt
4. Breathing tube
5. Facepiece/hood/helmet

3M offers continuous flow supplied air respirators in both high pressure (compressor fed) and low pressure (ambient air pump) configurations. The air source is not part of the NIOSH approval. The NIOSH approved supplied air respirator begins where the airline connects to the SERVICE OUTLET (think “hose to nose”).

Item	3M High Pressure Configuration	3M Low Pressure Configuration
Hose/Airline	W-9435 Standard Airline W-9445 Std with Schrader Fittings W-2929 Coiled Airline	W-3020 Low Pressure Airline
Valve	V-100 Cooling Valve V-200 Warming Valve V-300 Valve	V-400 Low Pressure Valve
Belt	TR-325 Standard Belt TR-326 High Durability Belt TR-327 Easy Clean Belt	TR-325 Standard Belt TR-326 High Durability Belt TR-327 Easy Clean Belt
Adapter	V-199 (loose-fitting) V-399 (tight-fitting)	V-199 (loose-fitting) V-399 (tight-fitting)
Loose Fitting Breathing Tubes	BT-20S, BT-20L, BT-30, BT-40SG-30, SG-30L, SG-40	BT-20S, BT-20L, BT-30, BT-40SG-30, SG-30L, SG-40

# Personal Safety Division

Item	3M High Pressure Configuration	3M Low Pressure Configuration
Loose Fitting Head tops	S-Series Hoods and Headcovers M-Series Head tops and Helmets 9100MP, G5-01, G5-03 Pro Air	S-Series Hoods and Headcovers M-Series Head tops and Helmets 9100MP, G5-01, G5-03 Pro Air
Tight Fitting Breathing Tubes	SA-1600 Comb. Front Mounted SA-2600 Comb. Back Mounted W-3188 (+W-3187 adapter)	SA-1600 Comb. Front Mounted SA-2600 Comb. Back Mounted W-3188 (+W-3187 adapter)
Tight Fitting Facepieces	HF: 6000, 6500, 7500 FF: 6000, 6000DIN, FF-400, 7800S	HF: 6000, 6500, 7500 FF: 6000, 6000DIN, FF-400, 7800S
<p>Refer to the User Instructions and/or the NIOSH Approval Label for a listing of components and optional accessories that can be used to assemble a complete NIOSH approved respirator system or contact 3M.</p> <p><b>3M 6500QL is not approved for use in supplied air configurations.</b></p>		

## V-Series Assemblies and Kits (2025)

Kit/ Assembly Components	V-100	V-100SR	V-200	V-300	V-300SR	V-400	V-100- PSK	V-100- HIK	V-100- PHK	V-300DA
V-100 Valve							✓	✓	✓	
V-100SR Valve		✓								
V-200 Valve			✓							
V-300 Valve				✓						✓
V-300SR Valve					✓					
V-400 Valve						✓				
V-199 Adapter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
V-399 Adapter				✓	✓	✓				✓
BT-30							✓	✓	✓	
SA-2600										✓
M-206							✓			
M-307								✓		
S-757									✓	
W-9435-25							✓	✓	✓	
TR-325 Belt	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
V-112 Pad	✓	✓	✓				✓	✓	✓	

Kit/ Assembly Components	V-100	V-100SR	V-200	V-300	V-300SR	V-400	V-100- PSK	V-100- HIK	V-100- PHK	V-300DA
BT-922 Cover							✓		✓	
BT-926 Cover								✓		

## 3M Supplied Air Brochures

English: <https://multimedia.3m.com/mws/media/2620234O/3m-psd-psa-versaflo-supplied-air-brochure-updates-hr-usac-en.pdf>

French Canadian: <https://multimedia.3m.com/mws/media/2626875O/3m-psd-psa-supplied-air-brochure-updates-hr-fr-ca.pdf>

## 3M Supplied Air Hose/Airline




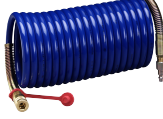

Compressed breathing air is delivered to the worker via the supplied air hose/airline. Supplied air hoses/airlines and fittings are part of the NIOSH approved respirator and cannot be modified unless authorized by the manufacturer.

Airline couplings MUST be incompatible with outlets for other gas systems to prevent inadvertent servicing of airline respirators with non-respirable gases or oxygen.

See the V-Series Valve User Instructions for approved hose combinations and refer to the NIOSH approval label for approved system configurations.

Testing and requirements for supplied air hoses include the following:

- Maximum length (300 feet for high pressure configurations, 100 feet for low pressure)
- Non-collapsibility
- Non-kinkability
- Strength of hose and couplings
- Tightness (i.e. leakage)
- Gasoline permeation
- Detachable couplings

3M Supplied Air Hoses/Airlines and Fittings (couplings)					
Item	W-9435	W-9445	W-2929	W-2929SR	W-3020
	W-9435-25	W-9445-25	W-2929-25	W-2929SR-25	W-3020-25
	W-9435-50	W-9445-50	W-2929-5	W-2929SR-50	W-3020-50
	W-9435-100	W-9445-100	W-2929-100	W-2929SR-100	W-3020-100
Pressure	High	High	High	High	Low
Image					
Connector Style	Industrial Interchange (II)	Schrader	Industrial Interchange (II)	Schrader	Industrial Interchange

Connector P/N	W-3080-2 Plug W-3184-2 Socket	W-3183-2 Plug W-3185-2 Socket	W-3080-2 Plug W-3184-2 Socket	W-3183-2 Plug W-3185-2 Socket	W-3057-2 Plug W-3224-2 Socket Optional Schrader W-3198-2 Plug W-3199-2 Socket
Material	Straight Blue EPDM	Straight Blue EPDM	Coiled Blue Nylon	Coiled Blue Nylon	Straight Red
Connections	Refer to UI	Refer to UI	None	None	None
Supplied Air Hoses (High Pressure) and Fittings User Manual: <a href="https://multimedia.3m.com/mws/media/1552650/high-pressure-supplied-air-hoses-and-fittings-user-instructions.pdf">https://multimedia.3m.com/mws/media/1552650/high-pressure-supplied-air-hoses-and-fittings-user-instructions.pdf</a> Supplied Air Hoses (Low Pressure) and Fittings User Manual: <a href="https://multimedia.3m.com/mws/media/4777520/3m-supplied-air-hose-w-3020-user-instructions.pdf">https://multimedia.3m.com/mws/media/4777520/3m-supplied-air-hose-w-3020-user-instructions.pdf</a>					

## 3M Air Regulating Valves/Regulators

The 3M V-Series Air Regulating Valves/Regulators are designed to be used with certain 3M headgear, breathing tube and supplied air hose to form a complete NIOSH approved respiratory system. When used in accordance with its NIOSH approval, these systems can provide positive pressure, supplied air respiratory protection. Refer to the NIOSH approval label for approved system configurations.

To meet NIOSH requirement 42 CFR 84, subpart 84.150 for minimum and maximum airflow (4-15 cfm, 113-425 lpm), the air control valves approved for use with the 3M respirators must be operated within the supply pressure ranges and hose lengths stated in their User Instructions.

3M Air Regulating Valves/Regulators						
Item	V-100	V-100SR	V-200	V-300	V-300SR	V-400
Pressure	High	High	High	High	High	Low
Image						
Assembly includes:	V-199 Adapter TR-325 Belt V-112 Pad	V-199 Adapter TR-325 Belt V-112 Pad	V-199 Adapter TR-325 Belt V-112 Pad	V-199 Adapter V-399 Adapter TR-325 Belt	V-199 Adapter V-399 Adapter V-399 Adapter TR-325 Belt	V-199 Adapter V-399 Adapter TR-325 Belt
Connector Style	Industrial Interchange	Schrader	Industrial Interchange	Industrial Interchange	Schrader	Industrial Interchange
Connector P/N	W-1279-2 Plug	W-3186-2 Plug	W-1279-2 Plug	W-1279-2 Plug	W-3186-2 Plug	W-3252-2 Plug


Temperature	Cools by up to 50°F (28°C)	Cools by up to 50°F (28°C)	Warms by up to 50°F (28°C)	NA	NA	NA
Loose-fitting Adapter	V-199	V-199	V-199	V-199	V-199	V-199
Tight-fitting Adapter	Not approved	Not approved	Not approved	V-399	V-399	V-399

3M V-Series Air Control Devices User Manual: <https://multimedia.3m.com/mws/media/2589623O/v-series-air-control-devices.pdf>

For a list of alternate fittings please consult:

- <https://multimedia.3m.com/mws/media/155265O/high-pressure-supplied-air-hoses-and-fittings-user-instructions.pdf>
- <https://multimedia.3m.com/mws/media/477752O/3m-supplied-air-hose-w-3020-user-instructions.pdf>

## 3M Belts for Use with Supplied Air Respirators

TR-325 Standard Belt	TR-326 High Durability Belt	TR-327 Easy Clean Belt
Included with V-Series Valves	Optional alternative	Optional alternative
		
Polyester ~62in (157cm)	Leather ~52in (132cm)	Polyurethane Coated with Polyethylene Webbing ~62in (157cm)




Refer to the User Instructions and/or the NIOSH Approval Label for a listing of components and optional accessories that can be used to assemble a complete NIOSH approved respirator system.

All belts can be interconnected for expanded size range.

Belt extender (15-0099-06 Leather belt extender ~36in [91cm]) available for the TR-326 belt.


## 3M Supplied Air Adapters




Certain adapters are required to connect certain breathing tubes. Refer to the NIOSH approval label for approved system configurations.

3M Supplied Air Adapters			
Item	V-199 Adapter	V-399 Adapter	W-3187 Adapter
Pressure	High/Low	High/Low	High/Low
Image			
Description	Required to connect an approved supplied air valve (V-100, V-200, V-300 or V-400) to an approved loose fitting breathing tube.	Required to connect an approved supplied air valve (V-300 or V-400) to an approved tight-fitting breathing tube.	Required to connect the W-3188 Breathing tube to the 6000DIN or 7800s. Brass fitting included with the W-3187 allows the W-3188 to connect to the V-399.

## 3M Supplied Air Breathing Tubes

Refer to the User Instructions and/or the NIOSH Approval Label for a listing of components and optional accessories that can be used to assemble a complete NIOSH approved respirator system or contact 3M.

3M Loose Fitting Breathing Tubes for Use with Supplied Air							
Model	BT-20S	BT-20L	BT-30	BT-40	SG-30W	SG-30WL	SG-40W
Image of the BT-20S							
Length (in)	28	38	26-42	33	21-41	24-46	29.5
Material	Polyurethane	Polyurethane	Polyurethane	Neoprene	Polyurethane	Polyurethane	Neoprene
Weight (g)	152	175	186	318	140	155	250

3M Tight Fitting Breathing Tubes for Use with Supplied Air			
Model	SA-1600	SA-2600	W-3188
Image			
Mounting	Front	Back	Front
Tight Fitting Facepieces	HF: 6000, 6500, 7500 FF: 6000, 6000DIN, FF-400, 7800S	HF: 6000, 6500, 7500 FF: 6000, 6000DIN, FF-400, 7800S	FF: 6000DIN, 7800S
Configuration	Use with 2 included 3M 6880 bayonet caps or approved filters or cartridges.	Use with 2 included 3M 6880 bayonet caps or approved filters or cartridges.	6000DIN: Requires 2 x 6880 Bayonet caps or NIOSH-approved filters or cartridges.  7800s: Requires 2 x 7890 plugs or 2 x 6880 bayonet caps or NIOSH-approved filters or cartridges. 7880s is shipped with one 7890 Full Face Plug.
Required Adapters	V-399	V-399	V-399  W-3187 (plus included brass fitting)

## 3M Supplied Air Headtops

3M headgear (respiratory inlet covering) used as part of a NIOSH approved supplied air respirator may include a tight fitting facepiece, loose fitting facepiece, hood, helmet or some combination of these that serves as a respiratory protective covering for the nose and mouth area. Refer to the User Instructions and/or the NIOSH Approval Label for a listing of components and optional accessories that can be used to assemble a complete NIOSH approved respirator system or contact 3M.

3M Loose Fitting Headtops for Use with Supplied Air		
M-Series	S-Series	Welding
M-206, M-207	S-103S, S-103L	9100MP
M-305, M-307	S-133S, S-133L	G5-01
M-405, M-407	S-403S, S-403L	G5-03 Pro Air
M-407SG, M-409SG	S-533S, S-533L	
	S-655, S-657, S-665	
	S-757, S-767	
	S-855, S-857, S-867	

3M Tight Fitting Headtops for Use with Supplied Air	
Half Face Options	Full Face Options
6000 Series (6100, 6200, 6300)	6000 Series (6700, 6800, 6900)
6500 Series (6501, 6502, 6503)	6000DIN Series (6700DIN, 6800DIN, 6900DIN)
7500 Series (7501, 7502, 7503)	FF-400 Series (FF-401, FF-402, FF-403)
	7800S Series (7800S-S, 7800S-M, 7800S-L)




**i NOTE**

The 3M™ Rugged Comfort Quick Latch Half Facepiece Reusable Respirator 6500QL is not NIOSH-approved with supplied air systems.

## 3M Portable Compressed Air Filter and Regulator Panels

The 3M™ Compressed Air Filter and Regulator Panels are intended to filter and regulate compressed air to be used with supplied air respiratory protection systems. The filtration panel is not part of the NIOSH approval.

Depending on the model selected, the filtration and regulation panel may: remove certain airborne contaminants including carbon monoxide, other gases and particulates; continuously monitor the air for carbon monoxide; regulate the air pressure and serve as the SERVICE OUTLET.

3M Portable Compressed Air Filter and Regulator Panels			
Item	W-2806	256-02-00	256-02-01
Image			
CFM Rating (max)	50	50	100
Outlets	3 (optionally 2 more)	4	8
CO Monitor and Alarm	Optional W-2808	Included	Included
CO Filtration	No	Yes (limited, ~60%)	No
Activated Charcoal Filter	Yes	Yes	Yes
Particulate and liquid removal	Yes	Yes	Yes
Installation	Fixed	Portable	Portable
Replacement Filter Kit	W-2811-10	523-01-28	523-01-29
Standard Industrial Interchange Socket	W-1449-2 (1/4-inch body size, 3/8-inch MPT)	W-1449-2 (1/4-inch body size, 3/8-inch MPT)	W-1449-2 (1/4-inch body size, 3/8-inch MPT)
Optional Schrader Socket	W-1449-2 (1/4-inch body size, 3/8-inch MPT)	W-3182-2 (1/4-inch body size, 3/8-inch MPT)	W-3182-2 (1/4-inch body size, 3/8-inch MPT)
Weight		31lbs. (14.1kg.) (includes monitor)	32lbs. (14.5kg) (includes monitor)
Dimensions	14.25"L x 4.75"W x 14.25"H (359mm x 121mm x 362mm)	23.25"L x 20.75"W x 9"D (590mm x 5276mm x 229mm)	23.25"L x 20.75"W x 9"D (590mm x 5276mm x 229mm)
Recommended inlet conditions	90-120 psig (max 125)  Supply line minimum 1/2" I.D. 35-150°F (2-65°C)  Minimum of 25 feet from the compressor	90-120 psig (max 125)  Supply line minimum 1/2" I.D. 68-150°F (20-65°C)  Minimum of 25 feet from the compressor	90-120 psig (max 125)  Supply line minimum 3/4" I.D. 35-150°F (2-65°C)  Minimum of 25 feet from the compressor

## 3M Air Filter and Regulator Panel User Manuals

- 3M™ Portable Compressed Air Filter and Regulator Panel 256-02-00, 50 CFM with Carbon Monoxide Filtration and Monitor [User Manual](#)
- 3M™ Portable Compressed Air Filter and Regulator Panel 256-02-01, 100CFM with Carbon Monoxide Monitor [User Manual](#)
- 3M™ Compressed Air Filter and Regulator Panel [User Manual](#)

### NOTE

There is no assurance that by using a Compressed Air Filter and Regulator Panel that the filtered compressed air will meet the requirements of Grade D breathing air or CSA standard Z180.1 in Canada.

While the filtration panel often serves as the SERVICE OUTLET, an alternate SERVICE OUTLET may be considered when the work area is of considerable distance from the filtration panel provided it satisfies the above requirements.

## Air Filtration and Regulator Panel Use and Installation Notes

The employer must have a written respirator program in place which is in accordance with the OSHA respiratory protection standard found in 29 CFR 1910.134 prior to using any respirator. In Canada, follow CSA Standard Z94.4 or the requirements of the authority having jurisdiction in your region.

Each person using respiratory protective equipment must read and understand the information in the User Instructions. Use of this equipment by untrained or unqualified persons or use that is not in accordance with the User Instructions, may adversely affect product performance and result in sickness or death.

The frequency of filter change will depend on the quality of the incoming compressed air and how much the panel is used and is outlined in the respective user manual. Refer to the below user manuals for filter change instructions. Always turn off air supply and bleed air pressure before disassembling the 3M filter and regulator panel or serious injury could result.

## How Many Users Can Connect to a Filtration Panel At Once

Each filtration panel is rated for a specific amount of airflow (CFM) as indicated in the below table. The actual number of respirators that may be connected to the filter and regulator panel is dependent on:

- The inlet volume and pressure to the panel
- The airflow and pressure requirements of the respiratory protection
- The airflow rating of the filtration panel

Model no.	W-2806	256-02-00	256-02-01
Outlets	3 (optionally 2 more)	4	8
Panel CFM Rating	50	50	100
CFM per V-Series Valve	20	20	20
No. workers at the same time	2	2	4-5
The indicated number of workers that may be connected assumes inlet airflow and pressure are adequate.			

## Service Outlet Pressure

To meet the NIOSH requirement 42 CFR 84, subpart 84.150 for minimum and maximum airflow (6 to 15 cfm, 170 to 425 lpm), the air control devices approved for use with the 3M respirators must be operated within the supply pressure ranges and hose lengths stated in the Use Instructions for the [V-Series Valves](#). Failure to do so may adversely affect respirator performance and result in sickness or death.

# Personal Safety Division

To look up the specific pressure schedule table in the V-Series user manual, the following information is required:

- Air line/hose model number
- Length of air line/hose between the SERVICE OUTLET and the worker
- Valve/regulator model number
- Facepiece/hood/helmet model number

Example:

Air line/hose model number:	W-9435
Length of air line between the SERVICE OUTLET and the worker	150 feet
Valve/regulator model number	V-100
Facepiece/hood/helmet model number	M-307

Using the above example, the appropriate pressure schedule table in the V-Series user manual can be referenced. Based on the above table, the required pressure at the SERVICE OUTLET for the above example is 69 - 82 psig.

**Table 1: Pressure Schedule Table for 3M™ V-Series Air Control Devices Used With All Approved 3M Loose Fitting Headgear Except L-501, L-503, L-505, L-701, L- 703, L-705, L-901, L-905**

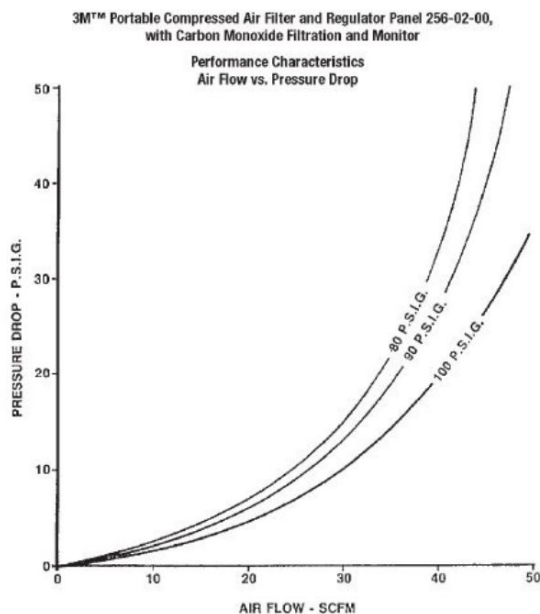
Air Control Device	High Pressure Hoses W-9435 and W-9445 (3/8" ID)	High Pressure Hose W-2929 (Coiled, 3/8" ID)	Low Pressure Hose W-3020 (1/2" ID)	Supply Pressure Range
V-100	25 - 100 ft	25, 50 or 100 ft of hose	N/A	62 - 72 psig (4.4 - 5.0 kg/cm <sup>2</sup> )
	125 - 200 ft	N/A	N/A	69 - 82 psig (4.9 - 5.7 kg/cm <sup>2</sup> )
	225 - 300 ft	N/A	N/A	75 - 91 psig (5.3 6.4 kg/cm <sup>2</sup> )
V-200	25 - 100 ft	25, 50 or 100 ft of hose	N/A	64 - 68 psig (4.5 - 4.8 kg/cm <sup>2</sup> )
	125 - 200 ft	N/A	N/A	71 - 78 psig (5.0 - 5.5 kg/cm <sup>2</sup> )
	225 - 300 ft	N/A	N/A	77 - 88 psig (5.4 - 6.2 kg/cm <sup>2</sup> )
V-300	25 - 100 ft	25, 50 or 100 ft of hose	N/A	30 - 35 psig (2.1 - 2.5 kg/cm <sup>2</sup> )
	125 - 200 ft	N/A	N/A	33 - 47 psig (2.3 - 3.3 kg/cm <sup>2</sup> )
	225 - 300 ft	N/A	N/A	38 - 58 psig (2.7 - 4.1 kg/cm <sup>2</sup> )
V-400	N/A	N/A	25 ft (7.6 m)	6 - 11 psig (0.4 - 0.8 kg/cm <sup>2</sup> )
	N/A	N/A	50 ft (15.2 m)	7 - 13 psig (0.5 - 0.9 kg/cm <sup>2</sup> )
	N/A	N/A	100 ft (30.5 m)	8 - 15 psig (0.6 - 1.0 kg/cm <sup>2</sup> )

## Filtration Panel Pressure Drop

As the air passes through the panel there is resistance to flow called pressure drop. The more airflow (CFM) through the filter and regulator panel, the greater the pressure drop. The V-Series Valves approved for use with the 3M respirators must be operated within the supply pressure ranges stated in their User Instructions.

If required, the estimated pressure drop across the panel can be estimated using the pressure drop curves in the filtration panel user manual along with information on the maximum airflow consumption (CFM) and inlet supply pressure ranges (psig).

The pressure drop curve for the 256-02-00 50 CFM Filtration Panel is shown here:



Recalling that each V-Series valve requires 20 CFM.

Assuming an inlet pressure of 90 psig, the estimated pressure drop for:

- 1 user is approximately 5 psig
  - 90 psig at inlet, 20 CFM
  - Approx. 85 psig at outlet
  - Above scenario required 69-82 psig at the service outlet
- Pressure expected to be adequate at SERVICE OUTLET
- 2 users is approximately 25 psig
  - 90 psig at inlet, 40 CFM
  - Approx. 65 psig at outlet
  - Above scenario required 69 – 82 psig at the service outlet
- Pressure expected to be inadequate at SERVICE OUTLET

## Filtration Panel Accessories

3M™ Replacement Filter Kit, 523-01-28 (for 256-02-00)



3M™ Replacement Filter Kit, 523-01-29 (for 256-02-01)



3M™ Replacement Filter Cartridge W-2811-10 (for W-2806)



## Filtration Panel Troubleshooting

Problem	Possible Causes	Corrective Action
You smell or taste contaminants or an irritation occurs.	Misuse, improper assembly or malfunction of equipment.	Leave work area immediately and contact your supervisor. Do not use until the cause is identified and corrected
	Filter cartridges may be used up	Replace filter cartridges
Airflow too low.	Clogged particulate filter	Replace all filter cartridges
	Pressure too low	Raise inlet pressure or adjust regulator

## 3M™ Carbon Monoxide Monitor and Retrofit Carbon Monoxide Monitor Kit W-2808



3M™ Retrofit Carbon Monoxide Monitor Kit W-2808 allows the 3M CO monitor to be used with filter and regulator panels that do not currently have CO monitoring capability, such as the 3M compressed air filter and regulator panel W-2806.

The 3M retrofit CO monitor kit is comprised of a 3M™ 5700 CO monitor, mounting bracket, flow meter, and hardware connections to attach the monitor to an available 3/8-inch port on a filter and regulator panel. The CO monitor air sample metering valve must be properly adjusted to ensure adequate airflow to the CO monitor.

Carbon monoxide monitor will alarm if carbon monoxide concentrations exceed the preset level:

- 10ppm USA
- 5ppm Canada

If alarm should sound, remove respirator or activate SCBA and immediately move to a safe, breathable atmosphere. Have the proper qualified personnel examine the equipment and make the appropriate corrections before using again.

Serious injury could result if the AIR SAMPLE METERING VALVE is not properly adjusted. Proper sample airflow to CO monitor is required for monitor to give correct CO level readout.

### Calibration Frequency:

- The monitor should be calibrated prior to use and every two weeks thereafter for the first month
- Calibrate monitor monthly thereafter if used continuously (daily or weekly)
- If the monitor is used on a non-continuous basis, calibrate prior to each use

### 3M Calibration Kits

529-04-49 Small Calibration Kit	529-04-48 Large Calibration Kit
Approximately 10 calibrations	Approximately 50 – 60 calibrations
529-05-18 Zero Gas Replacement	529-05-17 Zero Gas Replacement
529-05-19 CO Span Gas Replacement	529-05-16 CO Span Gas Replacement
NA	80144 Regulator for large cylinders (1000PSI)

## CO Monitor User Manual

<https://multimedia.3m.com/mws/media/216586O/3m-carbon-monoxide-monitor-retrofit-kit-w-2808-37027-user-instructions.pdf>

### CO Monitor Intrinsic Safety Notes:

- The CO monitor is CSA certified intrinsically safe for Class I, Div. I, Groups A, B, C, and D Hazardous Locations in Canada when utilizing two 9-volt alkaline batteries to power the monitor (Eveready 522, Duracell PC1604, or Radio Shack 23-553 9V Alkaline batteries only)
- Two 9-volt alkaline batteries will power the monitor continuously for approximately 30-35 hours
- The intrinsic safety of the carbon monoxide monitor is voided when:
  - The remote alarm is used
  - The 110–120-volt AC adapter is used
- It is not approved for use in these hazardous locations when used in the United States
- Consider locating the filtration panel outside the hazardous location

## CO Monitor Replacement Parts and Accessories

### 3M™ Carbon Monoxide Sensor 529-05-22



- Sensor Life Approximately 30 months
- Sensor Replacement by user is permitted
- User Manual: <https://multimedia.3m.com/mws/media/87676O/carbon-monoxide-sensor-529-05-22-user-instructions.pdf>

### 3M™ Adapter, 110-120 Volt AC (for CO Monitor)



- This accessory will supply operating power to the instrument if it is plugged into an active 115-volt AC outlet
- Since the adapter voltage is slightly higher than that of the internal batteries, the adapter will supply the power (even if batteries are installed)
- To prevent unnecessary electrical interference, the outlet should be on a dedicated circuit free of any intermittent heavy electrical loads, such as pumps, compressors or heaters
- The intrinsic safety of the carbon monoxide monitor is voided when the 110-120-volt AC adapter is used

## 3M™ Remote Alarm and Strobe, 529-05-20, 1/case.



- The 3M™ Remote Alarm may be used with the carbon monoxide monitor in the 3M™ Portable Compressed Air Filter and Regulator Panel, 256-02-00, 256-02-01 and the 3M™ Retrofit Carbon Monoxide Monitor Kit, W-2808
- It provides an audible (110dBa) signal outside the work area if the carbon monoxide level exceeds the preset level
- Plugs into the Remote Alarm Jack of the Carbon Monoxide
- The monitor's (2) 9-volt DC batteries will not energize the system
- Must be used with the 3M 529-04-50 110-120 VAC Adaptor for CO Monitor. The intrinsic safety of the carbon monoxide monitor is voided when the 110-120-volt AC adapter is used

## 3M™ Carbon Monoxide Monitor Troubleshooting

Problem	Possible Causes	Corrective Action
Low Battery	As the battery voltage declines toward the end of its life, the following indications occur: <ol style="list-style-type: none"> <li>1. At 7.0 volts, the amber LOW BATTERY light will come on. Battery replacement is recommended at this point, but continued operation is still possible.</li> <li>2. At 6.4 volts, the buzzer will beep at intervals of about 7 seconds.</li> <li>3. At 5.8 volts, the buzzer will beep at 1-second intervals and the display will go to--. This malfunction indication will continue until the battery is completely dead.</li> </ol>	At 7.0 volts, battery replacement is recommended, but continued operation is still possible.
CO monitor's LED red and green lights blink on/off along with the alarm buzzer and display shows 'SC'	The sensor has internal failure Poor connection between sensor pins and circuit board connections	Turn monitor off and after a few seconds turn monitor back on. Try to calibrate the monitor. If the monitor will not calibrate, replace the sensor.  Unplug-Plug circuit board from sensor pins to make better contact connection. Try to calibrate monitor. If monitor will not calibrate or 'SC' appears again, replace sensor.
CO monitor display will not move from zero '00' when the sensor is exposed to a known sample of CO	SPAN adjustment may be set to zero Span gas cylinder empty The sensor has lost sensitivity Circuit malfunction	Recalibrate the monitor Replace the cylinder Replace the sensor Repair is needed

Problem	Possible Causes	Corrective Action
The CO monitor cannot be calibrated	The span gas and/or zero gas bottle(s) may be empty The sensor has lost sensitivity	Replace the empty span and/or zero gas bottle(s) Replace the sensor
The span adjustment cannot be made when the span gas is applied (i.e. the reading will not reach the span gas value)	The span gas bottle may be empty The sensor has lost sensitivity	Replace the empty span gas bottle Replace the sensor
With zero gas flowing through the monitor after approximately one minute, display reads minus one (-1) to the far left	Zero potentiometer may be turned counterclockwise all the way The sensor has lost sensitivity	Adjust the zero potentiometer clockwise until zero '00' reached Replace the sensor
With span gas flowing through the monitor after approximately one-minute display reads one (1) to the far left	Span potentiometer may be turned clockwise all the way The sensor has lost sensitivity	Adjust the zero potentiometer counterclockwise to 199 and then turn down to value of span gas Replace the sensor
When calibrating the CO monitor you cannot move display off zero '00' with zero potentiometer	Monitor may have been adjusted '00' using the span potentiometer	Turn the span potentiometer screw several full revolutions clockwise until the display reads the value of the span gas then start the calibration procedure over again
Display goes below 0 (i.e. display indicates a ---02, -1, SC)	Zero misadjust Sensor has internal failure Circuit malfunction	Recalibrate the monitor Replace the sensor Repair is needed
Monitor display numbers wander and alarm periodically	Monitor is powered by the 110–120-volt AC adapter and walkie-talkies are being used near the monitor Large voltage spikes are present in the AC circuit Ambient temperatures exceed 110° F (43° C)	Do not use walkie-talkies in the area Isolate by using dedicated line Decrease ambient temperature

## Discussion on Compressed Breathing Air Quality

Many older compressed air systems may have air that is unfit for human use without secondary air treatment. This is due largely to the presence of objectionable oil vapors and odors. Rules and regulations governing air quality when using compressed air for respiration are quite specific. Precautions must be observed when using compressed air for breathing purposes.

Although it is theoretically possible that oil lubricated compressors can create carbon monoxide (CO) if the compressor overheats, studies have shown that the location of the compressor's air intake is the most likely source of carbon monoxide contamination.

Testing for compressed breathing air quality takes place at the SERVICE OUTLET.

In the United States, compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989 [paragraph (i)(1)(ii)]. Testing must be done upon commissioning and following major modifications and documentation must be maintained. The frequency of subsequent testing is not specified but it is recommended to be done annually.

Grade-D Breathing Air (ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989)	
Component	Level
Oxygen	19.5 - 23.5 %

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<b>Grade-D Breathing Air (ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989)</b>	
Carbon Monoxide	<10 PPM
Carbon Dioxide	<1000 PPM
Hydrocarbons	<5 mg/m <sup>3</sup>
Odor	Lack of noticeable odor
Minimize moisture content: Dew point at 1 atm is 10 °F (5.56 °C) < ambient temperature.	

In Canada, compressed breathing air shall meet the quality requirements of CSA Z180.1 and the authority having jurisdiction. Frequency and location of testing and accepted methods are discussed in the standard. Testing must be done upon commissioning and following major modifications and at least every 6 months or as specified by the authority having jurisdiction. Documentation must be maintained.

<b>Compressed Breathing Air Purity Requirements per CSA Z180.1-19 (reaffirmed in 2025)</b>	
<b>Component</b>	<b>Level</b>
Oxygen	19.5-23.5 %
Nitrogen and Rare Gas	78-80 %
Carbon Monoxide	<5 PPM
Carbon Dioxide	<600 PPM
Methane	≤10 PPM
VOC (non-halogenated)	≤5 PPM + <10% EL
VOC (halogenated)	≤5 PPM + <10% EL
Oil, Particulates, Condensate	≤1 mg/m <sup>3</sup>
Odour	No pronounced odour
Pressure Dew Point	See Table

While air filtration panels are intended to filter compressed air to be used with supplied air respiratory protection systems, there is no assurance that the filtered compressed air will meet the indicated air quality requirements.

## NOTE

This summary was prepared by the 3M Personal Safety Division. It does not in any way represent an official, legal or complete interpretation of the referenced standard and/or regulations and there is no representation, warranty, guarantee or other obligation of 3M Company or its employees arising out of its contents. Should specific questions arise, the standard and/or regulation itself should be reviewed and relied upon, and legal counsel consulted where appropriate, rather than relying upon this summary.



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