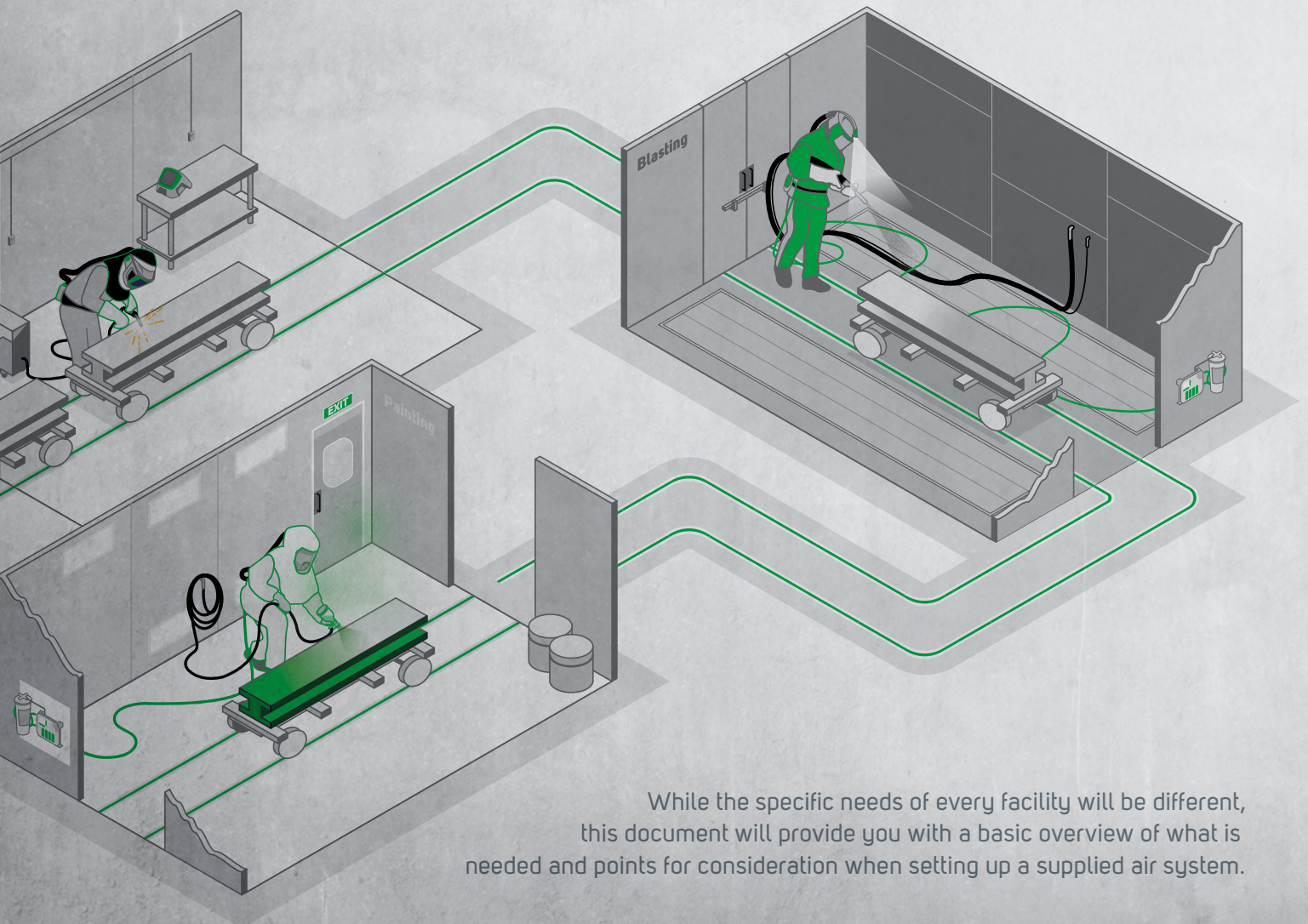


Supplied Air Respirators How-To Guide

Components & Best Practices



While the specific needs of every facility will be different, this document will provide you with a basic overview of what is needed and points for consideration when setting up a supplied air system.

Setting Up a Supplied Air Respiratory Protection System

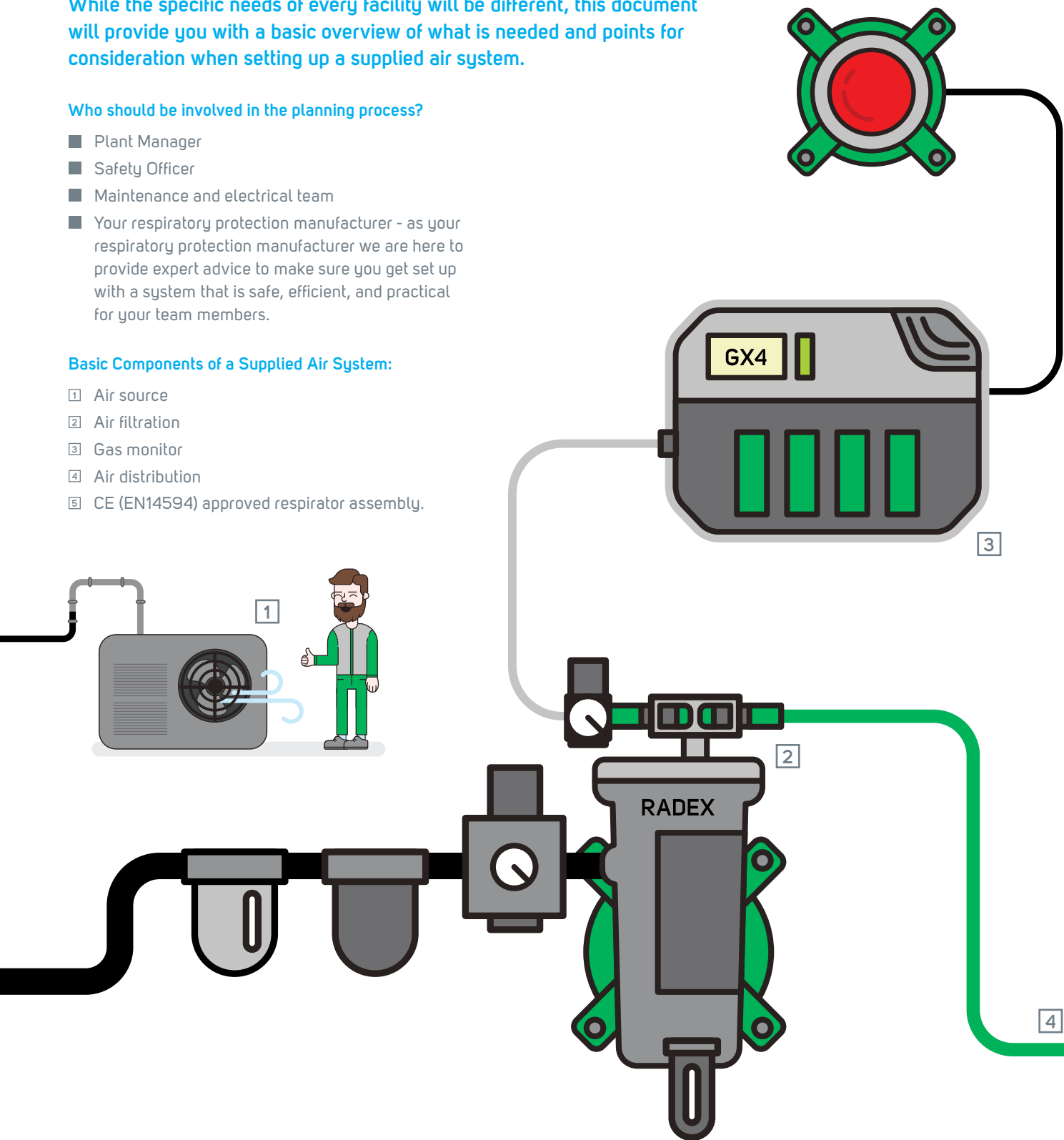
The process of setting up a supplied air respiratory protection system can at first appear complicated, but we are here to simplify the process. While the specific needs of every facility will be different, this document will provide you with a basic overview of what is needed and points for consideration when setting up a supplied air system.

Who should be involved in the planning process?

- Plant Manager
- Safety Officer
- Maintenance and electrical team
- Your respiratory protection manufacturer - as your respiratory protection manufacturer we are here to provide expert advice to make sure you get set up with a system that is safe, efficient, and practical for your team members.

Basic Components of a Supplied Air System:

- 1 Air source
- 2 Air filtration
- 3 Gas monitor
- 4 Air distribution
- 5 CE (EN14594) approved respirator assembly.



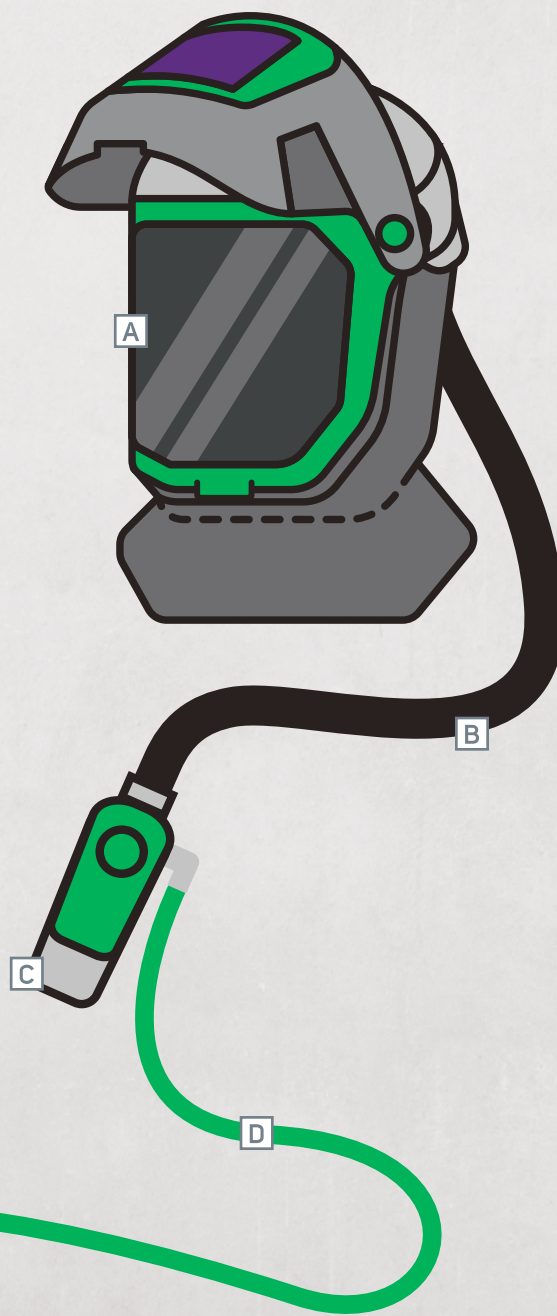
5 CE Approved Respirator Assembly

A CE approved respirator assembly, often referred to as “hose to nose” to clarify the assembly’s start and end points, is made up of the following components. For a CE approved respirator assembly, all these components must be from the same manufacturer and not interchangeable with parts from other brands to ensure compliance.

- A Headtop
- B Breathing Tube: Connects the headtop to the flow control device.
- C Flow Control Device: Controls the flow rate of air entering the headtop (pictured is the C40™ Flow Control Device, which can also heat the incoming air by up to 18°C or cool it by up to 29°C).
- D Airline Hose with Coupler.

Maintenance Tip:

Proper storage of the airline hose via a hose reel or hose rack will prevent early damage to hoses and couplers.



Additional Requirements*:

- A written respiratory protection program that meets national Respiratory Protection Standard requirements
- Medical evaluation for employees to assess their suitability for wearing the chosen respirator assembly
- Fit-testing (if using tight-fitting respirators).

*May differ in each country according to applicable law.



Air Source

The most common air source to a supplied air system is an Air Compressor.

Compressor Placement

The compressor should be located in an area with “clean air” to minimise the risk of contamination, i.e. away from vents and equipment or vehicle exhaust.

Compressor Size/Capacity

- It is important to ensure the compressor will be able to accommodate the airflow required per respirator assembly. This is measured in bar, and will also vary based on the length of airline hose and type of flow control device being used. All supplied air respirator manufacturers will include a Breathing Air Pressure Chart detailing the air pressure requirements for that particular respirator set up (see example on page 7).
- If your facility has an existing compressor that provides air drops throughout a facility you will need to confirm that the existing system meets breathing air requirements as described in EN12021:2014 and can provide the required bar to each operator.

Breathing Air Compressor Systems

A Breathing Air Compressor System is a compressor specifically dedicated to breathing air and may be an option you want to consider. These compressors often have filtration and carbon monoxide monitoring incorporated into the compressor setup, in which case additional in-line gas monitoring and filtration components are not needed.

Air Quality

In Europe, the compressor air must meet breathing air requirements as described in EN12021:2014.

Composition of Oxygen Compatible Air:

Component	Concentration at 1 013 mbar and 20 °C
Oxygen	(21 ± 1) %
Water	≤ 25 mg m ⁻³
Carbon Dioxide	≤ 500 ml m ⁻³ (ppm)
Carbon Monoxide	≤ 5 ml m ⁻³ (ppm)
Oil	≤ 0,1 mg m ⁻³

Testing

- Industry standard is to test annually and/or following any maintenance of your compressor.
- There are third party testing labs dedicated to compressed air testing and even specialising in breathing air standards.
- There are also companies that will provide you with an Air Sampling Kit, and a pass certificate upon your sampling achieving the target air quality.

Air Monitoring & Filtration



Compressed breathing air must be monitored for Carbon Monoxide levels; some facilities may also require monitoring for additional gases such as Oxygen and Hydrogen Sulfide. Compressed air must be filtered to ensure any excess moisture or oil is removed. GVS gas monitoring and filtration options include:

GX4® Gas Monitor

- Can monitor for Carbon Monoxide (CO), Oxygen (O₂), and Hydrogen Sulfide (H₂S)
- Connects to Radex airline filter
- Regular testing of the alarm and sensor cartridges should be undertaken every 30 days to ensure they are within calibration
- Real time monitoring with alarm and optional strobe.

GX4 Power Options:

For maximum flexibility when it comes to job sites, the GX4 can be set up in two different power configurations. 12V DC Cable with Battery Clips for remote job sites, or 110/240V AC Adapter Plug for longer term applications.

Radex® Airline Canister

- Can be wall or floor mounted
- 2-outlet or 6-outlet Radex configurations are available
- The 6-stage filter cartridge removes moisture, odor, and particulates down to 0.5 microns from the compressed air stream
- Radex filter cartridge replaced approximately every 3-months
- Attachments can be added on to provide additional filtration and air pressure regulation.

The Radex Filter system contains 6-stages of filtration media, to further filter compressed air and protect the respirator user from solid and/or liquid particulates, such as dusts 0.5 microns in size or larger, mists and/or odors. The filter system DOES NOT filter CO-Carbon Monoxide.



Safety Tip:

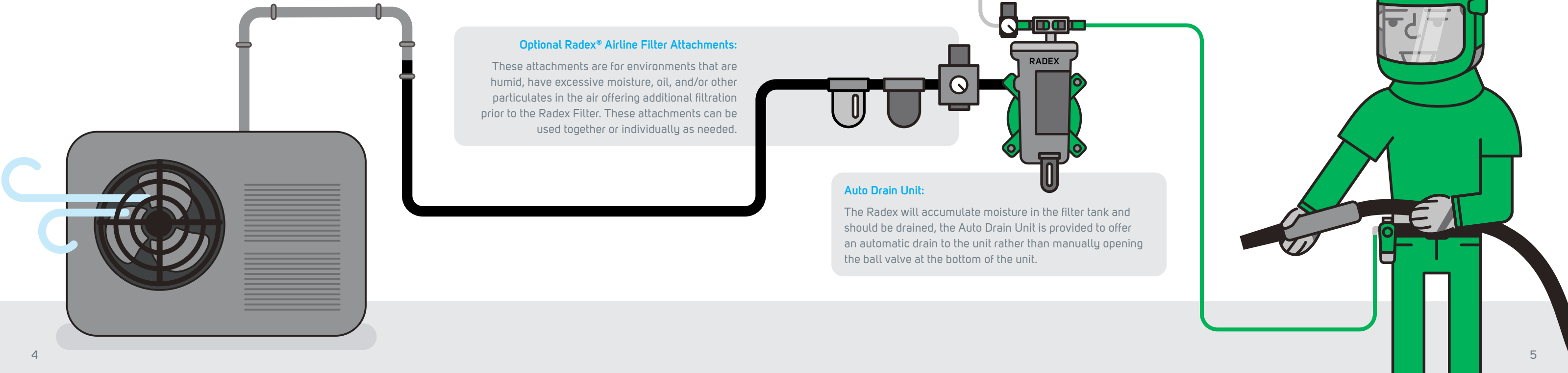
The optional GVS-RPB Auxiliary Strobe Light and Alarm connects to the GX4 as an additional safety measure. With a 50ft cable it should be positioned in a location easily visible to all operators connected to that air supply.

Optional Radex® Airline Filter Attachments:

These attachments are for environments that are humid, have excessive moisture, oil, and/or other particulates in the air offering additional filtration prior to the Radex Filter. These attachments can be used together or individually as needed.

Auto Drain Unit:

The Radex will accumulate moisture in the filter tank and should be drained, the Auto Drain Unit is provided to offer an automatic drain to the unit rather than manually opening the ball valve at the bottom of the unit.



Air Distribution to Operators



Hose Length

- The maximum length of hose allowed, measured from the Point of Attachment to the operator, is 90m.
- GVS offers hoses in lengths of 7.5m, 15m, and 30m.

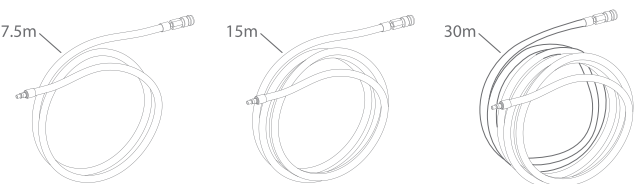
Fittings

- Each manufacturer has approved fittings for use with their respirator assemblies. It's important to understand the use of any non-approved fitting will void the CE approval of the assembly.
- GVS' standard fittings include CEJN for the European market.

Point of Attachment

The Point Of Attachment (POA), is where the fitting on an Air Supply Hose attaches to the compressed air source. The point of connection when using GVS Radex® Filtration, is at the coupler at the top of the Radex. For safety reasons, all of the components used from the Point of Attachment to the Respirator MUST all be of the same manufacturer. As seen here in our CE approved Respirator Assembly Components.

Air Supply Hoses

SERIES	1. COUPLERS	2. PLUGS	3. BREATHING AIR LINE ASSEMBLIES
RPB® Quick Disconnect	03-022-CF 	03-022-PMS Swivel 	04-322-25 7.5m 9.5mm 04-322-50 15m 9.5mm 04-322-100 30m 9.5mm
			

Safety Tip:

Always inspect airline hoses and couplers for visible wear and tear before each use. Check out the GVS Daily Checklist for Supplied Air Respirators:

www.gvs-rpb.com/discover/using-your-respirator/know-the-life-of-your-respirator

Pressure Settings

The GVS Respirators, NOVA 3®, NOVA 2000®, Z-Link®, and T-Link® all require air pressure ranges to provide a volume of air that falls within the required range of 170-425lpm EN14594.

Breathing table charts can be found in Instruction Manuals for each respirator for further reference. Pressure settings are determined by a combination of factors: Air Source, Type of Air Supply Hose, Flow Control, Air Supply Hose Length, and Number of Sections of Hose. Airline hoses can only be used in 7.5m, 15m, and 30m sections, and up to 90m total maximum.

Calculating Pressure Settings

To calculate the correct breathing pressure required, follow the steps below, ensuring you are referencing the correct Breathing Air Pressure Table for your specific headtop.

1. Use the correct air source. Do not use an ambient air pump, as it does not supply enough pressure (column 1).



2. Confirm the part number of the air supply hose you are using (column 2),



and the flow control device you are using (column 3).



3. Check your GVS Air Supply Hose is within the correct length (column 4) and the correct number of hose sections (column 5).

4. Set the air pressure at the point of attachment within the range specified (column 6).

Example: Z-Link Breathing Air Pressure Table

The below page from the Z-Link user manual details the air pressure requirements for various set ups.

I.e. A Z-Link respirator using a Constant Flow Valve and connected to a 15m airline hose will require 0.77-0.87 bar, whereas a Z-Link respirator using a C40™ Climate Control Device and connected to an airline hose with a total length of 60m will require a much higher pressure of 5.17-5.86 bar.

BREATHING AIR PRESSURE TABLE

S - SPECIAL OR CRITICAL USERS INSTRUCTIONS - SAR TABLE 1.1

This table lists Air pressure ranges needed to provide the RPB Z-Link with the volume of air that falls within the required range of 170 - 425 slpm (6 -15 cfm) according to GOVERNMENT REGULATIONS. Maximum working pressure of the compressed air supply tube is 20.7 BAR.

1. AIR SOURCE	2. AIR SUPPLY HOSE	3. FLOW CONTROL DEVICE USED WITH 04-835 BREATHING TUBE ASSEMBLY	4. SUPPLY HOSE LENGTH (METRES)	5. MAX NUMBER OF SECTIONS	6. PRESSURE RANGE (BAR)
PORTABLE OR STATIONARY COMPRESSOR	04-322-25 (7.5M) 04-322-50 (15M) 04-322-100 30M	03-102 CONSTANT FLOW VALVE ASSEMBLY	7.5	1	0.65 - 0.72
			15	1	0.76 - 0.80
			30	1	0.97 - 1.24
			45	2	1.17 - 1.52
			60	2	1.45 - 1.72
			75	3	1.70 - 2.00
			90	3	1.90 - 2.17
		03-502 C40 CLIMATE CONTROL DEVICE ASSEMBLY	7.5	1	3.79 - 4.48
			15	1	4.14 - 4.83
			30	1	4.48 - 5.52
			45	2	4.83 - 5.52
			60	2	5.17 - 5.86
			75	3	5.52 - 6.21
			90	3	6.21 - 6.55

⚠ WARNING Make sure you understand the Breathing Air Pressure table before using this respirator.

Use the correct air source. Do not use an ambient air pump, as it does not supply enough pressure (column 1).

Confirm the part number of the air supply hose (column 2) and the flow control device (column 3) you are using.

Check your RPB Safety Air Supply Hose is within the correct length (column 4) and the correct number of hose sections (column 5).

Set the air pressure at the point of attachment within the range specified (column 6). Make sure air is flowing through your respirator when setting the air pressure.

Failure to supply the minimum required air pressure at the point of attachment for the length of air supply hose will decrease the level of protection provided. Check that the capacity of the air supply systems can provide sufficient air to all users, with a maximum of 5 users connected simultaneously per air supply unit. In addition, could result in contaminants being inhaled as the pressure in the helmet may become negative due to peak inhalation flow when working at very high work rates. Low airflow will decrease the level of protection provided.

ALWAYS WEAR EAR PLUGS WHEN WEARING THIS APPARATUS.

Scan this QR code

View and download GVS Breathing Air Pressure Tables (located within GVS Headtop Instruction Manuals).



Common Questions

I'd like to switch to GVS® respirators for my supplied air system, do I also have to change my existing gas monitor and filtration to GVS brand?

While it is ideal to have the same manufacturer support all parts of your supplied air system, there are no regulations indicating that is mandatory. It can be changed at a later date if desired.

Is there anything I would need to modify on my current gas monitor and/or filter to accommodate for GVS supplied air respirators?

The employer shall ensure that breathing air couplings are incompatible with outlets of non-respirable air and/or other gas systems. GVS provides CEJN fittings as standard for the European market.

I have existing supplied air respirators and will be changing to GVS respirators, do I have to change the breathing air supply hose?

Yes. CE approvals are for specific and complete respirator assemblies after the respirator has been evaluated and found to comply with all the requirements. Only GVS branded breathing air supply hoses are tested and approved for use with GVS respirators.

Calibrations How-To and Who can do them?

While the gas sensors typically have a 2-year lifespan, a calibration check will need to be performed every 30-days. This can be done by the customer or outsourced through a distributor that offers service. The calibration gas and regulator can be purchased to do yourself. Review GX4® instruction manual for additional details.

How many operators can I run off a Radex® Airline Filter?

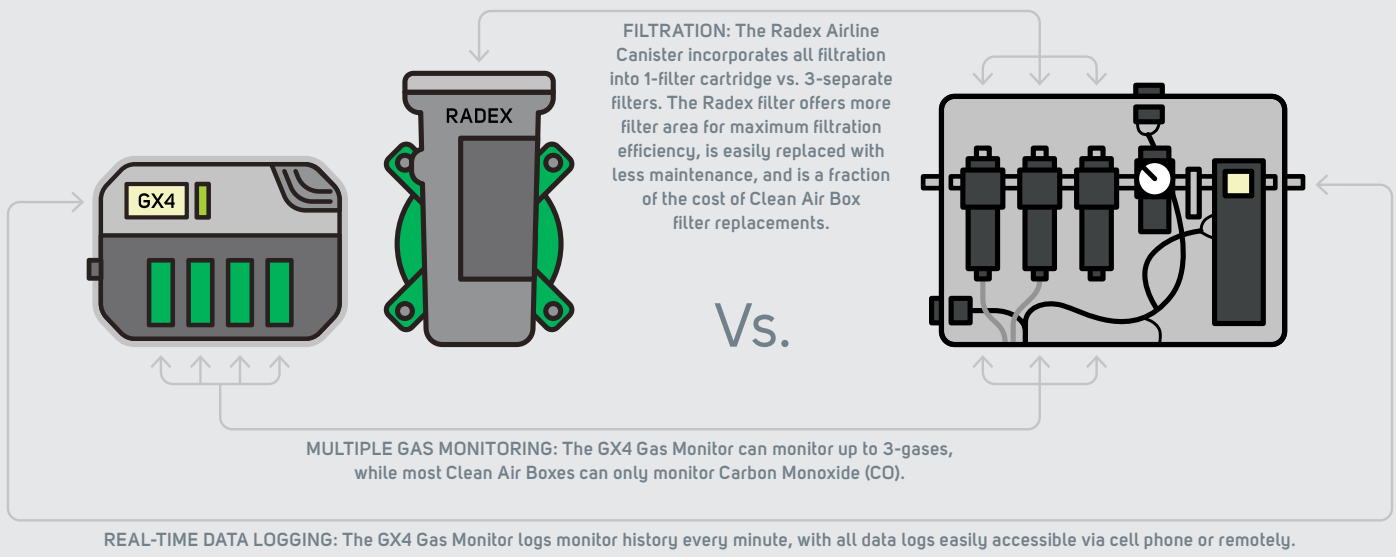
If using a Radex for multiple operators, our 04-906 (6-Outlet) is recommended. This unit can accommodate up to 5 operators, depending on the particular flow control device being used with the respirator. However, it is recommended that with use of the C40 or 4000 Series Cooling/Heating Tubes, only 3-4 operators should connect in order to accommodate the flow required per operator for optimum performance.

Do you have to purchase a GX4 for every Radex purchased?

Best practice is to have a GX4 for each Radex for audible and visible alarm notification purposes. However, it can be determined upon the compressed air source, does your facility have a single or multiple compressors providing the breathing air to operators? Also, are the areas requiring breathing air in close proximity to each other? For example, a single air compressor ran to a blast booth and paint booth that are in same building side by side, you could use only one GX4 Gas Monitor with a Remote Strobe Alarm, placing the remote strobe alarm in an area that can be seen and heard by all operators. Each remote strobe alarm is provided with a 15m cable to be ran into a shared notification area or a supervisor area.

GX4 + Radex Set-Up vs. Clean Air Box

The most familiar/common supplied air filtration with carbon monoxide monitoring, is known as a Clean Air Box, Air Filtration Box, or similar terminology. GVS' GX4 Gas Monitor with Radex Airline Canister combined performs not only the same functions, it exceeds, with additional safety features and ease of use as seen below.



Installation Guidance

Hard Ducting from Radex vs. Running Airline Hose direct from Radex

In some cases, due to the amount of operators or work area conditions, you may want to consider hard ducting from the Radex Filter rather than running airline hoses initially. Be sure when choosing to use hard ducting to consider pressure drop calculations and ducting materials. When choosing to hard duct, each new connection should be provided with an additional pressure gauge with relief valve to assure recommended pressures. Then at each new connection, GVS Breathing Airline Hoses should be connected at that point.

Example shown in the illustration below.

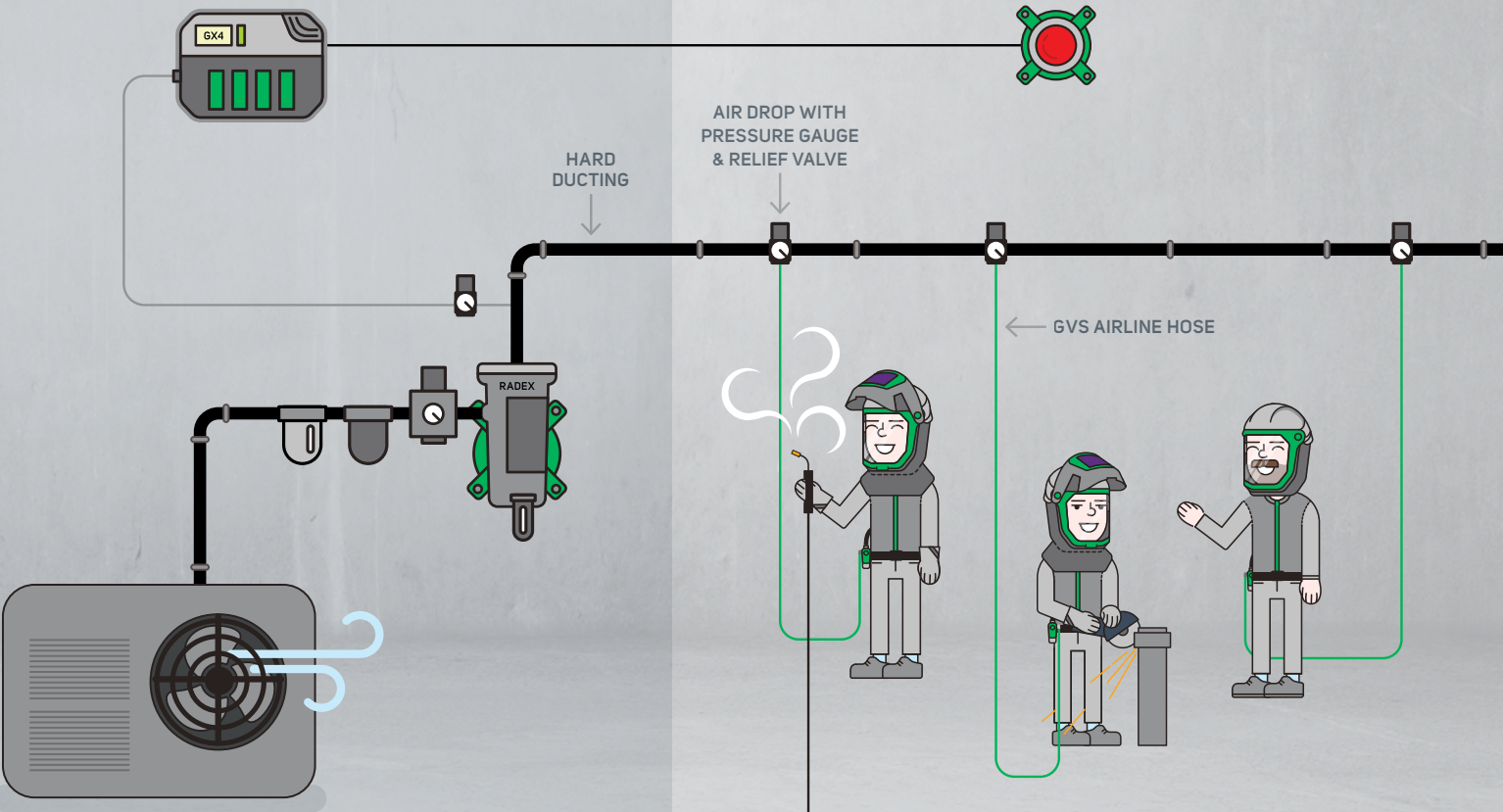
Heavy-Duty Case and its Purpose

Due to most environments, it is best to keep the GX4® protected from the elements with a GVS Heavy-Duty Carry Case.



Maintenance and Benefits of C40™ Cooling/Heating Vortex

The C40 Cooling and Heating Vortex, can withstand extreme conditions of work environments. It is built for longevity with the ability to be cleaned and maintained. As seen here, all components can be cleaned and/or replaced. See the C40 Operations Manual online for more details.



Your Guide to Selecting a Respirator by Application

Explore the versatility of GVS headtops that pair seamlessly with the Radex® Airline Filter and GX4® Gas Monitor across various industries. Discover the perfect match for your application with our comprehensive range.



Common Terminology

Bar: The bar is a metric unit of pressure defined as 100,000 Pa (100 kPa). Used in relation to a respirator's required airflow.

Fit Test: The use of a protocol to assess the fit of a respirator on an individual. This can be done based on a qualitative (QLFT) or quantitative (QNFT) method.

CE: The letters 'CE' appear on many products traded on the extended Single Market in the European Economic Area (EEA). They signify that products sold in the EEA have been assessed to meet high safety, health, and environmental protection requirements.

BS EN 14594:2018: Respiratory protective devices. Continuous flow compressed air line breathing devices. Requirements, testing and marking

POA: Point of Attachment. The point at which the respirator assembly connects to the supplied air source.

Respiratory Protection Program: A written respiratory protection program with required worksite-specific procedures and elements for required respirator use, such as respirator selection, cleaning, storage, fit testing, medical evaluations, and worksite-specific training.

Supplied Air Products & Part Numbers



Radex® Packages

	04-900	Radex Airline Filter 2-Outlet System
	04-906	Radex Airline Filter 6-Outlet System

GX4® Gas Monitor Packages

	08-400-G	GX4 Gas Monitor - No Sensor Package Includes Power Adaptor Pack, Mounting Brackets, Air Supply Hose
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GX4® Gas Monitor Sensors

	08-420-01	Gas Sensor Cartridge Carbon Monoxide - CO 10ppm
	08-420-02	Gas Sensor Cartridge Carbon Monoxide - CO 5ppm
	08-420-03	Gas Sensor Cartridge Hydrogen Sulphide H2S 10ppm
	08-420-04	Gas Sensor Cartridge Oxygen - 19.5-23%

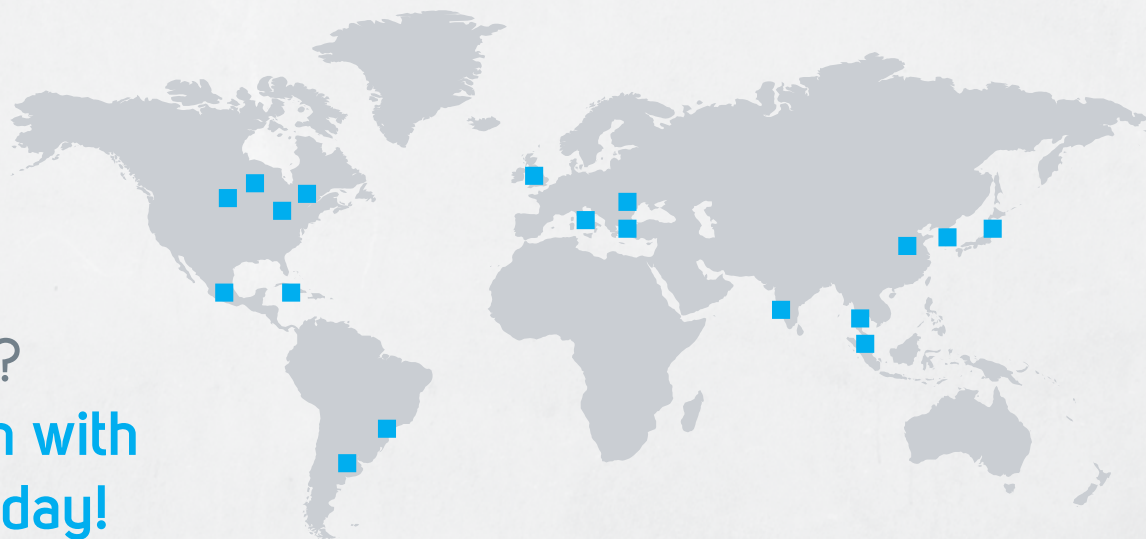
Breathing Airline Hoses

	04-322-25	7.5m Breathing Airline Hose - CEJN 342 7.4mm Safety Couplers
	04-322-50	15m Breathing Airline Hose - CEJN 342 7.4mm Safety Couplers
	04-322-100	30m Breathing Airline Hose - CEJN 342 7.4mm Safety Couplers

GX4® Gas Monitor Parts & Accessories

	04-924	Auto Drain Unit
	04-925	Micro Mist Filter 1/2"
	04-927	Mainline Pre-filter
	04-962	Super High Flow Regulator (includes 04-915)
	08-231	GX4 Aluminum Wall Bracket
	08-435	Strobe Light with 15m Cable
	08-436	Auxiliary Strobe Light & Alarm Tower with 15m Cable
	08-424	GX4 Heavy Duty Field Case
	08-451	GX4 Calibration Flow Regulator (for CO & Zero Air Gas Bottles)
	08-452	GX4 Calibration Flow Regulator (for H ₂ S Gas Bottles, includes hose and fitting)
	08-460	GX4 Zero Air (HAZMAT)
	08-461	GX4 CO 20ppm (HAZMAT)
	08-462	GX4 H2S 20ppm

Want to
know more?
**Get in touch with
our team today!**



AMERICAS

Argentina

Tel. +54-114-988-9041
gvsarg@gvs.com

Brazil

Tel. +55-193-879-7200
gvs@gvs.com.br

Mexico

Tel. +52-81-2282-9003
gvmex@gvs.com

U.S.A.

Tel. +1-866-494-4599
respirators@gvs.com

EUROPE

Italy (Head Office)

Tel. +39-051-617-6311
gvs@gvs.com

Romania

Tel. +40-244-463044
gvsromania@gvs.com

Turkey

Tel. +90-216-504-4767
gvsturkey@gvs.com

United Kingdom

Tel. +44-(0)-1524-847-600
gvsuk@gvs.com

ASIA-PACIFIC

China

Tel. +86-512-6661-9880
gvschina@gvs.com

India

gvsindia@gvs.com

Japan

Tel. +81-3-5937-1447
gvsjapan@gvs.com

Korea

Tel: +82-31-563-9873
gvskorea@gvs.com

Malaysia

Tel: +60 3 7800 0062
gvsmalaysia@gvs.com

Thailand

Tel: +66 2163 4310
gvsthailand@gvs.com

Help us spread the word about respiratory protection.
Find more information at **gvs.com**

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