

AIR PURIFYING RESPIRATOR Series 2000

Belt Mounted Half Mask

WARNING

DO NOT USE this respirator until you completely read and understand this instruction manual. You are required to inspect your respirator prior to putting it into service. Please refer to the inspection procedures in this manual.

I. INTRODUCTION

This manual provides instruction in the use and maintenance of the SURVIVAIR Series 2000 Belt Mounted Half Mask Respirator. The respirator comes in three sizes: small, P/N 250050, medium, P/N 260050, and large, P/N 270050. **You must read and understand this manual and be trained in the proper use of this respirator before wearing it in a contaminated atmosphere.**

II. SAFETY PRECAUTIONS

The Warnings, Cautions, and Notes contained in this manual have the following significance:

WARNING

Maintenance or operating procedures and techniques that will result in personal injury or death if not carefully followed.

CAUTION

Maintenance or operating procedures and techniques that may result in damage to equipment if not carefully followed.

NOTE

Maintenance or operating procedures and techniques or information considered important enough to emphasize.

III. DESCRIPTION

This SPERIAN air purifying respirator consists of a half mask facepiece and breathing tube assembly, and a plenum with two threaded connectors for attaching particulate filters, gas or vapor cartridges, and cartridge/filter combinations as required for specific contaminant protection. The plenum is designed to be clipped to the user's belt.

WARNING

- **The employer is responsible for establishing that this respirator is suitable for the user's applications.**
- **This respirator must be worn and used as specified in SPERIAN's instructions.**
- **This respirator does not supply oxygen and must not be used in atmospheres containing less than 19.5% oxygen by volume.**
- **Before entering a hazardous environment while wearing SPERIAN equipment, you must conduct safe, scientific tests to determine if the environment could render the equipment unsafe. Results of this testing should be well documented. Seek the help of a certified safety professional or industrial hygienist. DO NOT USE this equipment if the user would be endangered in any way through environmentally induced degradation of the materials in the apparatus.**
- **Do not use this respirator in environments where the concentrations of contaminants are unknown, or where the atmosphere is immediately dangerous to life or health (IDLH). IDLH atmospheres are defined as:**
 1. **Those which the wearer could not breathe for short periods.**
 2. **Those from which the wearer could not escape without the aid of the respirator.**
 3. **Those which have an immediate or delayed adverse effect on health.**
- **NEVER use this respirator without appropriate SPERIAN cartridges/filters identified on the NIOSH approval label securely threaded onto the plenum.**
- **Always read cartridge labels prior to use to be certain that you have cartridges and/or filter that will provide the required protection. Cartridges/filters labeled for protection against particulates only shall not be used for gases/vapors, and cartridges/filters labeled for protection against gases/vapors only shall not be used for particulates.**



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▲ WARNING—continued

- *Immediately return to a non-contaminated area if:*
 - a. *You taste or smell contaminants, or your eyes, nose, or throat become irritated;*
 - b. *Breathing becomes difficult;*
 - c. *The air you are breathing becomes uncomfortably warm;*
 - d. *You feel nauseous or dizzy;*
 - e. *Any of the end-of-service-life indicators on the metallic mercury vapor cartridge turns gray; or*
 - f. *The facepiece moves, slips, or leaks.*
- *This respirator must not be used for fumigation, abrasive blasting, underwater diving, or interior structural firefighting.*
- *If this respirator will be used during welding, it is the user's responsibility to obtain the proper equipment for protection against sparks, optical radiation, and impact.*
- *Do not wear this respirator if a satisfactory fit, as determined by a qualitative or quantitative fit test, cannot be obtained. See ANSI Z88.2, latest edition, and OSHA Standards for Asbestos and Lead. Beards, stubble, or sideburns will prevent a good facepiece seal, and facial hair may interfere with valve function. Do not use this respirator unless you are clean shaven. Absence of one or both dentures can seriously affect the fit of the facepiece.*
- *Never use this respirator without SPERIAN cartridges or filters securely threaded onto the plenum. This respirator must be used in conjunction with a written respirator program meeting the requirements of the OSHA Standard for Respiratory Protection, 29 CFR 1910.134, available from the U.S. Department of Labor, Occupational Safety and Health Administration. The program must include procedures for evaluating air contaminants and selecting appropriate respirators, procedures for proper use of respirators, procedures for testing the facepiece-to-face fit of respirators, procedures for cleaning, disinfecting, inspecting, maintaining, and storing respirators, procedures for determining if workers are physically and medically capable of wearing respirators, and procedures for training employees in the use of respirators and in recognizing the hazards associated with contaminants in the work place. This respirator will reduce, but not eliminate the inhalation of contaminants. Where suspected cancer-causing contaminants are present, positive pressure supplied air respirators will provide higher protection levels.*

▲ WARNING—continued

- *All persons using this SPERIAN breathing apparatus must be made aware of its limitations. We cannot be responsible for any damage to property, personal injury, or death in which environmental exposure is a contributing factor.*
- *This respirator does not protect exposed areas of the body. Some contaminants can be absorbed directly through the skin while others may irritate exposed areas.*
- *Do not use this respirator at temperatures above 130°F (55°C).*
- *SPERIAN respirators, accessories, and associated equipment should not be used in atmospheres which may contain contaminant concentrations above the lower explosive limit (LEL). Intrinsic safety certification of electronic components does not eliminate potential danger from ignition in these atmospheres.*
- *Your SPERIAN respirator has been made of materials chosen for their performance, safety, and durability. However, all respirator materials have limitations when exposed to extremes of heat or cold, or to chemicals. Materials may corrode or fail, and permeation of gases and liquids may occur. This could create conditions in which this respirator would be dangerous to use.*
- *S. Special or Critical User's Instruction: The mercury vapor cartridges incorporate four (4) end-of-service-life indicators (ESLIs). The ESLIs must be visible when wearing the respirator without having to manipulate either the facepiece or the indicator. If the indicator cannot be seen, do not wear the respirator.*
- *No respirator can provide complete protection from all conditions. Use extreme care for emergency operations. Do not use this respirator for applications involving exposure to high heat, sparks, or direct flame.*
- *Accessories not offered by SPERIAN may degrade performance, and will void NIOSH certification.*
- *Do not use this respirator if you have a health or respiratory problem.*
- **FAILURE TO OBSERVE ALL WARNINGS MAY RESULT IN PERSONAL INJURY, SERIOUS ILLNESS, OR DEATH.**

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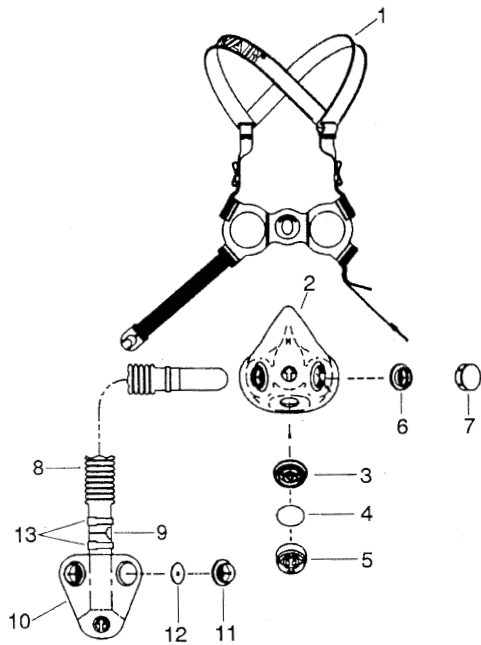


Figure 1. SURVIVAIR Series 2000 Belt-Mounted APR

IV. PARTS LIST


ITEM	QTY	P/N	DESCRIPTION
1	1	260023	Headband Assy
2	1	250012	Facepiece Skirt, Small
		260012	Facepiece Skirt, Medium
		270012	Facepiece Skirt, Large
3	1	260019	Exhalation Valve Seat
4	1	140005	Exhalation Valve (Pkg. of 4)
5	1	260018	Exhalation Valve Cover
6	1	140002	Threaded Connector (Pkg. of 2)
7	1	985020	Cap
8	1	260061	Breathing Tube Assy.
9	1	260058	Connector Tube
10	1	260054	Plenum (includes 2 each of 11 and 12)
11	2	360008	Threaded Connector
12	2	140001	Inhalation Valve (Pkg. of 6)
13	2	941732	Clamp
	2	140074	Filter Holder (not shown)
	2	140079	Filter Holder (not shown)
		Cartridges—See Table 1	
		Filters—See Table 1	

TABLE 1. CARTRIDGES AND FILTERS

MODEL NO.	CARTRIDGES
100100	Organic Vapors
100300	Organic Vapors and Acid Gases: Organic Vapors; Sulfur Dioxide, Chlorine, Hydrogen Chloride, Chlorine Dioxide, Hydrogen Fluoride, Hydrogen Sulfide (Escape Only)
100600	Mercury Vapor and Chlorine
109300	Combination Organic Vapors; Acid Gases; HEPA; Dusts, Fumes, and Mists; and Pesticides: Organic Vapors; Sulfur Dioxide, Chlorine, Hydrogen Chloride, Chlorine Dioxide, Hydrogen Fluoride, Hydrogen Sulfide (Escape Only); HEPA; Dusts, Fumes, and Mists; Pesticides
109600	Combination Mercury Vapor; Chlorine; HEPA; and Dusts, Fumes, and Mists
1093	Combination Organic Vapors; Acid Gases; and P100: Organic Vapors; Sulfur Dioxide, Chlorine, Hydrogen Chloride, Chlorine Dioxide, Hydrogen Fluoride, Hydrogen Sulfide (Escape Only); and P100
1096	Combination Mercury Vapor; Chlorine; and P100
FILTERS	
104000	Pesticides; Paint, Lacquer, and Enamel Mists; and Dusts, Fumes, and Mists when used with 100100 cartridge and 140079 retainer. Dusts, Fumes, and Mists when used with 100300 cartridge and 140079 retainer.
109000	HEPA; and Dusts, Fumes, and Mists
1090	P100
1195	P100 Disk


NOTE

Use only components with the part numbers listed on the NIOSH approval label. Use of any other components will void the approval.


 WARNING
<p><i>Below is a partial list of materials for which these respirators MUST NOT be used. This list is far from complete. Contact SPERIAN for information on other materials.</i></p>

Acroline	Methanol
Aniline	Methyl Bromide
Arsine	Methyl Chloride
Boron Hydrides	Methylene Chloride
Bromine	Nitro Compounds:
Carbon Dioxide	Nitrogen Oxides
Carbon Monoxide	Nitroglycerin
Carbonyls	Nitrobenzene
Cyanogen	Nitromethane
Dimethylaniline	Ozone
Dimethyl Sulfate	Phosgene
Ethyl Cyanide	Phosphine
Fluorine	Phosphorous Trichloride
Hydrogen Cyanide	Stibine
Hydrogen Selenide	Sulfur Chloride
Isocyanates: TDI, HDI, MDI	Vinyle Chloride

V. USE INSTRUCTIONS

 WARNING
<i>Always read cartridge labels prior to use to be certain that you have cartridges and/or filters that will provide the required protection against particulates only shall not be used for gases/vapors, and cartridges/filters labeled for protection against gases/vapors only shall not be used for particulates. Both cartridges/filters must be of the same type.</i>

A. Filter/Cartridge Installation

 WARNING
<i>Mercury vapor cartridges incorporate four (4) end-of-service-life indicators (ESLIs) around the side of the cartridge. Each ESLI, yellow in color when new, turns to gray when exposed to mercury vapor. Cartridges with gray ESLIs must not be used. Never enter or remain in a hazardous atmosphere wearing a respirator equipped with mercury vapor cartridges unless:</i>
<i>a. you can distinguish between the safe and discard colors of the end-of-service-life indicators on the side of the cartridge;</i>
<i>b. all end-of-service-life indicators are yellow; AND</i>
<i>c. the end-of-service-life indicators are visible when wearing the respirator.</i>


1. Ensure that you have the correct filter and/or chemical cartridge for the specific contaminants in your work area. If you are not sure, contact your supervisor or safety professional.
2. Thread the P100 or HEPA filters or chemical cartridges onto the plenum connectors and carefully hand-tighten, ensuring a good seal against the plenum. Do not overtighten

Particulate Filter Pad Installation

1. Insert the correct particulate filter pad into the filter retainer so that the side stamped with the part number will face the wearer.
2. Snap the filter retainer onto the filter holder or chemical cartridge.
3. Inspect the assembly through the retainer to ensure that:
 - a. The edge of the filter makes contact with the entire retainer wall.
 - b. The filter is not bunched or folded
 - c. The filter completely covers the top of the holder or cartridge and the outer diameter of the pad is compressed between the top lip of the cartridge or filter holder and the inner sealing edge of the retainer.
4. Thread the filter assemblies onto the plenum connectors and carefully hand-tighten, ensuring a good seal against the plenum. Do not overtighten.

C. Donning

1. Inspect the respirator as described in section VI, paragraph B.
2. Clip the plenum, with cartridges and/or filters attached, to the belt so that the breathing tube goes over the right shoulder.

 WARNING
<i>When using the mercury vapor cartridge, position the plenum on your side so that the cartridge end-of-service-life indicators are visible. Do not enter a hazardous atmosphere if the indicators are not visible.</i>

3. Position the bottom of the facepiece as low as possible under the chin.
4. Fit the narrow portion of the facepiece onto the bridge of the nose.
5. Position the cradle headband above the ears so that it straddles the crown of the head with the lower headband straps below the ears and around the back of the neck.
6. Adjust the upper headband straps by pulling both straps at the same time. Adjust the lower headband straps in the same manner. Do not overtighten.

D. Facepiece Fit Check

 WARNING
<p><i>If a leak-tight seal is not obtained during the following fit checks, do not wear the respirator. Ask your supervisor or safety professional for assistance.</i></p>

1. Positive Pressure Fit Check
 - a. Hold the palm of your hand lightly over the exhalation valve outlet. DO NOT distort the natural shape of the facepiece.
 - b. Exhale gently to create a slight positive pressure inside the facepiece.
 - c. If air leakage occurs, adjust the facepiece and headband until leak-tight.
2. Negative Pressure Fit Check
 - a. Move the plenum so that you can gain access to the cartridges and/or filters.
 - b. Cover the inlet of the cartridges and/or filters with the palms of your hands or another suitable item, such as a thin sheet of plastic or rubber.


NOTE


Alternately, the cartridges may be removed to perform the fit check. If the cartridges are removed, you must ensure that each cartridge is tightly sealed against the plenum and that the facepiece-to-face seal is not disturbed when reinstalling the cartridges.

- c. Inhale gently and hold your breath for a few seconds. The facepiece should collapse on your face without leaking. The plenum should also collapse slightly.
- d. If air leakage occurs, adjust the facepiece and headband until leak-tight
- e. If a leak-tight seal can not be maintained, the problem may be with the plenum and/or hose.
- f. If a good fit was achieved, relocate the plenum to its original position.

E. Using the Respirator

To receive the maximum protection available from your respirator, you must follow your employer's instructions on the use and maintenance of the respirator. Read and understand the following warnings prior to using the respirator.

 WARNING
<ul style="list-style-type: none"> • <i>Never remove your respirator for any reason while you are in the work area.</i> • <i>You must leave the work area immediately if the facepiece seal is disturbed for any reason, such as:</i> <ol style="list-style-type: none"> <i>a. Slipping due to excessive sweating or excessive head movement.</i> <i>b. The facepiece becomes dislodged as a result of being knocked.</i>

 WARNING—continued
<ol style="list-style-type: none"> <i>c. You sneeze or cough while wearing the facepiece.</i> <i>d. You need to blow your nose or scratch covered areas of your face.</i> <i>e. For any other reason that would cause the facepiece seal to be disturbed.</i> <p><i>You must restore the facepiece seal and perform a fit check before reentering the work area.</i></p>

F. Chemical Cartridge Service Life and Replacement

The Cartridge service life depends on the user's breathing rate, the characteristics of the contaminant, and environmental conditions such as humidity. Saturated cartridges leak trace amounts of contaminant to the wearer which may be detected by odor, taste, and/or irritation. Replace cartridges at the first trace of the characteristic contaminant odor or taste, at regularly scheduled intervals recommended by your safety professional, or if they show any signs of damage. Always replace cartridges in pairs. Dispose of used cartridges in accordance with applicable local, state, and federal guidelines.

1. Return to an area with clean air.
2. Unscrew the used cartridges from the plenum and discard.
3. Securely install new cartridges onto the plenum threaded connectors as described in section V, paragraph A.

G. Filter Replacement

The filter service life depends on the user's breathing rate, the characteristics of the contaminant, and environmental conditions such as humidity. Contaminant-laden filters cause the breathing resistance to increase until it becomes objectionable to the user. SPERIAN recommends that filters be replaced at least daily, more often if necessary, or in accordance with schedules established by regulatory agencies. Replace filters when they become contaminants; your eyes, nose, or throat become irritated; breathing becomes difficult; or if they show any signs of damage. Dispose of used filters in accordance with local, state, or federal guidelines.

1. Return to an area with clean air.
2. Remove the filter retainers from the filter holders or chemical cartridges. Remove the filter pads from the retainers and discard in accordance with federal, state and local guidelines.
3. Clean the filter retainers and holders or face of cartridges if necessary.
4. Install new filter pads into the filters retainers as described in section V, paragraph B.
5. If using P100 or HEPA filters, unscrew the filters from the plenum connectors and discard.
6. Install new P100 or HEPA filters onto the plenum connectors as described in section V, paragraph A
7. Perform a fit check.

VI. MAINTENANCE

NOTE

Inspect this respirator for defects before and after each use, and at least once monthly if not used. Repair as necessary. Clean and disinfect after each use, and store properly to assure that the respirator is maintained in satisfactory working condition. Keep a record of inspection and repair dates and results.

A. Cleaning

⚠ WARNING
<ul style="list-style-type: none"> • Specialized processes are required to disinfect and decontaminate a respirator. You MUST follow the instructions of the manufacturer who supplies the disinfecting or decontamination equipment or chemicals. • Its is the user's responsibility to ensure that the cleaning process chosen provides adequate disinfection or decontamination. • In the absence of a commercial sanitizing product, the hypochlorite solution described in the steps below will eliminate many, but not all biohazards.

CAUTION
<ul style="list-style-type: none"> • DO NOT USE gasoline, organic based solvents, or chlorinated degreasing fluids to clean any part of the respirator. • You must ensure that this respirator is not damaged when using disinfecting or decontamination equipment or chemicals. • Avoid wetting the inside of the breathing tube hose since this area is slow to dry. Be sure that all components are dry before reassembly.

NOTE

- Silicone and rubber parts of the respirator may be cleaned between washings with SPERIAN Mask Wipes, P/N 140096 or P/N 140082.
- ANSI Z88.2, latest edition, also provides information and guidelines on the cleaning and sanitizing of respirators.

1. Make a cleaning solution of warm water and a mild detergent.
2. Unscrew and remove the breathing tube from the facepiece.
3. Immerse the facepiece in the cleaning solution and gently clean with a soft brush.
4. Thoroughly rinse the facepiece in fresh water, paying particular attention to removal of all soap residue from the exhalation valve. If possible, direct running water onto the valve.
5. Wash the breathing tube and plenum if contaminated, avoiding as much as possible wetting the

inside of the tube or plenum. Remove the cartridges/filters from the plenum prior to washing.

6. Disinfect the facepiece in a warm (48°C or 120°F maximum) suitable sanitizing solution such as a "hypochlorite solution" for 2 to 3 minutes. A hypochlorite solution can be made by mixing two (2) tablespoons of chlorine bleach per each gallon of water. Rinse thoroughly with fresh warm (48°C or 120°F maximum) water.
7. Dry with a clean, lint-free cloth or allow to air dry. Warm air may be used to speed drying.
8. Hold the facepiece firmly against your face and exhale several times to ensure that the exhalation valve functions smoothly.
9. Screw the breathing tube onto the facepiece, making sure that it makes a proper seal with the facepiece.
10. Hold the facepiece firmly against your face and exhale several times to ensure that the exhalation valve functions smoothly.
11. Carefully inspect the respirator as described in section B. Reinstall the cartridges and/or filters.

B. Inspection

⚠ WARNING
<p>Routinely used respirators must be inspected before and after each use. Stored emergency respirators must be inspected after each use and at least once every 30 days. A written record must be kept of inspections of emergency respirators.</p>

1. Inspect the facepiece skirt for cuts, gouges, punctures, tears, nicks, and deterioration from age, heat, or contamination, and the face seal for distortion.
2. Inspect the headbands for abrasions, cuts, nicks, loss of elasticity, or deterioration from age, heat, or contamination.
3. Remove the exhalation valve cover and carefully inspect the valve for cracks, tears, wrinkles, cuts, or distortion. Ensure that the valve seat is free of nicks, dents, or cracks.

NOTE

The inhalation valves may flutter during exhalation if:

- a. no cartridges/filters are installed on the plenum, or
 - b. the plenum is oriented with the cartridges/filters facing up.
4. Check the exhalation valve for proper operation: exhale through the respirator and pause before inhaling. The exhalation valve must close during the pause before inhalation begins. Valves which fail to close must be replaced.

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5. Check that the breathing tube elbow and the cap make a proper seal with the facepiece.
6. Stretch the breathing tube and inspect it for cuts, holes, or deterioration from age, heat or contamination.
7. Inspect the tie wrap and clamps at the ends of the breathing tube for damage or deterioration from age, heat, or contamination.
8. Inspect the plenum for cuts, gouges, punctures, tears, and deterioration from age, heat, or contamination.
9. Inspect the plenum inhalation valves for nicks, cracks, or tears. Check the valves for proper operation: Gently exhale through the respirator. The inhalation valves must close during exhalation (also see note above).


C. Repair

Repair by the user is limited to replacement of components as listed on the NIOSH approval label and repairs listed in this manual. Disassembly should be performed only to the extent necessary to replace the components. To protect your warranty and the NIOSH certification of this respirator, all other repairs must be done only by authorized SPERIAN-certified technicians at your facility, consult your SPERIAN distributor for the one nearest you.

1. Threaded Connector Replacement (Facepiece Only)
 - a. Remove breathing tube or cap as required
 - b. Disengage threaded connector by pressing inward.
 - c. Insert the new connector, threaded end first, from inside the facepiece.
 - d. Push the connector until the threads are clear and the rubber flange is securely seated.
2. Exhalation Valve, Seat, and Cover Replacement
 - a. Using the small tab, remove the exhalation valve cover. Pull out the exhalation valve.
 - b. Push the valve seat inward to disengage from the facepiece.
 - c. Insert the new valve seat from inside the facepiece by flexing the facepiece material.
 - d. Securely seat the smaller diameter flange by pressing inward while working the facepiece material into the groove of the seat.
 - e. Replace the exhalation valve by pulling the stem through the valve seat until it snaps into place.
 - f. Snap on the valve cover.
 - g. Perform a fit check as described in section V paragraph D.

3. Threaded Connector Replacement (Plenum Only)
 - a. Firmly grasp the base of the plenum with one hand and pull the threaded connector out from the front of the plenum. To aid in the removal, a cartridge/filter may be loosely threaded onto the connector
 - b. Insert the new connector into the front of the plenum by working the material around the connector flange until the threads are clear.
4. Inhalation Valve Replacement
 - a. Remove the threaded connector from the plenum as stated above.
 - b. Pull the old valve off the connector stem. Press on the new valve and reinstall the connector.

D. Storage

 WARNING
<i>This SPERIAN respirator does not have a defined storage life. Carefully inspect it before each use.</i>

CAUTION
<i>The maximum storage temperature for this device is 140°F (60°C). Long term exposure to elevated storage temperatures could cause premature deterioration.</i>

After inspection and cleaning, store your SPERIAN respirator to protect it against dust, sunlight, extreme heat and cold, excessive moisture, or damaging chemicals.

E. Shipment

All products returned to SPERIAN's factory, distributors, or repair centers must be decontaminated prior to shipment.

F. Overhaul Frequency

This SPERIAN respirator does not have an overhaul requirement other than that required in Section VI, Maintenance.

G. Additional Information

If you need assistance or additional information on any SPERIAN product, consult your local distributor or contact:

SPERIAN
3001 South Susan Street
Santa Ana, CA 92704
(714) 545-0410 or (888) APR-SCBA
FAX (714) 850.0299

ALL RETURNED PRODUCTS MUST BE DECONTAMINATED PRIOR TO SHIPMENT. PRODUCTS CONTAMINATED WITH DANGEROUS SUBSTANCES WILL BE REFUSED AND RETURNED FREIGHT COLLECT.
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