Operating Manual

OptimAir MM PAPR

Mask-Mounted Powered Air-Purifying Respirator

Order No.: 10090982/6

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MSAsafety.com

WARNING!

Read this manual carefully before using or maintaining the device. The device will perform as designed only if it is used and maintained in accordance with the manufacturer's instructions. Otherwise, it could fail to perform as designed, and persons who rely on this device could sustain serious injury or death.

The warranties made by MSA with respect to the product are voided if the product is not installed and used in accordance with the instructions in this manual. Please protect yourself and your employees by following the instructions.

Please read and observe the WARNINGS and CAUTIONS inside. For additional information relative to use or repair, call 1-800-MSA-2222 during regular working hours.

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For your local MSA contacts, please go to our website www.MSAsafety.com

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1 Introduction

1.1 Cautions and Limitations

A — Not for use in atmospheres containing less than 19.5 percent oxygen.

B — Not for use in atmospheres immediately dangerous to life or health.

C — Do not exceed maximum use concentrations established by regulatory standards.

F — Do not use powered air-purifying respirators if airflow is less than four cfm (115 lpm) for tight fitting facepieces or six cfm (170 lpm) for hoods and / or helmets.

I — Contains electrical parts that may cause an ignition in flammable or explosive atmospheres.

J — Failure to properly use and maintain this product could result in injury or death.

L — Follow the manufacturer's User's Instructions for changing cartridges, canisters and / or filters.

M — All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.

N — Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.

O — Refer to User's Instructions, and / or maintenance manuals for information on use and maintenance of these respirators.

P — NIOSH does not evaluate respirators for use as surgical masks.

FF — Respirators are to be fit tested prior to use with the heaviest cartridges, canisters, filters and/or accessories intended to be used. Fit testing should also be conducted while wearing all personal protective equipment intended to be used. See User's Instructions for fit test requirements.

1.2 Important Notice for Respiratory Protection Program Administrators

(1) Before occupational use of this respirator, a written respiratory protection program must be implemented meeting all the local government requirements. In the United States, employees must comply with OSHA 29 CFR 1910.134, which includes medical evaluation, training, and fit testing.

(2) An adequate respirator protection program must include knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment, instruction and training in the use of equipment, inspection and maintenance of equipment, and medical surveillance. (See OSHA regulations, Title 29 CFR, Part 1910.134, Sub-part I par. 1910.134 (b) (1)).

(3) This respirator will perform as designed only if it is used and maintained strictly according to the manufacturer’s instructions, labels, and limitations. The Program Administrator and the users must read and understand these instructions before trying to use or service this product. We encourage our customers to write or call for information on this product before using it.

(4) This respirator shall not be worn in an atmosphere which is immediately dangerous to life or health (from which the wearer cannot escape without the aid of a respirator). Under no circumstances should the respirator be used as an underwater device.

(5) Users must wear suitable protective clothing and precautions must be taken so that the respirator is not worn in atmospheres that may be harmful to the device.

(6) Do not alter, modify, or substitute any components without the approval of the manufacturer. Such alterations will void the NIOSH approval.

(7) Inspect the respirator regularly and maintain it according to the manufacturer's instructions. Repairs must only be made by properly trained personnel.

1.3 Limitations

The OptimAir MM PAPR with OptiFilter Type HE filter cartridge, or Type HE particulate filter, are approved as high efficiency particulate air filter for powered air-purifying respirators. Filter does not remove gases or vapors from the air supply. No filter is designed for all substances, Therefore, you must know what the contaminant is, as well as its concentration, before selecting a respirator. This respirator does not supply oxygen. Do not use this respirator unless the surrounding air contains a minimum of 19.5 percent oxygen. The respirator may be used at temperatures between 0°F and 120°F, and may be worn under flame-retardant garments. If used below 40°F, a fullycharged battery may not operate the motor-blower for an entire shift.

1.4 Respirator Use Limitations

The wearer must comply with the following MSA respirator use limitations:

(1) Maximum Use Concentration – Do not exceed any of the following:
- 1000 times the exposure limit for the contaminants present.
- Immediately dangerous to life or health (IDLH) concentration for any contaminant present.

(2) The limitations outlined in the applicable NIOSH approval.

(3) Any applicable limitation contained in a standard established by a regulatory agency (such as OSHA) with jurisdiction over the wearer.

(4) NIOSH allows this respirator to be used for protection against a mixture of particulates that are present simultaneously or alternately against one particulate then another (using the same filter) if the mixture meets the following conditions:
- The filter must be approved for all particulate.
- Particulates (dusts, mists, fumes, asbestos, radionuclides) can be mixed with any other particulate for which the filter is approved.
- Contaminants present simultaneously must be below IDLH levels for the specific contaminants. If any one contaminant in the mixture exceeds the IDLH concentration then the entire mixture must be treated as IDLH and the respirator cannot be used (except for escape).

⚠ WARNING!

- This device does NOT supply oxygen. Use only in adequately ventilated areas containing at least 19.5 percent oxygen.
- This respirator must be used in conjunction with proper particulate cartridges for protection against specific contaminants.
- This respirator is not approved for use with chemical or combination cartridges. Use only with the particulate cartridges listed in the approvals matrix.
- Do not use when concentrations of contaminants are unknown or immediately dangerous to life or health (IDLH). (See the respirator NIOSH approval label P/N 818105 to determine if this device can be used for escape from those concentrations.)
- Do not use when appropriate exposure limit (OSHA, PEL, NIOSH REL, ACGIH TLV, etc.) is not known or when it is below the odor threshold or any other established warning level for the contaminant.
- Leave area immediately if:
  - Breathing becomes difficult.

  - Dizziness or other distress occurs.
  - You taste or smell contaminant.
  - You experience eye, nose or throat irritation.
- Use strictly in accordance with instructions, labels and limitations pertaining to this device.
- This respirator may not provide a satisfactory seal with certain facial characteristics, such a beards or large sideburns, that prevent direct contact between the skin and the sealing surface of the facepiece. Do not use this respirator if such conditions exist.
- Individuals who wear prescription glasses must use the spectacle kit to guarantee a correct fit. Ordinary prescription glasses cannot be worn under the facepiece. See 8.3 Spectacle Kit.
- Never alter or modify this device.
- This respirator is for use by trained and qualified personnel only.

Failure to follow these warnings can result in serious personal injury or death.

⚠ WARNING!

- This respirator provides LIMITED protection. A respirator paired with an appropriate particulate filter may help reduce exposure to airborne biological agents, including avian (bird) flu virus, other types of influenza, SARS, or other bacterial or viral biological agents, but WILL NOT ELIMINATE the risk of exposure, infection, illness, or death.
- This respirator is certified by NIOSH to comply with the requirements specified for the designated filter efficiency level; however, the government has NOT established a safe level of exposure to biological agents. Therefore, the respirator may NOT prevent transmission of influenza virus.
- Refer to the Centers for Disease Control and Prevention (CDC) at www.cdc.gov for guidance on the use of respirators to help decrease exposure to viral pathogens or other airborne biological agents in community, home, and occupational settings. The CDC recommends fit testing, medical evaluations, and training for optimal effectiveness when a respirator is used in a non-occupational setting. Neglecting these preparatory measures may cause an unsafe condition. Respirators used in an occupational setting MUST be used in accordance with a complete respiratory protection program as required by OSHA, which includes proper selection, training, fit-testing, and fit-checking. Detailed information on a respiratory protection program is available by contacting OSHA or visiting www.osha.gov.
- Do NOT remove respirator in contaminated areas. The outer surface of the respirator MUST be treated as if it is contaminated at all times. A respirator will NOT prevent one from exposure to the flu or other airborne biological agents in other ways such as by touching the mouth, nose, or eyes with contaminated hands or objects. Biological agents, such as the flu virus, can be transmitted when infected individuals cough or sneeze and spread virus particles through the air to exposed surfaces which are touched. Tight-fitting safety goggles, or a full-facepiece respirator, may further help prevent transmission of viral pathogens or other airborne biological agents.
- The CDC recommends frequent hand washing and wearing gloves to help prevent transmission of disease due to exposure to surfaces where contaminants may be present, and also immediately following removal of the respirator.
- Do not share filter cartridges between users.
- This respirator is NOT for use by
  a) children or
  b) people with a medical condition that may be adversely affected by using it.
- This respirator is equipped with an exhalation valve. Exhaled air from the user passes, unfiltered, through the exhalation valve and into the surrounding environment. Do not use where a sterile field is required.
- Test for Tightness before use. If a leak is detected, refer to 5.4 Testing the Negative Pressure Seal (Face-to-Facepiece Seal) in this manual for further instructions.

- An adequate respiratory protection program must include knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment, instruction and training in the use of equipment, inspection and maintenance of equipment, and medical surveillance.
- Do not alter, modify, or substitute any components.
- Inspect the respirator regularly and maintain it according to the instructions. Repairs must only be made by personnel authorized by MSA.
- Verify the contaminant(s) in the environment before entering. Always check that the filter cartridges are appropriate for use in the environment. A filter cartridge which is not designed for the contaminant present may not provide protection.
- DO NOT use the filter cartridges if the bag is opened, damaged, or missing. Filter cartridges must be in their original packaging prior to use in a contaminated environment.
- DO NOT replace canister/cartridge(s) in a contaminated area. Be sure to follow applicable decontamination procedures. Failure to follow this warning can cause inhalation of contaminated air, resulting in serious respiratory injury or death.
- DO NOT remove respirator until respirator and protective clothing are decontaminated; otherwise, exposure to contaminants may result. Follow decontamination and disposal procedures established by appropriate authorities

Failure to follow these warnings can result in serious personal injury or death.

2 Description

The OptimAir Mask-Mounted Powered Air-Purifying Respirator (PAPR) from MSA is certified by the National Institute for Occupational Safety and Health (NIOSH) as an air-purifying device designed only for use in atmospheres **NOT** immediately dangerous to life or health (IDLH).

The OptimAir MM PAPR is used with the facepiece, which is available in small, medium or large sizes. If needed, Advantage® 4100, Ultravue® and Ultra Elite® Facepieces may be equipped with an integral welder's lens or clip-on welder's adapter (only used with Ultravue Facepieces). See Accessories/ Spare Parts.

The motor-blower and replaceable high-efficiency filter are worn as an assembly attached to the facepiece. The rechargeable battery pack is worn on the support belt. A power cable connects the belt-mounted battery pack to the motor-blower on the facepiece. A battery charger is supplied with the respirator.

2.1 Principle of Operation

The motor-blower draws surrounding air through the filter which captures the particulate contaminant. Filtered air passes through to the facepiece and creates higher pressure than the surrounding atmosphere. Therefore, if a leak occurs, air will flow from inside the facepiece to the outside air. This is referred to as positive pressure. Air flow also provides wearer comfort. The rechargeable NiMH battery pack supplies 4.8 volts (nominal) to the motor-blower. The battery pack is replaceable. A fully charged battery is designed to operate in excess of 8 hours. Then the battery pack can be re-charged in 3 hours using the standard charger.

The replaceable filter cartridge which traps the particulate contaminant is at least 99.97% efficient against 0.3 micron DOP aerosol.

2.2 Respirator Fit Test

⚠ WARNING!

The user must perform a respirator fit test and follow all warnings and limitations specified.

Failure to follow this warning can result in serious personal injury or death.

A qualitative or quantitative respirator fit test must be carried out for each wearer of this respirator to determine the amount of protection it will provide. Respirator fit tests are explained fully in ASTM F3387 - Latest edition, Standard Practices for Respiratory Protection, ASTM International https://www.astm.org/Standard/standards-and-publications.html (ASTM F3387 formerly known as ANSI Z88.2).

Quantitative Test — If a quantitative fit test is used, a fit factor that is at least 500 shall be obtained before that respirator is assigned to an individual.

Qualitative Test — If a qualitative fit test is used, only validated protocols are acceptable. The individual must pass a test designed to assess a fit factor of at least 100.

Powered Air-Purifying Respirators must be qualitatively or quantitatively fit tested in a negative-pressure mode (with blower off). This will cover use of the respirator in the powered air-purifying mode operation.

2.3 Exposure Limits

A listing of acceptable exposure limits from the following sources:

- American Conference of Governmental Industrial Hygienists (ACGIH)
- Occupational Safety and Health Administration (OSHA)
- National Institute for Occupational Safety and Health (NIOSH)
- American Industrial Hygiene Association (AIHA)

Contact MSA at 1-800-MSA-2222 for information.

2.3.1 Exposure Limits for Mixtures

The American Conference of Governmental Industrial Hygienists (ACGIH) publishes the following information to determine the TLV of a mixture. First determine the total concentration of the chemical mixture (CMixture) from the individual contaminant concentrations (C1, C2, C3,…) using the following formula:

CMixture = C1 + C2 + C3 + …

The TLV of the mixture is found by using the following formula where T1, T2, T3,… are the individual contaminant TLVs and C1, C2, C3,… are the individual contaminant concentrations:

$$T_{Mixture} = \frac{C_{Mixture}}{\frac{C_1}{T_1} + \frac{C_2}{T_2} + \frac{C_3}{T_3} + \dots}$$

Only use these equations if the contaminants present are actually mixed. Some substances do not mix and may be present separately, for example, in pockets or at different levels. In that case, the lowest TLV of the substances present must be used to determine the appropriate respirator category for protection against all contaminants present.

3 Charging the Battery Pack

3.1 Unpacking and Inspection

The OptimAir Mask-Mounted PAPR kit consists of the following components:

- motor-blower
- battery pack
- support belt
- charger
- cable
- facepiece
- storage plug
- filter

⚠ WARNING!

- Thoroughly inspect all components of the respirator before the device is used. Read and observe all NIOSH approval limitations as they apply to using the OptimAir MM PAPR.
- Do not use the storage plug while working in a contaminated atmosphere. Doing so will compromise respirator performance and void NIOSH approval. Use plug only during decontamination and storage to help prevent debris from coming out of cartridge.
- Do not drop the OptimAir MM PAPR. The battery pack can be damaged by impact. The case can be cracked and could allow water into the pack. If the unit is dropped, inspect the case for cracks. If the motor blower no longer operates from the compromised battery pack, the battery pack must be replaced.
- The motor-blower housing can be damaged by impact. The blower impeller can be loosened or the motor shaft can be bent. If the unit is dropped, check the case for cracks. Listen closely to the sound of the motor. If the impeller binds or rattles, or if air output is reduced, the entire motor-blower must be replaced.

Failure to follow these warnings can result in serious personal injury or death.

3.2 Charging the Battery Pack

The battery pack must be fully charged before the respirator is first used. Use only the P/N 10090981 battery charger from MSA. Other chargers can damage the battery due to internal wiring differences or incorrect charging rates.

The battery pack should be stored at a temperature range of 50°F to 85°F. If the battery pack has been stored in a “fully charged” condition for more than one week, the battery pack should be charged until a full charge is indicated.

⚠ WARNING!

Do not charge the battery pack where there are explosive concentrations of combustible gases, vapors, or mists. An explosion or fire can result. Replace the charger if the cord is damaged or worn, or if the case is cracked or distorted. Do not use a damaged charger. Doing so can result in serious personal injury or death, or create a fire hazard.

Failure to follow this warning can result in serious personal injury or death.

(1) Line up the key in the charger cable plug with the slot in the female connector on the battery pack.

(2) Push the plug into the female connector and turn the ring to secure it.

(3) Plug the charger into a 115-120 V, 50, 60 Hz (standard AC) outlet. The charger can be used internationally with the appropriate adapter.

⚠ CAUTION!

Voltages lower than 115V are not recommended. Voltages greater than 120V will damage the battery charger and battery pack.

Failure to follow this caution can result in battery or equipment damage.

(4) Charge the battery pack until a full charge is indicated.

LED Signaling	
Condition	**LED Indication**
No Battery	Yellow
Charge Initialization	Yellow
Rapid Charge	Orange
Charge Top-Off	Green/Yellow
Trickle Charge	Green
Charge Error	Orange/Green

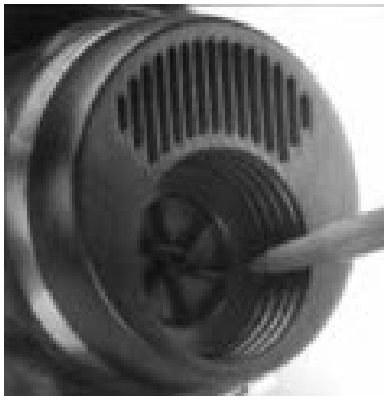
The charger uses one LED. When the battery is charging, the LED will be orange. When the LED is green the battery is fully charged. The battery can stay connected to the charger until it is needed. If the LED is yellow, the battery is either not

connected or not at the proper temperature. The charging will start when the battery pack reaches the optimum charging temperature of 35°F to 100°F. If the LED is orange/green , there is a failure. Disconnect battery pack, and unplug charger. Plug charger back into outlet and reconnect battery pack to reset charger. If the LED is orange/green during any part of the charge, after it has been reset, remove the battery from service.

4 Respirator Assembly

4.1 Assembling the Mask-Mounted Respirator

If necessary, remove the coupling nut from the facepiece inhalation housing. The coupling nut may be used if the facepiece is used on MSA respirators.



(1) Check that the inhalation check valve and spider gasket are in the facepiece inhalation housing.

NOTE: The gasket is needed so that the facepiece and motor-blower will seal.

NOTE: The Ultavue Facepiece is shown.

a) If using the **Ultravue Facepiece**, see step 4.

b) If using the **G1 Facepiece**, attach the APR adapter by following these steps:

(2) Push the APR adapter inward until you hear a click when it engages correctly in the facepiece. When the APR adapter is installed correctly and the facepiece is held in the as-worn position, the MSA logo is aligned horizontally.

(3) Pull on the APR adapter to make sure that it is attached tightly to the facepiece.

(4) Thread the motor-blower coupling nut into the facepiece until resistance is encountered.

NOTE: Continue tightening the coupling nut an additional 60 degrees (the distance of two notches on the coupling nut) into the facepiece.

(5) If attached, unthread the filter from the motor-blower assembly.

(6) Check that there is a gasket in the motor-blower housing.

NOTE: The gasket is necessary so that the filter and motor-blower will seal.

⚠ WARNING!

Do not use the respirator if the spider gasket in the facepiece inhalation housing or the gasket in the motor-blower housing is missing or appears damaged.

Failure to follow this warning will permit the contaminant to be drawn into the respirator and inhaled, resulting in serious respiratory injury or death.

(7) Thread the filter into the motor blower and hand-tighten.

(8) Line up the key on the battery cable plug with the slot in the female connector on motor-blower.

(9) Push the plug into female connector and turn to secure.

5 Using the Respirator

⚠ WARNING!

- Do not enter any atmosphere with this respirator unless you know that:
  - a) You have read, understood, and followed all instructions and warnings pertaining to the respirator.
  - b) The respirator and conditions meet the requirements outlined.
  - c) The cartridges are the proper type for the contaminant or contaminants present.
  - d) The amount of oxygen is sufficient to support life (that is, at least 19.5 percent oxygen by volume at sea level). Do not use is oxygen concentration sufficient to support life is questionable.
  - e) Respirator has passed a tightness test. (See 5.4 Testing the Negative Pressure Seal (Face-to-Facepiece Seal)
  - f) Filters/Cartridges do not need to be replaced. Discard exhausted cartridges.
- Do not use the respirator in an atmosphere containing gas or vapor contaminants. Do not use the respirator if the air contaminant is unknown or immediately dangerous to life or health (IDLH).
- The respirator filter is designed to provide limited protection from specific contaminants. See the filter label for specific information.
- If you are working with a contaminant which can be absorbed by your skin, wear protective clothing that will not allow the contaminant to contact your skin.
- When using the Advantage 4000 Facepiece, ensure the inhalation valve disc is laying flat against the adapter orifice.

Failure to follow this warning can result in serious personal injury or death.

5.1 Donning the Support Belt Battery Pack

(1) Thread the belt through the belt loops on the battery pack.

(2) Don the support belt.

NOTE: The battery pack may be worn on either side.

(3) Adjust the battery pack to a comfortable position.

5.1.1 Connecting the Battery Pack

(1) Line up the key on battery cable plug with the slot in female connector on battery pack.

(2) Push the plug into female connector and turn to secure.

(3) Turn the switch located on the battery pack on.

(4) Attach the retaining clip to your shirt or belt to secure the power cable.

⚠ CAUTION!

Return to a safe atmosphere and discard the respirator immediately if the facepiece becomes discolored, crazed, blistered or cracked, or if other signs of deterioration of the facepiece, motor-blower, filter or battery pack are observed.

Failure to follow this caution can result in minor or moderate injury.

NOTICE

You can breathe through the respirator with the motor-blower off, but breathing resistance may be noticed, as with a negative-pressure respirator.

5.2 Donning the Facepiece

⚠ WARNING!

Make sure the top of the facepiece seal contacts the forehead directly. Make sure there is no hair between the facepiece seal and your skin.

Failure to follow this warning can result in serious personal injury or death.

⚠ CAUTION!

Cover lenses are installed on the outside of the facepiece lens to protect the plastic surface. Do not use a cover lens in a high heat environment. High heat can cause the cover lens to distort.

Failure to follow this caution can result in minor or moderate injury.

5.2.1 Adjustable Rubber Harness

(1) Adjust the facepiece head straps so the end tabs are at the buckles.

(2) Grip the head-straps between the thumb and fingers with both hands. Insert your chin into the chin cup.

(3) Pull the facepiece head-straps over your head. Smooth the straps flat against your head.

(4) To tighten the lower (neck) straps, pull the straps straight back not out.

(5) Tighten the side (temple) straps.

(6) If needed, adjust the forehead strap to position the lens for best vision.

5.2.2 Donning the Advantage 3000 Model 3100 Single Port or Advantage 4000 Model 4100 Single Port with Rubber Harness

⚠ WARNING!

When using the Advantage 4000 Facepiece, ensure the inhalation valve disc is laying flat against the adapter orifice.

Failure to follow this warning can result in serious personal injury or death.

(1) Loosen the two bottom harness straps. Grip the straps by inserting thumbs through the straps. Insert chin well into lower part of facepiece and pull harness back over head.

(2) Push the back of the harness downward toward the neck until it is centered at the back of the head.

(3) If necessary hold the mask component housing with one hand and position the harness with the other hand, until obtaining a firm and comfortable fit against the face at all points.

(4) Tighten the two bottom straps so that the mask is snug against face. The top two harness straps should be flat against the top of the head.

(5) If the mask does not feel snug against the face, remove the mask and adjust the length of the two top straps. To adjust the top straps:

a) Remove the strap from the fastener button, by pulling the loose end of the strap away from the fastener button.

b) Move the slide away from the lens ring to allow the strap to slide through the lens ring connection. Adjust the length of the strap. Pull the straps to the next hole. Secure the strap in position by pulling the strap onto the button.

c) Smooth the straps so that they are flat. Move the slide so that it is located at the lens ring connection.

5.2.3 Donning the Respirator with Plastic Advantage 3000 (Model 3100 Single Port) Harness

NOTE: There are two recommended donning procedures.

Donning Procedure A

(1) Completely loosen the two bottom straps. Spread the straps of the head harness with both hands and place chin into the mask. Pull harness over head all the way, until plastic cradle lies flat on back of head.

(2) Tighten neck straps evenly so that the mask is snug against the face.

(3) If necessary, adjust the mask and tighten harness by pulling loop on the back of harness.

Donning Procedure B

(1) Completely loosen the two bottom straps, insert fingers and hold the loop on the back of the harness.

(2) Place chin into the mask.

(3) Pull the harness over head with loop, pull harness down to the back of the head until plastic cradle lies flat on back of head.

(4) Tighten neck straps evenly so that the mask is snug against your face.

5.3 Donning the Respirator with G1 Facepiece

⚠ WARNING!

Make sure the top of the facepiece seal contacts the forehead directly. Make sure there is no hair between the facepiece seal and your skin.

Failure to follow this warning can result in serious personal injury or death.

The neck strap in front of the chest or the clip on the shoulder strap is used to carry the facepiece. To protect against dirt and debris, make sure the facepiece opening is towards the user's body.

(1) Spread the harness with both hands.

(2) Put the chin into the chin cup.

(3) Pull the head straps over your head.

(4) Make sure the harness is in the correct position and is not twisted.

(5) Adjust the facepiece.

(6) Tighten the straps firmly and evenly.

5.4 Testing the Negative Pressure Seal (Face-to-Facepiece Seal)

To test facepieces for leakage using a negative pressure method:

(1) Block the filter opening.

(2) Inhale so that the facepiece collapses against your face. Hold your breath for 10 seconds. The facepiece should remain collapsed.

(3) If the facepiece does not remain collapsed, readjust the headstraps and repeat steps 1 and 2.

NOTE: If you cannot get a seal by adjusting the headstraps, check the facepiece for leaks. See 6 Maintaining the Respirator. Locate the problem and correct it before using the respirator.

Leave the area immediately if any of the following symptoms occur

- breathing becomes difficult
- dizziness or other distress occurs
- you taste or smell the contaminant
- you experience eye, nose or throat irritation

⚠ WARNING!

If you bump or impact the cartridges, leave area immediately and check the security of the cartridge. Perform an Air Tightness Test before re-entry.

Failure to follow this warning can result in serious personal injury or death.

⚠ WARNING!

This device may not seal properly with your face if you have a mustache, beard, gross sideburns or other physical characteristics that interfere with the face-to-facepiece seal [see ASTM F3387 - Latest edition , Standard Practices for Respiratory Protection, ASTM International https://www.astm.org/Standard/standards-and-publications.html (ASTM F3387 formerly known as ANSI Z88.2)]. If the facepiece does not seal against your face, non-respirable air can leak into the facepiece, reducing or eliminating the protection. The face-to-facepiece seal must be tested before each use. DO NOT USE A FACEPIECE THAT DOES NOT SEAL.

Failure to follow this warning can result in serious personal injury or death.

⚠ CAUTION!

- Return to a safe atmosphere and discard the respirator immediately if the facepiece becomes discolored, crazed, blistered or cracked, or if other signs of deterioration of the facepiece, motor-blower, filter or battery pack are observed.
- You can breathe through the respirator with the motor-blower off, but breathing resistance may be noticed, as with a negative-pressure respirator.

Failure to follow these cautions can result in minor or moderate injury.

5.5 Decontamination

The OptimAir MM PAPR may be used in some applications which may require decontamination of personal and respiratory equipment before the respirator may be removed. One such application is asbestos exposure decontamination.

Turn the motor-blower off before entering a decontamination shower. The OptimAir MM PAPR still provides respiratory protection with the motor-blower off, because all air is still drawn through the filter. However, breathing resistance will be greater than when the motor-blower is supplying air to the facepiece.

5.6 Removing the Respirator

(1) Return to fresh air and clean the outer surfaces of the respirator before removing the facepiece.

(2) Turn the power switch off.

(3) Place your fingertips behind the headstraps. Place your thumbs on the buckles.

(4) Pull the top of the buckles away from your head. Repeat as needed to loosen the headstraps.

(5) Grip the faceplate by the inhalation housing.

(6) Pull the facepiece out, then up over your head.

⚠ WARNING!

Do not pull the Ultravue Facepiece by the exhalation valve assembly. The facepiece rubber or the valve assembly can be damaged. A damaged facepiece seal or exhalation valve assembly can result in leakage of contaminants into the facepiece, resulting in serious personal injury or death.

Failure to follow this warning can result in serious personal injury or death.

(7) Remove the retaining clip from your shirt or belt.

(8) Remove the support belt. Be careful that you do not drop the battery pack.

6 Maintaining the Respirator

A maintenance program must be established. This program must include cleaning and sanitizing, component inspection and replacement of worn or damaged parts. See the appropriate parts lists for correct replacement part numbers.

⚠ WARNING!

Only MSA repair technicians are to maintain the respirator. Use only genuine MSA parts. Do not make repairs or design modifications other than as recommended by MSA or NIOSH certification will be voided.

Failure to follow this warning can result in serious personal injury or death.

6.1 Filter and Battery Pack

Service Times

Filter and battery pack (P/N 10090978) are designed to supply a minimum of four cubic feet per minute (cfm) of respirator air to the facepiece for a shift. Actual service time may vary; however, air flow must not drop below 4 cfm. Factors which will affect how long the filter can be used include the type and concentration of the contaminant. If breathing resistance is noticeable, replace the filter.

⚠ WARNING!

Do not remove the filter in a contaminated area. Return to a safe atmosphere and remove any contaminant from the surface. Do not remove the filter while the motor blower is running. With the filter removed, contamination from the surfaces of the respirator can be drawn into the facepiece.

Failure to follow this warning can result in serious personal injury or death.

(1) Replacing the filter:

a) Turn the motor-blower off.

b) Clean the surface of the filter.

c) Turn the filter counter-clockwise (left) and unthread it from the motor-blower.

d) Ensure the gasket located in the air intake hole on the side of the motor-blower is in place.

⚠ WARNING!

Do not install the filter or use the respirator if the gasket is missing or appears damaged.

Failure to follow this warning can cause the contaminant to be drawn into the respirator and can result in serious respiratory injury or death.

e) Thread the new filter into the motor-blower air intake and hand-tighten against the gasket.

(2) Replacing the battery pack:

a) Remove the pack from the support belt.

b) Loosen the ring and pull the two connectors apart.

c) To re-install the battery pack, clip the battery pack on the support belt.

d) Line up the key on the battery cable plug with the slot in the female connector on the battery pack.

e. Push the plug into the female connector and turn the ring to secure it.

6.2 Cleaning and Disinfecting

Confidence Plus® Germicidal Cleaner (P/N 10009971) from MSA is recommended. Refer to the label for use instructions. A solution as effective as Confidence Plus Cleaning Solution and compatible with MSA respirator components may be substituted.

⚠ WARNING!

- Be careful that you do not breathe or touch the contaminant in handling the respirator or its parts. Use equipment designed to protect you from the specific contaminant.
- Inspect the respirator after it has been cleaned and sanitized.

Failure to follow these warnings can result in serious personal injury or death.

⚠ WARNING!

There is no recommended method for cleaning or disinfecting the cartridge's internal filter element. Do not attempt to clean the filter using compressed air, scraping out dust or debris, submerging in a cleaning solution, or other cleaning techniques that may damage the internal filter element. Damage to the internal filter element will eliminate respiratory protection, resulting in serious respiratory injury or death.

(1) Preparing the cleaner:

a) Follow the instructions with the Confidence Plus Cleaning Solution.

b) If the Confidence Plus Cleaning Solution is not used, prepare in accordance with the instructions provided with cleaning products.

(2) Remove excess contaminant from the respirator. A vacuum cleaner equipped with high-efficiency filters to prevent recirculation of contaminant may be used.

(3) Unthread the motor-blower threaded insert from the facepiece inhalation housing.

(4) Clean and disinfect the facepiece:

a) Remove filters, cartridges, or canisters from the facepiece.

b) Remove any protective cover lens. This will prevent water from becoming trapped between the primary respirator lens and the cover lens (the trapped water will obscure vision).

c) Remove the nosecup (if used). This will facilitate cleaning the inside of the facepiece.

d) Remove the exhalation valve cover. This will allow access to the rubber exhalation valve.

e) Thoroughly wash the facepiece and components in the cleaning solution. A soft bristle (not wire) brush or sponge may be used to clean the facepiece. Be sure to clean under the exhalation valve.

f) Disinfect the facepiece and components by submerging the facepiece and components for the recommended time period.

g) Rinse the facepiece and components in clean, warm (110°F), preferably running water. Drain.

NOTE: If not rinsed thoroughly, cleaning agent residue may irritate the wearer's skin.

h) The facepiece and components should be air-dried or hand dried with a clean lint-free cloth.

⚠ WARNING!

Do not force-dry the parts by placing them in a heater or direct sunlight. This will cause the respirator to deteriorate.

Failure to follow this warning can result in serious personal injury or death.

i) After the facepiece is dry, inspect the facepiece thoroughly for missing or damaged parts. Reinstall the exhalation valve cover. Install the nosecup (if used) and a new cover lens (if used). The facepiece may be stored in a clean storage bag to protect from contamination until the next use.

⚠ WARNING!

Do not use alcohol as a germicide, because it may deteriorate the rubber.

Failure to follow this warning can result in serious personal injury or death.

(5) Use a damp cloth or sponge saturated with Confidence Plus cleaning solution or an equivalent solution to wipe the motor-blower and battery pack housing and battery cable clean.

⚠ WARNING!

Do not place the motor-blower or battery pack in any liquid. The blower impeller can be loosened or the motor shaft can be bent. If the motor-blower is dropped, check the housing for cracks. Listen closely to the motor. If the impeller binds or rattles, or if air output is reduced, the entire motor-blower must be returned to MSA for repair.

Failure to follow this warning can result in serious personal injury or death.

(6) Clean the support belt. Thoroughly wash and rinse the support belt in the Confidence Plus cleaning solution or an equivalent cleaning solution. A soft brush or sponge may be used.

6.3 Respirator Storage

The battery pack (P/N 10090978) should be stored within a temperature range of 50° to 85°F. If the battery pack has been stored in a "full charged" condition for more than one week, the battery pack should be charged until a full charge is indicated. Higher temperatures will shorten battery life. Lower temperatures will decrease capacity and operating time will be reduced. The other OptimAir MM PAPR components can be stored at temperatures of 0°F to 120°F.

7 Test Method for the OptimAir MM PAPR

The test method should only be used if any one of the OptimAir MM PAPR components (charger, battery pack, or motor-blower) is not functioning properly. This method will outline the steps needed to evaluate the proper electrical functions of each of the components of the MM PAPR. A digital multimeter is required.

7.1 Testing the Battery Pack

The electrical function of the battery pack can be measured by using a multimeter and measuring voltage and resistance across the pins of the connector.

Before Testing

(1) Examine the battery pack for cracks or other physical damage. If any of these conditions exists, replace the battery pack.

(2) Fully charge the battery before testing. If the charger failed during the charging process follow these steps below to determine the cause.

a) Unplug the charger from the outlet to reset the charger's electronics.

b) Plug the charger back in and connect a different battery to the charger.

c) If the charger fails again during charging the charger is defective and should be replaced. If the charger completes a successful charge the original battery is defective and should be replaced.

(3) Align connector/ battery pack like the diagram below.

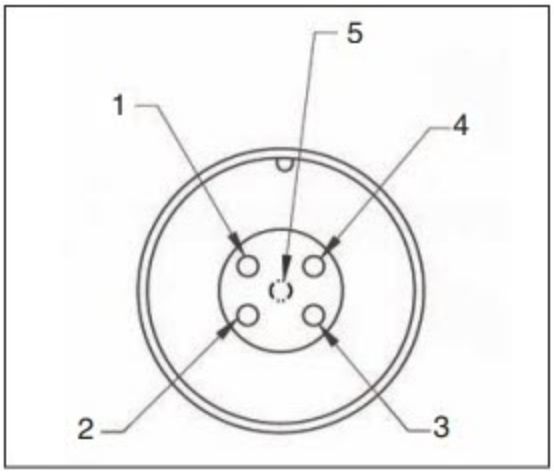


Figure 1 Diagram 1

(A) Testing the Open Circuit Voltage across the Switch

(1) Set the multimeter to measure voltage.

(2) Turn the switch on the battery pack to the "OFF" position.

(3) Place the positive probe on pin 2 and the negative lead on to pin 3.

(4) The voltage should read 0 volts.

(5) Turn the switch to "ON".

(6) The voltage should now read above 4.8 volts minimum.

(B) Testing the Open Circuit Voltage across the Recharge Circuit

(1) Set the multimeter to measure voltage.

(2) The switch can be "ON" or "OFF".

(3) Place the positive probe on pin 1 and the negative lead on to pin 3.

(4) The voltage should read above 4.8 Volts minimum.

Ⓒ **Testing the Thermistor for Charger Control**

(1) Set the multimeter to measure resistance.

(2) The switch can be "ON" or "OFF".

(3) Place the positive probe on pin 4 and the negative lead on to pin 3.

(4) The resistance should read between 7KΩ and 18KΩ. This measurement is temperature dependent, so the battery pack must be between 50˚F and 85˚F.

⚠ WARNING!

A battery pack that does not pass any of the above tests is not functioning properly must be replaced.

Failure to follow these warnings can result in serious personal injury or death.

NOTE: Attempting to charge a battery pack which failed the test for "Open Circuit Voltage Across the Recharge Circuit" or the tests for "Thermistor Resistance" will result in an indication of charge failure status by the charger. In this case, the battery pack is defective and should be replaced.

Indication of charge failure status when attempting to charge a battery which passes these tests is an indication of charger failure and the charger must be replaced.

7.2 Testing the Motor Blower

The function of the motor-blower can be tested by using an MSA flowmeter and a multimeter. (MSA adapter P/N 491046 and flow check meter P/N 487995 are required to run the flow test)

Before Testing

(1) Examine the motor-blower for cracks or other physical damage. If any of these conditions exists, replace the battery pack.

(2) Using a good battery pack as determined by the previous tests, fully charge the battery until a full charge is achieved.

Ⓓ **Testing the Flow of the Motor Blower**

(1) Assemble the motor-blower to the battery pack.

(2) Attach the motor-blower to the flow meter per the supplied instructions.

(3) Turn on the MM PAPR and notice the volumetric flow.

(4) This flow must be above 115 lpm.

Ⓔ **Testing the Resistance of the Motor**

(1) Refer to Figure 1 for proper pin locations.

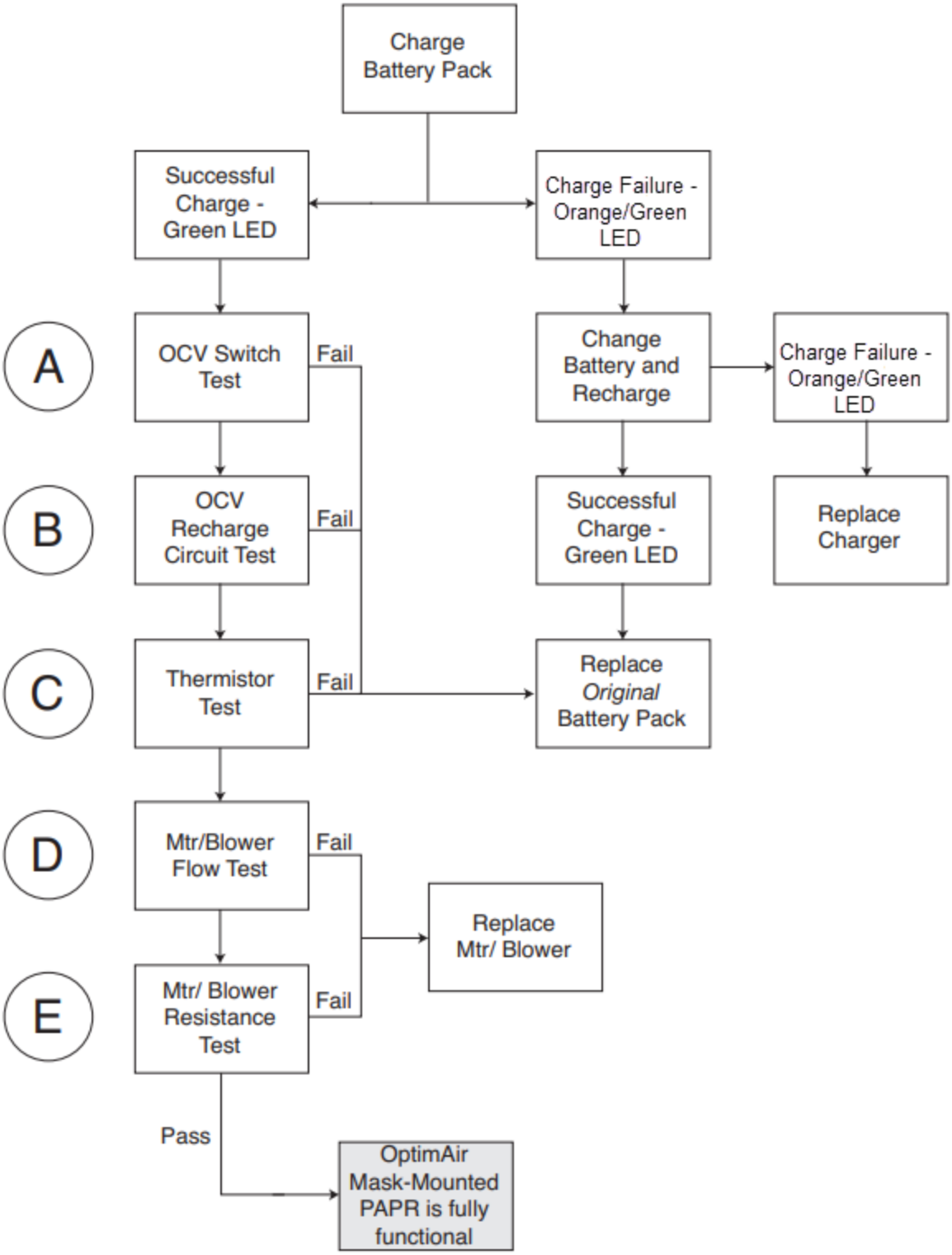
(2) Set the multimeter to measure resistance.

(3) Place the positive probe on pin 2 and the negative probe on pin 3.

(4) The resistance should be less than 10W.

Quick Reference Chart - Battery Tests

Test	Multimeter Setting	Positive Probe	Negative Probe	Switch Setting	Value
Open Circuit Voltage Switch Circuit	Voltage	Pin 1	Pin 2	Off/On	0/ >4.8 Volts
Open Circuit Voltage Recharge Circuit	Voltage	Pin 4	Pin 2	On or Off	> 4.8 Volts
Thermistory Resistance Charger Control Circuit	Resistance	Pin 3	Pin 2	On or off	7KΩ- 18KΩ


Charge Battery Pack
Successful Charge - Green LED
Charge Failure - Orange/Green LED
A
OCV Switch Test
Fail
Change Battery and Recharge
Charge Failure - Orange/Green LED
B
OCV Recharge Circuit Test
Fail
Successful Charge - Green LED
Replace Charger
C
Thermistor Test
Fail
Replace Original Battery Pack
D
Mtr/Blower Flow Test
Fail
Replace Mtr/ Blower
E
Mtr/ Blower Resistance Test
Fail
Pass
OptimAir Mask-Mounted PAPR is fully functional

8 Accessories

8.1 Installing the Nosecup for Ultravue / Ultra Elite Facepiece

(1) Place the nosecup in the facepiece and position it so its rubber ring faces toward the plastic retainer ring.

(2) Starting at the top, stretch and push the rubber ring of the nose-cup under the plastic retainer ring of the speaking diaphragm assembly.

(3) Continue stretching the nose-cup ring and work it into place.

NOTE: For Ultra Elite masks only, stretch the oval opening in the nose-cup around the lip on its component housing.

8.2 Installing Nosecup for Advantage 3000 / 4000 Masks Only

(1) Place nosecup into facepiece with notch of nose-cup facing the bottom of facepiece.

(2) Place bottom of nosecup under facepiece seal.

(3) Stretch nosecup over inhalation valve housing ensuring notch of nosecup is over tab of inhalation valve housing.

(4) Stretch nosecup around lip on inhalation valve housing ensuring nosecup is in place.

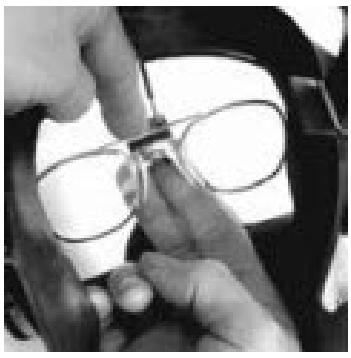
8.3 Spectacle Kit

Spectacle kits are available for the Ultravue (P/N 454819), Ultra Elite (P/N 804638), Advantage 3000/4000 (P/N 10029298), and G1 (P/N 10144230) Facepieces. The kit includes the support assembly, a rubber block, and the spectacle frame. Prescription lenses can be obtained locally or through MSA.

8.4 Adjusting the Spectacles

(1) To move the spectacles closer to your face, pull the frame prongs out of the rubber block.

(2) To move the spectacles farther from your face, push the frame prongs into the rubber block.



(3) To move the spectacles up or down, slide the rubber block up or down on the support arms.

8.5 Installing the G1 Spectacle Kit

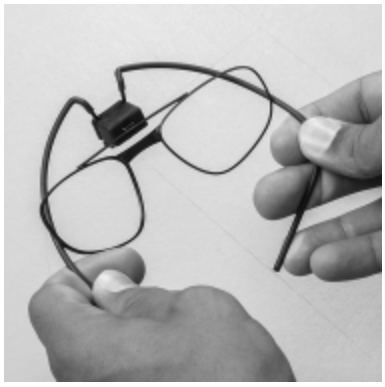
⚠ WARNING!

Before using a spectacle kit, an optometrist must examine the spectacle kit and prescribe the correct lenses to fit into the lens frame on the spectacle kit.

Failure to follow this warning can result in serious personal injury or death.

(1) Turn the head harness over the front of the facepiece so the harness covers the lens of the facepiece.

This will open up the faceblank to make it easier to install the spectacle kit.



(2) Squeeze in on the wire frame of the spectacle kit at the large bends about 2 in. (5 cm) from the ends.

(3) Push the top part of the wire frame into the lens of the facepiece.

The faceblank has three rubber tabs made to grab the wire frame.

(4) Push one end of the wire frame up into the facepiece so the frame is in position along the edge where the lens and faceblank meet.

(5) Make sure the end of the wire frame is in position in the small pockets in the faceblank on the edge of the lens.

(6) Do Steps (4) and (5) on the opposite side.

(7) Don the facepiece.

(8) Adjust the lens frame up/down and in/out to optimize fit and visibility.

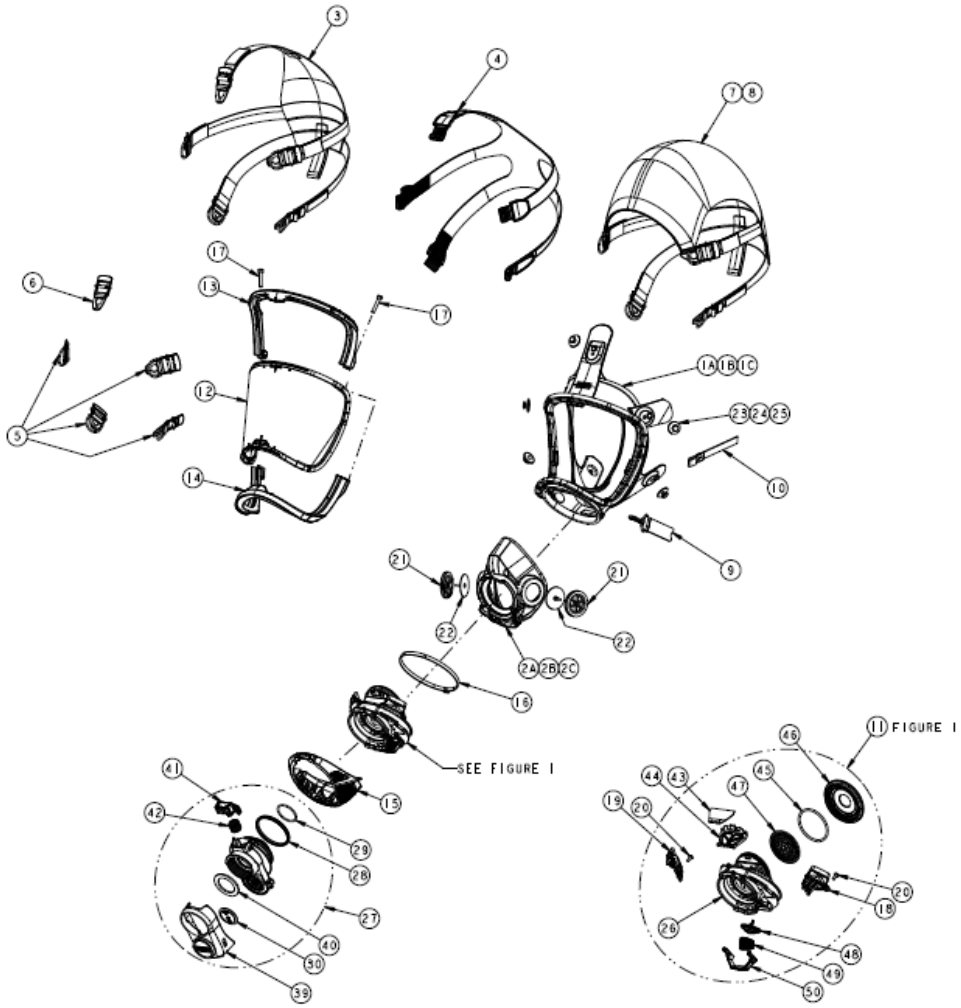
8.6 Parts

Confidence Plus Cleaner P/N 100009971

Flow Check Meter P/N 487995 and Adapter P/N 491046

9 Exploded Views and Parts Lists

9.1 G1 Facepiece



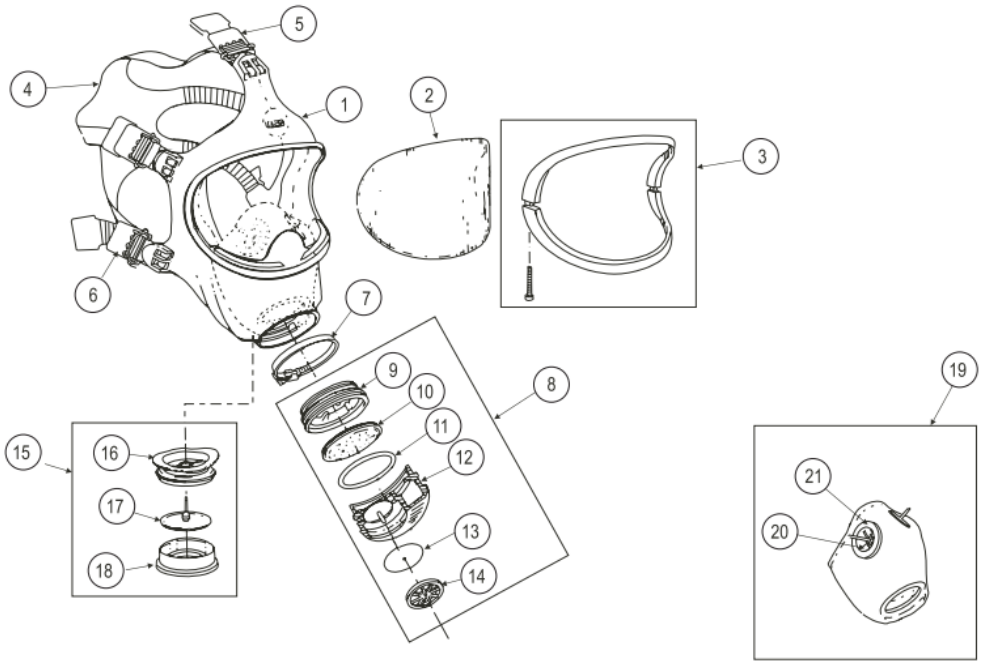
Item	Quantity	Description	Part Number
1A	1	Faceblank Small	10149577-SP
1B	1	Faceblank Medium	10149578-SP
1C	1	Faceblank Large	10149579-SP
2A	1	G1 Nose Cup Small	10149572-SP
2B	1	G1 Nose Cup Medium	10149573-SP
2C	1	G1 Nose Cup Large	10149574-SP
3	1	Harness, 5 Pt Adjustable	10144216-SP
4	1	Harness, Rubber	10144214-SP
5	4	Buckle D-Ring	10149551-SP
6	1	Buckle	10144217-SP

Item	Quantity	Description	Part Number
7	1	Harness, 4 Pt Adjustable, Polyester	10182346
8	1	Harness, 4 Pt Adjustable, Kevlar	10144215-SP
9	1	Neck Strap, Cloth	10144220-SP
10	1	Neck Strap, Rubber	10159699-SP
11	1	Component Housing Assembly	10144184-SP
12	1	Lens	10144194-SP
13	1	Lens Ring, Upper	10144195-SP
14	1	Lens Ring, Lower	10144196-SP
15	1	Cover, Component Housing	10144187-SP
16	1	Clamp, Component Housing	10144222-SP
17	2	Screw, Lens Ring	10144221-SP
18	1	Lightpipe Assembly, Left	10144180-SP
19	1	Lightpipe Assembly, Right	10144204-SP
20	2	Screw Delta Pt Screw Wn 5451, 30x8	10144233-SP
21	2	Inlet Valve Seat	10144192-SP
22	2	Inlet Valve	10144193-SP
23	5	Button, Headharness, Black	10144219-SP
24	5	Button, Headharness, Gray	10144235-SP
25	5	Button, Headharness, Green	10144234-SP
26	1	Component Housing	10144197-SP
27	1	Filter Adapter Assembly	10144231-SP
28	1	Gasket, Seal Ring	10146238-SP
29	1	O-Ring, Silicone,70d, Size 024, Orange	10153639-SP
30	1	Valve, Exhalation	10025295
39	1	Cover, Filter Adapter	10194547
40	1	Washer, RD40, Green	10194548
41	1	Button, Filter Adapter	10194549
42	1	Spring, Button	10146237-SP
43	1	Inhalation Valve	10144207-SP
44	1	Retainer, Inhalation Valve	10144208-SP
45	1	O-Ring, 46 mm ID x 2.5 mm Thick	10144232-SP
46	1	Screw Ring	10144213-SP
47	1	Speaking Diaphragm	10144209-SP
48	1	Exhalation Valve Assembly	10144174-SP
49	1	Spring, Exhalation Valve	10144179-SP

Item	Quantity	Description	Part Number
50	1	Retainer, Exhalation Valve	10144177-SP
	1	Snoop Leak Detector	600920

9.2 Ultravue Demand Facepiece

Ultravue Facepiece Assemblies			
Part No.	**Description**	**Part No.**	**Description**
471218	Small, Hycar	480251	Small, Silicone
457126	Medium, Hycar	480247	Medium, Silicone
471230	Large, Hycar	480255	Large, Silicone



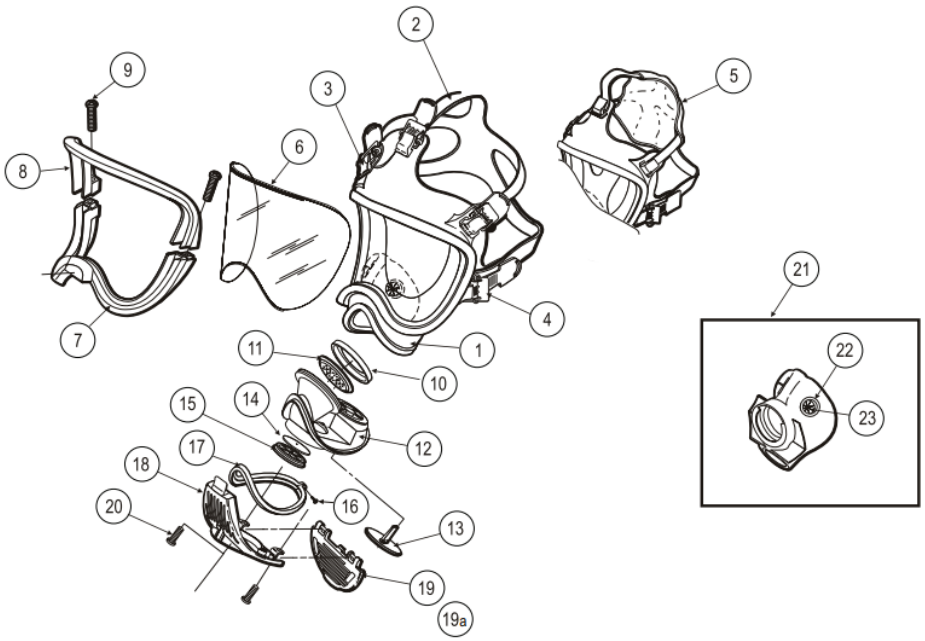
Ultravue Facepiece Components		
Item No.	**Part No.**	**Description**
1	471577	Small, Faceblank, Hycar
	468084	Medium, Faceblank, Hycar
	471580	Large, Faceblank, Hycar
	480224	Small, Faceblank, Silicone
	480223	Medium, Faceblank, Silicone
	480225	Large, Faceblank, Silicone
2	96677	Lens

Ultravue Facepiece Components		
Item No.	**Part No.**	**Description**
3	471249	Small Lens Ring, (Gray)
	464358	Medium Lens Ring (Black)
	471250	Large Lens Ring (Gold)
4	458173	Harness
5	96662	Buckle (3 Req'd)
6	457190	Buckle with D-ring (2 Req'd)
7	458212	Clamp
8	488609	Inlet Assembly
9	*	Retainer Ring
10	*	Speaking Diaphragm (flat side toward retainer ring)
11	*	O-ring
12	*	Housing
13	*	Inlet Valve
14	*	Inlet Valve Spider
15	462865	Exhalation Valve Assembly
16	*	Exhalation Valve Body
17	*	Exhalation Flapper Valve
18	*	Exhalation Valve Cover
Accessories		
19	471710	Small Nosecup
	471711	Medium Nosecup
	471712	Large Nosecup
20	804823	Valve Disk
21	804822	Valve Seat

* Item Available in Assembly

9.3 Ultra Elite Demand Facepiece

Ultra Elite Facepiece Assemblies			
Part No.	**Description**	**Part No.**	**Description**
493064	Small, Hycar	493072	Small, Silicone
493020	Medium, Hycar	493028	Medium, Silicone
493108	Large, Hycar	493116	Large, Silicone

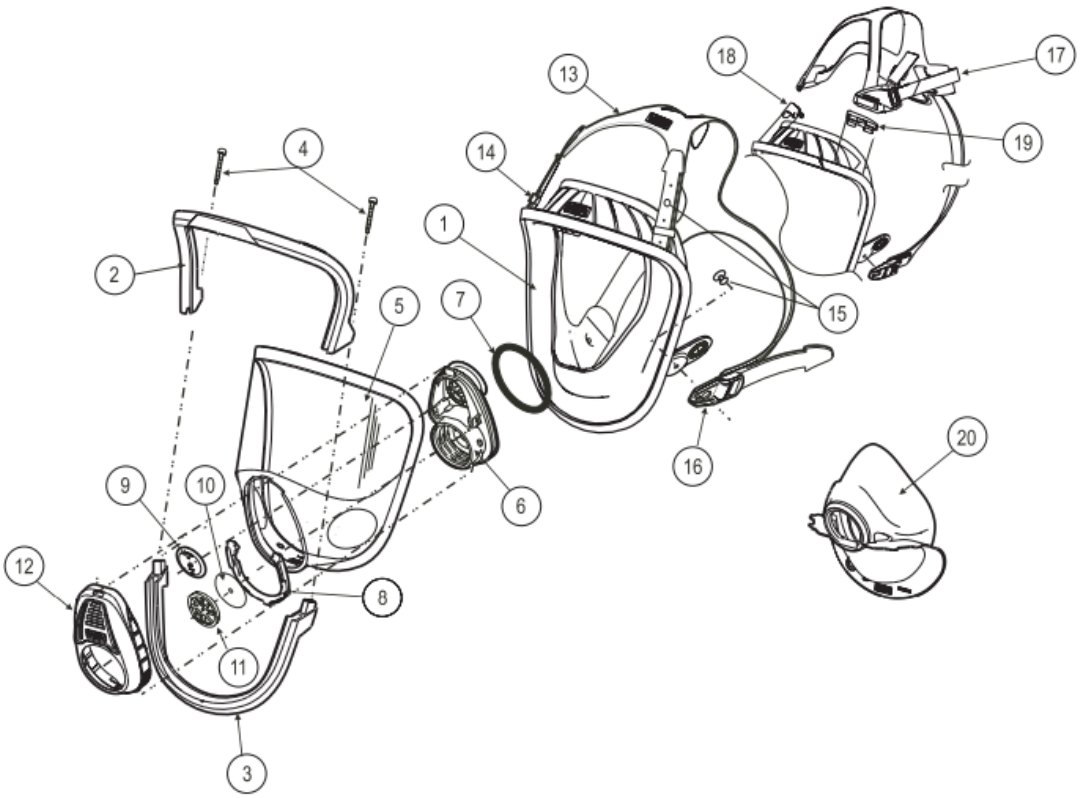


Ultra Elite Facepiece Components		
Item No.	**Part No.**	**Description**
1	491028	Small, Faceblank, Hycar
	490138	Medium, Faceblank, Hycar
	491039	Large, Faceblank, Hycar
	491388	Small, Faceblank, Silicone
	491387	Medium, Faceblank, Silicone
	491389	Large, Faceblank, Silicone
2	804830	Rubber Harness (with buckles)
3	804828	Buckle Assembly (3 Req'd)
4	804807	Buckle Assembly with D-ring
5	805016	E-Z Don Harness, Small (with buckles)
	805015	E-Z Don Harness, Medium (with buckles)
	805017	E-Z Don Harness, Large (with buckles)
6	804019	Lens Hardcoat
7	804805	Lower Lens Ring
8	804804	Upper Lens Ring
9	804806	Lens Ring Screw
10	804808	Speaking Diaphragm Retainer
11	804809	Speaking Diaphragm
12	804810	Component Housing

Ultra Elite Facepiece Components		
Item No.	**Part No.**	**Description**
13	804832	Exhalation Valve
14	804813	Inlet Disc
15	805011	Valve Spider
16	804812	Component Housing Ring Screw
17	804811	Component Housing Ring
18	804820	Cover, Component Housing
19	804831	Ring, Component Housing
19a	10116528	Door, Component Housing, ClearCommand
20	804821	Component Housing Screw (2 Req'd)
Accessories		
21	495188	Nosecup, Medium (with valves)
	495189	Nosecup Large (with valves)
22	804822	Nosecup Valve Seat
23	804823	Nosecup Valve Disc
Not Shown	804638	Spectacle Kit with Wrap Around Wire
Not Shown	493581	Spectacle Kit with Center Bar
Not Shown	491500	Cover Lens, Clear, 25 per package
Not Shown	805456	Cover Lens, Tinted, 25 per package
Not Shown	10024074	ClearCommand Amplifier Kit
Not Shown	10051290	ClearCommand Amplifer Radio Interface Kit
Not Shown	10023055	ClearCommand Bracket and Voicemitter Kit
Not Shown	806168	Van-Clear Personal Communication System

9.4 Advantage 3000 Model 3100 Single Port

Advantage 3100 Facepiece Assemblies			
Part No.	**Description**	**Part No.**	**Description**
493064	Small with Rubber Harness	493072	Small with Advantage (Plastic) Harness
493020	Medium with Rubber Harness	493028	Medium with Advantage (Plastic) Harness
493108	Large with Rubber Harness	493116	Large with Advantage (Plastic) Harness



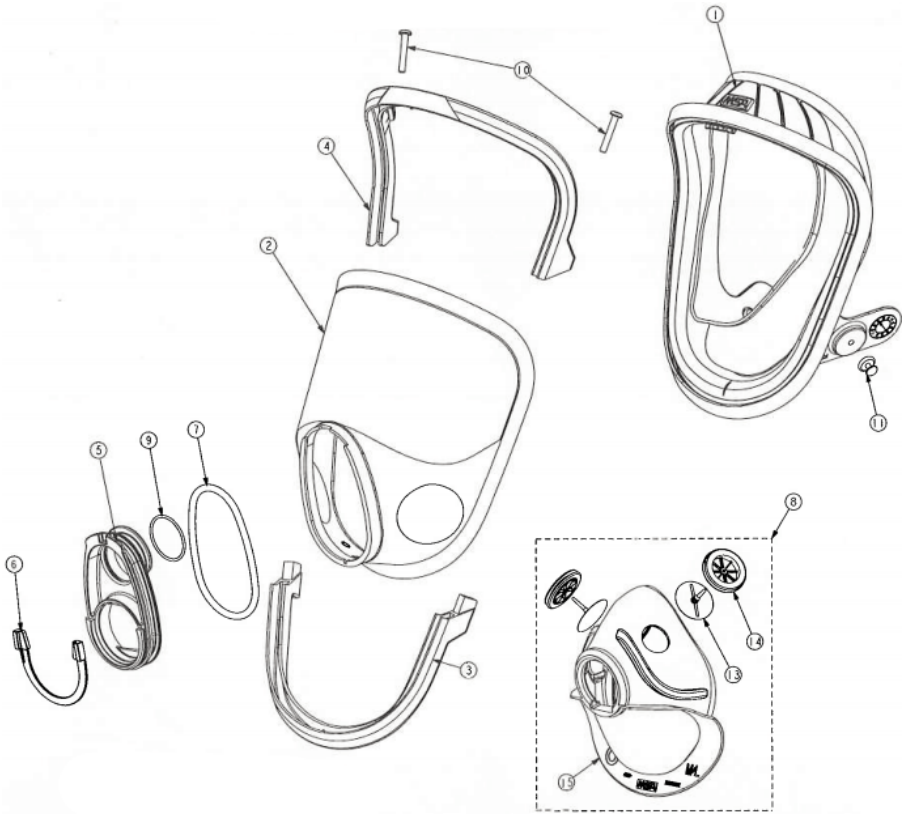
Advantage 3100 Facepiece Components		
Item No.	**Part No.**	**Description**
1	10025280	Small, Faceblank, Silicone
	10025258	Medium, Faceblank, Silicone
	10025259	Large, Faceblank, Silicone
-Kit-	10030785	Lens Ring Kit
2	*	1 - Upper Lens Ring
3	*	1 - Lower Lens Ring
4	*	2 - Lens Ring Screw
5	10025282	Single Port Lens
-Kit-	10030791	Single Port Housing Replacement Kit
6	*	1 - Single Port Housing
7	*	1 - O-ring
8	*	1 - Retainer Clip
9	10030789	Exhalation Valve, 6 per package
10	10030788	Inhalation Valve, 10 per package
11	10025292	Spider Gasket

Advantage 3100 Facepiece Components		
Item No.	**Part No.**	**Description**
12	10025291	Cover
-Kit-	10030794	Classic, Rubber Harness Kit
13	*	1 - Rubber Harness
14	*	2 - Slide
15	*	4 - Harness Button
16	*	2 - Buckle
14	10030797	Slide for Classic Rubber Harness, 6 per package
15	10030795	Harness Button, 12 per package
16	10030796	Buckle for Classic Rubber Harness, 6 per package
-Kit-	10030798	Advantage (Plastic) Harness Kit
17	*	1 - Advantage Harness
18	*	1- Right Adapter Clip
19	*	1 - Left Adapter Clip
Accessories		
20	10030792	Medium/Large Nosecup
	10030793	Small Nosecup
Not Shown	10029298	Spectacle Kit
Not Shown	10031542	Cover Lens, Clear, 25 per package
Not Shown	10031543	Cover Lens, Smoke, 25 per package

* Item Available in Assembly

9.5 Advantage 4000

Advantage 4000 Facepiece Assemblies			
Part No.	**Description**	**Part No.**	**Description**
10083796	Single, Silicone, Small	10083797	Single, Hycar, Small
10083792	Single, Silicone, Medium	10083793	Single, Hycar, Medium
10083800	Single, Silicone, Medium	10083801	Single, Hycar, Large



Advantage 4000 Facepiece Components			
Item No.	**Part No.**	**Qty Req'd**	**Description**
1	10073455	1	Small, Faceblank, Hycar
	10073457		Large, Faceblank, Hycar
	10073459		Medium, Faceblank, Hycar
	10083926		Small, Faceblank, Silicone
	10083927		Large, Faceblank, Silicone
	10083925		Medium, Faceblank, Silicone
2	10074738	1	Lens, Single Port, 4100-H
	10084808		Lens, Single Port, 4100-S
3	10073461	1	Lens Ring, Lower, Black
4	10073460	1	Lens Ring, Upper, Black
5	10025282	1	Housing, Inlet
6	10061996	1	U-clip
7	10025297	1	O-ring, Housing, Silicone
8	10065803	1	Nosecup Assembly, Medium/Large
	10065804		Nosecup Assembly, Small
9	10084819	1	O-ring, Size, 2-024

Advantage 4000 Facepiece Components			
Item No.	**Part No.**	**Qty Req'd**	**Description**
10	10026562	2	Screw, SST, 4m X 25mm Lg, Phil Pan HD
11	10025288	2	Button, Head Harness
Not Shown	465008	1	Bag, Drawstring
	10029294	1	Cover,Lens
	10075903	1	Cloth Head Harness Assembly
	10075901	1	Rubber Head Harness
Nosecup Assembly Components (Item 8)			
13	304787	2	Disc, Valve
14	491124	2	Seat, Valve
15	10065305	1	Nosecup, Medium/Large, TPE
	10065306		Nosecup, Small, TPE

MSA
The Safety Company

For local MSA contacts, please visit us at ***MSAsafety.com***