Air-Mate™ Belt-Mounted High Efficiency Powered Air Purifying Respirator

User Instructions for Air-Mate™ PAPR Assembly 231-01-30 and Air-Mate™ PAPR Unit 520-03-63R01

(Keep these User Instructions for reference)

⚠WARNING

This product helps protect against certain airborne particles. **Misuse may result in sickness or death.** For proper use, see supervisor, *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

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If final printed User Instruction ends up in a booklet form, include this following statement on front cover.

Important: Before use, the wearer must read and understand these *User Instructions*. Keep these *User Instructions* for reference.

GENERAL SAFETY INFORMATION

Intended Use

The belt-mounted Air-Mate™ PAPR Assembly consists of a blower unit, a high efficiency filter and a rechargeable nickel cadmium battery pack. The blower unit draws contaminated air through the high efficiency filter before it enters the breathing tube in the rear of the headgear. The PAPR unit includes an on/off switch for safety and convenience. When combined with appropriate 3M breathing tubes and headpieces, the Air-Mate™ PAPR Assembly 231-01-30 forms a complete NIOSH-approved powered air purifying respirator (PAPR). These PAPR systems are intended to help provide respiratory protection against certain airborne particulate contaminants.

List of Warnings and Cautions within these *User Instructions*

⚠WARNING

This product helps protect against certain airborne particles. **Misuse may result in sickness or death.** For proper use, see supervisor, *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

Each person using this respirator must read and understand the information in these *User Instructions* before use. Use of these respirators by untrained or unqualified persons, or use that is not in accordance with these *User Instructions*, may adversely affect respirator performance and **result in sickness or death**.

Do not use with parts or accessories other than those manufactured by 3M as described in these *User Instructions* or on the NIOSH approval label for this respirator. Do not attempt to repair or modify any component of the system except as described in these *User Instructions*. **Failure to do so may adversely affect respirator performance and result in sickness or death.**

Failure to conduct an inspection and complete all necessary repairs before use **may adversely affect respirator performance and result in sickness or death.**

Failure to pass a user performance check and complete all necessary repairs before use may adversely affect respirator performance and **result in sickness or death.**

Use of this respirator in atmospheres for which it was not NIOSH certified or designed **may result in sickness or death**. Do not wear this respirator where:

- Atmospheres contain hazardous vapors or gases
- Atmospheres are oxygen deficient
- Contaminant concentrations are unknown
- Contaminant concentrations are Immediately Dangerous to Life or Heath (IDLH)
- Contaminant concentrations exceed the assigned protection factor (APF) recommended for the applicable headpiece or the APF mandated by specific government standards, whichever is lower. Refer to the *User instructions* provided with the applicable headpiece.

Do not enter a contaminated area until properly donning the respirator system. Do not remove the respirator before leaving the contaminated area. **Doing so may result in sickness or death**.

Contaminants that are dangerous to your health include those that you may not be able to see or smell. Leave the contaminated area immediately if any of the following conditions occur. **Failure to do so may result in sickness or death.**

- Airflow decreases or stops
– Any part of the system becomes damaged
– Airflow into the respirator decreases or stops
– Breathing becomes difficult
– You feel dizzy or your vision is impaired
- – You taste or smell contaminants
- Your face, eyes, nose or mouth become(s) irritated
- You suspect that the concentration of contaminants may have reached levels at which this respirator may no longer provide adequate protection.

Do not expose blower/filter assembly directly to sparks or molten metal spatter. Direct contact with sparks or molten metal spatter may damage the filter, allowing unfiltered air into the breathing zone, **which may result in sickness or death**, and may cause the filter or blower housing to ignite, **resulting in serious injury, sickness or death.**

Do not clean respirator with solvents. Cleaning with solvents may degrade some respirator components and reduce respirator effectiveness. Inspect all respirator components before each use to ensure proper operating conditions. **Failure to do so may result in sickness or death**.

Never attempt to clean filters by knocking or blowing out accumulated material. This may result in damage to the filter membrane allowing hazardous particles to enter the breathing zone, **resulting in sickness or death.**

USE INSTRUCTIONS AND LIMITATIONS

Important

Before use, the wearer must read and understand these *User Instructions*. Keep these *User Instructions* for reference.

Use For

Respiratory protection against certain airborne particulate contaminants including dusts, fumes, mists, radionuclides and asbestos.

Do Not Use For

- Protection from gases or vapors
- Oxygen deficient atmospheres
- Contaminant concentrations that are unknown or immediately dangerous to life or health (IDLH)
- Contaminated concentrations that exceed the assigned protection factor (APF) recommended for the applicable headpiece or the APF mandated by specific government standards, whichever is lower.

Refer to additional limitations and cautions under NIOSH Cautions and Limitations.

Respirator Selection and Training

Use of these respirators must be in accordance with applicable health and safety standards, respirator selection tables contained in such publications as American National Standards Institute (ANSI) Z88.2-1992, Canadian Standards Association (CSA) Standard Z94.4 or pursuant to the recommendations of an industrial hygienist. The employer must have a written respirator program in place which is in accordance with the Occupational Safety and Health Administration (OSHA) respiratory protection standard found in 29 CFR 1910.134 prior to using any respirator. In Canada, follow CSA standard Z94.4 or the requirements of the authority having jurisdiction in your region.

Before use, the employer must assure that each respirator user has been trained by a qualified person in the proper use and maintenance of the respirator and air supply components according to the instructions contained in these *User Instructions* and other applicable *User Instructions*.

⚠ WARNING

Each person using this respirator must read and understand the information in these *User Instructions* before use. Use of these respirators by untrained or unqualified persons, or use that is not in accordance with these *User Instructions*, may adversely affect respirator performance and **result in sickness or death**.

Assigned Protection Factor

Refer to the *User Instructions* supplied with the respirator headpiece for information on protection factors.

NIOSH Approval

For a listing of the components of NIOSH approved 3M™ Respirator Systems using 3M™ Air-Mate™ PAPR Unit 520-03-63R01, refer to the NIOSH approval label that is part of the *User Instructions* included with the product or contact 3M Technical Service at 1-800-243-4630.

NIOSH 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 which have not been evaluated as an ignition source in flammable or explosive atmospheres by MSHA/NIOSH.

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, canister 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.

SPECIFICATIONS

Heat and flame resistance –	This respirator system is not designed for use in high temperature environments and should not be exposed to sparks or flame.
Battery pack –	Rechargeable nickel cadmium. Up to 8 hrs of use per charge.
Airflow range –	Greater than 6 cfm (170 lpm)
Weight PAPR –	Approximately 1.1 lb (0.5 kg)
Weight battery pack –	Approximately 1.7 lb (0.8 kg)

SYSTEM COMPONENTS AND REPLACEMENT PARTS

⚠WARNING

Do not use with parts or accessories other than those manufactured by 3M as described in these *User Instructions* or on the NIOSH approval label for this respirator. Do not attempt to repair or modify any component of the system except as described in these *User Instructions*. **Failure to do so may adversely affect respirator performance and result in sickness or death.**

3M™ Components and Replacement Parts

Product Number	Description
231-01-30	Air-Mate™ PAPR Assembly (includes PAPR unit, battery, filter, belt and airflow indicator)
520-03-63R01	Air-Mate™ PAPR Unit (does not include battery pack, belt and airflow indicator) (Fig. 1)
007-00-15R01	Battery Pack
451-02-01R01	High Efficiency Filter (includes gasket)
GVP-127	Waist Belt, Web
021-41-02R01	Waist Belt, Nylon, 59” long (150 cm)
021-14-00R01	Airflow Indicator
021-10-07R01	Back Cover (for PAPR unit)

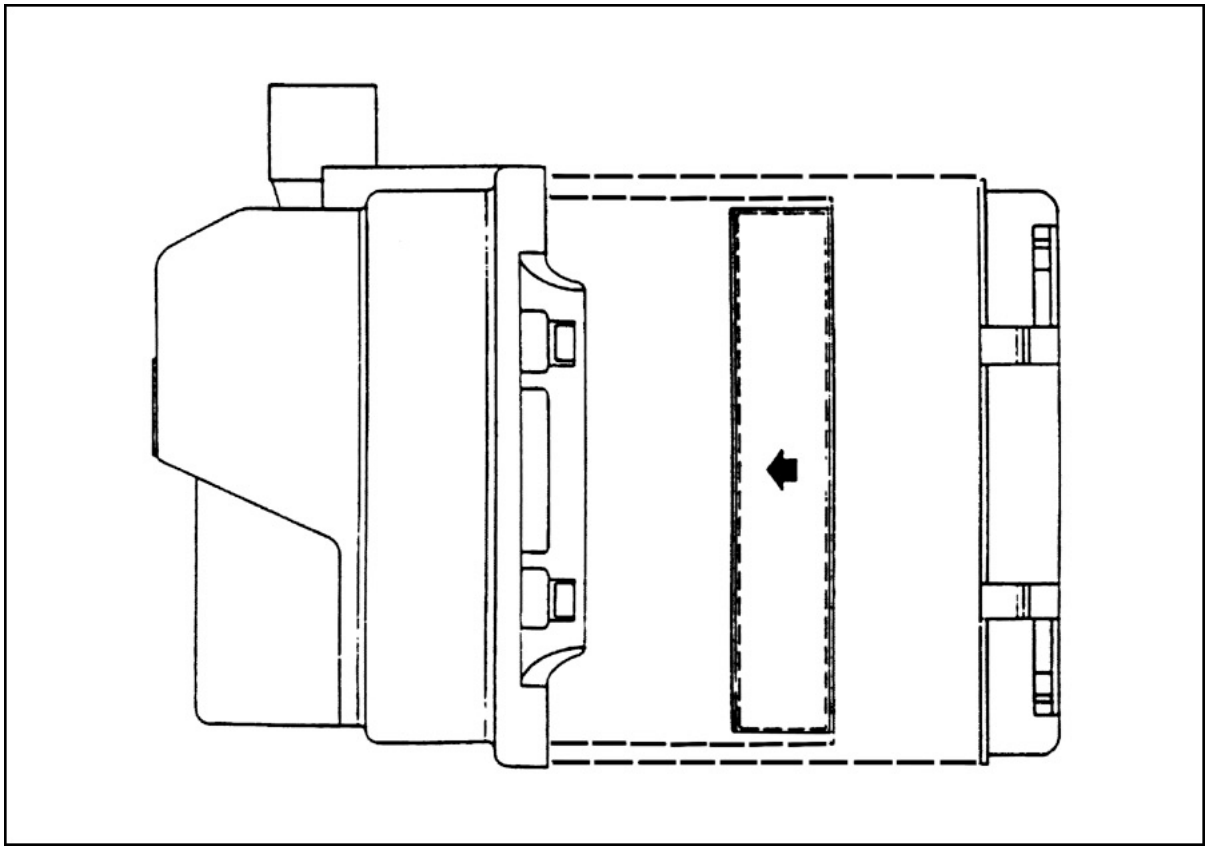

Fig. 1

3M™ Accessories

Product Number	Description
CB-1000	Comfort Belt (fits waist sizes from 26 – 52 in (66 to 132 centimeters)
GVP-117	Waist Belt, Vinyl
520-03-73	Smart Battery Charger, Single Unit
520-03-72	Smart Battery Charger, 5-Unit
520-01-61	Smart Battery Charger, 10-Unit
520-01-61SGL:	Smart Battery Charger, Single Unit (Canada only)
520-01-61FIV	Smart Battry Charger, 5-Unit (Canada only)

NIOSH-Approved System Configurations

The Air-Mate™ PAPR unit must be combined with a headpiece (respiratory inlet cover) and breathing tube in accordance with the following table to form a complete NIOSH approved respirator system.

3M(TM) Headpiece		3M™ Breathing Tube	
Current BE-10 Series Hoods	**Formerly R-Series Hoods**	**Current**	**Formerly**
BE-10-3	522-01-11R03	BE-224, Polyurethane, 38 inch	008-00-14R01, Polyurethane, 38 inch
BE-10-20	522-01-11R20		
BE-10L-20	522-02-17R03		
Current BE-12 Series Head Covers	**Formerly R-Series Head Covers**		
BE-12-3	522-02-00R03		
BE-12-50	522-02-00R50		
BE-12B-3	522-02-01R03		
BE-12B-50	522-02-01R50		
BE-12L-3	522-02-02R03		
BE-12L-50	522-02-02R50		
BE-12LB-3	522-02-03R03		
BE-12LB-50	522-02-03R50		

Note: 3M™ Hoods R-Series to BE-Series denotes a product number change only—no change to product.

ASSEMBLY

Breathing Tube

To connect the breathing tube to the PAPR unit, insert the breathing tube (male end with pin) into the PAPR unit and twist clockwise to lock in place.

To connect the breathing tube to the headgear, see the appropriate headgear *User Instructions*.

Battery Installation

1. Remove the back cover and the filter from the PAPR unit.
2. Insert the battery pack into its compartment and press it down to seat in place. This action will engage the battery terminals in the socket on the side of the battery pack. (Fig. 2)
3. Slide the battery pack clip under the slot on the housing to hold in place.
4. Assure that the filter gasket is properly installed in the grove on the housing.
5. Replace the filter with arrows pointing in towards the battery.
6. Snap the back cover into place.

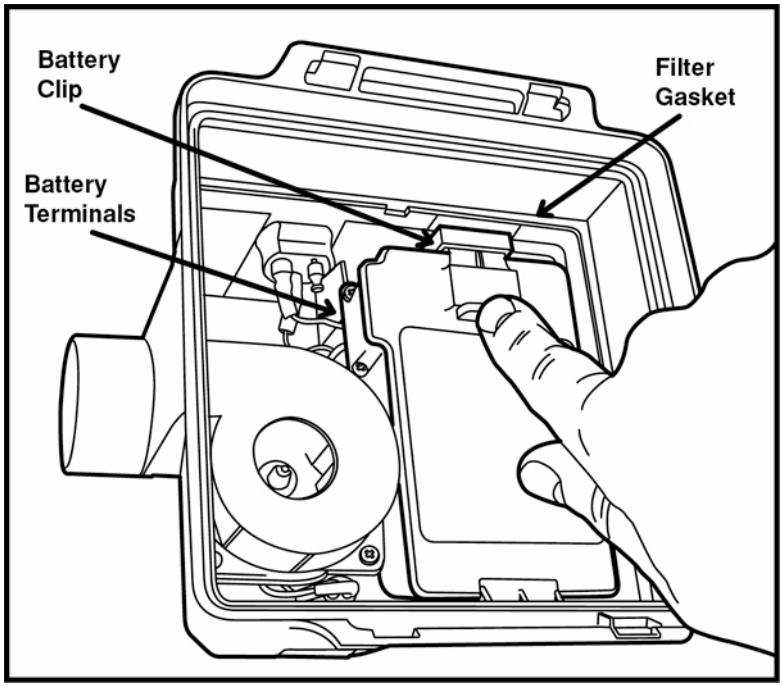

Fig. 2

Battery Charging

A completely exhausted battery pack should be charged for 16 to 24 hours. To use the 3M smart battery charger, place the charging station horizontally on a flat surface and plug the station AC power cord into a regulated 120v-60Hz outlet. The green LED light will turn on.

Insert the charging lead into the socket in the side of the blower/filtration unit. Alternatively, the battery can be removed from the blower/filtration unit and charged using the external charging adapter (sold separately as part number 520-04-24). The LED will turn off, indicating that the battery pack attached is being charged in a high rate mode. After approximately eight hours (depending on the amount of charging required) the LED will turn back on, indicating that the charger has switched to a trickle rate mode, preventing damage to the

battery from overcharge. For Canada chargers, when in trickle mode, the LED light will cycle on and off every 3 – 5 seconds. 3M batteries provide up to 500 charge/discharge cycles. However, the life of 3M batteries will be significantly reduced when they are exposed to high heat over an extended period of time. To maximize battery life, these guidelines should be followed:

- Charge 3M battery packs before they are completely discharged. Damage may occur if the battery pack is completely discharged ("deep discharged") frequently.
- 3M battery packs may be charged any time during the discharge cycle. Unlike some NiCd batteries, 3M battery packs do not develop a "memory". Whether it has been used 30 minutes or 8 hours, the battery pack may be charged.
- Always charge batteries at a temperature of 77° F (25º C) or less. At higher temperatures, the battery pack may not accept a full charge. If a battery pack feels hot, let it cool for 1/2-hour before charging.
- Batteries may be left on trickle rate mode to maintain optimum capacity for up to 30 days. Without periodic charging, a NiCd battery in storage loses approximately 1% of its charge each day. Infrequently used battery packs should be fully charged, initially, then charged overnight once per week or one hour each day to maintain a full charge. Allowing a battery to self-discharge during extended storage will not harm the battery pack. Batteries subjected to prolonged storage (longer than 6 months) may loose their capacity to hold a full charge. Battery capacity can be checked by running the PAPR motor/blower unit for eight hours and checking that airflow is maintained at six CFM or greater. Several charge/run-down cycles may restore battery capacity.
- Do not charge multiple battery packs in an enclosed cabinet without ventilation.
- To properly dispose of the battery pack, follow local solid waste disposal regulations or call the RBRC Battery Recycling Information Helpline at 1-800--8-BATTERY (1-800-822-8837).

Filter and Filter Gasket

The high efficiency filter must be changed:

- When an airflow check of the PAPR unit reveals that the airflow indicator does not rise to the specified level (with a properly charged battery pack powering the PAPR unit);
- When the filter has been physically damaged;
- When water has entered the high efficiency filter; or
- In order to comply with local administrative procedures. Examine the new high efficiency filter, and if no damage is evident, change the filter as follows.

Removal

Pull the belt through the belt retainers to form a loop, which is clear of the PAPR unit. Release the back cover's locking tabs and remove the back cover.

Remove and discard the high efficiency filter and filter gasket in accordance with local, state, and federal guidelines.

Replacement

Inspect the new filter gasket and ensure that it is not torn or damaged before proceeding. Fit the new filter gasket into the filter support ridge ensuring that the gasket is flush against the sides of the PAPR unit, leaving no gaps.

Fit the replacement filter into the PAPR unit with the arrows pointing into the PAPR unit.

Snap the back cover's locking tabs into the rear of the PAPR unit. Pull the belt through the belt retainers.

INSPECTION

⚠WARNING

Failure to conduct an inspection and complete all necessary repairs before use may adversely affect respirator performance **and result in sickness or death**.

An inspection must always be performed prior to each use of the respirator as follows:

1. Remove the back cover and filter.
2. Check that the filter gasket is clean, in good condition and properly installed.
3. Examine the blower housing for cracks or warping.
4. Check that the battery latch is fully extended under the retaining ledge in the blower housing.
5. Examine the inside of the blower housing and fan assembly. The presence of dust or other particulate matter inside the blower may indicate a damaged filter or improper seating of the filter/cartridge to the gasket. Contact 3M Technical Service for assistance.
6. Examine the outside of the battery for cracks. Replace if damaged.
7. Inspect the breathing tube and replace if punctured, cracked or worn.
8. Bend the breathing tube to verify that it is flexible.
9. Successfully complete the applicable User Performance Check.

USER PERFORMANCE CHECK

⚠WARNING

Failure to pass a user performance check and complete all necessary repairs before use may adversely affect respirator performance and **result in sickness or death.**

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1. Ensure that the breathing tube is connected to the PAPR unit. Hold the free end of the tube up by grasping the slotted connector and covering the slots of the connector with thumb and forefinger. Drop the black, bullet-shaped airflow indicator (pointed end first) into the slotted connector. (Fig. 3)
2. Switch the PAPR unit on. Hold the tube so that it is vertical and at eye level. The indicator should "float" on the air coming out and the lower band on the indicator should be above the connector's rim.
3. If the lower band on the indicator rises above the slotted connector edge, airflow is sufficient. If the indicator fails to rise to this level, airflow is insufficient. This may be the result of a battery with a low charge, a clogged filter or another malfunction. Refer to "Troubleshooting" section.

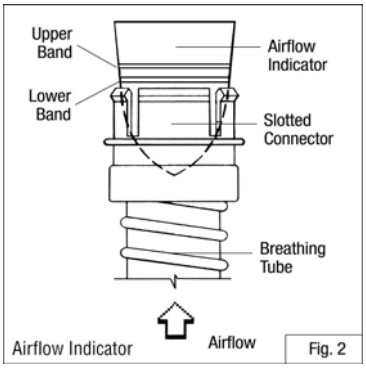

Fig. 3

DONNING THE PAPR

1. Complete assembly, inspection and user performance check of the PAPR assembly as described in these *User Instructions*.
2. Complete assembly and fitting of the respirator headpiece in accordance with the User Instructions provided with the respirator headpiece.
3. Place the belt with PAPR assembly around the waist and snap the buckle closed. Adjust the belt as needed for a comfortable and secure fit.
4 Press the power switch to turn the system on and verify that air is flowing to the headpiece.
5. Don the respirator headpiece, then enter the contaminated area.

OPERATING INSTRUCTIONS

⚠WARNING

Use of this respirator in atmospheres for which it was not NIOSH certified or designed **may result in sickness or death**. Do not wear this respirator where:

- Atmospheres contain hazardous vapors or gases
- Atmospheres are oxygen deficient
- Contaminant concentrations are unknown
- Contaminant concentrations are Immediately Dangerous to Life or Heath (IDLH)
- Contaminant concentrations exceed the assigned protection factor (APF) recommended for the applicable headpiece or the APF mandated by specific government standards, whichever is lower. Refer to the *User instructions* provided with the applicable headpiece.

Do not enter a contaminated area until properly donning the respirator system. Do not remove the respirator before leaving the contaminated area. **Doing so may result in sickness or death**.

Contaminants that are dangerous to your health include those that you may not be able to see or smell. Leave the contaminated area immediately if any of the following conditions occur. **Failure to do so may result in sickness or death.**

- Airflow decreases or stops
- Any part of the system becomes damaged
- Airflow into the respirator decreases or stops
- Breathing becomes difficult
- You feel dizzy or your vision is impaired
- You taste or smell contaminants
- Your face, eyes, nose or mouth become(s) irritated
- You suspect that the concentration of contaminants may have reached levels at which this respirator may no longer provide adequate protection.

Do not expose blower/filter assembly directly to sparks or molten metal spatter. Direct contact with sparks or molten metal spatter may damage the filter, allowing unfiltered air into the breathing zone, **which may result in sickness or death**, and may cause the filter or blower housing to ignite, **resulting in serious injury, sickness or death**

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1. After successfully completing the donning procedures, enter the contaminated area, breathing normally.

Note: This PAPR unit and battery are not waterproof. They should not be submersed or subjected to heavy spraying with water or other liquids. High concentrations of mist or sprays may temporarily clog filters and cause airflow to drop below safe levels.

2. Remove the respirator system in a clean area. Refer to the Inspection Cleaning and Storage sections of these *User Instructions* for cleaning, inspection and storage information.

CLEANING AND STORAGE

Follow the hygiene practices established by your employer for the specific contaminants to which you have been exposed.

⚠ WARNING

Do not clean respirator with solvents. Cleaning with solvents may degrade some respirator components and reduce respirator effectiveness. Inspect all respirator components before each use to ensure proper operating conditions. **Failure to do so may result in sickness or death**.

Cleaning

Solvents should not be used to clean the PAPR blower unit, battery pack or smart battery chargers. Liquid solvents may chemically weaken the plastic. Use the following suggested procedures for cleaning:

1. Wipe the PAPR blower unit, battery pack and smart battery charger with a mild cleaning solution.
2. Do not immerse the PAPR blower unit, battery pack or smart battery charger.
3. Properly dispose of used filters. Do not attempt to clean the filters. Dispose of the filter according to applicable regulations
4. Disconnect breathing tube from the headpiece and PAPR unit. Flush breathing tube with mild cleaning solution and soak as necessary. Flush with clean water and let drain until drippings stops. Immediately connect breathing tube to an assembled PAPR unit and run system for a minimum of 1/2 hour with the breathing tube hanging downward.

⚠ WARNING

Never attempt to clean filters by knocking or blowing out accumulated material. This may result in damage to the filter membrane allowing hazardous particles to enter the breathing zone, **resulting in sickness or death.**

Storage

Store your respirator at room temperature in a dry area that is protected from exposure to hazardous contaminants.

TROUBLESHOOTING

Problem	Possible Cause	Corrective Action
You smell or taste contaminants or an irritation occurs.	Misuse, improper assembly or malfunction of equipment.	Leave work area immediately and contact your supervisor. Do not use the PAPR until the cause is identified and corrected.
Blower does not run when switch is depressed	Battery is discharged Faulty power switch Faulty motor	Recharge 14-16 hours Replace battery pack Replace motor/blower
Battery does not accept charge, but PAPR unit runs when plugged into charger.	Faulty battery connection or terminals dirty/damaged.	Check that battery terminals are clean and battery is properly attached and locked into the PAPR housing.
PAPR fails airflow test	Clogged filter Battery needs charging Battery does not hold charge Breathing tube blocked	Replace filter Charge battery Replace battery Locate and remove restriction

IMPORTANT NOTICE

WARRANTY: In the event any 3M OH&ESD product is found to be defective in material, workmanship, or not in conformation with any express warranty for a specific purpose, 3M's only obligation and your exclusive remedy shall be, at 3M's option, to repair, replace or refund the purchase price of such parts or products upon timely notification thereof and substantiation that the product has been stored, maintained and used in accordance with 3M's written instructions.

EXCLUSIONS TO WARRANTY: THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHER WARRANTY OF QUALITY, EXCEPT OF TITLE AND AGAINST PATENT INFRINGEMENT.

LIMITATION OF LIABILITY: Except as provided above, 3M shall not be liable or responsible for any loss or damage, whether direct, indirect, incidental, special or consequential, arising out of sale, use or misuse of 3M OH&ESD products, or the user's inability to use such products. THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE.

FOR MORE INFORMATION

In United States, contact:
Internet: www.3M.com/occsafety
Technical Assistance: 1-800-243-4630
For other 3M products:
1-800-3M-HELPS or 1-651-737-6501

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