

**UNIVERSAL**



**DEFENDER**

**Powered Air Purifying Respirator  
User Instructions**

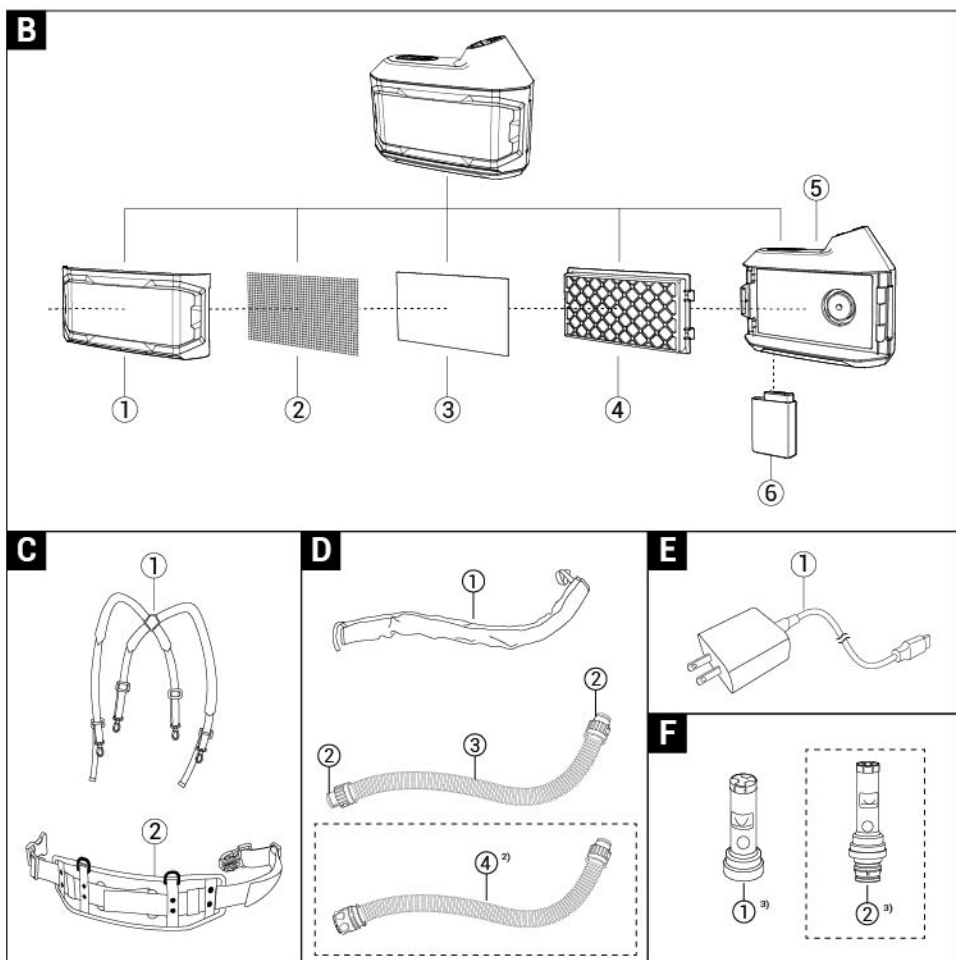
# 1. WARNING

1. This product is part of a system that helps reduce exposures to certain airborne contaminants, including dust, pollutants, fine particles, vapors or gases as well as other contaminants. Before use, the wearer must read and understand these User Instructions. Misuse may result in injury, sickness or death.
2. The Defender battery, chargers, and the Defender Air Unit assembly are not intrinsically safe. Do not use in flammable or explosive atmospheres. Doing so may result in serious injury or death.
3. Always correctly use and maintain the Lithium-ion battery pack. Failure to do so may cause fire or explosion or could adversely affect respirator performance and result in injury, sickness, or death.
  - a. Do not charge battery with unapproved chargers, in enclosed cabinets without ventilation, in hazardous locations, or near sources of high heat.
  - b. Do not immerse the product in any liquid.
  - c. Do not use, charge, or store battery out of the recommended temperature range.
  - d. Charge in an area free of combustible material and readily monitored.
4. Failure to follow these User Instructions may reduce respirator performance, overexpose you to contaminants, and may result in injury, sickness, or death.
  - a. Do not use with parts or accessories other than those manufactured by manufacturer as described in these User Instructions.
  - b. The Defender Air Unit is one component of an approved respiratory protection system. Always read and follow all User Instructions supplied with your Universal headtop and other system components in order to ensure correct system operation.
  - c. Do not turn off the blower, remove the headtop, or reach your hand into the headtop while inside the contaminated area. This could allow contaminants to enter the respirator and may result in sickness or death.
5. Always correctly use and maintain the filter assembly. Failure to do so may reduce respirator performance, overexpose you to contaminants, and may result in sickness or death.
  - a. Inspect the filter before each installation.
  - b. Always properly install the filter into the blower unit.
  - c. Never attempt to clean filter by knocking or blowing out accumulated material. Doing so will damage the filter media.
  - d. Use of the spark screen is mandatory for welding and all situations where the The Defender Air Unit are designed to provide respiratory protection against particulates. may be exposed to sparks, molten metal or other hot particulates. Failure to use the spark screen when needed may allow the filter to catch fire, or be damaged and allow contaminants to enter the respirator and may result in injury, sickness or death.
  - e. Store the filter as described in these User Instructions under the recommended storage temperature conditions and adhere to filter expiration dates.
  - f. The filter loading indicator is for particulate loading levels only.
6. To reduce exposure to hazardous voltage:

- a. Do not attempt to service the chargers. There are no user-serviceable parts inside.
- b. Do not substitute, modify or add parts to the chargers.
- c. Inspect the chargers and power cords before use. Replace if any parts are parts are damaged.
- d. Do not use the chargers outdoors or in wet environments.

## 2. SYSTEM DESCRIPTION

The Defender Air Unit is designed to provide respiratory protection against particulates. The Defender Air Unit does not provide protection against vapors or gases and is not an intrinsically safe system. A complete Defender Air Unit includes a blower, filtration unit, breathing tube assembly, battery, battery charger, shoulder strap and belt.



ITEM	PART NO.	DESCRIPTION	PERIOD OF OBSOLESCENCE
<b>B. Blower Unit</b>			
B-1	RP260-0000-005	Defender Air Filter Cover	5 years (manufacture date on product label)
B-2	RP261-0000-005	Defender Air Spark Screen	5 years (manufacture date on product label)
B-3	RP262-0000-005	Defender Air Pre-filter	5 years (manufacture date on product label)
B-4	RP263-0000-005	Defender Air Particle Filter (P3)	5 years (manufacture date on product label)
B-5	RP264-0000-005	Defender Air Replacement Body	5 years (manufacture date on product label)
B-6	AC646-0000-005	Defedner Air Fast-charging Standard Li-ion Battery	5 years (manufacture date on product label)
<b>C. Wears</b>			
C-1	AC422-000-005-000	Shoulder strap	5 years (manufacture date on product label)
C-2	AC649-0000-005	Defedner Air Waist Belt Cushion	5 years (manufacture date on product label)
	AC650-0000-005 <sup>1)</sup>	Defender Air Leather Belt	5 years (manufacture date on product label)
<b>D. Hose</b>			
D-1	AC651-0000-005	Defender Air Hose Cover	5 years (manufacture date on product label)
D-2	AC425-000-005-000	O-ring	5 years (manufacture date on product label)
D-3 <sup>2)</sup>	AC426-000-005-000	Hose (Including O-ring)	5 years (manufacture date on product label)
D-4 <sup>2)</sup>	AC527-0000-005-ONE	Quick-connection Hose (Including O-ring)	5 years (manufacture date on product label)
<b>E. Battery Charger</b>			
E-1	AC647-0000-005	Defedner Air Fast-charging Battery Charger	5 years (manufacture date on product label)
<b>F. Airflow Indicator</b>			
F-1 <sup>3)</sup>	AC428-000-005-000	Airflow indicator	5 years (manufacture date on product label)
F-2 <sup>3)</sup>	AC617-0000-041-ONE	Airflow indicator II	5 years (manufacture date on product label)

<sup>1)</sup> It is not included in the product, and needs to be purchased separately.

<sup>2)</sup> D-3/D-4 is suitable for different headtops, please choose it according to actual match.





<sup>3)</sup> F-1 is suitable for D-3, F-2 is suitable for D-4, please choose it according to actual match.

### 3. LIMITATIONS OF USE

- This PAPR product is not suitable for the applications which request intrinsic safety (IS).
- Oxygen deficient atmospheres.
- Contaminant generated in workplace and concentrations that are unknown or immediately dangerous to life or health (IDLH).
- Oxygen concentration of the air in workplace is 17% or lower.
- Do not use the product until it is fully assembled, as incomplete assembly may pose a danger to human life.
- Do not use in enclosed places or in locations with the risk of fire or explosion.
- Do not use the product with its power turned off, as it may lead to an increase in carbon dioxide concentration and a decrease in oxygen levels inside the headtop. In the power-off state little or no respiratory protection is to be expected.
- Do not use the product if it does not supply enough air (minimum 170+lpm).
- Do not use in workplaces with strong winds, as the negative pressure generated inside the headtop may allow outside air to enter, posing potential risks.

### 4. MARKINGS

#### MARKINGS ON THE EQUIPMENT

	Read the instruction before use.		Recycle
	Shall be disposed of as electronic waste.		Expiry date year / month

## 5. COMPONENT DESCRIPTION & ASSEMBLY

### 5.1 BATTERY

#### 1. Installation and Removal of the Battery (Fig.1)

- **To install the battery:** Hold the bottom UNLOCK buttons to release the battery cover from the blower. Grab the pull tab on the battery to remove it from the blower.
- **To remove the battery:** Insert the charged battery into the holder. Press and hold the UNLOCK buttons while snap-locking the cover.



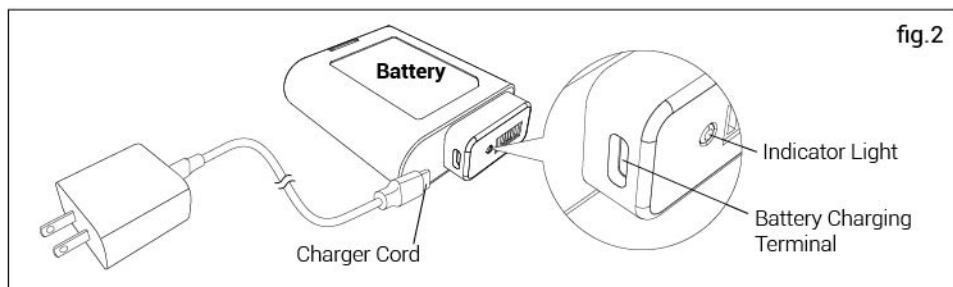
#### 2. Charge the Battery

- Place chargers in a cool, well-ventilated location free of particulates, combustible material, other airborne contaminants, and outside of a classified intrinsically safe area.
- When three sections show up, the battery is fully charged.
- Remove the battery pack from blower assembly. Connect the charger cord to the battery terminal (Fig.2). The battery is fully charged when the indicator changes from red to green. Remember to remove the charger after charging.
- Charger type: USB-C
- Charge indicators:

Red: charging in process

Green: fully charged

Flashing red and green repeatedly: battery issues





## 5.2 SPARK SCREEN, PRE-FILTER, PARTICLE FILTER AND COVER

### 1. Install the Filter (Spark Screen, Pre-filter, Particle Filter)

- The power must be turned off when replacing the filters. Install the spark screen, pre-filter, and particle filter in filter cover (Fig.3a).
- Before installation, ensure the filter is undamaged and dry with no tears or other damages.
- To remove the blower cover, insert your fingertip into the groove and pull the cover sideways and outward while firmly holding it with your thumb (Fig.3b).
- Insert the right tab on the P3 filter into the slot on the blower (Fig.3c), and snap-lock the left side to fit the filter cartridge into place (Fig.3d). Make sure the filter cover is correctly installed.

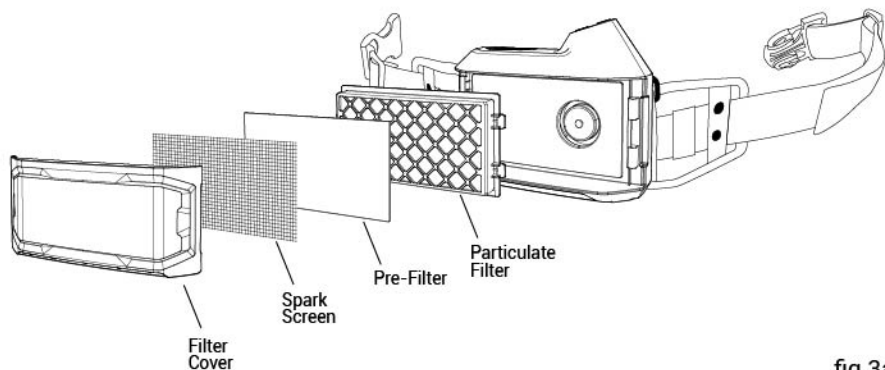


fig.3a

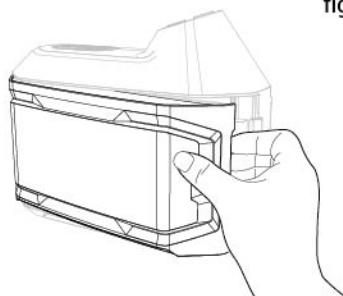


fig.3b

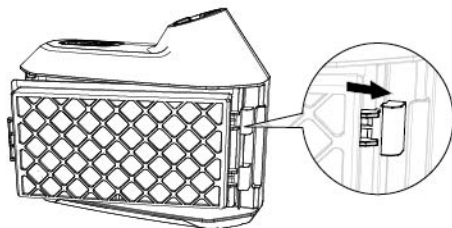


fig.3c

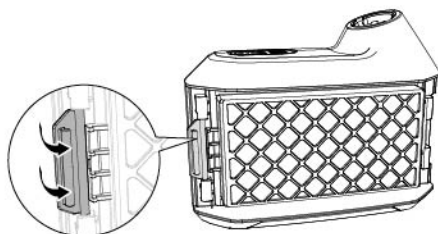


fig.3d

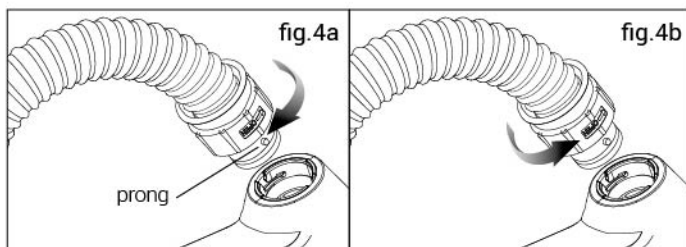
## 5.3 BREATHING TUBE

### 1. Assembling (Fig.4a)

- Insert the two prongs on the breathing tube into the blower unit and headtop receptacle, twist 1/4 turn to the anti - "OPEN" direction to lock into place .

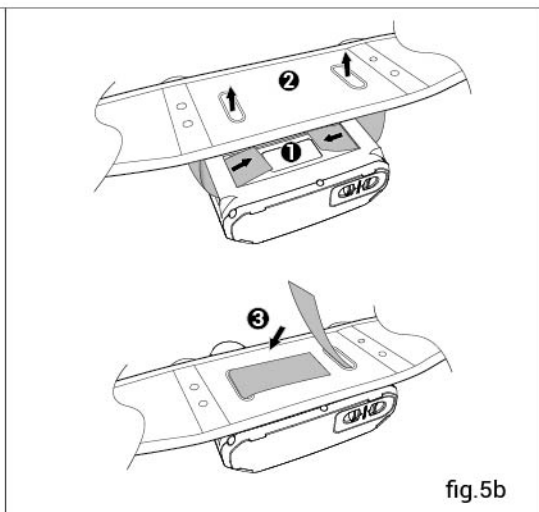
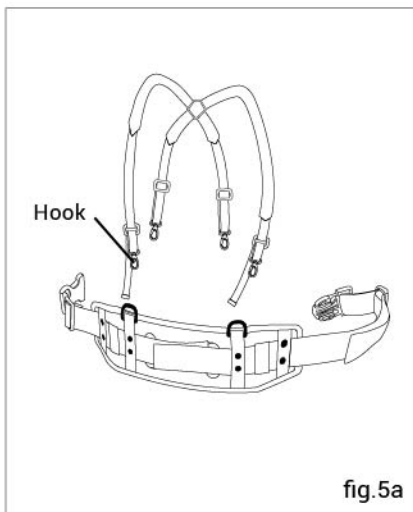
### 2. Disassembling (Fig.4b)

- Twist 1/4 to the "OPEN" direction and then take the prongs out from the end.



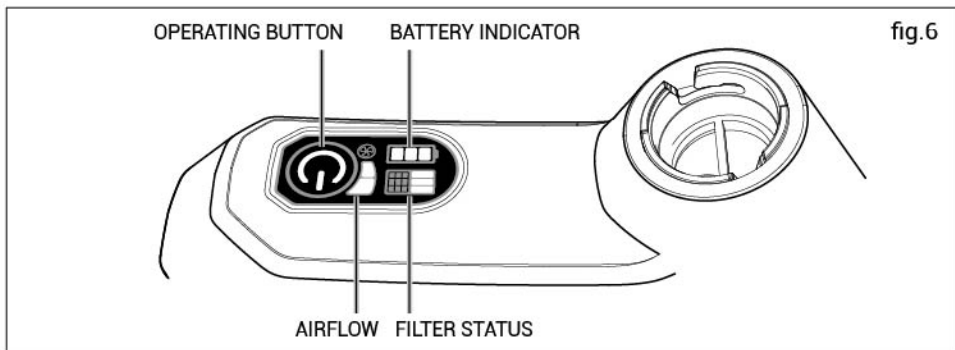
## 5.4 SHOULDER STRAP & BELT CUSHION

- Connect the hooks at the end of the shoulder straps to the D-rings on the belt cushion (Fig.5a).
- Tuck the hook-and-loop fastener strips inside the narrow slots on both sides of the blower.
- Push the strips through the corresponding slots on the belt cushion (Fig.5b-1/2).
- Align the hook and loop strips, then press them firmly together to ensure a secure closure (Fig.5b-3). Verify that the fastener is fully closed for the desired result.





## 6. OPERATING INSTRUCTIONS



### 1. Power On

Press and hold for 3 seconds.

### 2. Select Airflow

Press the button to switch between 170+lpm and 210+lpm.



normal speed – 170+lpm



high speed – 210+lpm

### 3. Power Off

Press and hold for few seconds until beeping sounds finish.



### Low Battery Alarm

When the last battery indicator bar turns red, accompanied by beeping sounds and vibrations, it's a reminder to immediately stop work and charge the battery.

The beeping sounds will happen every 30 seconds, and vibrations will occur every 2 minutes. Leave the work area within 30 minutes after the warning is triggered and charge the battery.



### 1. Filter Loading Alarm

If the filter becomes severely clogged and requires immediate replacement, the filter loading indicator will flash red, accompanied by vibrations and beeping sounds. Please immediately exit the contaminated environment and check the status.



### 2. Airflow Alarm

If the indicator flashes green, accompanied by audible alarms and vibrations, it signals an airflow issue caused by a squished breathing tube or a clogged air outlet. In such cases, leave the contaminated area immediately, conduct a thorough product inspection, and re-enter only when the airflow returns to normal.



## 7. INSPECTION

### 1. Blower Assembly

- Make sure the spark screen, pre-filter and particle filter are properly installed and securely latched.

### 2. Breathing Tube

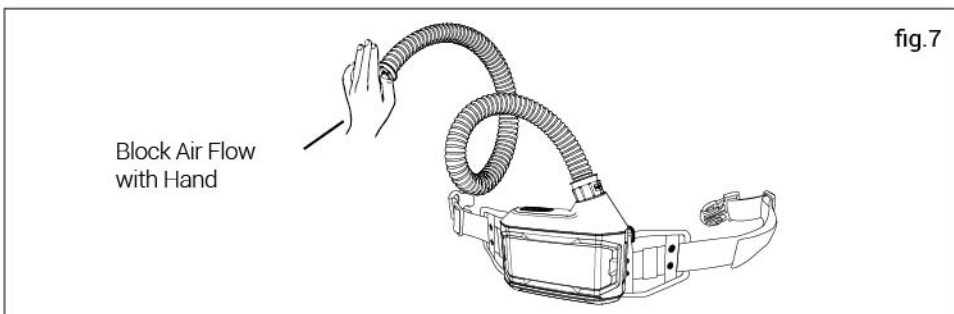
- Ensure the breathing tube is undamaged and securely attached to both the blower unit and the headtop.

### 3. Battery

- Make sure the battery is fully charged before each use (battery needs to be charged before the first use). Ensure the battery is securely connected to the blower unit.

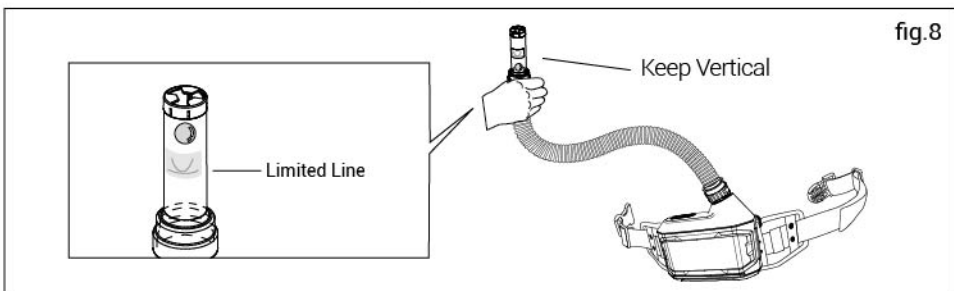
### 4. Alarm Sound Check

- It is necessary to perform both the airflow rate test and the alarm sound check before use. After turning on the product, check the audible alarm function by blocking the air outlet as shown in the diagram above (Fig.7). The warning signal on the panel should flash with a sound and blower vibration (approximately 15 to 30 seconds after the outlet is blocked). Ensure the filter is installed, and the battery is fully charged before conducting this test. The product is working correctly if the warning functions follow the process above.



### 5. Airflow Rate Test

- Make sure all the components are fully assembled before testing.
- Connect the end of hose to the bottom of airflow indicator and then start the button. Keep the airflow indicator vertical (Fig.8). If the ball inside the pipe floating above the limited line in low speed mode, it proves normal function. If the ball cannot float up to limited line, please refer to the TROUBLE-SHOOTING section on page13.



## 8. ENTER AND EXIT CONTAMINATED AREA

Prior to entering the contaminated area, complete the inspection procedures listed in these User Instructions and ensure the selected PAPR setup is appropriate protection for the given airborne contaminant and concentration.

1. Turn the blower on.
2. It is recommended to check both the airflow with the airflow indicator and low flow alarms.

**NOTE:** High environmental noise levels or use of hearing protection may interfere with the user's ability to hear audible alarms. User may need to check for the visual alarms more frequently in high noise environments.

3. Don the Defender Air Unit and headtop. Enter the work area.
4. Leave the contaminated area immediately if any of the following conditions occur:
  - a. Any part of the system becomes damaged.
  - b. Airflow into the respirator decreases or stops.
  - c. The low airflow or low battery alarm triggers. In the event an audible or visual alarm triggers, the user should immediately leave the contaminated area.
  - d. Breathing becomes difficult.
  - e. You feel dizzy or your vision is impaired.
  - f. You taste or smell contaminants.
  - g. Your face, eyes, nose or mouth becomes irritated.
  - h. You suspect that the concentration of contaminants may have reached levels at which this respirator may no longer provide adequate protection.
5. Do not turn off the blower, remove the headtop, or reach your hand into the headtop in areas where the air is contaminated. This could allow contaminants to enter the respirator and may result in sickness or death.

## 9. CLEANING AND STORAGE

### 9.1 CLEANING

The respirator components must be cleaned, inspected and prepared for next use after each use. Use soft cloth dipped in mild soap water for wiping. Be careful for the water NOT to get inside the body.

#### 1. Blower Unit and Battery Pack

- Clean the outer surfaces of the PAPR and battery pack with a soft cloth dampened in a solution of water and mild, pH neutral detergent. Be careful for the water NOT to get inside the body. Do not use solvents or abrasive cleaners. Make sure the electrical contacts of the motor/blower and battery pack are dry before assembling.

#### 2. Breathing Tube

- Wiping the exterior is insufficient. Clean the hose surface and the connection part of the breathing tube with a soft cloth dipped in water and detergent solution. Ensure the breathing tube is completely dry before using or storing. They cannot be immersed in liquids for cleaning and must be replaced if wet.

#### 3. Filter

- Open the filter cover and inspect all the filters and spark screen. The particle filter and pre-filter cannot be cleaned. The spark screen can be cleaned using a clean, soft cloth dipped in a solution of water and a mild pH neutral detergent. Completely dry the spark screen with a clean cloth. Replace the pre-filter and particle filter if excessively dirty, wet or damaged. Do not attempt to remove contamination using a compressed air line as this will automatically invalidate the warranty. If the spark screen cannot be cleaned or is damaged, replace with a new spark screen.

### 9.2 STORAGE

The Universal Defender Air Unit is not intrinsically safe. Keep away from flammable or explosive atmosphere. Store the product in a clean, dry and cool place.

#### 1. Blower

- Store the PAPR system at a temperature range between -10°C to 55°C (14°F to 131°F), in a clean environment without direct light.

#### 2. Battery

To help maximize battery service life:

- Disconnect the charger after a full charge has been received.
- Battery should be removed from the PAPR system if it is going to be stored for an extended period.
- Store the battery at -10°C to 55°C (14°F to 131°F), R.H. <85%, to get maximize battery service life.

## 10. TECHNICAL SPECIFICATIONS

Airflow Rate	Manufacturer's minimum design flow rate: 165+lpm (5.8+cfm)	
	Low speed: 170+lpm (6+cfm)	
	High speed: 210+lpm (7.4+cfm)	
Fast-charging Standard Battery	Battery type: rechargeable Li-ion battery	
	Battery duration: 12h - low speed (170+lpm); 8h - high speed (210+lpm)	
	Battery charge time: 3 hour	
	Battery life: ≥ 550 charges	
Filter	Filter efficiency: 99.997%	
	Alarms: Visible, audible and vibrate	
	Limited storage life	Unopened filter: 5 years after production, For details, refer to the "Do not use after ***" information on the filter label. Installed filter: should be well-kept under instruction given condition. For an installed filter which not use yet, it's suggest to store no more than one year.
Temperature	Operating temperature: -5°C to 55°C (23°F to 131°F)	
	Storage temperature: -10°C to 55°C (14°F to 131°F)	
	Charge temperature: 0°C to 40°C (32°F to 104°F)	
Relative Humidity (R.H.)	Operating R.H.: < 90%	
	Storage R.H.: < 85%	
Weight	1130g (Blower unit + fast-charging standard battery)	
Respirator Approval	EN12941 (Classifications please refer to the label on headtop) EAC	

## 11. TROUBLE-SHOOTING GUIDE

Problems	Causes	Trouble-shooting
No airflow from the blower	Blower not ON	Long press the ON button.
	Battery no power	Charge the battery.
	Battery not installed properly	Check and reassemble the battery.
	Tube blocked/air leakage	Check and clear the obstruction.
Airflow test failed	Hose may get blocked/air leakage	Check the tube status.
	Dirty filter	Replace the filter.
Insufficient battery life	Battery fault	Replace the battery.
	Inadequate charging	Fully charge battery.
	Filter is clogged	Replace the filter.
	Damaged charger	Replace the charger.
Increased noise level	Filter is getting clogged	Replace the filter and pre-filter as required.
Warning indicator ON, blower vibrates and alarm sound bleeping	Tube gets blocked/air leakage	Check if tube/anywhere gets blocked before use.
	Filter assembled without removing the package	Check if the package is removed.
You smell or taste contaminants	Damaged filter	Check the filter status and replace the filter if needed.
	Hose with leakage problem	Examine the tube assembly.
	Absence of essential filter component	Identify the missing filter and install the appropriate one.



## WARRANTY

Universal's only obligation shall be repair, replace or refund the purchase price of such parts or products material and fabrication defects free of charge within the warranty period. This warranty does not cover to cause by improper handling abuse or application other than recommended in the user instruction.

If you come across any problem during warranty period, contact your distributor, send the defective parts together with the completed defect problem if necessary.

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For future reference, please complete the owner's record below:

**Serial Number:**

**Purchase Date:**

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