

Sentinel ***XL™ HP***

 **POWERED AIR PURIFYING
RESPIRATOR**



SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM

MODEL NO. S-4000 USER INSTRUCTION MANUAL



Δ WARNING

IMPROPER USE OF THIS HOOD AND RESPIRATOR MAY RESULT IN PERSONAL INJURY OR DEATH. IMPROPER USE INCLUDES, BUT IS NOT LIMITED TO, USE IN ATMOSPHERES CONTAINING UNKNOWN CONTAMINATES AND/OR UNKNOWN CONCENTRATIONS OF CONTAMINANTS, USE WITHOUT ADEQUATE TRAINING, DISREGARD TO THE WARNINGS AND INSTRUCTIONS CONTAINED HEREIN AND FAILURE TO INSPECT AND MAINTAIN THIS RESPIRATOR.

THE HOOD AND RESPIRATOR IS NOT INTENDED FOR USE IN ATMOSPHERES WHERE THE IDENTITY AND/OR CONCENTRATION OF THE CONTAMINANT IS UNKNOWN. THIS MAY RESULT IN IMMEDIATE DANGER TO PERSONNEL.

THIS HOOD AND RESPIRATOR DOES NOT SUPPLY OXYGEN AND MUST NOT BE USED IN OXYGEN DEFICIENT ATMOSPHERES CONTAINING LESS THAN 19.5% OXYGEN.

Δ WARNING

TRAINING IS REQUIRED BEFORE USE OF THIS HOOD AND RESPIRATOR. FOLLOW THESE INSTRUCTIONS CAREFULLY. THIS POWERED AIR PURIFYING DEVICE IS ONLY FOR USE IN SPECIFIC ATMOSPHERES AND UNDER CERTAIN CONDITIONS. USE OF THIS RESPIRATOR WITHOUT PROPER TRAINING COULD RESULT IN SERIOUS INJURY OR DEATH.

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DESCRIPTION

The ILC Dover **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM** is a blower-assisted air-purifying respirator known as **Powered Air Purifying Respirator** or PAPR. The **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM** is comprised of the following components:

1. Sentinel Clear Hood, one size fits all P/N S-3101

The Sentinel XL™ Clear Hood is a loose fitting hood consisting of spun bond top and rear panels, and a large optically clear plastic visor. The hood has two identical skirts capable of being tucked into a single or double suit configuration, depending on the user requirement. A third outer skirt is used to secure the hood to the upper torso of the user through the use of four (4) tabs with integrated tape.

2. Blower P/N S-2002

The blower is comprised of an electrical motor that drives an air blower. An on/off switch is located on top of the blower. A red LED near the on/off switch at the top indicates when the blower is on. There is one male thread at the blower top to connect the breathing hose. There are three female threaded inlets with rubber gaskets at the blower sides. The blower is equipped with a self-test mechanism. Upon starting the blower, the red LED will blink once or twice, and a buzzer will sound one or two short beeps, followed by continuous LED light and no sound. This indicates that the blower is functioning correctly. The blower is equipped with an audio-visual low voltage alarm, indicating that battery voltage is starting to drop. Alarm is given by blinking LED and successive buzzer beeps. Alarm sound is well heard within the hood. Once the low voltage alarm has started, the user must exit the contaminated area.

3. Battery Pack

The battery pack is integrated to the blower assembly by a snap fastener at the blower assembly's aft side, facing the user's body. There are two types of battery packs as follows:

A. Rechargeable NiMH Battery Pack P/N S-2003

The NiMH Battery can go up to 500 charge/discharge cycles and does not have a considerable memory effect. The battery is equipped with a charging jack at its aft side. Charging the battery can be done without disassembling from waist belt, backpack or the blower assembly.

B. Non Rechargeable LiMnO₂ Battery Pack P/N S-2004 (Optional)

High capacity Lithium Battery, capable of extended shelf life.

C. Alkaline Battery Adapter P/N S-4013 (Optional)

Adapter is capable of running approximately 8 hours. Five D-cell Duracell batteries need to be properly installed to operate the Sentinel XL™ blower. Batteries have a long term shelf life and are easily accessible.

4. Cartridges P/N S-4002

ILC Dover **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM** utilizes two **HE** cartridges. The third blower inlet must be plugged securely with the blower plug, either P/N S-4006 or S-4007.

5. Cartridge P/N S-4012 (Optional)

The ILC Dover **SENTINEL XL™ HP FULL HOOD PAPR SYSTEM** alternative filter option utilizes three **Organic Vapor/Chlorine Dioxide/Chlorine/Hydrogen Chloride/Hydrogen Fluoride/Sulfur Dioxide/High Efficiency Particulate Air**.

6. Decon and Quick Release Belt and Clip P/N S-4011

This is a blower mounting option that allows quick and easy attachment or removal of the blower from the belt. This also facilitates the easy cleaning/disinfecting of biological materials from the belt using standard cleaning or disinfecting materials.

Note: Do not use autoclave or other high temperature sterilization methods.

7. Backpack P/N S-2008 (Optional)

The backpack is very comfortable and supports the blower assembly on the user's back and waist which better dividing system's weight on the user's body. The backpack can be used to store the entire system.

8. Hoses P/N S-4005 (33") and P/N S-4003 (25") (Optional)

The hose connects the blower unit to the hood. For use in supplying air from the blower to the hood.

9. Fast Battery Charger P/N S-2009

A smart charger recharges NiMH Battery Pack within less than 5 hours.

10. Flow Meter P/N S-2010

Used to check the ability of the blower to provide sufficient air flow to the hood. The air flow must be checked before each use.

11. Blower Plug P/N Standard S-4006 (with knob) or Optional S-4007 (Flat)

Can be removed for optional third filter. MAY REDUCE BATTERY LIFE.

12. Blower Flat Plug Installation and Removal Tool P/N S-4008 (Optional)

For use in installing or removing Optional S-4007 Flat Plug.

13. Sentinel XL™ HP Clear Hood User Instruction Manual P/N S-4014

Δ WARNING

FOLLOW THESE INSTRUCTIONS CAREFULLY. THIS POWERED AIR PURIFYING DEVICE IS ONLY FOR USE IN SPECIFIC ATMOSPHERES AND UNDER CERTAIN CONDITIONS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAREFULLY COULD RESULT IN SERIOUS INJURY OR DEATH.

GENERAL SAFETY INFORMATION

Intended Use

The ILC Dover **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM** can be used as a belt mounted blower unit, connected to the hood via a flexible breathing hose. The ILC Dover **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM** must be combined with the appropriate cartridges and battery pack. The ILC Dover **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM** systems are intended to provide respiratory protection against certain particulate contaminants and/or Organic Vapors, Acid Gases depending on the selected cartridge.

Note: Inspect emergency use respirators on a monthly basis.

Δ WARNING

THIS HOOD AND RESPIRATOR HELPS PROTECT AGAINST CERTAIN AIRBORNE CONTAMINANTS. MISUSE MAY RESULT IN INJURY OR DEATH. FOR PROPER USE, SEE SUPERVISOR, USER INSTRUCTIONS, OR CALL ILC DOVER TECHNICAL SERVICE AT (800) 631-9567. USE ONLY ILC DOVER PARTS AND ACCESSORIES FOR THE ILC SENTINEL XL™ HP PAPR SYSTEM AS DESCRIBED IN THESE USER INSTRUCTIONS.

ALWAYS DON THE HOOD AND RESPIRATOR SYSTEM PROPERLY AND IN AN UNCONTAMINATED AREA.

DO NOT REACH YOUR HAND INTO THE HOOD IN AREAS WHERE THE AIR IS CONTAMINATED. LEAVE THE CONTAMINATED AREA AND CLEAN CONTAMINANTS FROM YOUR HANDS BEFORE REACHING INSIDE THE HOOD.

IF YOU DISCOVER ANY OF THE WEAR AND DAMAGE DESCRIBED IN THE TROUBLESHOOTING SECTION OF THIS USER INSTRUCTION, DISCARD COMPONENT AND REPLACE IT WITH A NEW ONE. FAILURE TO DO SO MAY ADVERSELY AFFECT HOOD AND RESPIRATOR PERFORMANCE AND RESULT IN SICKNESS AND DEATH.

BEFORE USE, THE WEARER MUST READ AND FULLY UNDERSTAND THESE USER INSTRUCTIONS. KEEP THIS INSERT FOR FUTURE REFERENCE. IF YOU HAVE ANY DOUBTS ABOUT THE APPLICABILITY OF THIS HOOD AND RESPIRATOR SYSTEM TO YOUR JOB SITUATION, CONSULT AN INDUSTRIAL HYGIENIST OR CALL THE ILC DOVER TECHNICAL SERVICE.

Use the ILC Dover **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM** for:

Respiratory protection against certain particulate contaminants and/or Organic Vapors, Acid Gasses, depending on the selected cartridge

Never use the ILC Dover **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM** for:

Atmospheres where oxygen concentration is below 19.5%, where concentrations of contaminants are: unknown; immediately dangerous to life or health (IDLH); exceed applicable local standards or OSHA standards for maximum use concentrations for the respirator; whichever is lower. Refer to additional limitations and cautions under NIOSH Cautions and Limitations.

Respirator Selection and Training

Δ WARNING

THIS RESPIRATOR IS INTENDED TO BE USED ONLY IN CONJUNCTION WITH AN ORGANIZED RESPIRATORY PROTECTION PROGRAM WHICH COMPLIES WITH THE REQUIREMENTS OF "PRACTICES FOR RESPIRATORY PROTECTION" Z88.2-1992 AVAILABLE FROM AMERICAN NATIONAL STANDARDS INSTITUTE, 11 WEST 42ND STREET, NEW YORK, N.Y. 10036, OR WITH THE REQUIREMENTS OF OSHA STANDARD 29 CFR 1910.134 AVAILABLE FROM THE US DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OR WITH OTHER PERTINENT NATIONAL RECOGNIZED STANDARDS.

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 ACCORDING TO THE INSTRUCTIONS CONTAINED IN THIS USER INSTRUCTION AND OTHER APPLICABLE USER INSTRUCTIONS.

Δ WARNING

BEFORE USING THE ILC DOVER SENTINEL XL™ HP PAPR SYSTEM, EACH PERSON MUST READ AND UNDERSTAND THE INFORMATION IN THIS USER INSTRUCTION. USE OF THE RESPIRATOR SYSTEMS BY UNTRAINED OR UNQUALIFIED PERSONS, OR USE THAT IS NOT IN ACCORDANCE WITH THESE INSTRUCTIONS, MAY ADVERSELY AFFECT RESPIRATOR PERFORMANCE AND MAY RESULT IN INJURY OR DEATH.

Service Life of HE or OV/CD/CL/HC/HF/SD/HE Cartridge

The useful service life of High Efficiency Particulate Filter or OV/CD/CL/HC/HF/SD/HE cartridges will depend upon the flow rate, the specific type, volatility and concentration of the contaminants and environmental conditions such as humidity and temperature. Replace the cartridge in accordance with an established cartridge change schedule. Cartridges should be changed earlier if smell, taste or irritation from the contaminant is detected. Cartridges must be replaced if they become damaged, soiled, or if increased breathing resistance occurs.

Eye, Face and Head Protection

Δ WARNING

THESE HOODS DO NOT PROVIDE EYE, FACE OR HEAD PROTECTION WHEN EXPOSED TO EYE, FACE OR HEAD HAZARDS. THE RESPIRATOR WEARER MUST WEAR EYE, FACE AND/OR HEAD PROTECTION APPROPRIATE TO THE HAZARD. FAILURE TO DO SO MAY RESULT IN INJURY OR DEATH.

NIOSH APPROVAL

For a listing of the components in the ILC Dover respirator systems (ILC Dover **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM**), that are NIOSH approved refer to the NIOSH approved label insert.

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 (IDLH).
- C. Do not exceed maximum use concentrations established by regulatory standards.
- F. Do not use this respirator if airflow is less than four cfm (115 lpm) for tight-fitting facepieces or six cfm (170 lpm) for hoods and/or helmets.
- H. Follow established cartridge/canister change schedules or observe ESLI to ensure that cartridges/canisters are replaced before breakthrough occurs.
- I. Contains electrical parts which 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 instructions for changing cartridges 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.
- S. **Special or Critical User's Instructions and/or specific use limitations apply. Refer to User's Instructions before donning.**

REPLACEMENT PARTS

<u>Part No.</u>	<u>Component</u>
Cartridges and Plug	
S-4002	HE-High Efficiency Particulate Air (2 per package)
S-4012 (Optional)	OV/CD/CL/HC/HF/SD/HE Cartridge(3 per package)
S-4006	Blower Plug (with knob); used w/ S-4002 filters only
S-4007 (Optional)	Blower Plug (flat)
S-4008 (Optional)	Blower Flat Plug Installation and Removal Tool
Battery Packs and Charger	
S-2003	Rechargeable NiMH Battery Pack
S-2004 (Optional)	Non Rechargeable LiMnO ₂ Battery Pack
S-2009	Fast Battery Charger (with Instructions)
S-4013 (Optional)	Alkaline Battery Adapter
Blower	
S-2002	Standard Blower
Breathing Hose	
S-4005	33" Long Breathing Hose
S-4003 (Optional)	25" Long Breathing Hose
Hood	
S-3101	Sentinel XL™ Clear Hood
Waist Belt	
S-4011	Decon and Quick Release Belt and Clip
Flow Meter	
S-2010	Flow Meter
Instruction Manual	
S-4014	Sentinel XL™ HP Clear Hood User Instruction Manual

**ASSEMBLY AND PREPARATION FOR USE OF
DECON AND QUICK RELEASE BELT AND CLIP
ILC DOVER SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM
HE PROTECTION**



**ILC DOVER SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM
OV/CD/CL/HC/HF/SD/HE PROTECTION**



PREPARATION FOR USE (USING OR DECON WAIST BELT)

1. Open the package/box and take out the components:

**If purchased as a system, HE filters, plug and battery are already installed into the blower.*

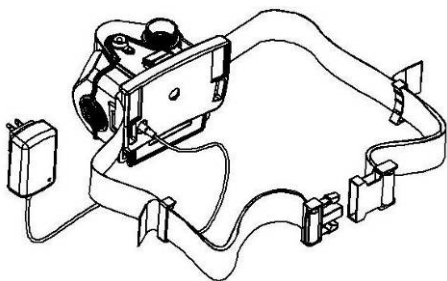
- Sentinel XL™ HP Clear Hood Users Instruction Manual S-2012
- Cartridges 2 each HE S-4002 or Optional S-4012 OV/CD/CL/HC/HF/SD/HE Cartridges 3 each
- Battery Charger (with Instructions) S-2009
- Rechargeable Battery Pack S-2003 or Optional Non-Rechargeable Battery Pack S-2004 **If purchased as a system battery is already installed into blower.*
- Alkaline Battery Adapter S-4013 (Optional)
- Blower S-2002
- Decon Quick Release Belt and Clip S-4011
- Clear Hood S-3101
- 33" Long Breathing Hose S-4005 or Optional 25" Long Breathing Hose
- Blower Plug S-4006 (with knob) or Optional S-4007 Flat Plug with installation / Removal Tool
- Flow meter S-2010

2. Remove Blower from box.

- *Usual packing method is for the battery pack, blower plug with knob, and HE filters to be installed in the blower.*

3. If using a rechargeable battery, remove the Battery Charger from its box. To charge the PAPR:

- Make sure that the battery pack is assembled to the blower unit at all times. The battery pack should be separated from the blower only for battery pack replacement.
- Plug the battery charger to the socket at the back of the PAPR.
- Connect the battery charger to an electrical outlet. If charger is connected to an electrical outlet before connecting to a battery, a solid green LED light indicates that the charger is operating properly. When plugged into the battery the charger LED will turn solid red after a short time, indicating that charging is underway.
- Charge the battery for approximately 5 hours.
- The charger's LED will change from solid red to flashing green when charging is complete. The charger will then be in a "trickle charge" mode. If the light goes to continuous green the battery is cooling down automatically and then will go to red and continue charging.

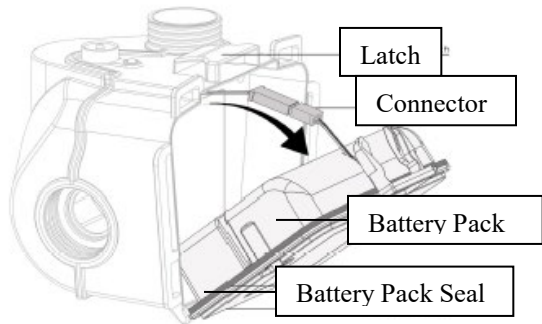


- Charging is also possible when the blower is attached to the Decon Quick Release Belt and Clip, as demonstrated in the picture above.
4. **If using the Alkaline Battery Adapter please refer to page 30 for installation instructions before moving onto step 6.**
 5. **If purchased as a separate component, remove battery pack from box. Install Battery pack per the following instructions.**

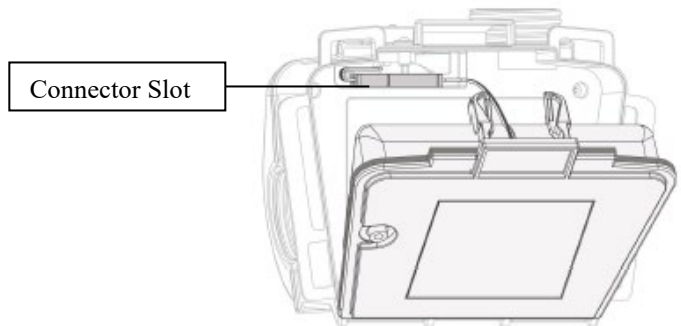
INSTALLING BATTERY PACK

**If purchased as a system battery is already installed.*

- a. Connect the battery pack connector to the blower connector.



- b. Insert the connector into its designated slots as demonstrated.

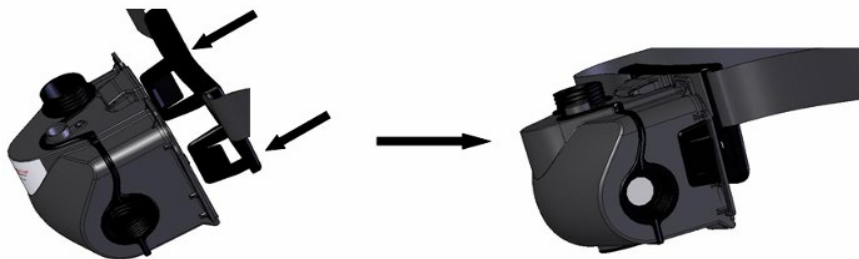
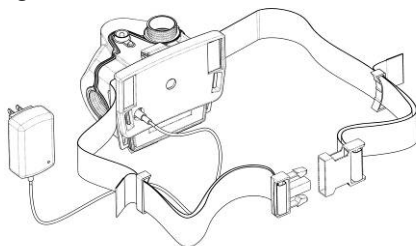


- c. Close the battery pack. Ensure the battery leads are not pinched when closing the battery pack.
- d. Ensure you hear an audible click when the battery pack latch locks into blower.
- e. Fully charge the battery then operate normally.

6. **Fit the waist belt length to your waist size while dressed in your protective garment.**

7. **Position the Blower on the Decon Waist Belt.**

- The charging socket is accessible through the plastic backing plate. Align the plate so that charging port is visible.
- For S-4011 Decon and Quick Release Belt and Clip align the quick don snap features as shown below and press belt clip firmly into place. Hole in clip aligns with battery recharging port.



Δ WARNING

USE OF THESE RESPIRATOR SYSTEMS BY UNTRAINED OR UNQUALIFIED PERSONS, OR USE NOT IN ACCORDANCE WITH THESE INSTRUCTIONS MAY ADVERSELY AFFECT RESPIRATOR PERFORMANCE AND RESULT IN INJURY OR DEATH.

USE OF THESE RESPIRATOR SYSTEMS MUST BE IN ACCORDANCE WITH APPLICABLE SAFETY AND HEALTH STANDARDS, RESPIRATOR SELECTION TABLES CONTAINED IN SUCH PUBLICATIONS AS ANSI Z88.2-1992, OR PURSUANT TO THE RECOMMENDATIONS OF AN INDUSTRIAL HYGIENIST. USE OF A RESPIRATOR REQUIRES THAT A WRITTEN RESPIRATOR PROGRAM BE IN PLACE, WHICH IS IN ACCORDANCE WITH THE OSHA RESPIRATORY PROTECTION STANDARD FOUND IN 29 CFR 1910.134 PRIOR TO USING ANY RESPIRATOR SYSTEM.

BEFORE USE, THE USER MUST BE TRAINED BY THE EMPLOYER IN THE PROPER USE AND MAINTENANCE OF THE ILC DOVER

SENTINEL XL™ CLEAR HOOD PAPR SYSTEM. SUCH TRAINING MUST BE IN ACCORDANCE WITH THIS USER INSTRUCTION. EACH PERSON USING THESE RESPIRATOR SYSTEMS MUST FIRST READ AND UNDERSTAND THIS ENTIRE USER INSTRUCTION. FAILURE TO DO SO MAY ADVERSELY AFFECT RESPIRATOR SYSTEM PERFORMANCE AND RESULT IN INJURY OR DEATH.

IF THESE RESPIRATOR SYSTEMS FAIL ANY OF THE REQUIREMENTS OF THE USER INSPECTION AND PERFORMANCE CHECK, DO NOT USE THE RESPIRATOR SYSTEM UNTIL ALL NECESSARY REPAIRS HAVE BEEN PERFORMED AND THE RESPIRATOR SYSTEMS PASS THE PERFORMANCE CHECKS. FAILURE TO DO SO MAY ADVERSELY AFFECT RESPIRATOR SYSTEM PERFORMANCE AND RESULT IN INJURY OR DEATH.

8. Cartridge Installation

The **SENTINEL XL™ HP CLEAR HOOD PAPR** system uses two (2) HE cartridges that thread into the blower inlets as shown. The third blower inlet must be plugged using the standard plug with knob (S-4006) or optional flat plug (S-4007) per the instructions in Step 9. The optional (S-4012) **SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM** uses three (3) OV/CD/CL/HC/HF/SD/HE cartridges that thread into the blower. Refer to Figure 2.

Note: Screw both HE cartridges in hand tight



Note: Screw plug in hand tight

Figure 1



Note: Screw all three OV/CD/CL/HC/HF/SD/HE cartridges in hand tight

Figure 2

- Verify that the cartridges are the appropriate type for the application by examining the label attached to the cartridge.
- Remove the cartridges from their packaging and inspect for damages. If in doubt do not use. Check that the connecting thread is not damaged.
- Check that the threads in the blower unit are in good condition and clear of foreign matter.
- Check that the blower thread inlets have the black rubber gasket seals present in the blower.
- Remove all plugs from the cartridges ends before using the system. Retain the plugs for future use.
- Screw the cartridges into the blower threads until they are hand tight.

Δ WARNING

DO NOT OVER TIGHTEN CARTRIDGE. OVER TIGHTENING MAY RESULT IN DISTORTION OR DISPLACEMENT OF THE SEAL AND ALLOW CONTAMINATED AIR TO ENTER THE RESPIRATOR HEADPIECE. RESULTING IN INJURY OR DEATH.

9. Blower Plug Installation

Optional S-4012 OV/CD/CL/HC/HF/SD/HE Cartridge

- Blower plug will not be used, for use with S-4002 Cartridges only. Skip to step 10 (See Figure 2).

S-4006 Blower plug with knob (standard)

**Blower plug will already be installed into the blower if a HE filter system was purchased.*

- Remove blower plug from cartridge package and discard poly bag.
- Verify that the blower plug and blower inlet connection thread are not damaged.
- Screw the plug directly into bottom blower inlet ensuring a tight seal against inlet gasket (See Figure 1 on the next page).

S-4007 Blower flat plug (optional)

- Remove blower plug from cartridge package and discard poly bag.
- Remove blower plug installation tool from cartridge package and discard poly bag.
- Verify that the blower plug and blower inlet connection thread are not damaged.
- Screw the plug directly into bottom blower inlet. (See figure 2)
- Using blower flat plug installation and removal tool, align and insert tool pins into blower plug. (See figure 3)
- Using a 1/2" box end wrench, or similar tool, secure blower plug ensuring a tight seal against inlet gasket. (See figure 4)



Figure 1

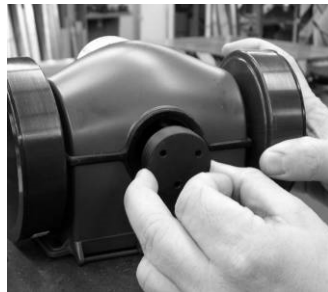


Figure 2



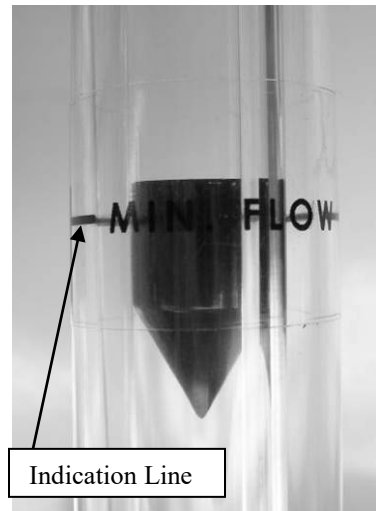
Figure 3



Figure 4

10. Check the airflow with the Flow Meter

- Ensure that the cartridges are installed on the blower. The blower can be installed on the waist belt.
- Switch the blower **ON**. A short beep should sound.
- Place the flow meter in the blower's hood connector, applying light pressure to allow a seal between the flow meter and the blower. Keep the flow meter vertical.
- The position of the upper (flat surface) black cone in the flow meter should be above the indication line. If any part of the upper (flat surface) of the black cone is below the line on the flow meter, **DO NOT USE** and check for:
 - Blower malfunction.
 - Clogged or damaged cartridges.
 - Low battery charge or battery malfunction.



- If the upper portion of the black cone is above the indication line on the flow meter, the system is ready for use.

11. Connect the Hood to the breathing hose and to the blower.

- Check that the breathing hose thread has the black rubber gasket seal present.
- Check that the thread in the blower unit is in good condition and clear of foreign matter.
- Screw the end of the breathing hose into the Sentinel XL™ Clear Hood and the blower unit until it is hand tight.

Do not over tighten!



Screw the Female Hose connector of the Breathing Hose to Male connector on the blower.



Screw the Female Hose connector of the Breathing Hose to Male connector on the hood.

Δ WARNING

BEFORE YOU ENTER A HAZARDOUS ATMOSPHERE WEARING THIS RESPIRATOR SYSTEM, YOU MUST INSPECT THE RESPIRATOR SYSTEM, COMPLETE AN AIRFLOW CHECK, AND DON THE SYSTEM ACCORDING TO THE INSTRUCTIONS IN THIS MANUAL. FAILURE TO DO SO MAY ADVERSELY AFFECT RESPIRATOR PERFORMANCE AND MAY RESULT IN INJURY OR DEATH.

DO NOT WEAR THIS RESPIRATOR SYSTEM TO ENTER AREAS WHERE ATMOSPHERIC CONCENTRATIONS OF CONTAMINANTS ARE UNKNOWN. AREA MAY EXCEED THE MAXIMUM USE CONCENTRATION (MUC) FOR THE RESPIRATOR HOOD, OR ATMOSPHERE MAY CONTAIN LESS THAN 19.5% OXYGEN. THIS MAY RESULT IN IMMEDIATE DANGER TO PERSONNEL.

Δ WARNING

ALWAYS DON THE RESPIRATOR IN A NON-CONTAMINATED AREA. FAILURE TO PROPERLY DON THIS RESPIRATOR BEFORE ENTERING A HAZARDOUS ATMOSPHERE MAY RESULT IN INJURY OR DEATH.

Δ WARNING

IF YOU HAVE ANY DOUBTS ABOUT THE APPLICABILITY OF THE EQUIPMENT TO YOUR JOB SITUATION, CONSULT AN INDUSTRIAL HYGIENIST OR CALL THE TECHNICAL SERVICE DEPARTMENT OF ILC DOVER AT (800) 631-9567.

DO NOT REACH YOUR HAND INTO THE HOOD IN AREAS WHERE THE AIR IS CONTAMINATED. LEAVE THE CONTAMINATED AREA AND CLEAN CONTAMINANTS FROM YOUR HANDS BEFORE REACHING INSIDE THE HOOD.

12. Donning the Hood with a Two-Suit Configuration

Don the blower and hood in a safe hazard-free area and accomplish the following:

- Adjust the blower and belt on your waist. Adjust the belt for a comfortable fit - keeping the breathing hose and hood behind the head and shoulders.
- Switch the blower **ON**.
- Check that the cartridges are properly mounted on the blower unit before donning the hood.
- With the help of another person complete the donning sequence as shown below.

ΔWARNING
SPECIAL OR CRITICAL USER'S INSTRUCTIONS

THIS HOOD SYSTEM IS DESIGNED FOR USE WITH COATED SPUN BOND POLYOLEFIN LABORATORY COATS OR SUITS (e.g. TYVEK® or TYCHEM® QC). PROPER INSTALLATION AND INTERFACE OF THE HOOD SKIRTS TO THESE GARMENTS IS CRITICAL TO PROVIDE PROPER PROTECTION LEVELS AND SYSTEM OPERATION.

Tyvek® and Tychem® QC is a registered trademark of DuPont.



Step 1

Pull the Sentinel XL™ Clear hood over your head. If necessary, put on safety glasses or hard hat prior to donning the hood.



Step 2

The hood has three skirts, identical inner and middle skirts to be tucked into the neck opening of one or two suits, and an outer skirt to secure the hood to the body. Start by tucking the inner skirt into the inner-most suit (if using two suits).



Step 3

View of the completed tucking operation for the inner skirt into the front half of a suit. **NOTE: If only one suit is used, tuck both the inner and middle skirts into the neck opening of the suit, and zip the suit closed as shown in Step 7. Then continue to Step 8.**



Step 4

Tuck the rest of the inner skirt around the neck and shoulders through the neck opening of the suit.



Step 5

Zip the suit closed. The picture above illustrates the inner skirt fully inserted and secured.



Step 6

Tuck the middle skirt into the into the neck opening of the second (outer-most) suit, identically to Steps 3 and 4.



Step 7

Zip the second suit closed.



Step 8

Remove the adhesive backing on the front and rear tabs. Four total tabs, two in the front and two in the rear.



Step 9

Lower the outer skirt across the chest and back. Firmly press the adhesive material such that it adheres to the suit or lab coat.



Step 10

Attach the rear adhesive tabs to the suit or lab coat, just above the waist belt. The adhesive tabs may be re-positioned to provide the best placement of the hood on the user's head.



Step 11

Completed picture of donning sequence.

- With the respirator in operation and donned according to the instructions, enter the contaminated area, breathing normally. Keep all the respirator system's components away from equipment, vehicles and other physical and chemical hazards.

Δ WARNING

DO NOT REMOVE RESPIRATOR SYSTEM WHILE YOU ARE IN A HAZARDOUS ATMOSPHERE. DOING SO MAY RESULT IN SICKNESS OR DEATH. CONTAMINANTS, WHICH ARE DANGEROUS TO YOUR HEALTH, INCLUDE THOSE THAT YOU MAY NOT BE ABLE TO SEE OR SMELL. LEAVE THE CONTAMINATED AREA IMMEDIATELY IF:

- **ANY PART OF THE SYSTEM BECOMES DAMAGED.**
- **AIRFLOW INTO THE RESPIRATOR HOOD DECREASES OR STOPS.**
- **THE ALARM SIGNAL OF LOW BATTERY IS ON: RED LED FLASHES AND BUZZER BEEPS.**
- **BREATHING BECOMES DIFFICULT.**
- **YOU FEEL DIZZY OR YOUR VISION IS IMPAIRED.**
- **YOU TASTE OR SMELL CONTAMINANTS.**
- **YOUR FACE, EYES, NOSE OR MOUTH BECOME IRRITATED.**
- **YOU SUSPECT THAT THE CONCENTRATION OF CONTAMINANTS MAY HAVE REACHED LEVELS AT WHICH THIS RESPIRATOR SYSTEM MAY NO LONGER PROVIDE ADEQUATE PROTECTION.**

Δ WARNING

USE OF THESE RESPIRATOR SYSTEMS BY UNTRAINED OR UNQUALIFIED PERSONS, OR USE NOT IN ACCORDANCE WITH THESE INSTRUCTIONS MAY ADVERSELY AFFECT RESPIRATOR PERFORMANCE AND RESULT IN INJURY OR DEATH.

USE OF THESE RESPIRATOR SYSTEMS MUST BE IN ACCORDANCE WITH APPLICABLE SAFETY AND HEALTH STANDARDS, RESPIRATOR SELECTION TABLES CONTAINED IN SUCH PUBLICATIONS AS ANSI Z88.2-1992, OR PURSUANT TO THE RECOMMENDATIONS OF AN INDUSTRIAL HYGIENIST. USE OF A RESPIRATOR REQUIRES THAT A WRITTEN RESPIRATOR PROGRAM BE IN PLACE, WHICH IS IN ACCORDANCE WITH THE OSHA RESPIRATORY PROTECTION STANDARD FOUND IN 29 CFR 1910.134 PRIOR TO USING ANY RESPIRATOR SYSTEM.

BEFORE USE, THE USER MUST BE TRAINED BY THE EMPLOYER IN THE PROPER USE AND MAINTENANCE OF THE ILC DOVER SENTINEL XL™ HP CLEAR HOOD CLEAR HOOD SYSTEM. SUCH TRAINING MUST BE IN ACCORDANCE WITH THIS USER INSTRUCTION. EACH PERSON USING THESE RESPIRATOR SYSTEMS MUST FIRST READ AND UNDERSTAND THIS ENTIRE USER INSTRUCTION. FAILURE TO DO SO MAY ADVERSELY AFFECT RESPIRATOR SYSTEM PERFORMANCE AND RESULT IN INJURY OR DEATH.

IF THESE RESPIRATOR SYSTEMS FAIL ANY OF THE REQUIREMENTS OF THE USER INSPECTION AND PERFORMANCE CHECK, DO NOT USE THE RESPIRATOR SYSTEM UNTIL ALL NECESSARY REPAIRS HAVE BEEN PERFORMED AND THE RESPIRATOR SYSTEMS PASS THE PERFORMANCE CHECKS. FAILURE TO DO SO MAY ADVERSELY AFFECT RESPIRATOR SYSTEM PERFORMANCE AND RESULT IN INJURY OR DEATH.

REMOVING THE PAPR SYSTEM

Remove the blower and hood in a safe hazard-free area.

- Doff the hood.
- Remove the belt and blower from your waist, (blower should be working at this stage).
- Turn the blower **OFF**.

INSPECTION

After each use, inspect the hood to identify signs of damage or wear that may affect performance of the respirator and reduce the degree of protection provided. The Troubleshooting Section, in this manual, contains a troubleshooting guide to help you identify the proper action to take for specific problems that may be detected.

Hood

Check that there are no tears or punctures in the Sentinel XL™ Clear Hood. Look closely at the stitching. There should be no tears that could permit contaminated air to enter the hood.

Visor

Look for scratches or other visual distortions that make it difficult to see through visor.

Breathing Hose

Carefully examine the entire breathing hose. Look for tears, holes or cracks. Bend the hose to verify that it is flexible.

PAPR Blower Unit

Remove the cartridges and assure that the rubber gaskets are in place in the blower.

Examine the blower housing for cracks. Replace if cracked or damaged.

Examine the outside of the battery pack for cracks. Replace if damaged.

Cartridges

Examine cartridges for mechanical damage and deformities. Replace if damaged.

Blower Plug

Examine the plug in the blower inlet, and insure a tight seal against the internal gasket. Re-tighten if necessary.

Δ WARNING

IF EXCESSIVE WEAR AND/OR DAMAGE TO THE RESPIRATOR SYSTEM OR ITS COMPONENTS IS OBSERVED AT ANY TIME, DO NOT USE THE RESPIRATOR SYSTEM UNTIL ALL NECESSARY REPAIRS HAVE BEEN PERFORMED AND THE WEARER HAS SUCCESSFULLY COMPLETED THE USER PERFORMANCE CHECK DESCRIBED IN THE OPERATING INSTRUCTIONS SECTION OF THIS USER INSTRUCTION. MISUSE MAY ADVERSELY AFFECT RESPIRATOR PERFORMANCE AND MAY RESULT IN INJURY OR DEATH.

CLEANING

Solvents should not be used to clean the PAPR blower unit, battery pack, hose and hood. Liquid solvents may chemically weaken the plastic. Wipe the PAPR blower unit, battery pack, hose and hood with a mild cleaning solution. The decontamination solutions may be applied via cloth, paper towels, or spraying methods. Do NOT decon the battery charger. Wipe components dry with a soft cloth following decontamination and rinsing with clean water, unless noted to air dry. Never submerge or immerse any Sentinel XL™ PAPR blower, filter, hose, or hood components in liquid, as this may permanently damage the electronics, batteries, or affect the hood or hose function. Ensure all components are **completely** dry before using the system or charging the battery.

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

For the S-4011 Quick-Loc Belt, standard disinfecting solutions may be used to clean the belt and clips.

Δ WARNING

DO NOT CLEAN SENTINEL XL™ HP CLEAR HOOD WITH DETERGENTS THAT CONTAIN LANOLIN OR OTHER OILS SINCE THEY MAY SOFTEN OR DISTORT THE VISOR.

DO NOT WIPE THE VISOR WITH SOLVENTS LIKE MEK, ACETONE, TOLUENE, AS THOSE MAY DAMAGE OR DISTORT THE VISOR.

DO NOT SOAK THE CLEAR HOOD OR COMPONENTS IN CLEANING SOLUTIONS OR SOLVENTS. MISUSE MAY ADVERSELY AFFECT RESPIRATOR PERFORMANCE AND RESULT IN INJURY OR DEATH.

STORAGE

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

DISPOSAL OF CARTRIDGE ELEMENTS AND BATTERIES

- 1. Remove used cartridge elements and dispose of properly.**
- Handle cartridge elements with care. Cartridge elements may contain the contaminant internally and externally that was in the atmosphere while the cartridge element was being used and must be handled as a contaminated or potentially contaminated object.
 - Disposal of cartridge elements must be in accordance with state and local environmental regulations.

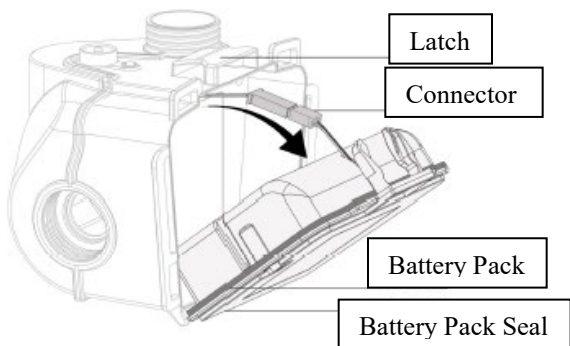
Δ WARNING
AFTER DECONTAMINATION, DISPOSE OF CARTRIDGE ELEMENTS IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS. DO NOT THROW AWAY DAMAGED OR UNUSABLE CARTRIDGE ELEMENTS AS ORDINARY WASTE. IMPROPER DISPOSAL OF CONTAMINATED CARTRIDGE ELEMENTS MAY RESULT IN EXPOSURE TO CONTAMINANTS WHICH MAY CAUSE INJURY OR DEATH.

- 2. Remove the Battery and dispose of properly.**
- Batteries may have been contaminated by the atmosphere in which they were used and must be handled as a contaminated or potentially contaminated object.
- Dispose of depleted or damaged batteries in accordance with state and local environmental regulations.
 - Do not throw away used cartridge elements or depleted or damaged batteries as ordinary waste.

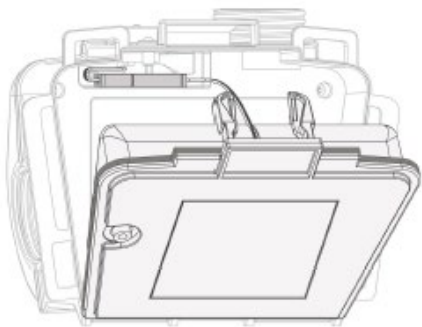
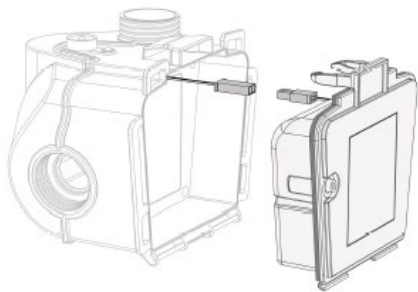
Δ WARNING
DISPOSE OF DEPLETED OR DAMAGED BATTERIES IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS. DO NOT THROW AWAY DEPLETED OR DAMAGED BATTERIES AS ORDINARY WASTE. IMPROPER HANDLING OF DEPLETED OR DAMAGED BATTERIES MAY RESULT IN INJURY OR DEATH.

CHANGING BATTERY PACK (P/N S-2003 and P/N S-2004)

1. Make sure the blower is turned off.
2. Open the battery pack compartment by pressing on the latch connecting it to the blower.
3. Disconnect the connector parts and separate the battery pack from the blower.



4. Connect the new battery pack.
5. Slot the connector into its designated place in the blower as demonstrated
6. Close the battery pack. Ensure that you do not pinch the battery leads when closing the battery pack.
7. Ensure you hear an audible click when the battery pack latch locks into place.
8. Fully charge the battery then operate normally.



INSTALLING THE ALKALINE BATTERY ADAPTER (P/N S-4013)

1. Make sure the blower is turned off.
2. Open the battery pack compartment by pressing on the latch connecting it to the blower.
3. Disconnect the battery wire connector from the blower and separate the battery from the blower. Set battery aside for future use.



4. Remove Alkaline Battery Adapter from its original packaging. Set aside the battery backing plate until Step #12.

**Battery
Backing
Plate**

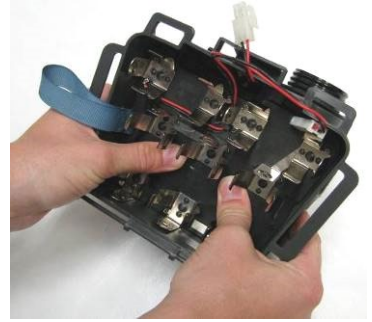
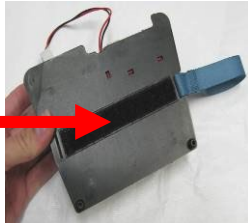


5. Remove the adhesive backing paper on the Alkaline Battery Adapter hook and place the adapter plate into the open cavity on the back of the blower, with metal connectors facing out. **Note: Do not separate Velcro hook from Velcro loop on the back of the Alkaline Battery Adapter. These parts need to remain together during assembly.**

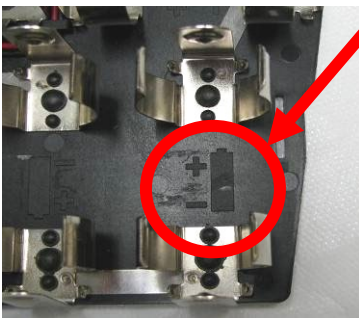
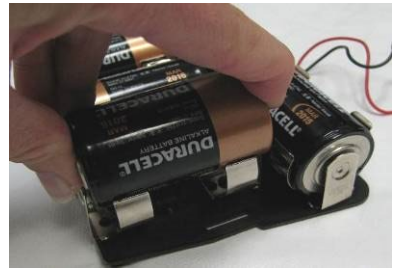


6. Press the adapter plate assembly firmly to ensure the white Velcro hook adheres to the inside wall of the blower. Then gently pull the blue fabric strap to pull the plate assembly out of the unit. The Velcro hook (color white) should remain adhered to the inside of the blower. Verify that the Velcro loop strip (black) is still firmly attached to the back of the adapter plate.

Velcro Loop on Back of Adapter Plate



7. Set the Alkaline Battery Adapter plate aside and use your thumbs to apply pressure across the Velcro hook (white) inside the blower to insure it is securely adhered.
8. Install five Duracell D-Cell batteries into the Alkaline Battery Adapter. (NOTE: USE ONLY DURACELL D-CELL ALKALINE BATTERIES!)
- Only remove and install the batteries when the Alkaline Battery Adapter Plate is removed from the blower.**
 - Be sure to pay attention to the polarity (+ or -) direction engraved into the back plate to insure correct battery orientation. This is very important to ensure the blower operates properly.



Alkaline Battery Adapter with Batteries Properly Installed



9. After batteries are placed into the Alkaline Battery Adapter install the part into the back of the blower. The pull strap should remain outside as shown below, and is used to remove the alkaline battery pack for exchange of battery cells or replacement with alternative battery options.



10. Connect the new battery pack to the blower.



11. Tuck the connector and wires into the open cavity at the top side of the blower as shown in the photo below.



Connector in stowed position

12. Install the Alkaline Battery Adapter by aligning the cover hinge to the hinge pin of the blower. Ensure that you do not pinch the battery leads or fabric loop when closing the battery pack.



13. Ensure you hear an audible click when the battery pack latch locks into place.
14. The blower may now be operated normally, and should provide approximately 8 hours of battery life.
15. When the low voltage alarm is heard, immediately stop operation of the blower and replace the batteries with a new set of five Duracell D-cell batteries.

REMOVING THE ALKALINE BATTERY ADAPTER (P/N S-4013)

1. Be sure to disconnect the battery connector and use the fabric pull strap to remove the Alkaline Battery Pack from the blower Velcro hook before removing the batteries.



2. After removing the Alkaline Battery Pack carefully take out each individual cell, one at a time and set aside for disposal. Replace with new cells as shown in Step 8 above, Installing the Alkaline Battery Adapter.



Δ WARNING

FOR ALKALINE BATTERY ADAPTER OPTION, P/N S-4013, USE ONLY DURACELL BATTERIES. DO NOT USE A COMBINATION OF DURACELL OR OTHER BRANDS. IT IS IMPORTANT THAT ALL FIVE BATTERIES ARE DURACELL D-CELL BATTERIES. WHENEVER BATTERIES ARE CHANGED, CHANGE ALL FIVE D-CELL BATTERIES AT THE SAME TIME. IMPROPER BRAND SELECTION, USING A COMBINATION OF BATTERY BRANDS, OR NOT USING FIVE BRAND NEW D-CELL BATTERIES AFTER THE LOW VOLTAGE ALARM IS INDICATED MAY RESULT IN INJURY OR DEATH.

CUSTOMER SERVICE INFORMATION

If you need additional information on the **Sentinel XL™ HP Clear Hood PAPR** or any ILC Dover product, consult your distributor or contact:

Customer Service

ILC Dover
One Moonwalker Road
Frederica, DE 19946-2080
Phone: 800.631.9567 OR 302.335.3911, ext. 506
Fax: 302.335.1320
www.ilcdover.com

TROUBLESHOOTING

Use the table below to help identify possible causes and corrective action for problems you may experience.

Problem	Possible Cause	Corrective Action
Poor visibility through visor	Visor is coated with debris. Visor is scratched.	Wipe debris off. Dispose of hood and replace it with new hood.
Continuous low voltage alarm sounds upon blower activation	Battery is not charged. Alkaline batteries are not installed properly.	Leave work area immediately. Rechargeable Battery: Switch to a fully charged battery, or recharge. Non-rechargeable Battery: Replace Battery Alkaline Battery Adapter: Install 5 new Duracell D-cell batteries Remove batteries and re-install into the adapter with the proper polarity.
Low airflow	Battery needs charging. One or more cartridges are loaded. PAPR blower malfunction.	Leave work area immediately; switch to fully charged rechargeable battery, a new non-rechargeable battery, or if using the Alkaline Battery Adapter replace batteries with 5 new ones. Replace cartridges. Switch to a different blower unit.
Blower gasket is raised, twisted, or has any visible surface defects	Gasket is not properly seated into the blower and may produce a leak path	Contact ILC Dover Customer Service Department immediately 1-800-631-9567
Blower housing is cracked Battery pack is cracked	Mishandling of the equipment Improper use of the equipment Excessive use/and or damage	Leave work area immediately and replace with a new blower or battery pack. Dispose damaged blower or battery and replace.
Dents, Tears, Holes, or Cracks in the Hood or Breathing Tube	Mishandling of the equipment/Improper use of the equipment Not following the decon procedures properly Excessive wear/ and or damage	Leave work area immediately to prevent contaminated air from entering the hood or hose. Dispose damaged hood or hose and replace it with a new hood or hose.



ILC LOVER INC.
FREDERICK, DE 19646
(302) 335 3811



SENTINEL XL™ HP CLEAR HOOD PAPR SYSTEM

THIS RESPIRATOR IS APPROVED ONLY IN THE FOLLOWING CONFIGURATIONS:

NIOSH APPROVAL NUMBER TC-	PROTECTION ¹	DESCRIPTION	HOOD	BLOWER	RESPIRATOR COMPONENTS				ALTERNATE CARRYING SYSTEMS			ACCESSORIES			ALTERNATE HOSES		ALTERNATE PLUGS		Cautions and Limitations ²																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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21C-0848	HE		X	X	S-2002	STANDARD BLOWER	RECHARGEABLE NiMH BATTERY PACK	S-2003	NON-RECHARGEABLE LiMO ₂ BATTERY PACK	S-2004	S-4013	ALKALINE BATTERY ADAPTER	HE - HIGH EFFICIENCY FILTER	S-4002	O ₂ /CO ₂ /CL/HC/HF/SD/HE CARTRIDGE	S-4012	DECON AND QUICK RELEASE BELT AND CLIP	S-4011	FAST BATTERY CHARGER	S-2009	FLOW METER	S-2010	FLOW METER	S-4008	BLOWER FLAT PLUG	S-4006	25" LONG BREATHING HOSE	S-4003	33" LONG BREATHING HOSE	S-4005	25" LONG BREATHING HOSE	S-4007	BLOWER PLUG, FLAT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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1. PROTECTION

HE - High Efficiency Particulate Air Filter for Powered, air-purifying respirators

- OV- Organic Vapor
- CD- Chlorine Dioxide
- CL- Chlorine
- HC- Hydrogen Chloride
- HF- Hydrogen Fluoride
- SD- Sulfur Dioxide

2. 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 this respirator if airflow is less than four cfm (115 lpm) for tight-fitting facemasks or six cfm (170 lpm) for hoods and/or helmets.
 - H. Follow established cartridge/canister change schedules or observe ESL to ensure that cartridges/canisters are replaced before breakthrough occurs.
 - I. Contains electrical parts which may cause an ignition in flammable or explosive atmospheres.
 - J. Failure to properly use and maintain this product could result in death or serious injury.
 - L. Follow the manufacturer's instructions for changing cartridges 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 users 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.
 - S. Special or Critical User's instructions and/or specific use limitations apply. Refer to User's instructions before donning.
- These limitations are not all inclusive. The respirator manufacturer may also identify further cautions and limitations for their respirators. In addition, regulatory agencies may also place a limit on the use of respirators in their standards.