

**PANTHER HIP-PAC™**  
**SUPPLIED-AIR RESPIRATOR, PRESSURE-DEMAND CLASS**  
**AND**  
**SELF-CONTAINED BREATHING APPARATUS**  
**P9684 SERIES 5- and 10-Minute Escape**  
**P9685 SERIES 15-Minute Escape**  
**P9686 SERIES HP 10-Minute Escape**  
**9649 SERIES HP 10-Minute Escape**  
**OPERATION MANUAL**



**WARNING**

***DO NOT USE this respirator until you completely read and understand this instruction manual. You are required to inspect your respirator prior to putting it into field service. Please refer to the inspection procedures in this manual. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.***



# Panther HIP-PAC

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## I. INTRODUCTION

This manual provides instructions for the use and maintenance of the SPERIAN Panther HIP-PAC™ pressure-demand supplied-air respirator and self-contained breathing apparatus, P968450 Series, P968470 Series, P968500 Series, P9686 Series, and 9649 Series. The Panther HIP-PAC is intended for supplied-air entry into hazardous atmospheres, and emergency exit using the five/ten/fifteen-minute cylinder in the event of a remote air supply failure. **You must read and understand this manual and be trained in the proper use of the Panther HIP-PAC before wearing it in a hazardous environment.**

## II. SAFETY PRECAUTIONS

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


 <b>WARNING</b>
<b>Maintenance or operating procedures and techniques that may result in serious personal injury, serious illness, or death if not carefully followed.</b>
<b>CAUTION</b>
<b>Maintenance or operating procedures and techniques that may result in damage to equipment if not carefully followed.</b>

## NOTE

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

## III. DESCRIPTION

The SPERIAN Panther HIP-PAC consists of a refillable cylinder, valve and pressure gauge assembly, first stage regulator, second stage regulator, facepiece, waist belt, and regulator hose. The cylinder stores 8 cubic feet of air at 2216 psig for the 5-minute apparatus, 15.2 cubic feet of air at 3000 psig for the 10-minute apparatus, 17 cubic feet of air at 4500 psig for the 10-minute apparatus, and 24 cubic feet of air at 3000 psig for the 15-minute apparatus. The cylinder valve controls air pressure to the regulator, and houses a safety relief device and a cylinder pressure gauge. The regulators reduce the cylinder pressure or remote air pressure and supply a flow to the facepiece. A check valve in the low pressure air line hose prevents inward leakage of contaminated air when disconnected from the air supply.

 <b>WARNING</b>
<ul style="list-style-type: none"><li>• <b>The employer is responsible for establishing that these respirators are suitable for the user's application.</b></li><li>• <b>No respirator can provide complete protection from all conditions. Use extreme care for all emergency operations. Do not use the Panther HIP-PAC for interior structural fire fighting, abrasive blasting, or under water.</b></li><li>• <b>The pressure within the Panther HIP-PAC remains positive under most working conditions, but as with all respirators, negative pressure excursions are possible. Conditions when a respirator can experience negative facepiece pressures include, but are not limited to: 1) the respirator is improperly worn, 2) the respirator is not used in accordance with the instructions, or 3) the respirator is over-breathed during heavy work rates. The HIP-PAC will provide reduced protection when operated in a negative pressure mode.</b></li><li>• <b>Your SPERIAN respirator has been constructed of materials selected for their performance, safety, and durability. However, all materials have limitations to exposure to extremes of heat and cold or to the many chemicals in use today, and could be degraded by exposure beyond their limitations, creating conditions in which this SPERIAN equipment would be dangerous to use.</b></li><li>• <b>Before allowing anyone to enter a hazardous environment while wearing SPERIAN equipment, the employer must conduct safe, scientific tests to determine if the environment could render the equipment unsafe. Results of</b></li></ul>

**⚠ WARNING—Continued**

*this testing should be well documented. Seek the help of a certified safety professional or industrial hygienist. DO NOT USE this equipment if the user would be endangered in any way through environmentally induced degradation of the materials in the apparatus.*

*• All persons using this SPERIAN respirator must be made aware of its limitations. We cannot be responsible for any damage to property, personal injury, or death in which environmental exposure is a contributing factor.*

*• SPERIAN cannot predict what will happen to this equipment in every potential environment. Materials can be chemically attacked if exposed to the wrong environment and may exhibit corrosion or other forms of damage. Permeation or penetration of gases, liquids, or particles through the materials could be excessive. Extremes of temperature might cause thermal degradation. Each of these things, or a combination of them, could create conditions in which this SPERIAN equipment would be dangerous to use.*

*• This respirator must be used in conjunction with a written respirator program meeting the requirements of the OSHA Standard for Respiratory Protection 29 CFR 1910.134, available from the U.S. Department of Labor, Occupational Safety and Health Administration. The program must include, but not be limited to, procedures for evaluating air contaminants and selecting appropriate respirators, procedures for proper use of respirators, procedures for testing the facepiece-to-face fit of respirators, procedures for cleaning, disinfecting, inspecting, maintaining, and storing respirators, procedures for determining if workers are physically and medically capable of wearing respirators, and procedures for training employees in the use of respirators and in recognizing the hazards associated with contaminants in the workplace.*

*• The air supply must meet the guidelines of the Compressed Gas Association (CGA) pamphlet G-7.1, Grade D Air, as appropriate.*

*• DO not wear this respirator if a satisfactory fit, as determined by a qualitative or quantitative fit test, cannot be obtained. See ANSI Z88.2, latest edition, and OSHA 1910.134. Beards and sideburns will prevent good facepiece seal. Do not use this respirator unless you are clean shaven.*

**⚠ WARNING—Continued**

*• This respirator does not protect exposed areas of the body. Some contaminants can be absorbed directly through the skin while others may irritate exposed areas. This respirator does not provide protection from splash of hazardous liquids, flying objects, hazardous rays, or harmful noise. Always wear proper head, ear, and eye protection.*

*• This respirator is designed for use in temperatures above -30°F.*

*• When using this respirator at temperatures of 0 to -30°F, the first stage regulator must be wrench tightened on the cylinder valve, and anti-fog solution, P/N 951015 or 951016, must be applied to the inside of the facepiece lens.*

*• The Panther HIP-PAC has a rated service time of 5, 10, or 15 minutes. Under average conditions, you will have up to 5, 10, or 15 minutes in which to escape from a toxic environment. Stress and exertion may cause extra air consumption and reduce the service time. Know escape routes in advance and the time required to travel them.*

*• Compressors, storage cylinders, valves, regulators, fittings, and other hardware must be large enough to deliver the air volume required by all users at peak demand.*

*• This respirator will reduce, but will not eliminate the inhalation of contaminants. Some sensitive individuals may experience health problems when exposed to even minute amounts of contaminants. This respirator will not prevent health problems for those individuals.*

*• Do not modify this respirator in any manner.*

*• This respirator must only be worn and used as specified in SPERIAN's instructions. Always read and follow the instructions listed in the Material Safety Data Sheet for the chemicals that are present in the work area. Selection and use of these respirators must be done in accordance with ANSI Z88.2, latest edition, and the applicable OSHA statutes.*

*• Do not use SPERIAN respirators, accessories, and associated equipment in atmospheres which may contain contaminant concentrations above the lower explosive limit (LEL). Intrinsic safety certification of electronic components does not eliminate potential danger from ignition in these atmospheres.*



## Panther HIP-PAC



### WARNING—Continued

- Some individuals are sensitive to chemicals (e.g., isocyanates or paint hardeners, latex, oil mists, etc.) or may have some type of respiratory disorder (e.g., asthma, chronic obstructive airway disease, etc.). If you are sensitive to any chemical or have a respiratory disorder, you may have a severe reaction at contaminant levels well below accepted health levels, such as the OSHA Permissible Exposure Limit (PEL), AIHA Threshold Limit Value (TLV), or the NIOSH Recommended Exposure Limits (REL). Many chemicals (e.g., isocyanates, mercury, etc.) have no physical warning properties and you cannot taste or smell the contaminants even though they may be present in the respirator facepiece. This respirator will reduce, but will not eliminate the possibility of contaminants entering the facepiece and causing a severe reaction. Do not use this respirator if you have been sensitized from previous exposure or believe that you may be sensitive or allergic to any chemical until you obtain clearance from a medical doctor.
- Users must clean and maintain this respirator only in accordance with SPERIAN's instructions. Accessories not offered by SPERIAN may degrade performance, and will void NIOSH certification.
- The respirator facepiece assembly contains natural rubber latex which may cause allergic reactions in some individuals. Discontinue use if you experience an allergic reaction.
- Discontinue use if you experience skin irritation or discoloration.
- FAILURE TO OBSERVE ALL WARNINGS MAY RESULT IN SERIOUS PERSONAL INJURY, SERIOUS ILLNESS, OR DEATH.

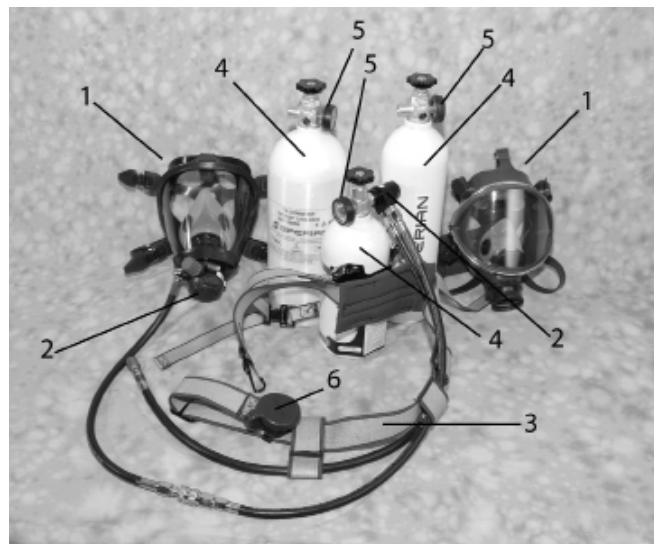


Figure 1A. Low Pressure HIP-PACs  
2216 psig & 3000 psig

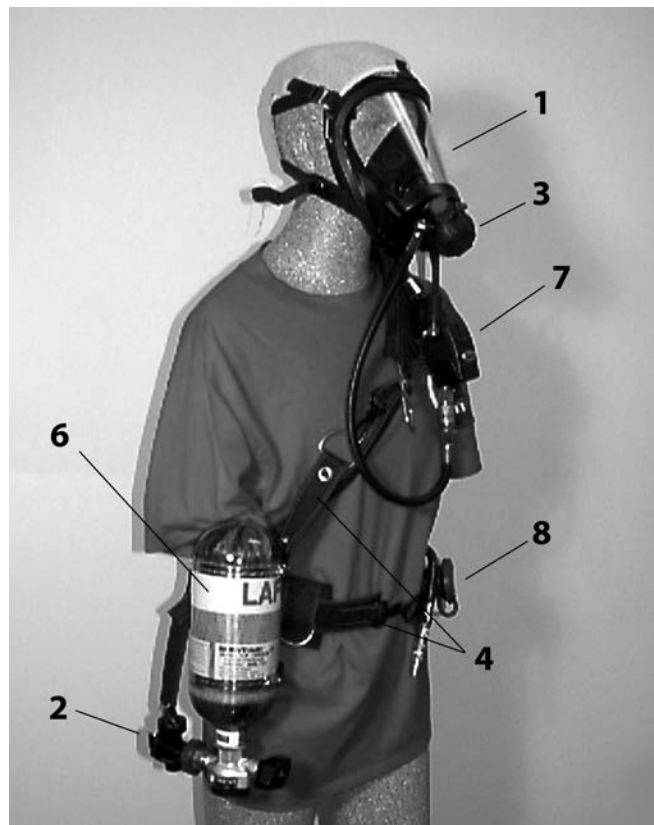


Figure 1B. High Pressure HIP-PAC, 4500 psig

IV. PARTS LIST (See Figure 1A for low pressure 2216 psig & 3000 psig HIP-PACs and Figure 1B for high pressure 4500 psig HIP-PAC.)

# Panther HIP-PAC

## LOW PRESSURE 2216 PSIG & 3000 PSIG HIP PAC PARTS LIST

Item	P/N	DESCRIPTION
1	968416	Classic Facepiece, Standard, Black
	968417	Classic Facepiece, Small, Black
	2120XX Series	21 Series Facepieces w/ Drink Tube**
	2220XX Series	TwentyTwenty Plus Facepieces*
	2320XX Series	TwentyTwenty Plus Facepieces**
	2420XX Series	TwentyTwenty Plus Facepieces**
	2520XX Series	TwentyTwenty Plus Facepieces**
	2620XX Series	TwentyTwenty Plus Facepieces**
	2720XX Series	TwentyTwenty Plus Facepieces**
	968005	Puma Hood, Standard, Red, Small Nose Cup
	968006	Puma Hood, Standard, Red, Medium Nose Cup
	968007	Puma Hood, Standard, Red, Large Nose Cup
2	968443	Regulator Assy., First and Second Stages, without Quick Disconnect
	968441	First Stage Pressure Reducer with Quick Disconnect
	961793	Second Stage Regulator with Quick Disconnect
3	968510	Harness Assy., 5 and 10-min., Kevlar
	968515	Harness Assy., 15-min., Kevlar
	975230	Harness Assy., 5 and 10-min., Nylon
4	975081	5-minute, 2216 psig, All-Aluminum Cylinder and Valve Assy.
	975154	10-minute, 3000 psig, All-Aluminum Cylinder and Valve Assy.
	968512	15-minute, 3000 psig, Hoop-wrapped Cylinder and Valve Assy.
5	975089	Gauge, 2216 psig
	975189	Gauge, 3000 psig
6	961289	Regulator Receiver
* No longer available but still holds current approval. See Matrix for detailed part numbers and descriptions.		
** See Matrix for detailed part numbers and descriptions.		
<b>Air Supply Hoses and Air Line Coupling Kits</b>		
Lightweight 3/8" PVC Air Supply Hoses w/out Air Line Coupling Kit		
	930801	25 feet
	930802	50 Feet
	930804	100 Feet
High Performance 3/8" Neoprene Air Supply Hoses w/out Air Line Coupling Kit		
	930870	10 Feet
	930861	25 feet
	930862	50 Feet
	930864	100 Feet
Air Line Coupling Kits - Female/Male quick disconnect for 3/8" hoses		
	930810	Foster
	930820	Schrader
	930830	Hansen
	945007	Hansen Stainless Steel, Two-way Shutoff
	930852	Snap-tite
Air Supply Hose Accessories		
	985237	Gasket for 3/8" hoses
	985238	Fitting, Double Male
<b>Accessories</b>		
	980003	Spectacles Kit, Classic Facepiece, Wire Frame
	964054	Spectacles Kit, Classic Facepiece, NexSpex
	962260	Spectacles Kit, all 2020 Series Facepieces , Wire Frame
	964044	Spectacles Kit, all 2020 Series Facepieces , NexSpex
	B140095	Lens Cover, Clear, Classic Facepiece
	702019	Lens Cover, Tinted, TwentyTwenty Plus
	702028	Lens Cover, Clear, TwentyTwenty Plus
	951015	Anti-fog Solution, (1 oz.)
	951016	Anti-fog Solution, (16 oz.)
	981805	Anti-fog Wipes, (Box of 100)
	B140096	Mask Wipes, (Box of 100)
	940172	Neck Strap Kit, Classic Facepiece
	962232	Neck Strap Kit, TwentyTwenty Facepiece
	962869	Neck Strap Kit, TwentyTwenty Plus Facepiece
	961710	Headnet Kit, Classic Facepiece, Standard
	961730	Headnet Kit, Classic Facepiece, Small
	969019	Headnet Kit, TwentyTwenty and TwentyTwenty Plus Facepieces
	962264	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Small, Clear
	962265	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Medium, Clear

Item	P/N	DESCRIPTION
	962266	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Large, Clear
	702064	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Small, Black
	702065	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Medium, Black
	702066	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Large, Black
	968469	Utility "D" Ring Kit
<b>Communications</b>		
	964331	TwentyTwenty Plus Radio Communication System
	964332	SmallTalk Plus Voice Amplifier Kit
	964333	TwentyTwenty Plus Radio Communication/SmallTalk Plus Voice Amplifier Kit
	969083	Remote Push-to-Talk Kit
<b>Upgrade and Conversion Kits</b>		
	P968453	SAR Upgrade Kit, 5 Minute
	P968473	SAR Upgrade Kit, 10 Minute
	P968535	SAR Upgrade Kit, 15 Minute
	P968453	SCBA Conversion Kit, 5 Minute
	P968472	SCBA Conversion Kit, 10 Minute
	P968540	SCBA Conversion Kit, 15 Minute
<b>Welding Accessories</b>		
	430000	Welding Shield, Classic Facepiece
	430005	Lower Welding Bib, Classic Facepiece
	430010	Upper Welding Bib, Classic Facepiece
<b>Tools</b>		
	962244	Air Klic Removal Tool, TwentyTwenty Plus Facepiece
<b>Fit Testing Accessories</b>		
	962900	APR Adapter/Qualitative Fit Test Adapter
	962920	Quantitative Fit Test Adapter (For use with 962900)
<b>Rebuild Kits</b> (You must be a Certified Technician to rebuild these systems)		
	975245	First Stage Pressure Reducer Rebuild Kit
	961572	Panther Second Stage Regulator Rebuild Kit

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## HIGH PRESSURE 4500 PSIG HIP PAC PARTS LIST

Item	P/N	DESCRIPTION
1	968416	Classic Facepiece, Standard, Black
	968417	Classic Facepiece, Small, Black
	2120XX Series	21 Series Facepieces w/ Drink Tube**
	2220XX Series	TwentyTwenty Plus Facepieces*
	2320XX Series	TwentyTwenty Plus Facepieces**
	2420XX Series	TwentyTwenty Plus Facepieces**
	2520XX Series	TwentyTwenty Plus Facepieces**
	2620XX Series	TwentyTwenty Plus Facepieces**
	2720XX Series	TwentyTwenty Plus Facepieces**
	968005	Puma Hood, Standard, Red, Small Nose Cup
	968006	Puma Hood, Standard, Red, Medium Nose Cup
	968007	Puma Hood, Standard, Red, Large Nose Cup
2	964683	First Stage Regulator
3	961793	Second Stage Regulator
4	968686	Harness Assy.
	968680	Harness Assy. For use with COMPASS
5	968713	Intermediate Pressure (IP) Hose
6	917250	Cylinder/Valve
	917212	Cylinder/Valve, LAFD, Red
	917215	Cylinder/Valve, LAFD, Blue
	917218	Cylinder/Valve, LAFD, Black
7	964912	COMPASS Kit, LAFD
	964914	COMPASS Kit
	964916	COMPASS Kit with Auxiliary Coupler
8	961289	Regulator Reciever
* No longer available but still holds current approval. See Matrix for detailed part numbers and descriptions.		
** See Matrix for detailed part numbers and descriptions.		
<b>Air Supply Hoses and Air Line Coupling Kits</b>		
Lightweight 3/8" PVC Air Supply Hoses w/out Air Line Coupling Kit		
	930801	25 feet
	930802	50 Feet
	930804	100 Feet
<b>High Performance 3/8" Neoprene Air Supply Hoses w/out Air Line Coupling Kit</b>		
	930870	10 Feet
	930861	25 feet
	930862	50 Feet
	930864	100 Feet
<b>Air Line Coupling Kits - Female/Male quick disconnect for 3/8" hoses</b>		
	930810	Foster
<b>Air Supply Hose Accessories</b>		
	985237	Gasket for 3/8" hoses
	985238	Fitting, Double Male
<b>Accessories</b>		
	980003	Spectacles Kit, Classic Facepiece, Wire Frame
	964054	Spectacles Kit, Classic Facepiece, NexSpex
	962260	Spectacles Kit, all 2020 Series Facepieces , Wire Frame
	964044	Spectacles Kit, all 2020 Series Facepieces , NexSpex
	B140095	Lens Cover, Clear, Classic Facepiece
	702019	Lens Cover, Tinted, TwentyTwenty Plus
	702028	Lens Cover, Clear, TwentyTwenty Plus
	951015	Anti-fog Solution, (1 oz.)
	951016	Anti-fog Solution, (16 oz.)
	981805	Anti-fog Wipes, (Box of 100)
	B140096	Mask Wipes, (Box of 100)
	940172	Neck Strap Kit, Classic Facepiece
	962232	Neck Strap Kit, TwentyTwenty Facepiece
	962869	Neck Strap Kit, TwentyTwenty Plus Facepiece
	961710	Headnet Kit, Classic Facepiece, Standard
	961730	Headnet Kit, Classic Facepiece, Small
	969019	Headnet Kit, TwentyTwenty and TwentyTwenty Plus Facepieces
	962264	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Small, Clear
	962265	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Medium, Clear
	962266	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Large, Clear
	702064	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Small, Black
	702065	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Medium, Black
	702066	Nosecup Kit, TwentyTwenty, Twenty Twenty Plus Facepiece, Large, Black
	968469	Utility "D" Ring Kit


Item	P/N	DESCRIPTION
<b>Communications</b>		
	964331	TwentyTwenty Plus Radio Communication System
	964332	SmallTalk Plus Voice Amplifier Kit
	964333	TwentyTwenty Plus Radio Communication/SmallTalk Plus Voice Amplifier Kit
	969083	Remote Push-to-Talk Kit
<b>Welding Accessories</b>		
	430000	Welding Shield, Classic Facepiece
	430005	Lower Welding Bib, Classic Facepiece
	430010	Upper Welding Bib, Classic Facepiece
<b>Tools</b>		
	962244	Air Klic Removal Tool, TwentyTwenty Plus Facepiece
<b>Fit Testing Accessories</b>		
	962900	APR Adapter/Qualitative Fit Test Adapter
	962920	Quantitative Fit Test Adapter (For use with 962900)
<b>Rebuild Kits (You must be a Certified Technician to rebuild these systems)</b>		
	975245	First Stage Pressure Reducer Rebuild Kit
	961572	Panther Second Stage Regulator Rebuild Kit

### NOTE

The respirator and hose assemblies are supplied without quick couplers. The desired quick coupler assemblies must be purchased separately. Instructions for assembling quick couplers and hoses are provided below in paragraph V, B, "Quick Coupler Assembly."

## V. USE INSTRUCTIONS

### A. Air Supply


 <b>WARNING</b>
<ul style="list-style-type: none"> <li>• <b>Compressors, storage cylinders, valves, regulators, fittings, and other hardware must be large enough to deliver the air volume required by all users at peak demand.</b></li> <li>• <b>You are responsible for air quality and compliance with safety and health codes applicable to your area.</b></li> <li>• <b>No more than three (3) lengths of air supply hose shall be used for the 9308 and 93080 series hose, and no more than six (6) lengths for the 9649 series hose.</b></li> <li>• <b>The air supply hose inlet must be supplied with 80 to 125 psig air pressure.</b></li> <li>• <b>The length of air supply hose must be 10 to 300 feet for the 9308 series hose, 25 to 300 feet for the 93080 series hose, and 50 to 150 feet for the 9649 series hose. Do not combine different series of hoses or coupler assemblies.</b></li> <li>• <b>The NIOSH approval applies to the use of the splitter (suit bypass) only as specified in the "Special or Critical User's Instructions."</b></li> <li>• <b>Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</b></li> </ul>

1. Ensure that the air supply is Type 1, Grade D, or better, as described in the Compressed Gas Association Commodity Specification for Air, G-7.1. Moisture content, expressed as dewpoint, shall be maintained at -65°F (-53.9°C) or lower, or less than 24.0 ppm by volume.

2. Set relief valves at a maximum pressure of 150 psig (1.03 MPa).


### B. Quick Coupler Assembly

A male coupler from one of the air line coupler kits listed in the parts list, paragraph IV, must be assembled to the open end of the respirator hose. This operation requires a torque wrench.

 <b>WARNING</b>
<p><b>Carefully inspect and clean all threads to remove foreign material. Foreign material entering the air line can restrict or block air flow to the user. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</b></p>

### 1. Respirator Hose

- Remove the shipping cap plug from the respirator hose.
- Hold the female threaded fitting with a wrench or vise.
- Apply thread sealant completely around the male threads of the coupler.

 <b>WARNING</b>
<p><b>Do not allow the thread sealant to extend past the last thread of the coupler. Thread sealant that extends past the coupler threads can restrict or block air flow to the user. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</b></p>

- Thread the male coupling into the female fitting on the respirator hose. Torque to 90 5 in-lb.
- Pressurize and check for leaks with a bubble-type leak detector.
- If leaks are detected, disassemble and repeat steps a through e.
- If the leaks persist, remove the hose from service and have repairs made by a SPERIAN-certified technician.

2. Air Supply Hose - Each length of hose is equipped with a 1/4 inch female NPT swivel nut at each end and a male-to-male 1/4 inch NPT adapter. The male-to-male adapter may be used to connect two lengths of hose or connect the hose to the air supply. Four approved methods of connecting hose lengths and air supply are illustrated in Figure 2.

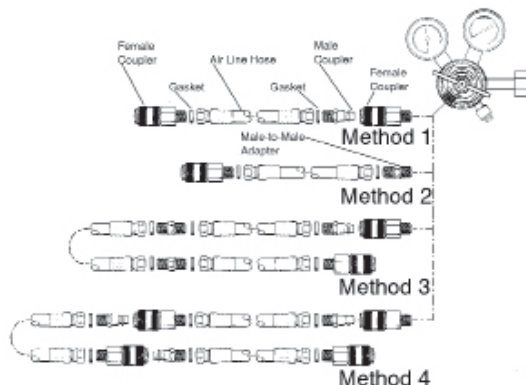


Figure 2. Hose Connections

3. When assembling the quick disconnect fittings of the coupler or the male-to-male adapters to the hose, verify that the hose gaskets are in place and torque to 90 5 in-lb. Thread sealant is not required.



## Panther HIP-PAC

4. The air supply connection using the 1/4 inch male-to-male adapter illustrated in Method 2 is also approved for use with Methods 3 and 4.

a. Method 1 is preferred when only one length of hose is required, since it allows the hose to be disconnected from the air supply.

b. Method 3 is preferred when multiple lengths of hose (maximum of three) are required, eliminating the cost of quick-disconnect couplers at the hose junctions.

5. Pressurize and check for leaks with a bubble-type leak detector. If leaks are detected:

a. Disassemble and repeat steps 3 through 5.

b. If the leaks persist, remove the hose from service and have repairs made by a SPERIAN-certified technician.



### WARNING

***Always verify that the swivel nut gaskets are in place and undamaged before assembly. Missing or damaged swivel nut gaskets may allow contaminants to leak into the system causing illness or death.***

## C. Donning



### WARNING

• ***Always don, remove, and fit check the respirator in a safe, uncontaminated area.***

• ***The regulator must be attached to the Panther HIP-PAC air cylinder before connecting the air line hose to the air supply. Using the supplied air line without the regulator being attached to the cylinder could result in loss of air, causing illness or death.***

• ***Verify that the air cylinder valve is turned off before connecting to the air supply. Using the Panther HIP-PAC with the air cylinder turned on while connected to the air supply will cause loss of air in the cylinder, resulting in reduced escape time in case of an emergency.***

• ***Always disengage the regulator from the facepiece and return it to the waist belt-mounted receiver when not in use. This will prevent contaminants from entering the regulator outlet port. Dirt, dust, and water may enter the regulator, causing it to malfunction.***

• ***Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.***

1. Verify that the air cylinder valve is turned off.

2. Verify that the bypass is in the OFF position and that the cylinder gauge reads full.

3. Depress the shutoff button on the second stage regulator.

4. Ensure that the waist belt and hip pad (if used) are properly positioned on the tank mounting bracket belt loop. See Figure 3.

5. Insert the air line hose through the first waist belt loop on the back of the waist belt and the restraint sleeve located on the waist belt. See Figure 4.

6. Route the second stage hose through the second loop on the back of the waist belt. Position the second stage hose so that it routes under your left arm. (If the hose is too tight, adjust the cylinder nearer the small of your back.)

### NOTE

The following steps 7-10 do not apply to the 5-minute and 10-minute nylon harness assembly, P/N 975230.

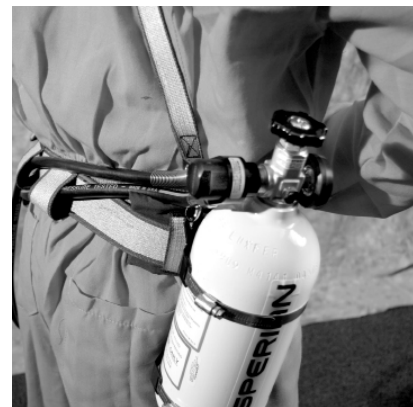


Figure 3. Waist Belt and Hip Pad Position

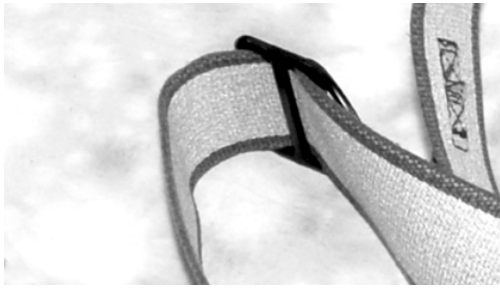


Figure 4. Routing of Hoses

7. Ensure that the regulator receiver is attached to the waist belt just behind the snap hook.

8. Ensure that the waist belt is laced properly through the D-ring slide and the snap hook. See Figure 5.

## Panther HIP-PAC



**Figure 5. Waist Belt D-ring**

9. Insert the second stage regulator into the regulator receiver on the waist belt.

10. Open the (optional) shoulder strap to its maximum position. Place the shoulder strap over the left shoulder and position the shoulder pad on the top of the left shoulder. Adjust the shoulder strap to raise the cylinder, and to raise the waist belt into position around the waist.

11. Position the cylinder so that the cylinder is located slightly behind the right hip, latch the belt buckle, and adjust both the waist and shoulder straps (if used) for comfort. Pull the loose end of the waist strap to tighten.

12. Connect the air line hose to the remote air supply.


### NOTE

When using Foster fittings, always ensure that the locking sleeves are rotated to the locked position.

13. When donning the respirator without the optional shoulder strap, follow the same procedures except omit step 10.

14. Tighten the AIR KLIC on the facepiece by turning it clockwise.

15. Verify that the AIR KLIC is secured by trying to turn it counterclockwise.

 <b>WARNING</b>
<p><b><i>The AIR KLIC must be held securely in the nozzle by the ratchet-and-pawl mechanism. If it is necessary to use a respirator that has been stored at a temperature below freezing (32°F or 0°C) prior to using, then DO NOT exhale into the facepiece until the facepiece has been properly donned with the nose cup situated properly on the face and the regulator installed and activated. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></b></p>

16. There are two methods, depending upon which head harness is used, to secure the Classic™ or TwentyTwenty Plus facepiece to the user. Both methods are described below.

a. Standard silicone headstrap:

i. Fully loosen the headstraps.

ii. If your SCBA is equipped with a neck strap, place the neck strap over your head.

iii. Grasp the lower headstraps as shown in Figure 6.



**Figure 6. Grasp Lower Headstraps**

iv. Place your chin in the chin cup and pull the straps over your head.

v. Center the facepiece and flatten the headstrap hub on the back of your head.

vi. Tighten the two lower straps. Do not over-tighten.

vii. Tighten the temple straps (Figure 7), then the top strap, until all the headstraps lie flat on your head.



**Figure 7. Tighten Upper Straps**

viii. Perform a leak check as described below.

### NOTE

When properly adjusted, the headstrap hub should be centered on the back of your head, and the lower straps should be below your ears. Make sure that your chin is properly recessed in the chin cup.

b. Optional Headnet

i. Inspection

• **Classic Facepiece**—Ensure that the three locking fabric straps located across the forehead are positioned so that they do not slip out from under the buckles.

• **TwentyTwenty Plus Facepiece and 21 Series Facepiece**—Ensure that the three locking fabric straps located across the forehead are fully inserted into their slots in the rims and that the locking flaps prevent the straps from pulling out of the slots.

## All Facepieces

- ii. Place your chin in the chin cup, pull the elastic adjustment strap over your head, and tighten by pulling evenly on both sides. See Figure 8.



Figure 8. Adjust Headnet

- iii. Center the facepiece and fasten the Headnet with a wiping motion toward the back of your head.
- iv. Retighten the elastic adjustment straps. Do not overtighten.
- v. Perform a leak check as described below.

### CAUTION

**Do not adjust the fit of the facepiece with the three locking straps at the top of the headnet. Use the two bottom straps only.**

### NOTE

When properly adjusted, the headnet should be centered on the back of your head, and the lower straps should be below your ears.

## c. Hood-Style Facepiece



### WARNING

**The SPERIAN hood-style facepiece:**

- **Must be worn in conjunction with an SAR and/or SCBA and used as specified in SPERIAN's instructions.**
- **When donned and used with its SAR/SCBA, will reduce, but not eliminate the inhalation of contaminants.**
- **Does not protect against falling objects or projectiles.**
- **Must not be worn around open flames. It must not be used for structural fire fighting, underwater activities, or abrasive blasting.**
- **Must not be used unless a satisfactory fit is obtained.**
- **Must not be reused if contaminated.**
- **Must not be altered or modified in any manner.**
- **Requires that the wearer must assure that the neck seal is not compromised by hair or clothing when in use.**
- **Requires that after each use and/or**



### WARNING—Continued

**cleaning and disinfecting, anti-fog solution (SPERIAN P/N 951015, 951016, OR 981805) must be applied to the inside of the lens.**

• **The Challenge® NXT, PVC lens, neoprene neck seal, and adhesive all may react in a different manner when exposed to chemicals or chemical mixtures. You must verify that none of the components of the hood will degrade against the chemicals or mixtures to which it may be exposed.**

• **It is vital to ensure that you have objective evidence that the hood will be able to maintain its integrity against the expected chemical exposure during operations. This can be accomplished by tests you conduct or by contacting SPERIAN for further information. Listed below are a few, but not necessarily all, chemicals that are known to degrade or destroy the PVC material. Do not use the hood in environments containing these chemicals:**

- Acetone
- Bleach
- Carbon tetrachloride
- Methanol
- Methyl ethyl ketone
- Nitric acid
- Toluene
- Trichloroethylene

• **Failure to comply with this warning may lead to serious personal injury, serious illness, or death.**

- i. Fully loosen the suspension straps.
- ii. Grasp the hood-style facepiece by the neck seal and pull the neck seal over your head.
- iii. Position the nose cup on your face, then simultaneously tighten the two suspension straps.

## D. Fit Check



### WARNING

- **Conduct fit checks only in a safe, uncontaminated environment.**
- **Do not use this respirator in a contaminated atmosphere if you do not obtain a satisfactory seal during the fit check. If a seal was not obtained, reposition the facepiece, check the straps, and perform the fit check again. Failure to obtain a satisfactory seal could allow contaminants to leak into the facepiece, causing illness or death. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.**



## Panther HIP-PAC

### NOTE

Steps 1-3 apply to conventional facepieces only.

1. Place the palm of your hand over the AIR KLIC as shown in Figure 9.
2. Inhale and hold your breath for a few seconds. The facepiece should collapse on your face without leaking.



**Figure 9. Fit Check for Conventional Facepiece**

3. If the facepiece leaks, reposition it, check the straps, and repeat the fit check.

### NOTE


Steps 4-5 apply to Puma hood-style facepieces only.

4. Don and pressurize the hood-style facepiece as shown in Figure 10.



**Figure 10. Fit Check for Hood-style Facepiece**

5. Hold your breath for several seconds and listen for audible leaks.
6. When a satisfactory fit is obtained, verify that the respirator hose is connected to the air line hose and the air line hose is connected to an air source set for the correct pressure.
7. Remove the second stage regulator from the waist strap regulator holder by pressing the two release buttons.

	<b>WARNING</b>
<b><i>Always close the regulator receiver cover to prevent contaminants from collecting in the receiver. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></b>	


### NOTE

The second stage regulator release buttons must be pressed simultaneously to remove the regulator from the holder.


8. Insert the regulator into the AIR KLIC on the facepiece and press firmly until you hear both release buttons snap into place.

### NOTE

- A CLICK will be heard when each AIR KLIC button is properly engaged.
- Do not press the release buttons when installing the regulator.

	<b>WARNING</b>
<b><i>Rotate and tug the regulator to ensure that both release buttons are properly engaged in the AIR KLIC. Do not push the release buttons while verifying the engagement of the regulator. Do not press the release buttons unless you intend to remove the regulator from the facepiece. Pressing both release buttons during or after installation onto the facepiece could result in inadvertent regulator disengagement, causing serious injury or death.</i></b>	

9. Take a sharp, deep breath to activate the regulator.
10. Take several breaths to check the flow of air.
11. Press the black rubber override button on the second stage regulator to ensure that it is operating properly.
12. Quickly open and close the bypass valve to ensure that it is operating properly.
13. The Panther HIP-PAC is now ready for use.

	<b>WARNING</b>
<b><i>• Entry into hazardous atmospheres with the Panther HIP-PAC must be done while connected to the air line. Do not use the escape cylinder air supply for entry.</i></b> <b><i>• Ensure that the escape cylinder is full.</i></b> <b><i>• The Panther HIP-PAC has a rated service time of 5, 10, or 15 minutes. Under average conditions, you will have up to 5, 10, or 15 minutes in which to escape from a toxic environment. Stress and exertion may consume extra air and reduce service time. Know escape routes in advance and the time required to travel them.</i></b> <b><i>• Always follow established safety procedures when exposed to atmospheres that are hazardous or immediately dangerous to life or health.</i></b> <b><i>• Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></b>	



## Panther HIP-PAC

### E. Emergency Exit

1. If the air line supply is cut off while the user is in a hazardous atmosphere, turn the cylinder valve of the Panther HIP-PAC counterclockwise at least one full turn to start the flow of air from the cylinder.
2. If required for escape, disconnect the air line hose from the Panther HIP-PAC respirator hose.
3. Proceed immediately to fresh air.
4. When in a safe environment, remove the facepiece and turn the cylinder valve clockwise to shut off air from the cylinder.

#### CAUTION

***Do not overtighten the cylinder valve. Damage to the valve seat could result.***

### F. Emergency Operation

1. PROBLEM: Restricted or interrupted air flow
  - a. Open the bypass valve by turning the red knob on the second stage regulator counterclockwise until the desired constant air flow is achieved.



#### WARNING

***Activating the bypass valve rapidly depletes your air supply. Immediately exit to a safe area. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.***

- b. IMMEDIATELY exit to a safe area.
  - c. Have the HIP-PAC inspected and/or repaired by a certified repair technician before reuse.
2. PROBLEM: First-Breath-On failure
    - a. Press the black rubber manual override button on the front of the regulator to start air flow.
    - b. IMMEDIATELY exit to a safe area.
    - c. Have the second stage regulator inspected and/or repaired by a certified repair technician before reuse.
  3. PROBLEM: Free flow
    - a. If the regulator will not shut off (free flows) during extremely heavy breathing, exhale forcefully. The regulator should return to normal flow.
    - b. If the free flow continues, open and close the bypass once, or depress the manual override button once.
    - c. If the problem persists, IMMEDIATELY exit to a safe area.
    - d. Have the HIP-PAC inspected and/or repaired by a SPERIAN-certified repair technician before reuse.

### G. Doffing



#### WARNING

- ***Follow all appropriate decontamination procedures before doffing the Panther HIP-PAC.***
- ***Doff the Panther HIP-PAC only in a safe area.***
- ***Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.***

1. Press the second stage regulator shutoff button.
2. Press the two release buttons and remove the regulator from the facepiece.



#### WARNING

***Always disengage the regulator from the facepiece and return it to the waist belt-mounted receiver when not in use. This will prevent contaminants from entering the regulator outlet port. Dirt and dust may enter the regulator, causing it to malfunction. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.***

3. Disconnect from the remote air source, or close the cylinder valve.
4. Press the override button on the second stage regulator to vent air from the Panther HIP-PAC.
5. Push the second stage regulator into the waist strap-mounted regulator holder until it clicks.
6. Place your thumbs under the headstrap buckles, loosen the lower straps, and remove the facepiece.
7. Unsnap the waist strap buckle and remove the Panther HIP-PAC.
8. Prepare the Panther HIP-PAC for storage.

#### CAUTION

***If the Panther HIP-PAC is to be transported unsecured for long periods of time, the first stage connection to the cylinder valve must be wrench-tight.***

## H. Use of the 21 Series Drink Tube

The drink tube allows the user to consume fluids while wearing the 21 Series facepiece and is compatible with a MIL-C-51278 water canteen cap.

<p><b>⚠ WARNING</b></p> <ul style="list-style-type: none"> <li>• <i>Using the drink tube in a contaminated area or after leaving a contaminated area may expose you to contaminants. Use the drink tube in accordance with instructions provided by the IC or ICS.</i></li> <li>• <i>Failure to comply with this warning may lead to personal injury, illness, or death.</i></li> </ul>
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1. While wearing the 21 Series facepiece, remove the drink tube coupling from the retainer and insert it into a MIL-C-51278 canteen cap.
2. Use mouth movements to insert the drink tube mouthpiece inside the nose cup into your mouth.
3. Hold the canteen upside down higher than the mouthpiece and suck the fluid into your mouth as shown in Figure 11.
4. When through drinking, turn the canteen right side up and remove the mouthpiece from your mouth.
5. Remove the coupling from the canteen cap and return the coupling to the drink tube retainer.



**Figure 11. 21 Series Drink Tube**

## VI. MAINTENANCE

<p><b>⚠ WARNING</b></p> <p><i>Specialized processes are required to disinfect and decontaminate a respirator. You <b>MUST</b> follow the instructions of the manufacturer who supplies the disinfecting or decontamination equipment or chemicals. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></p>
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<p><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>• <i><b>DO NOT</b> clean the facepiece with the regulator attached.</i></li> <li>• <i><b>You must ensure that this respirator is not damaged when using disinfecting or decontamination equipment or chemicals.</b></i></li> <li>• <i><b>The facepiece lens can be scratched through careless or abusive handling. DO NOT use abrasive cleaners or pads. DO NOT towel dry.</b></i></li> </ul>
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### NOTE

Inspect the Panther HIP-PAC for defects before and after each use, and at least once monthly if not used. Repair as necessary, clean and disinfect after each use, and store properly to assure that the Panther HIP-PAC is maintained in satisfactory working condition. Keep a record of inspection and repair dates and results. Refer to the inspection table in the back of this manual.

### A. Conventional Facepiece Cleaning

#### NOTE

Silicone and rubber parts of the facepiece may be cleaned between washings with SPERIAN Mask Wipes, P/N 140096.

1. Make a cleaning solution of warm water and a mild detergent.
2. Fully immerse the facepiece in the solution.
3. Agitate the facepiece and gently clean with a soft brush.
4. Thoroughly rinse the facepiece in fresh water, paying particular attention to removal of all soap residue from the exhalation valve. If possible, direct running water onto the exhalation valve.
5. Allow the facepiece to drip dry. Warm air may be used to speed up drying.

NOTE

Repeated cleaning may require reapplication of anti-fog coating to the facepiece lens. Use only SPERIAN Anti-Fog Solution, P/N 951015 (1 oz.), or P/N 951016 (16 oz.).

6. After cleaning, three drops of anti-fog solution may be applied to the inner surface of the lens with a lint-free cloth. Allow the coating to dry for 15 minutes before using the facepiece. The 2720 series of the Twenty-Two Plus facepiece has a permanent anti-fog coating. Anti-fog solution does not need to be applied.

7. Hold the facepiece firmly against your face and exhale several times to ensure that the exhalation valve functions smoothly.

8. Cleaning the 2120 Series Facepiece Drink Tube

a. Remove the retainer, internal & external drink tube from the facepiece. The internal drink tube is removed by pulling the drink tube from inside the noseclip until the tube comes off the plastic barb. The external drink tube is removed by using a 1 inch spanner wrench to unscrew the connector cap and pulling the drink tube off of the plastic barb. The retainer can be pulled off of the left side connector.

b. Rinse the insides of the retainer, internal & external drink tubes with warm water, removing any residue. Rinse thoroughly and allow the components to air dry.

c. Re-install the external drink tube over the barb of the flat side of the plastic connector. Place the adapter into the connector slot, and tighten on the o-ring seal and screw connector cap with the 1 inch spanner wrench. Do not overtighten. Place the retainer over the connector cap and place the external drink tube/valve inside the retainer. Re-install the internal drink tube by placing the connecting end of the tube through the noseclip hole and over the adapter's internal plastic barb. Orient internal tube to the user's preference by rotating drink tube around barb.

**B. Hood-style facepiece cleaning**



**WARNING**

**It is the user's responsibility to ensure that the cleaning process chosen provides adequate disinfection or decontamination. Specialized processes are required to disinfect and decontaminate a respirator. You MUST follow the instructions of the manufacturer who supplies the disinfecting or decontamination equipment or chemicals. Use ONLY the sanitizing products listed in this manual to disinfect**



**WARNING—Continued**

**and decontaminate the full facepiece hood.**  
**After each use and/or after cleaning and disinfecting, SPERIAN anti-fog solution, (P/N 951015, 951006, or 981805) must be applied to the inside of the lens.**  
**Failure to comply with this warning may lead to serious personal injury, serious illness, or death.**

**CAUTION**

**DO NOT clean the hood-style facepiece with the regulator attached.**  
**You must ensure that this respirator is not damaged by disinfecting or decontamination equipment or chemicals.**  
**The hood-style facepiece lens can be scratched through careless or abusive handling. DO NOT use abrasive cleaners or pads. DO NOT towel dry.**  
**Sanitizing solutions containing chloride bleach (such as a "hypochlorite solution") may damage the hood-style facepiece lens.**

NOTE

ANSI Z88.2 1992 also provides information and guidelines on the cleaning of respirators.  
 After each use, prior to cleaning and disinfecting, inspect the inside of the lens for an anti-fog appliqué. If an appliqué is present, inspect it to verify that it is still adhering to the lens properly. If the anti-fog appliqué is delaminating from the lens, remove it from the inside of the lens by lifting one edge of the appliqué and gently peeling it away, being careful not to damage the lens.  
 Once the appliqué has been removed, it is not necessary to replace it with another appliqué. Application of SPERIAN Anti-fog Solution, P/N 951015, 951016, or 981806, to the inside of the lens is adequate.

1. Make a cleaning solution of warm water (120° F or 48° C maximum) and a mild detergent.
2. Immerse the hood-style facepiece in the solution until the exhalation valve is covered.
3. Agitate it and gently clean it with a soft brush.
4. Thoroughly rinse the hood in fresh water, paying particular attention to removal of all soap residue from the exhalation valve. If possible, direct running water onto the exhalation valve.
5. Disinfect the hood using one of the following sanitizing products: ARI Sanitizer Deodorizer—ARI, Orchard Hill, GA; Lysol Disinfectant; or Simple

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Green All Purpose Cleaner.

6. Allow the hood to drip dry. Warm air may be used to speed up drying.

7. Hold the hood facepiece inner mask firmly against your face and exhale several times to ensure that the exhalation valve functions smoothly.

8. After cleaning and disinfecting the hood, liberally apply SPERIAN anti-fog solution, P/N 951015, 951016, or 981805 to the inside of the lens and allow it to dry thoroughly.

### C. Second Stage Regulator Cleaning

 <b>WARNING</b>
<ul style="list-style-type: none"><li>• <b>Do not allow water or cleaning solutions to enter the breathing system or the regulator. Dirt, dust, or soap residue could degrade regulator performance causing it to fail, possibly resulting in injury or death.</b></li><li>• <b>Do not submerge the regulator in water or cleaning solutions. It may be partially submerged only as instructed in step 6 below.</b></li><li>• <b>Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</b></li></ul>

#### NOTE

- Always hold the regulator with the outlet facing downward during washing and rinsing.
- The Protective Cleaning Cap, P/N 873004, may be used to seal the Panther second stage regulator to prevent contaminants from entering the regulator outlet. See Figure 12.

1. Make a cleaning solution of warm water and a mild detergent.
2. Have a bucket of fresh water available for rinsing.

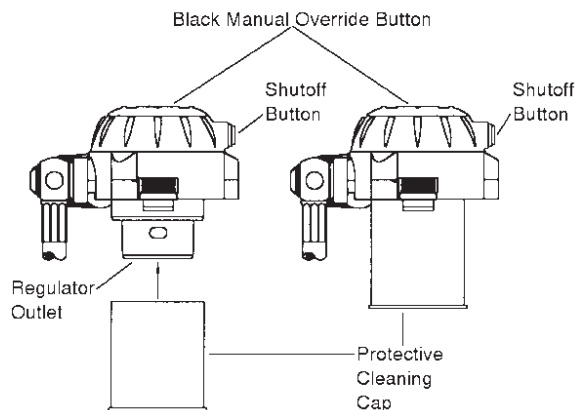


Figure 12. Protective Cleaning Cap

3. With the regulator facing downward, clean the exterior surfaces and the interior of the outlet tube with a soft brush.

4. With the regulator facing downward, immediately rinse the exterior surfaces and the interior of the outlet tube with fresh water. Scrub excess soap away with the brush.

5. Dry with a clean cloth or with low pressure (15 psig maximum) clean (breathing grade) air.

6. If dirt or debris interferes with the First-Breath-On mechanism, clean it as follows:


- a. Lift the edge of the rubber manual override button with a small, flat-blade screwdriver, and peel it off.
- b. Place the protective cap over the outlet tube.
- c. Hold the regulator with the cover facing downward and rinse in a shallow bucket of fresh water.
- d. Allow the water to drain, and dry with low pressure air (15 psig maximum).
- e. Replace the manual override button.

### D. Exterior Surfaces Cleaning

<b>CAUTION</b>
<i>The hoses, backpack harness, frame, and cylinder and valve assembly may be cleaned with a damp cloth or a mild soap and warm water solution. Rinse thoroughly and air dry or wipe with a clean cloth.</i>

### E. Inspection (see page 21)

### F. Repair (see page 22)

 <b>WARNING</b>
<i>Before disassembly, make sure that all air is bled from the lines. Shut off or deplete the air supply to prevent equipment damage or personal injury. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i>

<b>CAUTION</b>
User repair of the Panther HIP-PAC is limited to replacement of components listed on the NIOSH approval label and repairs described in this section. Disassembly should be performed only to the extent necessary to replace the components. To protect your warranty and the NIOSH certification on the equipment, all other repairs must be done only by SPERIAN-certified technicians. If there are none at your facility, consult your SPERIAN distributor for the repair facility nearest you.



## Panther HIP-PAC

### NOTE

All SPERIAN-certified Technicians are required to remain current on new procedures and parts through SPERIAN's published Technical Bulletins, technical manual revisions, and certification seminars.

### G. Functional Testing (see page 23)

Perform functional tests after cleaning or repair. After testing, fill the cylinder and store the Panther HIP-PAC.

### H. Cylinder Maintenance and Recharging

#### **WARNING**

- *You must read and understand all warnings and instructions provided on the cylinder DOT warning label and in instruction manuals before using the cylinder/valve assembly.*
- *Only trained personnel may store, fill, service, maintain, handle, use, or dispose of cylinders used with this HIP-PAC. Follow the guidelines of the Compressed Gas Association (CGA) pamphlets P-1, C-1, C-2, C-6, C-6.1, C-6.2, G-7, and G-7.1, as appropriate. Always follow established safety precautions when recharging cylinders.*
- *Do not alter cylinders used with this HIP-PAC.*
- *Fill only to the stamped service pressure. Do not overfill.*
- *Do not fill a leaking cylinder. Depressurize immediately.*
- *Do not tamper with the safety pressure relief device. Rapid depressurization when the safety pressure relief device activates will cause excessive noise. During rapid depressurization, cylinders may become ballistic and cause injury. Stay clear of cylinders when the safety relief device is activated.*
- *Do not fill the cylinder if unraveling or charring of composite fibers occurs.*
- *Do not fill or use the cylinder if you have any doubt about its suitability for recharge. Return it to a certified hydrostatic test facility.*
- *Do not expose cylinders used with this HIP-PAC to open flame or heat sources which may heat the cylinder to 350°F. Cylinders damaged by fire or exposed to heat of 350°F must be destroyed.*
- *Repainted or refinished cylinders must be hydrostatically tested before reuse.*

#### **WARNING—Continued**

- *Do not fill a composite cylinder if it is not marked as being hydrostatically tested within three (3) years. Do not fill an aluminum cylinder if it is not marked as being hydrostatically tested within five (5) years.*
- *Do not fill or use composite cylinders older than 15 years. Depressurize and destroy these cylinders.*
- *Inspect cylinders before each filling. Remove cylinders from service which have cuts, gouges, dings, bulges, corrosion, etc. A special internal and external visual inspection of cylinders must be completed at least every hydrostatic test. Follow the guidelines of CGA 6.2.*
- *Do not use caustic paint strippers or corrosive cleaners.*
- *Do not fill with oxygen.*
- *Do not remove, obscure, or alter any labels on HIP-PAC cylinders.*
- *Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.*

#### 1. Inspection

After each use and prior to recharging, each air cylinder shall be subjected to a thorough visual inspection.

#### **WARNING**

*Do not fill any cylinders that are damaged, you suspect may be damaged or unsafe, or are out of conformance with applicable hydrostatic test dates. Damaged cylinders must be inspected by an approved hydrostatic test facility and repaired as required before being filled. Failure to comply with this warning may lead to serious personal injury, serious illness, or death.*

#### a. Aluminum Cylinders

Ensure that no more than five years have elapsed since the last hydrostatic test has been performed, as indicated by the most recent date stamped into the cylinder shoulder. Inspect the exterior of the cylinder for dents, gouges, or rusted areas, and evidence of exposure to high temperature such as darkened or blistered paint, charred decals, melted or distorted gauge lens, etc.

### b. Composite Cylinders

Ensure that no more than three years have elapsed since the last hydrostatic test has been performed for the 3000 psig, hoop wrapped cylinder and five years for the 4500 psig fully wrapped fiber cylinder, and that the cylinder is less than 15 years old. Inspect the exterior of the cylinder for dents, gouges, or cuts which have penetrated and caused separation or unraveling of the composite overwrap. Watch for evidence of exposure to high temperature, such as darkened or blistered paint, charred overwrap or decals, melted or distorted gauge lens, etc.

### c. Cylinder Valve

The cylinder valve should also be examined for obvious external damage such as a deformed hand-wheel, inaccurate or inoperative pressure indicator, damaged threads on the outlet connection, or other evidence of impact or exposure to extreme heat. If internal contamination is suspected, remove the cylinder valve and inspect the interior of the cylinder. The cylinder valve overhaul cycle should be as follows. For steel, all aluminum, or fully wrapped carbon fiber cylinders, overhaul the valve at every hydrostatic retest (5 year cycle). For hoop wrapped cylinders, overhaul the valve at every other hydrostatic retest (6 year cycle).

### d. Additional Information

i. Additional information on cylinder inspection and maintenance can be found in CGA pamphlet C-6, "Standards for Visual Inspection of Compressed Gas Cylinders," CGA pamphlet C-6.1, "Visual Inspection of High Pressure Aluminum Cylinders," or CGA pamphlet C-6.2, "Guidelines for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders," available from the Compressed Gas Association, Inc. If there is any doubt about the suitability of a cylinder to recharge, it should be returned to a certified hydrostatic retest facility for expert examination and retesting.

ii. A comprehensive listing of all licensed hydrostatic test stations is available from the Department of Transportation.

## 2. Filling Procedure

### a. Air Purity

Unless safety and health codes in your area specify otherwise, air cylinders should be refilled with compressed air meeting the purity requirements for Type 1, Grade D Gaseous Air as specified by the Compressed Gas Association Commodity Specification for Air, publication G-7.1. The moisture content, expressed as dewpoint, shall be maintained at -65°F (-53.9°C) or lower, or less than 24.0 ppm by volume moisture content. **UNDER NO CIRCUMSTANCES SHALL AN AIR CYLINDER BE FILLED OR PARTIALLY FILLED WITH OXYGEN.**

### b. Maximum Fill Pressure

Determine the service pressure of the cylinder prior

to filling. Composite and aluminum cylinders may be filled only to the service pressure indicated on the cylinder label. Composite and aluminum cylinders must never be filled to a pressure greater than the marked service pressure.

### c. Filling Procedure

i. The fill station must be constructed and equipped in accordance with applicable state industrial safety codes.

ii. The cylinder may be partially immersed (DO NOT submerge the cylinder valve) in a water bath to minimize the temperature rise that occurs as the cylinder is filled. The fill hose should be equipped with a restraining cable to prevent uncontrolled "whipping" in case of hose failure.

iii. After connecting the fill hose, open the cylinder valve fully. A separate metering valve must be used to control the fill rate. Fill the cylinder slowly, at a rate not exceeding 500 psig per minute. (Use caution if faster recharging rates are used.) After the initial filling, allow the cylinder to cool to room temperature, then "top off" the cylinder to achieve full service pressure.

iv. Use particular care to ensure that an air cylinder is never connected to a source capable of supplying air at a pressure greater than the maximum service pressure of that cylinder.

v. Close the cylinder valve when the cylinder is full.

vi. Slowly bleed pressure from the filling lines.

vii. Disconnect the filling line.

viii. Let the cylinder cool and check the gauge reading. Top off if necessary.

### d. Storage

Air cylinders should be recharged as soon as practical after use. Cylinders should not be stored partially charged, for two reasons:

i. If used without recharge, the service duration of the apparatus is reduced.

ii. The safety relief device is designed specifically to protect a fully charged cylinder from the effects of a fire.


For maximum safety, the cylinders should be stored fully charged.

If the cylinder is stored empty and the valve is inadvertently left open, humid atmospheric air may enter the cylinder and result in interior corrosion.

If a HIP-PAC is to be maintained in "standby" mode, i.e., available for immediate emergency usage, the cylinder pressure gauge should be checked at least once a month to assure that the cylinder is charged to full service pressure. Place the cylinder in a suitable safety sleeve or filling area.

## I. Cold Weather Operation and Maintenance

Operation of the Panther HIP-PAC in cold weather, 32°F (0°C) or colder, requires the user to be aware of the potential problems caused by the combination of moisture and low temperatures.

 <b>WARNING</b>
<ul style="list-style-type: none"> <li>• <b><i>Moisture entering the regulator system, either from moisture in the cylinder air or by external means, e.g., overspray during operations or inclement weather conditions, may cause regulator system freezeup, restricting or stopping air flow to the user. This could result in serious injury or death to the user.</i></b></li> <li>• <b><i>Recharge the cylinders with Grade D or better air conforming to Compressed Gas Association Specification G-7.1. Moisture content, expressed as dewpoint, shall be maintained at -65°F (-53.9°C) or lower, or less than 24.0 ppm by volume. Air exceeding this moisture content may cause regulator system freezeup, restricting or stopping air flow to the user. This could result in serious injury or death to the user.</i></b></li> </ul>

### NOTE

- Moisture can cause regulator system freezing problems even if the ambient air temperature is above freezing. The air flowing from the HIP-PAC cylinder through the regulator system decreases from cylinder pressure to near atmospheric pressure very rapidly. As this pressure decreases, the air rapidly expands, causing the air and therefore the regulator to cool.
- Although the ambient temperature may be above 32°F (0°C), the temperature inside the regulator system may be considerably lower (below freezing).
- SPERIAN recommends that HIP-PACs used on a routine basis or HIP-PACs kept for emergency use be stored at temperatures above 32°F (0°C). HIP-PACs stored at temperatures below 32°F (0°C) may need to be warmed to at least 32°F (0°C) prior to use if ice has formed on the facepiece exhalation valve, AIR KLIC, and/or quick-disconnects.

SPERIAN recommends a "change of season" inspection and increased attention to your preventive maintenance during cold weather conditions. The following recommended inspections and procedures will help prevent cold weather problems; however, cold weather conditions may also cause other problems not listed below.

### 1. Air Supply

### NOTE

Cold weather conditions require very dry air. Moisture entering the HIP-PAC may cause icing and equipment malfunction.

- a. Test compressor(s) for air quality and dewpoint prior to the cold season.
  - b. Recharge the cylinders with Grade D or better air conforming to Compressed Gas Association Specification G-7.1. Moisture content, expressed as dewpoint, shall be maintained at -65°F (-53.9°C) or lower, or less than 24.0 ppm by volume.
  - c. Prevent any moisture from entering the HIP-PAC.
  - d. Remove ice and water from cylinder valve threads prior to filling in cold weather conditions.
- ### 2. Facepiece and Exhalation Valve
- a. The facepiece must be protected from moisture during cold weather conditions to reduce ice formation on the facepiece lens, in the AIR KLIC, and in the exhalation valve.
  - b. Prior to donning the facepiece in cold weather, visually inspect the lens, AIR KLIC, and exhalation valve for ice.
  - c. If ice is present, warm the facepiece to melt the ice. Ice may be melted by placing the facepiece inside outerwear near the body to warm.
  - d. Ice in the exhalation valve may be melted by at least six to eight exhalations onto the exhalation valve.
  - e. Verify the proper function of the exhalation valve by performing a positive pressure exhalation test and negative pressure leak check as follows.
  - f. Don the facepiece as specified in the Donning section of this manual.
  - g. Perform a positive pressure exhalation test:
    - i. Take a deep breath, and place your hand over the AIR KLIC.
    - ii. Exhale normally. The exhalation valve must function normally.
    - iii. If the exhalation valve does not function or it is difficult to exhale, remove the facepiece.
    - iv. Exhale on the exhalation valve at least six to eight more times to melt the ice.
    - v. Reposition the facepiece, check the straps, and repeat the test.
    - vi. If the exhalation valve continues to malfunction, remove the facepiece from service.
    - vii. Have the facepiece inspected and/or repaired by a SPERIAN-certified repair technician before reuse.
  - h. Perform a negative pressure leak check:
    - i. Place your hand over the AIR KLIC.
    - ii. Inhale and hold your breath for a few seconds.

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The facepiece should collapse on your face and remain collapsed for several seconds without leaking.

iii. If the facepiece leaks, exhale onto the exhalation valve at least six to eight more times. Reposition the facepiece, check the straps, and repeat the leak check.

iv. If the facepiece continues to leak, remove it from service.


v. Have the facepiece inspected and/or repaired by a SPERIAN-certified repair technician before reuse.

i. Again, visually check to verify that the facepiece, lens, AIR KLIC, and exhalation valve are ice-free.

 <b>WARNING</b>
<b><i>If it becomes necessary to remove the facepiece when using the HIP-PAC, move to a non-hazardous area first. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></b>

j. If the ambient temperature is near or below freezing, place the facepiece and regulator under outerwear to keep it warm in case reuse is necessary.

### 3. Second Stage Regulator

 <b>WARNING</b>
<b><i>• Ice on the second stage regulator AIR KLIC buttons or the facepiece AIR KLIC adapter may prevent proper engagement of the regulator.</i></b>
<b><i>• The user must ensure that the regulator is properly engaged by rotating and tugging the regulator to verify that both release buttons are properly engaged in the AIR KLIC.</i></b>
<b><i>• Failure to comply with this Warning may lead to serious personal injury, serious illness, or death</i></b>

a. The second stage regulator must be protected from moisture during cold weather conditions to avoid ice buildup on its exterior surfaces. Ice can interfere with emergency bypass operation or AIR KLIC button function, which can hinder regulator removal from the facepiece or from the regulator receiver.

b. Visually inspect the external surfaces of the regulator for ice prior to use.

c. If ice is present, it may be melted by placing the regulator inside outerwear near the body to warm.

d. Again, visually inspect the regulator for ice, then check the red bypass knob and the AIR KLIC buttons for proper function.

te. Should ice form on the regulator while the regulator is in the facepiece, it will continue to function properly. When it becomes necessary to remove the regulator, rotate the regulator to break off the ice, then remove the regulator from the facepiece.

f. If the AIR KLIC buttons are frozen and the regulator cannot be removed, do not force the buttons. Move to a non-hazardous area, depress the regulator shutoff button, and remove the facepiece and regulator as a unit.

g. If the shutoff button is nonfunctional, turn off the air supply at the cylinder valve.

h. Remove the facepiece and regulator as a unit.

i. Warm the facepiece and regulator until the normal function of the AIR KLIC button and/or the shutoff button returns.

j. Should ice form on the regulator while the regulator is in the regulator receiver, rotate the regulator to break off the ice, then remove the regulator from the regulator receiver.

k. If the AIR KLIC buttons are frozen and the regulator cannot be removed from the receiver, do not force the buttons. Unbuckle the waist belt, and place the belt, regulator receiver and regulator under outerwear next to your body to warm it until the AIR KLIC button functions properly.

### 4. Regulator Receiver

a. During cold weather operation, keep the regulator receiver cover in place on the regulator receiver to keep out moisture and debris.


b. Visually inspect the regulator receiver for ice prior to use.

c. Remove ice by warming the regulator receiver, placing it under outerwear near the body to warm.

### 5. Cylinder Valve

a. During cold weather conditions, ice can form on the cylinder valve.

b. Warm the cylinder valve to melt the ice.

 <b>WARNING</b>
<b><i>Do not use heat above 160°F (71°C) or direct flame to melt ice. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></b>

### NOTE

Remove ice and water from cylinder valve threads prior to filling in cold conditions.

### 6. Optional Quick-disconnect Fitting or Male Coupling

a. During cold weather conditions, ice may form on the optional quick-disconnect fitting or the male coupling.

b. If the quick-disconnect fitting and the male coupling are connected prior to ice buildup, they will continue to function properly.



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c. If the second stage regulator is not connected at the quick-disconnect fitting, ice formation on either the quick-disconnect fitting or the male coupling can make connection impossible.

d. Prior to use, visually inspect the quick-disconnect fitting and male coupling for ice.

e. Remove or melt the ice, then dry the quick-disconnect fitting and male coupling to avoid water entering the regulator.

### 7. Training and Use

a. Conduct training sessions for cold weather operations using all equipment and accessories which may be used during actual operations.

#### NOTE

A program for use, training, inspection, record keeping, and maintenance is given in National Fire Protection Association Standard 1404, Fire Department Self-Contained Breathing Apparatus Program.

b. During cold weather operations, do not place cylinders or HIP-PACs into wet or snowy areas.

c. Visually inspect the cylinder to remove ice; clean the threads; and take care to prevent water from entering the cylinder or accumulating on connecting surfaces.

d. Icing will be accelerated by high air flow conditions. Examples may include, but are not limited to:

- Bypass usage
- Facepiece leakage due to improper sealing
- Allowing the regulator to free-flow when the facepiece is off
- Improperly maintained equipment

e. After cleaning, allow the HIP-PAC to dry completely before returning it to storage. Be sure the facepiece exhalation valve is dry before placing the facepiece into storage. Coat the interior of the facepiece lens with SPERIAN anti-fog solution, P/N 951015 or 951016.

### 8. Accessories

Cold weather conditions may have adverse effects on the performance of the HIP-PAC accessories.

a. Air line hoses can become stiff.

b. Ice on quick-disconnect couplers can make them difficult or impossible to connect.

c. Electrical equipment (e.g., radios and lights) tends to become more difficult to use in cold temperatures, especially if there is ice.

d. Use HIP-PAC accessories with extreme care in cold weather conditions. Visually inspect them periodically for ice.

### J. Storage

Inspect, clean, and repair as required before storing.

1. Firmly hand tighten the first stage regulator to a fully charged air cylinder.

2. Secure the air cylinder to the waist belt.

3. Check that the bypass is closed.

4. Press the override button on the second stage regulator.

5. Fully loosen the facepiece lower headstraps; adjust the top headstraps so that approximately one inch protrudes through the buckles.

6. Place the facepiece in a plastic mask bag.

7. Store away from dust, sunlight, extremes of heat and cold, excessive moisture, or damaging chemicals.


### K. Overhaul Frequency

1. All HIP-PAC configurations must pass an annual performance flow test utilizing a properly calibrated Honeywell Analytics PosiChek with current Sperian-specific software.

2. Each year the Panther HIP-PAC must be cleaned; and the in-line filter 910032, on the P968455, P968410, P968475, P968411, P968500, P968510, P968605, P968610, and P968615 units must be changed. Panther HIP-PAC units P968457 and P968477 DO NOT utilize an in-line quick-disconnect and therefore do not require the annual in-line filter change.

3. Maintenance must be performed by a Honeywell/Sperian-certified technician. HIP-PACs subjected to daily or severe service such as heavy use, extreme temperatures, or exposure to chemicals, require more frequent servicing.

### L. Additional Information

 <b>WARNING</b>
<b><i>Panther HIP-PACs converted to supplied air respirators (SARs) without escape cylinders must have the bypass removed by a SPERIAN-certified technician. Failure to comply with this Warning may lead to serious personal injury, serious illness, or death.</i></b>

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

**SPERIAN**  
**3001 South Susan Street**  
**Santa Ana, CA 92704**  
**(800) 873-5242**

<b><i>ALL RETURNED PRODUCTS MUST BE DECONTAMINATED PRIOR TO SHIPMENT. PRODUCTS CONTAMINATED WITH DANGEROUS SUBSTANCES WILL BE REFUSED AND RETURNED FREIGHT COLLECT.</i></b>
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## VII. WARRANTY AND LIMITATION OF LIABILITY

**LIMITED WARRANTY:** SPERIAN warrants this product to be free from defects in materials and workmanship for 12 years from the date of purchase. During this period, SPERIAN will repair or replace defective parts, at SPERIAN's option. Freight charges to and from the SPERIAN factory shall be paid by the purchaser.

**EXCLUSIONS:** NOTWITHSTANDING ANY CONTRARY TERM IN THE PURCHASER'S PURCHASE ORDER OR OTHERWISE, THE ONLY WARRANTY EXTENDED BY SPERIAN IS THE EXPRESSED LIMITED WARRANTY DEFINED ABOVE. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY IMPLIED WARRANTY OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.

**CONDITIONS:** To maintain this warranty this product must be used, maintained, and inspected as prescribed in the owner's instruction manual, including prompt replacement or repair of defective parts and such other necessary maintenance and repair as may be required. Normal wear and tear, and parts damaged by abuse, misuse, negligence, or accidents are specifically excluded from this warranty.

**LIMITATION OF LIABILITY:** No other oral warranties, representations, or guarantees of any kind have been made by SPERIAN, its distributors, or the agents of either of them, that in any way alter the terms of this warranty. **EXCEPT AS HEREIN PROVIDED, SPERIAN SHALL HAVE NO LIABILITY FOR ANY LOSS OR DAMAGE, WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, TO ANY PURCHASER OR USER OF THIS PRODUCT ARISING FROM THE SALE, USE, OR OPERATION OF THIS PRODUCT.**

 <b>WARNING</b>
<p><i>The failure to use and maintain this equipment in strict conformance with the applicable instruction manual may result in serious personal injury, serious illness, or death. The equipment's use in any manner that is not expressly authorized pursuant to the applicable instruction manual may result in severe adverse impacts to human health.</i></p>

## Panther HIP-PAC

### VIII. INSPECTION TABLE

**IF ANY OF THE DEFECTS LISTED BELOW ARE FOUND, HAVE THE PANTHER HIP-PAC REPAIRED BEFORE USE.**

COMPONENT	LOOK FOR
CONVENTIONAL FACEPIECE LENS	1. Nicks, scratches, or abrasions which could impair visibility. 2. Deep gouges or cracks which could reduce impact resistance. 3. Anti-fog coating in need of replacement.
CONVENTIONAL FACEPIECE RIMS	1. Deformed, cracked, or broken rims. 2. Loose rim screws. (Do not overtighten.)
CONVENTIONAL FACEPIECE SKIRT	1. Cuts, gouges, or punctures. 2. Tears or nicks in the sealing area. 3. Deterioration from age, heat, or contamination.
CONVENTIONAL FACEPIECE HEADSTRAP, BUCKLE STRAPS (TWENTYTWO PLUS)	1. Abrasions or nicks. 2. Deterioration from age, heat, or contamination.
CONVENTIONAL FACEPIECE BUCKLES (CLASSIC FACEPIECE) ▲	1. Crushed, bent, or corroded. ▲ 2. Damaged or loose rivets.
CONVENTIONAL FACEPIECE INLET NOZZLE (CLASSIC FACEPIECE) ▲	▲ 1. Loose nozzle cover screws. 2. Heat damage to the nozzle body and cover. 3. AIR KLIC not seated and locking pawl not engaged. 4. Dirt and debris in the exhalation module. 5. Exhalation valve sticking closed. (Exhale a few times to test.) 6. Exhalation valve sticking open under positive pressure. (Test with regulator.) 7. Damaged exhalation valve seat.
HOOD LENS	Scratches, cuts, or abrasions that could impair visibility or cause the hood to leak.
HOOD SUSPENSION	1. Webbing color change, excessive wear, or fraying. 2. Inspect stitching for thread raveling, abrasion, cuts, tears, and chemical attack.
HOOD FABRIC AND NECK SEAL	1. Integrity of seams. 2. Cuts or abrasions in the fabric or neck seal that could cause the hood to leak or neck seal to tear.
SECOND STAGE REGULATOR AND HOSE	1. Cracks or heat damage to housing or cover. 2. Faulty operation of bypass valve, First-Breath-On, AIR KLIC, or override buttons. 3. Dirt and debris in the outlet port; screen and grill cracked. 4. Hose or fittings corroded, cracked, or leaking. 5. Sticking release and shutoff buttons.
FIRST STAGE REGULATOR	1. Hose and fittings corroded, cracked, or leaking. 2. Abrasion of hose. 3. Damaged threads on regulator body. 4. Damaged or missing gaskets. 5. Damaged, missing, or obstructed sintered filter.
AIR CYLINDER AND VALVE	1. Dents, gouges, blisters, or cuts. 2. External damage to cylinder valve. 3. Smooth operation of valve handwheel. 4. Damaged threads on valve outlet. 5. Cylinder pressure gauge lens scratched; pointer deformed or stuck. 6. Gauge reading incorrectly. 7. Hydrostatic test date within five years for aluminum cylinders and three years for fiberglass composite cylinders.
AIR LINE HOSES/RESPIRATOR HOSE	1. Hose or fittings corroded, cracked, or leaking. 2. Abrasion of hose. 3. Loose connectors and quick couplers. 4. Swivel nut gaskets damaged or missing.
HARNESS	1. Webbing color change; excessive wear or fraying; cuts, nicks, or broken stitching. 2. Buckles, hooks, and clips damaged or corroded. 3. Loose hardware. 4. Legibility of NIOSH label.
DRINK TUBE	1. Drink tube coupling crushed, bent, broken, or corroded 2. Nicks, cuts, cracks, or deterioration from age or heat to the drink tube, inner mouthpiece, or barbs. 3. Repair if damaged.

### NOTE

• Inspection guidelines for cylinders are prescribed in pamphlets C-6, C-6.1, and C-6.2 of the Compressed Gas Association. These pamphlets may be obtained from the Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Arlington, VA 22202.

• If there are any items not listed above that appear to be defective, have the HIP-PAC repaired before use.

## Panther HIP-PAC

### IX. REPAIR TABLE

COMPONENT	INSTRUCTIONS
HEADSTRAP REPLACEMENT	<ol style="list-style-type: none"> <li>1. Remove the old headstraps.</li> <li>2. Install new headstraps.</li> </ol>
EXHALATION MODULE (CLASSIC FACEPIECE)▲ (TWENTYTWENTY PLUS FACEPIECE)◆	<ol style="list-style-type: none"> <li>▲ 1. Turn the exhalation module counterclockwise to remove it from the facepiece.</li> <li>▲ 2. Carefully pull each leg of the spring retainer until it separates from the exhalation valve housing.</li> <li>▲ 3. Remove the spring retainer.</li> <li>▲ 4. Remove the large coil spring.</li> <li>▲ 5. Remove the diaphragm plate.</li> <li>▲ 6. Remove and inspect the exhalation diaphragm.</li> <li>▲ 7. Clean or replace the exhalation diaphragm and seat.</li> <li>▲ 8. Insert the diaphragm square peg into the exhalation valve seat, ensuring that the exhalation damping spring rests in tension on a flat side of the square peg.</li> <li>▲ 9. Position the diaphragm plate, large coil spring, and retainer on the diaphragm and snap the three legs of the retainer into place on the housing.</li> <li>▲ 10. Reinstall the exhalation module in the facepiece.</li> <li>CAUTION—Do not cross-thread and do not overtighten.</li> <li>◆ 11. Remove the nozzle cover by pressing the ratchet ring with a finger and unscrewing the AIR KLIC.</li> <li>◆ 12. Remove the valve assembly by squeezing the legs of the spring retainer.</li> <li>◆ 13. Clean or replace the valve assembly.</li> <li>◆ 14. Replace the valve assembly by guiding the valve stem into the opening in the nozzle, ensuring that the exhalation damping spring rests in tension on a flat side of the square peg.</li> <li>◆ 15. Insert the spring retainer legs into the openings on the nozzle.</li> <li>◆ 16. Reassemble the nozzle cover and AIR KLIC.</li> <li>17. Fit the facepiece over your face and cycle the exhalation valve by blocking the AIR KLIC opening with your palm and exhaling several times.</li> <li>18. Perform a leak check as described in OPERATION INSTRUCTIONS, or conduct a facepiece leak test on the SPERIAN Portable Test Console.</li> </ol>
NOSE CUP (CLASSIC FACEPIECE)▲ (TWENTYTWENTY PLUS FACEPIECE)◆	<ol style="list-style-type: none"> <li>▲ 1. Unscrew and remove the exhalation module.</li> <li>▲ 2. Remove the speaking diaphragm with the speaking diaphragm tool, P/N 980019.</li> <li>3. Gently remove the nose cup from the facepiece.</li> <li>4. Inspect, clean, or replace the nose cup.</li> <li>▲ 5. Align the holes in the nose cup and the nozzle, and start the threads of both the speaking diaphragm and exhalation module.</li> <li>▲ 6. Fully tighten both the speaking diaphragm and the exhalation module.</li> <li>◆ 7. Replace the nose cup on the nozzle, aligning the slot on the nose cup with the tab on top of the nozzle.</li> </ol>
CONVENTIONAL FACEPIECE LENS REPLACEMENT (CLASSIC FACEPIECE)▲ (TWENTYTWENTY PLUS FACEPIECE)◆	<ol style="list-style-type: none"> <li>1. Use a 5/32 inch Allen wrench to remove the rim nuts and screws.</li> <li>2. Gently separate the rims from the facepiece.</li> <li>3. Pull the silicone skirt away from the lens.</li> <li>▲ 4. Remove the old lens.</li> <li>▲ 5. Match one corner of the new lens with a corner of the skirt.</li> <li>▲ 6. Place the lens edge inside the lens channel of the skirt.</li> <li>▲ 7. Knead the skirt until the silicone fits evenly around the lens edge, and the corners of the skirt match the corners of the lens.</li> <li>◆ 8. Remove the nozzle cover by pressing the ratchet ring with a finger and unscrewing the AIR KLIC.</li> <li>◆ 9. Remove the nozzle by pushing it from the front of the facepiece. Use thumbs to press the locking tabs at the sides of the nozzle. (DO NOT push on the spring retainer.)</li> <li>◆ 10. Place the nozzle into the new lens.</li> <li>◆ 11. Reassemble the nozzle cover and AIR KLIC.</li> <li>◆ 12. Install the nose cup.</li> <li>◆ 13. Place the lens edge inside the lens channel of the skirt, centering the lens so that the facepiece-to-face seal is not distorted.</li> <li>14. Install the skirt rims; start the screw on one side; then start the screw on the other side.</li> <li>CAUTION—Do not pinch the silicone between the rims.</li> <li>15. Alternate tightening each screw until firmly tightened.</li> <li>16. Perform a leak check as described in OPERATION INSTRUCTIONS.</li> </ol>
HOOD REPLACEMENT—DISASSEMBLY	<ol style="list-style-type: none"> <li>1. Unsnap the cradle strap and remove.</li> <li>2. Unscrew the AIR KLIC and remove the yoke/adjusting straps.</li> <li>3. Remove the exhalation valve cover, spring, and spring pad.</li> <li>4. From inside the hood, separate the half-mask from the exhalation valve and remove the half-mask.</li> <li>5. Remove the exhalation valve seat from the hood.</li> </ol>
HOOD REPLACEMENT—ASSEMBLY	<ol style="list-style-type: none"> <li>1. From outside the hood, insert the exhalation valve seat into the appropriate opening. Carefully work it through so as not to tear the hood.</li> <li>2. From inside the hood, insert the exhalation valve seat flange into the half-mask. Orient it correctly if necessary.</li> <li>3. Replace the yoke/adjusting strap and secure it with the AIR KLIC. Hand tighten the yoke/adjusting strap.</li> <li>4. Weave the cradle strap through the slots in the rear of the hood and snap the strap together.</li> <li>5. Inspect and/or replace the exhalation valve.</li> <li>6. Replace the spring pad, spring, and exhalation valve cover.</li> <li>7. Inspect and/or replace the o-ring in the AIR KLIC.</li> </ol>
HARNESS REPLACEMENT (FOR ALL HARNESSES EXCEPT P/N 975230)	<ol style="list-style-type: none"> <li>1. To remove the old harness, remove the D-ring slide and the snap hook. Remove the hose restraint and the regulator receiver.</li> <li>2. Slide the waist belt through the belt clip on the tank bracket.</li> <li>3. To replace a portion of or all of the shoulder strap, unsnap the portion to be replaced from the tank bracket.</li> <li>4. To replace the hip pad, remove the waist belt.</li> <li>5. Installation is the exact reverse of removal.</li> </ol>

#### NOTE

Make appropriate entries on equipment record cards.



## Panther HIP-PAC

### X. FUNCTIONAL TESTING TABLE

**IF ANY DEFECTS ARE FOUND, HAVE THE PANTHER HIP-PAC REPAIRED BEFORE USE.**

COMPONENT	INSTRUCTIONS
CONVENTIONAL FACEPIECE	<ol style="list-style-type: none"> <li>1. Don and adjust the facepiece.</li> <li>2. Block the AIR KLIC opening with the palm of your hand.</li> <li>3. Inhale gently. The facepiece must "collapse" slightly and hold for a few seconds without leaking.</li> <li>4. Exhale with the AIR KLIC opening covered. The exhalation valve must not stick.</li> </ol>
SYSTEM FUNCTION TEST	<ol style="list-style-type: none"> <li>1. Disconnect the HIP-PAC from the air supply line.</li> <li>WARNING—after performing the following test, steps 2-11, refill or top off the air cylinder.</li> <li>2. Turn the cylinder valve on.</li> <li>3. Listen for leaks at the end of the quick-disconnect nipple.</li> <li>4. Listen to the second stage regulator; it should not flow.</li> <li>5. Listen for leaks at all hose connections.</li> <li>6. Don the facepiece.</li> <li>7. Connect the facepiece to the second stage regulator and inhale. The regulator must deliver air on inhalation without excessive effort, and must not free flow or flutter.</li> <li>8. Turn the bypass on to verify that it functions, then turn the bypass off.</li> <li>9. Hold your breath for 5 seconds. The second stage regulator must make no noise.</li> <li>10. While continuing to breathe, attach the HIP-PAC respirator hose to an air line with a minimum of 80 psig pressure.</li> <li>11. Turn off the HIP-PAC cylinder valve. Breathing must continue to be easy. The regulator must deliver air on inhalation without excessive effort, and must not free flow or flutter.</li> <li>12. Doff the HIP-PAC and refill the cylinder.</li> </ol>

### NOTE

Results of tests should be kept in a written record.

### XI. CAUTIONS AND LIMITATIONS

#### NOTE

This section must be read in conjunction with the NIOSH approval label in this user's manual. Failure to observe these cautions and limitations voids NIOSH approval.

D. Air line respirators can be used only when the respirators are supplied with respirable air meeting the requirements of CGA G-7.1, Grade D or higher quality.

E. Use only the pressure ranges and hose lengths specified in the user's instructions.

I. This respirator contains electrical parts which have not been evaluated as an ignition source in flammable or explosive atmospheres by NIOSH.

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

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

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

O. Refer to user's instructions and/or maintenance manuals for information on use and maintenance of these respirators.

S. Special or critical operation instructions and/or specific operation limitations apply. Refer to user's instructions before donning.

#### Special or Critical User's Instructions

1. This respirator is approved for use above -30°F except when used with the hood-style facepiece (P/Ns 968005, 968006, and 968007). When use with the hood-style facepiece, this respirator is approved for use above 10°F. When used with a conventional facepiece in temperatures of 0°F or lower, use anti-fog solution P/N 951015, 951016, or 981805. The use of anti-fog solution is not necessary for the 2720 Series of the Twenty-Twenty Plus facepiece.

2. This respirator is approved for respiratory protection during entry into and escape from oxygen-deficient atmospheres, gases, and vapors when using the air line supply. It is approved for escape only when using the self-contained air supply.

3. This device is approved only when the compressed air cylinder is fully charged with air meeting the requirements of the Compressed Gas Association Specification G-7.1 for Type 1, Grade D air having a moisture content, expressed as dewpoint, of -65°F or lower. The cylinder shall be marked "Fill With Compressed Air Only" and shall meet applicable DOT specifications.

4. When using this respirator at temperatures between 0 and -30°F, the first stage regulator must be wrench tightened on the cylinder valve.

5. This approval applies only when the respirator is supplied with respirable breathing air through no more than three (3) lengths of hose with a combined hose length of 10 to 300 feet at a pressure of 80 to 125 psig, for

the 9308 Series hose, no more than six (6) lengths of hose with a combined hose length of 10 to 300 feet at a pressure of 80-125 psig for the 9649 Series hose, or from the self-contained air supply. If the supplied air fails, open the cylinder valve and proceed to fresh air immediately.

6. DEATH OR SERIOUS INJURY may result if instructions are not carefully followed.

7. READ AND UNDERSTAND all instructions, limitations, and other warnings found on the respirator and in the instruction manuals.

8. USE WITH ADEQUATE SKIN PROTECTION. This apparatus does not protect against gases and vapors that poison through the skin (for example, hydrocyanic acid gas.)

9. This respirator is to be used at temperatures between -30 and +160°F.

10. After each use and/or cleaning and disinfecting of the hood-style facepiece, anti-fog solution (SPERIAN P/N 951015, 951016, or 981805) must be applied to the inside of the lens.

11. Never substitute, modify, andd, or omit parts. Use only exact replacement parts on the configuration specified by SPERIAN.

12. The respirators: 5 minute/2216 psig/SA/SC/PD, 10 minute/3000 psig/SA/SC/PD, and 15 minute/3000 psig/SASCPD, are approved for use with the Splitter Assembly (Suit Bypass), P/N 930856, only with the nitrile rubber hose and Snap-tite quick coupler. The splitter is approved to be used in conjunction with the SPERIAN Suit Pass-through Kit, P/N 980200. This approval applies only when the respirator is supplied with respirable breathing air through no more than three (3) lengths of 3/8" diameter 9649 Series nitrile rubber hose with a combined length of 50 to 150 feet at a pressure of 75 to 125 psig. If the supplied air fails, open the cylinder valve and proceed to fresh air immediately.



Revision M  
8/26/13  
P/N: 968126

**1. PROTECTION**  
SC-Self-contained  
SA-Supplied-air  
PD-Pressure-Demand  
ESC-Escape

**CAUTIONS AND LIMITATIONS**  
D - Air-line respirators can be used only when the respirators are supplied with respirable Air meeting the requirements of CGA G-7.1 Grade D or higher quality.

- |   |  |
|---|--|
| D | Air-line respirators can be used only when the respirators are supplied with respirable Air meeting the requirements of CGA G-7.1 Grade D or higher quality. |
| E | Use only the pressure ranges and hose lengths specified in the user's instructions.  |
| F | Contains electrical parts which have not been evaluated as an ignition source in flammable or explosive atmospheres by MSHA/NIOSH.                           |
| G | Failure to properly use and maintain this product could result in injury or death.   |
| H | All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.                    |
| I | Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration specified by the manufacturer.                           |
| J | Refer to user's instructions, and/or maintenance manuals for information on use and maintenance of these respirators.  |
| K | Special or critical user's instructions and/or specific use limitations apply. Refer to user's instructions before donning.                                  |
| L |  |
| M |  |
| N |  |
| O |  |



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Revision M  
8/26/13  
P/N- 968126

**2. CAUTIONS AND LIMITATIONS**  
 D - Air-line respirators can be used only when the respirators are supplied with respirable Air meeting the requirements of CGA G-7.1 Grade D or higher quality.

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D. Air-line respirators can be

D	Air-line respirators can be used only when the respirators are supplied with respirable Air meeting the requirements of CGA G-7.1 Grade 2.
E	Use only the pressure ranges and hose lengths specified in the user's instructions.
F	Contains electrical parts which have not been evaluated as an ignition source in flammable or explosive atmospheres by MSHANIOSH.
G	Failure to properly use and maintain this product could result in injury or death.
H	All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.
I	Never substitute, modify, add, or omit parts. Use only replacement parts in the configuration specified by the manufacturer.
J	Refer to user's instructions, and/or maintenance manuals for information on use and maintenance of these respirators.
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L	
M	
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O	

SPERIAN  
3001 S. SUSAN STREET, SANTA ANA, CA 92704 USA  
1-800-873-5242

PANTHER HIP-PAC  
OPEN-CIRCUIT, PRESSURE-DEMAND, ESCAPE, SELF-CONTAINED BREATHING APPARATUS OR COMBINATION, OPEN-CIRCUIT, PRESSURE-DEMAND, ESCAPE, SELF-CONTAINED BREATHING APPARATUS AND TYPE C SUPPLIED AIR RESPIRATOR



THESE RESPIRATORS ARE APPROVED ONLY IN THE FOLLOWING CONFIGURATIONS:

RESPIRATOR COMPONENTS

TO	PROTECTION <sup>1</sup>	ALTERNATE FACEPIECE										1ST STAGE	ALTERNATE 2ND STAGE REGULATOR	ALTERNATE CYLINDER AND VALVE	ALTERNATE HARNESS										REG. RECEIVER	ALTERNATE AIRLINE HOSE LENGTH	CAUTIONS/ LIMITATIONS <sup>2</sup>
		FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET	FACEPIECE-2020 PLUS-CBRN-LRG-BLACK-MED-BLK-IRG-CLEAR NC, HEADNET
13F-482	SA/SC/PO/ESC 10 mm 2210 psi	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	DELIMINOS
13F-300	SA/SC/PO/ESC 10 mm 2210 psi	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	DELIMINOS
13F-300	SA/SC/PO/ESC 10 mm 2210 psi	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	DELIMINOS
13F-307	SA/SC/PO/ESC 15 mm 3000 psi	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	DELIMINOS
13F-482	SA/SC/PO/ESC 10 mm 4500 psi	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	DELIMINOS

Revision M  
Rev 3  
PN: 866126

## 2. CAUTIONS AND LIMITATIONS

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- 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 specified by the manufacturer.
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- S - Special or critical user's instructions and/or specific use limitations apply. Refer to user's instructions before donning.

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PANTHER HIP-PAC  
OPEN-CIRCUIT, PRESSURE-DEMAND, ESCAPE, SELF-CONTAINED  
BREATHING APPARATUS or COMBINATION, OPEN-CIRCUIT,  
PRESSURE-DEMAND, ESCAPE, SELF-CONTAINED BREATHING  
APPARATUS AND TYPE C SUPPLIED AIR RESPIRATOR

THESE RESPIRATORS ARE APPROVED ONLY IN THE FOLLOWING CONFIGURATIONS:

RESPIRATOR COMPONENTS

	TC-	PROTECTION <sup>1</sup>	APPROVED ACCESSORIES	CAUTIONS/ LIMITATIONS <sup>2</sup>
13F-300	X	SUIT SPLITTER		
13F-301	X	NECKSTRAP		
13F-367	X	NECKSTRAP 2020, BLUE		
13F-482	X	NECKSTRAP 2020, DARK GRAY		
	X	HEADNET KIT, 2020, W/HOOD ATTACHMENT		
	X	HOOD KIT		
	X	HEADNET KIT, 2020, INTEGRATED HOOD		
	X	D-RING KIT		
	X	HEADNET W/SILICONE STRAP KIT		
	X	RADIO COMMUNICATION SYSTEM, CBRN		
	X	VOICE AMPLIFICATION KIT, CBRN		
	X	RADIO COMMUNICATION / VOICE AMPLIFICATION KIT, CBRN		
	X	SPECTACLE KIT, CLASSIC FACEPIECE		
	X	SPECTACLE KIT, 2020 & 2020 PLUS FACEPIECE		
	X	RADIO COMMUNICATION SYSTEM		
	X	VOICE AMPLIFICATION KIT		
	X	RADIO COMMUNICATION / VOICE AMPLIFICATION KIT		
	X	ST LOUIS NECKSTRAP		
DEJMNOS				
DEJMNOS				
DEJMNOS				
DEJMNOS				

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