



TECHNICAL SPECIFICATION

Deltair SCBA by Avon Protection

1.0 INTRODUCTION

- 1.1 The Deltair self-contained breathing apparatus (SCBA) by Avon Protection is designed for fire service use to meet the requirements outlined in NFPA and NIOSH standards.

Deltair is designed to meet and exceed the NFPA 1981, 1982, 2013 Edition Standard and is approved for use in a CBRN environment.

TC-13F-0737CBRN, SC/PD/CBRN, 30 MIN, 2216 PSIG, EOSTI-33
TC-13F-0738CBRN, SC/PD/CBRN, 30 MIN, 4500 PSIG, EOSTI-33
TC-13F-0739CBRN, SC/PD/CBRN, 45 MIN, 4500 PSIG, EOSTI-33
TC-13F-0740CBRN, SC/PD/CBRN, 60 MIN, 4500 PSIG, EOSTI-33

2.0 GENERAL REQUIREMENTS

- 2.1 The apparatus covered by this specification shall be of the open circuit compressed air pressure demand (positive pressure) type.
- 2.2 It shall be certified by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA) for use as either a 30 minute, 45 minute, or 60 minute rated duration breathing apparatus. Additionally the apparatus must be in compliance with all of the performance requirements of the National Fire Protection Association's 2013 Edition of their NFPA 1981 and 1982 standard.
- 2.3 It shall pass portions of MIL STD 810M.
- 2.4 It shall pass Intrinsic Safety testing UL913 6th edition.
- 2.5 The backframe shall withstand 1000lb lift capacity.

3.0 GENERAL COMPONENTS

- 3.1 The apparatus shall consist of the following major components:
 - 3.1.1 Two-piece composite backframe assembly with universal cylinder band to accommodate a variety of cylinders from 2216 psi to 4500 psi; 30, 45, 60-minute duration.
 - 3.1.2 A double curve facemask, available in 3 different sizes with permanent Anti-fog and hard coated visor. Facemask has inner mask that will accommodate "end of service alarm" light display, waterproof microphone for VAS communications, and a spectacle kit mounted on the nosecup. Head harness available in a Kevlar net head harness.
 - 3.1.3 Integrated AirSwitch™ Regulator allows you to switch from ambient air to cylinder air instantly.

- 3.1.4 Quick release waistbelt and shoulder harness assembly for easy cleaning.
- 3.1.5 Enclosed "end of service alarms" (bell and in-mask HUD display).
- 3.1.6 Integrated 2nd stage regulator built into facemask along with the head-up (HUD) display which is completely submersible for easy cleaning and disinfecting.
- 3.1.7 Fully sealed first stage pressure reducer.
- 3.1.8 Control Console with integrated VAS speaker, PASS reset and radio communications control.
- 3.1.9 Universal cylinder spoon accommodates all SCBA cylinders.
- 3.1.10 Electronics package to include a Personal Alert Safety System (PASS), Control Console with integrated Voice Amplification (VAS) and radio/PASS controls and analog gauge.
- 3.1.11 C-6 Battery Pack with quick release system.

4.0 PNEUMATIC ASSEMBLY

- 4.1 The 1st stage sealed pressure reducer shall be protected inside the 2-piece backframe assembly.
- 4.2 The 1st stage pressure reducer shall be connected to the cylinder valve by a 3/16" bore, covered stainless steel and fire retardant rubber wrap over P.T.F.E. high pressure hose.
- 4.3 The 1st stage pressure reducer shall have a double spring and a piston that requires no adjustment.
- 4.4 The 1st stage pressure reducer shall incorporate a self-seating pressure relief valve to prevent high-pressure air from entering the low-pressure side of the assembly and shall require no adjustment.
- 4.5 All hoses shall attach to the 1st stage pressure reducer by means of u-clip technology with o-ring seals. High pressure and low-pressure hoses shall be of different sizes so they can only be fitted in their respective positions; all hoses shall then be retained in reducer body by a cover screwed to the reducer body.
- 4.6 The 1st stage pressure reducer shall be capable of working at full input cylinder pressure of either 2216 psi or 4500 psi with no modification or adjustment.
- 4.7 The 1st stage pressure reducer shall be capable of accepting breathing air from an outside source through an optional airline pigtail assembly that will be connected directly to the reducer.
- 4.8 The airline pigtail shall be attached to the harness waist belt of the wearer for easy connection and disconnection.
- 4.9 The pneumatic assembly shall be capable of offering an optional dual tether, buddy-breathing system that will allow 2 or more people to use the same cylinder air in an emergency without unplugging pneumatics in an IDLH Atmosphere.
- 4.10 All solid state components are waterproof and intrinsically safe.
- 4.11 The Rescue Intervention Crew (RIC) fitting shall include a self-checking valve to prevent over pressurizing of a cylinder without venting air to atmosphere.
- 4.12 The handwheel connection to the cylinder valve assembly shall be of a large design so that it is easily accessible to the user using gloved or non-gloved hands.

5.0 AIRSWITCH SECOND STAGE DEMAND VALVE

- 5.1 The second stage regulator shall be integrated into the facemask and will be able to be submersed in disinfectant and water without disassembly.
- 5.2 The second stage regulator will incorporate a fresh air mode that allows switching from ambient air to cylinder air instantly.
- 5.3 The second stage regulator will incorporate the inhalation and exhalation into one component.
- 5.4 The second stage regulator shall not protrude from the facemask more than 1 ½ inches.
- 5.5 The second stage regulator shall be manufactured from rugged non-metallic material that will not corrode or deteriorate from chemical attack. It must be capable of delivering peak flows in excess of 500 lpm to a minimum of 30 breaths past the sounding of the audible alarm. The demand valve shall have been tested and remained functional after being subjected to direct flame for not less than 10 seconds at a peak temperature range of 1500 - 2000 degrees Fahrenheit. The average mean of all peak temperatures shall be no higher than 1742 degrees Fahrenheit. When the flame is extinguished, no part of the assembly shall show an after-flame duration of greater than 2.2 seconds

- 5.6 The second stage regulator shall incorporate a true emergency bypass, which when manually activated will flow between 85/120 liters per minute. The bypass on/off handwheel shall be at least 1½" in diameter, center mounted on the second stage demand valve, and allow for activation by a gloved hand. It shall take no more than a half turn of the bypass on/off handwheel to activate the bypass fully.
- 5.7 The second stage demand valve shall incorporate a secondary sintered filter.

6.0 FACEMASK

- 6.1 The facemask shall be a full facemask type that covers the wearer's nose, mouth and eyes.
- 6.2 The facemask mask shall have a single intensifier edge seal.
- 6.3 The facemask visor shall be one piece and constructed of an impact resistant polycarbonate material in a double curve design; it shall be optically correct and have permanent anti-fog and hard coating on the visor. The visor shall be tested to and pass the NFPA Radiant Heat Test.
- 6.4 The facemask shall have a removable inner mask constructed of the same material as the outer shell of the mask and the inner mask shall be fitted with inlet valves and allow for a nosecup mounted spectacle kit.
- 6.5 The facemask shall be available in 3 sizes.
- 6.6 The facemask shall contain a speech diaphragm and shall be mounted directly in line with the wearer's mouth.
- 6.7 The facemask will have a 2 -point "Pull Forward" Kevlar net head harness.
- 6.8 The facemask shall be made of a butyl blend.
- 6.9 The inner nosecup shall accommodate the "end of service alarm" light display that shows cylinder pressure in quarter increments, until it reaches 33% of full, by displaying LED lights.
- 6.10 VAS and radio interface system shall have an internal waterproof microphone inside the inner nosecup to provide clear communications.
- 6.11 The in-mask display shall have 7 LED lights. Four lights indicate quarter rating of cylinder pressure, until the 33% of full level. The fifth light indicates low battery status. PASS pre-alarm is indicated by alternately flashing red and green LED light. A 6th light indicates radio transmission (green when on and red when transmitting) and blinks green when in VOX mode and not transmitting. The 7th light shall blink green indicating in range for the telemetry option. It shall blink red for low battery and blink a rapid red for evacuate (along with the audible alarm. Constant red indicates "out of range".
- 6.12 The facemask shall have no loss of operational function after being subjected to direct flame for not less than 10 seconds at a peak temperature range of 1500 - 2000 degrees Fahrenheit. The average mean of all peak temperatures shall be no higher than 1742 degrees Fahrenheit. When the flame is extinguished, no part of the assembly shall show an after-flame duration of greater than 2.2 seconds.
- 6.13 The facemask shall include a robust hanger for hanging the mask when not in use.

7.0 BACKFRAME AND HARNESS

- 7.1 The backframe shall be made of fire retardant Thermoset Composite, 2-piece construction to protect the pneumatic system.
- 7.2 The backframe cover will be made of a stamped aircraft aluminum material, and the harness assembly and sidearms will be attached to the cover.
- 7.3 The backframe shall have swinging sidearm to distribute weight for wearer comfort.
- 7.4 The right and left shoulder straps shall be constructed of 2 inch woven Kevlar and be padded in areas of contact with PBI/Kevlar. They will be contoured to the user's body.
- 7.5 Shoulder strap adjustable slides shall be constructed of stainless steel. Two-inch pull straps shall be fitted to harness to allow easy adjustment even with gloved hands.
- 7.6 The harness shall have sleeves with reflective graphics for the routing of the pneumatic hoses and electronic cables.
- 7.7 The harness waist belt shall be of 2" woven Kevlar and be fitted with a "Double Pull Forward" design and incorporate a buckle latch.
- 7.8 The harness assembly shall experience no loss of operational function after being subjected to direct flame for not less than 10 seconds at a peak temperature range of 1500 - 2000 degrees Fahrenheit. The average mean of all peak temperatures shall be no higher than 1742 degrees Fahrenheit. When the flame is extinguished, no part of the assembly shall show an after-flame duration of greater than 2.2 seconds

- 7.9 The universal cylinder band assembly shall be adjustable in the field to accommodate all sizes of cylinders without the use of tools.
- 7.10 A universal cylinder band shall be designed so that during cylinder change it can remain in either the closed loop or fully open positions.
- 7.11 Cylinder changes shall be made without removing cylinder band.
- 7.12 All SCBA manufacturers cylinders shall mount easily onto the backframe.
- 7.13 A standard lumbar support shall be made of PBI/KEVLAR
- 7.14 Flashing locator lights to aid in rescue shall be emitting from the backframe and flash rapidly when the PASS is in full alarm.
- 7.15 Shoulder harnesses shall include large loop style buckles for use with gloved or non-gloved hands.

8.0 ALARM AND PRESSURE INDICATOR ASSEMBLY

- 8.1 The primary "end-of-service" alarm shall be an independent bell. The secondary "end-of-service" alarm shall be a heads-up display with a flashing red light for low air alert.
- 8.2 The bell alarm shall be located at the top of the backframe, close to the user's ear. The bell shall alarm at 33% of the remaining cylinder life.
- 8.3 The in-mask display shall have four lights that indicate cylinder pressure, two green, one yellow and one red light. When the cylinder is full, all four lights will be on. An additional yellow fifth light is off-set from the display indicate a low battery.
- 8.4 In-mask pressure display will display one light per quarter increments of cylinder pressure until it reaches the 33% level. As the pressure decreases, the display lights will go out until the red light is "on" and flashing rapidly as the 33% of full indication.
- 8.5 One battery source that powers the HUD, PASS, Control Console, VAS and Radio Interface option. They shall be communicating via a wired network.
- 8.6 A low battery indicator shall illuminate when battery has at least a minimum of three hours remaining.
- 8.7 A redundant analog gauge shall be incorporated into the console assembly as a backup air pressure indicator.

9.0 CONTROL CONSOLE

- 9.1 PASS operation shall be displayed within the control console. Light shall change from white to a red LED light when PASS is in alarm.
- 9.2 All communications shall be within the control console and can be operated hands free. This includes VAS and Radio Interface.
- 9.3 The VAS threshold settings shall have multiple settings and house the information in the HUD.
- 9.4 The solid state components can be switched between 2216 and 4500 without any component changes.
- 9.5 The Control Console shall have a sensor to identify motion.
- 9.6 The PASS alarm shall be a wired system from the control console.

10.0 PASS

- 10.1 The PASS shall activate after 30 seconds of no motion.
- 10.2 The PASS shall have a motion sensors to detect motion.
- 10.3 The PASS shall be enclosed inside the two-piece backframe.
- 10.4 The PASS shall only use one piezo alarm to meet the new NFPA standard, reducing battery consumption.
- 10.5 The PASS shall have Data Logging capability to log 2000 events.

11.0 BATTERY

- 11.1 The SCBA shall only have one battery source to power all standard electronic features to include HUD, PASS, Console radio functions, and VAS.
- 11.2 The SCBA shall be powered by only 6 "C" cell batteries.

12.0 RIC UNIVERSAL FITTING

- 12.1 The RIC shall have a check valve that stops airflow when the cylinder is full.
- 12.2 The RIC shall not vent air to atmosphere.
- 12.3 The RIC connections shall allow a 2216 or 4500 psi cylinder to be used to transfer cylinder air.

13.0 CYLINDER A CYLINDER VALVE

- 13.1 All cylinders supplied with the Deltair are to be approved by the United States Department of Transportation (DOT).

- 13.2 Cylinder valve assemblies shall contain a safety relief device. The cylinder valve shall contain a protected gauge visible from both sides. Cylinder valve handwheel shall be of the non-ratchet or locking type.
- 13.3 All high-pressure cylinder valve handwheels will be red to identify a high pressure cylinder. Low pressure cylinder valve handwheels will be black.
- 13.4 Cylinders are available in 2215 psi 30 minute carbon and 4500 psi 30, 45 and 60 minute carbon designs.

14.0 OPTIONS

- 14.1 Duo Tether Buddy Breather (Internal) will provide a two-foot tether from each SCBA when plugged into another Deltair SCBA and stowed inside the backframe. A second Duo Tether Buddy Breather version (External) is an externally stored Kevlar pouch design mounted on the left side of the waistbelt with a three foot tether from each SCBA.
- 14.2 Optional EchoTracer Ultrasonic Tracking System module shall, when ordered, easily mount on the backframe housing around the cylinder spoon with no required tools. The backframe beacon shall begin transmission when the PASS is in full alarm and cease transmission when PASS is reset.
- 14.3 Optional Airline attachment shall connect to the 1st stage reducer using u-clip technology. Available airline fittings shall be Hansen HK and Rectus. NIOSH 42 CFR only approval for airline hose sections in 6, 25, 50, 100 and 300 foot sections.
- 14.4 Optional rescue belt shall replace existing waistbelt assembly when attached to the Deltair SCBA and be detachable with no tool to be used as a stand-alone rescue belt. The SCBA shall be able to detach from the rescue belt quickly without removing the rescue belt with the use of two sidemounted release straps.
- 14.5 Radio interface shall be integrated into the Deltair SCBA. An additional radio interface cable is required to connect to user's radio. All radio operations are Control Console operated and can be put into voice activated or push-to-talk modes.