

Purchaser Specification Requirements for SCBA Gear

General Self-Contained Breathing Apparatus Requirements

The purpose of this bid specification is to establish the minimum requirements for an open-circuit self-contained breathing apparatus (SCBA). The SCBA shall consist of the following major sub-assemblies: (1) a removable facepiece-mounted, positive pressure breathing regulator with air-saver switch; (2) an automatic dual path redundant pressure reducing regulator; (3) end-of-service time indicators; (4) a harness and backframe assembly for supporting the equipment on the body of the wearer; (5) a shoulder strap mounted, remote gauge indicating cylinder pressure; and (6) cylinder and valve assembly for storing breathing air under pressure.

The successful bidder agrees to provide, at their own expense, a factory trained instructor for such time as the respirator user shall require complete instruction in the operation and maintenance of the respirator. Any exceptions to these specifications must be detailed in a separate attachment. Failure to do so will automatically disqualify the bidder.

The successful bidder must be a sales distributor, authorized by the manufacturer, to sell the equipment specified herein, and be a designated 5 Star Service Center.

The SCBA shall maintain all NIOSH standards with any of the following types of cylinders listed as provided by the SCBA manufacturer.

Approvals

The SCBA shall be approved to NIOSH 42 CFR, Part 84 for chemical, biological, radiological and nuclear protection (CBRN). The SCBA shall be compliant to the NFPA 1981, 2013 Edition, Standard on Open-Circuit Self-Contained Breathing Apparatus for Emergency Services. The SCBA shall be compliant to the NFPA 1982, 2013 Edition, Standard on Personal Alert Safety Systems. All electronic components shall be approved for Intrinsic Safety under UL 913 Class I, Groups C and D, Class II, Groups E, F and G, Hazardous locations.

Quantities

(16)Self Contained Breathing Apparatus (see below for specification)

(32) 4500 PSI, 45 minute bottles- Bottles shall be no older than 6 months at time of delivery. Delivery time is 30 to 45 days.

Mask-Mounted Regulator

The facepiece-mounted positive pressure-breathing regulator shall supply and maintain air to the facepiece to satisfy the needs of the user at a pressure greater than atmospheric by no more than 1.5 inches of water pressure static. The breathing regulator shall maintain positive pressure during flows of up to 500 standard liters per minute. The regulator shall also meet or exceed a dynamic flow requirement of remaining positive while supplying a minute volume of 160 liters.

The breathing regulator shall have attached a low pressure hose which shall be threaded through the left shoulder strap to couple to the pressure reducing regulator mounted on the backframe. . The low-pressure hose shall be equipped with a swivel attachment at the facepiece mounted regulator.

The regulator shall connect to the facepiece by way of a quarter (1/4) turn coupling. The user shall hear an audible sound when the regulator is attached correctly to the facepiece. The regulator shall be equipped with a doughnut-shaped gasket which provides a seal against the mating surface of the facepiece. The regulator cover shall be fabricated of a flame resistant, high impact plastic. The breathing regulator shall have a demand valve to deliver air to the user, activated by a diaphragm responsive to respiration. The demand valve shall use an extended temperature range dynamic O-ring seal composed of a fluorosilicone elastomer.

The diaphragm shall include the system exhalation valve and shall be constructed from a high strength butyl elastomer. A purge valve shall be situated at the inlet of the breathing regulator and shall be capable of delivering airflow of between 125 and 175 standard liters per minute. The breathing regulator shall be arranged to direct the incoming air over the inner surface of the facepiece for defogging purposes. The components of the breathing regulator shall be constructed of materials that are not vulnerable to corrosion. The flame resistant cover shall contain an air saver switch and pressure demand bias mechanism. It shall reactivate and supply air only in the positive pressure mode when the wearer affects a face seal and inhales. This device shall not affect the breathing flow through the system while in operation.

Pressure Reducer with CGA Cylinder Connection

The pressure-reducing regulator shall be mounted at the waist on the backframe and be coupled to the cylinder valve through a short length of internally armored high pressure hose with a hand coupling for engagement and sealing within the cylinder valve outlet. In lieu of a manual by-pass, the pressure-reducing regulator shall include a back-up pressure-reducing valve connected in parallel with the primary pressure reducing valve and an automatic transfer valve for redundant control. The back-up pressure reducing valve shall also be the means of activating the low-pressure alarm devices in the facepiece-mounted breathing regulator. This warning shall denote a switch from the primary reducing valve to the back-up reducing valve whether from a malfunction of the primary reducing valve or from low cylinder supply pressure.

A press-to-test valve shall be included to allow bench testing of the back-up reducing valve. The pressure-reducing regulator shall have extended temperature range dynamic O-ring seals composed of fluorosilicone elastomer. The pressure reducing regulator shall have incorporated a reseatable over-pressurization relief valve which shall prevent the attached low pressure hose and facepiece-mounted breathing regulator from being subjected to high pressure.

End-of-Service Time Indicator (EOSTI)

The SCBA shall have two end-of-service time indicators (EOSTI), a tactile alarm and a Heads-Up Display (HUD). The primary EOSTI shall be the integral low-pressure alarm device that shall combine an audible alarm with simultaneous vibration of the facepiece. The primary EOSTI shall be located in the Facepiece-Mounted Positive Pressure Regulator. This alarm device shall indicate either low cylinder pressure (33% +5%, -0%) or primary first stage regulator failure.

The HUD shall serve as the secondary EOSTI indicator. The HUD shall be powered by the SCBA's single power supply. It shall be mounted in the user's field of vision on the Facepiece-Mounted Positive Pressure Regulator. It shall display cylinder pressure in increments of 100%, 75%, 50% and 33%. The display shall not have a numerical representation of bottle pressure. At full bottle pressure, two green Light Emitting Diodes (LED) shall be illuminated. At three-quarter bottle pressure, one green LED shall be illuminated. At one-half bottle pressure, one "yellow" LED shall be illuminated and flash at a rate not to exceed one (1x) time per second. At one-third bottle pressure, one "red" LED shall be illuminated and flash at a rate not to exceed ten (10x) times per second. The HUD shall have a low battery indication that is distinct and distinguishable from the bottle pressure indications.

Harness and Backframe Assembly

A lightweight, lumbar support style backframe and harness assembly shall be used to carry the cylinder and valve assembly and the pressure reducing regulator assembly. The backframe shall be a solid, one-piece black powder-coated aluminum frame with a shroud made of glass filled nylon that is heat and impact resistant, that is contoured to follow the shape of the user's back. The backframe shall include a mounting for the pressure reducer. The backframe shall include an over-the-center, adjustable tri-slide fixture, a para-aramid strap and a double-locking latch assembly to secure 30, 45, 60, or 75 minute cylinders.

The harness assembly shall consist of a one size black para-aramid strap with a yellow stripe. This harness shall include box-stitched construction with no screws or bolts. The harness assembly shall incorporate parachute-type, quick-release buckles and shall include shoulder and hip pads. The harness shall include a seat-belt type waist attachment. The shoulder strap shall be fitted with a Drag Rescue Loop (DRL) capable of being deployed in an emergency situation to drag a downed firefighter to safety. The shoulder strap shall be attached to the backplate by way of a single, articulating metal bracket.

The backframe shall include accommodation and mounting spaces suitable for installation of a distress alarm integrated with the SCBA. These mounting spaces shall permit installation of an alarm sensor module in an area between the cylinder hanger locking mechanism and the backframe.

Cylinder

The cylinder threads shall be straight with an O-ring or quad-ring gasket type seal. The cylinder valve shall be a “fail open” type, constructed of forged aluminum and designed such that no stem packing or packing gland nuts are required. It shall contain an upper and lower seat such that the pressure will seal the stem on the upper seat, thus preventing leakage past the stem. No adjustment shall be necessary during the life of the valve. If the SCBA is equipped with a CGA cylinder connection, the cylinder valve outlet shall be a modification of the Compressed Gas Association (CGA) standard threaded connection number CGA 347 for 4500 systems.

Each cylinder valve shall consist of the following: 1) a hand activated valve mechanism with a spring-loaded, positive action, ratchet type safety lock and lock-out release for selecting “lock open service” or “non-lock open service”; 2) an upstream connected frangible disc safety relief device; 3) a dual reading pressure gauge indicating cylinder pressure at all times; 4) an elastomeric bumper; 5) an angled outlet. Each cylinder and valve assembly shall be equipped with a hanger bracket for positive locking attachment of the assembly to the backframe. The SCBA shall maintain all NIOSH and NFPA standards with any of the following types of cylinders listed as provided by the SCBA manufacturer.

Carbon-Wrapped

The cylinder shall be manufactured in accordance with DOT specifications and meet the Transport Canada requirements with working pressures of 4500 psi. The cylinder shall be lightweight, composite type cylinder consisting of an aluminum alloy inner shell, with a total overwrap of carbon fiber, fiberglass and an epoxy resin. The cylinder shall be available in 45-minute duration based on the NIOSH breathing rate of 40 liters per minute (lpm).

Personal Alert Safety System

The PASS device shall be compliant to the NFPA 1982, 2013 Edition Standard on Personal Alert Safety Systems. Operation of this distress alarm shall be initiated with the opening of the valve of an SCBA charged cylinder. The system shall feature a “hands-free” re-set capability that may be activated by means of a slight movement of the SCBA when the system is in a pre-alert mode. When the PASS device goes into pre-alarm, the user shall be notified through a distinct light pattern in the HUD display.

The system shall operate from a single power source containing six “AA” batteries. The battery life of the SCBA with PASS only shall be no less than 200 hours. The system shall have a battery check function that provides an LED indication of battery status while the SCBA is not pressurized. The PASS System shall be upgradeable to include a 2.4 GHz integrated locator system. The PASS System shall be upgradeable to include a 2.4 GHz integrated SCBA air / PASS (telemetry) management system. The PASS device shall contain two components: a Console and a Sensor Module.

Console

The console shall be located on the user's right shoulder strap. The console shall contain an integral edge lit mechanical pressure gauge that is automatically energized by opening the cylinder valve. The console shall display to the user the following: Pre-Alarm: alternating red flashing LED's; Full Alarm: dual flashing red LED's and a flashing PASS icon; Low Battery: red flashing LED's; Normal System Operation: flashing green LED. The console shall contain a photo sensing diode to dim and brighten the HUD as the environment changes. The console shall contain push buttons for user interface. The push buttons shall be designed to minimize accidental activation. A yellow color-coded push button shall permit system reset. A red color-coded push button shall permit manual activation of the full alarm mode.

Sensor Module

The system shall include a sensor module mounted to the SCBA backframe and located in an area between the cylinder and backframe in a manner designed to protect the assembly from damage. The sensor module shall contain a motion sensor that is sensitive to user hip movement to reduce false activations. The sensor module shall contain redundant, dual sound emitters for the audible alarm and dual visual "buddy" indicators. The sensor module sound emitters shall be oriented in multi-directions for optimal sound projection. The visual indicators on the backframe mounted sensor module shall flash green during normal operation. The visual indicators shall flash red 1) when the device is in pre-alert; 2) when the device is in full-alert; and 3) when the SCBA has reached one-third bottle pressure.

Emergency Breathing Support System "Buddy Breathing"

The Optional Dual Emergency Breathing Support System (EBSS) shall be approved to NIOSH 42CFR, Part 84 and NFPA 1981, 2013 Edition. The Dual EBSS shall have one of each of the following requirements; (1) a manifold with one of each of a female socket and male plug, both of which have check valves, (2) 40" minimum low-pressure hose, (3) a pouch for storing the hose, and (4) a dust cap for the female socket and male plug. The Dual EBSS system shall be on the wearer's left side and shall be capable of allowing for six feet of hose between like systems. The manifold shall be made of aluminum and be anodized black. The female socket and male plug shall have spacing, no less than 15° off-center. The female socket shall have a double action to disengage, noted as a "push-in/pull back". The female socket shall have an internal check valve. The male plug shall have an external check valve. The hose shall be made of high temperature rubber capable of sustaining a maximum 250 psig of pressure. The containment system shall include a pouch and shall be made of para-aramid materials and shall be **capable of storing 36" of hose. The pouch shall be attached to the SCBA by pull –the-dot fasteners.**

Mobile Servicing

Company shall provide a mobile servicing program for repairs and inspections of the SCBA. The servicing unit shall be staffed with a certified technician capable of field repairs to the entire SCBA unit.

Warranty

The unit shall be covered by a warranty providing protection against defects in materials or workmanship. This warranty shall be for a period of 10 years on the SCBA, except for the pressure reducer, which shall be covered for 15 years. Electronic components shall be warranted for five years.

Service Program Option 3 Year

Provide an option for a three-year Service Program per the following specifications,

- Vendor must be designated as a Safety 5 Star Service Center.
- Testing to be performed by certified technicians, using approved and current software.
- Perform and complete onsite, mobile service to SCBA to include functional flow testing, repairs, and inspections.
- Perform and complete onsite, fit testing at the identified location.
 - Alternate: Rental of a fit testing machine to include all adapters
- Perform and complete onsite warranty process/registration at the identified location.
- Test complies with yearly NFPA 1500 requirements.
- Functional flow tests for repairs occurring during annual flow testing period is offered at no charge.
- There is no additional charge for warranty repairs.