



3M™ Scott™ Air-Pak™ X3 Pro Self-Contained Breathing Apparatus (SCBA)

Self-Contained Breathing Apparatus Requirements

- The SCBA shall consist of the following major sub-assemblies: (1) full facepiece assembly; (2) a removable, positive pressure, mask-mounted regulator with air-saver switch; (3) an automatic dual path redundant pressure reducer; (4) end-of-service time indicators; (5) a harness and backframe assembly for supporting the equipment on the body of the wearer; (6) a shoulder strap mounted, remote gauge indicating cylinder pressure; (7) a rapid intervention crew/universal air connection (RIC/UAC); (8) a personal alert safety system (PASS); and (9) cylinder and valve assembly for storing breathing air under pressure.

Regulatory Approvals

- The SCBA shall be approved to NIOSH 42 CFR, Part 84 as an open circuit, pressure-demand self-contained breathing apparatus.
- The SCBA shall be certified to NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Emergency Services, 2018 Edition.
- The SCBA shall be certified to NFPA 1982, Standard on Personal Alert Safety Systems, 2018 Edition, when configured with a PASS device.
- The SCBA shall be compatible with an optional firefighter escape belt that would be compliant to NFPA 1983, Standard on Life Safety Rope and Equipment for Emergency Services, 2017 Edition.
- All 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.
- The SCBA shall maintain all NIOSH standards with any of the types of cylinders listed as provided by the SCBA manufacturer.

Required Components

Facepiece Assembly (Model: Vision C5)

- The facepiece shall have a large diameter inlet that enables both unrestricted breathing and voice communications, while also allowing for rehydration (oral) without having to remove the facepiece.
- The facepiece shall enable connection of the mask-mounted regulator by way of a quarter (1/4) turn rotation.
- The facepiece shall interface with the mask-mounted regulator, without the use of tools, with an audible click to assure the user that the regulator is properly seated.
- The facepiece assembly shall be available in three sizes, marked “S” for small, “M” for medium and “L” for large.
- The facepiece sizes shall be color-coded for ease of identification.
- The facepiece nose cup assembly shall be available in three sizes, marked “S” for small, “M” for medium and “L” for large.
- The facepiece assembly, including head harness, shall not be made with natural rubber latex.
- The facepiece shall include a face seal that is secured to the lens by a U-shaped bezel using no more than two fasteners.
- The face seal shall be a single-reflex design for enhanced comfort and easier donning.
- The facepiece shall contain inhalation valves that are contrasting in color and readily visible to enable quick visual inspection.
- Multi-directional voicemitters shall be recessed on both sides of the facepiece and ducted directly to an integral silicone nose cup to enhance voice transmission around the user.
- The facepiece shall meet the requirements of the NFPA 1981, 2018 Edition standard for nonelectronic communications.
- The face seal shall provide a landing area with ridges to help improve the interface with protective hoods.
- The facepiece shall incorporate attachment points for an optional accessory neck strap.
- The facepiece assembly shall be modular in design to enable ease of upgrading and serviceability.
- The facepiece shall incorporate an RFID tag for asset and maintenance tracking.
- The facepiece shall be capable of submersion for cleaning and disinfecting.
- The facepiece assembly shall be configurable to allow for the integration of wireless radio direct interface (RDI) communications.
- The facepiece assembly with optional radio direct interface shall be compatible with select Bluetooth® wireless technology enabled field radios.
- The facepiece assembly with optional radio direct interface shall provide in-mask communications to enhance voice intelligibility during two-way communications.
- The facepiece assembly with optional radio direct interface shall be available with optional bone conduction headphone (BCH) to enhance operator hearing and understanding of incoming radio communications.
- The facepiece assembly with optional radio direct interface and bone conduction headphone shall incorporate automated voice prompts to provide the operator with verbal notification of changing system conditions.
- The facepiece assembly with optional radio direct interface shall have an integrated volume switch to allow the operator to adjust volume level based on hearing acuity and environmental conditions.

- The facepiece assembly with optional radio direct interface shall have a single button for powering on/off the electronics, with a visual LED indication of power status and Bluetooth® radio connect status.
- The facepiece assembly with optional radio direct interface shall be powered by an intrinsically safe, lithium-ion rechargeable battery for up to 15 hours of continuous run-time.
- The lithium-ion battery shall be removable from the facepiece to allow for charging.
- The facepiece assembly with optional radio direct interface shall be software configurable using an iOS® or Android™ compatible mobile application.
- The facepiece assembly with optional radio direct interface shall enable continuous operation when transitioning between tactical (on air) and non-tactical (off air) use.

Facepiece Lens

- The lens is a component of the facepiece assembly and shall be a single, replaceable, modified-cone configuration, constructed of a high-temperature and radiant-heat-resistant, non-shatter type polycarbonate material.
- The lens shall be coated to resist abrasion and meet the requirements of the NFPA 1981, 2018 Edition standard for lens abrasion.
- The lens shall have an internal anti-fog coating to reduce fogging of the lens.
- The lens shall meet the requirements of the NFPA 1981, 2018 Edition standard for radiant heat and elevated temperature heat and flame resistance tests.
- The facepiece shall meet the penetration and impact requirements of ANSI Z87.1.

Head Harness

- The head harness is a component of the facepiece assembly and shall have five points of suspension connection, four of which shall be adjustable, made in the fashion of a net hood to minimize interference between securing of the facepiece and the wearing of head protection.
- The head harness shall be constructed of a para-aramid material for fire, first responder and CBRN applications.
- The head harness shall include an integrated handle to assist with donning of the facepiece.
- Two elastomeric straps, attached to the face seal in four locations, shall provide adjustment for proper seal to the face.
- The head harness shall be available in three sizes to accommodate persons of varying facial shapes and sizes.
- The head harness shall be designed for easy removal from the facepiece to assist with cleaning and serviceability.

Facepiece Assembly (Model: AV-3000 HT)

- The facepiece shall have a large diameter inlet that enables both unrestricted breathing and voice communications, while also allowing for rehydration (oral) without having to remove the facepiece.
- The facepiece shall enable connection of the mask-mounted regulator by way of a quarter (1/4) turn rotation.
- The facepiece shall interface with the mask-mounted regulator, without the use of tools, with an audible click to assure the user that the regulator is properly seated.
- The full facepiece assembly shall be available in three sizes, marked “S” for small, “M” for medium and “L” for large.
- The facepiece sizes shall be color-coded for ease of identification.
- The facepiece nose cup assembly shall be available in three sizes, marked “S” for small, “M” for medium and “L” for large.
- The facepiece assembly, including head harness, shall not be made with natural rubber latex.
- The facepiece shall include a face seal that is secured to the lens by a U-shaped bezel using no more than two fasteners.
- The facepiece shall contain inhalation valves that are contrasting in color and readily visible to enable quick visual inspection.
- Multi-directional voicemitters shall be recessed on both sides of the facepiece and ducted directly to an integral silicone nose cup to enhance voice transmission around the user.
- The facepiece shall meet the requirements of the NFPA 1981, 2018 Edition standard for nonelectronic communications.
- The facepiece assembly shall be modular in design to enable ease of upgrading and serviceability.
- The facepiece shall be capable of submersion for cleaning and disinfecting.
- The facepiece shall be able to incorporate multiple electronic communications options (amplification, radio interface, radio direct interface) without affecting NIOSH approvals and/or NFPA certification, where applicable.
- The facepiece shall enable the installation of communications bracket on either the right or left side.
- The facepiece shall be approved for use with multiple respiratory applications (e.g., airline respirator or negative pressure respirator with filters/cartridges) to enable the same user to switch from one application to another without the use of tools and without doffing the facepiece.

Facepiece Lens

- The lens is a component of the facepiece assembly and shall be a single, replaceable, modified-cone configuration, constructed of a high-temperature and radiant-heat-resistant, non-shatter type polycarbonate material.
- The lens shall be coated to resist abrasion and meet the requirements of the NFPA 1981, 2018 Edition standard for lens abrasion.
- The lens shall have an internal anti-fog coating to reduce fogging of the lens.
- The lens shall meet the requirements of the NFPA 1981, 2018 Edition standard for radiant heat and elevated temperature heat and flame resistance tests.
- The facepiece shall meet the penetration and impact requirements of ANSI Z87.

Head Harness

- The head harness is a component of the facepiece assembly and shall have five points of suspension connection, four of which shall be adjustable, made in the fashion of a net hood to minimize interference between securing of the facepiece and the wearing of head protection.
- The head harness shall be available in an optional, adjustable five-strap configuration.
- The head harness shall be constructed of a para-aramid material for fire, first responder and CBRN applications.
- The head harness shall include either a positioning strap or an integrated handle to assist with donning of the facepiece.
- Two elastomeric straps, attached to the face seal in four locations, shall provide adjustment for proper seal to the face.

Regulator (Model: E-Z Flo C5)

- The mask-mounted regulator shall maintain positive pressure during flows of up to 500 standard liters per minute.
- The mask-mounted regulator shall be available in a continuous hose configuration, with an optional inline quick disconnect coupling.
- The optional quick disconnect coupling shall be easily connected and disconnected by trained individuals with a gloved hand and in limited visibility conditions.
- The optional quick disconnect coupling shall be guarded against inadvertent disconnection during use of the equipment.
- The low-pressure hose shall be equipped with a swivel attachment at the mask-mounted regulator.
- The mask-mounted regulator shall connect to the facepiece by way of a quarter (1/4) turn rotation.
- A latch mechanism shall lock the mask-mounted regulator in place to prevent inadvertent rotation.
- An audible click shall provide notification that the mask-mounted regulator is securely attached to the facepiece.
- The mask-mounted regulator shall be equipped with a gasket to provide a seal against the mating surface of the facepiece.
- The mask-mounted regulator shall reactivate and supply air only in the positive pressure mode when the wearer affects a face seal and inhales.
- The mask-mounted regulator shall have a demand valve to deliver air to the user, activated by a diaphragm responsive to respiration.
- The diaphragm shall include an integrated exhalation valve.
- The mask-mounted regulator shall include a purge valve for use as an emergency bypass.
- The mask-mounted regulator shall be designed to direct the incoming air through a spray bar and over the inner surface of the facepiece lens for defogging purposes.
- The mask-mounted regulator shall incorporate a Heads-Up Display (HUD) to provide visual alerts to the SCBA user of air status and critical alarm conditions.
- The HUD shall be recessed into the mask-mounted regulator body to help improve downward visibility through the facepiece.
- The HUD shall provide visual alerts to the SCBA wearer for electronic personnel accountability report, evacuation, and system integrity alarm.
- The mask-mounted regulator shall incorporate status lights to assist with remote identification of a user's SCBA air remaining.
- The mask-mounted regulator shall incorporate a latch mechanism to enable removal from the facepiece.
- When fully engaged, the latch mechanism shall act as an auto air-saver switch to stop the air flow.
- An audible click shall provide notification that the latch is fully engaged, and the air-saver switch has been activated to stop the air flow.
- The mask-mounted regulator shall require pulling back of the thumb latch and a quarter (1/4) turn rotation for removal from the facepiece.

Regulator (Model: E-Z Flo+)

- The mask-mounted regulator shall maintain positive pressure during flows of up to 500 standard liters per minute.
- The mask-mounted regulator shall be available in a continuous hose configuration, with an optional inline quick disconnect coupling.
- The optional quick disconnect coupling shall be easily connected and disconnected by trained individuals with a gloved hand and in limited visibility conditions.
- The optional quick disconnect coupling shall be guarded against inadvertent disconnection during use of the equipment.
- The low-pressure hose shall be equipped with a swivel attachment at the mask-mounted regulator.
- The mask-mounted regulator shall connect to the facepiece by way of a quarter (1/4) turn rotation.
- A latch mechanism shall lock the mask-mounted regulator in place to prevent inadvertent rotation.
- An audible click shall provide notification that the mask-mounted regulator is securely attached to the facepiece.
- The mask-mounted regulator shall be equipped with a gasket to provide a seal against the mating surface of the facepiece.
- The mask-mounted regulator shall contain an air-saver switch to prevent airflow when disconnected from the facepiece.
- The mask-mounted regulator shall reactivate and supply air only in the positive pressure mode when the wearer affects a face seal and inhales.
- The mask-mounted regulator shall have a demand valve to deliver air to the user, activated by a diaphragm responsive to respiration.
- The diaphragm shall include an integrated exhalation valve.
- The mask-mounted regulator shall include a purge valve for use as an emergency bypass.
- The mask-mounted regulator shall be designed to direct the incoming air through a spray bar and over the inner surface of the facepiece lens for defogging purposes.

- The mask-mounted regulator shall incorporate a Heads-Up Display (HUD) to provide visual alerts to the SCBA user of air status and PASS alarm conditions.
- The mask-mounted regulator shall incorporate a latch mechanism to enable removal from the facepiece.
- The mask-mounted regulator shall require pulling back of the thumb latch and a quarter (1/4) turn rotation for removal from the facepiece.

Pressure Reducer with Snap-Change Cylinder Connection

- The pressure reducer shall be mounted at the waist on the backframe and be coupled to the cylinder valve through a stainless steel quick connect snout for engagement and sealing within the cylinder valve outlet.
- The cylinder shall be secured to the pressure reducer with two pull-rings 180° from each other.
- A stainless-steel rod shall secure each of the pull-rings to prevent removal of the cylinder while the SCBA is pressurized.
- The stainless-steel rods shall be actuated when the cylinder is opened and when cylinder pressure is above 30 psig.
- In lieu of a manual by-pass, the pressure reducer shall include a back-up pressure reducer connected in parallel with the primary pressure reducer and an automatic transfer valve for redundant control.
- The back-up pressure reducer shall also be the means of activating the low-pressure alarm devices in the mask-mounted regulator.
- The low-pressure alarm warning shall denote a switch from the primary pressure reducer to the back-up pressure reducer whether from a malfunction of the primary pressure reducer or from low cylinder supply pressure.
- A press-to-test valve shall be included to allow functional testing of the back-up pressure reducer.
- The pressure reducer shall have incorporated a resettable over-pressurization relief valve which shall prevent the attached low-pressure hose and mask-mounted regulator from being subjected to high pressure.

Pressure Reducer with CGA Cylinder Connection

- The pressure reducer 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 reducer shall include a back-up pressure reducer connected in parallel with the primary pressure reducer and an automatic transfer valve for redundant control.
- The back-up pressure reducer shall also be the means of activating the low-pressure alarm devices in the mask-mounted regulator.
- The low-pressure alarm warning shall denote a switch from the primary pressure reducer to the back-up pressure reducer whether from a malfunction of the primary pressure reducer or from low cylinder supply pressure.
- A press-to-test valve shall be included to allow functional testing of the back-up pressure reducer.
- The pressure reducer shall have incorporated a resettable over-pressurization relief valve which shall prevent the attached low-pressure hose and mask-mounted regulator from being subjected to high pressure.

End-of-Service Time Indicator (EOSTI)

- The SCBA shall have two end-of-service time indicators (EOSTI). One shall be both a tactile and audible alarm, and one shall be 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 positive pressure mask-mounted regulator.
- This alarm device shall indicate either low cylinder pressure (35% +/- 2%) or a malfunction of the primary pressure reducer.
- The HUD shall serve as the secondary EOSTI.
- The HUD shall be powered by the SCBA's single power supply.
- The HUD shall be mounted in the user's field of vision on the positive pressure mask-mounted regulator.
- The HUD shall display cylinder pressure in increments of 100%, 75%, 50% and 35% (+/- 2%).
- The display shall not have a numerical representation of cylinder pressure.
- At greater than three quarters cylinder pressure, two green Light Emitting Diodes (LED) shall be illuminated.
- Between three quarters and one-half cylinder pressure, one green LED shall be illuminated.
- Between one-half and 35% (+/- 2%) cylinder pressure, one "yellow" LED shall be illuminated and flash at a rate not less than one (1x) time per second.
- At 35% (+/- 2%) or less cylinder pressure, one "red" LED shall be illuminated and flash at a rate to exceed ten times (10x) per second.
- The HUD shall have a low battery indication that is distinct and distinguishable from the cylinder pressure indications.

Backframe and Harness 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 alloy frame that is contoured to follow the shape of the user's back.
- The backframe shall include a shroud to streamline hose and wire management by minimizing exposure of the low-pressure hose and electronics molded cable.
- 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 or 60-minute cylinders.

- The harness assembly shall include a waist pad and shoulder pads constructed of an outer shell material and incorporating a closed-cell foam design to help minimize water and contaminant absorption.
- The harness assembly shall incorporate parachute-type, quick-release buckles with an integrated bail to help secure the webbing.
- The harness assembly shall consist of a one-size, black, para-aramid strap with two red stripes along the outer edges and a reflective stripe in the center for enhanced visibility.
- The harness assembly shall include a seat-belt type waist belt attachment.
- The harness assembly shall include box-stitched construction with no screws or bolts.
- The harness assembly shall be removable from the backframe without the use of tools.
- The harness assembly shall be machine washable to help with contaminant exposure reduction.
- The harness assembly shall accommodate a waist belt extension.
- The waist pad shall be attached to the backframe such that movement by the wearer provides natural articulation. Articulation shall be accomplished without the use of mechanical devices.
- The waist pad and belt shall freely wrap around and conform to the user's hips.
- The shoulder harness shall be fitted with a Drag Rescue Loop (DRL) capable of being deployed in an emergency to drag a downed wearer to safety.
- The DRL shall be sewn into the shoulder harness assembly and shall provide a horizontal pull strength of 1000 lbs.
- The DRL shall be stored in a manner to prevent accidental snag but maintain accessibility with gloved hands.
- The shoulder harness shall be attached to the backframe such that the harness presents itself for ease of donning.
- The shoulder harness shall include reflective material to enhance the visibility of the user in low-light conditions.
- The shoulder harness shall accommodate two distinct positions for a chest strap attachment.

Rapid Intervention Crew / Universal Air Connection (RIC/UAC)

- The SCBA shall incorporate a RIC/UAC fitting to be compliant with the NFPA 1981, 2018 Edition standard.
- The RIC/UAC shall be an integral part of the pressure reducer and protected by the backframe.
- The RIC/UAC inlet connection shall be within 4" (4-inches) of the cylinder valve.
- The self-resetting relief valve shall be color-coded to identify pressure rating of the SCBA.
- The RIC/UAC shall have a check valve to prevent the loss of air when the high-pressure air source has been disconnected.

Cylinder and Valve Assembly

- The cylinder valve shall be constructed of forged aluminum.
- There shall be no mandatory maintenance required on the cylinder valve.
- If the SCBA is equipped with a Compressed Gas Association (CGA) threaded cylinder connection, the cylinder valve outlet shall be a modification of the CGA standard threaded connection number 346 for breathing air for 2216 psig and CGA 347 for 4500 and 5500 psig systems.
- If the SCBA is equipped with a Snap-Change cylinder connection, the cylinder valve shall be designed with a patented stainless steel quick connect snout that delivers air directly to the first stage pressure-reducing regulator. The quick connect snout shall be an integral part of the cylinder valve, rather than an adapter that threads onto the CGA fitting.
- If the SCBA is equipped with a Snap-Change cylinder connection, the cylinder valve shall be equipped with a CGA 346 or CGA 347 (depending on pressure) fitting for the purposes of filling the cylinder only.
- If the SCBA is equipped with a Snap-Change cylinder connection, the fill fitting shall have a check valve to prevent flow from the cylinder and allow the cylinder to be filled without opening the cylinder valve.
- If the SCBA is equipped with a Snap-Change cylinder connection, the fill fitting shall be provided with a dust cover, retained the the cylinder valve, to protect threads from damage and prevent interior surfaces from being contaminated when not in use.
- 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"; 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.
- The cylinder valve shall have an RFID tag molded into the elastomeric bumper with a universal RFID marking embossment.
- The RFID tag shall be capable of storing product specific information, including serial number, manufacture date, hydrostatic test date, pressure rating and life expectancy.
- The SCBA shall maintain all NIOSH and NFPA standards with any of the types of cylinders listed as provided by the SCBA manufacturer.

Cylinder Type – Aluminum

- The cylinder shall be manufactured in accordance with US Department of Transportation (DOT) specifications and meet the Transport Canada requirements with a working pressure of 2216 psig.
- The cylinder shall be made of an aluminum alloy.
- The cylinder shall be available in a 30-minute duration based on the NIOSH breathing rate of 40 liters per minute (lpm).

Cylinder Type – Carbon-Wrapped

- The cylinder shall be manufactured in accordance with US Department of Transportation (DOT) specifications and meet the Transport Canada requirements with working pressures of 2216, 4500, or 5500 psig.
- 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 have a 2D barcode located under the protective gel coat programmed with the following information, at a minimum: serial number, manufacture date, and hydrostatic test date.
- The cylinder shall be available in a 30-minute, 45-minute, 60-minute or 75-minute duration based on the NIOSH breathing rate of 40 liters per minute (lpm).
- The cylinder shall be available in a 30-year life design as defined by the DOT Special Permit 14232.

Personal Alert Safety System (PASS) with Firefighter Locator

- The PASS Device shall be certified to NFPA 1982, Standard on Personal Alert Safety Systems, 2018 Edition.
- Operation of this distress alarm shall be initiated with the opening of the valve of a charged SCBA cylinder.
- The system shall feature a “hands-free” reset capability that may be activated by means of a slight movement of the SCBA when the system is in a pre-alarm mode.
- The system shall operate from a single power source containing six “AA” batteries.
- The system shall have a battery check function that provides an LED indication of battery status while the SCBA is not pressurized.
- When the PASS is manually activated, the locator system shall immediately emit a 2.4 GHz signal able to be received by a separate hand-held receiver.
- When the PASS is activated due to lack of motion, the locator system shall have a ten second delay prior to emitting a 2.4 GHz signal able to be received by a separate hand-held receiver.
- The locating system shall be programmable with eight alpha-numeric characters to provide identification information.
- The PASS device shall contain two components: a Console and a Sensor Module.
- When the PASS device goes into pre-alarm, the user shall be notified through a distinct light pattern in the HUD display located on the mask-mounted regulator.

Console

- The console shall be located on the user’s right shoulder harness.
- The control console shall come with a mechanical (analog) pressure gauge that is angled at 30°.
- The console shall contain an integral, edge-lit, mechanical pressure gauge that is automatically turned on by opening the cylinder valve.
- The console shall display to the user the following:
 - Pre-Alarm: alternating red flashing LEDs;
 - Full Alarm: dual flashing red LEDs and a flashing PASS icon;
 - Low Battery: red flashing LEDs;
 - Normal System Operation: flashing green LED.
- The console shall contain a photo sensing diode that automatically adjust the brightness of the HUD as the ambient lighting conditions change.
- The console shall contain an integrated RFID tag.
- 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.
- The console shall be equipped with an LED “External HUD” allowing others to determine the user’s cylinder pressure through the same color-code scheme as the HUD display on the mask-mounted regulator.
- A green LED shall be illuminated across the gauge face to indicate a cylinder with greater than half cylinder pressure.
- A yellow LED shall be illuminated across the gauge face to indicate a cylinder with less than half cylinder pressure.
- A red LED shall be illuminated across the gauge face to indicate a cylinder with less than 35% (+/- 2%) of the rated cylinder pressure.

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” indicator lights.
- The sensor module sound emitters shall be oriented in multi-directions for optimal sound projection.
- The sensor module sound emitters shall broadcast a unique alarm tone for the following conditions:
 - Pre-alarm PASS
 - Full-alarm PASS
 - Low battery

- The visual indicators on the backframe-mounted sensor module shall flash green during normal operation.
- The visual indicators shall flash red when the device is in pre-alarm and full-alarm.
- The visual indicators shall flash orange when the SCBA has reached one-half cylinder pressure.
- The visual indicators shall flash a combination of red, green, and white when the SCBA has reached 35% (+/- 2%) of the rated cylinder pressure.
- The sensor module shall have a Bluetooth® chipset integral to the unit to provide wireless connectivity to external devices.

Warranty

- The SCBA shall be covered by a warranty providing protection against defects in materials and workmanship.
- The warranty period shall be for as long as the SCBA is owned by the original purchaser.
- This warranty shall not require a registration in order to activate.
- This warranty shall not be contingent upon completing mandatory overhaul or recommended preventative maintenance.

Universal Emergency Breathing Safety System (UEBSS)

- The optional Universal Emergency Breathing Safety System (UEBSS) shall be certified to the NFPA 1981, 2018 Edition standard.
- The UEBSS shall have one of each of the following requirements; (1) a manifold with one each of a Rectus socket and Rectus 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 socket and plug.
- The UEBSS shall be positioned on the wearer's right side and shall be capable of allowing for six feet of hose between like systems.
- The manifold shall be made of aluminum and anodized.
- The socket and plug shall have spacing, no less than 15° off-center.
- The socket shall have a double action to disengage, noted as a "push-in/pull-back".
- The plug and socket shall be equipped with a 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 snap fasteners.
- The pouch shall have a pull-strap to assist with opening of the flap and gaining access to the hose and manifold assembly.
- The pouch shall be marked "UEBSS" and be constructed of reflective material.
- The pouch shall be removable from the backframe without the use of tools.
- The UEBSS shall have provision for connection of a supplied airline for extended duration use while reserving the cylinder supply for egress.
- The UEBSS shall connect to a supplied airline using an extended duration airline adapter.
- The extended duration airline adapter shall have a plug on one end to connect to the UEBSS and a socket on the other end to connect to a supplied airline.
- The extended duration airline adapter shall be able to accommodate Industrial Interchange (e.g. Hansen, Foster, Parker, etc.), HK or twist lock fittings.
- The extended duration airline adapter shall have a check valve to prevent the accidental loss of air when the adapter is disconnected from the supplied airline.

Personal Alert Safety System (PASS) with Accountability

- The PASS device shall be certified to NFPA 1982, Standard on Personal Alert Safety Systems, 2018 Edition.
- Operation of this distress alarm shall be initiated with the opening of the valve of a charged SCBA cylinder.
- The system shall feature a "hands-free" reset capability that may be activated by means of a slight movement of the SCBA when the system is in a pre-alarm mode.
- The system shall operate from a single power source containing six "AA" batteries.
- The system shall have a battery check function that provides an LED indication of battery status while the SCBA is not pressurized.
- When the PASS is manually activated, the locator system shall immediately emit a 2.4 GHz signal able to be received by a separate hand-held receiver.
- When the PASS is activated due to lack of motion, the locator system shall have a ten second delay prior to emitting a 2.4 GHz signal able to be received by a separate hand-held receiver.
- The locating system shall be programmable with eight alpha-numeric characters to provide identification information.
- The system shall transmit user status information at a frequency of 2.4 GHz on a self-healing mesh network system that when deployed allows each energized SCBA to function as a repeater helps ensure system connectivity.
- The system shall provide bi-directional communications between incident command and the SCBA wearer.
- The communication shall contain: the user's name or ID, cylinder pressure, PASS alarms, PASS acknowledgement, evacuation status, evacuation acknowledgement, withdraw status, withdraw acknowledgement, system status, and electronic PAR status.
- The PASS device shall contain two components: a Console and a Sensor Module.
- When the PASS device goes into pre-alarm, the user shall be notified through a distinct flashing light pattern in the HUD display located on the mask-mounted regulator.

Console

- The console shall be located on the user's right shoulder harness.
- The control console shall come with a mechanical (analog) pressure gauge that is angled at 30°.
- The console shall contain an integral, edge-lit, mechanical pressure gauge that is automatically turned on by opening the cylinder valve.
- The console shall display to the user the following:
 - Pre-Alarm: alternating red flashing LEDs;
 - Full Alarm: dual flashing red LEDs and a flashing PASS icon;
 - Low Battery: red flashing LEDs;
 - Normal System Operation: flashing green LED.
- The console shall also include icons to indicate:
 - Range status
 - Evacuation
 - Withdraw (self-evacuation)
 - Electronic Personnel Accountability Report (ePAR)
 - When the system is ready to receive the user's ID through an RFID card
- The console shall contain a photo sensing diode that automatically adjusts the brightness of the HUD as the ambient lighting conditions change.
- The console shall contain an integrated RFID tag.
- 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.
- A gray color-coded push button shall permit the activation of the withdraw mode.
- The console shall be equipped with an LED "External HUD" allowing others to determine the user's cylinder pressure through the same color-code scheme as the HUD display on the mask-mounted regulator.
- A green LED shall be illuminated across the gauge face to indicate a cylinder with greater than half cylinder pressure.
- A yellow LED shall be illuminated across the gauge face to indicate a cylinder with less than half cylinder pressure.
- A red LED shall be illuminated across the gauge face to indicate a cylinder with less than 35% (+/- 2%) of the rated cylinder pressure.

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" indicator lights.
- The sensor module sound emitters shall be oriented in multi-directions for optimal sound projection.
- The sensor module sound emitters shall broadcast a unique alarm tone for the following conditions:
 - Pre-alarm PASS
 - Full-alarm PASS
 - Electronic Personnel Accountability Report (ePAR)
 - EVAC
 - System Integrity
 - Low battery
- The visual indicators on the backframe mounted sensor module shall flash green during normal operation.
- The visual indicators shall flash red when the device is in pre-alarm and full-alarm.
- The visual indicators shall flash orange when the SCBA has reached one-half cylinder pressure.
- The visual indicators shall flash a combination of red, green, and white when the SCBA has reached 35% (+/- 2%) of the rated cylinder pressure.
- The sensor module shall have a Bluetooth® chipset integral to the unit to provide wireless connectivity to external devices.

Firefighter Escape Belt

- The optional Firefighter Escape Belt shall be certified to the NFPA 1983, 2017 edition standard and as an accessory to the SCBA under the NFPA 1981, 2018 edition standard.
- The escape belt shall be available in one size, and adjustable to fit waist sizes 28" to 50".
- The escape belt shall be constructed of Kevlar® aramid fibers.
- The escape belt shall have dual adjustment points to allow the belt to remain centered while donning.
- The escape belt shall utilize side thumb-release buckles for ease of doffing.
- The escape belt shall incorporate an optional quick release feature to jettison the SCBA.
- The escape belt shall utilize the patented COBRA buckle system.
- The escape belt shall include a load-bearing attachment point, as well as a positioning point.
- The escape belt shall allow for attachment of an accessory pouch.
- The accessory pouch shall accommodate storage of individual escape components, including escape rope, a descent control device, and anchor device.

- When attached to the SCBA, the accessory pouch shall maintain the NFPA 1981 certification of the SCBA.

Electronic Voice Communications

- The respirator, when configured with the Vision C5 facepiece, shall have an optional facepiece-integrated radio direct interface communication system that provides wireless communication with two-way radios.
- The respirator, when configured with the AV-3000 HT facepiece, shall have an optional facepiece-mounted voice amplification device to electronically project the user's voice.

Refer to EPIC 3 Voice Amplifier Bid Specifications, H/S 7093

- The respirator, when configured with the AV-3000 HT facepiece, shall have an optional facepiece-mounted radio interface communication system that provides voice amplification and wireless communication with two-way radios.

Refer to EPIC 3 RI Voice Communication System Bid Specifications, H/S 7489

- The respirator, when configured with the AV-3000 HT facepiece, shall have an optional facepiece-mounted radio direct interface communication system that provides voice amplification and wireless communication with two-way radios.

Refer to EPIC 3 RDI Voice Communication System Bid Specifications, H/S 7570

In-Mask Thermal Imager

- The respirator, when configured with the AV-3000 HT facepiece, shall have an optional hands-free, in-mask thermal imager.
- The in-mask thermal imager shall consist of a facepiece-mounted thermal imaging camera and an in-mask display.

Disclaimer: All statements, technical information and recommendations set out in this Sample Bid Specification are based on information believed to be reliable and reflect the 3M Scott product(s) referenced above, but the accuracy or completeness thereof is not guaranteed. Before utilizing this Sample Bid Specification, the user should determine its suitability for use in the user's specific circumstances. The user assumes all risks and liability associated with any part of such use.

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3M Scott Fire & Safety

Personal Safety Division
Monroe Center, P.O. Box 569
Monroe, NC 28111

Phone 1-800-247-7257
Email US-3M-ScottMonroeCSR@mmm.com
Web 3M.com/ScottFire
3M.ca/ScottFire

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