



3M™ Scott™ Ska-Pak AT

General Requirements

One or more open-circuit, self-contained breathing apparatus consisting of the following major subassemblies:

1) cylinder and valve assembly; 2) full facepiece assembly; 3) pressure reducing regulator; 4) removable, facepiece mounted pressure demand breathing regulator with air-saver switch and purge valve; 5) harness assembly for supporting the respirator on the user's body. The units shall be certified by the National Institute for Occupational Safety and Health (NIOSH) as conforming to the Code of Federal Regulations, 42 CFR 84. The units shall carry a five-year warranty.

Successful bidder agrees to provide, at his 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 and failure to do so will automatically disqualify the bidder. Successful bidder must be a sales distributor authorized by the factory to sell the equipment specified herein.

The respirator shall be capable of supplying compressed air for human respiration, equivalent to Compressed Gas Association (CGA) Grade D or better.

Combination Entry/Egress Units

The respirator shall be available as an entry/egress unit that offers the capability of an escape self-contained breathing apparatus (SCBA) coupled with a Type C airline respirator for extended durations. When used as an airline respirator, minimum breathing air shall be supplied to the unit from a remote source while cylinder air is held in reserve for escape purposes. An optional dual supply connection shall be available so the user can transfer to a second source of remote air, when necessary.

As a combination entry/egress system, the unit shall be equipped with a choice of any of Compressed Gas Association (CGA) Grade D five types of fittings: Hansen, Schrader, Hansen HK, Cjen or Foster stainless steel. All couplings shall be quick-connect style fittings for easily connecting and disconnecting the supply hose.

When employed as an entry/egress system with Hansen, Schrader, Cjen or Foster couplings, the Type C airline respirator shall be capable of being used up to 300 feet at a maximum of 12 airline segments from the remote air source. When Hansen HK fittings are employed, the respirator shall be capable of being used up to 150 feet at a maximum of six airline segments from the air source.

Cylinder and Valve Assembly

3-Minute Version - 2216 psi aluminum

The cylinder shall be in accordance with DOT (Department of Transportation) specifications and it shall be constructed of Aluminum Alloy 6061. Its exterior surface shall be painted yellow. It shall have a working pressure of 2216 psig (15.3 MPa) and shall have a rated duration of three minutes. The cylinder shall have attached a hanger bracket that allows for easy donning and doffing of the cylinder. The female harness buckle shall be integrated directly into the harness of choice (see below). The cylinder shall meet the following requirements for dimensions and capacity: diameter – 4.38 in. (111.1 mm); length – 9.25 in. (235 mm); Air Capacity – 7.1 cu.ft. at 2216 psig (201.1 liters).

5-minute version - 3000 psi carbon

The cylinder shall be in accordance with DOT (Department of Transportation) specifications and it shall be constructed of a Carbon Full-Wrap cylinder with an aluminum liner. It shall have a working pressure of 3000 psig (20.7 MPa) and shall have a rated duration of five minutes. The cylinder shall have attached a hanger bracket that allows for easy donning and doffing of the cylinder. The female harness buckle shall be integrated directly into the harness of choice (see below). The cylinder shall have attached a hanger bracket that allows for easy donning and doffing of the cylinder. The female harness buckle shall be integrated directly into the harness of choice (see below). The cylinder shall meet the following requirements for dimensions and capacity: diameter – 4.0 in. (101.6 mm); length – 9.3 in. (236.2 mm); air capacity – 8.0 cu. ft. at 3000 psig (226.5 liters).

10-minute version – 3000 psi carbon

The cylinder shall be in accordance with DOT (Department of Transportation) specifications and it shall be constructed of a Carbon Full-Wrap cylinder with an aluminum liner. It shall have a working pressure of 3000 psig (20.7 MPa) and shall have a rated duration of ten minutes. The cylinder shall have attached a hanger bracket that allows for easy donning and doffing of the cylinder. The female harness buckle shall be integrated directly into the harness of choice (see below). The cylinder shall have attached a hanger bracket that allows for easy donning and doffing of the cylinder. The female harness buckle shall be integrated directly into the harness of choice (see below). The cylinder shall meet the following requirements for dimensions and capacity: diameter – 4.6 in. (115.8 mm); length – 14.0 in. (355.6 mm); air capacity – 17.0 cu. ft. at 3000 psig (481.4 liters).

15-minute version - 4500 psi carbon

The cylinder shall be in accordance with DOT (Department of Transportation) specifications and it shall be constructed of a Carbon Full-Wrap cylinder with an aluminum liner. It shall have a working pressure of 4500 psig (31.0 MPa) and shall have a rated duration of fifteen minutes. The cylinder shall have attached a hanger bracket that allows for easy donning and doffing of the cylinder. The female harness buckle shall be integrated directly into the harness of choice (see below). The cylinder shall meet the following requirements for dimensions and capacity: diameter – 4.69 in. (119.1 mm); length – 14.3 in. (363.2 mm); air capacity – 23.0 cu. ft. at 4500 psig (651.3 liters).

General Cylinder And Valve Requirements

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 so 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. The valve shall be constructed so that damage will not occur if the coupling is over-torqued by hand. 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 a lock-out release for selecting “lock open service” or “non-lock open service”; 2) an up-stream connected frangible disc safety relief device; 3) a dual reading pressure gauge indicating cylinder pressure; and 4) an elastomeric bumper. The cylinder valve outlet shall be interchangeable with Compressed Gas Association (CGA) standard threaded connection 346 or 347 for breathing air.

Facepiece Assembly

AV-2000 Facepiece

The full facepiece assembly shall fit persons of varying facial shapes and sizes with minimal visual interference. It shall be available in three color-coded sizes and maintain NIOSH/MSHA certification of the apparatus regardless of the size used. The color coded face seal shall be constructed of a blend of proprietary material and be secured to the lens by a U-shaped channel frame that is retained to the lens using five fastener assemblies, four of which also serve as attachments points for the head harness. A detachable bayonet-style mounting adapter for the voice amplifier shall be optionally available.

The lens shall be a single, replaceable, modified cone configuration constructed of a non-shatter type polycarbonate material and be designed to meet the impact and penetration requirements of a faceshield as specified in ANSI Z87.1 paragraphs 8.2 and 8.3, shall have a silica based coating to resist abrasion, chemical attack and meet the requirements of NFPA-1981 for lens abrasion. The lens shall have an anti-fog coating to reduce fogging in stand-by mode.

The facepiece shall have a large diameter inlet serving as the female half of a quarter (1/4) turn coupling which mates with the positive pressure breathing regulator. Multi-directional voicemitters shall be lens mounted on both sides of the facepiece lens and ducted directly to an integral silicone nose cup to enhance voice transmission and minimize fogging of the lens. The voicemitter ducts and nose cup shall be easily removable without the use of tools. The head harness shall be a four-point suspension made in the fashion of a net hood to minimize interference between securing of the facepiece and the wearing of head protection and be constructed of a Kevlar material. Two flame resistant elastic straps, attached to the lens in four locations, shall provide adjustment for proper face sealing. A four-point attachment polyester head harness shall also be available.

AV-3000 Facepiece

The full facepiece assembly shall fit persons of varying facial shapes and sizes with minimal visual interference. It shall be available in three color-coded sizes and maintain NIOSH certification of the respirator regardless of the size used. The face seal shall be constructed of a blend of proprietary material and be secured to the lens by a U-shaped channel frame that is retained to the lens using two fasteners.

The lens shall be a single, replaceable, modified cone configuration constructed of a non-shatter type polycarbonate material and shall meet the impact and penetration requirements of a faceshield as specified in ANSI Z87.1 paragraphs 5.2.8.1 and 5.2.8.2, it shall have a silica based coating to resist abrasion and chemical attack and meet the requirements of NFPA-1981, for lens abrasion. The lens shall have an anti-fog coating to reduce fogging of the lens.

The facepiece shall have a large diameter inlet serving as the female half of a quarter (1/4) turn coupling which mates with the positive pressure breathing regulator. Multi-directional voicemitters shall be lens mounted on both sides of the facepiece lens and ducted directly to an integral silicone noseclip to enhance voice transmission. The voicemitters, ducts, and noseclip shall be easily removable without the use of tools. The facepiece shall have a minimum of four sizes of noseclips.

The head harness shall be a six-point quad suspension (traditional system) or five-point suspension (SureSeal system) made in the fashion of a net hood to minimize interference between securing of the facepiece and the wearing of head protection and be constructed of a para-aramid material.

Pressure Reducer

The pressure reducer shall be a single stage system with a pressure relief valve and an Auto-Transfer mechanism for use in the event of primary air source interruption. The cylinder coupling shall be attached to the pressure reducer.

Facepiece-Mounted Positive Pressure 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. The breathing regulator shall maintain this positive pressure during flows of up to 500 standard liters per minute. The regulator shall also meet a dynamic flow requirement of remaining positive while supplying a minute volume of 160 liters. The regulator shall contain a tactical alarm for indicating a loss of primary air source.

The breathing regulator shall have attached a low pressure hose which shall be threaded through the shoulder strap to couple to the pressure reducing regulator mounted on the harness. An optional regulator shall be available with a quick connect coupling in line for use with the optional outlet manifold and accessory hose to allow the breathing regulator to be disconnected from the unit and reconnected to the auxiliary hose of a second unit in the event rescue is required. The quick connect coupling shall be easily connected and disconnected by training individuals with a gloved hand and/or in low light conditions. The coupling shall also be guarded against inadvertent disconnect during use of the equipment.

The low pressure hose shall be equipped with swivel attachments at both ends. The breathing regulator outlet port shall be configured as the male half of a quarter (1/4) turn coupling which mates with the facepiece and shall be equipped with a doughnut-shaped gasket which provides the 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 also have an integral transfer alarm device which shall alarm the user by vibration of the facepiece. This alarm indicates loss of primary air source and the initiation of the Auto-Transfer mechanism in the reducer.

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 fluoro silicone elastomer. This diaphragm shall include the system exhalation valve and shall be constructed from a high strength silicone elastomer. A purge valve shall be situated at the inlet of the breathing regulator and shall be capable of delivering an air flow 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 which 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 effects a face seal and inhales. This device shall not affect the breathing flow thorough the system while in operation.

Visual/Low Cylinder Pressure/ or Cylinder Leak Detection

The cylinder leak detector is engaged by the decay of cylinder pressure. This may be the results of a cylinder valve failure or the activation of the automatic transfer mechanism. The cylinder leak detector engages, warning the end-user with a red flashing LED, when the cylinder pressure drops to 90% of the full pressure charge at 72 degrees F. The unit is powered by a 9-volt battery. An amber led flashes when battery voltage is low.

Harness Assembly

Harness with Kevlar® webbing

The respirator shall be equipped with a harness assembly constructed of a Kevlar material and shall contain a metal push-button, seat belt style buckle. To prevent strain on the respirator's airline supply hose, the hose shall be routed through a sleeve that shall be an integral part of the waist belt. The harness assembly shall feature a padded shoulder strap and both the shoulder and waist straps shall be adjustable.

Harness with nylon webbing

The respirator shall be equipped with a harness assembly constructed of a nylon material and shall contain a plastic fastener. To prevent strain on the respirator's airline supply hose, the hose shall be routed through a sleeve that shall be an integral part of the waist belt. The harness assembly shall feature a padded shoulder strap and both the shoulder and waist straps shall be adjustable.

Fall protection harness

The respirator shall be equipped with Fall Protection Full-Body (nylon) harness assembly constructed of a material with Dri-lex® Aero-space-webbing with back D-ring and shoulder D-rings. To prevent strain and entanglements on the respirator's airline supply hose, the hose shall be routed through Velcro straps that shall be an integral part of the harness. Strain relief is provided by clip attachment to the tri-slide on the harness. Shoulders straps shall be adjustable with parachute style buckles. The respirator's regulator hose shall be routed through snap-keepers that shall be an integral part of the harness. The fall protection harness shall be equipped with patented dual release mechanism on the chest strap and leg straps. The design of the dual release is such that no accidental activation may occur. The fall protection harness shall carry CSA and ANSI approval.

Optional Equipment

The respirator shall be capable of being outfitted with the following optional accessories: clear lens cover; neck strap to hold facepiece; spectacle kit for prescription eyeglass lenses; pass-through assembly for use in adapting a combination entry/egress unit to fully encapsulated protective clothing; a voice amplifier and other communications equipment for use with a voicemitter equipped facepiece, and full facepiece equipped with integral welding visor protection.



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