

Defence and Law Enforcement (UNSPSC : 46)

Personal safety and Protection (UNSPSC:4618)

Respiratory Protection UNSPSC: (461820)

Fire Breathing Apparatus (SCBA-EN 137) UNSPSC: 46182004

S No	Parameters	Value 1	Value 2	Value 3	Value 4	Value 5	Validation	Unit	Remarks	
GENERIC										
1	Conformity to Indian/ International Standard	BS EN137								M
2	Self-contained open circuit compressed air breathing apparatus (BA set contain air cylinder, back plate, face mask, lung demand regulator, pressure reducing valve, pressure gauges, hoses, carrying case, etc)	compressed air carried in cylinder/cylinders is fed either via pressure reducer and lung governed demand valve or lung governed demand valve connected to the facepiece to enable the wearer to breathe Exhaled air passes through the non-return valve to the atmosphere.								M
3	Application	Suitable for optimum utilization of compressed air stored in the cylinder during fire fighting and rescue operation without any risk of poisonous gases entering the breathing circuit.								
4	Classification of Breathing Apparatus	Type 1 - 600 litres (minimum capacity)	Type 2 - 800 litres (minimum capacity)	Type 3 - 1200 litres (minimum capacity)	Type 4 - 1600 litres (minimum capacity)	Type 5 - 2000 litres (minimum capacity)			G	
5	Safe working duration including 10 minutes safety margin									TBD
CONSTRUCTION										
1	Robust in Design	Sufficiently robust to withstand the rough usage it is likely to receive in service and designed so that it will continue to function satisfactorily, while temporarily, accidentally submerged in water at a maximum depth of one metre and thereafter until the air in the cylinder is exhausted.								M

2	The apparatus shall be so designed that no parts or sharp edges are likely to be caught on projections in narrow passages	yes			M
3	The apparatus shall be so designed that the wearer can remove it and while still wearing the facepiece, continue to breathe air from the apparatus	yes			M
4	Designed to ensure its full function in any orientation	yes			M
5	The main valve(s) of the air cylinder(s) shall be arranged so, that the wearer can operate them while wearing the apparatus	yes			M
6	The apparatus shall be so designed and constructed as to prevent ingress of the external atmosphere within the limit set out	yes			M
Material and Components					
1	Back Plate and Body Harness	made of non - metallic, antistatic, impact, chemical & fire resistant material and orthopedic ally designed and manufactured in conformity to EN/ DIN/ US standards and certified for use by the fire fighters, It shall facilitate mounting of air cylinder through cam lock. The body harness shall be wearer friendly and safe for carrying load while all buckles shall be quick release type			M
2	Face Mask	Reverted edge seal type and made of flame resistant material confirming to EN 136-CLASS 3. The reflex seal on the outer mask shall be so designed so as to facemask to reduce dead space, speech transmitter for clear voice reproduction and a wide angle panoramic vision visor made of Polycarbonate material and shall e self - de- misting type. The head straps shall be easy to tighten and quick to release.Head Harness shall be ribbed in buckled area.			M

3	Demand valve	The lung operated demand valve design shall either be titling diaphragm type or piston type. This shall be provided on the facemask and connected to the pressure reducer with the help of rubber hose through quick connector. The demand valve shall be rated for minimum 300 Lpm airflow and shall activate with the first breath.					300 lpm
4	Types of Pressure Gauge	Bourdon pressure gauge with luminescent dial analog type	Digital Pressure gauge	Digital cum Mechanical Pressure Gauge			F
5	Hoses	The low pressure hoses shall be flexible and non-kinking type and suitably reinforced to with stand 30 bar air pressure while the high - Pressure hoses shall either be flexible or rigid metallic tube suitably secured to the back plate so as not to obstruct the movement of the wearer.					M
6	Warning Whistle	fitted either on the back plate or provided along with the pressure gauge assembly and shall be automatic in operation giving audible alarm of minimum 90 dB intensity at 1 meter distance of low cylinder pressure in the range of 50+ 5 Bar					M
7	Air Cylinder	The size of the cylinder shall be such that it can hold sufficient quantity of air for declared working duration when charged at 300 bars pressure. The cylinder shall be provided with cross flow valve and EN 144 compliant. The cylinder shall be duly approved by the Chief Controller Explosive Nagpur and shall be capable of with standing a minimum hydraulic testing pressure of 450 bars.					M
8	Air Cylinder material (Non Corrosive)	Aluminium alloy	Alloy Steel	Carbon composites with Aluminium alloy liner	Carbon composites with PET liner		G
9	Total weight of the ready to use set	10≤N≤16				Kg	TBD
10	Approval from BS / EN 136, 137, 139/93 or ISO 9001 and should bear mark of relevant specification	yes					

11	PESO approval Type for cylinder	Type 1	Type 2	Type 3	Type 4			F
12	Hydrostatic Pressure Test for Breathing Apparatus Cylinder	Cylinder of adequate water capacity for 45 minutes effective duration at filling pressure not exceeding 300 bar duly hydro-tested to 1.5 times of filling pressure, (must bear ISO/BS/DIN/NIOSH/EN mark on body of cylinder).						M
13	Certificate from authorized test station of the country from where it has been imported/ manufactured It must have approval from CCE, Nagpur and should be painted as per latest cylinder rules	yes						M
14	The cylinder should be marked with photo luminescent strip in which a way that when set is assembled it is visible from back side to trace/ follow the BA wearer in smoke filled compartment	yes						M
15	The air pressure of the cylinder should be reduced by a two stage pressure reduction system	yes						M
16	Cylinder Valve	The cylinder valve should be both hand operated, perpendicular to cylinder but should not protrude beyond cylinder width, having safety device to prevent accidentally closure of valve.	Excess flow cylinder valve should be both hand operated, perpendicular to cylinder but should not protrude beyond cylinder width, having safety device to prevent accidentally closure of valve.					M

17	The valve assembly must include anti- debris tube for preventing the debris flowing from the cylinder to air circuit and should also have universal coupling for connecting different type of sets and air compressor A blank cap should be provided to protect cylinder valve threads	yes				M
18	Pressure Reducer	Compact designed should reduce the cylinder pressure up to 7 to 10 bars to meet the design requirement of demand valve and should maintain the same reduced pressure even with decreasing cylinder pressure. It should have built in pressure relief valve, designed to prevent excess pressure in the low pressure circuit and also safety device to restrict the flow in high pressure circuit in case of failure/ damage of high pressure hose. The pressure reducer also contains the sintered metal filter for filtering out particles up to size of 20 micron				M
19	Second-Man Attachment	yes	No			F
20	Indication in case of Digital Pressure Gauge, Digital cum Mechanical Pressure Gauge	<p>The dial must be marked red to indicate low pressure in the cylinder, in addition to warning whistle set to operate at a pressure when it is left with a 10 minutes air in the cylinder. It should be protected by safety device including restriction valve that will limit the loss of air in event of damage of pressure gauge to 10 liters/ minute maximum.</p> <p>The system incorporates a gauge to monitor the following: a) Pressure b) Temperature c) Remaining service time d) Alarm at low cylinder pressure</p>		NA for Bourdon pressure gauge with luminescent dial analog type)		F

21	Low Pressure Warning Whistle	<p>BA set must be provided with low pressure warning whistle, which shall operate automatically, when cylinder pressure drops to a predetermined pressure (i.e. air in the cylinder is left for 10 minutes at the rate of 40 liters/ minute) for safety margins.</p> <p>It should not be externally adjustable, and the consumption air by warning whistle should not exceed 5 liters/ minute. It should be positioned at left shoulder for easy hearing and should not produce sound less than 90 db</p>			M
22	Demand Valve operation	<p>Quiet in operation to prevent disturbance during communication between BA wearers. It should also have a provision of by-pass valve to provide extra air in case wearer demands and should be totally independent from demand valve functioning (EN-137)</p>			M
23	Demand Valve Function	<p>continue to function satisfactorily after being submerged in water to a maximum depth of one meter, once worn by BA wearer. The provision of shut off button on demand valve assembly should also be made for stopping air flow in face mask, which should be capable of de-activating on next breath. The coupling should be of quick release mechanism type to unplugged demand valve from the mask connector.</p>			M
24	Full Face Mask Material as per EN 136				TBD M
25	Full face mask pan-seal including optically correct and with full view replaceable visor made from poly- carbonate having resistance to chemicals and shock and should be ant scratch	yes			M
26	The inner mask should allow the air to pass across the visor to keep it free from condensation and should reduce the dead space within the face-mask to prevent accumulation of carbon-dioxide to uncomfortable level	yes			M

27	Full face mask Speech diaphragm for effective communication should be provided A safety device should be incorporated in the exhalation valve to release excess pressure in the face mask than the design positive pressure	yes			M
28	Full face mask provided with suitable strap with locking for easy donning the face mask Strap made of fire retardant material should also be provided It should have double reflex sealing and quick fitting plug-in connection for demand valve	yes			M
29	For preventing the deterioration of face-mask from the effect of ultra violet light and also dust etc, a suitable black bag shall be provided with each face mask	yes			M
30	Manufacturers /suppliers shall submit fit-up test, exhalation and inhalation valve resistant test report conducted by authorized agencies / notified body according to EN standards	yes			M
31	Harness (Ribed in buckled area)	The harness should be fire resistance, should not deteriorate or shrink in contact with water/ moisture/ water miscible substances or on contact with oil grease etc., and also provide resistance to chemicals, it neither should not built up static electricity nor should retain static charge. It should be fully adjustable to be worn by a fireman having variation in height and waist size. The design should be such that wearer could don the apparatus quickly without the aid of another including the chest strap, if provided should be easily distinguishable by touch. The method of fastening should be of similar and also the adjustment. The buckles provided should be quick release type. The light weight webbing harness ensures optimal load distribution, balance, comfort and reduced wearer fatigue			M

32	Back Plate design	Height Adjustable back plate	Universal (Fixed Backplate)			M
33	Carrying Case	<p>a) A standard strong carrying case to store complete assembled BA set along with BA cylinder should be provided. It should be designed in such a way that all parts of the assembled set could be placed in its proper position.</p> <p>b) A black colour plastic bag to avoid deterioration due to the effect of ultra violet light and also to prevent mask being contaminated by oil, fuel, dust etc. It will be used to cover the face mask and then store it in the carrying case.</p>				M
34	Workmanship and Finish	It is essential that the standard of workmanship and finish of all parts is such that replacement parts can be supplied and that they will fit correctly and without difficulty. Exposed metal parts would have a finish which can be kept up without the use of metal polish or any other special preparation				M
35	Tools	Tools necessary for routine testing and servicing must be provided with each set along with one kit of consumable spares				M
36	Instruction Book	An instruction book in English, for the guidance of the user including both operating and normal maintenance procedure must be supplied. The book must include an itemized and illustrated spare parts list, giving reference numbers to all parts.				M
37	Training	The supplier shall provide training to selected staff / Officer for operation and maintenance of BA set.				M
38	Spares	Supplier shall ensure availability and supply of fast moving spares at short notice for at least five years. The supplier shall provide a price list of such spares along with commercial bid.				M

39	Exposed parts excluding cylinders, that is, those which may be subjected to impact during practical performance tests shall not be made of magnesium, titanium, aluminium or alloys containing such proportions of these metals which on impact, give rise to frictional sparks capable of igniting flammable gas mixtures	yes						M
40	Materials that may come into contact with the skin shall be non-staining, soft, pliable and shall not contain known dermatitic substances	yes						M
41	Connections (Couplings)	The design and construction of the apparatus shall permit its component parts to be readily separated for cleaning, examination and testing. The couplings required to achieve this shall be readily connected and secured, where possible by hand. Any means for sealing used shall be retained in position when the joints and couplings are disconnected normal maintenance.						M
42	Adjustable Parts	All parts requiring manipulation by wearer shall be readily accessible and easily distinguishable from one another by touch. All adjustable parts and controls shall be so constructed that their adjustment is not liable to accidental alteration during use.						M

PERFORMANCE

1	Water Capacity of Breathing Apparatus Cylinder	4.7	6.8	8	9	10		litres	G
		12							
2	Charging Pressure	200 to 250			251 to 300			Bars	MF
3	Air Capacity of Breathing Apparatus After Charging					TBD		litres	M

CERTIFICATION

1	Complete System to be tested to prove conformity of declared parameters as per EN - 137 latest from any ILAC/NABL accredited/Central Govt Lab	Yes						G	
2	Test Report Number							M	
3	Test Report Date							M	
4	Name of the Lab where test Conducted							M	
5	Test Reports to be furnished to the buyer on demand	Yes						M	
6	Any other certification/marketing on complete set (like CE/UL/FM/NFPA/etc)					TBD		M	
7	Warranty / Guaranty:	1	2	3	5		year	G	
8	Service warranty at consignee end	5		10		15		year	F