

# Technical Specifications and Trial Directives of BA Set with Spare cylinder

| SN | Technical Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Trial Directives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| 1. | <p><b>a) General:</b> - A Breathing Set with spare cylinder (or SCBA) is personal protective equipment designed to provide respiratory protection in <b>CBRN</b> environments where the air quality is compromised by <b>hazardous CBRN materials</b>. It is used by rescuers where the presence of hazardous gases, smoke, or lack of oxygen poses a significant threat to human health. The Breathing Set with spare cylinder (or SCBA) comprises a full-face mask, a high-pressure cylinder containing compressed breathing air, a regulator, and other associated components. The face-mask protects from inhalation of harmful substances. The high-pressure tank stores breathable air and the regulator control the flow and pressure of the air supplied to the user. Breathing Apparatus set must be holding EN 137 Type 2 / BIS 10245 (Part 2): 2023.</p> | <p>BOO to check EN 137 type 2/ BIS 10245 Part 2: 2023 for BA Set from Govt accredited/NABL-approved lab/ International lab</p> <p>Certificate/Lab test report must cover the following components: -</p> <ol style="list-style-type: none"> <li>1. Air Cylinder</li> <li>2. Pressure Gauge</li> <li>3. Pressure reducer</li> <li>4. Back Plate and Body Harness</li> <li>5. Face Mask (EN 136/ 137 type 2/ BIS 10245 Part 2: 2023/ 14166)</li> <li>6. Demand Valve</li> <li>7. Hoses</li> </ol> |
| 2. | <p><b>Air Cylinder:</b></p> <p>a) Cylinder shall be corrosion and impact resistant and made of Aluminium Cylinder/ Carbon composites with Aluminium alloy liner/ Carbon composites with PET liner.</p> <p>b) <b>Volume of the cylinder:</b> -<br/>Volume 6.8 Litre</p> <p>Can be charged at 300 bars pressure.</p> <p>Air cylinder can hold sufficient quantity of air (Not less than 1800 Litters) for providing 45 minutes' total working duration</p> <p>c) The cylinder shall be provided with standard flow valve.</p>                                                                                                                                                                                                                                                                                                                                         | <p>a), b) &amp; c) BOO to check OEM certificate against the requirements outlined in the specifications.</p> <p>d) BOO to check the certificates from Chief Controller Explosive / PESO approval for cylinder.</p> <p>e) BOO to physically check the parameter.</p>                                                                                                                                                                                                                             |

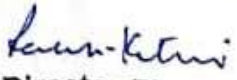
  
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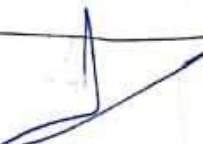
  
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|    | <p>d) The cylinder shall be duly <b>approved by the Chief Controller Explosive / PESO</b> shall be capable of withstanding a minimum hydraulic testing pressure of 450 bars.</p> <p>e) One spare cylinder with each BA set.</p>                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                           |
| 3. | <p><b>Pressure reducer:</b><br/>This shall be so designed so as to meet the air demand at a stable pressure on the outfit with inlet pressure varying from 300 bars to 20 bars.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                   | BOO to physically check the reading of the pressure gauge.                                                                                                                                                                                                                                |
| 4. | <p><b>Pressure gauge:</b> Digital cum Analogue Pressure Gauge in which digital gauge should indicate time of usage.</p> <p><b>Features of the Pressure Gauge</b></p> <p>a) Pressure gauge part should work independently of the Alarm Cum Signalling Unit. In case of non-functioning of Digital Unit, pressure gauge should give warning in case of low air pressure.</p> <p>b) The gauge shall be connected to pressure reducer through non-metallic rubber hose.</p> <p>c) The integrated control unit shall be mounted on the shoulder of the wearer in a way that it is readable to the wearer conveniently.</p> | <p>a) BOO to check OEM certificate against the requirements outlined in the specifications.</p> <p>b) &amp; c) BOO to physically check the parameter.</p> <p>Additionally, BOO to check <b>ATEX/ PESO/Chief Controller Explosive / IECEX</b> approval for the Digital Pressure Gauge.</p> |
| 5. | <p><b>a) Warning System:</b> Distress Signal Unit system (either integrated with Digital Pressure gauge or separate) for the purpose of alarm in case there is no movement by rescuer.</p> <p><b>b) Warning Whistle:</b> Shall be automatic in operation giving audible alarm of in case of low cylinder pressure in the range of 55 +/-5 Bar.</p>                                                                                                                                                                                                                                                                    | a) & b) BOO to physically check the parameter.                                                                                                                                                                                                                                            |

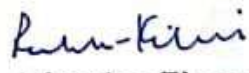
  
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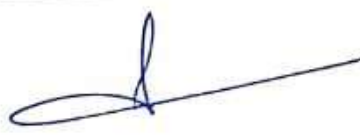
  
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| <p>6. <b>Back Plate and body harness: -</b><br/> (a) Back plate should be made of non - metallic, antistatic material.<br/> (b) Material should be impact resistant, chemical &amp; fire-resistant.<br/> (c) Body harness should be with adequate padding.<br/> (d) The body harness shall be safe for carrying load of the BA Set.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>a) &amp; b) BOO to check OEM certificate for the parameter.<br/> c) &amp; d) BOO to physically check the parameters.</p>                                                                                                                                                                                                                                                                                                 |
| <p>7. <b>Face Mask: -</b><br/> a) The facemask to be made of flame-resistant material and seal on the should be designed to prevent the leakage.<br/> b) It should have a wide-angle panoramic visive (Min 120°) visor which shall be self-de-misting type.<br/> c) In facemask, all components shall be easily accessible for easy maintenance and cleaning.<br/> d) Firms to provide facemasks in universal sizes as per EN/BIS standards that would fit in all shapes and sizes of faces whether small, medium or large.<br/> e) The face mask should have: -<br/> i) Compatible communication system (e.g. Bone conduction mic etc.) or an in-built communication system in mask.<br/> ii) Communication system shall have a separate PTT button for ease of operation.<br/> iii) Communication system should produce clear voice at both ends.</p> | <p><b>For Mask-</b><br/> a) BOO to check the OEM certificate for the parameters.<br/> b) BOO to check the OEM certificate for the parameters.<br/> c) BOO to physically check the parameters.<br/> d) BOO to physically check the parameters &amp; OEM certificate.<br/> e) <b>For Communication system: -</b> BOO to check <b>ATEX/ PESO/ Chief Controller Explosive/ IECEX</b> approval for the Communication system.</p> |

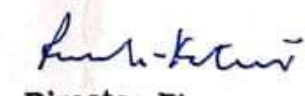
  
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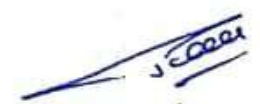
  
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| 8.  | <b>Demand Valve:</b><br>a) The lung operated demand valve design shall either be tilting diaphragm type or piston type.<br>b) The demand valve shall be detachable type.<br>c) The demand valve shall be rated for minimum 500 LPM airflow and shall activate with the first breath. | a) BOO to check the OEM certificate for the parameters.<br>b) BOO to physically check the parameters.<br>c) BOO to check the OEM certificate for the parameters. |
| 9.  | <b>Hoses:</b><br>a) Hoses shall be flexible.<br>b) Hose should withstand 30 bar air pressure.<br>c) Hose secured to the back plate so as not to obstruct the movement of the wearer.                                                                                                 | a) BOO to physically check the parameter.<br>b) BOO to check the OEM certificate for the parameters.<br>c) BOO to physically check the parameter.                |
| 10. | <b>"Y" Manifold</b> for additional connections: This set shall have provision through suitably placed "Y" manifold to facilitate receiving air from a different source (For e.g. Airline trolley)                                                                                    | BOO to physically check the parameter.                                                                                                                           |
| 11. | <b>Weight:</b> The weight of the ready to use set shall not be more than 14 kgs.                                                                                                                                                                                                     | BOO to physically measure the weight of equipment.                                                                                                               |
| 12. | <b>Guarantee/ warranty/ Service support:</b> - 01 Year warranty + 09 Year Service support                                                                                                                                                                                            | BOO to check the Undertaking of the guarantee/ warranty provided by the Firm/OEM.                                                                                |
| 13. | <b>Manuals:</b> - User Operation Manual/Technical Manual to be provided with the equipment.                                                                                                                                                                                          | BOO to physically check the manuals and literatures as mentioned in the specifications.                                                                          |

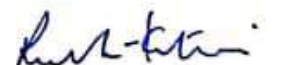
  
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# Technical specifications and Trial directives of Closed-Circuit Breathing Apparatus (CCBA)

| SN | Technical Specifications                                                                                                                                                                                                                                                                                                                                                                                                                      | Trial Directives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| 1. | Closed-Circuit-Breathing-Apparatus with oxygen cylinder to protect the user for 4 hours or more.                                                                                                                                                                                                                                                                                                                                              | BOO to physically check by operating the CCBA set for one hour and see in pressure gauge if sufficient Oxygen is left for 03 hours.                                                                                                                                                                                                                                                                                                                                                                          |
| 2. | <p>a) Must work under positive pressure CCBA.</p> <p>b) Inhaled air must contain carbon dioxide: &lt; 1.0 vol. %, Oxygen &gt; 80 vol. %</p>                                                                                                                                                                                                                                                                                                   | <p>a) BOO to physically check the parameter.</p> <p>b) Firm to submit a valid EN 145 certificate or lab test report as per EN145 from International Lab/ Govt accredited lab/NABL lab for CCBA on GeM along with Bid Document.</p>                                                                                                                                                                                                                                                                           |
| 3. | Full face mask with central connecting for CCBA, Mask body, inner mask and head harness.                                                                                                                                                                                                                                                                                                                                                      | BOO to physically check the parameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4. | <p><b>Radio Communication</b></p> <p>i. The face mask must have provision for hand free radio communication.</p> <p>ii. Control unit with large Push-To-Talk button for easy handling of the radio transmitter.</p> <p>iii. Must be IP65 or better / MILSTD-810G or better complied.</p> <p>iv. Must comply with ATEX/ PESO/IECEX approval.</p> <p>v. Compatible with Vertel(DPR-7000)/Motorola(R-7/GP-328/338) set (as per requirement).</p> | <p>i) BOO to physically check by connecting a compatible radio and verify voice transmission without holding the radio.</p> <p>ii) BOO to physically check by operating the PTT button while wearing gloved hands to test ease of use.</p> <p>iii) Firm to submit OEM certificate for ingress protection and ruggedness on GeM along with Bid Document.</p> <p>iv) Firm to submit relevant ATEX/ PESO/IECEX certificate on GeM along with Bid Document.</p> <p>v) BOO to physically check the parameter.</p> |
| 5. | Must be able to provide constant oxygen supply from 1.4 to 1.7 litre/min. (Any flow rate between 1.4 to 1.7 l/min is acceptable.                                                                                                                                                                                                                                                                                                              | Firm to submit OEM certification. (BOO may verify technical datasheet confirms flow rate is within 1.4–1.7 l/min. range) on GeM along with Bid Document.                                                                                                                                                                                                                                                                                                                                                     |
| 6. | <p><b>Weight: -</b></p> <p>Weight should not exceed 18 Kg (including mask, full oxygen cylinder, CO2 absorber.)</p>                                                                                                                                                                                                                                                                                                                           | BOO to physically check the weight of the equipment.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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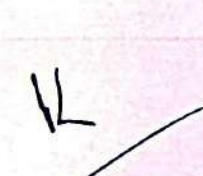
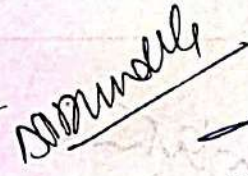
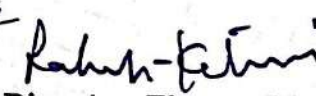
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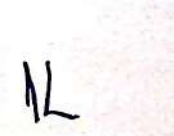
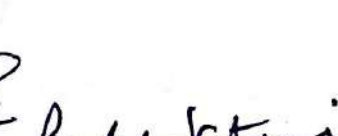
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| 7.  | Manual adding of oxygen when needed (manual bypass switch)                                                                                                                                                                                           | BOO to physically check the parameter.                                                                                                                                                       |
| 8.  | <b>CCBA electronic integration must have: -</b><br>a) Indicating the time of usage/ Indicating the cylinder pressure (Warning of low cylinder pressure)<br>b) Warning in case of failure or error<br>c) Warning in case of motionlessness (PASS)/DSU | BOO to physically check the parameter.                                                                                                                                                       |
| 9.  | CO2 absorber Type: -<br>Disposable cartridges / pre-packed cartridge / Refillable canister/ Replaceable cartridge                                                                                                                                    | BOO to physically check & inspect the cartridge/canister to confirm it is a disposable/replaceable/refillable type.                                                                          |
| 10. | Operational temperature: - -10 °C to +50 °C                                                                                                                                                                                                          | Firm to submit OEM certificate on GeM along with Bid Document.                                                                                                                               |
| 11. | Storage Temperature: - -10 °C to +50°C                                                                                                                                                                                                               | Firm to submit OEM certificate on GeM along with Bid Document.                                                                                                                               |
| 12. | a) One spare oxygen cylinder with each set<br>b) CO2 absorber materials for at least 02 continuous use of min. 04 hrs each                                                                                                                           | a) BOO to physically check the spare cylinder.<br>b) BOO to physically check the spare materials.                                                                                            |
| 13. | Must comply to EN 145 (for technical safety requirements and performance criteria for the device) and DGMS certificate (for Legal permission to take that equipment into an Indian mine)                                                             | Firm to submit valid EN 145 or lab test report as per EN145 from International Lab/ Govt accredited lab/NABL lab and DG Mines & Safety approval certificates on GeM along with Bid Document. |
| 14. | Must comply to Flame Engulfment Test.                                                                                                                                                                                                                | Firm to submit EN 137 certification or lab test report as per EN 137 from International Lab/ Govt accredited lab/NABL lab for Flame Engulfment Test on GeM along with Bid Document.          |
| 15. | Complete CCBA including face mask and communication device should be disassembled and assembled for cleaning and disinfection purposes ( <b>without using specific tools</b> ).                                                                      | BOO to disassemble and reassemble the mask and comms device by hand to verify the same.                                                                                                      |

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| 16. | <p><b>Facemask</b> (Full face mask with central connecting for CCBA.)</p> <p>Mask body, inner mask and head harness with double reflex sealing for extra protection with anti-scratch coated polycarbonate visor and wiper.</p> <p><b>Approvals:</b> Mask must comply EN136 class 3.</p> | Firm to submit EN 136 Class 3 certificate or lab test report as per EN 136 Class 3 certificate from International Lab/ Govt accredited lab/NABL lab on GeM along with Bid Document. |
| 17. | <p><b>Harness:</b></p> <ul style="list-style-type: none"> <li>• Harness must have adjustable shoulder straps.</li> <li>• Pull forward waist belt for back mounting and easy donning.</li> </ul>                                                                                          | BOO to physically check the parameter.                                                                                                                                              |
| 18. | <p><b>High Pressure Testing (HPT) Facility:</b> OEM should have available in-house HPT testing Facility in India for periodic hydrostatic testing of cylinders as per statutory guidelines.</p>                                                                                          | Firm to submit PESO certificates for cylinder/filling and documentation for in-house HPT facility on GeM along with Bid Document.                                                   |
| 19. | The OEM must have a <b>designated service team</b> available in India each for after sales support.                                                                                                                                                                                      | Firm to submit OEM certification for the services & provide service centre list on GeM along with Bid Document.                                                                     |
| 20. | Warranty-One Year                                                                                                                                                                                                                                                                        | Firm to submit the undertaking of the Warranty on GeM along with Bid Document.                                                                                                      |
| 21. | Spare & service support- Assured supply of Spare and maintenance for Ten years                                                                                                                                                                                                           | Firm to submit the undertaking of the Spare & service support on GeM along with Bid Document.                                                                                       |

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