Technical Specifications For 12000 ltr. Capacity Water Bowser

CHASSIS

The Water Bowser (WB) shall be fabricated on TATA/Ashok Leyland / Eicher / Bharat Benz or equivalent make with Gross Vehicle Weight (GVW) not less than 28000 kg (6 x 2 / 6 x 4), minimum 4800mm Wheelbase, Minimum 180 HP Engine Premium Cabin Chassis considering space/accommodation required for crew, water and equipment specified including all accessories / tools . The Vehicle chassis with (BS 6 Phase 2) *BS* 6 compliant with RDE (Real Driving Emission) Standards emission norms is to be purchased and delivered duly fabricated by Successful bidder on their risk and responsibility.

GENERAL

The WB including all its accessories & equipments is required for the Department. It shall be designed & manufactured in strict compliance with the specifications given below, as well as other relevant Indian / International standards where applicable & as per sound engineering practices. The WB shall be designed to effectively & efficiently carry 12,000 Litres of Water, a Godiva / Rosenbauer / equivalent CE certified / UL listed pump with a discharge capacity of 4000 LPM @ 10 Kg/cm^2 & 300 LPM @ 40 Kg/cm^2 driven through heavy duty Power Take Off (PTO) units, an UL listed Water cum Foam Monitor of approximately 1000 GPM, equipment, accessories, etc. All the equipments & accessories will be fixed on the appliance in a compact, neat & ergonomic manner & will be easily & readily accessible for immediate use during emergencies. Due care should be taken to ensure that all aggregates are designed for ease & comfort of the operator.

DESIGN & CONSTRUCTION

The WB shall be designed to be as compact as possible with ease of accessibility to all the service parts. The pump & other equipment controls shall be so arranged that user can operate them easily & conveniently. Lever type valves shall be preferred unless impractical in any way. The WB shall be supplied complete with all the equipments & accessories mentioned in these specifications. The material for construction shall be used with a view to combine lightness with strength & durability. No form of wood, (timber or ply) shall be used anywhere in the body construction. All parts which form water ways, come in contact with water or are made from materials that are prone to corrosion, shall be treated with a good quality anti-corrosion system / treatment / paint (epoxy coats) / zinc coating etc. The vendor should submit weight distribution chart along with design of supporting structure shall be submitted along with design calculations to department with the technical bid, failing which, bid shall be summarily rejected.

PUMPING SYSTEM

The pump fitted on the WB will be a Godiva / Rosenbauer / equivalent CE certified / UL listed, centrifugal pump, capable of delivering, not less than 4000 LPM @ 10 Kg/cm^2 & 300 LPM @ 40 Kg/cm^2. The pump shall be UL/IRS/EL Certified with minimum discharge as 4000 LPM @ 7 kg / cm^2 . The primer shall be capable of working even if left dry over extended periods. It shall be capable of delivering its full performance with all strainers (external & internal). The details of the pump such as its make & model, supported with catalogs

/ brochures / drawings etc. should be attached with the offer. The discharge of the pump shall be routed to the outlets for hand lines and monitor fitted on the top. Other construction details shall be as per following specifications.

Pump Suction Inlet

The suction inlet of the pump should be capable of being connected either directly to hydrant discharge outlets through headers or to the water tank of the vehicle. It should be of a suitable size to give the rated output of the pump, but not less than 140 mm or 2 x 100 mm. The inlet should be of round-thread type & will be provided in such a way that it is convenient to take water from outside sources like open wells. The connection from the water tank to the pump will be suitably sized (min 150 mm) to allow full pumping at the rated output. A ball / butterfly valve of good quality will be fitted between the suction inlet of the pump & the water tank. Stainless Steel strainer will be fitted inside the tank on the pipe outlet to pump.

Pump Discharge Outlets

There shall be 4 outlets of 63 mm each (2 on left and right side lockers) of standard size (63mm) with screw down type delivery valves, having female instantaneous couplings. These shall be provided for operating the pump via hand lines connected directly to the pump. In case the pump has a single outlet in its volute design, it shall be divided into 4 connections by means of a manifold. The manifold shall be strictly cast type & material shall be of SS / Light Alloy. One connection will be taken from the manifold to the monitor discharge outlet with a suitably sized flange connection with the manifold. A ball / butterfly valve of good quality will be fitted at the starting point of the water flow to the monitor. A second valve will be provided at a suitable place near the base of the monitor. This is to ensure that in case of a leakage at any time in the first valve, the second valve fitted near the monitor base will hold the pressure.

Pump Mounting

The pump will be rear mounted to ensure maximum hydraulic efficiency when working from open water sources. It shall be mounted in such a way that vibrations from the drive line are not transmitted to the control panel. The pump shall have at least four mounting points to ensure that the complete load of the system is evenly distributed. The mounting shall be done on heavy "C" channels / plates only. The mounting will be secured to the chassis members by bolting. Welding of the mounting shall be strictly avoided. The rotating drive flange shall be provided with a cover / guard so that injury is minimized during operation or maintenance of the pump. The guard shall be bolted and easily removable.

Pump Material of Construction

The Pump body / casing, impeller, delivery outlets, etc shall be made of CF8 (SS 304). The wearing rings & other parts that may be subject to frequent wear should be of renewable type. The impeller shaft will be of SS & will be carried in anti-friction bearings as per the pump manufacturer's standard design. The impeller neck rings & impeller rings will be renewable type. The bearing housing shall be of Cast Iron for better heat dissipation. An easily accessible drain valve made of SS304 will be provided at the bottom of the casing to enable easy draining of the complete system.

Pump Shaft Sealing

The shaft sealing will be of self adjusting type. The sealing system shall be as per pump manufacturer's standard design.

Pump Control Panel

The pump control panel will be supplied and designed keeping in mind ease of operation as well as maintenance. The control panel will be ergonomically designed with the following:

- ✧ Pump to Delivery Outlets
- ✧ Pump to Monitor
- ✧ Pump to Tank Filling
- ✧ Foam Tank to Pump
- ✧ Pump to Cooling line
- ✧ Tank to Pump Suction
- ✧ Outside source to Pump suction
- ✧ Water Level Indicator

Pump Priming System

To ensure that the priming system will be fully automatic Vacuum Vane/ Rotary Vane/Reciprocating Type. The system shall be Fully Automatic Vacuum Vane / Rotary Vane type, which is capable of lifting water from 7 Mtrs. depths within 30 seconds when tested using 100 mm suction hose on barepump without piping. The system shall be maintenance free to the extent possible & shall be constructed of suitable materials to prevent corrosion due to salty / brackish water.

POWER TAKE OFF

The PTO for the pump will be of Firefly / VAS make of suitable ratio for the rated output of thepump & the torque of the vehicle. The lever/switch for engaging the P.T.O. will be provided in Driver's cabin. Inspection / maintenance hatch of removable type shall be provided at suitableplaces for gaining access to gear box / PTO. Necessary modifications, to the standard drivesystem as available on the chassis, shall have to be done by the vendor so as to adopt the PTOUnits in the system. PTO engage lever would get engaged pneumatically and also get disengaged by air pressure and for this purpose a switch controlling both the operations would be provided in the driver's cab. An alternative system as stated above to get the PTO engaged mechanically would also be provided so that in case of pneumatic failure lever could be engaged by mechanical means. Necessary supports for PTO Units, propeller shafts coupling, universal joints etc. for powerinput to and output from PTO Units shall have to be provided by vendor. The drive assembly components (shafts, coupling etc.) shall be dynamically balanced and the vibration at any of therotary parts shall be minimized.

WATER TANK

The Water tank shall be of minimum 12,000 Ltrs. capacity & shall be suitably mounted on thechassis in such a way that the weight distribution is optimized. In addition a 2% expansionspace shall be made in the tank over & above the water capacity. The tank will be fabricated outof MS 316L plates of min. 6 mm thick for the bottom & 5 mm for the sides. The top & baffle plates shall be of 3 mm. The tank shall be of welded construction & will be die-pressed on all sides toprevent distortion & to ensure torsional rigidity. Due care should be taken to ensure that butt-weld joints are minimized. Wherever butt joints are unavoidable, they shall be radio-graphicallytested. The test films & reports shall be submitted at the time of stage inspections. All other joints shall be DP tested for soundness of weld joints. Complete welding shall be done using MIG welding process only.

Baffles

The tank will be suitably baffled to prevent surge when the vehicle is cornering or braking. The baffle plates shall be of minimum 3 mm thickness bolted type. The fasteners used shall be SS material only so that they do not freeze due to rusting. The nuts shall be tack welded to the baffle plates. The baffles should be so designed that they do not buckle under any circumstances during braking & cornering.

Tank Mounting

The water tank will be mounted on the vehicle on a subframe using Rubber Metacones. This subframe will be made from Anti-Corrosive Treated MS 4" section and will be bolted with the chassis using the high tensile bolts. 'U' Bolts shall not be used for mounting of tanks on vehicle.The rubber metacones shall facilitate to absorb the jerks and bending torsions in expansion aswell as compression mode without high deflection. The manufacturer shall provide complete design data of metacones and subframe including the load calculations and metacone quantitysufficiency. Tank will be mounted on the chassis in a manner keeping in view the proper load distribution on the axles. The baffles will be arranged in a manner to facilitate easy cleaning ofthe tanks. The tank will be mounted on two / three cross bearers to counteract stresses causedby chassis flexing. The Centre of Gravity shall be maintained as low as possible. The mountingshall permit the full contents of tank to flow to the pump. The bottom of the tank shall besloped towards rear. Suitable hooks / lifting eyes shall be provided on top of the tank to enable it to be lifted off the vehicle for maintenance / repairs. The bottom of the hooks shall be suitably reinforced with pads to avoid stress on the tank top plate. Sides of tank should be die-pressed to give additional strength & stiffness so that it does not distort due to chassis flexion.

Connections for Filling

The tank shall be have a filling orifice of 250 mm & an inspection & maintenance manhole of 450 mm at the top. The cover for this port shall be of hinged or threaded type as per themanufacturer's standard design & will be clearly marked with the words (either etched orraised) "WATER". This port will be used for filling the water tank from overhead storage tanks. Apart from the above, two more filling connections will be provided on the sides of the tankterminating in filling connections of 63mm male instantaneous couplings made of GM or SSmaterial incorporated with a strainer. The header & the line will be suitably designed to ensurethat the inflow of the water into the tank is sufficient to maintain the output of the pump whilethe tank is being replenished from other vehicles or from hydrant lines. These connections shall be fitted with a valve to prevent water leaking through the filling pipe & shall be provided as close to the pump as possible. The valve may be of NRV / Ball / butterfly type. One connection will also be provided for filling the tank from the pump itself. The connection will be taken from the pump manifold & will be controlled by a shut-off ball / butterfly valve.

Draining, Cleaning & Repairs

A 50mm diameter drain line with a ball / butterfly valve will also be provided to drain the tankfor maintenance / cleaning / repairs etc. A cleaning hole of 250mm will be provided at thebottom of the tank & will be taken down to a point below the chassis without reducing the effective ground clearance. The connection shall ensure that the water is discharged as faraway from the wheels of the vehicle as possible, to reduce the chances of tire slippage. Suitablelifting lugs shall be provided on the shell of the tank to enable it to be lifted off vehicle for repairs/replacement as necessary.

Overflow

One overflow pipe of suitable diameter shall be fitted to the tank. The diameter of the overflowpipe shall be determined as per the filling connections provided. However it shall not be less than 100 mm diameter in any case. In case the inlets provided at the sides are more, theoverflow pipe diameter should be suitably changed to accept the additional flow. As a thumb rule, the diameter of the overflow pipe should be two times the sum of all incoming pipes. Forexample, if there are two header pipes are of 100 mm diameter each, the overflow pipe shouldbe of 200 mm diameter. This is to ensure that the tank does not get unnecessarily pressurized.The overflow pipe will be taken up to 2 inches higher than the top of the vehicle from the insideof the tank & shall be cut at an angle of approx. 45 degrees. The pipe shall be covered by asuitable flanged cover above the tank to ensure no spillage of water during movement of the vehicle.

Miscellaneous

The tank will be connected to the Pump with a butterfly valve for ease of operation. The tank shall be hydraulically tested at 0.5 kg/cm^2 pressure to find out if there are any leakages. Thistest may be carried out in the presence of the inspecting officers or done by the manufacturers as per their own internal quality program. However due care must be taken to keep all recordsof such tests for verification at the time of final inspection. The inlet line in the tank shall have an adequately strong deflector plate, which will avoid the incoming jet of water from hitting the tank side/roof. All plumbing shall be reasonably accessible for maintenance purposes. Screwedbends, joints shall be avoided as far as possible. All the joints will be flanged type & shall have Oring sealing. Rubber gaskets shall not be used anywhere in the plumbing. All the outlets and inlets from the tank shall be taken by installing nozzles of suitable length and reinforcement pads.

Foam Proportioner

An Auxiliary around the pump Foam Proportioning system (RTP) with a selector valve to induce3 or 6% of foam compound shall be provided. The proportioner shall be installed in such a waythat it will not be liable to mechanical or other failures. The selector valve will have three settings. Each upward setting will result into an equal increase in the foam compound flowrate. The linkages of this purpose shall be as simple as possible to avoid distortion due to chassis flexion. It shall be reliable & shall not require frequent calibration checks. The proportioner RTP type shall be duly calibrated & supplied by the pump manufacturer only.

Electronic LED Indicators

Electronic LED Water Level Indicators indicating the tank levels as EMPTY, ¼, ½, ¾ and FULL shall be provided on the pump control panel. These levels shall be indicated by number of glowing LED lights (no LED Lights means and empty tank, All LED Lights means full tank). The indicators shall sense the fluid level in the tank with help of a pressure sensing probe. The indicators shallbe located on the rear pump control panel in such a manner that the Operator / Firemen can easily view the tank levels while being away from the vehicle. Repeater Secondary Level Indicators shall be provided in the driver's cab to help the crew members to check the fluid levelfrom the cab while travelling.

PIPING & VALVES

Complete pipeline circuit on the vehicle including water lines & fittings will be of SS304 material only, including all water lines. All valves up to 2" size will be lever operated SS304 ball valves &all valves above 2" size shall be normal ball / butterfly valves but made of SS304. Seats of the valves shall be easily replaceable, readily available & at least 2 sets of spare seals will beprovided for each size of valves. All the lines shall be tested hydraulically for at least 3 times the working pressure or 1.5 times the working pressure of the pump. A flow chart and schematic diagram shall be made and submitted with the technical bid failing which the bid shall besummarily rejected.

WATER FOAM MONITOR

An UL listed / FM Approved Foam Monitor made of SS 304 having discharge capacity of 3850 LPM@ 7 shall be mounted on the top of the fire tender in such a manner that it can be operated by acrew member. The monitor shall be capable of traversing through 360° in horizontal plane, elevating from horizontal to 75° and depressing from horizontal to not less than 15° and fully rotation in both directions. The monitor shall be capable of discharging water to an effective distance of not less than 65 - 70 meters & projecting the foam discharge to an effective distance of not less than 45 meters in still air conditions when operated at rated pressure.Monitor shall be provided with variable flow (500 – 750 – 1000 GPM) Jet / Spray type Nozzle.

BODY WORK

The MFT shall be supplied with original single cabin with seating arrangement for Driver + Officer. Enclosed accommodation for four persons will be provided in the separate crew cabin. The cabin will be double compartment with partition & with one communication window. The driver seat & Fire officer seat will be of OEM supplied. All the seats will have foam cushion and will be coveredwith best quality Rexene. One door on each side will be provided on the crew compartment. Doors will be fitted with safety glasses and be of sliding type window. The glasses on crewcabin windows and doors will be fixed in aluminium sections. The cabin doors will be hingedtype opening outwards & hung forward with catch latches. The cab and lockers will be ofcomposite construction with sufficient rigidity and reinforcement and will be kept as light as possible.

The rear equipment lockers superstructure (after the cabin) shall be fabricated in CORROSION FREE extrusion profile section framework constructed with bolt and nut system without welding work & paneled with aluminium plate by means of glue without any welding work. The Profiles shall be strong, solid construction, light in weight & intrinsic rectangular design with distortion insensitive bearing. Roof panels shall be made of aluminium padded plates. The roof should bestrong enough for being walked-on and must be sufficiently supported. The intermediate walls and shelves shall be constructed from aluminium sheets panelled to the extruded aluminium profile structure by means of glue without any welding work. The outer and inner panelling of the superstructure will be done from 3 mm aluminium sheets of GRADE 5052. The complete top ofthe rear superstructure would be covered with 3 mm aluminium sheets with anti-skid material. The sheets of the outer panelling will be bonded / glued to the skeleton framework. Rivets /screws shall not be allowed. The area over the tank will be suitably treated for slippage bychequered plates or anti-skid material. The doors of the cabin will be fitted with safety glasses& winding type regulators. The driver will be provided with large size rear view mirrors on bothsides of the cab & convex round mirrors for overall rear view of the vehicle from top to bottom &left to right. The cabin will be as per the latest international standards & ergonomically designed so that the crew members are comfortable in transit as well as are able to use thevehicle in an efficient & comfortable manner.

Seating

The driver & officer seat shall be provided by chassis OEM. The crew shall have individual seating, with each seat fitted with brackets for placement of Breathing Apparatus in an uprightposition. The seats shall be of the wear & walk away type so that when the crew disembarks from the vehicle the BA sets should easily come off the seats with them. The seat bottom will betheatre type, which will automatically flip up when the fireman gets up, thereby freeing up thespace for easy embarking & disembarking. The seats shall have integrated seat springs toisolate shock while in motion. They shall have a fixed type, seat-back recline, to improve ridercomfort & an auto-pivot & return headrest for rapid seat egress. The side cushions shall be easily removable, to accommodate all types of SCBA. The seats shall have right shoulder seatbelt release & a chrome swivel bezel. If there is space available, the seats shall be fitted with flip-up armrests. The seats shall be of HO Bostrom (model Tanker 450 ABTS) / Seats Inc (BattalionSCBA Crew Flip Seat) or equivalent make only.

Lockers

Suitable lockers will be provided for storage of equipments & accessories wherever required. Size and number of locker shall be decided at the time of stage inspections. The lockers will be constructed in a modular way so that in case if the configuration needs to be changed, it can be achieved without major modifications. All equipment stored in lockers will be strapped / clamped in a neat & convenient manner so that it has an identified place. All lockers will be suitably labeled so that each item will have identification when it is required to be accessed. For all water fittings like branch pipes etc. quick release type couplings or snap clamps of spring steel (as per the manufacturers standards) will be provided which shall enable theoperator to locate the desired equipment instantly & save valuable time.

Roller Shutters

For the easy operation of the Fire tender roller-shutters covering the equipment lockers shall be installed on both sides of the appliance. These shutters shall be rolled inwards underneath the roof giving unobstructed access to the equipment lockers & the equipment / accessories fittedin the vehicle. Roller shutters shall be made of hollow rectangular shaped aluminium linkswhich will be inter connected with the help of plastic / rubber profiles, sealing the roller shutter watertight when closed. They would be durable, maintenance free, weather & corrosion resistant & capable of opening in every position of the vehicle even in rough terrain & on slopes. A spring mechanism will be fitted so that the shutters are held up at any point of opening. It would be easy to operate & shall ensure that the shutters can be easily pulled down. The sections of the shutter shall be powder-coated / anodized to a smooth finish & aesthetic look. Guide rails should support the shutters over the entire length on both sides & make them corrosion free. The shutters shall have a sturdy locking mechanism which will prevent accidental opening during movement of the vehicle. A master switch for isolating locker lighting circuit shall also be fitted in the driver's cabin. The shutters shall be of MCD - France /Fireco - Italy / Equivalent Imported make only.

ELECTRICAL EQUIPMENT

Adequate lighting arrangement shall be made in all compartments. All equipment lockers will have internal lighting arrangement automatically switched on and off by opening/closing of doors/shutters. All the wiring will be properly fixed in position & will be protected against heat, oil & physical injury. To the extent possible all wiring will pass through conduits. All wires usedin the vehicle shall be stranded copper or copper alloy conductors of a gauge rated to carry atleast 125 percent of the maximum current for which the circuit is protected & shall be uniquelyidentified by color coding or permanent marking. Voltage drops in all wiring from the powersource to the using device shall not exceed 10 percent. The use of star washers for circuit ground connections shall not be permitted. All the electrical circuits will have their own separate fuses, suitably marked & grouped in a common fuse box, located in an easily accessible position. Provision will be made for min. 4 spare fuses in the box which shall beprovided in driver's cabin. All the controls for electrical system will be provided near the driver'sseat. The battery will be placed in a totally enclosed box. Radio suppression of the electrical system, which is sufficient to ensure positive operation of radio equipment without interference, should be provided. Arrangement shall be made on dashboard opposite to the fire officers' seat to fix a mobile wireless set. Power supply shall be provided from vehicle battery. Mechanism shall be provided to charge the vehicle battery from external power source.

PERIMETER & UNDERBODY LIGHTING

LED Lights shall be installed under the cabin & body around the perimeter of the vehicle. The lights shall be strategically placed to illuminate the immediate ground area around the vehicle.There shall also be provided 5 LED lights at the highest level of the vehicle for area lighting inthe vicinity of the vehicle. Minimum one light shall be installed above each shutter. Blue strobelights shall be provided at all four corners of the vehicle top (two on cabin and two at the rear).These shall be of the high intensity type with regular and intermittent flash pattern.

LADDER GALLOWS

Ladder gallows shall be provided on the roof with Ladder for fixing a 10.5 mtrs aluminium double extension ladder. The design shall be such that the ladder can be released withoutdifficulty. Means will also be provided for locking the ladder when stowed.

FITTINGS & ACCESSORIES

Following accessories will be provided on the appliance:

a) Two Spot lights in front
b) Two Fog lamps (Hella make)
c) Four Blinker type traffic indicators (OEM supplied)
d) One Removable type search light with 30 Mtrs. cable & tripod stand.
e) Grand make LED Light bar of minimum 75-100 watts with P.A. System, Hooter Amplifier &Speakers.
f) Reputed make Reverse Parking Audio Sensors & Camera with 4" / 6" Display in the Driver's Cabin.

ACCESSORIES TO BE SUPPLIED WITH WATER BOWSER

	Description	Qty
1	Aluminium Trussed Type Double Extension Ladder 10.5 m as per IS:4571	1
2	PVC Suction Hose with Light Alloy Round Threaded Couplings to suit the Pump Inlet – 2.5 m	4
3	Delivery Hose (Type B), ISI, CE & KITE marked, 63 mm x 15 meters with BIS marked couplings	10
4	Suction Strainer for Item 2	1
5	Basket Strainer for Item 2	1
6	Pair of Suction Wrench	1
7	Fog Nozzle with Extension Applicator with Fog Head	1
8	Hand Controlled Branch Pipe of Light Alloy	1
9	Universal Branch Pipe	1
10	Branch with Revolving Head	1
11	Short Branch Pipe Light Alloy (fitted with tips of 12 mm, 16 mm, 20 mm & 25 mm)	4
12	Nozzle Spanners	2
13	Foam Branch FB-10X	4
14	First Aid Box for 10 Persons	1
15	Tool Kit	1
16	DCP 10 Kgs & CO2 10 Kgs ISI marked – 2 Each	4
17	Multipurpose Hand Held Nozzle shall be made of Light Alloy Extruded Construction As Per ISO 64430WP Grade. It shall have twist type control for straight jet, spray and wide angle fog, operating efficiently at low pressure of 3.5 bar. It shall have facility to operate Solid Jet & Fog simultaneously or independently and discharge more than 500 LPM for jet and 300 LPM for spray (combined discharge capacity – 800 LPM) @ 5 bar pressure. The horizontal Jet Throw in still air shall be around 35 mtrs at 5-6 bar pressure. It shall have provision for change over to flush mode without shutting-off the flow. It shall have superior design of rubber grip, twist shut off from fog to stream and provision of teeth to provide dense fog. It shall have a Control Lever for ON-OFF Position and a 63 mm size inlet connection. A pistol grip handle for better grip shall be provided. The nozzle shall be hard anodized to prevent corrosion and wear. The weight of the nozzle shall be max. 3 Kgs. The nozzle shall be CE certified to EN15182.	2
18	Multi Flow Hand Held Nozzle shall be made of Light Alloy Extruded Construction As Per ISO 64430WP Grade. The nozzle shall be hard anodized to prevent corrosion & wear. It shall have a twist type control for Straight Jet, Spray And Wide-Angle Fog. It shall have arrangement for selection of five flow ranges from 350 to 900 LPM by twist of a dial on the nozzle. The horizontal Jet Throw in still air shall be around 35 mtrs at 7 bar pressure. It shall have Pistol Grip handle to provide for superior grip control to the operator. It shall have provision for change over to flush mode without shutting-off the flow. It shall have a replaceable spinning teeth ring for generating a dense fog curtain, a ball valve type handle for shutting off the flow and a 63 mm Inlet connection as per IS: 903. The nozzle shall be CE certified to EN15182.	2

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Battery Driven Positive Pressure Ventilator (Blower)
Positive Pressure Ventilator fan must have following Parameters.
<table>
<tr><th></th><th>Technical Parameters</th><th>Specifications</th></tr>
<tr><td>1</td><td>Size of Blade (Inch/mm)</td><td>24’’/610</td></tr>
<tr><td>2</td><td>Ingress Protection</td><td>IP-67</td></tr>
<tr><td>3</td><td>Max CFM</td><td>16,300 AMCA Equivalent (27,694 m3/h)</td></tr>
<tr><td>4</td><td>Open Air Flow</td><td>34,000 CFM
(57,600 m3/h)</td></tr>
<tr><td>5</td><td>Battery</td><td>Li-Ion</td></tr>
<tr><td>6</td><td>Sound Decibels</td><td>91 dB @ 10 ft (3 m)</td></tr>
<tr><td>7</td><td>Tilt</td><td>0-180 degrees</td></tr>
<tr><td>8</td><td>Size in mm</td><td>642 x 642 x 642</td></tr>
</table>
Positive Pressure Ventilator must have minimum battery cycle life up to 500 discharges. Positive Pressure Ventilator must be light weight and ergonomic, which shall be easily carried and set up by one person. Features of battery capacity indicator must be incorporate in to appliance. Positive Pressure Ventilator must have 100 % charging capabilities within 3 Hours, However, It must be charged 90 % within minimum Two Hours.
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Locker Mounted Manual Turning Light Mast

An imported Telescopic Light Mast pneumatically operated through the vehicle air tank should be fixed rigidly on suitable side of the vehicle in such a manner that it should not be damaged due to any jerks. It should be extendable up to a steady height of approx 5-6 mtrs from ground level and fitted with 4 x 50 W LED Lights (20,000 Lumens) through a Fixed Light Support Head. A handle shall be provided at the bottom of the mast to rotate the mast to Left or Right. Permanent connections for taking power supply from a power source set through spiral wire in protective sleeve shall be provided along with the earthed sockets at the Light Supports. Mast shall be made of extruded seamless aluminium construction, anodized in natural color.
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DOCUMENTS REQUIRED AFTER COMPLETION OF ORDER

The following documents shall be submitted in 2 sets.

1. As built drawings of tender
2. As built drawings for tank.
3. Flow diagram.
4. GA & cross sectional drawings, characteristic curves & other details for pumps.
5. As built Drawings for Installation of PTO Unit.
6. As built Drawing for water monitor as per spec.
7. As built Line diagram for electrical circuits.
8. All inspection and testing records for tank, pump, PTO, piping, valves, monitor etc.
9. Three sets of Operating and instruction manual for the tender.

PERFORMANCE GUARANTEE

The manufacturer shall guarantee the design, material, workmanship and the performance of the complete unit for a period of 12 months from the date of supply of completed vehicle. Any mechanical defect, faulty workmanship or operational defects found during this period shall be rectified by the vendor at owner's premises within reasonable time without any extra cost of DEPARTMENT. The tank shall be warranted against leakage for a period of 5 years after supply in writing.

TRAINING

After supply of vehicle, vendor shall provide training on operation & maintenance including chassis at DEPARTMENT & charges for the same shall be included in the price. Additional one week free training will be given at owner's site within warranty period as & when desired by the DEPARTMENT.

DEVIATIONS

There shall be no deviation to the specification unless agreed by owner in writing. In case there are any deviations from the above mentioned specifications / tender Documents, the vendor shall give the same separately for the scrutiny of the technical committee. In case there are any valid deviations, these may be considered by DEPARTMENT. However, the technical committee of DEPARTMENT shall have absolute power & may reject the offer without assigning any reasons whatsoever.

WORKMANSHIP & FINISH

The GVW of appliance will not exceed the rated GVW of the chassis manufacturer with all equipments & crew. The weight distribution diagram should be submitted along with the offer failing which the offer is liable for rejection.

PAINTING & MARKING

Surface Preparation

Once the paneling is completed, all the outside surfaces should be painted with a good quality paint system, like Du-Pont, PPG, Standox etc. This should be poly-urethane (PU) based paint with a life of minimum 10 years. The bidder shall guarantee fade resistance of minimum 5 years from supply even if the vehicles are kept in the open.

Vehicle Exterior Paint

The complete vehicle (all exterior surfaces) and monitor should be painted with at least 2 coats of zinc phosphate primer each of 50 microns DFT and two coats of polyurethane finish paint each coat of 50 microns DFT. Further improvement on the paint may be carried out by the manufacturer beyond that mentioned above, to give better protection & surface finish. The color for the outside will be as per the latest international & Indian norms for fire brigade vehicles. The user name will be written on both-sides with yellow color.

Water Line Paint

Water lines should be painted with of zinc phosphate epoxy primer each of 50 microns DFT and two coats of polyurethane finished paint each coat of 50 microns DFT. Water lines shall be painted red in colour.

Details Required

The bidder should give the details of the entire painting process & also the details of in house painting facilities like paint booth etc. The color for the outside will be as per the latest international & Indian norms for fire brigade vehicles. The user name will be written on both-sides with yellow color.

Reflective stripes

Reflective stripe(s) shall be affixed to the perimeter of the apparatus. The stripe or combinationof stripes shall be a minimum of 4 in. (100 mm) in total width and shall conform to the minimum requirements of ASTM D 4956, Standard Specification for Retro reflective Sheeting for Traffic Control, Type I, Class 1 or Class 3. At least 50 percent of the cab and body length on each side, at least 50 percent of the width of the rear, and at least 25 percent of the width of thefront of the apparatus shall have the reflective material affixed to it.

Marking / Name Plates & Owner's Emblem

All the lockers / cabins shall be provided with Stainless steel Name Plates with letters itched on it boldly indicating the content. Owner's emblem in original colour together with name (in Hindi and English) as below shall be written in golden yellow colour on both sides of the vehicle.

Other Miscellaneous Works

The inside of lockers shall be painted in pale cream / grey colour. The chassis frame shall be painted black and wheel arch shall be painted grey/white. Under frame of Chassis shall be painted with chlorinated rubber paint. The appliance shall clearly have the following marks at suitable locations.

1. Manufacturer's name & trade mark.
2. Year of manufacture
3. Pump serial numbers and capacities.
4. Capacity of water tank in litres.
5. Engine and chassis number.
6. All instrument control & valves shall be identified with properly itched metallic Nameplates.

ACCEPTANCE TESTS

The acceptance tests as mentioned below will be given to complete satisfaction of inspecting officers. Vendor shall ensure that design of tender will not affect chassis parameters such as speed, turning circle, acceleration etc. All inspections & tests shall be carried out by the vendor to the complete satisfaction of DEPARTMENT's representative, who shall have access at allreasonable times to vendor's works. All testing parameters should be carried out at manufacturer's premises.

Stability

Stability of appliance will be such that when fully equipped & laden, if the surface on which the appliance stands is titled to either side at an angle of 27º from horizontal it will not overturn.

Gradient

The vehicle will be tested on a gradient test ramp at an angle of 1:4. as per BIS.

Endurance Test

The pump will be tested for a continuous period of four hours non-stop & the water will not be replenished during this test & the engine will not show signs of overheating. This test will be offered at the pump manufacturer's workshop prior to shipment. The testing charges for the same shall be borne by the vendor.

Priming Test

The priming will be tested as per the latest standards & the system will be subjected to a test at a suction of 7 Mtrs. The priming should be achieved in less than 30 seconds.

Articulation Test

The vehicles shall be tested for articulation & will not show any signs of stress during this test. The clearance in the wheel wells will be checked for tolerances.

Hydraulic Testing

All the piping will be subjected to hydraulic test pressure of 15 Kg/cm^2 for a period of min. 10 minutes. The pump casing will be subjected to a hydraulic test pressure of a minimum 21Kg/cm^2. In case of the high pressure section, it will be tested at a minimum of 45 Kg/cm^2.

Shower Test

After completion of the fabrication, the vehicle will be subjected to shower test as per the norms laid down under BIS. The appliance will not show any signs of leakages during this test.

Road Test

After completion of all the above mentioned tests, a road test will be carried out where the vehicle will be tested as per the parameters laid down by the BIS. The braking, acceleration & top speed tests will be checked & recorded by the inspecting officers.