

**DIRECTORATE GENERAL NATIONAL SECURITY GUARD**  
**OPERATIONS BRANCH (WE SEC)**

1. Formulation of QRs and Trial Directives for **Scuba Diving Set** as per Appx 'A' and 'B' are being contemplated.
2. OEM/Firms are requested to forward their comments/suggestions on the draft QRs and Trial Directives as per proforma given below alongwith the details (product specifications, pectoral's etc) of their product meeting the referred QRs.
3. It is requested that comments if any on the QRs and Trial Directives may please be forwarded to the under mentioned within 30 days.

**Operations Directorate**  
**WE Branch**  
**HQ National Security Guard**  
**Mehram Nagar**  
**Near Domestic Airport**  
**Palam**  
**New Delhi – 110037**  
**Fax No – 011-25671528++**  
**E-mail : [twoic.weops@nsq.gov.in](mailto:twoic.weops@nsq.gov.in)**

**DRAFT QRs OF SCUBA DIVING SET WITH COMPLETE EQUIPMENT AND ACCESSORIES**

Ser No	Specifications	Parameters	Remarks																																																																																																																					
1.	<p>(a) <b>Parameters for both Diving Set Open Circuit Type and Closed Circuit Type have been elucidated below. User force to choose the type of set at the time of tendering based on Operational requirement. User to specify the type and number of each set at the time tendering.</b></p> <p>(b) <b>All equipments to be under service with any Special/Security/Armed Forces around the world, and should not be under research and development stage.</b></p>																																																																																																																							
2.	One set of Scuba Diving Set will comprise of following equipments:																																																																																																																							
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(b)	Life line (50 mtr reel.	01 Nos per 04 sets
(c)	Buoyancy Compensative Device (BCD)	01 Nos
(d)	Full Face Mask/Half Face mask	01 Nos
(e)	Free Diving Long Fin with Adjustable Straps	01 Nos
(f)	Medium Size Fins with Adjustable Straps	01 Nos
(g)	Wet Suit with Hood – 7mm	01 Nos
(h)	Wet Suit with Hood – 5mm FX	01 Nos
(j)	Wet Suit with Hood – 3mm FX	01 Nos
(k)	Wet Suit without Hood – 3mm FX	01 Nos
(m)	Wet Suit without Hood – 5mm FX	01 Nos
(n)	Wet Suit without Hood – 7mm	01 Nos
(o)	Diving Gloves – 3mm	01 Nos
(p)	Diving Gloves – 5mm	01 Nos
(q)	Semi Dry Diving Gloves – 5mm	01 Nos
(r)	Semi Dry Diving Booties High Ankle – 5mm Double Lined (reinforced toe and heel)	01 Nos
(s)	Diving Booties High Ankle – 4.5mm (reinforced toe and heel)	01 Nos
(t)	Dry Suit with Hood	01 Nos
(u)	Dry Suit Liner with Hood	01 Nos
(v)	Spare Straps of face mask – clear silicon	02 Nos
(w)	Spare Straps of Long Fins of spring type	02 Nos
(x)	Spare Straps of Medium Fins	02 Nos
(aa)	Torch Rechargeable Large (50W) with charger	01 Nos per 02 Sets
(ab)	Torch Rechargeable Medium (10W) with charger	01 Nos per 02 Sets
(ab)	Titanium Divers Knife	01 Nos
(ac)	Diver Tables	01 Nos per 02 Sets
(ad)	Spare Mouthpiece	01 Nos
(ae)	Hose Clamps	01 Nos
(af)	Weight Belt with Stainless Steel Quick Release Buckle	01 Nos
(ag)	Spare Quick Release Fin Buckle	04 Nos
(ah)	Spare Rubber Knife Strap	02 Nos
(aj)	Stainless Steel Multi Tool	01 Nos per 04 Sets
(ak)	Regulator Tool Kit including O Ring kit	01 Nos per 06 sets
(al)	Silicon Grease	01 Nos
(am)	Under water communication sys (used with FFM full face mask. One can use them with Divator 324.	01 Nos per 04 Sets
(an)	'O' Ring Kit	01 Nos per 04 sets
(ao)	Dive Bag Medium (water proof)	01 Nos per 02 set
(ap)	Surface Pressure Gauge (with DIN and Yoke converter)	01 Nos per 06 sets
(aq)	Waterproof buoyancy control bags to carry out equipment underwater (Alision bags)	01 Nos
(ar)	Wrist compass	01 Nos per 02 sets
(as)	Diver Computer	01 Nos per 02 sets
(at)	Weight 1kg/2kg	03 kgs
(au)	Lead sinker 50kgs,20kgs,5kgs	01 Nos per 03 Sets
(av)	Surface marker buoy	01 Nos per 02 sets
(aw)	GPS	01 Nos per 02 sets
(ax)	Underwater camera	01 Nos

**OPERATIONAL PARAMETERS OF EACH ITEM DESCRIBED BELOW**

**Equipments for Open Circuit Type Only.**

1.	Air Set/Scuba Tank (Open Circuit Type)	(a) Tank material –Stainless Steel/Aluminum/Carbon Fiber or a composite alloy of the same). (b) Tank internal volume- Maximum - 12 ltr, minimum 08 to
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		<p>10 ltrs.</p> <p>(c) Tank to be supplied with 300 bar DIN (7 thread G5/8) Valve fitting.</p> <p>(d) Weight on land (empty)-16 kg maximum.</p> <p>(e) To be supplied with tank mesh, tank handles and tank boot or rubber/plastic.</p> <p>(f) Tank to have stamp/markings of OEM on shoulder, carrying required inspection and safety related information.</p> <p>(g) Equipment should be in service with Special Forces/Armed Forces around the world and should not be under development/trial stage.</p>	
2.	BA Compressor CTP 200	<p>(a) Intake pressure- 1+.02 bar.</p> <p>(b) Rated over pressure 350 bar.</p> <p>(c) Filling rate (0 to 200 bars) 200 ltrs/minute.</p> <p>(d) Number of stage – 03.</p> <p>(e) Number of cylinder 03.</p> <p>(f) <u>Intermediate over pressure</u></p> <p>(i) 1 st stage -7 bar.</p> <p>(ii) 2<sup>nd</sup> stage – 40-46 bar.</p> <p>(g) <u>Setting of target</u></p> <p>(i) Pressure safety valve- 225 – 330 bar.</p> <p>(ii) Temperature - + 50 C to 450 C</p> <p>(iii) Maximum Angle – 5<sup>0</sup></p>	
3.	Regulator 1 <sup>st</sup> Stage	<p>(a) Air balanced flow-through piston.</p> <p>(b) Titanium Body.</p> <p>(c) Anti freeze protection.</p> <p>(d) Externally adjustable intermediate pressure.</p> <p>(e) Low pressure ports-5 on shiver turret.</p> <p>(f) High pressure Ports-02.</p> <p>(g) Tank Connection-DIN 300 Bar.</p> <p>(h) Weight Maximum 350 gms+/-10%.</p> <p>(i) Air flow at 200 Bar&gt;8500L/Min-301 SCFM.</p> <p>(j) Intermediate Pressure-9-9.8 Bar-130-142 psi.</p>	
4.	Regulator 2 <sup>nd</sup> stage	<p>(a) Air balance valve.</p> <p>(b) Diver adjustable inhalation effort.</p> <p>(c) Full metal valve housing.</p> <p>(d) Weight Maximum 160 gms +/- 10%.</p> <p>(e) Air Flow at 200 Bar-1850 L/Min-66 SCFM.</p> <p>(f) Maximum Low Pressure-14 Bar/203 psi.</p>	
5.	Low Pressure Hose	<p>(a) Length – Minimum 210 cm.</p> <p>(b) Should be compatible with Regulator 1<sup>st</sup> and 2<sup>nd</sup> stage.</p>	
6.	High Pressure Hose	<p>(a) Length – Minimum 210 cm.</p> <p>(b) Should be compatible with Regulator 1<sup>st</sup> and 2<sup>nd</sup> stage.</p>	
7.	DIN//Yoke Converter	<p>(a) Should be easy to mount without any tools.</p> <p>(b) Should fit on both standard configuration of DIN and Yoke.</p>	
8.	Hose Protector	<p>(a) Should have internal ribbing on the protector for flushing under the protector to avoid hose damage.</p> <p>(b) Should have external baffles which help natural progressive bend of hose enduring real hose protection.</p> <p>(c) Should including spare O rind holder.</p>	
9.	Buoyancy Compensative Devise (BCD)	<p>(a) Material – 420 denier nylon/polythene outer shell.</p> <p>(b) Backpack should be Semi rigid with 2 pinch clip straps.</p> <p>(c) Should have adjustable harness.</p> <p>(d) Should have adjustable waist straps.</p> <p>(e) Should have rear trim weight pockets (2x2.5KG) and front integrated weight pockets (2x5kg).</p> <p>(f) Should have an integrated weight ditching system.</p> <p>(g) Should have minimum two top dump valves and one real</p>	

		<p>dump valve.</p> <p>(h) Should have built-in power dump inflator.</p> <p>(i) Should have two large zip pockets.</p> <p>(j) Should have knife housing.</p> <p>(k) Should have minimum four D-rings.</p> <p>(l) Should be supplied with a travel bag.</p>	
10.	Snorkel	<p>(a) Anatomic curvy semi-rigid barrel.</p> <p>(b) Adjustable loop for masks strap connection.</p> <p>(c) Inner diameter 22 mm.</p> <p>(d) Length 35 cm approximate.</p> <p>(e) Material :</p> <p>(i) PVC barrel.</p> <p>(ii) Silicone mouthpiece.</p> <p>(iii) ABS plastic loop.</p> <p>(f) Colors :-</p> <p>(i) Black barrel.</p> <p>(ii) Clear mouthpiece.</p> <p>(iii) Safety orange sticker.</p>	
11	Console- Pressure Gauge+ Dive Computer +Compass (including PC interface)	<p>(a) Dive Computer to include following features :-</p> <p>(i) Electronic Depth gauge.</p> <p>(ii) Should display all data needed from diving with dive table-current depth maximum depth achieved, dive time, ascent rate, surface interval time, dive profile etc for both air and other gas blends.</p> <p>(iii) Should have back lighting.</p> <p>(iv) Should have navigation mode.</p> <p>(v) Should have a PC and Mac interface for setting up the instrument downloading dive profile and uploading data in preparation for navigation mode diving.</p> <p>(vi) Should be usable to an operating depth of 120 mtr.</p> <p>(vii) Should have a user-replaceable battery.</p> <p>(b) Compass :-</p> <p>(i) Day compass.</p> <p>(ii) Suitably illuminated for night time usage.</p> <p>(c) Pressure gauge - Should be able to be used on tanks pressurized to 300 bar and be compatible with standard HP hose that is being supplied with the equipment.</p>	
12.	Deco Stop Parachute	<p>(a) Should be compact.</p> <p>(b) Should be of orange color.</p> <p>(c) Should be able to be packed into a small package.</p> <p>(d) Should have a Snap clip allowing it to be mounted on BCD tags/D Rings.</p>	
13.	Wrist Slate.	<p>(a) Should have mounting straps for wrist.</p> <p>(b) Should have minimum three plastic plates.</p> <p>(c) Should be supplied with waterproof pencil/ writing source attached to slate.</p>	
14.	Survival sausage.	<p>(a) Material – 210 denier nylon.</p> <p>(b) Dimensions</p> <p>(i) Diameter – 13 cms.</p> <p>(ii) Length – 114 cms.</p>	
15.	Hose Protector	<p>(a) Should have internal ribbing on the protector for flushing under the protector to avoid hose damage.</p> <p>(b) Should have external baffles which help natural</p>	

		progressive bend of hose enduring real hose protection. (c) Should include spare O ring holder.	
16.	Regulator Tool Kit including O Ring Kit	(a) Tool kit should be of the same make and company as that of Regulator 1 <sup>st</sup> stage and Regulator 2 <sup>nd</sup> stage. (b) Should be able to disassemble and assemble the supplied regulators for servicing.	
17.	Wreck Reel (Auto Stop Type, 270 ft)	(a) Frame to be of high resistance anodized alloy frame with nylon fiberglass reel and handle. (b) Auto stop – friction adjuster for breaking action or to prevent free reeling. (c) To have a quick adjustment feature on handle for either free rotation or with two friction positions. (d) Length-90 mtr/270 ft of 2mm diameter polyester line.	
18.	Surface Pressure Gauge (with DIN and Yoke converter)	(a) Should allow for a quick check of the tank pressure on surface. (b) Chrome plated brass body. (c) Should be in DIN configuration. (d) Should have a scale of 300 bar.	
19.	Wrist Dive Computer	(a) Maximum diving time: 9h 59 Min. (b) Automatic altitude compensation. Maximum altitude: 4 to 70m/14000 ft. (c) Maximum operating depth: 120m/400 fit. (d) Operating temperature in water: - 2 <sup>o</sup> c to 35 <sup>o</sup> C/ Out of water – 6 <sup>o</sup> c to 60 <sup>o</sup> c. (e) Low consumption electroluminescent back lighting (activation by push button). (f) Manual or automatic switching on. (g) Battery: 1-3 VDC type CR 2450 Li. (h) Shelf life: Minimum 5 yrs. (i) Battery. Life expectancy (with 50 % back life constantly on): Minimum 50 hrs in Navigation mode. (j) Number of recorded dives: 24 most recent. (k) Data uploading /downloading throw PC Interface. (l) PC displaying: Recorded dive profiles /pre loading navigation data.	
20.	Surface Marker Buoy	(a) Surface buoy for signaling. (b) Inflatable with check valve. (c) Halyard attachment (i) Diameter – 305 mm. (ii) Length – Minimum 30 mtrs. (iii) Color – Orange. (d) Background ballast water compartment. (e) Clamp for the lower part. (f) Removable diving flag. (g) Dimensions (i) Diameter – maximum 400mm. (ii) Maximum – 350 mm.	
21.	Test Wench	(a) Test wench for all diving equipments. (b) Regulator 1 <sup>st</sup> and 2 <sup>nd</sup> Stage. (c) Pressure hose. (d) Din/ Yok Converter.	
<b><u>For Closed Circuit Type Only.</u></b>			
1.	Close Circuit Pure Oxygen Pack	(a) The set should enable re-breathing of pure oxygen after safe removal of exhaled CO <sub>2</sub> . (b) The diving set should be rugged military standard, lightweight suitable for carrying by a single person. (c) The set should comprise of following :- (i) Closed circuit Pure oxygen pack. (ii) Harness (Basic structure on which the cylinders are mounted and other accessories of the set are	

		fitted) (iii) Regulator unit. (iv) Breathing Bag. (v) O2 supply system. (vi) CO2 removal system. (vii) Oxygen bottle. (d) Additional Features. Set should be supplied with :- (i) Oxygen charging adaptor. (ii) Pressure test gauge. (iii) Tool kit for the closed circuit set. (iv) Manual Booster pump for filling of oxygen into cylinder @ one per three sets. (iv) Large oxygen cylinder. (v) CO2 Observer.	
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### **Equipments Common for Both Type of Sets.**

1.	Buddy Line	(a) Length – Minimum 2 mtrs. (b) Should have harness and brass clasps on both ends. (c) Material Nylon.	
2.	Life Line (50 mtr reel)	(a) Length 50 mtr minimum. (b) Should have adjustable rugged lanyard. (c) Should have brass hook carabineer. (d) Material of body fiberglass reinforced plastic. (e) Material of reel –Nylon. (f) Diameter of line – 2 to 2.2 mm.	
3.	Full Face Mask/Half Face Mask	(a) Should have dual lens mask with a double watertight skirt. (b) Should have quick adjustable swiveling buckles. (c) Should have double safety head straps. (d) Material : (i) Skirt black silicon rubber. (ii) Strap black silicon rubber. (iii) Lens: tempered glass 4 mm thick. (iv) Main frame: Polycarbonate (PC) molded plastic. (v) Buckles: ABS molded plastic. (e) Frame Size. (i) Height maximum 70 mm. (ii) Width maximum 155 mm. (iii) Closest position from face 26 mm.	
4.	Free Diving Long Fin with Adjustable Straps.	(a) Length of blade – 48 to 52 cms. (b) Material. (i) Foot and blade to be made of high quality abrasion resistant rubber. (ii) Ankle straps to be made of high quality abrasion resistant black rubber.	
5.	Medium size Fin with Adjustable Straps	(a) To be fitted with heel adjustable straps. (b) Material. (i) Blade made with copolymer molded plastic (E.V.A). (ii) Shoes and straps are made with synthetic molded rubber. (iii) Adjustable buckles are made with A.B.S and polycarbonate molded plastic. (c) Colors. (i) Black Blades. (ii) Black shoes. (d) Length of blade – 43 to 48 cms.	
6.	Wet Suit with Hood - 7mm	(a) One piece design in 7mm of thickness. (b) Preformed Elaskin neoprene Jersey with Fireskin interior around the mid section. (c) Embossed “Flex System “behind the elbows and knees “Supratex” reinforcement on hard wearing areas.	

		(d) "Elaskin" Double seals around the wrist and ankles "G" Lock rear zipper.	
7.	Wet Suit with Hood - 5mm FX	(a) Microcell neoprene foam, 5mm thick, double lined with full Nylon 70 deniers. (b) Black binding stretch tape 24mm wide. (c) Heat glued reinforcement pads on knees.	
8.	Wet Suit with Hood - 3mm FX	(a) Microcell neoprene foam, 3mm thick, double lined with full Nylon 70 deniers. (b) Black binding stretch tape 24mm wide. (c) Heat glued reinforcement pads on knees.	
9.	Wet Suit without Hood - 3mm FX	(a) Microcell neoprene foam, 3mm thick, double lined with full Nylon 70 deniers. (b) Black binding stretch tape 24mm wide. (c) Heat glued reinforcement pads on knees.	
10.	Wet Suit without Hood - 5mm FX	(a) Microcell neoprene foam, 5mm thick, double lined with full Nylon 70 deniers. (b) Black binding stretch tape 24mm wide. (c) Heat glued reinforcement pads on knees.	
11.	Wet Suit without Hood - 7mm	(a) One piece design in 7mm of thickness. (b) Preformed Elaskin neoprene Jersey with Fireskin interior around the mid section. (c) Embossed "Flex System "behind the elbows and knees "Supratex" reinforcement on hard wearing areas. (d) "Elaskin" Double seals around the wrist and ankles "G" Lock rear zipper.	
12.	Diving Gloves- 3 mm	(a) Material Neoprene. (b) Thickness – 3 mm. (c) Anti slip material.	
13.	Diving Gloves- 5mm	(a) Material Neoprene. (b) Thickness – 5 mm. (c) Anti slip material.	
14.	Semi Dry Diving Gloves- 5mm	(a) Material Neoprene. (b) Thickness – 5 mm. (c) Elaskin neoprene with double 2.5mm seals.	
15.	Semi Dry Diving Booties High Ankle-5mm Double Lined (reinforced toe and heel)	(a) Shoes to be made of synthetic material that can be used in water and also on land for prolonged period, while retaining its shape and dimensions to normal boots thus allowing to be used in tandem with adjustable fins. (b) Inside material to be thermal 5mm neoprene sock. (c) Sole-Over molded elastomeric stiff sole with studs. (d) Should have protective reinforcement pads in the foot's toe and heel. (e) Should have a low support ankle in synthetic fabric. (f) Should have a comfortable five points lacing up interlock the foot to the sole sizes-7 to 10.	
16.	Diving booties High Ankle-4.5mm(reinforced toe and heel)	(a) Material –Neoprene. (b) Thickness – 4.5 mm. (c) Additional feature- thickened sole, double lined Neoprene zip reinforced to and heal. (d) Size – 7 to 10.	
17.	Dry Suit with hood	(a) Mtrl – black trilaminate Fabric Polyester/butyl /polyester. (b) Hood –attached 55 mm Neoprene hood with smooth Neoprene face seal. (c) Should have adjustable in side suspenders. (d) Should have latex neck seal with Neoprene protective cover. (e) Should have latex wrist seal with protective cover. (f) Should have an intake vibe on the left groin place to be connected either to D S hose or alternatively to a 0.41 HP air cylinder.	



		<p>(g) Should have dump valve on the left forearm.</p> <p>(h) Should be supplied with low pressure inflating 120 cm hose w/Standard 3/8" first Stage Connection.</p> <p>(i) Should be supplied with 3 mm Neoprene socks with anti-abrasion soles which can be worn to gather with diving suit.</p> <p>(j) Should have a neoprene pocket with Velcro flap on the upper thigh.</p> <p>(k) Should have anti-abrasion pads on knees elbow shoulders and buttocks.</p> <p>(l) Should be supplied with a carrying bag LP hose Zipper lubricating wax dry suit hanger.</p>	
18.	Dry Suit liner with hood	<p>(a) Should be a light weight water repellent breathable, two layer soft material.</p> <p>(b) Should have two slides front zipper.</p> <p>(c) Should have Velcro neck closures.</p> <p>(d) Should have a neoprene pocket with Velcro flap on the upper right thigh.</p> <p>(e) Should have anti-abrasion pads on knees and buttocks.</p> <p>(f) Should have reflective 50 mm tapes on arms and fore arms.</p> <p>(g) Should be supplied with carrying bags.</p>	
19.	Spare Straps of Face mask – clear silicon	Should be compatible with and of the same make and quality as the supplied face mask.	
20.	Spare Straps of Long fins of Spring type	Should be compatible with and of the same make and quality as the supplied long fins.	
21.	Spare Straps of Medium fins	Should be compatible with and of the same make and quality as the supplied Medium fins.	
22.	Torch Rechargeable large (50W) with charger	<p>(a) Should have anodized aluminum cylinder incorporating the battery pack and all electronic control system.</p> <p>(b) Should have a switch with safety on /off lock.</p> <p>(c) Battery - 12 V Min H batteries.</p> <p>(d) Burn time: 60 Min with 50W bulb.</p> <p>(e) Operating depth: 100 mtr min.</p> <p>(f) Should have a fast charger (115/220V) facility.</p>	
23.	Torch Rechargeable Medium (10W)	<p>(a) Should have anodized aluminum cylinder/plastic rubberized water proof housing, incorporating the battery pack and all electronic control system.</p> <p>(b) Should have a switch with safety on /off lock.</p> <p>(c) Rechargeable battery pack.</p> <p>(d) Burn time: 100 Min with 10W bulb.</p> <p>(e) Operating depth: 60 mtr min.</p> <p>(f) Should have a fast charger (115/220V) facility.</p>	
24.	Titanium Dive knife	<p>(a) Material – Titanium alloy blade.</p> <p>(b) Blade Length – 140 mm (5.6 inch) +/- 10 %.</p> <p>(c) Thickness 4 mm (16inch) +/- 10 %.</p> <p>(d) Should have one cutting edge and serrated saw cutting edge with line cutting notch.</p> <p>(e) Should have ABS plastic sheath with double lock safety system.</p>	
25.	Dive tables	<p>(a) Should be usable for both air and nitrox diving (can be separate cards or air and nitrox tables printed on reverse) as approved by PADI.</p> <p>(b) Material - plastic water proof card.</p>	
26.	Spare Mouthpiece	Should be compatible with and of the same make and quality as the supplied with regulator 2 <sup>nd</sup> stage.	
27.	Hose Clamps	<p>(a) Used to securely fix HP and LP hoses.</p> <p>(b) Material – brass /steel /plastic.</p>	
28.	Weight Belt with stainless Steel quick release buckle	<p>(a) Belt should be of polypropylene material.</p> <p>(b) Should have 6 to 8 housings assembled into rubber buckets.</p>	

		(c) Should have a stainless steel quick release buckle. (d) Each bucket should be able to accept 100 gms to 750 gms lead / plastic weight.	
29.	Spare quick release fin buckle	Should be compatible with and of the same make and quality as the supplied long and medium fins.	
30.	Spare rubber Knife strap	Should be compatible with and of the same make and quality as the supplied knife straps.	
31.	Stainless steel Multi tool	(a) Should provide minimum 12 different stainless steel O ring picks to hold and remove stubborn O ring. (b) All picks should fold neatly in to the main body. (c) Dimension when closed 14x5x4.5 x3.8 cm + - 10%. (d) Total pick to include :- (i) 90 degree (ii) Straight (iii) Curved (iv) Complex (v) Thirst (vi) Small hook (vii) Hook (vi) 60 degree (vii) Small complex (viii) Double angle (ix) Combination (x) Small double angle	
32.	Regulator tool kit including O ring kit	(a) Tool kit should be of the same make and coy as that of 1 st stage and 2 <sup>nd</sup> stage regulator. (b) User should be able to disassemble and assemble the regulators for servicing.	
33.	Silicon Grease	(a) Should be usable under water diving equipment to provide lubrication w/o any chemical reacting/corrosion. (b) Should be solvent based. (c) Should be chemically inert. (d) Should have low coefficient of friction. (e) Should be thermally stable for normal diving purpose.	
34.	Under water Comn Sys (Used with FFM full face mask .	(a) DUCS (diver underwater communication system). (b) Handset and boom micro phone - 01. (c) Portable surface unit - 01. (d) Diver air phone /MIC assembly – 02. (e) Communication rope 50 mtr – 02. (f) Surface Unit In put voltage 12V DC. (g) In put current 600 m A PEAK. (h) Idle current 30 MA. (i) Power output 2W RMS. (j) Frequency response 600 Hz, 10 K z. (k) Communication rope (Nylon with for gage wires in centre). (l) Battery (AA- ALKALINE Life 12 Hrs). (m) Microphone – dynamic pressure compensation up to 245 FSW (n) Portable surface Unit. (o) WUCS (Wireless under Water Communication System). (p) Nominal Range 50 mtr to 500 mtr. (q) Transmission type Ultrasound and single band. (r) Frequency – 32.768 Khz Audio bandwidth 300 to 3000 Hz. (s) Automatic gain control - 80 Db. (t) Airphone Mic FM II Model (Dynamic). (u) Tranducer. (v) Maximum Operating depth up to 55 mtr. (w) Weight – 8 oz maximum.	

35.	"O" Ring Set	(a) Rubber type (b) Size-Ring type	
36.	Dive bag medium (Water proof )	(a) Water proof fabric with taped seams, water proof zipper and of durable bag design. (b) Material – heavy duty PVC (Tarpaulin) fabric. (c) Zipper should be YKK salt water resistant with double slider. (d) Main compartment to have a U- Shaped top zipper, one zippered and two velcro pockets in side. (e) Should have padded shoulder strap for easy carrying. (f) Should have side handles. (g) Capacity- 125 L minimum. (h) Weight empty – 1 to 1.5 kg.	
37.	Surface Pressure guage(with din and yoke converter)	(a) Allow quick check of the tank pressure on surface. (b) Chrome plated brass body. (c) Should have a scale to 300 bar.	
38.	Water proof buoyancy control bags to carrying out eqpt under water (Alison bags )	(a) Should be of water proof fabric with taped seams, water proof zipper. (b) Material – heavy duty PVC (Tarpaulin) fabric in black color. (c) Zipper should be YKK salt water resistant with double slider. (d) Should have inflation /deflation system which can control the buoyancy of the bag under water. (e) Should have padded shoulder strap for easy carrying. (f) Should have side handles. (g) Capacity- 125 L minimum.	
39.	Wrist compass	(a) Water proof case & 55 mm with damping fluid. (b) Luminescent dial. (c) Rubber protection integrated to the strap. (d) Side viewing window. (e) Adjustable rubber strap with stainless steel buckles. (f) Graduated bezel 360 <sup>0</sup> . (g) Rose graduated with lubber line and an indication of the four cardinal points.	
40.	Weight 1 Kg/2Kg	(a) Weight 1kg/2kg. (b) LED White Metal. (c) Size - Square type. (d) Should have a must hole.	
41.	Lead sinker 50 Kgs,20 Kgs and 5Kgs	(a) LED White Metal. (b) Sling ship and a through hole. (c) Weight - 50kg, 20 kg,10kg.	
42.	GPS (Under Water)	(a) 50 Mtr depth. (b) Should give position in latitude, longitude and GRs. (c) GPS Accuracy 2 mtr or less. (d) Should be able to save way point – minimum 50. (e) Export of Navigation data to computer. (f) Power backup minimum 72 hrs. (g) GPS gateway antenna. (h) Wrist unit (Diver unit).	
43.	Underwater camera	(a) 100 mtr depth. (b) Video and photo mode. (c) IR source for low light condition. Expandable Memory slot up to 8 GB. Helmet /head and wrist mounting. HD + recording should have lush/dive light – minimum 2000 luminous. Full shield body with Wi-fi connectivity.	
44.	Miscellaneous	All the sets to be provided with following:	

		<ul style="list-style-type: none"><li>(a) Brochures and literatures of all equipments.</li><li>(b) Training manuals in soft and hard copies.</li><li>(c) Maintenance manual (daily, weekly and yearly).</li><li>(d) In situ training on all equipments to be arranged by the OEM. Duration and number of trainees to be intimated by the user at the time of tendering.</li></ul>	
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**DRAFT QRs & TD FOR SCUBA DIVING SET WITH COMPLETE EQUIPMENT AND ACCESSORIES**

Ser No	Specifications	Parameters	Trial Directives																																																															
1.	<p>(a) <b>Parameters for both Diving Set Open Circuit Type and Closed Circuit Type have been elucidated below. User force to choose the type of set at the time of tendering based on Operational requirement. User to specify the type and number of each set at the time tendering.</b></p> <p>(b) <b>All equipments to be under service with any Special/Security/Armed Forces around the world, and should not be under research and development stage.</b></p>																																																																	
2.	One set of Scuba Diving Set will comprise of following equipments:																																																																	
	<table border="1"> <thead> <tr> <th data-bbox="197 517 293 587">Ser No</th> <th data-bbox="293 517 954 587">Equipment</th> <th data-bbox="954 517 1146 587">Qty in One Set</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="197 587 1146 624"><b>For Open Circuit Type Only</b></td> </tr> <tr> <td data-bbox="197 624 293 660">(a)</td> <td data-bbox="293 624 954 660">Air Set/Scuba Tank (Open Circuit Type)</td> <td data-bbox="954 624 1146 660">01 Nos</td> </tr> <tr> <td data-bbox="197 660 293 697">(b)</td> <td data-bbox="293 660 954 697">BA Compressor CTP 200 Capacity</td> <td data-bbox="954 660 1146 697">01 Nos</td> </tr> <tr> <td data-bbox="197 697 293 734">(c)</td> <td data-bbox="293 697 954 734">Regulator 1<sup>st</sup> Stage</td> <td data-bbox="954 697 1146 734">01 Nos</td> </tr> <tr> <td data-bbox="197 734 293 770">(d)</td> <td data-bbox="293 734 954 770">Regulator 2<sup>nd</sup> Stage</td> <td data-bbox="954 734 1146 770">01 Nos</td> </tr> <tr> <td data-bbox="197 770 293 807">(e)</td> <td data-bbox="293 770 954 807">Low Pressure Hose</td> <td data-bbox="954 770 1146 807">01 Nos</td> </tr> <tr> <td data-bbox="197 807 293 844">(f)</td> <td data-bbox="293 807 954 844">High Pressure Hose</td> <td data-bbox="954 807 1146 844">01 Nos</td> </tr> <tr> <td data-bbox="197 844 293 880">(g)</td> <td data-bbox="293 844 954 880">DIN/Yok Converter</td> <td data-bbox="954 844 1146 880">01 Nos</td> </tr> <tr> <td data-bbox="197 880 293 917">(h)</td> <td data-bbox="293 880 954 917">Hose Protector</td> <td data-bbox="954 880 1146 917">01 Nos</td> </tr> <tr> <td data-bbox="197 917 293 954">(j)</td> <td data-bbox="293 917 954 954">Buoyancy Compensative Device (BCD)</td> <td data-bbox="954 917 1146 954">01 Nos</td> </tr> <tr> <td data-bbox="197 954 293 991">(k)</td> <td data-bbox="293 954 954 991">Snorkel</td> <td data-bbox="954 954 1146 991">01 Nos</td> </tr> <tr> <td data-bbox="197 991 293 1043">(m)</td> <td data-bbox="293 991 954 1043">Console – Pressure Gauge + Dive Computer + Compass (including PC interface)</td> <td data-bbox="954 991 1146 1043">01 Nos</td> </tr> <tr> <td data-bbox="197 1043 293 1080">(n)</td> <td data-bbox="293 1043 954 1080">Deco Stop Parachute</td> <td data-bbox="954 1043 1146 1080">01 Nos</td> </tr> <tr> <td data-bbox="197 1080 293 1144">(o)</td> <td data-bbox="293 1080 954 1144">Wrist Slate</td> <td data-bbox="954 1080 1146 1144">1 Nos per 2 sets</td> </tr> <tr> <td data-bbox="197 1144 293 1214">(p)</td> <td data-bbox="293 1144 954 1214">Survival Sausage</td> <td data-bbox="954 1144 1146 1214">1 Nos per 2 sets</td> </tr> <tr> <td data-bbox="197 1214 293 1251">(q)</td> <td data-bbox="293 1214 954 1251">Hose Protector</td> <td data-bbox="954 1214 1146 1251">04 Nos</td> </tr> <tr> <td data-bbox="197 1251 293 1321">(r)</td> <td data-bbox="293 1251 954 1321">Regulator Tool Kit including O Ring kit</td> <td data-bbox="954 1251 1146 1321">01 Nos per 06 sets</td> </tr> <tr> <td data-bbox="197 1321 293 1358">(s)</td> <td data-bbox="293 1321 954 1358">Wreck Reel (Auto Stop Type, 270 ft)</td> <td data-bbox="954 1321 1146 1358">01 Nos</td> </tr> <tr> <td data-bbox="197 1358 293 1428">(t)</td> <td data-bbox="293 1358 954 1428">Surface Pressure Gauge (with DIN and Yoke converter)</td> <td data-bbox="954 1358 1146 1428">01 Nos per 06 sets</td> </tr> <tr> <td data-bbox="197 1428 293 1492">(u)</td> <td data-bbox="293 1428 954 1492">Dive Computer</td> <td data-bbox="954 1428 1146 1492">01 Nos per 02 sets</td> </tr> </tbody> </table>	Ser No	Equipment	Qty in One Set	<b>For Open Circuit Type Only</b>			(a)	Air Set/Scuba Tank (Open Circuit Type)	01 Nos	(b)	BA Compressor CTP 200 Capacity	01 Nos	(c)	Regulator 1 <sup>st</sup> Stage	01 Nos	(d)	Regulator 2 <sup>nd</sup> Stage	01 Nos	(e)	Low Pressure Hose	01 Nos	(f)	High Pressure Hose	01 Nos	(g)	DIN/Yok Converter	01 Nos	(h)	Hose Protector	01 Nos	(j)	Buoyancy Compensative Device (BCD)	01 Nos	(k)	Snorkel	01 Nos	(m)	Console – Pressure Gauge + Dive Computer + Compass (including PC interface)	01 Nos	(n)	Deco Stop Parachute	01 Nos	(o)	Wrist Slate	1 Nos per 2 sets	(p)	Survival Sausage	1 Nos per 2 sets	(q)	Hose Protector	04 Nos	(r)	Regulator Tool Kit including O Ring kit	01 Nos per 06 sets	(s)	Wreck Reel (Auto Stop Type, 270 ft)	01 Nos	(t)	Surface Pressure Gauge (with DIN and Yoke converter)	01 Nos per 06 sets	(u)	Dive Computer	01 Nos per 02 sets		To be physically checked by the BOO.
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(v)	Surface marker buoy	01 Nos per 02 sets
(w)	Test wench	01 Nos per 12 sets
<b><u>For Closed Circuit Type Only</u></b>		
(a)	Close Circuit Pure Oxygen Pack	01 Nos
(b)	Harness for Mounting Cylinder and Accessories	01 Nos
(c)	Regulator Unit	01 Nos
(d)	Breathing Bag	01 Nos
(e)	Oxygen Supply System	01 Nos
(f)	CO <sub>2</sub> Removal System	01 Nos
(g)	Oxygen Material	01 Nos
(h)	Oxygen Charging Adaptor	01 Nos
(j)	Pressure Test Gauge	01 Nos
(k)	Tool Kit for the close circuit Set	01 Nos
(l)	Manual Booster Pump/Elect Booster pump	01 Nos per
(m)	Large Oxygen Cylinder	01 Nos per 05 Sets
(n)	CO <sub>2</sub> Observer	01 Nos per 02 sets
<b><u>Equipments Common for Both Type of Sets</u></b>		
(a)	Buddy line	01 Nos per 02 sets
(b)	Life line (50 mtr reel.	01 Nos per 04 sets
(c)	Buoyancy Compensative Device (BCD)	01 Nos
(d)	Full Face Mask/Half Face mask	01 Nos
(e)	Free Diving Long Fin with Adjustable Straps	01 Nos
(f)	Medium Size Fins with Adjustable Straps	01 Nos
(g)	Wet Suit with Hood – 7mm	01 Nos
(h)	Wet Suit with Hood – 5mm FX	01 Nos
(j)	Wet Suit with Hood – 3mm FX	01 Nos
(k)	Wet Suit without Hood – 3mm FX	01 Nos
(m)	Wet Suit without Hood – 5mm FX	01 Nos
(n)	Wet Suit without Hood – 7mm	01 Nos
(o)	Diving Gloves – 3mm	01 Nos
(p)	Diving Gloves – 5mm	01 Nos
(q)	Semi Dry Diving Gloves – 5mm	01 Nos
(r)	Semi Dry Diving Booties High Ankle – 5mm Double Lined (reinforced toe and heel)	01 Nos

(s)	Diving Booties High Ankle – 4.5mm (reinforced toe and heel)	01 Nos		
(t)	Dry Suit with Hood	01 Nos		
(u)	Dry Suit Liner with Hood	01 Nos		
(v)	Spare Straps of face mask – clear silicon	02 Nos		
(w)	Spare Straps of Long Fins of spring type	02 Nos		
(x)	Spare Straps of Medium Fins	02 Nos		
(aa)	Torch Rechargeable Large (50W) with charger	01 Nos per 02 Sets		
(ab)	Torch Rechargeable Medium (10W) with charger	01 Nos per 02 Sets		
(ab)	Titanium Divers Knife	01 Nos		
(ac)	Diver Tables	01 Nos per 02 Sets		
(ad)	Spare Mouthpiece	01 Nos		
(ae)	Hose Clamps	01 Nos		
(af)	Weight Belt with Stainless Steel Quick Release Buckle	01 Nos		
(ag)	Spare Quick Release Fin Buckle	04 Nos		
(ah)	Spare Rubber Knife Strap	02 Nos		
(aj)	Stainless Steel Multi Tool	01 Nos per 04 Sets		
(ak)	Regulator Tool Kit including O Ring kit	01 Nos per 06 sets		
(al)	Silicon Grease	01 Nos		
(am)	Under water communication sys (used with FFM full face mask. One can use them with Divator 324.	01 Nos per 04 Sets		
(an)	'O' Ring Kit	01 Nos per 04 sets		
(ao)	Dive Bag Medium (water proof)	01 Nos per 02 set		
(ap)	Surface Pressure Gauge (with DIN and Yoke converter)	01 Nos per 06 sets		
(aq)	Waterproof buoyancy control bags to carry out equipment underwater (Alision bags)	01 Nos		
(ar)	Wrist compass	01 Nos per 02 sets		
(as)	Diver Computer	01 Nos per 02 sets		
(at)	Weight 1kg/2kg	03 kgs		

	(au)	Lead sinker 50kgs,20kgs,5kgs	01 Nos per 03 Sets		
	(av)	Surface marker buoy	01 Nos per 02 sets		
	(aw)	GPS	01 Nos per 02 sets		
	(ax)	Underwater camera	01 Nos		

**OPERATIONAL PARAMETERS OF EACH ITEM DESCRIBED BELOW**

**Equipments for Open Circuit Type Only.**

1.	Air Set/Scuba Tank (Open Circuit Type)	<p>(a) Tank material –Stainless Steel/Aluminum/Carbon Fiber or a composite alloy of the same).</p> <p>(b) Tank internal volume- Maximum - 12 ltr, minimum 08 to 10 ltrs.</p> <p>(c) Tank to be supplied with 300 bar DIN (7 thread G5/8) Valve fitting.</p> <p>(d) Weight on land (empty)-16 kg maximum.</p> <p>(e) To be supplied with tank mesh, tank handles and tank boot or rubber/plastic.</p> <p>(f) Tank to have stamp/markings of OEM on shoulder, carrying required inspection and safety related information.</p> <p>(g) Equipment should be in service with Special Forces/Armed Forces around the world and should not be under development/trial stage.</p>	<p>For points (a), (b) and (c) OEM to provide certificate from an National/International/NABL certified lab. The same to be physically verified by the BOO.</p> <p>Points (d), (e) and (f) to be physically checked by the BOO.</p> <p>OEM to provide certificate certifying point (g) and the same to be physically verified by the BOO.</p>
2.	BA Compressor CTP 200	<p>(a) Intake pressure- 1+.02 bar.</p> <p>(b) Rated over pressure 350 bar.</p> <p>(c) Filling rate (0 to 200 bars) 200 ltrs/minute.</p> <p>(d) Number of stage – 03.</p> <p>(e) Number of cylinder 03.</p> <p>(f) <u>Intermediate over pressure</u></p> <p>(i) 1 st stage -7 bar.</p> <p>(ii) 2<sup>nd</sup> stage – 40-46 bar.</p> <p>(g) <u>Setting of target</u></p> <p>(i) Pressure safety valve- 225 – 330 bar.</p> <p>(ii) Temperature - + 50 C to 450 C</p> <p>(iii) Maximum Angle – 5<sup>0</sup></p>	<p>To be demonstrated by the OEM and the same to be physically checked by the BOO.</p>



3.	Regulator 1 <sup>st</sup> Stage	<ul style="list-style-type: none"> <li>(a) Air balanced flow-through piston.</li> <li>(b) Titanium Body.</li> <li>(c) Anti freeze protection.</li> <li>(d) Externally adjustable intermediate pressure.</li> <li>(e) Low pressure ports-5 on shiver turret.</li> <li>(f) High pressure Ports-02.</li> <li>(g) Tank Connection-DIN 300 Bar.</li> <li>(h) Weight Maximum 350 gms+/-10%.</li> <li>(i) Air flow at 200 Bar&gt;8500L/Min-301 SCFM.</li> <li>(j) Intermediate Pressure-9-9.8 Bar-130-142 psi.</li> </ul>	<p>Points (a) to (h) to be physically checked by the BOO.</p> <p>Points (j) &amp; (k) to be demonstrated by the OEM and the same to be physically checked by the BOO.</p>
4.	Regulator 2 <sup>nd</sup> stage	<ul style="list-style-type: none"> <li>(a) Air balance valve.</li> <li>(b) Diver adjustable inhalation effort.</li> <li>(c) Full metal valve housing.</li> <li>(d) Weight Maximum 160 gms +/- 10%.</li> <li>(e) Air Flow at 200 Bar-1850 L/Min-66 SCFM.</li> <li>(f) Maximum Low Pressure-14 Bar/203 psi.</li> </ul>	<p>Points (a) to (d) to be physically checked by the BOO.</p> <p>Points (e) &amp; (f) to be demonstrated by the OEM and the same to be physically checked by the BOO.</p>
5.	Low Pressure Hose	<ul style="list-style-type: none"> <li>(a) Length – Minimum 210 cm.</li> <li>(b) Should be compatible with Regulator 1<sup>st</sup> and 2<sup>nd</sup> stage.</li> </ul>	To be physically checked by the BOO.
6.	High Pressure Hose	<ul style="list-style-type: none"> <li>(a) Length – Minimum 210 cm.</li> <li>(b) Should be compatible with Regulator 1<sup>st</sup> and 2<sup>nd</sup> stage.</li> </ul>	To be physically checked by the BOO.
7.	DIN//Yoke Converter	<ul style="list-style-type: none"> <li>(a) Should be easy to mount without any tools.</li> <li>(b) Should fit on both standard configuration of DIN and Yoke.</li> </ul>	To be physically checked by the BOO.
8.	Hose Protector	<ul style="list-style-type: none"> <li>(a) Should have internal ribbing on the protector for flushing under the protector to avoid hose damage.</li> <li>(b) Should have external baffles which help natural progressive bend of hose enduring real hose protection.</li> <li>(c) Should including spare O rind holder.</li> </ul>	To be physically checked by the BOO.
9.	Buoyancy Compensative Devise (BCD)	<ul style="list-style-type: none"> <li>(a) Material – 420 denier nylon/polythene outer shell.</li> <li>(b) Backpack should be Semi rigid with 2 pinch clip straps.</li> <li>(c) Should have adjustable harness.</li> <li>(d) Should have adjustable waist straps.</li> <li>(e) Should have rear trim weight pockets (2x2.5KG) and front integrated weight pockets (2x5kg).</li> <li>(f) Should have an integrated weight ditching system.</li> <li>(g) Should have minimum two top dump valves and one real dump valve.</li> <li>(h) Should have built-in power dump inflator.</li> <li>(i) Should have two large zip pockets.</li> <li>(j) Should have knife housing.</li> <li>(k) Should have minimum four D-rings.</li> <li>(l) Should be supplied with a travel bag.</li> </ul>	To be physically checked by the BOO.

10.	Snorkel	<ul style="list-style-type: none"> <li>(a) Anatomic curvy semi-rigid barrel.</li> <li>(b) Adjustable loop for masks strap connection.</li> <li>(c) Inner diameter 22 mm.</li> <li>(d) Length 35 cm approximate.</li> <li>(e) Material : <ul style="list-style-type: none"> <li>(i) PVC barrel.</li> <li>(ii) Silicone mouthpiece.</li> <li>(iii) ABS plastic loop.</li> </ul> </li> <li>(f) Colors :- <ul style="list-style-type: none"> <li>(i) Black barrel.</li> <li>(ii) Clear mouthpiece.</li> <li>(iii) Safety orange sticker.</li> </ul> </li> </ul>	To be physically checked by the BOO.
11	Console- Pressure Gauge+ Dive Computer +Compass (including PC interface)	<ul style="list-style-type: none"> <li>(a) Dive Computer to include following features :- <ul style="list-style-type: none"> <li>(i) Electronic Depth gauge.</li> <li>(ii) Should display all data needed from diving with dive table-current depth maximum depth achieved, dive time, ascent rate, surface interval time, dive profile etc for both air and other gas blends.</li> <li>(iii) Should have back lighting.</li> <li>(iv) Should have navigation mode.</li> <li>(v) Should have a PC and Mac interface for setting up the instrument downloading dive profile and uploading data in preparation for navigation mode diving.</li> <li>(vi) Should be usable to an operating depth of 120 mtr.</li> <li>(vii) Should have a user-replaceable battery.</li> </ul> </li> <li>(b) Compass :- <ul style="list-style-type: none"> <li>(i) Day compass.</li> <li>(ii) Suitably illuminated for night time usage.</li> </ul> </li> <li>(c) Pressure gauge - Should be able to be used on tanks pressurized to 300 bar and be compatible with standard HP hose that is being supplied with the equipment.</li> </ul>	To be demonstrated by the OEM and the same to be physically checked by the BOO.
12.	Deco Stop Parachute	<ul style="list-style-type: none"> <li>(a) Should be compact.</li> <li>(b) Should be of orange color.</li> <li>(c) Should be able to be packed into a small package.</li> <li>(d) Should have a Snap clip allowing it to be mounted on BCD tags/D Rings.</li> </ul>	To be physically checked by the BOO.
13.	Wrist Slate.	<ul style="list-style-type: none"> <li>(a) Should have mounting straps for wrist.</li> <li>(b) Should have minimum three plastic plates.</li> <li>(c) Should be supplied with waterproof pencil/ writing source attached to slate.</li> </ul>	To be physically checked by the BOO.

14.	Survival sausage.	(a) Material – 210 denier nylon. (b) Dimensions (i) Diameter – 13 cms. (ii) Length – 114 cms.	To be physically checked by the BOO.
15.	Hose Protector	(a) Should have internal ribbing on the protector for flushing under the protector to avoid hose damage. (b) Should have external baffles which help natural progressive bend of hose enduring real hose protection. (c) Should include spare O ring holder.	To be physically checked by the BOO.
16.	Regulator Tool Kit including O Ring Kit	(a) Tool kit should be of the same make and company as that of Regulator 1 <sup>st</sup> stage and Regulator 2 <sup>nd</sup> stage. (b) Should be able to disassemble and assemble the supplied regulators for servicing.	To be physically checked by the BOO.
17.	Wreck Real (Auto Stop Type, 270 ft)	(a) Frame to be of high resistance anodized alloy frame with nylon fiberglass real and handle. (b) Auto stop – friction adjuster for breaking action or to prevent free reeling. (c) To have a quick adjustment feature on handle for either free rotation or with two friction positions. (d) Length-90 mtr/270 ft of 2mm diameter polyester line.	To be physically checked by the BOO.
18.	Surface Pressure Gauge (with DIN and Yoke converter)	(a) Should allow for a quick check of the tank pressure on surface. (b) Chrome plated brass body. (c) Should be in DIN configuration. (d) Should have a scale of 300 bar.	To be physically checked by the BOO.
19.	Wrist Dive Computer	(a) Maximum diving time: 9h 59 Min. (b) Automatic altitude compensation. Maximum altitude: 4 to 70m/14000 ft. (c) Maximum operating depth: 120m/400 fit. (d) Operating temperature in water: - 2 <sup>o</sup> c to 35 <sup>o</sup> C/ Out of water – 6 <sup>o</sup> c to 60 <sup>o</sup> c. (e) Low consumption electroluminescent back lighting (activation by push button). (f) Manual or automatic switching on. (g) Battery: 1-3 VDC type CR 2450 Li. (h) Shelf life: Minimum 5 yrs. (i) Battery. Life expectancy (with 50 % back life constantly on): Minimum 50 hrs in Navigation mode. (j) Number of recorded dives: 24 most recent. (k) Data uploading /downloading throw PC Interface. (l) PC displaying: Recorded dive profiles /pre loading navigation data.	Points (a), (e), (f), (k), (l) and (m) to be physically checked by the BOO.  Points (b), (c), (d), (g) and (j) OEM to provide certificate from National/International/NABL certified laboratory and the same to be physically verified by the BOO.
20.	Surface Marker Buoy	(a) Surface buoy for signaling. (b) Inflatable with check valve. (c) Halyard attachment (i) Diameter – 305 mm. (ii) Length – Minimum 30 mtrs.	To be demonstrated by the OEM and the same to be physically checked by the BOO.

		<ul style="list-style-type: none"> <li>(iii) Color – Orange.</li> <li>(d) Background ballast water compartment.</li> <li>(e) Clamp for the lower part.</li> <li>(f) Removable diving flag.</li> <li>(g) Dimensions <ul style="list-style-type: none"> <li>(i) Diameter – maximum 400mm.</li> <li>(ii) Maximum – 350 mm.</li> </ul> </li> </ul>	
21.	Test Wench	<ul style="list-style-type: none"> <li>(a) Test wench for all diving equipments.</li> <li>(b) Regulator 1<sup>st</sup> and 2<sup>nd</sup> Stage.</li> <li>(c) Pressure hose.</li> <li>(d) Din/ Yok Converter.</li> </ul>	To be physically checked by the BOO.

**For Closed Circuit Type Only.**

1.	Close Circuit Pure Oxygen Pack	<ul style="list-style-type: none"> <li>(a) The set should enable re-breathing of pure oxygen after safe removal of exhaled CO2.</li> <li>(b) The diving set should be rugged military standard, lightweight suitable for carrying by a single person.</li> <li>(c) The set should comprise of following :- <ul style="list-style-type: none"> <li>(i) Closed circuit Pure oxygen pack.</li> <li>(ii) Harness (Basic structure on which the cylinders are mounted and other accessories of the set are fitted)</li> <li>(iii) Regulator unit.</li> <li>(iv) Breathing Bag.</li> <li>(v) O2 supply system.</li> <li>(vi) CO2 removal system.</li> <li>(vii) Oxygen bottle.</li> </ul> </li> <li>(d) Additional Features. Set should be supplied with :- <ul style="list-style-type: none"> <li>(i) Oxygen charging adaptor.</li> <li>(ii) Pressure test gauge.</li> <li>(iii) Tool kit for the closed circuit set.</li> <li>(iv) Manual Booster pump for filling of oxygen into cylinder @ one per three sets.</li> <li>(iv) Large oxygen cylinder.</li> <li>(v) CO2 Observer.</li> </ul> </li> </ul>	To be physically checked by the BOO.
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**Equipments Common for Both Type of Sets.**

1.	Buddy Line	<ul style="list-style-type: none"> <li>(a) Length – Minimum 2 mtrs.</li> <li>(b) Should have harness and brass clasps on both ends.</li> <li>(c) Material Nylon.</li> </ul>	To be physically checked by the BOO.
2.	Life Line (50 mtr reel)	<ul style="list-style-type: none"> <li>(a) Length 50 mtr minimum.</li> <li>(b) Should have adjustable rugged lanyard.</li> <li>(c) Should have brass hook carabineer.</li> <li>(d) Material of body fiberglass reinforced plastic.</li> </ul>	To be physically checked by the BOO. OEM to provide certificate regarding material of body and reel.

		(e) Material of reel –Nylon. (f) Diameter of line – 2 to 2.2 mm.	
3.	Full Face Mask/Half Face Mask	(a) Should have dual lens mask with a double watertight skirt. (b) Should have quick adjustable swiveling buckles. (c) Should have double safety head straps. (d) Material : (i) Skirt black silicon rubber. (ii) Strap black silicon rubber. (iii) Lens: tempered glass 4 mm thick. (iv) Main frame: Polycarbonate (PC) molded plastic. (v) Buckles: ABS molded plastic. (e) Frame Size. (i) Height maximum 70 mm. (ii) Width maximum 155 mm. (iii) Closest position from face 26 mm.	Points (a), (b), (c) and (e) to be physically checked by the BOO.  Points (d) OEM to provide certificate from National/International/NABL certified laboratory, and the same to be physically verified by the user.
4.	Free Diving Long Fin with Adjustable Straps.	(a) Length of blade – 48 to 52 cms. (b) Material. (i) Foot and blade to be made of high quality abrasion resistant rubber. (ii) Ankle straps to be made of high quality abrasion resistant black rubber.	OEM to provide certificate for the same.
5.	Medium size Fin with Adjustable Straps	(a) To be fitted with heel adjustable straps. (b) Material. (i) Blade made with copolymer molded plastic (E.V.A). (ii) Shoes and straps are made with synthetic molded rubber. (iii) Adjustable buckles are made with A.B.S and polycarbonate molded plastic. (c) Colors. (i) Black Blades. (ii) Black shoes. (d) Length of blade – 43 to 48 cms.	To be physically checked by the BOO. OEM to provide national/international/NABL certified laboratory certifying the material of the equipment, the same to be physically verified by the user.
6.	Wet Suit with Hood - 7mm	(a) One piece design in 7mm of thickness. (b) Preformed Elaskin neoprene Jersey with Fireskin interior around the mid section. (c) Embossed “Flex System “behind the elbows and knees “Supratex” reinforcement on hard wearing areas. (d) “Elaskin” Double seals around the wrist and ankles “G” Lock rear zipper.	To be demonstrated by the OEM and the same to be physically verified by the BOO. OEM to provide national/international/NABL certified laboratory certifying the material of the equipment, the same to be physically verified by the user.

7.	Wet Suit with Hood - 5mm FX	(a) Microcell neoprene foam, 5mm thick, double lined with full Nylon 70 deniers. (b) Black binding stretch tape 24mm wide. (c) Heat glued reinforcement pads on knees.	OEM to provide national/international/NABL certified laboratory and the same to be physically verified by the user.
8.	Wet Suit with Hood - 3mm FX	(a) Microcell neoprene foam, 3mm thick, double lined with full Nylon 70 deniers. (b) Black binding stretch tape 24mm wide. (c) Heat glued reinforcement pads on knees.	
9.	Wet Suit without Hood - 3mm FX	(a) Microcell neoprene foam, 3mm thick, double lined with full Nylon 70 deniers. (b) Black binding stretch tape 24mm wide. (c) Heat glued reinforcement pads on knees.	
10.	Wet Suit without Hood - 5mm FX	(a) Microcell neoprene foam, 5mm thick, double lined with full Nylon 70 deniers. (b) Black binding stretch tape 24mm wide. (c) Heat glued reinforcement pads on knees.	
11.	Wet Suit without Hood - 7mm	(a) One piece design in 7mm of thickness. (b) Preformed Elaskin neoprene Jersey with Fireskin interior around the mid section. (c) Embossed "Flex System" behind the elbows and knees "Supratex" reinforcement on hard wearing areas. (d) "Elaskin" Double seals around the wrist and ankles "G" Lock rear zipper.	To be demonstrated by the OEM and the same to be physically verified by the BOO. OEM to provide national/international/NABL certified laboratory certifying the material of the equipment, the same to be physically verified by the user.
12.	Diving Gloves- 3 mm	(a) Material Neoprene. (b) Thickness – 3 mm. (c) Anti slip material.	To be physically checked by the BOO. OEM to provide certificate regarding material of the equipment.
13.	Diving Gloves- 5mm	(a) Material Neoprene. (b) Thickness – 5 mm. (c) Anti slip material.	To be physically checked by the BOO. OEM to provide certificate regarding material of the equipment.
14.	Semi Dry Diving Gloves- 5mm	(a) Material Neoprene. (b) Thickness – 5 mm. (c) Elaskin neoprene with double 2.5mm seals.	To be physically checked by the BOO. OEM to provide certificate regarding material of the equipment.
15.	Semi Dry Diving Booties High Ankle-5mm Double Lined (reinforced toe and heel)	(a) Shoes to be made of synthetic material that can be used in water and also on land for prolonged period, while retaining its shape and dimensions to normal boots thus allowing to be used in tandem with adjustable fins. (b) Inside material to be thermal 5mm neoprene sock. (c) Sole-Over molded elastomeric stiff sole with studs. (d) Should have protective reinforcement pads in the foot's toe and heel. (e) Should have a low support ankle in synthetic fabric. (f) Should have a comfortable five points lacing up interlock the foot to the sole sizes-7 to 10.	To be physically checked by the BOO. OEM to provide certificate regarding material of the equipment.

16.	Diving booties High Ankle-4.5mm(reinforced toe and heel)	<ul style="list-style-type: none"> <li>(a) Material –Neoprene.</li> <li>(b) Thickness – 4.5 mm.</li> <li>(c) Additional feature- thickened sole, double lined Neoprene zip reinforced to and heal.</li> <li>(d) Size – 7 to 10.</li> </ul>	To be physically checked by the BOO. OEM to provide certificate regarding material of the equipment.
17.	Dry Suit with hood	<ul style="list-style-type: none"> <li>(a) Mtrl – black trilaminate Fabric Polyester/butyl /polyester.</li> <li>(b) Hood –attached 55 mm Neoprene hood with smooth Neoprene face seal.</li> <li>(c) Should have adjustable in side suspenders.</li> <li>(d) Should have latex neck seal with Neoprene protective cover.</li> <li>(e) Should have latex wrist seal with protective cover.</li> <li>(f) Should have an intake vibe on the left groin place to be connected either to D S hose or alternatively to a 0.41 HP air cylinder.</li> <li>(g) Should have dump valve on the left forearm.</li> <li>(h) Should be supplied with low pressure inflating 120 cm hose w/Standard 3/8” frist Stage Connection.</li> <li>(i) Should be supplied with 3 mm Neoprene socks with anti-abrasion soles which can be worn to gather with diving suit.</li> <li>(j) Should have a neoprene pocket with Velcro flab on the upper thigh.</li> <li>(k) Should have anti –abrasion pads on knees elbow shoulders and buttocks.</li> <li>(l) Should be supplied with a carrying bag LP hose Zipper lubricating wax dry suit hanger.</li> </ul>	To be physically checked by the BOO. OEM to provide national/international/NABL certified laboratory certificate regarding material of the equipment.
18.	Dry Suit liner with hood	<ul style="list-style-type: none"> <li>(a) Should be a light weight water repellent breathable, two layer soft material.</li> <li>(b) Should have two slides front zipper.</li> <li>(c) Should have Velcro neck closures.</li> <li>(d) Should have a neoprene pocket with Velcro flap on the upper right thigh.</li> <li>(e) Should have anti –abrasion pads on knees and buttocks.</li> <li>(f) Should have reflective 50 mm tapes on arms and fore arms.</li> <li>(g) Should be supplied with carrying bags.</li> </ul>	To be demonstrated by the OEM and the same to be physically checked by the BOO. OEM to provide national/international/NABL certified laboratory certificate regarding material of the equipment.
19.	Spare Straps of Face mask – clear silicon	Should be compatible with and of the same make and quality as the supplied face mask.	To be physically checked by the BOO.
20.	Spare Straps of Long fins of Spring type	Should be compatible with and of the same make and quality as the supplied long fins.	To be physically checked by the BOO.
21.	Spare Straps of Medium fins	Should be compatible with and of the same make and quality as the supplied Medium fins.	To be physically checked by the BOO.
22.	Torch Rechargeable large (50W) with charger	<ul style="list-style-type: none"> <li>(a) Should have anodized aluminum cylinder incorporating the battery pack and all electronic control system.</li> <li>(b) Should have a switch with safety on /off lock.</li> <li>(c) Battery - 12 V Min H batteries.</li> <li>(d) Burn time: 60 Min with 50W bulb.</li> <li>(e) Operating depth: 100 mtr min.</li> <li>(f) Should have a fast charger (115/220V) facility.</li> </ul>	To be demonstrated by the OEM and the same to be physically checked by the BOO.

23.	Torch Rechargeable Medium (10W)	<p>(a) Should have anodized aluminum cylinder/plastic rubberized water proof housing, incorporating the battery pack and all electronic control system.</p> <p>(b) Should have a switch with safety on /off lock.</p> <p>(c) Rechargeable battery pack.</p> <p>(d) Burn time: 100 Min with 10W bulb.</p> <p>(e) Operating depth: 60 mtr min.</p> <p>(f) Should have a fast charger (115/220V) facility.</p>	<p>To be physically checked by the BOO.</p> <p>In addition OEM to provide national/international/NABL certified lab certificate for point (a).</p>
24.	Titanium Dive knife	<p>(a) Material – Titanium alloy blade.</p> <p>(b) Blade Length – 140 mm (5.6 inch) +/- 10 %.</p> <p>(c) Thickness 4 mm (16inch) +/- 10 %.</p> <p>(d) Should have one cutting edge and serrated saw cutting edge with line cutting notch.</p> <p>(e) Should have ABS plastic sheath with double lock safety system.</p>	<p>Point (a) OEM to provide certificate from national/international/NABL certified laboratory and the same to be verified by the BOO.</p> <p>Points (b) to (e) to be physically checked by the BOO.</p>
25.	Dive tables	<p>(a) Should be usable for both air and nitrox diving (can be separate cards or air and nitrox tables printed on reverse) as approved by PADI.</p> <p>(b) Material - plastic water proof card.</p>	<p>PADI approval certificate to be provided by the OEM.</p> <p>To be physically checked by the BOO.</p>
26.	Spare Mouthpiece	Should be compatible with and of the same make and quality as the supplied with regulator 2 <sup>nd</sup> stage.	To be physically checked by the BOO.
27.	Hose Clamps	<p>(a) Used to securely fix HP and LP hoses.</p> <p>(b) Material – brass /steel /plastic.</p>	To be physically checked by the BOO.
28.	Weight Belt with steeliness Steel quick release buckle	<p>(a) Belt should be of polypropylene material.</p> <p>(b) Should have 6 to 8 housings assembled into rubber buckets.</p> <p>(c) Should have a stainless steel quick release buckle.</p> <p>(d) Each bucket should be able to accept 100 gms to 750 gms lead / plastic weight.</p>	To be physically checked by the BOO.
29.	Spare quick release fin buckle	Should be compatible with and of the same make and quality as the supplied long and medium fins.	To be physically checked by the BOO.
30.	Spare rubber Knife strap	Should be compatible with and of the same make and quality as the supplied knife straps.	To be physically checked by the BOO.
31.	Stainless steel Multi tool	<p>(a) Should provide minimum 12 different stainless steel O ring picks to hold and remove stubborn O ring.</p> <p>(b) All picks should fold neatly in to the main body.</p> <p>(c) Dimension when closed 14x5x4.5 x3.8 cm + - 10%.</p> <p>(d) Total pick to include :-</p> <p>(i) 90 degree</p> <p>(ii) Straight</p> <p>(iii) Curved</p> <p>(iv) Complex</p> <p>(v) Thirst</p> <p>(vi) Small hook</p> <p>(vii) Hook</p>	To be physically checked by the BOO.



		<ul style="list-style-type: none"> <li>(vi) 60 degree</li> <li>(vii) Small complex</li> <li>(viii) Double angle</li> <li>(ix) Combination</li> <li>(x) Small double angle</li> </ul>	
32.	Regulator tool kit including O ring kit	<ul style="list-style-type: none"> <li>(a) Tool kit should be of the same make and coy as that of 1 st stage and 2<sup>nd</sup> stage regulator.</li> <li>(b) User should be able to disassemble and assemble the regulators for servicing.</li> </ul>	To be physically checked by the BOO.
33.	Silicon Grease	<ul style="list-style-type: none"> <li>(a) Should be usable under water diving equipment to provide lubrication w/o any chemical reacting/corrosion.</li> <li>(b) Should be solvent based.</li> <li>(c) Should be chemically inert.</li> <li>(d) Should have low coefficient of friction.</li> <li>(e) Should be thermally stable for normal diving purpose.</li> </ul>	OEM to provide national/international accredited laboratory certificate and the same to be physically verified by the BOO.
34.	Under water Comn Sys (Used with FFM full face mask .	<ul style="list-style-type: none"> <li>(a) DUCS (diver underwater communication system).</li> <li>(b) Handset and boom micro phone - 01.</li> <li>(c) Portable surface unit - 01.</li> <li>(d) Diver air phone /MIC assembly – 02.</li> <li>(e) Communication rope 50 mtr – 02.</li> <li>(f) Surface Unit In put voltage 12V DC.</li> <li>(g) In put current 600 m A PEAK.</li> <li>(h) Idle current 30 MA.</li> <li>(i) Power output 2W RMS.</li> <li>(j) Frequency response 600 Hz, 10 K z.</li> <li>(k) Communication rope (Nylon with for gage wires in centre).</li> <li>(l) Battery (AA- ALKALINE Life 12 Hrs).</li> <li>(m) Microphone – dynamic pressure compensation up to 245 FSW</li> <li>(n) Portable surface Unit.</li> <li>(o) WUCS (Wireless under Water Communication System).</li> <li>(p) Nominal Range 50 mtr to 500 mtr.</li> <li>(q) Transmission type Ultrasound and single band.</li> <li>(r) Frequency – 32.768 Khz Audio bandwidth 300 to 3000 Hz.</li> <li>(s) Automatic gain control - 80 Db.</li> <li>(t) Airphone Mic FM II Model (Dynamic).</li> <li>(u) Tranducer.</li> <li>(v) Maximum Operating depth up to 55 mtr.</li> <li>(w) Weight – 8 oz maximum.</li> </ul>	To be demonstrated by the OEM and the same to be physically checked by the BOO.
35.	“O” Ring Set	<ul style="list-style-type: none"> <li>(a) Rubber type</li> <li>(b) Size-Ring type</li> </ul>	To be physically checked by the BOO.

36.	Dive bag medium (Water proof )	<ul style="list-style-type: none"> <li>(a) Water proof fabric with taped seams, water proof zipper and of durable bag design.</li> <li>(b) Material – heavy duty PVC (Tarpaulin) fabric.</li> <li>(c) Zipper should be YKK salt water resistant with double slider.</li> <li>(d) Main compartment to have a U- Shaped top zipper, one zippered and two velcro pockets in side.</li> <li>(e) Should have padded shoulder strap for easy carrying.</li> <li>(f) Should have side handles.</li> <li>(g) Capacity- 125 L minimum.</li> <li>(h) Weight empty – 1 to 1.5 kg.</li> </ul>	To be physically checked by the BOO.
37.	Surface Pressure guage(with din and yoke converter)	<ul style="list-style-type: none"> <li>(a) Allow quick check of the tank pressure on surface.</li> <li>(b) Chrome plated brass body.</li> <li>(c) Should have a scale to 300 bar.</li> </ul>	To be physically checked by the BOO.
38.	Water proof buoyancy control bags to carrying out eqpt under water (Alison bags )	<ul style="list-style-type: none"> <li>(a) Should be of water proof fabric with taped seams, water proof zipper.</li> <li>(b) Material – heavy duty PVC (Tarpaulin) fabric in black color.</li> <li>(c) Zipper should be YKK salt water resistant with double slider.</li> <li>(d) Should have inflation /deflation system which can control the buoyancy of the bag under water.</li> <li>(e) Should have padded shoulder strap for easy carrying.</li> <li>(f) Should have side handles.</li> <li>(g) Capacity- 125 L minimum.</li> </ul>	To be demonstrated by the OEM and the same to be physically checked by the BOO.
39.	Wrist compass	<ul style="list-style-type: none"> <li>(a) Water proof case &amp; 55 mm with damping fluid.</li> <li>(b) Luminescent dial.</li> <li>(c) Rubber protection integrated to the strap.</li> <li>(d) Side viewing window.</li> <li>(e) Adjustable rubber strap with stainless steel buckles.</li> <li>(f) Graduated bezel 360<sup>0</sup>.</li> <li>(g) Rose graduated with lubber line and an indication of the four cardinal points.</li> </ul>	To be physically checked by the BOO.
40.	Weight 1 Kg/2Kg	<ul style="list-style-type: none"> <li>(a) Weight 1kg/2kg.</li> <li>(b) LED White Metal.</li> <li>(c) Size - Square type.</li> <li>(d) Should have a must hole.</li> </ul>	To be physically checked by the BOO.
41.	Lead sinker 50 Kgs,20 Kgs and 5Kgs	<ul style="list-style-type: none"> <li>(a) LED White Metal.</li> <li>(b) Sling ship and a through hole.</li> <li>(c) Weight - 50kg, 20 kg,10kg.</li> </ul>	To be physically checked by the BOO.
42.	GPS (Under Water)	<ul style="list-style-type: none"> <li>(a) 50 Mtr depth.</li> <li>(b) Should give position in latitude, longitude and GRs.</li> <li>(c) GPS Accuracy 2 mtr or less.</li> <li>(d) Should be able to save way point – minimum 50.</li> <li>(e) Export of Navigation data to computer.</li> <li>(f) Power backup minimum 72 hrs.</li> </ul>	To be physically checked by the BOO.

		(g) GPS gateway antenna. (h) Wrist unit (Diver unit).	
43.	Underwater camera	(a) 100 mtr depth. (b) Video and photo mode. (c) IR source for low light condition. Expandable Memory slot up to 8 GB. Helmet /head and wrist mounting. HD + recording should have lush/dive light – minimum 2000 luminous. Full shield body with Wi-fi connectivity.	To be demonstrated by the OEM and the same to be physically checked by the BOO.
44.	Miscellaneous	All the sets to be provided with following:  (a) Brochures and literatures of all equipments. (b) Training manuals in soft and hard copies. (c) Maintenance manual (daily, weekly and yearly). (d) In situ training on all equipments to be arranged by the OEM. Duration and number of trainees to be intimated by the user at the time of tendering.	To be physically checked by the BOO.