



No.	Description	Requirement	Confirmation / declaration by bidder / contractor
3	Controls and accessories	a) Supply and installation of Refrigerant circuit piping. Installation of controls and accessories including valves, temperature switches, pressure switches, temperature & pressure gauges etc. are to be installed & commissioned. Qty: 1 lot/ship b) To carryout necessary piping including supply of all Cupro Nickel pipes and Nickel Aluminium Bronze valves, fittings, clamps, packing and fasteners etc. required for installation of Seawater cooling circuit. Installation of controls and accessories including valves, temperature switches, pressure switches, Temperature & Pressure gauges etc. Qty: 1 lot/ship	a) lot / ship b) lot / ship
4	Drain arrangement	To carryout Condensate drain arrangement piping for AHU - Qty: 1 no. Including supply of pipes and fittings / fasteners / packing and insulation etc. no. / ship
5	Electric starter panels	To install and make connections of Electric starter/ control panels.
6	Refrigeration line & oil	Piping including supply of pipes, fittings, fasteners, packing, clamps, sealant, insulation and consumables like gases, electrodes brazing rods and flux etc. a) Fabrication, brazing, cleaning, installation and insulation of piping for refrigerant system b) Pressure testing with the use of nitrogen gas c) Cleaning and purging of piping d) Initial charging of refrigerant and refrigeration oil as recommended by compressor maker for complete system as installed. Qty: 1 lot/ship a) b) c) d) lot / ship

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SCOPE FOR FORCED VENTILATION SYSTEM TO BE DESIGNED, FABRICATED SUPPLIED INSTALLED, COMMISSIONED AND TRIED OUT FOR NON AC COMPARTMENTS / SPACES ONBOARD 6 NOS. INDIAN NAVY SURVEY VESSELS, YARD NO. 257-262 INCLUDING SUPPLY OF ALL EQUIPMENTS, MATERIAL, FASTNERES, PACKING & CONSUMABLES INCLUDING VENTILATION FANS WITH W.T. COVERS, SHIPBUILDING GRADE STEEL PLATES AND SECTIONS REQUIRED FOR JOB SHALL BE SUPPLIED BY AAGL

No.	Description	Requirement	Confirmation / declaration by bidder / contractor
1	General	Various non A/C utility spaces are to be provided with forced ventilation arrangement. All ventilation fans are to be designed, supplied, installed, commissioned and tried out onboard Indian Navy Survey Vessels and complete ventilation ducting material (GI sheet, clamps etc.) is to be supplied and fabricated and erected including fabrication and erection of penetrations, coamings, and fitment of W.T. covers etc. Job also includes fabrication and erection of seatings for various ventilation fans, Job also includes to carryout necessary end power connections for various ventilation fans.	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
2	Ventilation fans, Design, Supply	Design, Supply & Installation of ventilation fans and accessories / fittings / fasteners etc. including fabrication, erection and welding of seating at site. Fitment of all ventilation fans on seating along with anti-vibration mounting foot in case of centrifugal fans.	<p>.....</p> <p>.....</p> <p>.....</p>
3	Coamings	Fabrication and welding of coamings (rectangular as well as round) from required thickness plate and also flat bar sleeve for the same. To make rectangular / round flange including drilling of bolt holes matching with ventilation fans and welding of the same with the coamings. Erection of the above assembly at site as per shipbuilding standard practice and welding of the same by an approved welder. Fitment and bolting of the ventilation fans with coaming flanges for the corresponding fans with the use of rubber gasket.	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
4	Deck / bhd. penetration	Fabrication and welding of penetrating piece passing through deck / A 60 / watertight bhd and flat bar sleeves. To make flanges and welding of the same with above penetrating piece on one side and welding of other flange at site. Erection of the above assembly at site and welding by an approved welder.	<p>.....</p> <p>.....</p> <p>.....</p>
5	Ducts	Supply, fabrication and erection of rectangular ducts from required gauge G.I. sheet and required flanges including drilling of bolt holes in duct flanges. Fitting and bolting of ducting using rubber gaskets. Fabrication and welding of suitable clamp and flexi mounts and erection of the same to support the G.I. ducts at site.	<p>.....</p> <p>.....</p> <p>.....</p>

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No.	Description	Requirement	Confirmation / declaration by bidder / contractor
6	M.S. box construction	Fabrication and welding of boxes below fan coaming. Erection of the same and welding at site by an approved welder.
7	Watertight covers and grills	Supply & Fitment of watertight covers for all the ventilation fans with the use of rubber gasket and welding wherever required.
8	Engine room supply fan	(i) Type: Tube axial (ii) Make and model: Supplier to declared (iii) Capacity: To be designed / calculated by supplier and declared (iv) Pressure: To be designed / calculated by supplier and declared (v) Power / rating & rpm of electric motor: To be designed / calculated by supplier and declared (vi) Power supply [available on ship]: 415 V, 3 Ph, 3 wire, 50 Hz AC (vii) Drive: Direct (viii) Fan dia and no. of blades: To be declared (ix) Material of construction: (a) Casing: MS duly surface treated and painted with marine grade primer and subsequent finish paint. Thickness as per class requirements (b) Impeller: Marine grade cast aluminium (x) Class of insulation for electric motor: As per requirements of class / Indian Navy (xi) Enclosure for electric motor: As per requirements of class / Indian Navy (xii) Sound / noise level: As per IS-13161 [Part 3] standards (xiii) Shock and vibration level: To comply classification standards (xiv) Dynamic balancing: As per ISO-1940-6.3 Gr. (xv) Maximum length of casing: To be declared (xvi) Casing flange OD, & PCD for bolting, bolt size, no. of bolt hole: To be declared (xvii) Total weight of fan including electric motor: To be declared (xviii) Quantity: 2 nos. / vessel	(i) Type: (ii) Make & model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Electric motor power / rpm: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan dia and no. of blades: mm, no. (ix) Material of construction: (a) Casing:, mm thickness (b) Impeller: (x) Class of insulation for electric motor: Class (xi) Enclosure for electric motor: Gr. IP (xii) Sound/noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Maximum length of casing: mm (xvi) Casing flange OD: mm, PCD: mm Bolt size: mm, No. of bolt: (xvii) Total weight of fan including electric motor: kg. (xviii) Quantity: nos./vessel

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No.	Description	Requirement	Confirmation / declaration by bidder / contractor
9	Engine room exhaust fan	(i) Type: Tube axial (ii) Make and model: Supplier to declare (iii) Capacity: To be designed / calculated by supplier and declared (iv) Pressure: To be designed / calculated by supplier and declared (v) Power / rating & rpm of electric motor: To be designed / calculated by supplier and declared (vi) Power supply [available on ship]: 415 V, 3 Ph, 3 wire, 50 Hz AC (vii) Drive: Direct (viii) Fan dia and no. of blades: To be declared (ix) Material of construction: (a) Casing: MS duly surface treated and painted with marine grade primer and subsequent finish paint. Thickness as per class requirements (b) Impeller: Marine grade cast aluminium (x) Class of insulation for electric motor: As per requirements of class / Indian Navy (xi) Enclosure for electric motor: As per requirements of class / Indian Navy (xii) Sound / noise level: As per IS-13161 [Part 3] standards (xiii) Shock and vibration level: To comply classification standards (xiv) Dynamic balancing: As per ISO-1940-6.3 Gr. (xv) Maximum length of casing: To be declared (xvi) Casing flange OD, & PCD for bolting, bolt size, no. of bolt hole: To be declared (xvii) Total weight of fan including electric motor: To be declared (xviii) Quantity: 2 nos. / vessel	(i) Type: (ii) Make & model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Electric motor power / rpm: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan dia and no. of blades: mm, no. (ix) Material of construction: (a) Casing:, mm thickness (b) Impeller: (x) Class of insulation for electric motor: Class (xi) Enclosure for electric motor: Gr. IP (xii) Sound/noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Maximum length of casing: mm (xvi) Casing flange OD: mm, PCD: mm Bolt size: mm, No. of bolt: (xvii) Total weight of fan including electric motor: kg. (xviii) Quantity: nos./vessel

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No.	Description	Requirement	Confirmation / declaration by bidder / contractor
10	Steering gear compartment supply fan	(i) Type: Tube axial (ii) Make and model: Supplier to declared (iii) Capacity: To be designed / calculated by supplier and declared (iv) Pressure: To be designed / calculated by supplier and declared (v) Power / rating & rpm of electric motor: To be designed / calculated by supplier and declared (vi) Power supply [available on ship]: 415 V, 3 Ph, 3 wire, 50 Hz AC (vii) Drive: Direct (viii) Fan dia and no. of blades: To be declared (ix) Material of construction: (a) Casing: MS duly surface treated and painted with marine grade primer and subsequent finish paint. Thickness as per class requirements (b) Impeller: Marine grade cast aluminium (x) Class of insulation for electric motor: As per requirements of class / Indian Navy (xi) Enclosure for electric motor: As per requirements of class / Indian Navy (xii) Sound / noise level: As per IS-13161 [Part 3] standards (xiii) Shock and vibration level: To comply classification standards (xiv) Dynamic balancing: As per ISO-1940-6.3 Gr. (xv) Maximum length of casing: To be declared (xvi) Casing flange OD, & PCD for bolting, bolt size, no. of bolt hole: To be declared (xvii) Total weight of fan including electric motor: To be declared (xviii) Quantity: 1 no. / vessel	(i) Type: (ii) Make & model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Electric motor power / rpm: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan dia and no. of blades: mm, no. (ix) Material of construction: (a) Casing:, mm thickness (b) Impeller: (x) Class of insulation for electric motor: Class (xi) Enclosure for electric motor: Gr. IP (xii) Sound/noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Maximum length of casing: mm (xvi) Casing flange OD: mm, PCD: mm Bolt size: mm, No. of bolt: (xvii) Total weight of fan including electric motor: kg. (xviii) Quantity: no./vessel

Stamp & sign of the Bidder



No.	Description	Requirement	Confirmation / declaration by bidder / contractor
11	Bow thruster compartment supply fan	(i) Type: Tube axial (ii) Make and model: Supplier to declared (iii) Capacity: To be designed / calculated by supplier and declared (iv) Pressure: To be designed / calculated by supplier and declared (v) Power / rating & rpm of electric motor: To be designed / calculated by supplier and declared (vi) Power supply [available on ship]: 415 V, 3 Ph, 3 wire, 50 Hz AC (vii) Drive: Direct (viii) Fan dia and no. of blades: To be declared (ix) Material of construction: (a) Casing: MS duly surface treated and painted with marine grade primer and subsequent finish paint. Thickness as per class requirements (b) Impeller: Marine grade cast aluminium (x) Class of insulation for electric motor: As per requirements of class / Indian Navy (xi) Enclosure for electric motor: As per requirements of class / Indian Navy (xii) Sound / noise level: As per IS-13161 [Part 3] standards (xiii) Shock and vibration level: To comply classification standards (xiv) Dynamic balancing: As per ISO-1940-6.3 Gr. (xv) Maximum length of casing: To be declared (xvi) Casing flange OD, & PCD for bolting, bolt size, no. of bolt hole: To be declared (xvii) Total weight of fan including electric motor: To be declared (xviii) Quantity: 2 nos. / vessel	(i) Type: (ii) Make & model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Electric motor power / rpm: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan dia and no. of blades: mm, no. (ix) Material of construction: (a) Casing:, mm thickness (b) Impeller: (x) Class of insulation for electric motor: Class (xi) Enclosure for electric motor: Gr. IP (xii) Sound/noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Maximum length of casing: mm (xvi) Casing flange OD: mm, PCD: mm Bolt size: mm, No. of bolt: (xvii) Total weight of fan including electric motor: kg. (xviii) Quantity: nos./vessel

Stamp & sign of the Bidder



No.	Description	Requirement	Confirmation / declaration by bidder / contractor
12	Emergency D G set room supply fan	(i) Type: Tube axial (ii) Make and model: Supplier to declared (iii) Capacity: To be designed / calculated by supplier and declared (iv) Pressure: To be designed / calculated by supplier and declared (v) Power / rating & rpm of electric motor: To be designed / calculated by supplier and declared (vi) Power supply [available on ship]: 415 V, 3 Ph, 3 wire, 50 Hz AC (vii) Drive: Direct (viii) Fan dia and no. of blades: To be declared (ix) Material of construction: (a) Casing: MS duly surface treated and painted with marine grade primer and subsequent finish paint. Thickness as per class requirements (b) Impeller: Marine grade cast aluminium (x) Class of insulation for electric motor: As per requirements of class / Indian Navy (xi) Enclosure for electric motor: As per requirements of class / Indian Navy (xii) Sound / noise level: As per IS-13161 [Part 3] standards (xiii) Shock and vibration level: To comply classification standards (xiv) Dynamic balancing: As per ISO-1940-6.3 Gr. (xv) Maximum length of casing: To be declared (xvi) Casing flange OD, & PCD for bolting, bolt size, no. of bolt hole: To be declared (xvii) Total weight of fan including electric motor: To be declared (xviii) Quantity: 1 no. / vessel	(i) Type: (ii) Make & model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Electric motor power / rpm: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan dia and no. of blades: mm, no. (ix) Material of construction: (a) Casing:, mm thickness (b) Impeller: (x) Class of insulation for electric motor: Class (xi) Enclosure for electric motor: Gr. IP (xii) Sound/noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Maximum length of casing: mm (xvi) Casing flange OD: mm, PCD: mm Bolt size: mm, No. of bolt: (xvii) Total weight of fan including electric motor: kg. (xviii) Quantity: no./vessel

Stamp & sign of the Bidder



No.	Description	Requirement	Confirmation / declaration by bidder / contractor
13	Emergency D G set room exhaust fan	(i) Type: Tube axial (ii) Make and model: Supplier to declared (iii) Capacity: To be designed / calculated by supplier and declared (iv) Pressure: To be designed / calculated by supplier and declared (v) Power / rating & rpm of electric motor: To be designed / calculated by supplier and declared (vi) Power supply [available on ship]: 415 V, 3 Ph, 3 wire, 50 Hz AC (vii) Drive: Direct (viii) Fan dia and no. of blades: To be declared (ix) Material of construction: (a) Casing: MS duly surface treated and painted with marine grade primer and subsequent finish paint. Thickness as per class requirements (b) Impeller: Marine grade cast aluminium (x) Class of insulation for electric motor: As per requirements of class / Indian Navy (xi) Enclosure for electric motor: As per requirements of class / Indian Navy (xii) Sound / noise level: As per IS-13161 [Part 3] standards (xiii) Shock and vibration level: To comply classification standards (xiv) Dynamic balancing: As per ISO-1940-6.3 Gr. (xv) Maximum length of casing: To be declared (xvi) Casing flange OD, & PCD for bolting, bolt size, no. of bolt hole: To be declared (xvii) Total weight of fan including electric motor: To be declared (xviii) Quantity: 1 no. / vessel	(i) Type: (ii) Make & model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Electric motor power / rpm: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan dia and no. of blades: mm, no. (ix) Material of construction: (a) Casing:, mm thickness (b) Impeller: (x) Class of insulation for electric motor: Class (xi) Enclosure for electric motor: Gr. IP (xii) Sound/noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Maximum length of casing: mm (xvi) Casing flange OD: mm, PCD: mm Bolt size: mm, No. of bolt: (xvii) Total weight of fan including electric motor: kg. (xviii) Quantity: no./vessel

Stamp & sign of the Bidder



No.	Description	Requirement	Confirmation / declaration by bidder / contractor
14	Galley exhaust fan	(i) Type: Centrifugal (ii) Make and model: Supplier to declared (iii) Capacity: To be designed / calculated by supplier and declared (iv) Pressure: To be designed / calculated by supplier and declared (v) Power / rating & rpm of electric motor: To be designed / calculated by supplier and declared (vi) Power supply [available on ship]: 415 V, 3 Ph, 3 wire, 50 Hz AC (vii) Drive: Direct (viii) Impeller dia and no. of blades: To be declared (ix) Material of construction: (a) Casing and scroll: MS duly surface treated and ZRP coated and subsequent marine grade finish paint. Thickness as per class requirements (b) Impeller: MS duly surface treated and ZRP coated and subsequent marine grade finish paint. Thickness as per class requirements (x) Class of insulation for electric motor: As per requirements of class / Indian Navy (xi) Enclosure for electric motor: As per requirements of class / Indian Navy (xii) Sound / noise level: As per IS-13161 [Part 3] standards (xiii) Shock and vibration level: To comply classification standards (xiv) Dynamic balancing: As per ISO-1940-6.3 Gr. (xv) Fan foundation size: To be declared (xvi) Maximum height of fan: To be declared (xvii) Sizes of inlet and outlet of fan: To be declared (xviii) Total weight of fan including electric motor: To be declared (xix) Quantity: 1 no. / vessel	(i) Type: (ii) Make and model: (iii) Capacity: m ³ /hr (iv) Pressure: Outlet mm wg Inlet mm wg, Total mm wg (v) Power / rating & rpm of electric motor: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Impeller dia: and no. of blades: (ix) Material of construction: (a) Casing and scroll: Thick mm (b) Impeller: Thickness: End plate: mm, Blade: mm, Cover: mm (x) Insulation for electric motor: Class (xi) Enclosure for electric motor: Gr IP (xii) Sound / noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Fan foundation size: mm length, mm width (xvi) Maximum height of fan: mm (xvii) Inlet [flange]: OD: mm, PCD: mm Bolt size: mm, No. of bolt: Outlet [flange]: Length: mm, Width: mm Bolt size: mm, No. of bolt: (xviii) Total weight of fan including electric motor: Kg. (xix) Quantity: no. / vessel

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No.	Description	Requirement	Confirmation / declaration by the bidder / supplier
15	a) Exhaust fan systems for Ablutions / Toilet / Wash spaces for Junior / Senior Sailors and Officers / Scientists	<p>a) The Ablutions / Toilet / Wash spaces for Junior / Senior Sailors and Officers / Scientists are to be provided with forced exhaust ventilation systems. The above spaces [p&s] are to be arranged with common duct system for respective side [p&s]. The spaces located on each side shall be served by exhaust fan provided on each side [p&s]. Location of fans and routing of the ducts on respective sides to be arranged taking in to consideration the GA plan and layout of the vessel. Accordingly design and capacity calculations are to be carried out by the vendor and system / equipments are to be offered.</p> <p>(i) Type: Centrifugal (ii) Make and model: Supplier to declared (iii) Capacity: To be designed / calculated by supplier and declared (iv) Pressure: To be designed / calculated by supplier and declared</p> <p>(v) Power / rating & rpm of electric motor: To be designed / calculated by supplier and declared (vi) Power supply [available on ship]: 415 V, 3 Ph, 3 wire, 50 Hz AC (vii) Drive: Direct (viii) Impeller dia and no. of blades: To be declared (ix) Material of construction: (a) Casing and scroll: MS duly surface treated and ZRP coated and subsequent marine grade finish paint. Thickness as per class requirements (b) Impeller: MS duly surface treated and ZRP coated and subsequent marine grade finish paint. Thickness as per class requirements (x) Class of insulation for electric motor: As per requirements of class / Indian Navy (xi) Enclosure for electric motor: As per requirements of class / Indian Navy (xii) Sound / noise level: As per IS-13161 [Part 3] standards (xiii) Shock and vibration level: To comply classification standards (xiv) Dynamic balancing: As per ISO-1940-6.3 Gr. (xv) Fan foundation size: To be declared</p> <p>(xvi) Maximum height of fan: To be declared</p>	<p>a)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>(i) Type:</p> <p>(ii) Make and model:</p> <p>(iii) Capacity: m³/hr</p> <p>(iv) Pressure: Outlet mm wg Inlet mm wg, Total mm wg</p> <p>(v) Power / rating & rpm of electric motor: kw / rpm</p> <p>(vi) Power supply: V, Ph, wire, Hz AC</p> <p>(vii) Drive:</p> <p>(viii) Impeller dia: and no. of blades:</p> <p>(ix) Material of construction: (a) Casing and scroll: Thick mm (b) Impeller: Thickness: End plate: mm, Blade: mm, Cover: mm</p> <p>(x) Insulation for electric motor: Class</p> <p>(xi) Enclosure for electric motor: Gr IP</p> <p>(xii) Sound / noise level: db from mtr. distance</p> <p>(xiii) Shock and vibration level:</p> <p>(xiv) Dynamic balancing:</p> <p>(xv) Fan foundation size: mm length, mm width</p> <p>(xvi) Maximum height of fan: mm</p>

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No.	Description	Requirement	Confirmation / declaration by the bidder / supplier
		(xvii) Sizes of inlet and outlet of fan: To be declared (xviii) Total weight of fan including electric motor: To be declare (xix) Quantity: 2 nos. / vessel	(xvii) Inlet [flange]: OD: mm, PCD: mm Bolt size: mm, No. of bolt: Outlet [flange]: Length: mm, Width: mm Bolt size: mm, No. of bolt: (xviii) Total weight of fan including electric motor: Kg (xix) Quantity: nos. / vessel
	b) Suitable extractor / exhaust fan for attached W/C for Captain's cabin	Suitable arrangement of W/C exhaust for Captain cabin to be provided by vendor [to be specified]
16	Ventilation system for various workshop spaces of the vessel as shown in GA plan	Various workshop spaces onboard Survey vessel are to be provided with appropriate forced ventilation system. Based on design consideration and feasibility, the group of spaces may be provided with combine duct system served by common fan/s. Based on above criteria, the type of fan/s to be selected and proposed by the vendor and depending upon type of fan selected and design methodology adopted by vendor, the technical data [I to xviii] as applicable are to be submitted by the vendor.	(i) Type: (ii) Make and model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Power / rating & rpm of electric motor: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan / Impeller dia: and no. of blades: (ix) Material of construction: (a) Casing:..... mm thick (b) Fan/Impeller: (x) Insulation for electric motor: Class (xi) Enclosure for electric motor: Gr IP (xii) Sound / noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Size of fan / foundation: (xvi) Size / detail of fan Inlet & Outlet (xvii) Total weight of fan: Kg. (xviii) Quantity: nos. / vessel

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No.	Description	Requirement	Confirmation / declaration by the bidder / supplier
17	Ventilation system for various non AC store / locker spaces including deep freezer room [provided with 500 liters capacity each 3 nos. self contained deep fridge] of the vessel as shown in GA plan	Various non AC store spaces onboard Survey vessel are to be provided with appropriate forced ventilation system. Based on design consideration and feasibility, the group of spaces may be provided with combine duct system served by common fan/s. Based on above criteria, the type fan/s to be selected and proposed by the vendor and depending upon type of fan selected and design methodology adopted by vendor, the technical data [I to xviii] as applicable are to be submitted by the vendor.	(i) Type: (ii) Make and model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Power / rating & rpm of electric motor: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan / Impeller dia: and no. of blades: (ix) Material of construction: (a) Casing:..... mm thick (b) Fan/Impeller: (x) Insulation for electric motor: Class (xi) Enclosure for electric motor: Gr IP (xii) Sound / noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Size of fan / foundation: (xvi) Size / detail of fan Inlet & Outlet: (xvii) Total weight of fan: Kg. (xviii) Quantity: nos. / vessel
18	Ventilation system for laundry	Laundry onboard Survey vessel is to be provided with appropriate ventilation system. Based on design consideration, feasibility and other requirements, laundry may be integrated with the ventilation system provided for other suitable group of spaces through common duct / fan system or otherwise by providing independent fan. Based on above criteria and methodology adopted, the vendor is required to propose the system / fan [Option I or II].	Option I (common / combine system) OR Option II (independent fan)

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No.	Description	Requirement	Confirmation / declaration by the bidder / supplier
			(i) Type: (ii) Make and model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Power / rating & rpm of electric motor: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan / Impeller dia: and no. of blades: (ix) Material of construction: (a) Casing:..... mm thick (b) Fan/Impeller: (x) Insulation for electric motor: Class (xi) Enclosure for electric motor: Gr IP (xii) Sound / noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing: (xv) Size of fan / foundation: (xvi) Size / detail of fan Inlet & Outlet: (xvii) Total weight of fan: Kg. (xviii) Quantity: nos. / vessel
19	Ventilation system for Co ₂ room	Co ₂ room onboard Survey vessel is to be provided with ventilation system complying the class / statutory requirements. Based on design consideration, feasibility and other requirements, the type of fan to be selected and proposed by the vendor and depending upon the type of fan selected and design methodology adopted by the vendor, the technical data [I to xviii] as applicable are to be submitted by the vendor against the requirements, taking in to account the type of fan/s proposed.	(i) Type: (ii) Make and model: (iii) Capacity: m ³ /hr (iv) Pressure: mm wg (v) Power / rating & rpm of electric motor: kw / rpm (vi) Power supply: V, Ph, wire, Hz AC (vii) Drive: (viii) Fan / Impeller dia: and no. of blades: (ix) Material of construction: (a) Casing:..... mm thick (b) Fan/Impeller: (x) Insulation for electric motor: Class (xi) Enclosure for electric motor: Gr IP (xii) Sound / noise level: db from mtr. distance (xiii) Shock and vibration level: (xiv) Dynamic balancing:

Stamp & sign of the Bidder



No.	Description	Requirement	Confirmation / declaration by the bidder / supplier
		<p>The vessel's AC and ventilation machinery, equipment, fittings, accessories etc. as supplied to be inspected by the contractor before installation on board at builder's yard, according to the requirements of the yard / Indian Navy / classification society / statutory authority / manufacturers etc. as applicable. After the installation and commissioning of complete system the following tests are to be essentially carried out by the contractor:</p> <p>i) PERFORMANCE TEST In accordance with the relevant standards and requirements and class and statutory requirements to the extent applicable. And as per the procedure and norms of the Indian Navy.</p> <p>ii) CONTINUOUS RUNNING TEST At rated load for each set and for complete system shall be carried out in accordance with the requirements and relevant standards and as per class, statutory and Indian Navy requirements as applicable.</p> <p>Note: Any fault in the workmanship or rectification / modification suggested by yard / class / Indian Navy / statutory authority should be carried out by the contractor without any extra cost implications to the yard.</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>i)</p> <p>.....</p> <p>.....</p> <p>ii)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
II	Reports for AC and non AC ventilation system	Installation and commissioning reports to be made and submitted by the contractor with relevant test data sheets duly certified by class / Indian Navy / statutory authority / yard as applicable – 6 sets / ship	<p>.....</p> <p>.....</p> <p>..... sets / ship</p>

Stamp & sign of the Bidder



ONBOARD SPARES AS A STANDARD SCOPE OF SUPPLY FOR AIR CONDITIONING AND VENTILATION SYSTEM FOR 2 YEARS (OPERATION CYCLE: 4500 HOURS / ANNUM) OPERATION OF THE SHIP AS PER CLASS REQUIREMENT AND MAKER'S STANDARD (LIST OF ABOVE SPARES TO BE SUBMITTED WITH QTY. SPECIFIED)

No.	Description	Quantity / Ship	Remark
1			
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Stamp & sign of the Bidder



TOOLS, SPECIAL TOOLS, JIGS AND FIXTURES REQUIRED FOR THE GUARANTEED OPERATION CYCLE OF TWO YEARS AS A STANDARD SCOPE FOR AIR CONDITIONING AND VENTILATION SYSTEM AS PER CLASS REQUIREMENT AND MAKER'S STANDARD (LIST OF ABOVE TOOLS TO BE SUBMITTED WITH QTY. SPECIFIED)

No.	Description	Quantity / Ship	Remark
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Stamp & sign of the Bidder



BASE AND DEPOT SPARES FOR AIR CONDITIONING AND VENTILATION SYSTEM FOR 5 YEARS OPERATION OF THE SHIP AS PER MAKER'S STANDARD (LIST OF ABOVE SPARES TO BE SUBMITTED WITH QTY. AND ITEM RATE / PRICE SPECIFIED)

No.	Description	Quantity / Ship	Rate	Remark
1				
2				
3				
4				
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Stamp & sign of the Bidder