

RESTRICTED  
**TENDER SPECIFICATION OF AIR CONDITIONING PLANT (CAPACITY: 40 TON)**  
**(FOR SOMUDRA AVIJAN)**

1. **Name of the Equipment.** Air Conditioning Plants (Marine Type).
2. **Purpose.** Purpose of this proposed replacement is to ensure habitability of ship ensuring proper cooling for designated areas such as offices, accommodations, magazines, other working and equipment spaces. It must deliver conditioned air with automatic temperature and humidity control within specified limits to ensure comfort and recommended environment for heat sensitive sensors and equipment.
3. **Operational Requirements.** Two AC plants will be connected to forward section and another will be connected to aft section as per the existing system. Each plant will be connected to existing dedicated chiller units. In each plant, only one compressor will be in line and another will remain standby. Fan Coil Units need to be repaired/ renewed as necessary as mentioned in this tender specifications. Necessary electrical cable arrangements need to be provided. All associated accessories and fittings need to be installed.
4. **Quantity.** 3 (Three).
5. **Manufacturer, Principal Supplier & Local Agent .** Names and full addresses are to be mentioned in the following table.

Ser	Description	Remarks
a.	Brand/Manufacturer	To be mentioned
b.	Principal Supplier	To be mentioned
c.	Local Agent	To be mentioned

6. **Year of Manufacture.** 2025 or later. The item should be brand new and original.
7. **Country of Origin.** USA, UK, EU Countries, Japan, Canada, Australia, Turkey, South Korea and New Zealand.
8. **Country of Manufactures.** Same as the Country of Origin.
9. **Certificate/Document of Authentication.** The local agent must provide the following original certificate(s)/ document(s) with the offer/quotation of items as regard to the genuinity of the source and item(s) to establish a chain of links from the original source to supply:
  - a. One certificate/ document from the manufacturer in favour of the supplier (in the case of the manufacturer as the direct source).
  - b. Two certificates/ documents, one from the manufacturer to the authorised agent and the other from the authorised agent to the supplier (in case the authorised agent is the immediate source).
  - c. Three certificates/ documents, first one by the manufacturer to the authorised agent, second one by the authorised agent to the sub-agent and third one by the sub-agent to the supplier (in case of the sub-agent as immediate source). If the supplier is unable to obtain the first certificate (by the manufacturer to an authorised agent), then relevant documents to prove the agency-ship of its claimed agent of the recognised manufacturer need to be produced.
10. **Basis of Design/ Design Criteria.**

- a. **Outdoor Design/ Combined Conditions.** Based on climatological data of Bangladesh, the ambient conditions are as follows:



Ser	Description	Remarks
(1)	Outside Air Temperature	5°C to 45°C
(2)	Inside Air Temperature	20°C or less
(3)	Relative Humidity (RH)	Up to 95%
(4)	Water Condition	Salty and highly muddy.

b. **Indoor Design Conditions.** Indoor design conditions for air-conditioned spaces of ship/craft shall be:

Ser	Description	Remarks
(1)	Dry Bulb Temperature	38°C
(2)	Relative Humidity (RH)	50%

11. **Duty Cycle/ Nature of Duty.** 24-hour operation per day.

12. **Electrical Power Supply.**

a. The available power supply onboard ship from Generator is 450 V, 60 Hz, 3-Phase and the shore power supply is 410-440 V, 50 Hz, 3-phase.

b. All machineries and equipment of the plant should be compatible to run with both onboard generated supply (450 V, 60 Hz, 3-Phase) and shore power supply (410-440 V, 50 Hz, 3-phase).

c. The input power supply tolerance of compressors, pumps and associated motors of the plants should be  $\pm 10\%$  of the rated electric supply.

13. **Standard.** The Air Conditioning Plant are to be designed and constructed according to international standards. The standard to which the quoted Air Conditioning Plant complies is to be specified in detail (ISO/ASHRAE or any other equivalent global standard).

14. **Scope of Supply.** The scope of supply is to include the following:

a. 3 x Air Conditioning Plant, with all items necessary for immediate operation without the requirement of any other items (attachments, accessories, consumables, etc) (as per paragraphs 15 to 16).

b. Standard Tools (as per paragraph 17).

c. Optional items (as per paragraph 18).

d. Spare parts and special tools (as per paragraphs 19 and 20).

e. Documents (Instruction Manual, Workshop Level Repair Manual, Parts Catalogue, Factory Test Certificate, etc; as applicable) (as per paragraphs 21 to 23).

f. Installation, Test, Trial and Acceptance, and Training (as per paragraphs 25 to 27).

g. Factory Acceptance Test (FAT) (as per paragraph 29).

h. Warranty and Guarantee (as per paragraphs 30 and 31).



15. Technical Specification.

<b>a. General</b>	
(1) Type	Marine and chilled water type
(2) Capacity	3 in no plant (Capacity of each plant - 40 tons)
(3) Dimensions	Max allowable space (Each plant): Length: 250 cm, Breadth: 130 cm, Height: 170 cm
(4) Capacity control	To be mentioned
(5) Refrigerant	To be mentioned/ R-134a
<b>b. Compressor</b>	
(1) Manufacturing Country	USA, UK, EU Countries, Japan, Canada, Australia, Turkey, South Korea and New Zealand.
(2) Type	Semi-Hermetic, Marine type, Type approved
(3) Model	To be mentioned
(4) Qty	2 per each plant
(5) Capacity	40 tons each
(6) Weight	To be mentioned
(7) Dimension	To be mentioned
(8) Operating Voltage, Phase, Frequency	410-450 V, 3 ph, 50 and 60 Hz
(9) Safety Devices/ Features	The compressors are to be supplied complete with motors, star delta starters, safety devices and control panels. Each compressor will be fitted with the following devices: (1) Necessary HP and LP cut outs (2) Low and high refrigerant pressure gauge (3) Oil pressure gauge (4) Manual/electrical reset high and low pressure cut out (5) Thermal and overload trip mechanism for compressor motor with provision for manual reset
(10) Lubrication System	To be mentioned/ Forced lubrication system
(11) Grade of Lubricating Oil	To be mentioned
(12) Drive	Electric motor driven
(13) Power	To be mentioned
(14) Motor Type	To be mentioned
(15) RPM	To be mentioned
(16) Mounting	To be mentioned
<b>c. Condenser</b>	
(1) Manufacturing Country	USA, UK, EU Countries, Japan, Canada, Australia, Turkey, South Korea and New Zealand.
(2) Type	Horizontal Shell and Tube (water cooled)
(3) Model	To be mentioned
(4) Qty	2 (two) for each plant
(5) Weight	To be mentioned
(6) Dimensions	To be mentioned
(7) Tube material	To be mentioned (Must be refrigerant grade Cu-Ni or equivalent or better grade material compatible with the refrigerant and compressor oil). Higher tube thickness is preferable considering highly suspended mud, sand and dirt in sea water
(8) Pressure relief valve	To be fitted
(a) Type of relief valve	To be mentioned



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	(9) Water capacity per condenser	To be mentioned
	(10) Designed pressure	To be mentioned
	(11) Min & Max Temperature	To be mentioned
	(12) Cooling Media	Sea Water
<b>d.</b>	<b>Evaporator</b>	
	(1) Manufacturing Country	USA, UK, EU Countries, Japan, Canada, Australia, Turkey, South Korea and New Zealand.
	(2) Type	To be mentioned
	(3) Model	To be mentioned
	(4) Qty	1 (one) for each plant
	(5) Tube material	To be mentioned (Must be refrigerant grade Cu-Ni or equivalent or better grade material compatible with the refrigerant and compressor oil). Higher tube thickness is preferable considering highly suspended mud, sand and dirt in sea water
	(6) Min & Max Temperature	To be mentioned
	(7) Design Pressure	To be mentioned
	(8) Weight	To be mentioned
	(9) Dimension	To be mentioned
	(10) Water Capacity	To be mentioned
<b>e.</b>	<b>Fan Coil Unit</b>	
	(1) General	All units (79 in no) to be surveyed and repaired/renewed as necessary. Initial estimate shows 34 in number need major repair/renewal
	(1) Air Flow Rate	To be mentioned
	(2) Cooling Capacity	To be mentioned
	(3) Fan Type	To be mentioned
	(4) Coil Type	To be mentioned
	(5) Power Supply	To be mentioned
	(6) Mounting	To be mentioned
<b>f.</b>	<b>AC Circulating / Chiller Water Pump</b>	
	(1) General	To be replaced if not compatible with supplied AC Plants. Initial assessment indicates it will not be necessary
	(2) Type	To be mentioned
	(3) Model	To be mentioned
	(4) Drive	Electric motor driven
	(5) Suction Head	To be mentioned
	(6) Discharge Head	To be mentioned
	(7) Motor Power	To be mentioned. Must be compatible with existing Chiller Water pipelines
	(8) Qty	01 (One) for each plant
<b>g.</b>	<b>Associated Electrical Items</b>	
	(1) Necessary Device in Control Panel	Necessary control panels for each plant are to be provided and installed. Each control panel shall include but not be limited to, the following features:  (a) Power On/Off selector switch with indication light (b) Compressor start/stop control with status indicators (c) Temp control and monitoring system with digital display (d) Fault alarm system for high temp, high pressure, low pressure and compressor overload



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		(e) Emergency stop button for immediate shutdown (f) Any other important necessary features required for the control panel
(2) Electrical Installations		The supplier shall provide and install all necessary electrical items, including main wiring for replacement of AC plants. Cable for the power panel to the controls shall also be provided to operate both compressors independently.
(3) Mode of operation		Options for both auto and manual operation need to be provided
(4) Shore Supply Beaker		Shore supply beaker (450V, 50 Hz, 3 Ph, 600 Amps).
(5) Qty		01 (One) for each plant
<b>h. Other Components/ Accessories</b>		
Other Components/ Accessories		(a) Necessary electrical sensors are to be provided with the plant. (b) All necessary accessories and spares are to be provided and mentioned with the offer.

16. **Standard Accessories.** Standard accessories must include all items and accessories essential to operating each Air Conditioning Plant, whether mentioned in the specification or not. The price of standard accessories is to be included in FOB value. However, an itemised price list of standard accessories is to be provided with the offer for reference value only. Following standard accessories should be included with each bench:

Ser	Description	Qty
a.	One Expansion valve with associated pipes for each plant	02
b.	Cable electric (450V, 60Hz, 3Ph, 125A,)	100 m
c.	Thermostatic control valves ((after onboard survey) in Chiller Water pipelines along the ship).	As required
d.	Valves	As required
e.	Thermostatic valves	As required
f.	Solenoid valves	As required
g.	Shut off and bypass valves	As required
h.	Expansion valves	As required

17. **Standard Tools.** 02 (two) sets of standard tools for maintenance of Air Conditioning Plants are to be provided. The price of standard tools is to be included in the FOB value. However, an itemised price list of standard tools is to be provided with the offer for reference value only.

18. **Optional Items.** The quotation should include a list of optional items (if any) required to operate each Air Conditioning Plant. When evaluating the comparative prices of the suppliers, only the prices of selected items by BN will be added to the total price.

19. **Spare Parts.** A recommended list of spare parts required for 05 years of satisfactory operation must be provided, indicating the itemised price. Only the prices of selected items by BN will be added to the total price while evaluating the comparative prices of the suppliers.

20. **Special Tools.** A recommended list of special tools required for carrying out maintenance of each Air Conditioning Plant are to be submitted with the quotation indicating itemised price. That price will be added to the total price while evaluating the comparative price of the suppliers.

21. **Documents.** 2 (two) sets of the following documents in English are to be supplied with Air Conditioning Plant (free of cost):



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- a. The Instruction Manual Includes Technical Specifications, Installation, Operation, and Maintenance.
  - b. Spare Parts Catalogue and its Components.
  - c. Factory Test Certificate/Performance Certificate.
22. **Certificates.** The manufacturer must give a certificate, which will form a part of the contract, stating that all the mechanical, electrical, and electronic components of the Air Conditioning Plant and its control system are currently in production. The following certificates should be provided with the crane as per international standards:
- a. Factory Test Certificates of all main equipment of the Portable Air Conditioning Plant.
  - b. Certification from internationally recognised standards
23. **Quality Assurance Certificate.** Quality Assurance Certificate in respect of the associated equipment regarding its manufacturing and performance is to be provided at the time of delivery of the items.
24. **Record of Sales.** Record of sales of the quoted model of Air Conditioning Plant with names of the customers in the preceding three years is to be included with the quotation.
25. **Installation.** The buyer will install the Air Conditioning Plant in presence of supplier's representative. However, the supplier/ manufacturer will provide the necessary drawings and instructions. All necessary installation materials are to be supplied with the complete sets.
26. **Test, Trial, and Acceptance.** The buyer will carry out tests and trials of the item at Chattogram in the presence of the supplier's representative. After a satisfactory test and trial, an acceptance certificate will be signed jointly by the supplier's representative and the buyer's representative.
27. **Training.** The supplier's/manufacturer's installation engineer will provide operation and maintenance training in Bangladesh to the operators (08 persons) for 3 (three) days after the air condition plant is tested, trialed, and commissioned. The bidder will quote the cost of training separately in their financial offer. The supplier will bear the cost of the trainers' air ticket, internal transportation, accommodation, food, medical support, etc.
28. **On Board Survey/ Site visit by the Bidder.** Prospective bidders may visit the ship before submitting quotation to clearly understand the available spaces for installation and requirements. Bidders will provide with associated drawing related with installation of AC Plants. Upon request by the bidder, necessary permission/security clearance related to visit will be arranged by BN.
29. **Factory Acceptance Test (FAT).**
- a. Factory Acceptance Test (FAT) will be carried out for all 3 plants by 3 (three) BN officers for 5 (five) days, excluding the journey period, at the buyer's expense. The supplier should inform the buyer about the date, schedule and procedure of FAT at least 8 (eight) weeks prior to the commencement of the said FAT. After inspection, a joint inspection report will be prepared and signed by both the seller and buyer's representatives.
  - b. On return from the country of supplier, the BN officers will submit a report to DNE. DNE, through DTS, will, in turn, forward the final decision along with the FAT report within 2 (two) weeks, based on which DGDP will render clearance for the shipment of stores to the supplier concerned. The supplier will not ship any item of the contract without clearance from the DGDP.
  - c. All types of movement/ transportation (air, sea, road, rail) of the BN officer within the manufacturer/ supplier's country, reception and arrangement for entry into the country/ concerned area for the FAT are to be borne by the supplier.



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30. **Warranty.** The principal/manufacture will give a warranty for trouble-free operation for at least one year from the date of acceptance by the buyer. During the warranty period, if the Air Conditioning Plant remains non-operational due to any action pending by the supplier, the warranty will be extended for the same period. The warranty covers all parts and labour (including the cost of the service engineer) throughout the warranty period.
31. **Guarantee for supply of spares.** The manufacturer will guarantee the supply of the spare parts for at least 5 (five) years at a reasonable price. The annual increase in the price of spares should not be more than 5% of the price list provided with the quotation.
32. **Shipment.**
- The supplier will arrange the shipment of all items by sea to Chittagong Port, Bangladesh.
  - All items are to be delivered in sea-worthy packing to ensure safe transportation by sea.
  - All packages must have detailed packing notes showing their contents, and they must be marked with the consignee's name, address, and gross weight.
  - The supplier will arrange transportation of all supplied items from Chittagong port to the NSD Chattogram.
  - Port of Shipment.** Any port of the manufacturing country. In case of shipment through any port of the manufacturer's authorised dealer, the relevant manufacturer's certificate is to be provided as proof of the genuineness of the offered item.
33. **Delivery.**
- The items are to be delivered within **9 (Nine) months** from the date of signing the contract to the following consignee:  
  
The Commanding Officer, NSD Chattogram, New Mooring, Chattogram, Bangladesh
  - Place of Delivery.** NSD Chattogram.
  - The supplier will carry the items from Chittagong Port to NSD Chattogram at the cost and risk of the supplier.
34. **Validity of Offer.** The offer should remain valid till 180 days from the date of tender opening.
35. **Currency.** Foreign Currency.
36. **Terms of Payment.** L/C for the full purchase amount will be opened in favour of the principal supplier under the following payment terms:
- 80% of the total LC value will be paid on delivery of the items described under the scope of supply and on production of necessary shipping documents.
  - The remaining 20% of the LC value will be paid upon producing an 'Acceptance Certificate' after satisfactory test and trial jointly carried out by the buyer's and supplier's representatives.



37. **Condition for Acceptance of Quotation.** The quotation has to have supporting documents (booklets, leaflets, catalogues, brochures, etc.) with details about Air Conditioning Plant. If detailed information regarding specifications, maker's books and catalogue for the quoted model of the Portable Air Conditioning Plant, spare parts, accessories, scope of supply, etc, are not provided; the quotation will not be accepted.

38. **Compliance Statement.** A compliance statement fulfilling all the requirements of the tender is to be submitted with the offer for evaluation of the quotations. Merely stating 'Yes' or 'No' will not suffice, rather detailed descriptions/information as required are to be provided. An incomplete compliance statement may contribute to the cancellation of the offer. If any clause of this specification is not commensurate with the offered Air Conditioning Plant, the deviation must be spelt out clearly.

