



प्रसारभारती / PRASAR BHARATI
भारतीयलोकसेवाप्रसारक/ INDIA'S PUBLIC SERVICE BROADCASTER
अपरमहानिदेशक(अभि.) (द.क्षे) काकार्यालय/ O/o. ADDL. DIRECTOR GENERAL (E)(SZ)
आकाशवाणीएवंदूरदर्शन / ALL INDIA RADIO & DOORDARSHAN
स्वामीशिवानंदासालै, चेन्नई / SWAMY SIVANANDA SALAI, CHENNAI - 600 005

No. ADG(E)(SZ)/SMT/IEBR/METP/26-27

Date: 20.05.2026

Sir/Madam,

Sub: Request for Budgetary Quotation for SITC of 2 nos 8.5 ton ductable Packaged type AC for Akashvani Karaikal and Markapur stations.

Sl. No.	Particulars	Qty.
1.	2 nos 8.5 ton ductable Packaged type AC for Akashvani Karaikal and Markapur stations.	2 Nos


1) GUARANTEE / WARRANTEE:

One year from the date of supply of material.

2) Payment terms :100% payment on testing of item.

Quotations may be addressed to : Shri.V.Dinesh kumar , Deputy Director(E), Room No 209, O/o Additional Director General(E), Akashvani & DD, Swamy Sivananda Salai, Chennai - 600005.
and by email to : diravm_sz@yahoo.com & airmaintenance.sz@prasarbharati.gov.in

Yours faithfully


V.Dinesh Kumar
Deputy Director (E)
For ADG(BO-SZ)

Specification for SITC 2x8.5 TR Air-cooled Packaged Air-conditioning plants at Akashvani Markapur and Karaikal (as a replacement of existing 6X3TR AC Plants)

**SECTION-I
GENERAL**

1.1 SCOPE

- 1.1.1 This specification, for SITC of Air-cooled packaged 2X8.5TR Air-conditioning plants, covers supply at site, installation, testing and commissioning of complete equipment at Akashvani Markapur and Karaikal as a replacement of existing 6X3TR AC Plants. The plants shall work on non-ODS refrigerant. The plants shall deliver the specified tonnage, both in summer and monsoon seasons. The AC plants are to run 20 hours a day, 365 days in a year.

1.2 GENERAL CONDITIONS OF CONTRACT

Payment terms, insurance cover, SITC schedule and time of completion, inspection, testing and commissioning of equipment and warranty terms, penalty for delay etc. would be applicable as per Akashvani terms and conditions on the subject framed by the indenter, namely, ADG(E) (SZ) AKASHVANI & DOORDARSHAN, No. NO.5, Swamy Sivananda Salai, Chennai -600 005.

1.3 DESCRIPTIVE TECHNICAL LITERATURE AND DRAWINGS

1.3.1 Site visit

In case, the tenderer desires to have idea regarding the electrical, refrigerant piping for preparation of schematic layout of equipment in plant room, they are advised to inspect the site before submitting their tender.

1.3.2 Tender Documents

The tenderers shall submit the following along with their tender (as a part of technical bid). Commercial bid will be in a separate sealed cover.

- i. Descriptive and technical leaflets giving complete mechanical and electrical data the equipment offered including detailed dimensions of the equipment.
- ii. The statement of bill of quantities of the equipment offered as per Section-II of the specifications.
- iii. Technical particulars of Packaged AC Plant as per Annexure – 1 of the Specifications.
- iv. Technical performance specifications of the equipment offered in the Performa as per Section-III of the specifications.
- v. A tentative piping drawing showing layout for the entire piping with all diameters, lengths, sizes and number of valves etc.
- vi. Tentative details showing cable sizes and length, equipment capacities, switch gear rating and number, rating and number of control components.
- vii. A schedule giving time period from start to finish of the complete work.
- viii. In order to avoid correspondence and clarifications at a later date, tenderers are requested to indicate clearly all the technical details and information asked for in Section II & III of this specification.

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1.3.3 Installation Drawings

The successful Tenderer shall supply to the indenter, 3copies each along with soft copy, of the following for approval within one month from the date of placement of the order:-

- a) Dimensional drawings (including sections) giving complete details for erection of plants including foundation.
- b) Electrical wiring diagram and control circuit so fall electrical equipment showing cable sizes and electrical rating of the related equipment.
- c) Instruction manuals of various equipments for the A/C plant, giving details of all adjustments, operation & maintenance/servicing procedure.

Before taking up the installation work at site. the tenderer shall ensure that the indenter approves the installation drawings

1.3.4 COMPLETION DRAWINGS AND OTHER INFORMATION

Threesets of complete drawings comprising of the following shall be submitted by the tenderer while handing over the installation:

- a) Electrical drawings for the entire electrical equipments showing cable sizes, equipment capacities. switchgear ratings. control components. control wiring.
- b) Schematic control drawings giving detailed notes to explain the sequence of operation of the control circuit.
- c) Detailed drawings and specifications in respect of wearing parts and consumable parts.
- d) Lists of components like thermostats, other control components, relays, timers, contactors etc. giving their type, designation, function etc.
- e) Schedule of items of which the tenderer is not the manufacturer/the manufacturer's authorized dealer. This should contain the specifications of each item and the agency from which these items are procured.

1.4 EXCLUSIONS

The following items of work shall be undertaken by the indenter and need not therefore be included In the tender.

- a) Main power supply connection terminated in a cable box at the switch board of the tenderer. (Zonal office (WZ) to ensure the power handling capacity of connected cable)

1.5 ERECTION

- 1.5.1 This specification provides for dismantling of the existing plants & the complete erection including all the associated civil works like equipment foundation for the air conditioning equipment at site by the tenderer. The tenderer may examine the site before quoting the rates.
- 1.5.2 The entire work shall be carried out as per latest IS codes, regulations etc. and as per terms and conditions contained in this document.
- 1.5.3 The tenderer shall make his own arrangement for storage of all equipment and materials brought to site from time to time and their safe custody at site till the plants are taken over by the indenter/his representative.

Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal (as a replacement of existing 6X3TR AC Plants)

- 1.5.4 The tenderer shall make his own arrangements for providing accommodation for his workmen at site. Tents may, however, be pitched in the site compound at place to be decided up on by the indenter or his representative at site.
- 1.5.5 The tenderer shall make own arrangements for procuring necessary labourer, skilled and un skilled. He should conform to all local government laws and regulations covering labour and their employment.
- 1.5.6 The tenderer shall indemnify and hold harmless the purchaser against all claims in respect of injury to any person howsoever arising out of the erection of the equipment in the course of such installation.
- 1.5.7 The tenderer shall discharge all his obligations under the Indian work man's compensation act as far as it affects workmen in his employment.
- 1.5.8 The tenderer and his employees shall comply with the regulations in force for controlled entry into the premises where the air-conditioning equipment is to be installed.

1.6 TENDERER'S LIABILITY FOR DAMAGES CAUSED:

Tenderer shall be liable for damages caused during installation work, If the tenderer or his/her workmen or servants shall break, deface, in jure or destroy any part of the building in which they may be working or any building, road, road kerb, fence, enclosure, water pipe, cable, drains, electric or telephone posts or wires, trees, grass or grasslands in the premises on which the work or any part of it is being executed. Tenderer shall also be liable, if any damage shall happen to the work while in progress from any cause whatsoever.

1.7 TENDERER'S LIABILITY FOR IMPERFECTIONS IN WORK DURING WARRANTY PERIOD:

Tenderer shall be liable for imperfections noticed within the warranty period if any defect or other faults appear in the work arising out of defective or any improper materials or workmanship within 12 months (after completion certificate given by the indenter). The tenderer shall, upon receipt of a written notice, rectify the fault at his/her own expense. In case of default, the indenter may get the same rectified and deduct the expenses from any amount due for payment or from his security deposit.

1.8 INSPECTION AND TEST PROCEDURE

The testing of the plants shall be carried out as per Acceptance Test procedure for Air-cooled AC plants as mentioned at Annexure-3.

WARRANTY

- a) The compressors shall be provided with onsite warranty for satisfactory working for a minimum period of five years.
- b) The remaining air-conditioning equipment shall be warranted or a minimum period of one year.
- c) For this purpose, the warranty period shall be counted from the date of completion certificate. Given by the indenter.
- d) Various defects arising/reported within the warranty period shall be rectified by repairs/replacement at site by the tenderer free of charge. This shall also include free supply of the refrigerant and compressor oil etc., if required, by the tenderer for optimum running of the plant during the warranty period.

**Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal
(as a replacement of existing 6X3TR AC Plants)**

1.1 QUOTATIONS IN MKS IS. I UNITS

Values for performance figure given in these specifications are in MKS/SI units. Full particulars of all figures of performance of the equipment offered shall be furnished in MKS/SI Unit. The technical data should be furnished in MKS/SI units only. The technical data should be typed or in capitals.

1.2 TRAINING

The tenderer shall undertake to extend free training for minimum three days in operation & maintenance of air-conditioning plants offered by them to two technical personnel from Akashvani Sangali. Details of the training offered with period may be indicated.

1.3 PAST EXPERIENCE

The tenderer should furnish detailed data regarding his past experience in supply, erection and commissioning of air-conditioning plants of similar or higher capacity and type. Due weightage will be given for the past experience while evaluating tenders. The criteria for this will be decided by the zonal office.

1.4 AFTER SALE SERVICE

The tenderer shall ensure adequate and prompt after sale service in the form of maintenance/servicing personnel and spare as and when required with a view to minimizing the break down period. The tenderer has also to give a written undertaking from OEM that spare parts required for air-conditioning plants shall be available off-the-shelf for a period of at least 10 years from the date of commissioning of the plants at site. Sufficient advance intimation shall be given to the indenter before phasing out any spare component/part so that indenter is able to stock the same for future use.

**Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal
(as a replacement of existing 6X3TR AC Plants)**

SECTION-II

**SCHEDULE OF REQUIREMENTS FOR SITC OF 2X8.5TR AIR-COOLED PACKAGED AIR-
CONDITIONING PLANTS FOR AKASHVANI SANGALI 20kW MW TRANSMITTER**

S No	Description of the equipment	Quantity	Reference to para of section-III for Technical specification	Remarks
1.	Supply of Packaged type air conditioning plants of capacity 8.5 Tons each. Equipment consisting of the following i)Compressor Unit ii)Air-cooled Condenser iii)Cooling Coil iv)Blowers. v)Refrigerant Piping system	Two Sets of AC plants	1	Normally one of the two Plants shall be working at a time and other shall be standby.
2.	Existing Plenum chambers to be used. The Plenum chamber shall be connected to the plants and to the existing ducting system. Minor Repair work, if required shall be done by the firm.	1No.	3	
3.	Return air chamber	1No.	4.1.4.2, 4.3a, 4.4& Suggestive Layout Plan Drg. No. TE-16786	Existing Brick wall Return air chamber shall be utilized. Repairs if any shall Be carried out.
4.	Fresh air opening	1No.	4.1,4.2,4.3a 4.4& Suggestive Layout Plan Drg. No. TE-16786	Existing Window W1 to be utilized as fresh air Opening and shall be made air tight. Required arrangement for closing/opening of louvers etc. Shall be provided.
5.	i) Switch Board & Wiring of Equipment ii) Electrical Earthing	1 Set 2 Nos	5&Annexure-4	
6.	Dismantling of old AC Plants	Lumpsum	Section-I Para 1.5	Dismantled AC Plant shall be handed over to Akashvani Sangali 20kW Transmitter Authorities.

Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal (as a replacement of existing 6X3TR AC Plants)

S No	Description of the equipment	Quantity	Reference to para of section-III for Technical specification	Remarks
7.	Civil works:	As per site requirement	6	Heavy-duty flooring in AC Plant Room if required, Shall be provided by Akashvani.
8.	Erection, commissioning & Testing of the plant at site.	Lumpsum	7, Annexure-3. Section 1Para 1.3.3&1.3.4	
9.	Accessories			The price/charges of each tern shall be quoted separately at along with make.
9.1	Belts for Blower	5Sets		
9.2	Pressure Gauges for refrigerant & oil	2 Nos. each of High Pr., Low Pr. & Oil Pr. Gauge.		
9.3	Dial type thermometer	2Nos.each for suction and discharge side		
9.4	Air-Filters	3complete Sets used in one plant.		
9.5	EmptyGas cylinder with regulating valve adopter & Pressure gauge.	1Nos.		
9.6	Liquid line strainer	2Nos.		
9.7	Whirling Psychometer	2Nos.		
9.8	Anemometer	2Nos.		
9.9	Thermometer	2Nos.		
9.10	Valve Key	2Nos.		

SECTION –III

TECHNICAL SPECIFICATION FOR SITC OF 2X8.5TR AIR-COOLED PACKAGED AIR-CONDITIONING PLANTS**FOR AKASHVANI Markapur and Karaikal (as a replacement of existing 6X3TR AC Plants)**

S NO	PARTICULARS	AIR'S REQUIREMENT	TENDERER'S OFFER
1.	Packaged Air-Conditioner		
1.1	Cabinet		
1.1.1	Modular design	Packaged AC plant should be modular in construction.	
1.1.2	Access Doors/panels	Packaged unit shall have hinged quick operating air-tight access doors.	
1.1.3	Heat & Sound Insulation	The cabinet of the packaged unit shall be treated for heat and sound insulation and shall be So arranged As to provide easy accessibility to the various components mounted inside.	
1.1.4	Vibration Isolators for the Packaged unit	To be used if necessary, as per manufacturer's recommendation.	
1.1.5	Microprocessor Controlled	Whole packaged unit shall be micro processor controlled.	
1.1.6	Supply outlet & Return Intake	The supply outlet shall be duct able. The return intake shall be arranged for connections to Air Chamber.	
1.2	Power Supply		
1.2.1	Operating Power supply	3Ph,415V, +/-10%,50+/-3%Hz	
1.2.2	Starting Current	Not to exceed the limits stipulated by the local electric supply company. Provision of reduced in rush starting system to be confirmed by the Tenderer	
1.2.3	Normal (full load) running current	To be indicated by the tenderer	
1.3	Working Noise	Silent and smooth-noise level not to exceed 85dBA at a distance of 1m from the machine	
1.4	Compressor		
1.4.1	Type	Hermetically sealed (Scroll)	
1.4.2	Capacity	At least 8.5Tons (To be indicated by Tenderer)	
	(a) Under ASHARE conditions of 4.4°C Suction temperatures and 40.5°C condensing temperature.	At least 25704Kcal/ hr	

Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal (as a replacement of existing 6X3TR AC Plants)

S NO	PARTICULARS	AIR'S REQUIREMENT	TENDERER'S OFFER
	{b}Under site conditions.	To be indicated by tenderer	
1.4.3	Design (Mechanical).	Scroll type Compressor	
		Not more than two units to form the total capacity of plant	
1.4.4	Refrigerant		
	a) Type	Non-ODS refrigerant as per ASHRAE standards 34Class A-1	
	b) Quantity	For full capacity	
1.4.5	Make of compressor	By standard and reputed manufacturer	
1.4.6	Mounting	The compressor should be suitably mounted on vibration absorbers.	
1.4.7	Protection Circuits	The compressor units shall be rated for continuous working under tropical conditions and shall be provided with suitable starter incorporating overload, under voltage protection and also with single phasing preventers. The compressor shall be provided with thermal protector. preferably winding embedded to ensure automatic switching off the motor when the winding temperature Tends to go beyond safety limits.	
1.4.8	Interlocking of Compressor with Blower & Condenser units	Provision for interlocking the compressor with blower motor and condenser cooling fan motor shall be available.	
1.4.9	First charge of refrigerant and oil	The first charge of refrigerant and oil shall be included in the supply.	
1.6	CONDENSERUNIT		
1.5.1	He at Rejection Capacity	Shall be of adequate capacity to match the compressor	
1.5.2	Type	Outdoor Type	
1.5.3	Type of Cooling	Air-cooled	
1.5.4	Design material of Condenser Coils	Copper Tubes with Aluminium fins	
1.5.5	Outdoor Unit Cabinet	The cabinet of the outdoor unit shall be weather proof and shall be kept on platform outside the AHURoom. Necessary arrangement for placing the cabinet shall be made.	

Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal (as a replacement of existing 6X3TR AC Plants)

S NO	PARTICULARS	AIR'S REQUIREMENT	TENDERER'S OFFER
1.5.6	Outdoor Unit Mounting	The outdoor unit shall be mounted on a vibration proof mounting at platform.	
1.6	Evaporator Coll Section		
1.6.1	Capacity of cooling coil	Its capacity shall be adequate so that the evaporation coil shall cool and dehumidify the quantity of air specified. It should match fully with the compressor offered.	
1.6.2	Construction Material	The evaporator coll shall be made of Copper tube with aluminum fins.	
1.7	Blower & Fan section		
1.7.1	Type & make of fan	Centrifugal	
1.7.2	Balancing	Static and dynamic (both).	
1.7.3	Direction of discharge	Vertical	
1.7.4	Nominal fan discharge (Speed not to exceed 1000RPM)	5780CMHor3400CFM	
1.7.5	Static pressure at Nominal discharge	36mmWG	
1.7.6	Fan Speed	Should be around 950 RPM.	
1.7.7	Fan Motor	The fan motor shall be rated for continuous duty and shall conform to the relevant IS specification. Fan Motor should have BEE Star Rating of 5.	
1.8	AIRFILTER		
1.8.1	Type	The filter shall be dry, cleanable type, rejection capacity down to 10Microns mounted in frame with section.	
1.8.2	Path	Air filter shall be provided in the return air oath.	
1.9	Expansion Valve		
	a) Type	Direct Expansion	
	b) Capacity	To match the refrigeration capacity.	

Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal (as a replacement of existing 6X3TR AC Plants

SNO	PARTICULARS	AIR'SREQUIREMENT	TENDERER'SOFFER
1.10	Thermostat for shutting off the plant.	<ol style="list-style-type: none"> 1. A separate thermostat to be provided in the return air circuit. 2. The thermostatic Switch shall be operational between the temperature ranges of 20 °C to 30°.C for cutting out and bringing in the compressor. 3. Each plant shall have separate set of thermostats. 4. Thermostat shall be of adjustable type. 5. Accuracy shall be within+/- 1 deg. C 	
1.11	Refrigerant, electrical & Control Circuits	The air conditioning unit shall be completed with all internal refrigerating piping, electrical wiring and control switches necessary for the control and operation of the equipment within the unit.	
2.	Modiflcation/Connection of Supply &Return Duct		
2.1	Location	Plant-1, Plant-2,Plant-3, (As shown in the Drawing No.TE-16786)shall be directly connected to existing plenum chamber.	
2.2	Size	Existing Supply & Return duct of Transmitter shall be reutilized.	
2.3	Coupling to ACP lant	Double folded canvas coupling shall be provided between the supply outlet of plants and duct connecting. The plenum chambers, in each plant.	
2.4	Control Dampers	Control damper shall also beprovided in supply duct, located below false ceiling level for convenience of operation, and with open and close position of the damper clearly marked.	
3.	Plenum Chamber		
3.1	Location	Existing plenum chamber shall be used which is installed above the false ceiling of AHU room with provision of connection from supply air outlet of each plant to plenum chamber and from plenum chamber to existing supply ducts.	

Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal (as a replacement of existing 6X3TR AC Plants)

S NO	PARTICULARS	AIR'S REQUIREMENT	TENDERER'S OFFER
3.3	Coupling to AC Plant	Double folded canvas coupling shall be provided between the supply outlet of plants and duct connecting the plenum chambers, in each plant.	
4	Return AIR Chamber		
4.1	Requirement	Indoor Units of the Packaged AC plants shall be installed in the return air chamber constructed in the existing AC Plant room as shown in Ref Drg no. TE-16786 Existing Window W1 to be utilized as fresh air opening and shall be made air tight. Required arrangement for closing/opening of louvers etc. shall be provided.	
4.2	Restriction/Precaution	Electric switchgears of the New AC plant shall be installed at the old electric switchgear of replaced AC plant so that routing of cable in the Existing trenches can be done.	
4.3	Construction Material	a) An air tight door made of puff insulated double skinned aluminium panel (not less than 19 mm thick) with rubber lining if required shall be provided and shall remain closed with the arrangement of tower/sliding bolt.	
4.4	Size of chambers	Existing Return air chamber shall be utilized.	
5	Electrical Switch Gear & Accessories		
5.1	Construction	One cubicle type switchboard with appropriate ratings of an incoming MCCB, bus bar and individual MCCB units for each plant has to be Provided in the AC plant room.	
5.2	Wiring of Control circuit of AC Plant	Normally plants shall run on main supply. In case of failure of main supply, only blowers will run on D/G supply. Necessary arrangement shall be made for the same by the Firm.	
5.3	Bus-bar	The bus bar shall be three phase and neutral copper/aluminium bus bar adequately rated for the load.	

S NO	PARTICULARS	AIR'S REQUIREMENT	TENDERER'S OFFER
5.4	Electrical Earthing	Earthing shall be provided as per drawing placed at Annexure-4 .The earth shall be connected to electrical switchgear.	
5.5	Indicator/Instruments	The switchboard shall be provided with at least the following minimum indicators/instruments etc. i) Voltmeter with selector switch for measuring the voltage of all the 3 phases. ii) Separate ammeter of suitable range for each plant. iii) The switchboard shall be provided with neon lamp/LED type phase indicator in each phase. iv) Indicators shall be provided on The switch board to indicate the functioning of individual plants.	
5.6	Remote status indication Panel	1. A Panel with status indications of the working of packaged unit shall be wired & installed in Transmitter Hall. 2. The panel shall have indication lamps i.e. Green Lamp/LED for OFF & Red for ON conditions of the equipment. 3. The tenderer shall carry Out SITC of Remote Indication panel Including cabling from A/C plant room to Control Room.	
5.7	Electrical Wiring	The wiring in AC plant room for AC equipment shall be carried out in concealed conduits as per site condition. Necessary conduits shall be provided and buried in walls/floor by the tenderer. Alternatively cables may be neatly taken on cable trays above 2300mm height.	
5.8	Cables	Copper conduct or PVC cables of 1100V rating shall be used for wiring of various plants.	
5.9	Conformity to IS Standards	The switch board, electrical equipment and wiring shall conform to the relevant IS specification.	

**Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal
(as a replacement of existing 6X3TR AC Plants)**

SNO	PARTICULARS	AIR'S REQUIREMENT	TENDERER'S OFFER
6	Civil Works		
6.1	Foundation blocks &Vibration Isolation	The tenderer shall provide the foundation blocks, suitable mounting arrangements with vibration isolation for the Packaged units for effective control of transmission of vibrations & structure borne noise. Various InstructionasperAnnexure-2'Noise &Vibration Control' should be followed.	
6.3	Heat Insulation Treatment in AC Plant Room	i) Necessary Heat insulation treatment on the wall exposed outer environment up to roof ceiling slab of Heat Camber shall be carried out as indicated in the sketch Drg no. TE-16786.	
6.4	Platform for outdoor condenser unit	Platform of appropriate size shall be provided by the tenderer. Location of the platform shall be decided in consultation with the station authority. How ever it should be nearest to the Indoor unit.	
6.5	Securing of Outdoor unit& Outdoor Piping	Provision shall be made for securing the outdoor unit against rain, theft and tampering by un authorized persons if there is not such existing arrangement. Ac age Is to be Provided that will be fabricated by SWG G. S. Sheet & provided with Suitable locking arrangement and Coated with rust-proof paint. Similarly refrigerant Pipes from Plant room to Outdoor unit shall be secured by routing them through Proper Cable Trays	

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(as a replacement of existing 6X3TR AC Plants)**

SNO	PARTICULARS	AIR'S REQUIREMENT	TENDERER'S OFFER
6.6	Miscellaneous	<p>i) Any other work not specifically mentioned above but necessary for satisfactory completion of entire job shall be the responsibility of the tenderer.</p> <p>ii) The holes if any made by the tenderer in the walls for passage of pipes, conduits, trenches, cables etc. shall be repaired & original finish shall be given by the tenderer.</p>	
7.	Installation of Piping		
7.1	Installation of Piping	<ol style="list-style-type: none"> All necessary piping shall to be provided to make the AC equipment complete and ready for regular and safe operation. The equipment connection shall be as per recommendation of manufacturer. All condensate drainage to be pitched in the direction of flow to ensure proper drainage. Necessary precautions shall be taken to close ends of pipes to prevent debris entering the piping system. The pipes shall be cut accurately to measurements established at site so as to place them in position without forcing. 	
7.2	Piping Support:	<ol style="list-style-type: none"> Proper supports shall be provided for all piping or tubing, to prevent vibration or excessive deflection of piping or tubing. Extra supports shall provided at the bends and at heavy fittings like valves to avoid undue stresses on the pipes. Independent supports shall be provided for piping so that Equipment is not stressed by piping weight. 	

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(as a replacement of existing 6X3TR AC Plants)**

S No	PARTICULARS	AIR'SREQUIREMENT	TENDERER'SOFFER
7.3	Piping Sleeve:	<ol style="list-style-type: none">1. Where pipes pass through walls, steel pipe sleeve of size 50mm larger than outside diameter of pipe shall be provided.2. Where pipes are insulated, sleeve shall be large enough to have ample clearance for insulation also	

**Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal
(as a replacement of existing 6X3TR AC Plants)**

ANNEXURE-1

STATEMENT OF PARTICULARS FOR 2X8.5TR AIR-COOLED PACKAGED AC PLANTS
(To be submitted with the technical bid)

The tenderer should submit the following technical data of the equipment offered along with the tender (vide clause 1.3.2 of section I).

Sl. No.	ITEMS	
A	AIRCONDITIONER:	
i)	Packaged air conditioner make & Model	
ii)	Packaged air conditioner type	
iii)	Guaranteed refrigerating capacity of packaged air conditioner for return Air condition of 26.7 Deg. CDB and 17.9 Deo. CWB	Kcal/Hr.
iv)	%De-rating of capacity with increase in ambient temp. by a) 5 Deg. C ---% b) 10 Deg. C-%	
B.	COMPRESSOR UNIT:	
i)	Refrigerating capacity under ASHRE Kcal/Hr. rating conditions & 50 Hz operation	Kcal/Hr
ii)	Number of compressors prepackaged AC plant	
iii)	Power consumption KW/TR Full load and part load at 75%, 50% and 25% as per compressor design	
iv)	Operating speed of the compressor	
v)	Refrigerant (name) & Quantity	
c.	BLOWER	
i)	Blower (Fan) speed	R.P.M.
ii)	Static pressure developed	W.G.
iii)	HP of blower motor	
iv)	Speed of blower motor	R.P.M.
D.	COOLING COIL	
i)	Coil face area	Sq.mtr.
ii)	Number of Rows	
iii)	Fins per cm.	
iv)	H.P of fan motor	
E.	AIR COOLED CONDENSER	
i)	Coil face area	
ii)	Number of Row	
iii)	Fins per cm.	
iv)	H.P of fan motor	
v)	Speed of Condenser Fan R.P.M.	
vi)	Heat rejection capacity	

**Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal
(as a replacement of existing 6X3TR AC Plants)****ANNEXURE-2****NOISE AND VIBRATION CONTROL**

The tenderer must take all necessary precautions to have a minimum noise generation and its transmission as deemed necessary. Minimum vibration as permitted by BIS relevant code shall be ensured. A few points for guidance are given below:

- a) Double fire retardant flexible connections shall be made for air discharge to the duct.
- b) Vibration isolation pads of suitable thickness and loading for elimination of vibration of DUNLOP or similar make shall be provided for air handlers etc. as per recommendations of the manufacturer.
- c) Flexible conduits of suitable diameter and length are to be provided for making flexible electrical connection to the motors.

The floor supported piping shall be mounted on rubber pads with 7.5 mm ribbed neoprene pads between the base plate and the support.

- d) All suspended ceiling shall be isolated on hangers. The vibration hangers shall have stable steel spring. A neoprene neck shall be provided where the hanger rod is connected to the supporting element to prevent metal to metal contact. The steel spring element shall have Static deflection equal to half the static deflection of the isolated equipment and shall be used to support all equipment from the vibration equipment or from the floor or ceiling of the equipment room.
- e) In case of conduits, pipes, tubes, the annular space between construction and penetrating element shall be filled with fibrous material and both sides sealed with hardening; resident sealant.
- f) All floor mounted vibration isolated equipment shall be supported on steel frames or concrete block.
- g) The air conditioning tenderer shall take all other precautions or provide on his own, if not specified above for reducing noise level to within limits or minimize vibrations in all mechanical equipment without any additional cost.

**Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal
(as a replacement of existing 6X3TR AC Plants)**

ANNEXURE-3

ACCEPTANCE TEST PROCEDURE AT SITE AFTER INSTALLATION WITH TEST READINGS

Tenderer's representative shall witness all type of routine tests.
Performance tests of equipment/control installed shall be carried out.

On completion of installation, the tenderer shall conduct initial test. Any defects found shall be rectified immediately. The test readings during initial test run shall be recorded.

The initial test which has to be carried out by the tenderer shall be (but not limited to) as follows:-

- a) Pressure tests for all condenser and refrigerant circuit as recommended by the manufacturer before charging the system.
- b) To check satisfactory functioning of all electrical motors, switch-gear, control, pressure testing of all condensers and refrigerant system. air-handler's etc.
- b) To check alignment of motors.
- c) To operate, check and run compressor, condenser fan. Air-handlers.

NOTES:

All necessary test instruments such as thermometers, pressure gauges, anemometer, Sound level (decibel) meter, personnel, and required quantity of gas, oil and lubricants etc. shall be arranged by the tenderer at his own expense. However, power for testing and commissioning of the system shall be provided free of cost by the indenter.

In addition to the initial test as explained above. The tenderer shall also give to continuous running tests of the system during peak summer and monsoon each of 24hour duration or for 3 days each of 10hour duration when the ambient conditions are close to the design conditions. The capacity test shall be conducted in presence of representative of the indenter. Inside and outside conditions shall be recorded on hourly basis during the test.

CAPACITY OF PLANT

Before capacity tests are conducted, the following aspects shall be checked:

- a) The tests shall be conducted during the peak season only. In case the outside design conditions are not available, then tests shall be conducted at design conditions closest to outside design conditions.
- b) All internal loads such as light load, occupancy or equipment load shall be close to design loads. Otherwise, artificial load shall be generated to satisfy internal design loads.
- c) Hourly readings of temperature, relative humidity, electric current, power consumption etc. shall be recorded. The capacity of the system components shall be computed as given in the TEST READING-PROFORMA given below.
- d) Test readings shall be furnished in duplicate prior to handing over the plants.

**Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal
(as a replacement of existing 6X3TR AC Plants)**

1. OUTSIDE DESIGN CONDITIONS

- a) Season
- b) Dry bulb temp. Deg. C.
- c) Wet bulb temp. Deg. C.

2. INSIDE DESIGN CONDITIONS

- a) Dry bulb temp. Deg. c.
- b) Wet bulb temp. Deg. C.
- c) Relative Humidity%

3. COMPRESSOR

- a) Suction Temp. Deg. C.
- b) Suction Pressure Kg./Sq.cm.
- c) Discharge temp. Deg. C.
- d) Discharge pressure Kg./Sq.cm.
- e) Oil Pressure Kg./Sq.cm.
- f) Capacity of compressor motor (HP):
- g) Starting current (Amps)
- h) Readings of volt meter. Ammeter and power factor meter.

Power computation at various loads of 100%, 75%, 50%, 25%

Motor current- Amps

Voltage- Volts Starting

current -Amps.

4. Condenser Fan motor

- a) Voltage-volts
- b) Starting current-Amp
- c) Running Current-Amp

Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal (as a replacement of existing 6X3TR AC Plants)

- a) Noise generated-dBA
- b) Speed of condenser motor & fan (RPM)

5. AIR HANDLERS

- a) CoilfaceareaSq.mt.
- b) Maximum air quantity CMH
- c) Actual air quantity CMH
- d) Airvelocitym³/hour
- e) Entering air temp. DBMIB Deg. C
- f) Leaving air temp. DBNVB Deg. C
- g) Motor drive for air handlers
 - i. Rated horse power (HP)
 - ii. Rated voltage/current/volt/ampere:
 - iii. Actual voltage/current/volt/ampere:
 - iv. Starting current tamperes

The above data should be recorded for each individual AHU.

6. FILTERS

- a) Area of filters m sq.
- b) Effective area m sq
- c) Velocity of air m/hr.
- d) Quantityofairm³1hr.

Notes

1. TESTING VARIOUS LOADING CONDITIONS

The performance tests shall be conducted at various loads of 100%,75%, 50%and 25% of the capacity of each plant.

2. COMPUTATION OF CAPACITY OF VARIOUS EQUIPMENT

a) Compressor

$$\text{B.H.P./Ton} = \frac{\text{Power in put in kW}}{0.746 \times \text{Compressor Capacity in ton.}}$$

The capacity of compressor shall be taken from manufacturer's rating chart to be supplied by the tenderer.

**Specification for 2X8.5TR Air-Cooled Packaged A/C Plants at Akashvani Markapur and Karaikal
(as a replacement of existing 6X3TR AC Plants)**

b) Cooling coils of Air Handlers

$$\text{Capacity of cooling coil} = \frac{\text{Cfm} \times 60 (\text{he} - \text{h1})}{\text{V} \times 12000}$$

Whereas

he=Enthalpy of entering air in btu/lb*

h1=Enthalpy of leaving air in btu/lb. •

Ve=Specific volume of air entering in Cft/lb of air

V1=Specific volume of leaving air Cft/lb of

air. V =Average Specific volume= (V. + V1)/2

* Wet bulb temperature of air before and after the cooling coil of the AHU should be measured to know he and h1values.

3. All functional tests of motors, other electrical equipment and electrical cables shall be conducted as per Indian Electrical Rules and IS specifications.
4. The interlocking of various stages and all safety devices shall be checked.
5. HP/LP cut-out, oil failure switches, etc. shall be thoroughly checked and tested at various settings.
6. The in-built capacity control arrangement of each compressor shall be checked at various steps of loading.
7. Functional check & Remote Indication Panel shall be ascertained.