भारत संचार निगम लिमिटेड
(भारत सरकार का एक उद्यम)
कार्यालय कार्यकारी अभियंता (ई), बीएसएनएल विद्युत प्रभाग
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SECTION-2

ADDITIONAL SPECIFICATION

NAME OF WORK: SITC of 7nos X 3 TR Ductable Split AC Units with power feeding arrangement for MUX Room of ETR Station at Telephone Bhawan, Bhubaneswar (In replacement of old and Life expired Split AC units)(SW: SITC of 7nos X 3 TR Ductable Split AC Units).

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SCOPE OF WORK

1. General

The work is of Supply, Installation, Testing and Commissioning (SITC) of 3.0 TR, ductable split AC units in MUX Room of ETR Station at Telephone Bhawan, Bhubaneswar in the state of Odisha. The above AC units are to be supplied directly at site only. The actual site may change at the time of supply of AC units as per requirement of buyer i.e BSNL. Decision of Engineer-in-charge shall be final and binding in this regard .Nothing extra shall be paid on this account.

2. General Scope of work

The work contains supply of new ductable split AC units directly at site/work locations. Thereafter, installation, testing and commissioning (ITC) of above split AC units are to be done at site only. The work shall be carried out as per relevant BIS / CPWD general specifications amended up to date. Any small sundry items not specifically mentioned in the bid document but required for complete execution of work shall also be in the scope of work. Nothing extra shall be paid on this account.

Wherever any specific technical specifications are mentioned in this document, the same will prevail.

3. Store and Material

The transportation of materials up to the desired site/work location is the responsibility of contractor and included in the scope of the work. Lockable space for storing materials at site may be provided by the department, if available However, safety of material at consignee locations/ work site till completion of work/handing over to BSNL shall be the responsibility of contractor only. Nothing extra shall be paid on this account.

The bidder/contractor shall got approve make and model of the ductable split AC unit(s) intended to be supplied by Engineer –in–charge before supply at site.

4. Test Certificate

The firm shall submit Manufacturer's test certificates for ductable split AC Units at the time of delivery. In addition, Type Test Certificate for two samples of each type/model of ductable split air conditions from any NABL / ILAC Accredited laboratory shall be submitted to Engineer –in – Charge. Product must have valid BIS::ISI Mark Certification. The Product must be BEE (Bureau of Energy Efficiency, Govt. of India) certified and certificate must be valid as on date.

5. Testing

All the materials use for the work should be got approved before use . Rejected Material should be removed from the site immediately. Original test certificates guarantee cards (if any) and operation manual to be submitted to the SDE(E) /JTO(E) concerned . In addition to the factory testing and submission of test certificate, the performance of the ductable split AC units shall be tested by Technical committee/ officer duly authorized by BSNL for this purpose, at site. Nothing extra shall be paid for the same.

6. Date of Completion

The work shall be deemed to have been completed after the fulfillment of the following:

(i) Physical installation of 7 Nos 3.0 TR ductable split A.C. Units .
(ii) Successful completion of testing & commissioning of above AC unit in the presence of Engineer-in-Charge or his representative.
(iii) Completion of date of contract shall be the date of ITC of complete all seven ductable AC units

7. Special Conditions

1. The work shall generally be carried out as per CPWD/BSNL specifications , IE rules and IS standards .

2. **Manufacturer's Guarantee:**

a). The compressor shall have warranty as offered by the manufacturer subjected to a period of minimum 03 (three) years for ductable AC in it from the date of commissioning.

b) The agency shall give warranty for the soundness of construction and performance of the complete air conditioner unit i/c compressor and all accessories and shall be responsible for putting right any manufacturing defects without any extra cost for a period of 12 months.

c) The OEM/dealer shall provide 02 (two) free servicing to each ductable AC machine in a 12 month time.

Note: - The contractor shall submit relevant documents for availing warranty as supplied above along-with complete address and contact telephone numbers to the consignee. The seller shall upload all relevant data on OEM's website for availing warranty smoothly in future.

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SPECIFICATIONS

A. GENERAL SPECIFICATIONS

1. **Conformity to IE Act, IE Rules and Standards**:
   All Electromechanical works shall be carried out as per CPWD specifications, provision of IE Act' 2003, Central Electricity Authority Regulations'2010 (measures relating to safety and electric supply/execute) and BIS amended up to date.

2. List of safety standards.

618-Code of practice for safety and health requirement in electrical and gas welding and cutting operation .
659-Safety code for air conditioning.
660- Safety code for mechanical refrigeration.
3016-Code of practice for fire precaution in welding and cutting operation.
3696-Safety for scaffolds and ladders.

3. General Requirement of Components:

i. **Quality of Materials:** All materials and equipment supplied by the Bidder shall be new. They shall be of such design, size and materials as to satisfactorily function under the rated conditions of operation and to withstand the environmental conditions at site.

4. Ratings of Components

i. All components shall be appropriate ratings of voltage, current and frequency as required at respective sections of electrical installations in which they are used.

ii. All conductors, Cables, switches and accessories shall be such size as to be capable of carrying minimum current which will normally flow through them, without their respective ratings being exceeded.

5. Conformity to Standards:
All components shall conform to relevant Indian Standards specifications (IS).

6. Workmanship:
Good workmanship is an essential requirement to be complied with. The entire work of manufacture, fabrication, assembly and installation shall confirm to sound Engineering Practice.

7. Use of quality materials
Only quality materials of reputed makes as specified in the bid will be used in work or otherwise as recommended by OEM.

8. Testing
All tests prescribed in general specifications to be done before, during and after installation shall be carried out and test results shall be submitted to the Engineer-in -Charge in prescribed format forming part of the completion certificate.

9. Commissioning on completion of work:
After the work is completed, it shall be ensured that the installations must be tested and commissioned properly.

10. The work shall be done as per current BSNL/CPWD specifications for Electrical work as amended from time to time & Central Electricity Authority Regulations'2010 (measures relating to safety and electric supply/execute) and BIS as amended up to date.

11. Any damages done to the building by the suppliers /contractors during the execution of work shall have to be made good at his cost & risk only. If he does not do himself within a reasonable time determined by the Executive Engineer (E), then the same will be got done at his risk & cost departmentally after giving notice to him.

12. Bad workmanship will not be accepted and defects shall be rectified at Bidder's / contractor's cost to the satisfaction of the Engineer–in–charge. The progress of work is to be coordinated in accordance with the availability and clearance of sites. No claim for idle staff / labour will be entertained by the department under any circumstances. Nothing extra shall be paid on this account.

13. All the debris of the work should be removed and the site should be cleared by the bidder /contractor immediately after the occurrence of debris. Similarly, any rejected materials should be immediately cleared-off from the site by the bidder/contractor.

14. The entire installation/equipment shall be at the risk & responsibility of the bidder / contactor until these are installed, tested and handed over to the department. However, if there is any delay from the department side, the installation may be taken over in parts but the decision on the same shall rests with Engineer – in – charge which shall be binding on the Bidder /contractor.

15. Notwithstanding the schedule of quantities, all items of interrelated work considered necessary to execute and complete the work are deemed to be included, shall be provided by the contractor at no extra cost.

16. The connections & inter-connections shall be done by the bidder / contractor wherever required for energization of the installation/equipment /machineries and nothing extra shall be paid on this account.

17. All tools and plants, testing, Personal Protective Equipment (PPE) and Safety equipment/accessories required to carry out the work shall have to be arranged by the Bidder / contractor at its own cost.

18. All materials to be used on this work by the bidder/contactor shall be got approved from the Engineer in – charge before installation at site.

19. The bidder/contactor or his authorized representative is bound to sign the site order book as and when required by the Engineer – in – charge and to comply with the remarks therein.

B. TECHNICAL SPECIFICATIONS

1. Construction

1.1 General

1.1.1 The air conditioner and its parts shall be constructed with the strength and rigidity adequate for normal conditions of handling, transport and usage.

1.1.2 There shall be no sharp edges or corners liable to cause injury under normal conditions of use and all moving parts which constitute accident hazards shall be effectively guarded.

1.1.3 Parts which require periodic servicing shall be readily accessible.

1.1.4 These units shall be ceiling suspended with suitable supports to take care of operating weight of the unit, without causing any excessive vibration & noise.

1.1.5 The cold air supplied by these units will be supplied to the area to be air conditioned, through duct system specified in the tender.

1.1.6 Each indoor unit must have electronic expansion valve operated by microprocessor thermostat based temperature control to deliver cooling/ heating as per the heat load of the room

1.1.7 The Sound Pressure level of unit at the highest operating level shall not exceed 38 dB (A), at a vertical distance of 1.5 m below the units with duct connected to the unit.

1.1.8 The unit must have provision of adding drain pump kit if required & specified. The drain pump must be suitable to lift drain up to 1000 mm from the bottom of the unit.

1.2 Material

1.2.1 Materials used in the construction of cabinet, front panel etc. shall comply with the relevant Indian Standards (IS) wherever applicable except where such requirements are modified.

1.2.2 The material shall be free from defects which are liable to cause undue deterioration or failure.

1.2.3 Under normal conditions of use and maintenance, the materials used shall not shrink, deteriorate, warp or cause mould or odours and shall be resistant to attack of vermin and destructive pests.

1.2.4 Sealing and insulating material shall not lose their essential properties such as adhesion, moisture and heat resistance.

1.2.5 Internal and external finishes shall be capable of being cleaned effectively without undue deterioration and shall be such as to afford protection against climatic action in all seasons under normal use. All metal parts which are exposed to moisture or ambient conditions shall be corrosion resistant or adequately protected against corrosion.

2. Refrigerant Circuit

2.1 All refrigerant pipes and fittings shall be type 'L' hard drawn copper tubes and wrought copper fitting suitable for connection with silver solder. The copper thickness of wall shall be 20G/ 22G (0.7 to 1 mm).

2.2 All joints in copper piping shall be swaged joints using low temperature brazing and/ or silver solder. Before jointing any copper pipe or fittings, its interior shall be thoroughly cleaned be passing a clean cloth via wire or cable through its entire length. The piping shall be continuously kept clean of dirt etc while construction of the joints. Subsequently, it shall be thoroughly blown out using nitrogen.

2.3 Refrigerant lines shall be sized to limit pressure drop between evaporator and condensing unit to less than 0.2 kg per Sq.cm.

2.4 After the refrigerant piping installation has been completed the refrigerant piping system shall be pressure tested using Freon mixed with nitrogen at a pressure of 20 Kg per Sq. cm. (High side) and 10 Kg per Sq. cm (Low side). Pressure shall be maintained on the system for 24 hours.

2.5 The system shall then be evacuated to a minimum vacuum of 70 cm. of mercury and held for 24 hours, during which time; change in vacuums shall not exceed 12 cm of mercury.

2.6 All refrigerant piping shall be installed strictly as per the instructions and recommendations of air conditioning equipment manufacturers.

2.7 The refrigerant pipes and fittings shall be of approved quality and shall withstand normal working pressure of air conditioners and should conform to IS 10773:1983 or equivalent national standard / international standard.

2.8 The refrigerant used shall be chemically pure, free from moisture or any other chemical contamination.

2.9 Ductable Split Air conditioners shall be provided with standard length of refrigerant copper pipe (both suction & discharge line with insulation) and electrical wire shall be provided as per OEM standard.

3.0 The unit shall have high static pressure (minimum 45 pascals) . The agency has to produce documentary evidence such as technical data sheet of the manufacturer and same shall be uploaded along with the other documents while participating in the bid .

3.1 Type Test Certificate for two samples of each type /model of Air conditioners from any NABL/ILAC Accredited laboratory shall be submitted by the firm. The type test results shall include capacity test at standard rating test conditions and maximum operating test as specified in IS: 1391(Part-2)-1992.

3.2 Integrated drain pump shall be provided with ceiling unit so as to drain the condense water effectively without damaging the false ceiling.

3.3 Ductable Split air conditioning unit shall be fitted with rotary/ scroll compressor operating on refrigerant R 410A or equivalent with suitably rated variable speed motor. It shall be equipped with overload protection and shall be mounted on resilient mountings for quiet operation. The compressor shall be covered by manufacturers test certificate and Type Test Certificate according to JIS or ASHRAE.

3. Electrical Ratings

3.1 Ratings in watts for split air conditioners shall be based on standard voltage which shall be 230 V, single phase, 50 Hz, the units, however, shall be capable of working at any voltage within +/- 10 percent of the of the standard voltage.

3. 2 Ductable split Air conditioners shall be capable of performing the functions as cooling, dehumidifying, air circulating and filtering. The Air conditioners shall be provided with adjustable step less type electronic thermostat.

3.3 Remote wired/cordless control with LCD/LED Display shall be provided with one On/Off timer, selecting Fan speed (as per OEM) and setting up of temperature etc. Display shall be provided on indoor unit or on handset or on both.

3.4 The ceiling unit shall be extremely quit in operation.

3.5 The logic control of the units shall ensure that the unit operates at the most suitable capacity according to indoor and outdoor conditions .

3.6 The ceiling unit fan shall be able to operate at different speed high/Low/Medium through remte control unit .

4. Servicing

Two (02) nos free servicing shall be provided during warrantee period of 12 months of the air conditioner unit. Firm is required to send service engineer at least 02 times during the warranty period while servicing of these AC units. In case, if the agency fails to carry out the servicing of AC units as per the above, recovery will be made from security deposit @ Rs. 500/- per unit per visit. The decision of Engineer-in-charge shall be final and binding in this regard.

5. Installation

The installation work shall include the following work :-

i) Mounting/Fitting indoor and outdoor units at the respective locations.
ii) Laying refrigerant piping of standard length and connecting both the units after drilling hole/holes in the wall, if required.
iii) Leak testing of the entire system.
iv) Charging Refrigerant gas in the unit required.
v) Suitable electric wiring between indoors and outdoors units of required length up to switch at location of indoor unit. Switches/ Sockets /Plugs are not included in the scope of supply.

vi) All tools, plants, machineries, scaffoldings etc required for installation of the AC units shall be arranged by the firm without any extra payment.

vii) The length of connecting refrigerant pipes between outdoor and indoor unit be kept to minimum feasible at site. However it should not exceed 9 m , as the efficiency of the unit gets severely affected on increase of distance. The refrigerant pipes should be taken along the walls/ columns etc. duly clamped to their surface by saddles. If walls etc. are not available, tray be used to support the refrigerant pipes. Where bending of refrigerant pipes is required, proper pipe bending tool should be used to avoid pinching of pipes.

viii) The refrigerant pipes should be properly insulated as per the recommendations of the manufacturer of split type AC units. The insulation over refrigerant pipes be examined once in a year and in case of any deficiency/ defect the same may be replaced.

6.0 **Ducts**

6.1 All ducts shall be fabricated either from galvanised Sheet Steel (GSS) conforming to IS: 277 or aluminum sheets conforming to IS:737. The steel sheets shall be hot dip galvanized with MAT finish with coating of minimum 120 grams per square meter (GSM) of Zinc, GI sheets shall be lead free, eco friendly and RoHS compliant.

6.2 The thickness of sheets for fabrication of rectangular ductwork shall be as under. The thickness required corresponding to the longest side of the rectangular section shall be applicable for all the four sides of the ductwork.

Longest side (mm)	Minimum sheet thickness	
	For GSS	For Aluminium sheets
750 mm and below	0.63	0.80
751 mm to 1500 mm	0.80	1.00
1501 mm to 2250 mm	1.00	1.50
2251 mm & above	1.25	1.80

6.3 Thickness of sheet for Round Ducts

Diameter of duct, mm	**Thickness of Sheet, mm**	
	GI sheets	Aluminium Sheets
150 to 500	0.63	0.80
501 to 750	0.80	0.80
751 to 1000	0.80	1.00
1001 to 1250	1.00	1.50
1251 and above	1.25	1.80

6.4 All sheet metal connections, partitions and plenums required for flow of air through the filters, fans etc. shall be at least 1.25 mm thick galvanised steel sheets, incase of G.I. sheet ducting or 1.8 mm thick

aluminium sheet, in case of aluminium sheet ducting and shall be stiffened with 25 mm x 25 mm x 3 mm angle iron braces.

6.5 Circular ducts, where provided shall be of thickness as specified in IS: 655 as amended up to date.

6.6 Aluminium ducting shall normally be used for clean room applications, hospitals works and wherever high cleanliness standards are functional requirements.Associated Items.

6.7 Supply/ return air outlets, F.A. grilles and accessories shall be constructed from extruded aluminium sections.

6.8 Flanges for matching duct sections, stiffening angles (braces) and supporting angles shall be of rolled steel sections, and shall be of the following sizes.

Application	**Duct Width**	**Angle size**
Flanges	Upto 1000 mm	35 mm x 35 mm x 3 mm
-do-	1001 mm to 2250 mm	40 mm x 40 mm x 3 mm
-do-	More than 2250 mm	50 mm x 50 mm x 3 mm
Bracings	Upto 1000 mm	25 mm x 25 mm x 3 mm
-do-	More than 1000 mm	40 mm x 40 mm x 3 mm
Support angles	Upto 1000 mm	40 mm x 40 mm x 3 mm
-do-	1001 mm to 2250 mm	40 mm x 40 mm x 3 mm
-do-	More than 2250 mm	Size and type of RS section shall be decided in individual cases

6.9 Hanger rods shall be of mild steel and of at least 10 mm dia for ducts upto 2250 mm size, and 12 mm dia for larger sizes.

6.10 All nuts, bolts and washers shall be zinc plated steel. All rivets shall be galvanised or shall be made of magnesium - aluminium alloy. Self tapping screws shall not be used.

7 CONSTRUCTION

7.1 Ducts

i) Ducts shall be fabricated at site or factory fabricated and shall be generally as per IS: 655 "Specifications for metal air ducts", unless otherwise deviated in these General Specifications.

ii) The interior surfaces of the ducting shall be smooth.

iii) All the ducts up to 600 mm longest side shall be cross broken between flanges by a single continuous breaking. Ducts of size 600 mm and above shall be cross broken by single continuous breaking between flanges and bracings. Alternatively, beading at 300 mm centres for ducts up to 600 mm longest side, and 300 mm centres for ducts above 600 mm size shall be provided for stiffening.

iv) As far as possible, long radius elbows and gradual changes in shape shall be used to maintain uniform velocity accompanied by decreased turbulence, lower resistance and minimum noise. The ratio of the size of the duct to the radius of the elbow shall be normally not less than 1:1.5.

v) Flanged joints shall be used at intervals not exceeding 2500 mm. Flanges shall be welded at corners first and then riveted to the duct.

vi) Stiffening angles shall be fixed to the sides of the ducts by riveting at 1.25 meters from joints for ducts of size 600 mm to 1500 mm, and 0.6mm from joints for ducts of size larger than 1500 mm. Bracings for ducts larger than 1500 mm can alternatively be by diagonal angles.

vii) Plenums for filters shall be complete with suitable access door of size 450 mm x 450 mm.

viii) All factory fabricated duct shall be supplied in L sections; the length of any piece shall not be more than 1800 mm for duct with longest side of cross section as 600 mm and above and 3000 mm for rest.

7.2 Air Outlet and Inlets (Supply and Return)

i) All air outlets and intakes shall be made of extruded aluminium sections & shall present a neat appearance and shall be rigid with mechanical joints.

ii) square and rectangular wall outlets shall have a flanged frame with the outside edges returned or curved 5 to 7 mm and fitted with a suitable flexible gasket between the concealed face of the flanges and the finished wall face. The core of supply air register shall have adjustable front louvers parallel to the longer side to give up to 22.5 degrees vertical deflection and adjustable back louvers parallel to the shorter side to achieve a horizontal spread air pattern to at least 45 degrees. Return air grilles shall have only front louvers. The outer framework of the grilles shall be made of not less than 1.6 mm thick aluminium sheet. The louvers shall be of aerofoil design of extruded aluminium section with minimum thickness of 0.8mm at front and shall be made of 0.8mm thick aluminium sheet. Louvers may be spaced 18 mm apart.

iii) square and rectangular ceiling outlets/intakes shall have a flange flush with the ceiling into which it is fitted or shall be of anti smudge type. The outlets shall comprise an outer shell with duct collar and removable diffusing assembly. These shall be suitable for discharge in one or more directions as required. The outer shell shall not be less than 1.6 mm thick extruded section aluminium sheet. The diffuser assembly shall not be less than 0.80 mm thick extruded aluminium section.

iv) Circular ceiling outlets/intakes shall have either flush or anti smudge outer cone as specified in the tender specifications. Flush outer cones shall have the lower edge of the cone not more than 5 mm below the underside of the finished ceiling into which it is fitted. Anti smudge cones shall have the outer cone profile designed to reduce dirt deposit on the ceiling adjacent to the air outlet. The metal sheet used for construction of these shall be minimum 1.6 mm thick extruded aluminium sheet.

v) Linear diffusers shall have a flanged frame with the outside edges returned 3.5 mm and shall have one to four slots as required. The air quantity through each slot shall be adjustable. The metal sheet used for the construction of these shall be minimum 1.6 mm thick extruded aluminium sheet.

vi) Grilles and diffusers constructed of extruded aluminium sections shall have grille bars set straight, or deflected as required. These shall be assembled by mechanical interlocking of components to prevent distortion. These grilles and diffusers shall have a rear set of adjustable blades, perpendicular to the face blades for deflection purposes.

vii) All supply air outlets shall be fitted with a volume control device, made of extruded aluminium gate section. The blades of the device shall be mill finish/ block shade pivoted on nylon brushes to avoid rusting & rattling noise, which shall be located immediately behind the outlet and shall be fully

adjustable from within the occupied space without removing any access panel. The volume control device for circular outlets shall be opposed blade radial /shutter type dampers, or two or more butterfly dampers in conjunction with equalizing grid. Opposed blade dampers shall be used for square and rectangular ceiling/wall outlets and intakes.

viii) All the products supplied by contractor should supplement in performance by selection curves of product ratings from the manufacturer.

ix) Laminar supply air diffusers shall be made of 2mm thick powder coated aluminium sheet duly insulated with 5mm thick closed cell polyethylene foam insulation having factory laminated aluminium foil and joints covered with self adhesive aluminium tape and having holes 2/3 mm dia including frame work.

8 Inspection

Quality inspection certificate / Routine test certificate of the Inverter type ductable Split AC units shall be submitted at the time of supply by the contractor.

9 Acceptance of Product

13.1 Type Test Certificate for two samples of each type /model of Air conditioners from any NABL/ILAC Accredited laboratory shall be submitted by the firm within two weeks (14 days) from the date of acceptance of bid. In case , the test reports does not meet the standard of specifications or the contractor does not submit the test reports in time, then the action shall be taken against the contractor as per the relevant provision(s) made in the agreement thereto. Decision of Engineer-in-charge shall be final and binding in this regard. No claim what so ever shall be entertained by BSNL on this account.

14. BSNL reserves the right to carry out any work at the risk and cost of the Contractor, if the Contractor fails to perform his duty at any stage as per the contract.

ANNEXURE –"A"

TECHNICAL DATA SHEET FOR 3.0 TR INVERTER TYPE DUCTABLE AIR COOLED SPLIT AC UNITS

(*TO BE FILLED UP , SCANNED & UPLOADED*)

A.	**CAPACITY**	UNIT	To be filled up by agency
1.	Nominal Capacity of the Unit	3.0 TR/36000 BTU/HR	
2.	Refrigerant	R410A or equivalent	
3.	Power Supply	230 V ±10%, 1 Phase, 50 Hz	
4	Power input at rated conditions	In Watts	
5.	EER BTU/w-h (Minimum)	10 BTU/w-h	
B.	**INDOOR UNIT**		
1.	Nominal Capacity (WXDXH)		
2.	Weight (Approx.)	In Kg	
3.	Nominal air flow (CFM)	CFM	
4.	Blow fan type	Centrifugal forward curve	
5.	Blower material	Aluminum	
6.	Fan Motors I) Nos	In Numbers	
	II) Input watts	In watts	
7.	Indoor coil Material	Copper confirms to IS equivalent national standard / international standard	
8.	Indoor air filter	Anti-dust washable aluminum /Non -Woven polyster media enclosed in HDPE mess air filters for clean indoor air quality (IAQ)	
9.	Indoor static pressure	Minimum 45 Pa	
10.	Remote type	wireless	
C.	**Out door Unit**	As per IS:1391 (Part 2) latest as amended.	
1.	Nominal dimensions (WXDXH) in mm	As per actual	
2.	Weight (Approx)	In Kg	

3.	Type of Compressor	Rotary/ Scroll	
4.	No of compressors	In numbers .	
5.	Condenser coil	Copper confirms to IS equivalent national standard / international standard	
	I) Type		
	II) Tube material		
6.	Condenser fan Type	Copper confirms to IS equivalent national standard / international standard	
7.	Refrigerant piping sizes		
	I) Liquid side		
	II) Gas side		
D.	**Micro Controller**		
	1. Type		

SCHEDULE OF REQUIREMENT

Name of work: - SITC of 7nos X 3 TR Ductable Split AC Units with power feeding arrangement for MUX Room of ETR Station at Telephone Bhawan, Bhubaneswar (In replacement of old and Life expired Split AC units)(SW: SITC of 7nos X 3 TR Ductable Split AC Units).

Sl. No.	Description of items	Quantity
1	Supply of 3 TR (36000 BTU/Hr) powder painted metal body Ductable Air conditioner unit comprising of copper coil evaporator unit with blower, copper coil air cooled condenser with Rotary/Scroll Compressor, fan units, and wired/wireless control unit with LCD/LED displays etc. suitable for working with R 410A/R32 (or similar equivalent environment friendly) refrigerant gas and operation on 415V, 3 Phase 50 Hz AC supply, first charge of Refrigerant gas including delivery at site as per the specifications/additional specifications etc. complete as required.	07 nos
2	Installation, Testing & Commissioning of 3.0 TR ductable Air conditioning unit with fixing/fitting of indoor unit from ceiling with MS angle iron support, tie rods and ceiling fasteners etc., installation of outdoor unit on M S Angle iron supporting stand/platform with anti-vibration pads, fixing/fitting of dampers/grills, canvas connections, connection of copper refrigerant pipes with indoor and outdoor units, connecting drain pipes, making electrical interconnection between indoor and outdoor units and extending power supply from the nearest power point, making opening in the wall for laying of refrigerant pipes, drain pipes, interconnecting cables and making good the damages, leak testing as per additional specifications etc complete as required. (materials are not included in this item)	07 jobs
3	Supplying and laying of suitable sizes copper refrigerant pipes as recommended by the manufacturer for 3 TR Ductable AC units (both liquid and hot gas lines) along with insulation and all accessories including welding/brazing, flaring, jointing and clamping the pipes with existing tray/wall as per specifications / additional specifications etc. complete as required.	40 Mtrs
4	Extra for supply and charging of additional Refrigerant gas (R32/R410A) suitable for Ductable AC units as per specifications/additional specifications etc. as required.	07 Kg
5	Providing indoor unit ceiling mounting bracket system made of 25mmX25mmX5mm MS angle, 8-10mm dia full threaded M S tie rods with ceiling fasteners, nuts and bolts for mounting the Indoor units and M S angle/flat iron stand made out of 40mmx40mmx5mm angle & 40mmx5mm flat for outdoor units including grouting on CC roof with suitable nuts and bolts, painting with two coats of primer and two coats of weather proof enamel paint as per specifications / additional specifications etc. as required	07 jobs
6	Supplying and laying of 2.5sq.mm 4 core PVC/XLPE insulated and PVC sheathed copper conductor unarmoured cable of 1.1 KV grade on the surface of wall with saddles/ on the existing cable tray by fixing with saddles/cable ties etc as required	70 mtrs
7	Supplying and installing 300 mm width X 50 mm depth X 1.6 mm thickness size perforated painted with powder coating M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting the suspenders etc. as required.	40 mtrs
8	Providing and laying of following size Fire retardant, corrosion free medium class U PVC pipe along with accessories i.e bends, sockets/couplers etc. confirming to IS 9537 - Part 3, for uPVC conduits, IS 3419:1988 for uPVC fittings and saddles/clamps etc. for drainage of condensate water of AC units i/c laying/fixing, cutting, threading etc. complete as required.	

8.1	40mm dia	10 mtrs
8.2	32mm dia	20 mtrs
8.3	25mm dia	25 mtrs
9	Supply, fabrication and installation of 22 SWG GI sheet plenum/duct complete with all accessories viz. anchor fastener, black painted M.S Angle/rod supporting from ceiling, expanded Polyethylene gasket, galvanized hardware etc. complete as per the specifications/additional specifications and site conditions as required.	14 sqmtrs
10	Supply and Fixing of rectangular fire retardant Canvas duct connector having fabric section vinyl coated woven nylon/polyester blend material and is connected to steel with a grip lock seam with fixing/jointing hardware suitable for 3TR 1200CFM Ductable AC as per specifications/additional specification etc. as required.	07 noa
11	Supplying & fixing of powder coated extruded aluminium Supply Air Grills with fixed front louvers suitable for fixing with the Ductable AC unit / GI plenum / Duct as per specifications etc. as required.	07 nos

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