

**BOQ & SPECIFICATIONS OF PROPOSED AIR -CONDITIONING WORK'S FOR VRM CENTRE, FIRST FLOOR, SULTANIA MAIN BRANCH  
BHOPAL**

S.No	Description of items	Qty	Unit	Rate	Amount

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	<b>AIR-CONDITIONING WORKS</b>				
	Supply, installation, testing and commissioning of following AIR CONDITIONERS as under. The Rate shall be inclusive of all taxes excluding GST. GST will be paid additionally by the Bank as applicable subject to GST Number. and system has complete one year warranty & If any additional warranty provided by company/vendor in any specific part like compressor etc that is acceptable, please mentioned it. including carpentry work, minor civil work and material				
1	<p><b>VRV/VRF outdoor AC unit : (Inverter outdoor unit with inbuilt phase reversal protection with joining kit and manual hardware addressing. System shall be modular (minimum 2–3 modules) to ensure redundancy in case any module fails.)</b></p> <p><b>VRV/VRF outdoor AC unit:-Supply installation testing and commissioning</b> of VRV /VRF /MRV outdoor units with following multiple inverter based scroll type compressors, electronic expansion valve, R 410A/ecofriendly green refrigerant, cooling &amp; heating mode both options, special pre-coated fin type heat exchanger, low noise direct driven propeller condenser fans in each module with top discharge including internal wiring, microprocessor controls, safety. The condensing unit should be capable of providing cooling between +/-5deg. C. to 48 deg.C &amp; heating within 0 deg.C to 15 deg.C, COP not less than 3.3. Each system should have the provision to combine maximum 3 nos compressor in each outdoor unit, every single outdoor unit should not have more than maximum Capacity 20 HP (3 phase) each compressor complete as per specification. Outdoor/indoor units should be of same make (brand). (Single phase/three phase). Including nitrogen pressure test, leak test, vacuum, additional refrigerant charging, electrical and control configuration, system balancing and complete commissioning of VRF system as per OEM guidelines, including submission of commissioning log sheet and warranty activation. Make of ACs:- Daikin/LG/Bluestar/ O- General / Mitsubishi Electric only</p>				
	<b>42 HP</b>	1	EACH		
2	<p>Supply installation testing and commissioning of <b>Treated Fresh Air Unit (TFA) (Indoor &amp; outdoor units both)</b> shall have a total capacity of 2000 CFM (±10%) and be capable of delivering conditioned fresh air at approximately 26°C ±2°C measured at the diffuser outlet under peak summer outdoor conditions (40–45°C ambient DB). The unit shall be equipped with a low-noise EC/plug fan or forward-curved blower and shall operate at a maximum noise level not exceeding 55 dB(A) when measured at a distance of 1 metre from the unit casing after stabilization. Including complete stand-alone Treated Fresh Air (TFA) system comprising one ceiling-suspended indoor TFA unit and one matching outdoor condensing unit (capacity 3000 CFM ±10%), including all necessary installation accessories and materials. The scope includes fixing the indoor ceiling-suspended TFA unit with M10 threaded rod hangers, anti-vibration mounts, support brackets and hardware; installation of the outdoor condensing unit with base supports, vibration pads, fixing bolts and hardware; installation of interconnecting refrigerant piping with insulation, brazing using nitrogen purging, leak testing, pressure testing and vacuuming; installation of insulated condensate drain piping with proper slope, traps and supports; installation of electrical power cable of Indoor, control wiring, communication wiring, earthing with conduit and cable management accessories; installation of flexible connection between TFA and duct; sealing, testing and making the system operational and internal wiring, controls complete as per specification. (Single phase/three phase)</p>				

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a).	TFA 3000 CFM	1	EACH		
3	VRF/VRV indoor AC unit (ceiling mounted 4 way) : VRF/VRV indoor AC unit (ceiling mounted 4 way):-Supply installation testing and commissioning of 4 way round flow ceiling suspended/mounted cassette type unit comprising of copper evaporator, electronic expansion valve, blower, motor, filter pad, auto air swing louvers, temperature & on/off display with inbuilt drain pump & decorative panels including internal wiring, controls. Dimension in terms of length & width should not be more than 950mmX 950mm with wireless remote controller, refnet joints, front panel, washable filter, inbuilt expansion valve, and drain pump as required with Haangers and Supports. (Single phase/three phase) 5 Star rating. Make of ACs:- Daikin/LG/Bluestar/ O-General / Mitsubishi Electric only				
a).	3.2 TR	4	EACH		
b).	2.6 TR	6	EACH		
c).	2.0 TR	2	EACH		
d).	1.0 TR	2	EACH		
4	Supply & of Central controller with set-point lock, fan speed control, mode limitation, group control, and scheduling for multiple indoor units.	1	EACH		
5	<b>Copper piping :</b> Copper piping: - <b>Supply, installation, testing and commissioning</b> of interconnecting copper refrigerant pipe work (19mm / 13mm thick) duly insulated with elastomeric nitrile rubber type tubular insulation between indoor & outdoor units as per specifications. And exposed piping should be wrapped with glass woven cloth and lag coating for vapour barrier and weather protection. Joints shall be covered with nitrilerubber tape of 3 mm thick complete as per specification. <b>(copper refrigerant piping conforming to ASTM-B280 grade, complete with all elbows, fittings, with nitrogen purging. Piping shall include OEM-recommended sizing for suction and liquid lines. All refrigerant lines will be be insulated with closed-cell elastomeric insulation, minimum 13 mm thickness for liquid lines and 19–25 mm thickness for suction lines (as per pipe size), with vapour barrier tape at joints. All exposed outdoor insulated lines shall be protected with UV-resistant aluminium cladding with sealed joints.)</b>				

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a).	41.3 mm O.D : 41.3 mm O.D.wall thickness ≥ 1.4mm (insulation –19 mm thick)	30	RMT.		
b).	28.6 mm O.D : 28.6mm O.D.wall thickness ≥ 1.2mm (insulation –19 mm thick)	50	RMT.		
c).	25 mm O.D : 25 mm O.D.wall thickness ≥ 1.2mm (insulation –19 mm thick)	30	RMT.		
d).	22.2 mm O.D : 22.2 mm O.D.wall thickness ≥ 1.0mm (insulation –19 mm thick)	25	RMT.		
e).	19.1 mm O.D : 19.1 mm O.D.wall thickness ≥ 1.0mm (insulation –13 mm thick)	60	RMT.		
f).	15.9 mm O.D : 15.9 mm O.D.wall thickness ≥ 0.8mm (insulation –13 mm thick)	175	RMT.		
g).	12.7 mm O.D : 12.7 mm O.D.wall thickness ≥ 0.8mm (insulation –13 mm thick)	140	RMT.		
h).	9.5 mm O.D : 9.5 mm O.D.wall thickness ≥ 0.8mm (insulation –13 mm thick)	105	RMT.		
j).	6.4 mm O.D : 6.4 mm O.D.wall thickness ≥ 0.8mm (insulation –13 mm thick)	25	RMT.		
<b>6</b>	Drain piping ; Drain piping :-Providing and fixing of CPVC, 6Kg/cm2 drain water piping with fittings, support and insulated with 6 mm thick closed cell elastomeric nitrile rubber insulation complete as per specification. Make:- Kasta/supreme				
a).	25 mm dia	100	RMT.		
b).	32 mm dia	60	RMT.		
c).	40 mm dia	30	RMT.		
<b>7</b>	Supply And Installation of GI Sheet Metal Ducting with Aecessories as G.I. hangers, supports, angles, studs, anchor fasteners, sealant, gaskets, hardware 0.63 mm thick (24G)	115	SQM		
<b>8</b>	Supply and fixing of insulation of 25 mm thick thermal insulation (XLPE / mineral wool with Al cladding) on TFA supply duct	125	SQM		
<b>9</b>	Supply and fixing of Insulated Flexible Duct insulated flex duct for FA to 16 IDUs Ø150 mm (6")	90	RMT.		
<b>10</b>	Supply and fixing of GI Volume Control Dampers (TFA main duct)	3	SQM		
<b>11</b>	Supply and fixing of GI Volume Control Dampers (TFA branches to IDUs) For 150 mm round take-offs / behind FA grilles	8	NOS.		
<b>12</b>	Supply and installation of powder-coated aluminium square ceiling diffuser ), suitable for an airflow capacity of approximately 250-300 CFM. The diffuser shall be complete with factory-fitted collar, opposed blade volume control damper (OBD), and necessary fixing accessories. The diffuser must be suitable for mounting in grid ceiling and connected through insulated flexible ducting as required. The diffuser face shall be removable for cleaning and airflow balancing				
a).	<b>300 × 300 mm Aluminium Square Diffuser with 250 × 250 mm Neck</b>	9	NOS.		
b).	<b>300 × 300 mm Aluminium Square Diffuser</b>	9	NOS.		

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14	Supply, installation, testing and commissioning of OEM-recommended communication/transmission cable for VRF system, minimum specification: shielded twisted pair (STP) / 2-core × 18 AWG or 0.75–1.5 sq.mm copper conductor, UV-protected for exposed runs. The cable shall be installed in separate conduits/trays, not shared with power cables, with proper end termination, polarity maintenance, and ferruling.	180	RMT.		
15	Supply and installation of remote controller cable for VRF and TFA indoor units, OEM-approved, typically 2-core 0.75 sq.mm copper (or as recommended by manufacturer), suitable for low-voltage communication between indoor unit and wired remote controller, laid in PVC/FRLS conduits or casing-capping, properly clamped and routed without sharing with power cables.	140	RMT.		
16	Supply and installation of power cable for VRF indoor units, 3-core × 1.5 sq.mm stranded copper conductor, PVC/FRLS insulated and sheathed, 650/1100V grade, laid in PVC/FRLS conduit or cable tray from floor nearest given point or from distribution board to each indoor unit, including saddles, clamps, terminations, ferrules and identification. Cable shall include phase, neutral and dedicated earth, routed so that it does not touch floor or bare wall surfaces directly, and properly supported at intervals as per standards.	200	RMT.		
17	Supply, installation, testing and commissioning of Higher Efficient models of <b>SPLIT AC, FIVE STAR INVERTER RATING OF BEE AIR CONDITIONERS 1.0 Ton</b> Machines confirming to latest Indian Standards and suitable for operation on 230 Volts + 10 %, single Phase, 50 Hz AC supply with rotary compressor, Refrigerant and capable to perform cooling, dehumidifying, Air Circulating, auto mode, auto swing, anti bacteria filtering, ventilation and with remote control with Cool/Fan/Dry/Auto mode, sleep mode & on/off timer with suitable thermostat. The rate should include installation charges after making appropriate changes in existing false ceiling. Heavy ready made/fabricated M S Stand to house the out door unit as per site conditions including carpentry work, minor civil work and material including copper piping of hard & prime quality of min. 22 G upto 3 metres with class "o" Nitrile insulation 12mm , cabling from indoor to outdoor unit, heavy gauge PVC drain piping with insulation as per site requirement. The copper piping, drains piping and electrical cabling should be fixed with clamps and no loose piping/cabling is allowed. The out door unit should be anti-rust powder coated. Indoor unit should have LED display. The rates inclusive of all repairs of civil and carpentry work The cost includes original fill and additional top up of refrigerant gas as per site condition. The rate inclusive of all chisel work, plastering, finishing, painting & all civil related work pertaining to mentioned work. Make of ACs:- Daikin/'O' General/Bluestar/LG/ Mitsubishi electric only	2	EACH		

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18	Supply, installation, testing and commissioning of Higher Efficient models of <b>CASSETTE TYPE AIR CONDITIONERS(4-WAY) 2.0 Ton, INVERTER AC</b> Machines confirming to latest Indian Standards and suitable for operation on 220 Volts + 10 %, three Phase, 50 Hz AC supply with Scroll compressor, Refrigerant and capable to perform cooling, dehumidifying, Air Circulating, auto mode, auto swing, anti bacteria filtering, ventilation and with remote control with Cool/Fan/Dry/Auto mode, sleep mode & on/off timer with suitable thermostat. The rate should include installation charges after making appropriate changes in existing false ceiling. Heavy ready made/fabricated M S Stand to house the out door unit as per site conditions including carpentry work, minor civil work and cabling from indoor to outdoor unit, heavy gauge PVC drain piping with insulation as per site requirement. The copper piping, drains piping and electrical cabling should be fixed with clamps and no loose piping/cabling is allowed. The rates inclusive of all repairs of civil and carpentry work The out door unit should be anti-rust powder coated. The cost includes original fill and additional top up of refrigerant gas as per site condition. The rate inclusive of all chisel work, plastering, finishing, painting & all civil related work pertaining to mentioned work. Make of ACs:- Daikin/O' General/Bluestar/LG/ Mitsubishi electric only	6	EACH		
19	Supply and installation of soft & prime quality of min. 22 G Copper pipe for " Split AC only" with class "o" Nitrile insulation of minimum 12mm for split air conditioner including interconnection power/ communication cable between indoor and outdoor unit as per site requirement. ( If required additionally, payment will made as per actual installtion. The rate inclusive of all chisel work, plastering, finishing, painting & all civil related work pertaining to mentioned work. Make of Insulation:- Superlon/Aflex/Armacell/Kflex Make of cable:- Finolex/RR/Havells	30	MTRS.		
20	Supply and installation of hard & prime quality of min. 22 G Copper pipe for "Cassette AC Only" with class "o" Nitrile insulation of minimum 12 mm for 2 / 3 ton cassette type air conditioner including interconnection power/ communication cable between indoor and outdoor unit as per site requirement.( If required additionally, payment will made as per actual installtion.) The rate inclusive of all chisel work, plastering, finishing, painting & all civil related work pertaining to mentioned work. Make of Insulation:- Superlon/Aflex/Armacell/Kflex . Make of cable:Finolex/RR	80	MTRS.		
21	Y joints : Y joints:- Supply, installation, testing & commissioning of ref nut/Y-joints brass for indoor and outdoor units of suitable size as per requirement.	15	EACH		
22	Surface PVC conduit MMS : Supplying and fixing PVC conduit ISI marked FRLS along with accessories on surface etc. as required				
a).	20 mm. MMS : PVC conduit 20 mm. (MMS)	150	RMT.		
b).	25 mm. MMS : PVC. conduit 25 mm (HMS)	50	RMT.		
23	XLPE insulated FRLS heavy duty power cable : Supply of XLPE insulated FRLS heavy duty power cable conforming IS-7098 (Part-1) 1988, 1100 Volt grade, 2/3/4/8/10/12 core ISI marked with copper stranded/ solid conductor. Make of cable:- Finolex/RR/Havells				

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	<b>Armoured 4 core</b>				
a).	10 sq. mm	100	RMT.		
b).	16 sq. mm	30	RMT.		
<b>24</b>	Outdoor stand fabrication : Outdoor stand fabrication :- Supply, fabrication and erection of angle/channel/flat iron stand, hanging arrangement for air conditioning machines & ducts etc, back/support clamps or other similar work etc. including nut bolts of required size, making holes, fabrication, welding, cutting, etc. and painting with one coat of red	500	KG		
<b>25</b>	Cable tray : Supply and erection of hot dip G.I. cable tray perforation not more than 17.5% for specific dimensions along with tees, bends. The cable tray shall be hang from ceiling/ fixed to wall with necessary angle/flat				
a).	150 x 50 x 1.6mm thick	20	RMT.		
b).	300 x 50 x 1.6 mm thick	38	RMT.		
c).	450 x 50 x 2mm thick	20	RMT.		
<b>26</b>	Digital Timmer to control outdoor lights with enclosure and all accessories.	1	Nos		
<b>27</b>	Providing & fixing of 4 KVA Voltage stabilizer with time delay option including all accessories with installation at site ( For 1.0/1.5 Tr Split AC & 2.0 Tr Cassette AC) Make:-Microtek, V-Gards (Voltage Range	2	Nos		
<b>28</b>	Providing & fixing of 5 KVA Voltage stabilizer with time delay option including all accessories with installation at site ( For 2.0 Tr Split AC &	6	Nos		
<b>(A)</b>	<b>TOTAL OF AIR CONDITIONING WORK</b>				
<b>(B)</b>	Fully Comprehensive AMC(CAMC) after Defect Liability Period for 1 year: Fully comprehensive AMC of above AC system after Defect liability period on one year. Comprehensive AMC includes all the equipments pertians to above AC installationS (LIKE OUTDOOR UNIT , COMPRESSOR, PCB, INDOOR UNIT, COPPER PIPING, DRAIN PIPING, DUCTING SYSTEM, TFA SYSTEM, INSULATIONS, ALL ELECTRICAL PARTS & CABLING ETC PERTAIN TO ABOVE INSTALLATIONS)				
B.1	For 1st Year	1	Lot		
B.2	For 2nd Year	1	Lot		
B.3	For 3rd Year	1	Lot		
B.4	For 4th Year	1	Lot		
B.5	For 5th Year	1	Lot		
<b>(B)</b>	<b>TOTAL OF CAMC AC WORK</b>				
	<b>GRAND TOTAL ( A + B)</b>				
	Note:- (To arrive L-1 vendor, cost of AC work and its CAMC will be considered)				
	GST to be paid additionally				
	Seal & Signature of Contractor				