

**BILL OF QUANTITY OF VRF - AIR CONDITIONING WORK AT DR. BABASAHEB ABMBEDKAR OPEN UNIVERSITY**

Item No.	DESCRIPTION	Qty.	Unit	Unit Price	
				Rate	Amount
A	<b>VARIABLE REFRIGERANT FLOW (VRF) SYSTEM with HOT &amp; COLD Technology with Green Refrigerant R410A</b>				
1.1	<b>SITC OF VRF OUTDOOR UNIT - HOT AND COLD Technology (MAKE : Daikin/ Carrier / Mitsubishi HEAVY / O-General)</b>				
1.1.1	Supply, Installation, testing and commissioning of <b>42 HP VRF Outdoor Units (condensing Units) -TOP DISCHARGE with Hot &amp; Cold Technology, with minimum 4 Nos. of compressors for the better reliability of the system.</b> Special pre-coated fins, panel, corrosion resistant coated condenser, condenser fan , electrical & microprocessor panel, isolating valves and all the necessary accessories for proper functioning of the units. having following approximate capacities. Power Supply will be made available at one point only near outdoor unit	1	Set.	1000000	1000000
1.1.2	Supply, Installation, testing and commissioning of <b>30 HP VRF Outdoor Units (condensing Units)-TOP DISCHARGE with Hot &amp; Cold Technology, with minimum 4 Nos. of compressors for the better reliability of the system.</b> Special pre-coated fins, panel, corrosion resistant coated condenser, condenser fan , electrical & microprocessor panel, isolating valves and all the necessary accessories for proper functioning of the units. having following approximate capacities. Power Supply will be made available at one point only near outdoor unit	1	Set.	700000	700000
1.1.3	Supply, Installation, testing and commissioning of <b>20 HP VRF Outdoor Units (condensing Units)-TOP DISCHARGE with Hot &amp; Cold Technology, with minimum 2 Nos. of compressors for the better reliability of the system.</b> Special pre-coated fins, panel, corrosion resistant coated condenser, condenser fan , electrical & microprocessor panel, isolating valves and all the necessary accessories for proper functioning of the units. having following approximate capacities. Power Supply will be made available at one point only near outdoor unit	1	Set.	450000	450000
1.1.4	Supply, Installation, testing and commissioning of <b>16 HP VRF Outdoor Units (condensing Units)- with Hot &amp; Cold Technology, with minimum 2 Nos. of compressors for the better reliability of the system.</b> Special pre-coated fins, panel, corrosion resistant coated condenser, condenser fan , electrical & microprocessor panel, isolating valves and all the necessary accessories for proper functioning of the units. having following approximate capacities. Power Supply will be made available at one point only near outdoor unit.	1	Set.	360000	360000
1.1.5	Supply, Installation, testing and commissioning of <b>14 HP VRF Outdoor Units (condensing Units)- with Hot &amp; Cold Technology, with minimum 2 Nos. of compressors for the better reliability of the system.</b> Special pre-coated fins, panel, corrosion resistant coated condenser, condenser fan , electrical & microprocessor panel, isolating valves and all the necessary accessories for proper functioning of the units. having following approximate capacities. Power Supply will be made available at one point only near outdoor unit.	3	Set.	340000	1020000
1.2	Supply installation, testing and commissioning of VRF based indoor units complete <b>with Cordless remote, Drain pump and all accessories</b> , Vibration isolators & supports,Including all electrical control panel. (Bidder To offer nearest size of the Unit available)				

1.2.1	<b>Ceiling Suspended "High-Static Type Ductable type" VRF Indoor Unit</b> having following approximate capacities with <b><u>Coardless remote Controls and Drain Pump.</u></b>				
a	<b>5.5 TR Hi-Static Ductable</b> VRF Indoor Unit (with Coardless Remote and Drain Pump).	2	Set.	85000	170000
b	<b>8.0 TR Hi-Static Ductable</b> VRF Indoor Unit (with Coardless Remote and Drain Pump).	1	Set.	101000	101000
c	<b>12.0 TR CALCULATED LOAD / (6.0 TR + 6.0 TR) Hi-Static Ductable</b> VRF Indoor Unit (with Coardless Remote and Drain Pump for each Indoor).	5	Set.	180000	900000
d	<b>16 TR CALCULATED LOAD / (8.0 TR + 8.0 TR) Hi-Static Ductable</b> VRF Indoor Unit (with Coardless Remote and Drain Pump for each Indoor).	1	Set.	202000	202000
1.2.2	<b>Ceiling suspended "Four-way Cassette type" VRF Indoor Unit</b> having following approximate capacities with <b><u>Cordless remote Controls, Decorative Panel-Grill and Drain pump.</u></b>				
a	<b>4.0 TR Four-way Cassette</b> VRF Indoor Unit (with cordless remote, Decorative Panel and Inbuilt Drain pump)	1	Set.	51000	51000
b	<b>3.2 TR Four-way Cassette</b> VRF Indoor Unit (with cordless remote, Decorative Panel and Inbuilt Drain pump)	0	Set.	50000	0
c	<b>2.0 TR Four-way Cassette</b> VRF Indoor Unit (with cordless remote, Decorative Panel and Inbuilt Drain pump)	9	Set.	43000	387000
d	<b>1.6 TR Four-way Cassette</b> VRF Indoor Unit (with cordless remote, Decorative Panel and Inbuilt Drain pump)	2	Set.	41000	82000
1.2.3	<b>Ceiling suspended "One-way Cassette type" VRF Indoor Unit</b> having following approximate capacities with <b><u>Cordless remote Controls, Decorative Panel-Grill and Drain pump.</u></b>				
a	<b>2.0 TR One-way Cassette</b> VRF Indoor Unit (with cordless remote, Decorative Panel and Inbuilt Drain pump)	3	Set.	48000	144000
1.2.4	<b>Wall Mounted "Hi-wall type" VRF Indoor Unit</b> having following approximate capacities with <b><u>Cordless remote Controls and Drain pump.</u></b>				
a	<b>1.6 TR Hi-wall</b> VRF Indoor Unit (with Cordless remote and Drain pump)	1	Set.	26000	26000
1.3	<b><u>CENTRAL CONTROLLER W/o PC Monitering Systems</u></b> Supply installation, testing and commissioning of Central Remote Controller. System should have facilities for start, stop,temperature setting,fan speed control,mode control,Group control,emergency start & stop, BMS access and fault Diagnosis.	7	Nos.	22000	154000
1.4	Supply installation , testing commissioning of FACTORY SUPPLIED INSULATED REF JOINTS / Y-JOINTS, CONTROL BOX, SPLITTERS, PIPE FITTINGS, ACCESSORIES ETC. for all the above VRF IDUs units.				
a	For VRF Circuit - 42 HP	1	Lot	36000	36000
b	For VRF Circuit - 30 HP	1	Lot	24000	24000
c	For VRF Circuit - 20 HP	1	Lot	12000	12000
d	For VRF Circuit - 16 HP	1	Lot	12000	12000
e	For VRF Circuit- 14 HP	3	Lot	20000	60000
1.5	Supply installation , testing commissioning of FACTORY SUPPLIED INSULATED REF JOINTS / Y-JOINTS, CONTROL BOX, SPLITTERS, PIPE FITTINGS, ACCESSORIES ETC. for all the above VRF <b><u>ODUs</u></b> units.				

a	For VRF ODUS -Total ODUs 150 HP	1	Lot	25000	25000
B	LOW-SIDE WORK FOR VARIABLE REFRIGERANT FLOW (VRF) SYSTEM				
1.1	<p>Supply and installation of All refrigerant piping, pipe fittings, splitters, Gas Charging, SI angles/ flats supports, accessories, minimum <b>19mm thick Class O</b> Nitrile Rubber Insulation for entire piping system, Refrigerent piping should be additionally insulated with factory laminated <b>200 GSM</b> glass cloth for UV and mechanical protection and manufacturer recommended adhesive (solvent-free) sealant applied at all joints. Refrigerent pipes on terrace or platform shall be installed on raised GI Cable tray and finally covered with GI Sheet Cover for protection. Rates should include the same.along with 19mm O class Nitrile insulation and supports, between indoor &amp; outdoor units duly insulated as per Drawing. All piping inside the room in ceiling shall be properly supported in cable tray.</p> <p>Rates should include pressure testing, vaccumising and inital &amp; final charging of refrigerent gas.</p> <p>Quoted rates should be inclusive of Loading, Unloading of all IDU/ODU/ pipes / accessory everything.</p>				
a	For VRF Circuit - 42 HP	1	Lot	200000	200000
b	For VRF Circuit - 30 HP	1	Lot	140000	140000
c	For VRF Circuit - 20 HP	1	Lot	90000	90000
d	For VRF Circuit - 16 HP	1	Lot	70000	70000
e	For VRF Circuit- 14 HP	3	Lot	60000	180000
1.2	<p><b>CONDENSING UNIT MS PLATFORM STAND</b> FOR VRF ODUs Supply and Installation of Hot-dip galvanised MS platform stand of adequate wight-bearing capacity, should be safe for maintenace and installation work. It to be mounted on wall or Slab provided by Civil agency. Double rubber pads &amp; galvanised MS plates for each leg. Rates should be quoted per VRF ODU circuit not per Kg rates.</p>	7	Set.	14000	98000
1.3	<p><b>COMMUNICATION CABLE/ CONTROL WIRING</b> The rates should be inclusive of the Supply and laying of braided or shielded communication cablling work using 1.5 Sq.mm x 3 Core in ISI PVC Couduits between IDU-ODU-Cetral Remote Rates should be quoted per VRF ODU circuit.</p>	7	Set.	14000	98000
1.4	<p><b>UPVC Drain</b> SCH-40. The rates should be inclusive of the Supply and laying of piping 25mm/ 32 mm with 9mm nitrile rubber insulation from indoor unit to nearest drain point. Drain piping shall be U-PVC SCH-40. Piping shall be complete with supports</p>	7	Set.	7000	49000
C	AIR-DISTRIBUTION NETWORK				0
1.1	<p><b>22 G (0.80 mm) GI Plenums with Accoustic Insulation</b> (Approximate size-in Inch 36" x 24" x 132") Supply and Fitting of GI 22G, Lead free air-tight plenums fabricated out of prime qolity LFQ sheets with 120 GSM galvanizing. Complete with necessary supports, expansion fasteners, etc. Rates should be inclusive of acoustic lining of entire plenum using <b>25mm</b> thick resin bounded fiberglass wool having 48 Kg/CuMt density, fixed with GI fastners and covered with RP tissue paper &amp; perforated Aluminium sheet.</p>	6	Job	14000	84000

1.2	<b>RTV SEALED RECTANGULAR GI DUCTING</b> Supply and Fitting of GI Lead free air-tight square duct fabricated as Per IS-655 out of prime quality LFQ sheets with 120 GSM galvanizing. Complete with MS Angle supports & flanged, threaded support for level adjustment, expansion fasteners, etc.				
a	24 G (0.63 mm) GI Duct	265	Sq.Mt.	800	212000
b	22 G (0.80 mm) GI Duct	80	Sq.Mt.	1000	80000
c	20 G (1.0 mm) GI Duct	Nil	Sq.Mt.		Rate Only
	<b>13mm Thermal Insulation</b> Of Ducts with Closed Cell Elestomeric Sheet Insulation (class "O") of density 50kg/cu.meter for duct. covered with glass cloth and paint for UV & mechanical protection	130	Sq.Mt.	550	71500
	<b>Duct Acoustic Lining</b> for Duct with 12 mm thick resin bounded fiberglass wool with BLACK Glass woven cloth factory laminated at either side in rigid board, having 48 KG/CuMt density,covered with RP tissue paper & perforated Aluminium sheet, fixed with GI nut-bolts & washer and covered with GI cross	210	Sq.Mt.	600	126000
1.3	<b>Round / Oval shaped Ducting 22G (0.80 mm) GI with Accoustic Insulation_22</b> Gauge exposed GI ducting without collar, Including necessary supports. Installation & supporting details of round ducts, SA collars & grille-fixing details shall be as approved by Architect. Sample of duct to be prepared for Architect's approval immediately on placement of order. Rates should be inclusive of acoustic lining of entire duct using <b>25mm</b> thick resin bounded fiberglass woolwith BLACK Glass woven cloth factory laminated at either side in rigid board, having 48 KG/CuMt density,covered with RP tissue paper &	130	Sq.Mt.	2500	325000
1.2	Manufacturing and fixing- hanging of Fire retardant flexible <b>Canvass connection</b> at outlet of each Ducted IDU with <b>zipper</b> to facilitate temprature measurement. Rates is per Machine, not per Outlet.	15	Nos.	4000	60000
1.4	<b>ALUMINIUM POWDER COATED GRILLS/ VCD</b> Supply and Fitting of Powder coated Alluminium SA/RA Grilles / Diffusers as per the shade & finish shall be approved by the Archtect, SA grilles shall be with adjustable vertical & horizontal deflection louvers where required. Rear louvers of black colour				
a	SA/RA Flenged Grilles with Aluminium VCD, with curving front surface suitable for fixing directly on round duct (without collar)	5.75	Sq.Mt.	11000	63250
b	SA/RA (Flenged/Linear) Grilles with Aluminium VCD	4	Sq.Mt.	10000	40000
c	SA/RA (Flenged/Linear) Grilles with out VCD	6	Sq.Mt.	6500	39000
D	FREASH AIR ARRANGEMENT				
1.1	Supply, Installation, Testing and Commissioing of <b>Treated Freash - Air handling unit</b> with Double skin 50mm Thick Thermal break profile with Freash air damper, Panel filters, Copper tube cooling coil with aluminium fins & insulated drain pan, DIDW Centrifugal Backward curved supply air blower, necessary electrical and plumbing connection, Motor shall be suitable for 415V+/-10% V & 50 Hz AC supply. Rate is inclusive of Electrical Control Panel and Connecting TFA with specified Air cooled Condensing unit with <b>SCROLL-fixed speed type compressor</b> inclusive of Mounting stand for both TFA & Condensing unit, UP TO the length 5 RMT - Connecting 8mm Nitrile Insulated Copper piping, Caballing between Panel-TFA-Condensing Unit, 6mm PVC drain pipe is inclusive in the given rates				
a	1500 cfm 50mm static pressure TFA with 8.5 TR condensing unit with SCROLL Compressor	1	Set.	199200	199200
1.2	Supply, Installation, Testing & Commissioning of <b>300 cfm INLINE FRESH AIR FAN UNIT (25 dB)</b>	3	Set.	11500	34500

1.3	Freash air assemblies comprising of SS bird screen, rain louvers & opposed-blade type fresh air damper: fixed on the wall surface with wooden frames. (The colour shade & finish shall be as approved by Architect, size: up to 750mm x 300 mm	3	Set.	4500	13500
E	Supply, Installation, testing & Commissioning of STAND ALONE AIR COOLED Dx <b>3.0 TR INVERTER CASSETTE UNITS R410A / R32</b> with MS Stand for ODU, Cordless Remote Control etc. inclusive of 5 Rmt - Copper piping with 9mm Nitrile rubber insulation, PVC drain pipe with 6mm Insulation, and control cabling between IDU to ODU.	1	Set.	165000	165000
	<b>GRAND TOTAL</b>				<b>8353950</b>

Amount in words.....

**List of Approved Makes**

Sr.	Equipment / Material	Material Makes
1	VRF / VRV units	Daikin/ Carrier / Mitsubishi HEAVY / C
2	Inverter DX System	Daikin/ Carrier-Toshiba / Mitsubishi H
3	Copper Pipe	Mandev / Rajco / Totaline / Maxflow ,
4	Hard UPVC Pipes	Supreme / Prince/ Vitco / Finolex / As
5	G.I SHEET	TATA /JINDAL/ESSAR/NIPPON
6	ACCOUSTIC LINNING	KIMMCO/ LLOYD/ UP TWIGA/ OWENS
7	Thermal Insulation Material: Nitrile Rubber	Armaflex/Aeroflex / Paramount / Sup
8	Cable	Finolex / Polycab / RR Kabel
9	Alluminium Grills / Diffusers	Carryaire / Cosmos / Dynacraft / Radi
10	TFA	Ethos / Citizen/ Zeco
11	Condensing Unit for TFA	Daikin/ Carrier
12	Anchor Fastners	Hilti / Fischer

**Note**

- 1 Electrical Work - cabling or DB for Power supply to IDU- Single Phase / ODU- TFA - Three Phase are not taken in to estimate.
- 2 Any type of Civil Work - zari digging, Core Cutting, Hole making are not taken in to estimate.
- 3 False Ceiling related work - Trap Door for the maintenace, frame work to fix the Grills/ Diffusers are not taken in to estimte.
- 4 GST should be included in the quoted rates.











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