

Original Estimate

Name of Work: Interior designing and allied works at Level-6 of Faculty Building Annexe at IIT Kanpur. (SH: HVAC Work)

Sub:- SITC of 36 HP (2x8 HP+2X10 HP) VRF System at Director and Dy. Director Office,Conference room's, Staff office of

| Sl. No | Description | Qty | Unit | Rate | Amount |
|--|---|-----|------|-----------|------------|
| <u>Part (A) High Side Works (Equipment & accessories)</u> | | | | | |
| <u>1 Variable Refrigerant Flow/Variable Refrigerant Volume System</u> | | | | | |
| <u>Outdoor Unit (IVRF/IVRV)</u> | | | | | |
| 1.1 | Supplying, Installation, Testing & Commissioning of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s),minimum two compressors (with individual separate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condenser fan shall be capable to operate at different speed with respect to load.The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 °C. The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kW R ISEER 7.4, Capacity > 40 and <70 ISEER 7.5, Capacity > 70 ISEER 7.6 for Super ECSBC Building) For Cooling or Heating or Both | | | | |
| i) | (2 x 10 HP) | 20 | HP | 19,289.00 | 385,780.00 |
| ii) | (2 x 8 HP) | 16 | HP | 20,119.00 | 321,904.00 |
| <u>Indoor Unit (Hi-wall)</u> | | | | | |
| 1.2 | Supplying, Installation, Testing and Commissioning of following minimum capacity High wall type Indoor unit equipped with and comfort washable synthetic media prefilter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, outer cabinet, cord less remote control, drain pan, necessary accessories etc., suitable for operation on 230 V ± 10%, 50 Hz, single phase AC supply, complete as required. The Indoor units must shut down upon receiving a signal from the BMS System/Fire Signals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 OC DB and 19 OC WB temperature. (Make will be same as of Outdoor) | | | | |
| i) | 2.0 TR | 14 | Nos. | 19,215.00 | 269,010.00 |
| <u>Y-Joints & Headers</u> | | | | | |
| 1.3 | Supplying, Installation, Testing and Commissioning of Y/T/Multi Joints. Joints shall be of same Original Equipment Manufacturer (OEM) make as of ODUs and IDUs | | | | |
| i) | Y- joints (Pair) for IDU - IDU refrigerant piping | 11 | Set | 3,843.00 | 42,273.00 |
| <u>Part (B) Low Side Works (Fitting items & accessories)</u> | | | | | |

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|----------|--|-----|------|----------|-----------|
| 2 | Refrigerant Piping | | | | |
| 2.1 | Supply, Installation, testing and commissioning including vaccumiazation and Nitrogen testing of following nominal sizes of specified soft / hard drawn copper refrigerant piping for VRV/VRF system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/ with Class-O closed cell elastomeric Nitrile rubber tubular sleeves section specified thickness as given below for Suction and Liquid lines, all accessories with MS support complete as per specifications etc as required. | | | | |
| i) | 6.4 mm dia (OD) tube thickness 1.2 mm with 13 mm thick insulation | 42 | Mtr | 217.00 | 9,114.00 |
| ii) | 9.5 mm dia (OD) tube thickness 1.2 mm with 13 mm thick insulation | 24 | Mtr | 293.00 | 7,032.00 |
| iii) | 12.7 mm dia (OD) tube thickness 1.2 mm with 19 mm thick insulation | 42 | Mtr | 413.00 | 17,346.00 |
| iv) | 15.86 mm dia(OD) tube thickness 1.2 mmwith 19 mm thick insulation | 16 | Mtr | 521.00 | 8,336.00 |
| v) | 19.0 mm dia (OD) tube thickness 1.2 mm with 19 mm thick insulation | 12 | Mtr | 626.00 | 7,512.00 |
| vi) | 22.2 mm dia (OD) tube thickness 1.2 mm with 19 mm thick insulation | 18 | Mtr | 766.00 | 13,788.00 |
| 3 | Top-up additional Refrigerant R-410a charging | | | | |
| 3.1 | Supply and charging/ refilling of additional R-410a (Du-pont/approved make) Refrigerant Gas charging on VRF system complete as required. | 20 | Kg | 1,000.00 | 20,000.00 |
| 4 | Power/Control and Communication cabling | | | | |
| 4.1 | Supply, laying, testing, and commissioning of following size (Shielded) PVC insulated Copper Communication cable in pvc conduit of following size on surface/recessed i/c clamping complete as required. | | | | |
| i) | 2 core x 1.0 Sq mm, armoured/ Shielded copper cable | 180 | Mtr | 200.00 | 36,000.00 |
| 4.2 | Providing, laying, testing, and commissioning of following size Un-armoured XLPE insulated Copper conductor power/control cable of following size on surface/recessed complete as required. | | | | |
| i) | 3 Core x 1.5 Sq mm | 30 | Mtr | 71.00 | 2130.00 |
| ii) | 4 Core x 10.0 Sq mm | 25 | Mtr | 454.00 | 11350.00 |
| 5 | PVC Conduit | | | | |
| 5.1 | Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required. | | | | |
| i) | 25 mm | 25 | Mtr | 142.00 | 3550.00 |
| 6 | Condensate Drain CPVC Piping | | | | |
| 6.1 | Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Concealed work, including cutting chases and making good the walls etc. | | | | |
| i) | 25 mm | 60 | Mtr | 517.00 | 31,020.00 |
| ii) | 32 mm | 50 | Mtr | 610.00 | 30,500.00 |
| 7 | Plug Top | | | | |
| 7.1 | Providing and fixing of Single Phase Plug top ISI Marked for AC (IDU) unit etc i/c dismantling old plug top if any complete as required. | | | | |
| i) | 3 pin- 6 Amp. | 14 | Nos | 119.00 | 1,666.00 |
| 8 | DLP Trunkig | | | | |
| i) | Supply & Installation of DLP trunking 105 x 50 mm without cover and partition/accessories etc. | 25 | RMT | 909.00 | 22,725.00 |
| ii) | Supply & Installation of flexible cover 85 mm for DLP trunking 105 x 50 mm etc. | 25 | RMT | 400.00 | 10,000.00 |

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|-----------|--|-----|------|-----------|---------------------|
| iii) | Supply & Installation of Elbow for DLP trunking 105 x 50 mm etc. | 16 | Nos | 185.00 | 2,960.00 |
| 9 | ODU MS Stand steel work | | | | |
| i) | Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete | 120 | Kg | 110.00 | 13,200.00 |
| 10 | Cable Tray & GI Duct for Cover | | | | |
| 10.1 | Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with two numbers GI <i>Suspenders</i> i/c base of suitable size GI angle GI bolts & nuts fastner etc as required | | | | |
| i) | 150 mm width X 50 mm depth X 1.6 mm thickness | 60 | Mtr | 681.00 | 40,860.00 |
| ii) | 300 mm width X 50 mm depth X 1.6 mm thickness | 40 | Mtr | 900.00 | 36,000.00 |
| 10.2 | Supplying, installation, balancing and commissioning of fabricated at site GSS sheet metal rectangular/ round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports, bends, transitions, reducers, end caps, collars etc as required complete in all respect in confirmation with IS : 655 and approved drawings and specifications of following sheet thickness complete as required | | | | |
| i) | Thickness 0.63 mm sheet | 10 | SqM | 1,028.00 | 10,280.00 |
| 11 | <u>CMC of VRF System by OEM/Auth Vendor</u> | | | | |
| 11 | Annual comprehensive maintenance contract of capacity as above annexure complete 40 hp VRF system by OEM/Auth Vendor which cover IDU,ODU, AHU, all spare parts, Compressor, PCB, Refrigerant, and consumables requirement software upgration, to run the VRF system of capacity 38 HP after expiring of 1 year (12 Months) defect liability period. | | | | |
| i) | For 1st year (0-12 Months) | 4 | Qtr | 32,000.00 | 128,000.00 |
| | Total | | | | 1,482,336.00 |
| | GST @ 18% | | | | 266,820.48 |
| | Grand Total | | | | 1,749,156.48 |