

Special Condition for HVAC

The O&M scope shall include all VRF outdoor units, indoor units, refrigerant piping, control wiring, centralized BMS/Controllers, ventilation systems associated with HVAC, electrical panels related to HVAC, condensate drainage system, pumps (if any), AHUs/FAHUs/Treated Fresh Air Units, ventilation fans, and associated accessories installed for approximately 100 guest rooms along with conference halls, dining areas, waiting lounges, offices and common facilities.

1. Scope of Comprehensive O&M

The scope shall include:

Routine preventive maintenance. Breakdown maintenance. Emergency response services. Supply and replacement of consumables. Skilled manpower deployment. Performance monitoring and optimization. Seasonal calibration and testing. Energy efficiency monitoring. Record keeping and reporting. Coordination with Electrical and Civil agencies wherever required. Maintaining indoor comfort conditions as per design parameters.

The contractor shall maintain all systems in healthy operational condition throughout the contract period.

2. Minimum Performance Requirements

The HVAC system shall maintain:

Indoor temperature: 22°C to 24°C for air-conditioned areas.

Relative Humidity: 50% to 60% where applicable.

Noise and vibration levels within OEM permissible limits.

Minimum uptime:

99% uptime for critical areas.

95% overall system uptime annually.

3. Preventive Maintenance Schedule

A. Daily Activities : General Inspection, Check operation of all VRF outdoor units. Check indoor unit functioning. Monitor abnormal noise/vibration. Check controller status and fault alarms. Inspect refrigerant pressure indication. Check condensate drain functioning. Verify room temperature performance. Inspect electrical panels for overheating/tripping. Record operating parameters in logbook. Cleaning & Housekeeping Clean accessible indoor unit filters where required. Ensure HVAC equipment rooms remain clean. Check outdoor unit

surroundings for obstruction. Monitoring Monitor centralized control/BMS operation. Check power supply voltage/current imbalance. Attend guest/user complaints immediately.

B. Weekly Activities: Clean air filters of indoor units. Inspect outdoor unit coils visually. Check drain trays and drain lines. Verify thermostat/controller calibration. Check refrigerant leakage signs. Inspect insulation condition. Tightening check for accessible terminals. Test operation of standby equipment. Check fresh air systems and exhaust fans.

C. Monthly Activities: Deep cleaning of filters. Cleaning of outdoor condenser coils using approved method. Inspection of compressors and fan motors. Check refrigerant gas pressure and temperature. Electrical current recording of compressors/fans. Check contactors, relays and MCBs. Test safety controls and protections. Check vibration isolators and supports. Check condensate pumps (if applicable). Verify BMS communication and alarm history. Energy consumption analysis and reporting.

D. Quarterly Activities: Complete preventive maintenance shutdown inspection. Refrigerant leakage testing using electronic detector. Tightening of all electrical terminations. Calibration of sensors and thermostats. Functional testing of all indoor units. Performance testing of compressors. Drain line flushing and chemical cleaning. Insulation repair/replacement where required. Testing of earthing system related to HVAC. Review of system balancing and load distribution. Checking corrosion protection and painting touch-up.

E. Half-Yearly Activities: Chemical cleaning of condenser coils. Comprehensive electrical insulation resistance testing. Megger testing of motors/cables. Functional testing of centralized control system. Performance verification against design TR/load. Verification of refrigerant charge quantity. Thermal scanning of panels and electrical connections.

F. Yearly Activities: Major shutdown preventive maintenance. Complete servicing of outdoor units. Inspection of compressor oil condition. Replacement of worn-out consumables. Calibration of all instruments and controls. Deep chemical cleaning of indoor coils. Complete drain system descaling. Review and optimization of system performance. Annual energy audit of HVAC system. Submission of annual health assessment report. Updating asset history and maintenance records.

4. Emergency / Breakdown Maintenance Requirements

The contractor shall provide 24x7 emergency breakdown support throughout the contract period.

Fault Categories & Response Timeline		Category	Example	Response	Time
Resolution Time	Critical Fault	Complete shutdown	of conference hall/dining/main block		
Within 30 minutes		Within 4 hours			
Major Fault	Multiple rooms affected / Outdoor unit failure			Within 1 hour	Within 8 hours

Minor Fault Single room indoor unit issue Within 2 hours Within 24 hours Non-Critical
Complaint Controller/display issue Within 4 hours Within 48 hours

5. Emergency Activities During Breakdown

Immediate Actions, Attend complaint immediately. Diagnose fault through controller/BMS. Isolate faulty equipment safely. Restore partial cooling through alternate systems where possible. Inform Engineer-in-Charge with preliminary report. Technical Actions Rectification of refrigerant leakage. Compressor replacement/repair. PCB/controller troubleshooting. Electrical fault rectification. Drain blockage removal. Fan motor replacement. Communication wiring troubleshooting. Sensor replacement/calibration. Reprogramming of centralized controller/BMS. Critical Area Priority

Priority restoration shall be provided for: VIP rooms/suites., Conference halls., Dining facilities., Waiting lounges., Security/control rooms.

6. Manpower Deployment Requirements

Minimum Manpower to be Deployed On Site, Regular Deployment (24x7 Operation),
Designation Minimum Qty Shift Requirement, HVAC Service Engineer 1 General Shift

HVAC Supervisors	2	Rotational, Skilled VRF Technicians	6	3 Shifts, Helper
/ Assistant Technicians	4	3 Shifts, BMS / Controls Technician	1	Shared/On-call,
Emergency Standby Technician	1	Night Standby		

7. Qualification Requirements

HVAC Service Engineer, Diploma/Degree Mechanical/Electrical., Minimum 5 years experience in VRF systems., Experience in large hospitality/institutional buildings. Technicians, ITI/Diploma certified. Minimum 3 years experience in VRF maintenance. BMS Technician Experience in centralized VRF/BMS controls.

8. Spare Parts & Consumables

The contractor shall maintain minimum inventory of: PCB cards, Sensors, Thermostats/controllers, Fan motors, Contactors/relays, Refrigerant gas, Filters, Drain pumps, Fuses/MCBs, Communication cables, Critical spares shall be available locally in Ahmedabad for immediate replacement.

9. Documentation & Reporting

The contractor shall maintain: Daily logbook, Breakdown register, Preventive maintenance checklist, Energy consumption reports, Gas charging records, Complaint response register, Annual performance reports, Monthly reports shall be submitted to the Engineer-in-Charge.

10. Penalty Clause

Penalty may be imposed for: Non-deployment of manpower, Delay in complaint response, Failure to maintain uptime, Improper maintenance records, Excessive breakdown frequency.

Suggested penalty: ₹5,000 to ₹25,000 per incident depending upon severity.

11. OEM Authorization Requirement

The O&M agency shall be: Original VRF OEM, OR OEM authorized service partner.

Valid authorization certificate shall be submitted along with bid and renewed throughout contract duration.

12. Training Requirement

The contractor shall provide: Initial operational training, Annual refresher training, Emergency shutdown handling training, BMS operation training to department staff.

Deputy Executive Engineer,
Ahmedabad Electrical Sub Div
Ahmedabad.

Executive Engineer,
Ahmedabad Electrical Dn-01,
Ahmedabad.