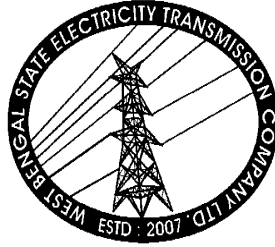


AIR CONDITIONING SYSTEM



March 2015

Engineering Department

WEST BENGAL STATE ELECTRICITY TRANSMISSION COMPANY LIMITED

পশ্চিমবঙ্গ রাজ্য বিদ্যুৎ সংবহন কোম্পানি লিমিটেড
(পশ্চিমবঙ্গ সরকারের একটি উদ্যোগ)

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CIN: U40101WB2007SGC113474; Website: www.wbsetcl.in

TECHNICAL SPECIFICATION FOR AIR-CONDITIONING SYSTEM OF SUB-STATIONS

1. SCOPE :

- a) This section of the specification covers design, manufacture, assembly, testing at manufacturer's works, supply, delivery at site of Air-conditioning equipment.
- b) The scope of supply shall include all components/parts, accessories etc. which are necessary for assembly, operation and maintenance of air-conditioning equipment even though not individually or specifically stated or enumerated.

2. STANDARDS :

The air conditioning equipment shall comply fully with latest editions of relevant Indian Standards. The following Indian Standards may also be referred to:

IS:660 – Safty code for mechanical refrigeration
IS 659:1964 (reaffirmed 1996)-Safety Code for Air-Conditioning
IS 8148:200 - Packaged Air-Conditioners
ANSI-B-31.5 – Refrigeration piping
BS-6540(Part-1) – Air filters used in air conditioning and general ventilation

3. DRAWINGS ENCLOSED :

Indicative drawing of control room building of sub-station is enclosed for the purpose of preparing estimate for the bid.

4. DESIGN CONDITIONS :

The system shall be designed to provide air-conditioning in the rooms so as to maintain a temperature between 24.4°C to 25.5°C / 23.3°C dry bulb temperature at 55% relative humidity with a tolerance of +/- 5% in relative humidity, under maximum ambient condition of 40.5°C Dry Bulb and 28.3°C Wet Bulb, without formation of hot pocket zone in any part of the air-conditioned rooms. The designed cool air temperature and relative humidity shall be uniformly maintained at all parts of the air-conditioning zone.

- a) AIR CONDITIONING SYSTEM DATA FOR 400/220/132/33KV S/STN. :

Item	400KV Control Room	400KV Conference Room	400KV Communication Room	Chamber of Engineer in charge
No. of people	15	20	2	5
Equipment load (KW)	6.0 (Indicative)	0	2.0 (Indicative)	-
Lighting load (in KW) (excl. choke loss)	7.5 (Indicative)	1.5 (Indicative)	2.0(Indicative)	0.5

False ceiling height	3.3 m (Approx.)			3.5m (Approx.)
Hours of operation	24X365 days	-	24X365 days	-

b) AIR CONDITIONING SYSTEM DATA FOR 220/132/33KV S/STN. :

Item	220KV Control Room	220KV Conference Room	220KV Communication Room
No. of people	15	15	2
Equipment load (KW)	5.0	0	2.0
Lighting load (in KW) (excl. choke loss)	4.5	1.0	2.0
False ceiling height	3.3m (Approx.)	3.3m (Approx.)	-
Hours of operation	24X365 days	-	24X365 days

c) AIR CONDITIONING SYSTEM DATA FOR 132/33KV S/STN. :

Item	132KV Control Room	132KV Communication Room
No. of people	10	2
Equipment load (KW)	3.5	2.0
Lighting load (in KW) (excl. choke loss)	2.0	2.0
False ceiling height	3.3m (Approx.)	-
Hours of operation	24×365 days	24×365 days

5. AIR-CONDITIONING LOAD & PLANT TONNAGE :

- a) The infiltrations through windows, doors, walls & ceiling shall be assessed by the contractor.
- b) Solar & transmission gain through roof shall be adequately considered (without considering any over deck or under deck insulation).
- c) The estimated Air Quantity cubic meter per hour (CMH) shall also be assessed by the contractor from the indicative drawing of Control room building.
- d) Heat load calculations in support of machines are to be submitted showing refrigeration load and c.f.m. load capacity, mentioning any assumption considered for calculation. Relevant charts, graphs, documents in support of the calculations are also to be submitted along with the calculations.
- e) Room wise refrigeration capacity, so designed, shall be guaranteed by the contractor to maintain the desired conditions in all parts of the room as stipulated in Cl.4 of this specification without formation of any hot pocket in any part of the room.
- f) The total installed capacity of AC machine shall be made considering 40% excess capacity higher of above calculated Heat Load (TR) and Capacity (CFM) for rotational running of each machine for not more than 16 hours at a stretch In addition to above two no m/cs for control room & one no m/c for communication room are to be provided considering outage and maintenance of machines. Rating of spare machines shall be identical with the other machines to be installed in control room and communication room
- g) No. of machine as well as capacity for each location should be based on actual heat load calculation but individual machine capacity shall preferably be not less than 1.5 TR.
- h) The Air conditioning system shall be interlocked with fire detection system of Control room building so as to shut down the air Conditioning system in case of fire hazard occurs in the building.

6. TECHNICAL SPECIFICATION OF THE EQUIPMENT :

- a) The air-conditioning equipment shall be a standard product of the manufacturer and of a design of proven reliability & satisfaction in the service intended.
- b) The system shall be designed for continuous operation of 24 hours a day and 365 days in a year to maintain the proper temperature of the rooms.
- c) The condensing unit shall be air cooled type and shall be provided with hermetically sealed compressor meant to give a durable, trouble free and low noise performance. The compressor shall be capable of operating continuously at the maximum ambient temperature of 50°C. The condensing unit shall be suitable for outdoor installation in a weather exposed to sun and rain.
- d) Cooling units of higher static pressure (for ductable) and higher cubic foot per minute (CFM) are to be provided to cover the depth of the room.
- e) The refrigerant shall be non-inflammable, non-toxic and non-explosive and have the pressure and temperature characteristics suitable for this operation. It is proposed to provide FREON 22 being the safest.
- f) All refrigerant pipe shall be of copper possessing sufficient strength and size suitable for service and shall be provided with thermal insulation of suitable material.
- g) Air-conditioning system of each room shall be complete with condensing units, interconnecting refrigerant copper piping, PVC piping for condensed water drain, wiring between the outdoor condensing unit and indoor room unit, wiring between AC Distribution Board and outdoor condensing unit, protection devices, temperature control units and other accessories. All wiring shall be fire retardant. The inclination of the PVC piping for draining away of water shall be properly adjusted so that water leaked from the air-conditioning units is drained away from the room.
- h) The equipment shall be suitable for operation on 400V +/- 10% V, three phase AC, 50 Hz supply / 230 V +/- 10% V, Single Phase AC, 50 Hz depending on the size of the machine. Necessary earthing arrangement shall be made.
- i) If any equipment fails to meet the specified and guaranteed performance as found from test at site, then the equipment is liable to be rejected and to be replaced the same free of cost by the contractor.
- j) The air-conditioning machines in the Control Room and Communication Room shall be Programmable logic controlled (PLC) type so that the rotational running of the machines is maintained automatically. This should include supply and installation of required panel board, distribution board and timer unit for programmable automatic running of individual air-conditioning machines for maximum period of 16 Hrs. continuously at one stretch. Running combination of individual units shall have to be indicated in the layout drawing.

7. DESCRIPTION OF WORK :

The work under this contract for supply, erection, testing and commissioning of air-conditioning unit shall be included but not limited to the following :

- a) Split type non-ductable / ductable Refrigeration Units.
- b) False Ceiling of Control Room, Communication Room , Conference Room,& chamber of in-charge of 400KV sub-station.
- c) Mounting structures for outdoor condensing units / indoor room units
- d) Cables required for wiring of input power upto AC switchboard and from AC switchboard to outdoor units/indoor room units.
- e) All masonry works for installation of split type non-ductable refrigeration units.

8. GUARANTEE :

Electrical characteristics shall be guaranteed by the bidder. In case of failure of materials to meet the guarantee, WBSEB shall have right to reject the material. Guaranteed Technical Particulars are to be submitted by successful bidder during detailed engineering alongwith submitted drawings/documents. However format for submission of GTP shall be handed over to intending bidders at the time of sale of tender documents.

9. CONTRACT DRAWINGS, CALCULATIONS, CATALOGUE :

- a) In the event of placement of Letter of Award (LOA) the bidder shall submit six (6) copies of drawings and catalogue and design calculations to determine the total tonnage capacity of individual rooms under the scope of contract to the Chief Engineer, Engg. Deptt., VidyutBhawan (9th floor), Salt Lake, Kolkata - 700 091, for approval.
- b) Ten (10) sets of approved drawings/design documents and ten (10) copies of operation and maintenance manual shall be submitted to the Chief Engineer, Engg. Deptt., VidyutBhawan (9th floor), Salt Lake, Kolkata - 700 091 for our record and distribution to site.

10. DOCUMENTS TO BE SUBMITTED AFTER COMMISSIONING :

After supply, erection, testing and commissioning of the air-conditioning units, the bidder shall submit the following documents in triplicate :

- a) As built drawing of the air-conditioning system.
- b) Instruction manual for operation and maintenance of the air-conditioning system.
- c) Guarantee certificate as per relevant Clause of General Condition of Contract and Cl.11 of the Technical Specification.

11. DEVIATION / MODIFICATION :

Normally the offer should be as per Technical Specification without any deviation. If any modification felt necessary to improve performance, efficiency and utility of equipment, the same must be mentioned in the 'Modification schedule' with reasons duly supported by documentary evidences and advantages. Such modifications suggested may or may not be accepted, but the same must be submitted along with Pre-Bid Queries. The modifications not mentioned in Schedule will not be considered.

12. COMPLETENESS OF BID :

The bid shall be complete and include all accessories even though not specifically mentioned in these specifications, schedules etc. but which are essential for the complete air-conditioning system. The intending bidder shall be responsible for proper coordination of the design, construction, testing and commissioning of the equipment as a whole.

13. TEST AT FACTORY AND TEST CERTIFICATES :

Acceptance and routine test at manufacturer's works shall be carried out on each Air-conditioning machine as per relevant Indian standard in presence of representative of WBSETCL and the same shall be submitted to the Chief Engineer (Engg. Deptt.) for approval. Three (3) copies of test reports shall be submitted to the Chief Engineer, Engg. Deptt., VidyutBhawan (9th floor), Salt Lake, Kolkata - 700 091 for approval.

GUARANTEED TECHNICAL PARTICULARS OF AIR CONDITIONING SYSTEM

(To be filled in and signed by the Bidder)

1	GENERAL	
1.1	Manufacturer name	
1.2	Type & Model as per Manufacturer	
1.3	Standard to which confirm	
1.4	Relative Humidity in %	
1.5	Refrigerant to be used	
1.6	Material & size of refrigerant pipe	
2	ELECTRICAL PARAMETERS	
2.01	Power required for each unit (WATT)	
2.02	AC Supply Voltage (Volts) & frequency	
2.06	Other specific particulars relating to system	
3	AIR PARAMETERS	
3.01	Total designed Tonnage Capacity	
3.02	Air Quantity	
3.03	Supply cool air throw distance	
3.04	Static pressure of each room unit	