

# S. N. MISSION HOSPITAL

## SUPPLY OF DIESEL GENERATORS

### TENDER DOCUMENT

TENDER NO: /2009

Architect:

**Keerthi and Bhavana**

Architects and Interior Designers

TC 16/172, B.V Road

Vazhuthacaud

Trivandrum 695 014

Consultant:

**SUMANAM**

Engineering Services

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## SUMMARY OF NOTICE INVITING TENDER

1. Defects Liability Period : Twelve months
2. Date of Delivery : 45 days from receipt of work order.
3. Tender cost : Rs: 2600/- + VAT
4. EMD : 2.5% of quoted amount
5. The firm period of Tender : Three months from the date of submission.
6. Escalation : No escalation

The Secretary  
S.N.Mission Hospital,  
Varkala,  
Kerala

## TENDER NOTICE

Name of Project : Supply of 320kVA Diesel Generator set with Acoustic Enclosure for S.N Mission Hospital,Varkala

S.N Mission Hospital,Varkala invites sealed competitive tenders from experienced agencies for the :

### **Supply of 320kVA Diesel Generator set with Acoustic Enclosure**

Last Date and time for receipt of bids : \_\_\_\_\_ P.M

This tender will be on two-cover system. Cover No. I contain the Technical bid. The technical bid should include details of the agency such as type of firm, previous experience in the field. List of supplies made with name of client, cost of supply, date of supply, and copy of documents to show experience etc. and should also contain the existing arrangements for after sales service. Cover No. II should contain the price bid quoting the rate and amount for the supply of items. Cover No. I & II enclosed in another cover superscripted "**Tender for the Supply & Installation of 320kVA Diesel Generator set with Acoustic enclosure** " should be sent **The Secretary,S.N Mission Hospital,Varkala,Kerala** to before the closing date and time given above. The Tenders will be opened at the office of The Secretary, S.N Mission Hospital,Varkala,kerala \_\_\_\_\_P.M in the presence of such of the tenderers or their authorized representatives who may be present at that time ( only cover No. I ).The technical bid will be evaluated and further action taken as specified in the general conditions of tender. The Secretary, S.N Mission Hospital,Varkala Kerala reserves the right to accept or reject any or all bids without assigning any reason what so ever.

Sd/-

The secretary ,  
S.N Mission Hospital,Varkala  
Kerala

## GENERAL CONDITIONS

Sealed tenders are invited for the supply of the material as specified In the schedule below / attached.

1. The tenders should be addressed to The Secretary, S.N Mission Hospital,Varkala,Kerala,
2. The tender is to be given in two cover system as stated in the tender notice. The rates quoted should be only in Indian currency. Tenders in any other currency are liable to rejection.
3. Intending tenderers should send their tenders so as to reach the office of. S.N Mission Hospital,Varkala,Kerala on or before \_\_\_\_\_PM, on \_\_\_\_\_2009. No tender received after the specified date and time will be accepted on any account. The rates will be considered firm for acceptance for a period of 60 days from the date of tender receipt. Tenders with price variation clause or any other condition will be rejected.
4. The tenders will be opened at \_\_\_\_\_P.M on \_\_\_\_\_2009 in the office of S.N Mission Hospital,Varkala,kerala in the presence of such of those tenderers or their nominees who may be present at that time. Only Cover No. I will be opened. Technical bid or proper document for exemption will be evaluated.
5. Tenderers shall invariably specify in their tenders the delivery conditions including the time required for the supply of each articles tendered for.  
The total time allowed for the supply at locations is **45 (fifty) days** from the date of issue of selection notice.
6. (a) The tenderer shall clearly specify whether the articles offered bear Indian Standards Institution Certification Mark or not. In such cases, they shall produce copies of Certification mark along with their tender in support of it.  
(b)Tenderers shall clearly specify whether the goods are offered from Indigenous sources, from imported stocks in India or from foreign sources to be imported under a licence.
7. The final acceptance of the tenders rests entirely on S.N Mission Hospital,Varkala,Kerala who does not bind himself to accept the lowest or any tender. But the tenderers on their part should be prepared to carry out such portion of the supplies included in their tenders as may be allotted to them.
8. All payments to the suppliers will be made by S.N Mission Hospital,Varkala,kerala In case the supplier fails to supply and deliver any of the said articles and things within the time

provided for delivering the same, or in case the supplier commits any breach of any of the covenants, stipulations and agreements herein contained, and on his part to be observed and performed, then it shall be lawful for S.N Mission Hospital,Varkala,kerala.

9. Any sum of money due and payable to the supplier under this contract may be appropriated by S.N Mission Hospital,Varkala,kerala or any other person authorized by The Secretary, S.N Mission hospital, Varkala,Kerala
10. Every notice hereby required or authorized to be given may be either given to the supplier personally or left at his residence or last known place of abode or business, or may be handed over to his agent personally, or may be addressed to the supplier by post at his usual or last known place of abode or business and if so addressed and posted, shall be deemed to have been served on the supplier on the date on which, In the ordinary course of post, a letter so addressed and posted would reach his place abode or business.
11. The tenderer shall undertake to supply materials according to the standard sample and / or specifications.
12. No representation for enhancement of rates once accepted will be considered.
13. Any attempt on the part of the tenderers or their agents to influence the purchaser in their favour by personal canvassing of persons concerned will disqualify the tenderers.
14. Telegraphic quotations will not be considered unless they give details of prices and are immediately followed by confirmation with full relevant details posted before the due date of the tender.
15. All correspondence shall be addressed to The Secretary, S.N Mission Hospital,Varkala, Kerala
16. Rates shall be inclusive of all applicable excise duties, local/central taxes, VAT, levies, fabricating, transportation, loading, unloading, erection on the platform provided, assembling, supervision, works contract tax, service tax etc. complete, which are or may become payable by the supplier under existing or future laws or rules of the country of origin / supply or delivery during the course of execution of the contract.

17. Special conditions If any, of the tenderers attached with the tenders will not be applicable to the contract unless they are expressly accepted in writing by the purchaser.
18. For every week of delay amount at the rate of 1.5% of the total contract to a maximum of 15% of the total contract value shall be paid to the client after which the contract stands cancelled.
19. Payment shall be made by S.N Mission Hospital, Varkala, Kerala against bill raised by the supplier as follows:
  - (a) 35% Mobilization advance against bank guarantee.
  - (b) 50% on against supply of materials at site after preliminary verification and certification.
  - (c) 15% on Commissioning and test running.

The Secretary  
S.N Mission Hospital,Varkala,  
kerala

FORM OF AGREEMENT

Agreement No:

Between

The Secretary  
S.N Mission Hospital,Varkala,  
Kerala.

And

Name of work : Supply of 2 nos of 320 kVA Diesel Generators with Acoustic enclosure for S.N Mission Hospital,Varkala,kerala.

Time of delivery : 45 days

The agreement will be the contract

Date of agreement

Notes:

- 1. The accepted tender with conditions of contract and all other tender documents annexed should be attached to this agreement and will form part of the agreement.
- 2. The agreement should be signed by the parties in the presence of two witnesses.
  - 1. In the event of the agreement being executed by a firm, it must be signed by a person or Persons who is / are legally competent to execute agreement on behalf of the firm.

Receipts for payments made on account of a work when executed by a firm, must be signed by the person or persons legally competent to accept payments on behalf of the firm.

ARTICLES OF AGREEMENT MADE THIS.....day  
of..... two thousand and nine between S.N Mission Hospital,Varkala,Kerala ( herein after referred to as the "Employer" which expression shall where the context so admits or implies be deemed to include his successors in office and assignees) acting for and on behalf of S.N Mission Hospital,Varkala,kerala on the one part and .....  
.....(herein after called the supplier which expression shall where the context so admits or implies be deemed to include his heirs, executors, administrators, successors in interest, legal representative and assignees as well ) on the other part.

Whereas S.N Mission Hospital,Varkala,kerala,( hereinafter called S.N Mission Hospital,Varkala) are desirous of purchasing 320kVA diesel generator and have cost an estimate of probable price for the material and have invited tenders from suppliers for supplying the said material in accordance with the estimate, notice inviting tenders and general and special conditions of contract which together are termed tender documents, and whereas the supplier.....has tendered for the supply of the material in accordance with the tender documents.

And whereas the supplier has deposited the sum of Rs..... (Rupees.....as initial security deposit and whereas .....acting for and on behalf of S.N Mission Hospital,Varkala,kerala has accepted the tender of the said supplier now therefore it is agreed between the parties as follows:

1. In consideration of the payment by S.N Mission Hospital,Varkala,to the supplier the sum of Rs.....(Rupees.....) or such other sum as may be arrived at under the terms of contract and method of payment detailed in the tender document, the supplier will upon and subject to the said conditions supply the materials as shown in the said tender documents with such variation as may be found necessary.
2. Time shall be considered as of the essence of contract and the supplier hereby agrees to supply the materials within such time as is specified in the tender documents, complete the supply in all respects within three months from the date of selection notice.

Signed by Sri/Smt.....  
S.N Mission Hospital,Varkala,kerala In the presence of witnesses:-

(1) .....(Full name, address and signature)

(2) .....(Full name, address and signature)

Signed by Sri/Smt.

(The Supplier) In the presence of witnesses:-

(1).....(Full name, address and signature)

(2).....(Full name, address and signature)



**ANNEXURE**

**AGREEMENT**

**(To be executed in stamp paper at the time of submitting the tender)**

Articles of agreement executed on this the.....day of .....Two thousand and nine between S.N Mission Hospital,Varkala,kerala ( herein after referred to as the "Employer") on the one part and Shri. M/s..... ..  
.....  
.....( H. E. name and address of the tenderer ) ( hereinafter referred to as "the bounden" ) on the other part.

Now this presents witness and it is hereby mutually agreed as follows :

1. In case tender submitted by the bounden is accepted by M/s. S.N Mission Hospital,Varkala,kerala and the contract for supply of 320kVA Diesel Generator for S.N Mission Hospital,Varkala,kerala is awarded to the bounden, the bounden shall within **15 (fifteen) days** of acceptance of his tender execute an agreement with S.N Mission Hospital,Varkala,kerala incorporating all the terms and conditions under S.N Mission Hospital,Varkala,kerala accept his tender.
2. In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, The Secretary, S.N Mission Hospital,Varkala,kerala shall have power and authority to recover from the bounden any loss or damage caused to S.N Mission Hospital,Varkala,kerala
3. All sums found due to S.N Mission Hospital,Varkala,kerala under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as S.N Mission Hospital,Varkala,kerala may deem fit.

In witness whereof Shri..... ,.....  
..... (H. E. name and designation) for S.N Mission Hospital,Varkala,kerala and on behalf of M/s.....,Shri.....  
.....(H. E. name and designation)the bounden have hereinto set their hands the day and year shown against their respective signatures.

Signed by Shri.....(date).....

In the presence of witnesses:

- 1.....
- 2.....

Signed by Shri.....(date).....

In the presence of witnesses:

- 1.....
- 2.....

## DRAFT OF BANK GUARANTEE

ON STAMP PAPER worth Rs.(Value according to the Bank norms.)

BANK GUARANTEE No.

- 1) This deed of Bank Guarantee made on this \_\_\_\_\_ Day of \_\_\_\_\_ of 2009 by the \_\_\_\_\_ Bank (address of the Bank) (hereinafter called THE BANK) at the request of (name and address of the Party) (hereinafter called THE CONTRACTOR) in favour of M/s. \_\_\_\_\_ having its registered office at \_\_\_\_\_ (hereinafter referred to as \_\_\_\_\_) which expression shall include its executors, administrators and assignees
- 2) Whereas \_\_\_\_\_ has floated a tender for work of \_\_\_\_\_ (hereinafter referred to as "THE SAID WORK" and the Contractor has decided to offer his quotation in response to the tender.
- 3) And whereas \_\_\_\_\_ has agreed to accept an irrecoverable Bank Guarantee from THE BANK for Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ Only) in lieu of Earnest Money Deposit for a like amount towards the Contractual obligations for submission of the tender for the SAID WORK.
- 4) NOW THIS GUARANTEE WITNESSETH THAT in consideration of THE BANK, having agreed to the request of the Contractor to pay \_\_\_\_\_ within 30 Days of receipt of written demand from \_\_\_\_\_ and without demur or delay and without recourse to THE CONTRACTOR the amount or any part thereof due and payable under this guarantee but not exceeding the amount of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) merely by stating that the CONTRACTOR has failed in his obligations as per his tender The decision of \_\_\_\_\_ whether the CONTRACTOR has failed in his obligations under the tender shall be final and binding on THE BANK and THE BANK shall not refer any such matter to THE CONTRACTOR
- 5) This Guarantee shall come into effect from the date of its issue.
- 6) This guarantee is irrevocable during its currency and will remain in full force until (90 days from the date of opening the tender) (hereinafter called THE DATE) and any claim there under must be received by THE BANK at this office of issue of THE BANK on or before THE DATE Any claim received by us after the close of office hours on THE DATE will not be entertained.
- 7) Our liability under this guarantee is limited to a maximum amount of Rs. \_\_\_\_\_ (in words)
- 8) This bank guarantee must be returned to THE BANK at the time of its invocation by \_\_\_\_\_ or on its expiry, returned to THE CONTRACTOR, whichever shall occur first.

**AUTHORISED SIGNATORY  
NAME & DESIGNATION**

*Signature of the bidder*

**PRICE BID ( IN COVER II )**

PRICE BID ( IN COVER II )

TENDER FORM

To,

The Secretary,  
S.N Mission Hospital,Varkala,  
kerala

Sir,

Sub: - Tender for the supply of 320kVA Diesel Generators with acoustic enclosure for S.N Mission Hospital,Varkala,kerala

With reference to the tender invited by you for the above-mentioned supply, I / We write this after having.

- a) Examined the details, specifications, notice inviting tenders, general conditions of contract and all other papers connected with the above supply enclosed in the bid document.
- b) Given the Technical details of the 320kVA Diesel Generator as per manufacturer's specification.
- c) Added all the required amounts towards all taxes and levies and are willing to accept the terms and at the rates as entered in the schedule enclosed.

I / We hereby offer to carry out the above supply in strict accordance with the contract documents and at the rates as entered in the schedule enclosed.

I / We under take to complete the whole of the work within the specified time of 45 days.

Signature of Tenderer

Place:  
Date:

Name of Authorised  
Signatory

**SPECIFICATION FOR SUPPLY AND INSTALLATION OF 320KVA DIESEL GENERATOR  
SET WITH ACOUSTIC ENCLOSURE**

**Scope of work**

The scope of the supplier shall cover the following.

- a) Design, manufacture, Supply, testing and commissioning of Diesel generator set with all accessories including required numbers of best quality anti vibration mountings.
- b) Supply of Piping required for lub. Oil system, fuel system, and engine cooling system  
Supply of Flexible connections, if any, to be inserted in cooling system, lub. Oil fuel oil
- c) Supply of Starting equipments
- d) Supply of Control cubicle and isolating facility as per schedule.
- e) Supply of necessary set of vibration, isolation mounting as per schedule.
- f) Initial filling of coolant, oil, oil filter etc shall be provided.
- g) Supply, installation, testing and commissioning of factory made integral type outdoor acoustic enclosure for the mentioned generator set which shall bring down the sound level of generator set to latest CPCB norms.
- h) One day capacity fuel tank with necessary fuel for eight hours running of the DG set shall be supplied.
- i) The supplier should provide their validity of the offer, Guarantee, taxes and duties, freight, insurance, loading & unloading charges, their terms and conditions regarding delivery.

**STANDBY DIESEL GENERATOR TECHNICAL SPECIFICATIONS**

**ENGINE**

The engine shall be of multi cylinders, vertical four stroke cycle water cooled type with or without turbo charger. Diesel operated and running at 1500 RPM and developing suitable BHP at site conditions for giving a continuous output as specified at the load terminals of alternator exclusive of the power requirements of the auxiliaries. The engine shall have 10% overload capacity for any one hour during 12 hours continuous run.

The engine should be complete with the following accessories and as per IS 1601 and IS 1002 amended upto date.

- i) Fly wheel dynamically balanced to suite flexible coupling
- ii) Necessary flexible coupling with guard for alternator from engine
- iii) Air cleaner
- iv) Corrosion inhibitor, if necessary
- v) Radiator complete hoses, fan, fan drive and first fill of coolant.
- vi) Daily fuel service tank
- vii) Fuel pump
- viii) Electronic Governor.
- ix) Starter 24 V
- x) Set of heavy duty starting batteries consisting of 24V,120AH batteries with leads and termination
- xi) Fuel oil filter
- xii) Necessary engine cooling system, oil lub. System, fuel system.

- xiii) Turbo charger (exhaust gas driven)
- xiv) Instrument panel comprising of starting with key (or push button arrangement lub. oil pressure gauge water temperature gauge battery charging ammeter and running hour meter with RPM indicator (Note: This may also be integrated with control panel).
- xv) Necessary control push / pull for speed adjustment
- xvi) Lub. oil filter
- xvii) Safety control against low lub. oil pressure, high cooling water temperature and over speed.
- xviii) Common bed plate with suitable foundation bolts or suitable anti vibration mounting.
- xix) Residential type exhaust silencer with necessary pipe work

### **Cyclic variation**

Cyclic variation set shall be within the time limit specified in BSS 649 and IS 1601/1960

### **Oil lubrication**

The scope of work shall include provision of lubrication oil circulation system for engine bearings.

### **GOVERNER**

The governor and shall be electronic and self contained unit capable of monitoring speed. The governer shall be suitable for PLC ( Genop based ) operation.

### **SPEED VARIATION**

The speed variation from No load to FULL load shall not exceed at any constant load including No load shall remain within a band of 0.5% of rated speed.

### **FUEL SYSTEM**

It shall be gravity fed to engine driven fuel pump. The replacement element of fuel filter shall be suitably located to permit easy servicing.

The daily service fuel tank shall be of capacity suitable for 12 hours continuous operation on full load and complete with necessary supports, capacity, indicator, connecting tubing, air vent, drain plug etc.

### **COOLING SYSTEM SHALL BE OF:**

Integrated mounted radiator on common base plate with suitable vibration arrestor pads and brackets

### **STARTING SYSTEM**

This shall comprise of batteries of 24 V DC, starter motor, axial type gear to match with the toothed ring on the flywheel. A bimetallic relay or a mechanical release system such of bendex assembly to protect the starter motor from excessively long cranking runs suitably integrated with the engine protection system shall be included within the scope of the work. Battery capacity shall be suitable for meeting the needs of the starting system as well as the

requirements of control panel, indications and other auxiliaries. The scope shall cover all cabling termination, initial charging etc.

### **SILENCERS**

Residential type silencer should be provided

### **INSTRUMENTATION**

Engine instrumentation shall be centralized on an instrumentation panel and resilient mounted on the engine

### **ENGINE PROTECTION AND SWITCHING DEVICES**

Necessary protection devices for the following shall be provided.

- a.Low lubricating oil pressure
- b.High coolant temperature
- c.Over speed shutdown

### **PIPING WORK**

MS piping of adequate size shall be used for fuel oil piping and exhaust piping.

The pipe work shall be inclusive of all fittings and accessories such as valves, bends, reducers, elbows, flanges, flexible connections, necessary hardware etc. The installation shall cover clamps, supports, hangers, etc., as are necessary for completing the work, welding, brazing will be permitted in the installation. However the work shall be sectionalized with flanged connections as are necessary for easy isolation. All M.S pipe for water line and exhaust line work shall be medium class type.

For measurement purpose, the length of runs shall include all the accessories and fittings, but excluding valves/silencer. Those runs forming part of factory assembly on the engine shall however be exclusive.

### **COMMON BED PLATE**

Engine and alternator shall be mounted on a common bedplate together with all auxiliaries. Fabricated bedplate will be acceptable. The bedplate shall also be suitable for installation on suitable anti vibration mounting system.

### **ANTI VIBRATION MOUNTING**

Suitable anti vibration mounting duly approved by Engineer –in-charge shall be employed (where specified under BOQ) for mounting the unit so as to prevent to the maximum extent feasible transmission to the structure

## **ALTERNATOR**

### **RATING**

The alternator shall be of brushless design and rated 320 kVA for a continuous output as specified at 0.8 PF lag at 415 V 3 ph 50 Cycles suitable for 4-wire system exclusive of power requirement for auxiliaries.

Windings are to be star connected and neutral shall be brought out through a separate terminal and will be solidly grounded. Speed of alternator shall match the engine for a direct drive.

### **EXCITATION**

Self-excited, self-regulated, and static excitation facility. The exciter unit shall be mounted on the control panel or on the alternator assembly. The rectifier shall be suitable for operation at high ambient of the site.

### **STANDARDS**

The alternator shall be in accordance with the following standards as are applicable.

IS 4722 /BS 2613/1970 – The electrical performance of rotating electric machine.

IS 4889/BS 269 - rules for method of declaring efficiency of a electrical machine.

### **PERFORMANCE**

Voltage regulation from NO load to rated load shall be within a band of 2.5% of rated voltage. The frequency regulation from NO load to full load shall be as defined by the engine governor.

Voltage dip for any addition to load upto and including 90% load shall not exceed 23% of rated voltage and shall recover to and remain within the steady band in not more than 1.5 sec. Similarly the frequency shall recover to the steady state band within 5 sec.

The windings shall not develop hot spots exceeding safe limits due to an imbalance of 30% between any two phases from NO load to FULL load.

The alternator shall be capable of satisfactory and safe operation for an unbalance of upto 30% of rated capacity. The motor starting capacity of the alternator shall be 300% of its rated capacity.

### **ENCLOSURES**

Alternator enclosure shall be screen protected drip proof (SPDP) conforming to IP 21 of IS 4691-1968

### **TERMINAL BOX**

The termination boxes shall be suitable for necessary PVC 1.1 KV grade of U G cable conforming to IS1554 Part I. There shall be sufficient space for trifurcating inside the box. The box shall have removable gland plates. Suitable segregation shall be available for other cables



such as excitation, control etc. the terminal box shall be suitable for withstanding the mechanical and thermal stresses developed due to short circuit at the terminals.

### **EARTHING TERMINALS**

2 Nos. earth terminals on opposite side with vibration proof connections, nonferrous hardware etc., with galvanized or plated and passivated washers of minimum 12mm dia shall be provided.

### **VOLTAGE REGULATION**

Voltage regulation shall be automatic and compatible with excitation system described above

A manually operated voltage variance or an equivalent alternative to vary the output voltage from 400 V to 430 V while the set is running and on load conditions may be incorporated on the regular panel or control panel where specified under BOQ.

### **WINDINGS**

The insulation for stator/rotor windings shall be Class-F or superior.

### **Monitoring and metering facilities**

- a) Volt meter 0 - 600V with selector switch for monitoring of main alternator voltage and load voltage.
- b) Three C.T connected ammeters for monitoring of mains and alternator current. (On load side)  
CTs shall be of 1000/5A, Class1, 10VA
- c) Frequency meter for monitoring of alternator supply frequency and having range from 45 to 55Hz.
- d) C.T connected kWh meter on the alternator side suitable for 3 Ph four-wire system.

### **Visual monitoring lamp indicator for**

- a) Load on set.
- b) Load on mains.
- c) Engine shutdown due to over speed
- d) Engine shut down due to low lub. oil pressure.
- e) Engine shut down due to high coolant (water) temperature.
- f) Earth leakage trip of alternator.

g) Engine lock out and failure to start.

### **Operation devices**

A set of operation device described as under shall be incorporated in the front panel.

Master Engine Control Switch.

This shall cut off in OFF POSITION DC CONTROL SUPPLY to the entire panel thus preventing start up of engine due to any cause under this status. However, battery charger, lamp test button, for testing the healthiness of indication lamps, DC voltmeter/ammeter etc., shall be operative. It shall be feasible to lock the switch in OFF position for maintenance and shut down purposes.

Operation selector/switch with OFF/ auto/ manual/ test positions.

Selector switches for all meters as specified.

A set of push buttons as specified.

Buck/ boost charge selector switch.

### **Control panel**

Separate control panel as approved by the Kerala state Electrical inspectorate shall be supplied. The MCCB on the control panel shall be of 500A 35kA rated and having field settable external overload setting arrangement. The C.P shall have cable entry facility at the bottom. Alstom make CDG11 earth fault relay of 10% to 40% shall be provided on the control panel with tripping facility on the MCCB with 240V A.C shunt trip coil 500/5A,15VA ,Class 5P10 protection C.T shall provided in the neutral earthing lead. An easily detachable neutral link shall be provided in the control panel for isolating the earthing for testing purpose.

### **Battery charger**

This shall be complete with boost / trickle selector, DC voltmeter, DC ammeter and lamp indications for boost charge and float charge.

### **Test on generating sets.**

Tests shall cover the following;

Routine tests as per standards at manufacturers works.

Insulation resistance tests.

Operation checks.

Full load run test after installation at site for a period of at least 8 hours continuous run.

1

### **GENERATOR WITH ACOUSTIC ENCLOSURE**

Supply, testing and commissioning 2nos of 320KVA DG set, with acoustic enclosure with the following specification. 3phase 415V, 0.8pf 50hz. Water cooled Diesel generating set with electronic governor comprising of diesel engine alternator, fuel tank, starting system, battery etc. Diesel engine shall be suitable for continuous operation of generator set and satisfies with EURO -II specifications. Generator set inclusive of fly wheel, flexible coupling, air cleaner, corrosion resistor, fan with guard, fuel pump, fuel filter, electrical starting system with starter, 24V battery with regulator, instrument panel, rpm indicator, residential silencer, (for synchronizing). protection against low lubrication oil pressure. Alternator shall be 415V, 3phase 50Hz, 4wire 0.8 pf self excited, self regulated brushless type, drip proof conforming to IS:4722 with latest amendments. The engine shall be coupled over a sturdy common base frame.

Floor mounted dust and vermin proof, indoor type standard control panel consisting of MCCB rating of 500A 3pole 50KA breaking capacity, neutral link, voltmeter with selector switch, 3 ammeters of 0-500A range, frequency meter, energy meter, CTs and indicating lamps with fuse and switch control etc. as complete with necessary interconnections etc including first filling of oil and diesel for commissioning of the DG set.

(Energy meter & CTs shall be tested and certificate shall be obtained from electrical inspectorate lab)

Following sanction may be obtained by the contractor,

(i) sanctions from Municipality/ Corporation

(ii) Sanction from Pollution control Board

Outdoor acoustic enclosure with compartment for control panel for the following DG set .The sound level shall be brought down to 60DB+/-5 with at a distance of 3M.( as per CPC norms the sound level shall be 70dB at a distance of 1M from the silencer at the top of the enclosure) The base frame shall be made of 100x50mm M.channel, body shall be with 16SWG corrugated painted G.I sheet, roof No 18 SWG corrugated, painted G.I sheet, inner shall be with 22SWG Al perforated sheet with 2.5mm perforation. Body thickness shall be minimum 150mm. Acoustic insulation material

shall be mineral wool/resign bounded fibre glass of grade 64 and 98kg/meter cube, having an N.R.C value of 0.96 and 1.21 (with minimum thickness of 50mm.The 48kg/meter cube shall be with black glass tissue faced .40kg/meter cube. RP tissue shall be used in between metal and insulation. Doors shall be sliding on either side. Exhaust fan of sufficient capacity tube lights etc. shall be provided inside the enclosure. Sufficient fresh air intake and hot air outlet with splitters to be arranged so that the temperature inside should not increased 5 degree above ambient temperature. (The enclosure shall bare certificate from the generator manufacturer conforming the CPC norms and serial numbers of the test certificate.)

Exhaust pipe inside the enclosure up to and including silencer shall be enclosed with Aluminium cladding over thermal insulation. First filling of oil and fuel required for 8 hours test run on full load should be included in the offer

Required sanction and certificate for running the DG should be obtained from CPCB.

Rate to be quoted for

2	Supply	Each
	Total	

## LIST OF APPROVED MAKES

1. Diesel Engine	:	Kirloskar / Cummins/ Mahindra /Caterpillar
2. Alternator	:	Kirloskar / Stamford / Crompton /ELGI
3. Indicating Meters	:	L&T / IMP/ Enercon / MECO / HPL
4. MCCB	:	L & T/ MDS / SIEMENS / SCHNIDER
5. CTs	:	Intrans / Kappa / Voltamps
6. Battery	:	Exide / STANDARD
7. E /F Relay	:	ALSTOM / L&T / ABB