

TECHNICAL SPECIFICATION OF PORTABLE INDUSTRIAL DIESEL GENERATOR SET
(01 x 150 KVA, 120 kW, 415 ± 10% VOLT, 3 Ph, 04 WIRE, 50 Hz & 60 Hz)

1. **Name of Equipment.** Trolley Mounted Portable Industrial Diesel Generator with soundless canopy, 04 (four) wheel trolley system (150 KVA, 120 KW, 415 ± 10% VOLT, 3 Ph, 50 & 60 Hz).
2. **Purpose.** The Generator set will be capable to generate and distribute electric power. The Generator power will be used to operate various refit ship support, VIP & VVIP program.
3. **Quantity.** 01 (One) complete set with standard accessories.
4. **Estimated Price.** No source found.
5. **Manufacturer.** To be mentioned.
6. **Year of Manufacturer.** 2021 or later.
7. **Country of Origin.** USA, UK, GERMANY, FRANCE, JAPAN, SWEDEN & Equivalent.
8. **Manufacturing Country.** USA, UK, GERMANY, FRANCE, JAPAN, SWEDEN & Equivalent.
9. **Qualification of Bidders.** Only the genuine manufacturers or their authorized dealer (principal) can submit quotation through their authorized agent in Bangladesh. In case of dealer (principal), manufacturer's certificate of authorization has to be submitted with the offer.
10. **Ambient Condition.** The generator set is to be designed to operate in the following ambient condition:

a.	Air temperature	5°C - 50°C.
b.	Relative humidity	Up to 98% (Non-condensing).
c.	Location	Close to the sea shore area in Bangladesh.

11. **Scopes of Supply.** Following are the scope of supply:

- a. 01 x Portable Industrial Diesel Generator set to be supplied along with all standard accessories, fittings, attachments etc and also complete necessary works mentioned in the specifications as per subsequent paragraph.
- b. 01 x Changeover Switch, 04 poles, 400 Amps.
- c. Cable electric multi strand (NYY) flexible 4 x 150 RM, 50 mtr.

12. **Designs and construction of generator set.** The generator set, control panel and associated equipment are designed, constructed/ manufactured and tested are according to internationally recognized standard, the standard those item met needs to be mentioned. Necessary certificates need to be submitted during the delivery of the generator sets. List of certificates those will be submitted finally to be provided during the submission of the tender. Generator sets and all other items are to be brand new and of latest design with fulfilling high manufacturing standard.

13. **Technical Specification of Portable Industrial Diesel Generator Set.**

- | | | |
|----|--|---|
| a. | Manufacturer | : CAT/ MTU/ DEUTZ/ CUMMINS/ PERKINS/ ATLAS COPCO. |
| b. | Type | : Portable industrial outdoor type. |
| c. | Model | : To be mentioned. |
| d. | Compliance of international standards | : To be mentioned. |
| e. | Type of operation required (Prime power) | : To be mentioned. |
| f. | Maximum Continuous Rating (MCR) | : Not less than 120 kW/ 150 KVA |
| g. | Power Factor | : 0.8 Lagging |

- h. Output : 415 ± 10% Volt, 150 KVA or 120 kW, 50 Hz & 60 Hz, 3 phases, 04 wires.
- j. RPM : To be mentioned.
- k. Weights : To be mentioned.
(Unit weight kgs to be mentioned)
- l. Dimensions : (i) Standard open set dimensions/ To be mentioned.
(ii) Enclosed set standard dimensions/ To be mentioned.
- m. Capacity : Not less than 150 KVA/ 120 kW, 415 ± 10% Volt, 3 phases, 50 & 60 Hz.
- n. Canopy : (i) Should be sound less and water proof.
(ii) Noise level to be mentioned.
(iii) Net weight to be mentioned.
(iv) Dimension to be mentioned.
(v) Material & Drawing details to be provided.
- p. Coupling (Prime Mover and Alternator) : To be mentioned.
- q. Combined Base Frame : The Prime Mover and the Alternator are to be mounted on a combined base frame to be rigidly fixed to the generator seating. Lifting eyes are to be provided for lifting the complete generator set with canopy and 04 (four) wheel trolley system.
- r. Mounting : The generator set is to be elastically mounted on the common base frame.
- s. Trolley : The generator set will be fitted with a 04 (four) wheel double axle trolley which front axle are swing base and attach a towing hook for shifting the generator from one place to another place easily.
- t. Loading Condition : The Governor and AVR system must be highly responsive and should meet the following conditions:

(1) Voltage

- (i) Voltage transient tolerance : To be mentioned.
- (ii) Voltage transient recovery time : To be mentioned.

(2) Frequency

- (i) Frequency transient tolerance : To be mentioned.
- (ii) Frequency transient recovery time : To be mentioned.

- u. Fuel consumptions at different loading conditions to be mentioned according to the following table:

Fuel consumption	Prime			
	KVA (kW)			
Ratings	To be mentioned			
Load	1/4	1/2	3/4	Full
Gph	To be mentioned	To be mentioned	To be mentioned	To be mentioned
L/hr	To be mentioned	To be mentioned	To be mentioned	To be mentioned

v. Engine

Engine	Prime rating
Engine manufacturer	CAT/ MTU/ DEUTZ/ CUMMINS/ PERKINS/ ATLAS COPCO.
Engine model	To be mentioned.
Configuration	To be mentioned.
Aspiration	To be mentioned.
Gross engine power output	To be mentioned.
BMEP at set rated load, kPa	To be mentioned.
Bore, mm	To be mentioned.
Stroke, mm	To be mentioned.
Number of Cylinder	To be mentioned.
Rated speed, rpm	To be mentioned.
Piston speed, m/s	To be mentioned.
Compression ratio	To be mentioned.
Lub oil	To be mentioned.
Lub oil capacity, L	To be mentioned.
Fuel	HSD (High Speed Diesel) oil.
Fuel tank capacity, L	To be mentioned.
Over speed limit, rpm	To be mentioned.
Regenerative power, kW	To be mentioned.
Governor type	To be mentioned.
Starting system	To be mentioned.
Starting voltage	To be mentioned.
Shut down system	To be mentioned.
TBO:	
(a) Major Overhauls	Minimum 20,000 hours.
(b) Top Overhauls	10,000 hours or more.
(c) Others maintenance routine	To be mentioned.
Safety Devices	Following safety protections are to be incorporated. (i) Engine over speed. (ii) High engine temperature. (iii) Low engine oil pressure. (iv) Others to be mentioned.

w. Fuel flow

Fuel flow	Prime rating
Maximum fuel flow, L/hr	To be mentioned.
Maximum fuel inlet restriction, mm Hg	To be mentioned.
Maximum fuel inlet temperature (°C)	To be mentioned.

x. Air

Air	Prime rating
Combustion air, m ³ /min	To be mentioned.
Maximum air cleaner restriction, kPa	To be mentioned.

y. Exhaust

Exhaust	Prime rating
Exhaust gas flow at set rated load, m ³ /min	To be mentioned.
Exhaust gas temperature, °C	To be mentioned.
Maximum exhaust back pressure, kPa	To be mentioned.
Appropriate silencer	To be mentioned.

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z. Standard set-mounted radiator cooling.

Standard set-mounted radiator cooling	Prime rating
Ambient design, °C	To be mentioned
Fan load	To be mentioned
Coolant capacity (with radiator), L	To be mentioned
Total heat rejection, BTU/ min	To be mentioned

aa. Alternator data:

(i)	Manufacturer	: Stamford/ Leroy Somer/ Caterpillar
(ii)	Type	: Brushless AC generator
(iii)	Brand/Model	: To be mentioned
(iv)	Excitation	: Self excited/ Permanent magnet
(v)	Power Factor	: 0.8 lagging
(vi)	Rated voltage	: Phase to Phase, 415 ± 10% Volt AC
(vii)	Frequency	: 50 Hz
(viii)	Frequency selector switch.	: 50 Hz
(ix)	No. of Phases	: 3 Phase 4 Wire
(x)	Voltage regulation%	: ± 0.5%
(xi)	Overload Acceptance	: 10% of rated capacity for one hour in every 12 hours operation. Sustain short-circuit current ratings to be mentioned.
(xii)	Speed	: To be mentioned
(xiii)	AVR	: Electronic Type or to be mentioned.
(xiv)	Insulation	: H or better
(xv)	Protection Class	: IP23.
(xvi)	Number of bearing	: Double.
(xvii)	Safety device	: Following safety protections are to be incorporated: a. Over load protection device b. Short-circuit condition protection device. c. Reverse power protection device. d. Under frequency indicator e. Excitation loss indicator f. Emergency stop. g. Others to be mentioned

14. Fittings/ Attachments. All necessary fittings/ attachments including the following will be provided with diesel generator set:

Ser	Description	Remarks
a	Lifting arrangement of Complete Generator Set	To be mentioned.
b	Battery: Make, Model, Capacity & Qty	To be mentioned.

15. Standard Accessories. Standard accessories must include every item and accessories, which are essential to install and operate the Generator sets whether those are mentioned in the specification or not. A list of such items/ accessories is to be provided

16. Optional Items. A list of optional items (if any) which may be required for the generator set is to be provided.

17. Tools. 01 (One) set of standard tools for maintenance of the generator set is to be provided indicating item wise price. Quantity and size of these tools are to be mentioned in the quotation.

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18. **Special Tools.** A recommended list of special tools required for carrying out maintenance of the generator set is to be submitted with the quotation indicating item wise price.

19. **Spare parts.** Following spare parts are to be supplied:

Ser	Parts Name	Deno	Qty
a	Oil Filter	No	06
b	Air Filter	No	04
c	Fuel Filter	No	06
d	Fuel Water Separator	No	01
e	Oil Pressure Sensor	No	02
f	AVR	No	01
g	Control & Monitor Module	No	01
h	Bridge Rectifier Unit (Rotary Diode Assembly)	No	02

20. **Control panel.** Following are to be incorporated:

- Multifunction digital control.
- Automatic start.
- Scrolling digital LCD.
- Stop/ Manual/ Auto start option.
- Others (if any) to be mentioned.

21. **Digital panel meter.** Following are to be incorporated:

- Generator volt meter (Phase to Phase and Phase to Neutral).
- Generator Amps meter (for line current measuring).
- Generator Frequency meter.
- Engine oil pressure.
- Running hour meter.
- Battery voltage meter.
- Others (if any) to be mentioned.

22. **Generator Supply Breaker.** A Generator supply breaker of EU origin about 300 Amps 04 pole (as appropriate) or higher with following safety devices will be incorporated in the generator supply breaker:

- Under and over voltage release.
- Over Load/ Short circuit release.

23. **Test Equipment.** Following test equipment to be supplied and offered equipment make and model to be submitted with the offer:

- 1 x Digital Multimeter (Fluke 116 digital HVAC, USA or equivalent).
- 1 x Meager Analogue (0-500V) (ZC25-3 Meager or equivalent).
- 1 x Digital Clamp Meter AC/DC 0-1000 Amps (Fluke 376 FC, USA or equivalent)

24. **Supplier/ Local Agent.** Name and full address with e-mail of Supplier/ Local agent is to be mentioned.

25. **Certificate and Reports.** Following certificates and reports are to be provided for the generating set and associated equipment/ accessories during delivery:

- Prime power industrial type approval certificates for both mechanical, electrical and electronics items.
- Quality assurance certificates for the generating set and their associated equipment and instruments in regard to its manufacturer and performance is to be provided. It is to be in accordance with IEEE or equivalent classification standard.
- Guarantee and Warranty certificates.
- Factory test certificate at various load conditions including 110% overload test

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26. **Supply Assurance Certificate.** The bidder should submit necessary governmental license for the concerned components/ items are free for sale with obligation for supply of spare parts, technical advice etc in future.

27. **Technical Support.** Technical support is to be provided to solve any maintenance and operational problem arising with the item for a considerable period (To be mentioned). An assurance by the Bidder starting agreement in this respect is to be submitted with the offer.

28. **Documents.**

a. 02 (Two) sets of following documents (in English) will be supplied with the diesel generator set.

- (i) Operation manual,
- (ii) Maintenance manual,
- (iii) Workshop level repair manual with circuit diagram,
- (iv) Parts catalogue,
- (v) Switchboard diagrams and functional description,
- (vi) Source code.

b. 02 (Two) sets of brochure/ booklet in English having details of the offered Generator set (the prime mover, alternator, AVR, Governor, etc) must be provided with the quotation for evaluation and assessment. The brochure should contain in addition to other behaviors of the Generator sets including characteristics/ performance curves, behavior when various loads are added or taken-off.

29. **Test, Trial and Acceptance.** Test and trial will be carried out in buyer's premises by the buyer in presence of supplier's representative. After satisfactory of test and trial (including testing the generator sets with dummy load), a certificate will be signed jointly by the representative of supplier and representative of buyer. The certificate is to be forwarded to Chief Inspectorate of Naval Store (CINS) office. On completion of successful test and trial, the items will be accepted by the buyer.

30. **Record of Sales.** Record of sales of the quoted model of the generator set indicating year and buyer with full address is to be submitted with the quotation.

31. **Factory Acceptance Test (FAT).**

a. FAT report (Alternator & Prime Mover) is to be provided by the supplier before shipment.

b. Serial No of Prime Mover and Alternator are to be provided eight weeks before FAT.

c. The FAT criteria in details is to be submitted which should include the following

(i) **Generator Load Tests.** Generators load test will be carried out to fulfill the required condition mentioned at paragraph 13aa (v, vi, vii, viii, x & xi). Recording of voltage, frequency, transient voltage, and frequency variation and recovery time will be made to ascertain the specified condition.

(ii) **Tests of Alarm and Safety Devices.** Various test for checking temperature, pressure, fuel oil consumption etc. with recording of alarm and shut down steps are to be provided.

(iii) **Test Report.** Test reports are to be prepared in English which will include all test results and other relevant information. The complete test report is to be submitted to BN before shipment.

(iv) Any other issues.

32. **Training.** The manufacturer/ supplier is to provide sufficient training for operation and maintenance to BN personnel for duration of 03 (Three) working days after test, trial and commissioning. During training, emphasis is to be given on operation, maintenance and fault finding of Prime Mover, Governor, Alternator, AVR etc. Cost of internal transportation, accommodation and food of the instructor is to be borne by the supplier. The training syllabus is to be submitted with the offer. Number of trainees will be selected by buyers and the number would not be more than 10 (Ten). Training venue will be arranged by the buyer.

33. **Source of supply.** Source of supply of all items (as per para 11) are to be mentioned.

34. **Warranty.** Warranty for trouble free operation will be given by the suppliers/ manufacturer for all the supplied items for a period of 12 months from the date of acceptance by the buyer. During the Warranty period, If the Diesel Generator remains non-operational for any duration within the warranty period then the warranty will be extended for the same period. The warranty covers all parts and labor (including service engineers cost) throughout the warranty period. For Warranty repair/ replacement, the supplier will collect the defective item from NSD, Chattogram and re-supply the same or repair the generator set at site under warranty repair or replacement.

35. **Guarantee.** The manufacturer will guarantee to supply the spare for at least 10 years with reasonable price. Yearly increase of price of spares should not be more than 5% of the contract price of spares.

36. **Shipment.**

a. The supplier will arrange shipment of all items by sea port/ air port to Chattogram/ Dhaka, Bangladesh.

b. All items are to be delivered in sea-worthy packing to ensure safe transportation by sea/ air.

c. All packages are to have packing notes showing their contents in details and all packages shall be marked with name and address of the consignee and gross weight.

d. The supplier will arrange transportation of all supplied items from Chattogram/ Dhaka to NSD/ NSSD.

e. **Port of Shipment.** Any port of manufacturing countries.

37. **Delivery.** The items will be delivered within 03 (Three) months from the date of signing the contract to the following consignee:

The Commanding Officer
Naval Stores Depot, Chattogram.
New Mooring, Chattogram, Bangladesh.

38. **Terms of Payment.** NSD Ctg.

39. **Validity of Offer.** The offer should remain valid until 180 days.

40. **Condition for Acceptance of Quotation.** Quotation has to have supporting documents (booklets, leaflet, catalogue, brochure etc) having detailed particulars of the offered Generator set. If detailed information regarding specifications, maker's books and catalogue about the same model of the Generator set quoted, spare parts, accessories, scope of supply etc are not provided, the quotation will not be accepted.

41. **Certificate of Authenticity.** Letter of authenticity from the Principal/ Manufacturer stating about the supplied product/ item is of brand new, latest production and meet the US and Western European standard with the generator sets to be provided in support of its authenticity.

42. **Compliance Statement.** A compliance statement fulfilling all the requirement of the tender is to be submitted for evaluation of the quotations. Stating mere 'Yes' or 'No' will not suffice and detailed description/ information, brochures/ booklet, drawing and diagram as required is to be given. An incomplete compliance statement may attribute to cancellation of the offer. If any clause of this specification does not commensurate with offered Generator set, the deviation has to be spelt out clearly.