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BHARAT COKING COAL LIMITED
(A Subsidiary of Coal India Limited)
Office of the Chief General Manager(MM)
Materials Management Department
Commercial Block L-III , Koyla Bhawan : Koyla Nagar
Dhanbad : 826005(Fax No- 0326-2230183)

SUPPLY ORDER NO BCCL/PUR/216086/Transformer/16-17/63/67 Date- 06.11.2017

To,

M/S SAI ELECTRICALS,
301, Czar Woods, Om Gardens,
Maitree Vihar, Chandrashekharpur,
Bhubaneswar – 751023

BY REGD POST
PAN no - AACCS2787B
E-mail : saielectricals.cuttack@gmail.com

SUB: SUPPLY OF POWER TRANSFORMERS

Ref: 1.Our Open domestic tender no. BCCL/PUR/216086/Transformer/16-17/63 DATE: 25.10.2016 in coal India portal
2. Our Tender ID no. 2017_BCCL_66652_1
3. Your offer vide Bid no.14358 on coal India portal and subsequent correspondence.

Dear Sirs,

With reference to the above, we are pleased to place an order on you for Supply of Power Transformers at the rates and scope of supply as indicated under as per the technical specification specified in the Annexure-A &A-1 enclosed and as per the terms and conditions given hereunder alongwith general terms and conditions of NIT.

Sl No	Item Description		Price in Rs.
1	Power Transformer 750 KVA, 11KV/550-440V	Basic price	Rs.4,36,000.00
		Packing and Forwarding	Rs.10,000.00
		Freight Charges	Rs.50,000.00
		GST @ 18 %	Rs.89,280.00
		Total Price	Rs.5,85,280.00
		Quantity	02 nos
		Landed Price	Rs.11,70,560.00
		Pre- dispatch Inspection charges @ 1%	Rs.11,705.60
		GST @ 18 % on Pre-dispatch Inspection charges	Rs.2,107.00
		Total Landed Price in Rs.	Rs.11,84,372.61

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1.PRICES: The above prices are Firm & on FOR destination basis inclusive of Packing& Forwarding, Freight and Insurance Charges. Total value of order is Rs.11,84,372.61(Eleven Lakhs Eighty Four Thousand Three Hundred Seventy Two and Sixty One Paisa only)

2. GST :GST shall be Payable extra at actuals as applicable within the stipulated delivery schedule. Present rate of GST is @ 18%. The invoice shall be raised by you giving all the details as per GST Act/ Rules so as to enable BCCL to avail Input Tax Credit. You have to ensure proper uploading in your return so that BCCL may be able to avail Input Tax Credit. You have to ensure that if BCCL does not be able to avail Input Credit due to fault of the supplier then the loss amount to be recovered from the supplier. The benefit of any extra input tax credit earned by you, if any, in future shall be passed on to BCCL. E-Way bill, if required, shall be arranged by you.
(NB: Any increase in taxes & duties beyond the stipulated delivery period will be to your account)

3.DELIVERY PERIOD: To be delivered "Within 04(four) months". Delivery shall be reckoned from the 10th day from the date of order and the date of receipt of materials at our stores shall be treated as the date of delivery.

4.**PAYMENT TERMS**:100% Payment shall be made within 21 days of receipt and acceptance of the materials or from the date of submission of the bill,whichever is later, against submission of Performance Bank Guaranty. Photocopy of Your bank details/EFT mandate submitted by you alongwith your offer is enclosed for payment through EFT.

5.CONSIGNEE: Depot Officer, Lodna Area,Dist;Dhanbad,Jharkhand.

6.**PAYING AUTHORITY:** HOD(F)MM,BCCL, Koyla Bhawan,Dhanbad .

7.GURANTEE /WARRANTY: The supply shall be covered by the maker's standard guarantee as follows:
The supplier shall warrant that the equipment supplied under the contract / supply order
(a)is new, unused and of current design not likely to be discontinued or become obsolete till the life of the offered equipment.
(b) Is in accordance with the contract specifications.
(c) Shall have no defects arising out of design, materials or workmanship.
The supplier shall guarantee for the satisfactory performance of the complete equipment/ stores for a period of 12 months from the date of commissioning or 18 months from the date of receipt and acceptance of the materials, whichever is earlier.In the event of any defects in materials, design and workmanship during the aforesaid period is found due to faulty design or poor workmanship, the defective part or parts will be replaced by the supplier at site free of cost within 30 days of settlement of warranty claims.The supplier will be required to stock spare parts to take care of warranty failures. Spares should be available within 2 weeks of the breakdown being intimated to them.

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The guarantee/composite warranty shall be submitted along with the bill. The warranty shall cover for the total equipment so that the necessity of having to approach different manufacturers of various components/assemblies does not arise and all services under warranty clause shall be the responsibility of the ultimate supplier of the composite equipment. You will also replace the defective parts, if any, during the warranty period free of cost. The responsibility to collect the defective / rejected material will lie with the supplier and the cost for such collection will have to be borne by the supplier.

8.**SECURITY DEPOSIT**: Exempted being NSIC registered.

9.PERFORMANCE BANK GUARANTEE (PBG)- PBG on schedule/Nationalized Bank in India valid for three months beyond the expiry of Guarantee/Warranty period of the contract(ie valid for 21 months from the date of receipt and acceptance of materials at destination site) for 10% value of the contract ie for Rs 1,18,438.00(Rupees One Lakhs Eighteen Thousand Four hundred and Thirty Eight only) shall have to be submitted to MM Division, BCCL, Koyla Bhawan on or before commencement of supply/ installation/commissioning. The format for PBG shall be as was provided alongwith the NIT.The original Bank Guarantee should be sent to the beneficiary directly by the issuing bank under registered post with A.D

10.Inspection and Tests:

i)The purchaser or its authorised representative shall have the right to inspect and/or to test the goods to confirm their conformity to the contract. The purchaser shall notify the supplier in writing of the identity of any representative retained for these purposes.

ii) The inspections and tests may be conducted on the premises of the supplier or its sub-contractors), at point of delivery and/or at the goods final destination when conducted on the premises of the supplier or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production date, shall be furnished to the inspectors at no charge to the purchaser.

iii) Should any inspected or tested Goods fail to conform to the specifications, the purchaser may reject them and the supplier shall either replace the rejected goods or make all alternatives necessary to meet specification requirements free of cost to the Purchaser.

iv) The Purchaser's right to inspect, test and, where necessary, reject the goods after the Goods arrival in the Purchaser's country shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the Purchaser or its representatives prior to the Goods shipment from the country of origin.

v)Materials are subject to inspection by the purchaser before dispatch.The materials may also be

subject to stage inspection by a third party nominated by BCCL for the purpose. Final inspection shall, however, be carried out at the consignee's end.

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v)Materials are subject to inspection by the purchaser before dispatch.The materials may also be subject to stage inspection by a third party nominated by BCCL for the purpose. Final inspection shall, however, be carried out at the consignee's end.
vi)Nothing in these documents shall in any way release the supplier from any warranty or other obligations under this contract.
vii)The purchaser shall, at its discretion, have the right to test the ordered material in a Government Test House or in a test house nominated by the purchaser. In case of failure of the material after testing, the cost of tests as well as of the material shall have to be borne by the supplier.
Final Inspection at destination site shall be arranged by the consignee within one week from the date of receipt of the material.Supplier's technical representative must be available at the time of inspection.

10A.PRE-DISPATCH INSPECTION: Pre-dispatch inspection of each consignment shall be carried out by M/s. Central Mine Planning & Design Institute Ltd (CMPDIL), Ranchi/their Regional Office as per the terms and conditions indicated hereunder:

Pre-dispatch inspection shall be carried out by M/s. CMPDIL (the above firm) as per their methodology. The third Party Inspection shall include examination of raw material, test certificate verification, continuous monitoring of quality assurance by manufacturer which will include regular and surprise visits. In brief, the scope and condition of inspection by M/s.CMPDIL will be as follows :

Checking and approval of test procedures/quality assurance plans.
Verification of records and documents of your works.
Verification of documents and test certificate of bought out items and cross checks.

You shall provide facilities for carrying out all necessary tests as required in the specification at your works else these will be carried out at an independent test house at your cost.

Final testing and checking of materials as per specifications.
M/s.CMPDIL will have full and free access to the premises of manufacturer during the process of manufacturing and during inspection activities.
Inspection fee @ 1% of total consignment billing (plus statutory levis like GST etc,as aplicable on inspection fee) is to be paid to M/s.CMPDIL along with inspection call letter payable by SBI Collect as per enclosed appendix-III(a) which will be reimbursed subsequently by BCCL together with consignment billing.

Minimum 7 calendar days notice shall be given by the manufacturer to M/s.CMPDIL for arranging inspection within valid delivery period as per contract.
The ultimate responsibility for supply of correct materials as per requirement of relevant specification lies solely with the manufacturer inspite of clearance/acceptance by inspection authority i.e. M/s.CMPDIL. The manufacturer will be required to replace the material free of cost if found defective/unserviceable/not according to relevant specifications.

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The charges for third party inspection and the cost of materials that would be required for destructive tests, if any, shall be reimbursed by BCCL together with the consignment billing. Such cost shall be reimbursed only if it is duly certified by M/s.CMPDIL.
Please send inspection call to M/s.CMPDIL, Ranchi/ their Regional. Office as per appendix-III (b).

Final inspection shall be arranged by the consignee after receipt of the material at our destination.

The purchaser shall, at its discretion, have the right to test the ordered material in a Government Test House or in a test house nominated by the purchaser. In case or failure of the material after testing the cost of tests as well as of the material shall have to be borne by the supplier.

11.TRANSIT INSURANCE: Shall be arranged and covered by you for safe arrival of the materials to the consignee end at your cost and risk.

12.PENALTY FOR FAILURE TO SUPPLY IN TIME: Liquidated Damage(LD) Clause/Risk Purchase clause: The delivery of stores stipulated in Purchase order shall be deemed to be of the essence of the contract and delivery of the stores must be completed by the date specified. No materials should be supplied beyond the specified delivery period, unless specific approval has been obtained from the purchaser.
In the event of failure to deliver the stores within the stipulated date/ period in accordance with the samples and/or specification mentioned is the supply order, and in the event of breach of any terms and conditions mentioned in the supply order. Bharat Coking Coal Limited reserves the right:
a) To recover from successful tenderer, as agreed liquidated damages,a sum not less than 0.5% (half percentage) of the price of the stores which successful tenderer has not been able to supply (for this purpose part of a unit supplied will not be considered) as aforesaid for each week or part of a week during which the delivery of such stores may be in arrears limited to 10%. Where felt necessary the limit of 10% can be increased to 15% at the discretion of Head of the Materials Management Division .
b) To purchase elsewhere, after due notice to the successful tenderer on the account and at the risk of the defaulting supplier the stores not supplied or others of a similar description without cancelling the supply order in respect of consignment not yet due for supply or
c) To cancel the supply order or a portion thereof, and if so desired to purchase the store at the risk and cost of the defaulting supplier and also
d) To extend the period of delivery with or without penalty as may be considered fit and proper. The penalty, if imposed shall not be more than the agreed liquidated damages referred to in clause (a) above.

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e) To encash any Bank guarantee which is available for recovery of the penalty or
f) To forfeit the security deposit full or in part.
g) Whenever under the contract a sum of money is recoverable from and payable by the supplier, BCCL shall be entitled to recover such sum by appropriating,in part or whole by deducting any sum or which at any time thereafter may be due to the successful tenderer in this or any other contract with Bharat Coking Coal Ltd. or any subsidiary of Coal India Ltd. Should this sum be not sufficient to cover the full amount recoverable, the successful tenderer shall pay BCCL on demand the remaining amount. The supplier shall not be entitled to any gain under this clause.

13.PRICE FALL CLAUSE:

i)The prices charged for the stores supplied under the contract by the supplier shall in no event exceed the lowest price at which the supplier offer to sell the stores of identical description to any other organization from date of offer till completion of supply under the contract.
ii) If at any time during the said period the supplier offers lower sale price of such stores to any other organization at a price lower than the price chargeable under this contract, the supplier shall forthwith notify such reduction or sale to the consignee concerned under intimation to GM(MM),Bharat Coking Coal Limited , Commercial Block , Level –III , Koyla Bhawan , Koyla Nagar , Dhanbad and the price payable under the contract for the stores supplied after the date of coming into force of such reduction or sale, shall stand correspondingly reduced. The above stipulated will not, however apply to exports by the supplier.
A certificate to this effect shall be submitted by you alongwith the supply bill.
14.SUBMISSION OF BILL: Pre–receipted stamped original bill for 100% value in four copies along with delivery challan in original,Guarantee/ Warranty certificate, and other relevant documents as indicated elsewhere in the order should be submitted to the Paying Authority through Consignee only.
15.PACKING: Consignment shall be supplied in suitable standard proper packing.
16.FORCE MAJEURE CLAUSE: If the execution of the supply order is delayed beyond the period stipulated in the supply order as a result of out-break of hostilities, declaration of an embargo / curfew or blockade or fire, flood, acts of nature or any other contingency beyond the supplier's control due to act of God then BCCL may allow such additional time by extending the delivery period, as it considers to be justified by the circumstances of the case and its decision shall be final.

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17.DOCUMENTS: Following Documents will have to be submitted at the time of supply :

1)The manufacturer shall carry out all routine standard tests in accordance with IS-2026 on each transformer and a copy to be submitted.
2)Operation & maintenance manual
3)Manufacturer test certificate

This issues with the concurrence and approval of the competent Authority.

All disputes will have jurisdiction of Dhanbad Court & Jharkhand High Court only.

ALL OTHER REMAINING COMMERCIAL TERMS & CONDITIONS AND TECHNICAL SPECIFICATIONS ALONG WITH SCOPE OF SUPPLY WILL STRICTLY BE AS PER OUR NIT AS CONFIRMED IN YOUR OFFER AND YOUR SUBSEQUENT LETTERS.

N.B:- This purchase order/ contract is issued with the approval of the Competent Authority.

This contract is concluded with the issuance of this order.

This issues with the concurrence and approval of the competent Authority.

Enclosure: 1.Annexure-A- Detailed technical specifications

2.Annexure-A-I -Technical particulars

Yours faithfully,

06/11

(Nadeem Khan)
AM(MM)

06/11/17

(N.S.Saini)
General Manager(MM)
For & on behalf of Bharat Coking Coal Ltd.

INDENT AND BUDGET REFERENCE:

Indent reference	Budget Certification no. & dt., & FC No.& dt.
Indent no.LOD/IND/15-16/114 dtaed 05.11.2015 MM IR no. 216086 dated 02.09.2016	BC NO.BCCL/C&B/CAP/Reg PN.194/SN-143/ebc no.81 Dated 11.07.2017 For Value: Rs 11,33,911.73 BC NO.BCCL/C&B/CAP/Reg PN.-07/SN-37/ebc no.308 Dated 30.10.2017 For Value: Rs.50,460.00 BC NO.BCCL/C&B/CAP/Reg PN.-07/SN-42/ebc no.311 Dated 03.11.2017 For Value: Rs.1.00 FC given by CM(F)OP vide e-FC No.199 dated 03.11.2017 for Rs.11,33,911.73, eFC no.200 daed 03.11.2017 for rs.50,460.00 and 201 dated 03.11.2017 for rs.0.88.

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SUPPLY ORDER NO BCCL/PUR/216086/Transformer/16-17/63/67 Date- 06.11.2017

COPY:

1.GM(E&M), Koyla Bhawan
2. HOD(F),MM , Koyla Bhawan.
3.HOD(F)C&B, BCCL HQ, Dhanbad.
4. Depot Officer,Lodna Reginal Store, Lodna Area ,Dist:Dhanbad, Jharkhand,India .
5. CGM(E&M),CMPDIL,Gondwana Place,Kanke Road,Ranchi
6.MM(Tech Cell), MM Div, Koyla Bhawan.
7.GM(MM)CIL/CCL/SECL/ECL/NCL/WCL/MCL/NECL
8.MF/Office Copy

Assistant manager(MM)

General Manager(MM)

Annexure-A

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TECHNICAL SPECIFICATION OF POWER TRANSFORMER (750 KVA 11KV/550-440V)-02 no

This specification broadly covers design , manufacture , supply and other requirements of power transformers to be used for power supply to coal mines .This shall meet all the technical requirements of IS 2026 and relevant standards .

The transformer shall be of proven design for giving satisfactory and reliable performance in heavily coal dust laden atmosphere unit ambient temperature of 45°C and other service condition prevalent in coalfield areas of BCCL.

The power transformer shall be of indoor type , vector group DY11 , naturally oil cooled , copper wound of suitable class of insulation and shall be suitable for 3 phase , 50 HZ , ac power supply system .Continuous operated at rated KVA within ± 10% variation of voltage .Temp. rise limited to the following values :

Cooling	Oil	Winding
ONAN	45°C	55°C

Mechanical features

a) The transformer shall withstand the electro-dynamic stress due to thermal short circuit of the LV side assuming the HV side fed from an infinite bus . All leads and windings in cores shall be properly supported , clamped and tightened after vacuum drying to ensure the short circuit withstand ratings . The short circuit withstand duration shall be minimum 2 sec.

b) The Transformer shall be so designed as to minimize any undue noise and vibration .

Constructional details

Core

a) The transformer core shall be made of high grade non- ageing grain oriented cold rolled steel sheets of low hysterisis loss and high permeability . The core structure shall be securely grounded to prevent electrostatic potential . Lifting eyes and lugs shall be provided on the limbs and coils assembly . Preferably no bolt shall be used in the cores . Clamping shall be done externally to the limb.

b) The design of the magnetic circuit shall be such as to avoid static discharges , development of short circuit paths within itself or to the earthed clamping structure and the production of flux component at right angles to plane of lamination which may cause local heating .

c) Core and windings shall be capable of withstanding shocks during transport , installation & service and adequate provision shall be made to prevent movement of core & winding relative to tank during these conditions.

d) All steel sections used for supporting the core shall be thoroughly sand blasted after cutting , drilling and welding .

Tanks

a) Tanks shall be of welded construction and fabricated from boiler steel plates of adequate thickness . The weld procedure and performance shall be in line with ASME BPV –IX.

b) All seams and joints those are not required to be opened at site shall be factory welded and wherever possible shall be double welded.

c) Tanks stiffness shall be provided for general rigidity and these shall be designed to prevent retention of water.

d) d)The tanks shall be designed to withstand – Mechanical shocks during transportation , Vacuum filling of oil & short circuit force .

e) e)Adequate space shall be provided at the bottom of the tank for settlement of sediments .

f) f)Suitable guides shall be provided in the tank for positioning the core & coil assembly.

g) g)The tanks shall be suitable for movement in both direction during shipment & each tanks shall be provided with Lifting lugs suitable for lifting the complete transformer and a minimum of four jacking pads.

Tank cover

a. The tank cover shall be sloped to prevent retention of rain water and shall not distort when lifted.

b. At least two adequately sized inspection covers one at each end of the tank shall be provided for easy access to bushing and earth connection. The inspection covers shall have suitable lifting arrangement.

c. The tank covers shall be fitted with thermometer pockets. The thermometer pocket shall be fitted with a captive screwed top to prevent ingress of water.

Mounting arrangement

The transformers shall be provided with two nos. bi- directional skids and pulling eyes integral with tank body for fixing the transformer tank on foundation.

Conservator tank

a) The conservator tank shall have adequate capacity to accommodate oil preservation system and volumetric expansion of the total cold oil volumetric expansion of the total cold oil volume in transformer and radiators for a change in temperature from minimum ambient air temperature of 5°C to 110°C.

b) The conservator shall be bolted into position so that it can be removed for cleaning purpose.

c) The conservator tank , shall be fitted with a silica gel filter breather.

d) The conservator of transformers shall be fitted with plain oil level gauge with two independent low level electrically insulated alarm contacts . The oil level at 30°C shall be marked on the gauge.

Explosion vent

a) The transformers shall be provided with the single diaphragm type of explosion vent with air release device .

b) An equalizer pipe shall be connected to explosion vent from the conservator.

Buchholtz Relay

A double float type buchholtz relay confirming to IS 3637 shall be provided . All gas evolved in the transformer shall be collected in this relay . The relay shall be provided with a test coke suitable for a flexible pipe connection for checking its operation . A copper tube shall be connected from the gas collector to a valve located about 1200 mm above ground level to facilitate sampling with the transformer in the service . The device shall be provided with two potential free contacts , one for alarm on gas accumulation and the other for tripping on rise of pressure.

Temperature indicator

Oil temperature indicator (OTI)

The transformers shall be provided with a 150 mm dial type thermometer for top oil temperature indication. The thermometer shall have adjustable, potential free alarm and trip contacts, maximum reading pointer and resetting device and shall be mounted on tank cover . A temperature sensing element located in a pocket in the top oil shall be furnished. This shall be connected to the OTI by means of capacity tubing. Accuracy class of OTI shall be 2° C or better. The OTI shall have full scale deflection of at least 240° C and shall have linear graduation to read every 2° C.

Winding

- The conductors shall be of electrolytic grade copper free from scales & burns.
- All winding shall be fully insulated .
- Coil assembly and insulation spacers shall be so arranged as to ensure free circulation of oil and to reduce the hot spot of winding.
- All bus bars and leads shall be adequately supported in insulated cleats or frames shall be effectively locked.

Insulation materials

- Class "A" insulating materials specified in IS 1271 or latest version shall be used . Wood insulation , where used , shall be well seasoned and treated .
- **Insulating oil :** The new insulating oil shall confirm to IS 335 . No inhibitors shall be used in the oil.

The manufacturer shall dispatch the transformer filled with oil . Ten percent extra oil shall be supplied for topping up , in non returnable sealed containers suitable for outdoor storage.

Earthing Terminals

Two earthing terminals suitable for connecting 50 x 8 mm mild steel flat shall be provided at position close to the two diagonally opposite bottom corners of tank . These grounding terminals suitable for bolted connection . Two earthing terminals shall also be provided on marshalling box and any other equipment mounted separately

Cable boxes and disconnecting chambers

Cable boxes of suitable sizes shall be provided to accommodate cable termination . Cable boxes shall have terminals connectors of adequate size and bolt holes to receive cable lugs . Cable boxes shall have degree of protection IP-52 as per IS : 2147. Disconnecting chamber will be as per standard norms & practice.

Off circuit Tap changer switch

The tap change switch shall be three phase , hand operated , for simultaneous switching of similar taps on the three phases by operating an extra handle

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.Arrangement shall be made for securing and pad locking the tap chamber in each of the working position . An indicating device shall be provided to show tap in use.

Radiators : The radiators shall be detachable type , mounted on the tank . Each radiator shall be provided with the following :

- **a.** A drain valve at the bottom
- **b.** An air release plug at the top
- **c.** Shut off valve

Fittings : The following fittings shall be provided with all the transformers :

1. Rating and diagram plate
2. Terminal marking plate
3. Two earthing terminals
4. Lifting lugs
5. Jacking lugs
6. Drain valve with plug of 50mm size
7. Dehydrating breather
8. Buchholtz relay with alarm and trip contacts with one shut off valve on 50mm conservator side
9. Plain oil level indicator
10. Off load tap changing switch
    a. 11.Oil filling hole with cover
    b. 12.Conservator
11. OTI
12. Explosion vent with air release device
    a. .Skids and pulling eyes on both sides
    b. Rollers
    c. Filter valve
    d. Inspection cover

TESTS

You shall carry out type tests in accordance with IS : 2026 on transformer .

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ANNEXURE-A-I
TECHNICAL PARTICULARS

1. Rated capacity /quantity :-

SL.NO.	KVA	PRIMARY VOLTAGE(KV)	SECONDRY VOLTAGE(KV)
1.	750	11	0.55KV-0.44KV

2. No. of phases : 3
3. Frequency : 50 HZ +3%,- 5%
4. Location : Indoor
5. Type of cooling : ONAN
6. Type of oil : Mineral oil
7. Impedance voltage at rated current : 6.5%± 10%
8. Tap changer type : Off circuit
9. Tapping : ±2.5%,±5%,±7.5%,0
10. Temp. rise (over ambient) in oil : 45°C
11. Temp. rise (over ambient) in Winding : 55°C
12. Earthing of neutral terminals : Required for LV winding
13. Method of system earthing : Star – solid (LV winding)

A) GENERAL a) Name of manufacturer :	NA	SAI ELECTRICALS
b) Service	NA	INDOOR
c) Rating	NA	750KVA
d) Rated KVA	KVA	750KVA
e)Rated voltage of HV	KV	11
f)Rated voltage of LV	KV	550-440
g)Temperature rise in oil :°C	Degree Celsius	45 Deg C
h)Temperature rise in winding :°C	Degree Celsius	55 Deg C
i) Rated frequency	Hz	50Hz
j)Number of Phases	NA	3Nos.
k) Connection: HV	NA	Delta

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LV	NA	Star
Vector Group	NA	Dyn11
l) Tapping	NA	+/-7.5% @ 2.5%
m) No load loss at rated voltage & frequency	KW	1300W +/- IS Tol.
n)Load loss at rated current at 75°C	KW	10250W +/- IS Tol.
o)Impedance at rated current & frequency at 75°C	Percent	6.5% +/- 10%
p)Reactance at rated current & frequency	Percent	6.35%
q)Efficiency at 75°C at unity p.f.: At full load	Percent	98.48%
At 3/4 full load	Percent	98.76%
At 1/2 full load	Percent	98.98%
r) Regulation at full load at 75°C : At unity pf	Percent	1.57%
At 0.8 p.f. lagging	Percent	4.60%
s) No load current at rated voltage & frequency	NA	3% of Full Load Current
t) Approximate Weight: Core and Winding	Kg	1025Kg App.
Tank & fitting	Kg	600Kg App.
Oil	Kg	415Kg App.
Total weight	Kg	2040Kg App.
u)Approx quantity of oil	Litres	465Ltr. App.
v)Approx overall dimensions : Length	mm	2070 +/- 15%
Breadth	mm	1900 +/- 15%
Height	mm	1800 +/- 15%
w) Terminal arrangement : HV	NA	Cable Box
LV	NA	Cable Box
x) Reference Standard	NA	IS 2026
y) Remarks:	NA	NA

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B) SPECIAL : (i) Approximate Maximum Flux Density at rated voltage and frequency	Tesla	1.7T
(ii) Efficiency at 75°C at 0.8 p.f. lagging :at Full Load	Percent	98.11%
At 3/4 full load	Percent	98.45%
At 1/2 full load	Percent	98.73%
(iii)Load at which maximum Efficiency occurs	Percent Full Load	35.52%
(iv) Maximum Efficiency	Percent	99.04%
(v) Impulse Level : HV	NA	As Per IS 2026
LV	NA	NA
(vi) No load loss at 110% rated voltage & frequency	KW	2500W App.
(vii) No Load Current at 110% rated voltage & frequency	Percent	6% of Full Load Current
(viii) Type of Winding : HV	NA	Copper
LV	NA	Copper
(ix) Insulating Materials : Turn Insulation HV	NA	Press Board & Paper
Turn insulation LV	NA	Press Board & Paper
Insulation core to LV	NA	Press Board & Paper
Insulation HV to LV	NA	Press Board & Paper
(x) Clearances : Minimum Clearance between phases :In oil	mm	As Per IS 2026
Minimum Clearance between phases :out of oil	mm	As Per IS 2026
Minimum clearance HV to earth in oil	mm	As Per IS 2026
Minimum clearance HV to tank in oil	mm	As Per IS 2026
(x) Details of Tank : Approx Thickness of sides	mm	3.15mm
Approx Thickness of bottom	mm	5.00mm

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Approx Thickness of cover	mm	5.00mm
Approx Thickness of tube radiators	mm	1.00mm
(x) Minimum clearance height for lifting core and windings from tank	mm	2000mm App.
(x)Shipping Details : Parts dispatched for transport	NA	Radiators
Approx weight of heaviest package	Kg	2040Kg App.
Approx dimension of largest package (L*B*H)	mm	2070x1900x1800
OFF -LOAD TAP CHANGER : Make and Type	NA	Reputed Make
Rated voltage and Current	NA	12KV
Step Voltage and no. of steps	NA	275V
Locking arrangement	NA	Provided
Position Indication and Line Drop Compensation	NA	On HT Side

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B) SPECIAL : (i) Approximate Maximum Flux Density at rated voltage and frequency	Tesla	1.7T
(ii) Efficiency at 75°C at 0.8 p.f. lagging :at Full Load	Percent	98.11%
At 3/4 full load	Percent	98.45%
At 1/2 full load	Percent	98.73%
(iii)Load at which maximum Efficiency occurs	Percent Full Load	35.52%
(iv) Maximum Efficiency	Percent	99.04%
(v) Impulse Level : HV	NA	As Per IS 2026
LV	NA	NA
(vi) No load loss at 110% rated voltage & frequency	KW	2500W App.
(vii) No Load Current at 110% rated voltage & frequency	Percent	6% of Full Load Current
(viii) Type of Winding : HV	NA	Copper
LV	NA	Copper
(ix) Insulating Materials : Turn Insulation HV	NA	Press Board & Paper
Turn insulation LV	NA	Press Board & Paper
Insulation core to LV	NA	Press Board & Paper
Insulation HV to LV	NA	Press Board & Paper
(x) Clearances : Minimum Clearance between phases :In oil	mm	As Per IS 2026
Minimum Clearance between phases :out of oil	mm	As Per IS 2026
Minimum clearance HV to earth in oil	mm	As Per IS 2026
Minimum clearance HV to tank in oil	mm	As Per IS 2026
(x) Details of Tank : Approx Thickness of sides	mm	3.15mm
Approx Thickness of bottom	mm	5.00mm

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ANNEXURE-A-I
TECHNICAL PARTICULARS

1. Rated capacity /quantity :-

SL.NO.	KVA	PRIMARY VOLTAGE(KV)	SECONDRY VOLTAGE(KV)
1.	750	11	0.55KV-0.44KV

2. No. of phases : 3
3. Frequency : 50 HZ +3%,- 5%
4. Location : Indoor
5. Type of cooling : ONAN
6. Type of oil : Mineral oil
7. Impedance voltage at rated current : 6.5%± 10%
8. Tap changer type : Off circuit
9. Tapping : ±2.5%,±5%,±7.5%,0
10. Temp. rise (over ambient) in oil : 45°C
11. Temp. rise (over ambient) in Winding : 55°C
12. Earthing of neutral terminals : Required for LV winding
13. Method of system earthing : Star – solid (LV winding)

A) GENERAL		
a) Name of manufacturer :	NA	SAI ELECTRICALS
b) Service	NA	INDOOR
c) Rating	NA	750KVA
d) Rated KVA	KVA	750KVA
e)Rated voltage of HV	KV	11
f)Rated voltage of LV	KV	550-440
g)Temperature rise in oil :°C	Degree Celsius	45 Deg C
h)Temperature rise in winding :°C	Degree Celsius	55 Deg C
i) Rated frequency	Hz	50Hz
j)Number of Phases	NA	3Nos.
k) Connection: HV	NA	Delta

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LV	NA	Star
Vector Group	NA	Dyn11
l) Tapping	NA	+/-7.5% @ 2.5%
m) No load loss at rated voltage & frequency	KW	1300W +/- IS Tol.
n)Load loss at rated current at 75°C	KW	10250W +/- IS Tol.
o)Impedance at rated current & frequency at 75°C	Percent	6.5% +/- 10%
p)Reactance at rated current & frequency	Percent	6.35%
q)Efficiency at 75°C at unity p.f.: At full load	Percent	98.48%
At 3/4 full load	Percent	98.76%
At 1/2 full load	Percent	98.98%
r) Regulation at full load at 75°C : At unity pf	Percent	1.57%
At 0.8 p.f. lagging	Percent	4.60%
s) No load current at rated voltage & frequency	NA	3% of Full Load Current
t) Approximate Weight: Core and Winding	Kg	1025Kg App.
Tank & fitting	Kg	600Kg App.
Oil	Kg	415Kg App.
Total weight	Kg	2040Kg App.
u)Approx quantity of oil	Litres	465Ltr. App.
v)Approx overall dimensions : Length	mm	2070 +/- 15%
Breadth	mm	1900 +/- 15%
Height	mm	1800 +/- 15%
w) Terminal arrangement : HV	NA	Cable Box
LV	NA	Cable Box
x) Reference Standard	NA	IS 2026
y) Remarks:	NA	NA

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