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Engr. Md. Harunor Rashid
Chief Operating Officer
Cross World Power Ltd.



Kazi Nesar Uddin Ahamed
Vice President
General Services Division
Export Import Bank of Bangladesh Ltd.
Head Office, Dhaka

THIS AGREEMENT made on this 04th day of May 2021 between **EXPORT IMPORT BANK OF BANGLADESH LTD.** a scheduled bank incorporated in Bangladesh under the Companies Act, 1994 and governed by the Bank Companies Act, 1991 carrying out banking business having its Head Office at "Symphony" Plot No. SE(F):9, Road No. 142, Gulshan Avenue, Dhaka-1212 (hereinafter called "the Employer") of the one part and Cross World Power Ltd, Plot 1/B, Road 90, Gulshan 2, Dhaka 1212 (hereinafter called "the Contractor or Supplier") of the other part:

WHEREAS the Employer invited Bids for Supply, Installation, Testing & Commissioning of 1 x 2000 KVA, 11/0.415 KV Sub-Station & 3 x 650 KVA (Prime rated) Diesel Generator set with foreign canopy and 20 KWp Solar Power (grid – tie) system of "EXIM TOWER" at Plot No. 15, Road No. 15, Block No. CWS(C), Ward No. 19, Gulshan – 1, Dhaka -1212 and has accepted the Bid submitted by the Bidder for the execution of those supply and related services in the sum of Taka [Contract Price in TK 82,000,000.00 and in word Taka Eight Core Twenty Lac] (hereinafter called "the Contract Price").

NOW THIS AGREEMENT WITNESSED AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the General Conditions of Contract hereinafter referred to.
2. The following documents shall altogether form the Contract (the 'Contract') and shall be integral part of each other and interpreted in the following order of priority:
 - (a) the signed Contract Agreement
 - (b) the work order in place of Notification of Award
 - (c) the Conditions of Contract
 - (d) "দেশব্রতের শপথ নিন, দুর্নীতিকে বিদায় দিন"



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- (e) the Design and Drawings
 - (f) the priced Bill of Quantities
 - (g) any other document listed/mentioned/annexed anywhere in the Contract.
3. In consideration of the payments of the Contract Price to be made by the Employer to the Supplier, the Supplier hereby covenants with the Employer to execute and complete the supply works and to remedy any defects therein in conformity in all respects with the provisions of the Contract.
 4. The Employer hereby covenants to pay the Supplier in consideration of the execution and completion of the supply works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.
 5. Time shall be essence of the Contract and as to the payments of the Contract Price and the Supplier shall be responsible for completion of supply works and remedy the defects if any, relating to the Project within the stipulated time and in the manner as mentioned in the Contract.
 6. The Contract shall be construed in accordance with the laws of Bangladesh and the Courts of Bangladesh shall be exclusive jurisdiction to resolve any matter or dispute arising out of the Contract.

“দেশপ্রেমের শপথ নিন, দুর্নীতিকে বিদায় দিন”



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Rashid
Engr. Md. Harunor Rashid
Chief Operating Officer
Cross World Power Ltd.

Kazi Nesar Uddin Ahamed
Vice President
General Services Division
Export Import Bank of Bangladesh Ltd.
Head Office, Dhaka

IN WITNESS whereof the parties hereto have caused this Contract Agreement to be executed in accordance with the laws of Bangladesh on the day, month and year first written above.

For the Employer

For the Contractor

Signature

Kazi Nesar Uddin Ahamed

Kazi Nesar Uddin Ahamed
Vice President
General Services Division
Export Import Bank of Bangladesh Ltd.
Head Office, Dhaka

Engr. Md. Harunor Rashid
Engr. Md. Harunor Rashid
Chief Operating Officer
Cross World Power Ltd.

In the presence of

Name

Ahmed Shibly Faisal
Ahmed Shibly Faisal
EXIM Bank, Head Office,
Gulshan, Dhaka.

Md Arifur Rahman
Md Arifur Rahman
Manager
Cross world power Ltd

“দেশপ্রেমের শপথ নিন, দুর্নীতিকে বিদায় দিন”

GENERAL SERVICES DIVISION

EXIM/HO/GSD/2021/
March 15, 2021

567/5412

M/s. Cross World Power Ltd.
Mr. Md. Harunor Rashid
Chief Operating Officer
Plot-1/B, Road-90, Gulshan-2, Dhaka-1212
Bangladesh.

Sub. : Work order for Supply, Installation, Testing & Commissioning of 1X2000KVA, 11/0.415KV Sub-Station & 3X650KVA (prime rated) Diesel Generator set with foreign canopy and 20KWp solar power (grid-tie) system for our EXIM Tower.

Muhtaram,
Assalamu Alaikum.

With reference to your bid dated: 14 September, 2020 and subsequent submission of revised offer letter no. Nil, date: 16 February, 2021 and letter no. Nil, date: 02 March, 2021, we are pleased to inform you that our Bank Management has decided to award you the captioned work as per below mentioned terms and conditions:

Package Name	Supply, Installation, Testing & Commissioning of 1X2000KVA, 11/0.415KV Sub-Station & 3X650KVA (prime rated) Diesel Generator set with foreign canopy and 20KWp solar power (grid-tie) system
Package No	02
Date	March 15, 2021
Work Order Awarded By	Export Import Bank of Bangladesh Limited Represented by: Mohammad Feroz Hossain Additional Managing Director Export Import Bank of Bangladesh Limited Symphony, Plot # SE(F):9, Road # 142, Gulshan Avenue, Dhaka-1212.
Work Order Awarded To	Cross World Power Ltd. Mr. Md. Harunor Rashid Chief Operating Officer Plot-1/B, Road-90, Gulshan-2, Dhaka-1212 Bangladesh.
Brief Scope of the Work	Supply, Installation, Testing & Commissioning of 1X2000KVA, 11/0.415KV Sub-Station & 3X650KVA (prime rated) Diesel Generator set with foreign canopy and 20KWp solar power (grid-tie) system in due time, desired quality and negotiated cost as agreed and submitted to the client for "EXIM Tower" at Plot No. 15, Road No. 15, Block No. CWS(C), Ward No. 19, Gulshan-1, Dhaka-1212.
Parts of the works order	The following documents are considered as parts of this work order:

GENERAL SERVICES DIVISION

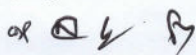
	<ol style="list-style-type: none"> 1. Negotiated and revised Bill of Quantities with cost estimate 2. All conditions and instructions to bidders as stated in the tender document 3. General & Special conditions of the work order (page 03 – 04) 4. Performance security 5. The agreed time schedule (180 days from issue of work order)
Conditions of the work order	As stated under the General & Special Conditions (page 03 – 04)
Validity of the work order	The work order is to be accepted by the vendor within three (03) days of issuance by the client
Financial value of the order	Tk. 8,20,00,000.00 (Taka Eight Crore and Twenty Lac) only
Payment Modality	<p>Advance: 25% of contract value (up on submission of APG)</p> <p>Up on delivery at site: 20% of contract value</p> <p>Rest 50 % as running bills up to commissioning of the package</p> <p>Remaining 5% at the end of defect liability period</p>
Deductions	7.5% VAT shall be deducted from each payment

If the above terms & conditions are acceptable to you, kindly provide your acceptance of this work order in writing and return to the undersigned.

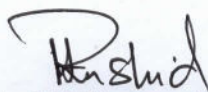
Issued by:



Dr. Mohammed Haider Ali Miah
Managing Director and CEO

or 

Accepted by:



Mr. Md. Harunor Rashid
Chief Operating Officer
Cross World Power Ltd.
Plot-1/B, Road-90, Gulshan-2, Dhaka-1212,
Bangladesh.

GENERAL SERVICES DIVISION

Special Conditions of the work order

1. It is understood that the vendor has visited the site and well understands all parameters and site conditions as it may exist and consents to work through such parameter and deliver the packages positively within the agreed deadline and in satisfactory quality as approved by the client & Architect / Engineer In-Charge.
2. All works under the scope of electrical and substation works are responsibility of the vendor.
3. The vendor shall not raise any further work request in relation to electrical and substation works of the project.
4. The work shall be completed within the agreed time reckoned from the day of issue of work order.
5. On receipt of confirmed works order the contractor shall prepare detailed works schedule (within the timeline agreed and stated herewith) showing all milestones in order to complete the work in time and to the satisfaction of Architect/Engineer in charge.
6. The vendor understands that all other packages have high dependency on electricity supply and the vendor shall make immediate arrangement for flawless availability of electricity supply for all other vendors of the project.
7. The vendor shall work in good conjunction, coordination and harmony with all other package vendors and shall conduct all general coordination at own initiative for a timely and flawless implementation of own and other packages.
8. The vendor under no circumstances shall conduct any physical change to the building / floor plans without written consent of the client & Architect / Engineer In-Charge.
9. The vendor must submit an APG for acquiring any advance payment.

General Conditions of the work order

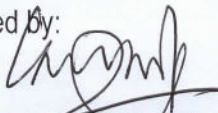
1. The entire work shall be carried out by contractor in accordance with the conditions and specifications stipulated in the schedule of quantity/quotation and in the best workmanship manner and as per standard practice.
2. Materials required for satisfactory completion of work shall be of best quality, make, grade, as mentioned in quotation and / or conforming desired and discussed quality and approved by client & Architect / Engineer In-Charge.
3. Any damage to the client's property will be made good at contractor's risk and cost.
4. The client reserves the right to reject the bad work / or pay for the inferior quality work at reduced rates, as will be worked out by client. The client's decision in this regard will be final and binding on contractor / vendor.
5. The client will not be held responsible for payment of any compensation to the labourers engaged by contractor. Contractor will pay all compensations etc. including accident compensations due to his labourers.
6. Any resource or supplies required for the work shall be under the scope of the contractor. Client's property/materials shall not be used by the contractor. A suitable penalty shall be charged if contractor fail to observe this condition.
7. Contractor shall follow all safety rules and security procedure that are in force and applicable during execution of work.
8. 5% of the bill amount will be retained by the client, which will be released after completion of defect liability period of 12 months against submission of Bank Guarantee.

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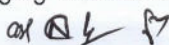
GENERAL SERVICES DIVISION

9. The contractor shall comply with the provisions of all acts, statutes, rules, regulations etc. of the government organizations as applicable.
10. Contractor shall submit performance guarantee of work as per the requirement and format given by the client.
11. The contractor shall submit the running/final bills. These bills shall be paid after proper and thorough scrutiny by the client within one month of submission of bill.
12. The contractor will not at any time cause or permit any nuisance on the site or adjoining areas or do anything, which shall cause unnecessary disturbances or inconveniences to the neighbors.
13. Contractor shall obtain necessary gate pass, labor token etc. from the security officer.
14. Contractor shall obtain special prior permission for carrying out work between 05 pm to 08 am, on weekends and on government holidays. No work can be conducted in the above time frame without written permission of the client.
15. Method of work, specification, mode of measurement and other details wherever not mentioned should be followed as per architect / engineer in charge's instructions.
16. Contractor shall intimate in advance and obtain prior approval before undertaking any extra items. The rate for such extra items, if approved, will be based on calculation of existing market rates and the decision of the client shall be deemed final.
17. The owner will be at liberty to cancel some of the items from the contract. In such cases, the contractor cannot claim any commission or percentage as profit.
18. The Contractor shall employ full-time technically qualified staff with adequate experience during the execution of the work.
19. The quality, time schedule for completion of work and well behavior with Client, and engineers of this project shall be essential & must for this project.
20. On the completion of the works the contractor shall at his own cost clear away and remove from the site all construction material, equipment, surplus materials, rubbish and leave the entire site and works clean in a workmanship condition to the satisfaction of the employer.
21. The Contractor agrees to bear their proportion of utility bills as distributed by the Architect / Engineer in Charge.
22. The client reserves rights to add or amend any condition of the contract.
23. The Contractor shall furnish a Performance Security in the specified format and in the amount of 10% of contract value, within fourteen (14) days of receipt of this Work Order but not later than 29 March, 2021, in accordance with ITB Clause 21.
24. The Contractor must sign the Contract within twenty-eight (28) days of issuance of this Notification of Award but not later than 12 April, 2021, in accordance with ITB Clause 22.
25. The Work Order shall substitute the Notification of Award stated in Bid Document.

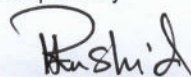
Issued by:



Dr. Mohammed Haider Ali Miah
Managing Director and CEO

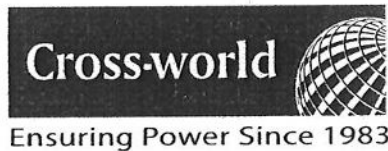


Accepted by:



Mr. Md. Harunor Rashid
Chief Operating Officer
Cross World Power Ltd.
Plot-1/B, Road-90, Gulshan-2, Dhaka-1212,
Bangladesh.

CROSS WORLD POWER LTD.



16th February, 2021

Additional Managing Director
Export Import Bank of Bangladesh Limited
Symphony, Plot # SE(F) : 9, Road # 142
Gulshan Avenue, Dhaka 1212

Sub: Tender for Supply, Installation, Testing & Commissioning of 1 x 2000 KVA, 11/0.415 KV Sub-Station & 3 x 650 KVA (Prime rated) Diesel Generator set with foreign canopy and 20 KWp Solar Power (grid – tie) system of " EXIM TOWER " at Plot No. 15, Road No. 15, Block No. CWS (C), Ward No. 19, Gulshan – 1, Dhaka -1212

Dear Sir,

Many thanks for giving us the opportunity to participate in the above tender and take part in subsequent discussions. We hope, the discussions will lead to a permanent business relationship between us, which will be really a matter of pride for us.

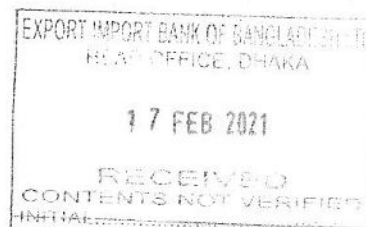
Refer to subjected tender please be informed that, due to COVID 19 pandemic situation & BREXIT, currency exchange rate of GBP vs. BDT & EURO vs. BDT has been increased significantly. In addition, cost of Cable has also increased now a days.

With reference to the meeting dated 14th February, 2021, it is really encouraging for us to know that the Payment terms of tender could be revised during contract agreement of project, to facilitate some advance payment, under the special jurisdiction of EXIM Bank top management. Keeping this in mind and considering Export Import Bank of Bangladesh Limited as our esteemed corporate client, we are pleased to offer an additional discount of BDT 2,741,207.00 from the total project value, bringing our offer down to BDT 83,800,000.00 Please find attached BOQ in this regard.

We are very much hopeful that our offer would meet your expectations and hence requesting you to provide us the opportunity to serve you by awarding the tender in our favor.

Best regards,

Md. Harunor Rashid
Chief operating officer
Cross World Power Ltd.



ABSTRACT

Supply, Installation, Testing & Commissioning of 1X2000KVA, 11/0.415KV
Sub-Station & 3X650KVA (prime rated) diesel Generator set with foreign
canopy and 20KWp solar power (grid-tie) system for "EXIM TOWER" at Plot
no. 15, Road no. 15, Block no. CWS(C),
Ward no. 19, Gulshan-1, Dhaka-1212

PACKAGE-2		
SL NO	DESCRIPTION	AMOUNT IN TK.
1.	SUBSTATION EQUIPMENT AND GENERATOR	82,203,210₳
2.	SOLAR SYSTEM	1,596,790₳
TOTAL =		83,800,000₳

Taka.....

Eight core Thirty Eight Lac only

..... only)

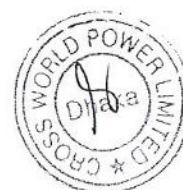


EXIM TOWER

Bill of Quantities for Sub-Station

Schedule of Items, Bill of Quantities for Supply, Installation, Testing & Commissioning of
1x2000KVA, 11/0.415KV Sub-Station & 3X650KVA (prime rated) diesel Generator set with foreign
canopy for "EXIM TOWER" at Plot no. 15, Road no. 15, Block no. CWS(C),
Ward no. 19, Gulshan-1, Dhaka-1212

Item No.	Description of Items	Unit	Quantity	Quoted Rate in Tk	Total Rate in Tk
1.0	Supply of 11KV AVR & By-Pass Switch.				
1.1	Supply of 11KV Automatic Voltage Regulators according to NEMA and ANSI C57.12.31 or equivalent standards and shall meet latest requirements of BPDB/ REB/ DESCO/ DPDC. The Voltage Regulators shall be from reputed manufacturer's of USA, Japan or European countries (1Set = 3Nos). Automatic Voltage Regulators shall be Type Tested Assembling 150A, 11KV, 3-phase/ 6.35KV, Single Phase in sealed tank design with digital control panel, Ground clamps & standard accessories and as per following technical specification similar to model no.10-06.6-144.0: Rated output : 99KVA Rated voltage : 11KV, 3-phase/6.35KV, 1-phase Rated frequency : 50Hz Rated current : 150Amps Basic Insulation Level (BIL) : 95KV Rated range of regulation : +/-10% in 32steps of 0.625 % each Sealed tank design : Yes Cooling : Self Surge Protective device: 50KA Temperature rise : Upto 65deg.0 without increase the oxidation rate of Oil. Provision for 230VAC, 50Hz test input voltage for testing of the voltage regulator with external power supply:Yes Micro-processor based control panel : Yes Non-PCB oil for the voltage regulator : Yes Accuracy class of regulator control panel:Class-1 Installation : Indoor/Outdoor Voltage Regulators shall be supplied with following spares: 6Nos. Fuses 2Nos. Position Indicator Glass 2Nos. Oil Sight Gauge Glass 1No. Digital control panel	Set	1	5,718,000.00	5,718,000.00
1.2	Supply of sheet steel clad, dust & vermin proof, free standing, floor mounting, indoor type 11KV By-Pass Switch panel boards having self quenching, single phase, two position device 3-sets of LBS type with 25KA (3-sec) and Isolating/de-energizing of Auto Voltage Regulator as per following technical data/ specification: (1set=3nos.) and Surge Arrester. The LBS shall be from reputed manufacturer's of European countries. Maximum design voltage : 15.5KV Basic Insulation Level (BIL) : 95KV Rated Continuous Current : 630A Momentary ratings : Disconnect blades 40KA By-pass blade 30KA	Set	1	414,883.00	414,883.00
2.0	SUPPLY OF 11KV SWITCHGEAR:				
2.1	Supply of sheet steel clad (14SWG) dust & vermin proof, free-standing, floor mounting type completely factory assembled with painting 11KV, 25KA, 50Hz, 3-phase indoor type high tension switchgear panel having 800Amps hard-drawn electrolytic copper busbars and comprising of the following components in accordance with NEMA/ IEC/ VDE /BS/ IIS. 11KV PANEL: 1-630Amp, 11KV, 50Hz Triple Pole, Earth Switch rated at 2.1 KA at 3.0 seconds, to be interlocked with VCB. 1-630A, 11KV, 25KA, rated short time current, 50Hz, electro-magnetically operated/ spring charged stored energy mechanism totally withdrawable type VCB, manual closing/ tripping device for emergency operation, maximum service voltage 12KV, short circuit breaking capacity 25KA, 24DC power pack operated shunt tripping coil, ON/ OFF/ TRIP indicator. 2-11KV, cast resin insulated double pole potential transformer having ratio 11000/110V (open delta), burden 50VA, class 0.5 for metering protection. 1-6A, TP MCB for PT secondary protection. 3-11KV, cast resin insulated dry type double core current trans-former having ratio 125/5/5A, burden 10-15VA, for metering first core of class 0.5MS & second core protection of class 10 P10. 1-Ammeter having scale 0-125A with 4-way selector switch. 1-Voltmeter having scale 0-15 KV with 7-way selector switch. 1-Triple pole solid state micro-processor operated IDMT relay with 2(two) Over Current instantaneous element & short circuit and one Earth Fault protection element with standard setting. 1-3-Phase, 3-wire, two-part-time -of- the-day KWH meter with indicating 'PEAK' and 'OFF PEAK' energy with maximum demand indicator in KW with time integrating period of 30 minutes. Quartz locked a synchronous 24-hour time switch for double tariff operation of KWH meter. Indicating lamp ON/OFF/TRIP. Panel heater.	Set	1	718,229.00	718,229.00

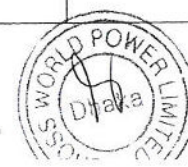


3.0	SUPPLY OF 2000KVA TRANSFORMER :				
3.1	Supply of 2000KVA dry type, cast resin insulated imported power transformer & shall be complying generally with IEC726, VOE 0532 etc. of following specifications: Voltage ratio: 11000/415V. Type of cooling : AN 3-Phase, 50Hz, vector group DYN-11. Impedance volt: 4%-6% Terminal : HT & LT to be brought out in separate terminals. HT suitable for XLPE /PVC cable of maximum 185mm ² & LT suitable for BBT connection. Type of loading: Distribution. Tapping $\pm 2.5\%$, $\pm 5\%$ of constant KVA output on HV Off-load manually operated tap changer. Permissible average winding temperature rise 100deg.K on the high voltage side and 100deg.K on the low voltage side. With noise reduction supporting blocks. Temperature sensors with alarm & tripping system. Mounted on wheels and fitted with all necessary accessories. Provision of force cooling system with 15% increase in capacity of the imported power transformer	Set	1	5,112,504.00	5,112,504.00
4	SUPPLY OF L.T.PANEL: Supply of sheet steel clad.Type Tested Assembling, free standing, floor mounting Low Tension cubical type switchgear according to IEC 439-1 for 415V, 3-phase, 4- wire, 50Hz operation complete with all wiring accessories. hard drawn electrolytic copper busbars of appropriate ratings & equipped with the following :				
4.1	L.T. PANEL-1: Incoming: 1X3200A, 50KA, TP motorized ACB with micro processor based time dependent selectively operating built-in-adjustable overload, adjustable short circuit protection, ON- OFF & Trip indicating auxiliary contacts and having provision for BBT connection. 3-Current Transformer ratio: 3200/5A, with adequate accuracy and burden. 1-Complete Power Network Analyzer with RS485 Port for BMS 1-Push button "ON,OFF". 3-Indicating lamps ON/OFF/TRIP.	Set	1	1,670,564.00	1,670,564.00
4.1.2	L.T. PANEL-2 :AUTOMATIC CHANGE OVER SWITCH Incoming: 2X3200A, 50KA, TP motorized withdrawable type ACB with micro processor based operating built-in-adjustable overload, adjustable short circuit protection, under voltage & shunt releases, ON-OFF & Trip indicating auxiliary contacts & other accessories to act as an automatic change over switch and connections between circuit breaker & BBT etc. Each ACB of automatic COS shall have the following: 3-Current Transformer ratio: 3200/5A, with adequate accuracy and burden. 1-Multifunction Meter 1-Push button "ON,OFF". 3-Indicating lamps ON/OFF/TRIP.	Set	1	4,100,262.00	4,100,262.00
4.1.3	L.T. PANEL-3 : Outgoing : 2X1250A, 50KA, TP motorized ACB with micro processor based time dependent selectively operating built-in-adjustable overload, adjustable short circuit protection, ON- OFF & Trip indicating auxiliary contacts & having provisions for 2-sets of 600 KVAR PFI plant.	Set	1	2,243,007.00	2,243,007.00
4.1.4	L.T. PANEL-4 : Outgoing: 1X1600A, 50KA, TP motorized ACB with micro processor based time dependent selectively operating built-in- adjustable overload, adjustable short circuit protection, ON- OFF & Trip indicating auxiliary contacts and having provisions for BBT connection with 3nos. 1600/5A C.T & 1no. multi-function meter for measuring current, voltage, power factor reading for BBT.	Set	1	1,262,321.00	1,262,321.00
4.1.5	L.T.PANEL-5 : Outgoing : 1X1600A, 50KA, TP motorized ACB with micro processor based time dependent selectively operating built-in-adjustable overload, adjustable short circuit protection, ON- OFF & Trip indicating auxiliary contacts and having provisions for BBT connection with 3nos. 1600/5A C.T & 1no. multi-function meter for measuring current, voltage, power factor reading for BBT.	Set	1	1,262,321.00	1,262,321.00



4.1.6	<p>L.T. PANEL-6: Outgoing: 1X630A, 50KA, TP MCCB with electronic micro-processor based, built in adjustable overload & adjustable short circuit protection, ON-OFF & Trip indicating auxiliary contacts, rotary handle with pad lock facilities, provision for data management interface module, diagnostic & parameterization software & box terminal. 1X500A, 50KA, TP MCCB with electronic micro-processor based, built in adjustable overload & adjustable short circuit protection, ON-OFF & Trip indicating auxiliary contacts, rotary handle with pad lock facilities, provision for data management interface module, diagnostic & parameterization software & box terminal. 1X300A, 36KA, TP MCCB with built in adjustable overload & adjustable short circuit protection, ON-OFF & Trip indicating auxiliary contact, rotary handle & box terminal. 1X250A, 36KA, TP MCCB with built in adjustable overload & adjustable short circuit protection, ON-OFF & Trip indicating auxiliary contacts, rotary handle & box terminal. 1X200A, 36KA, TP MCCB with built in adjustable overload & adjustable short circuit protection, rotary handle with padlocking facilities & box terminals. 2X160A, 36KA, TP MCCB with built in adjustable overload & adjustable short circuit protection, rotary handle with padlocking facilities & box terminals. 5X63A, 25KA, TP MCCB with built in adjustable overload & adjustable short circuit protection, rotary handle with padlocking facilities & box terminals. 1X160KA SPD as per technical specification</p>	Set	1	2,267,615.00	2,267,615.00
5.0 5.1	<p>SUPPLY OF 600KVAR AUTOMATIC PFI PLANT: Supply of 600KVAR 415volt, 3-phase, 50Hz automatic power factor improvement plant complete with TP busbars and earth block, micro processor controlled auto power factor correction relay with digital PF reading display, capacitor bank, contactor, fuse, ON indicators for every stage of capacitor bank (except directly connected one) etc. the locally factory assembled in 16SWG sheet steel clad, Type Tested Assembling, dust & vermin proof, free standing, floor mounting, epoxy resin powder coat painted cabinet, contactors, capacitor bank, relays, discharge resistor, fuse etc. shall comply NEMA / IECNDE/BS/JIS standard. The components of the PFI panel shall be from Siemens (Germany), Eaton (USA/ UK), ABB (Germany), Schneider (France), Frako (Germany), Roederstein (Germany) etc & consists of: 3nos. 415V, 1250A hard drawn electrolytic copper busbar 1-12 steps digital micro-processor based power factor correction relay with in-built power factor meter. 1-12.5KVAR TP Power capacitor bank, rated 415V, 50Hz with built-in/separate discharge coil for connection directly with line through fuse 1-12.5KVAR TP Power capacitor bank, rated 415V, 50Hz with built in/separate discharge resistor. 3-25KVAR TP Power capacitor bank, rated 415V, 50Hz with built in/separate discharge resistor. 6-50KVAR TP Power capacitor bank, rated 415V, 50Hz with built in/separate discharge resistor. 2-100KVAR TP Power capacitor bank, rated 415V, 50Hz with built in/separate discharge resistor. 1no. 415V, 25Amps, 50Hz. Auto TP magnetic contactor with AC3 duty. 3nos. 415V, 50Amps, 50Hz. Auto TP magnetic contactor with AC3 duty. 6nos. 415V, 100Amps, 50Hz. Auto TP magnetic contactor with AC3 duty. 2nos. 415V, 200Amps, 50Hz. Auto TP magnetic contactor with AC3 duty. 3nos. 415V, 30Amps HRC fuses with Fuse Base. 9nos. 415V, 60Amps HRC fuses with Fuse Base. 18nos. 415V, 100Amps HRC fuses with Fuse Base. 6nos. 415V, 200Amps HRC fuses with Fuse Base. 1-Auto/Mannual selector switch.</p>	Set	2	2,087,722.00	4,175,444.00
6.0 6.1	<p>SUPPLY OF BUSBAR TRUNKING SYSTEM: Supply of imported Type Tested Assembly (TTA) 3200A TP+N busbar trunking system from reputed manufacturer having ISO9001: 2008 and conforming to IEC-439 with all necessary bends, expansion units, closed type transformer connection units, distribution board connection units, fixing brackets, aluminum enclosure etc. for connecting the transformer secondary terminals & LT-1 panel (BBT-1) as per drawing, specification and direction of the Engineer-in-charge.</p>	Lot	1	1,159,498.00	1,159,498.00
6.2	Supply of imported Type Tested Assembly (TTA) 3200A TP+N+E Busbar Trunking system from reputed manufacturer having ISO9001: 2008 and conforming to IEC-439 as per specification and drawing with necessary distribution board (LT) connection units, bends, fixing brackets etc. for connecting the LT-1 to LT2 (ATS) (BBT-2).	Lot	1	481,525.00	481,525.00
6.3	Supply of imported Type Tested Assembly (TTA) 3200A TP+N+E Busbar Trunking system from reputed manufacturer having ISO9001: 2008 and conforming to IEC-439 as per specification & drawing with necessary distribution board (LT) connection unit, bends, fixing brackets etc. for connecting the LT2 (ATS) to Gen. panel (BBT-3).	Lot	1	542,351.00	542,351.00
6.4	Supply of imported Type Tested Assembly (TTA) Busbar Trunking system from reputed manufacturer having ISO9001: 2008 and conforming to IEC-439 of 1600A TP+N+PE BBT Riser from Substation room to L-13 with 15nos. TP+N+PE Tap-off-boxes. having 1no. 200A TP MCCB (36KA), 13nos. 125A TP MCCB (36KA), 1no. 100A TP MCCB (36KA), with adjustable overload protection & adjustable short circuit release (BBT-4 Riser-1 for NC)	Lot	1	4,072,619.00	4,072,619.00
6.5	Supply of imported Type Tested Assembly (TTA) Busbar Trunking system from reputed manufacturer having ISO9001: 2008 and conforming to IEC-439 of 1600A TP+N+PE BBT Riser from Substation room to & Lift machine room with 17nos. TP+N+PE Tap-off-boxes. having 1no. 500A TP MCCB (50KA), 1no. 200A TP MCCB (36KA), 15nos. 100A TP MCCB (36KA) with adjustable overload protection & adjustable short circuit release (BBT-5 Riser-2)	Lot	1	4,270,053.00	4,270,053.00
7.0 7.1	<p>Installation of 11KV AVR and By-pass Switch: Installation, testing & commissioning of 11KV Automatic Voltage Regulators and By-pass Switch as detail in item no.1.0 including carrying the equipment, making necessary civil foundation, 11KV cable termination, equipment earthing and all necessary fittings, fixings, accessories as required and as per direction of the Engr-in-charge</p>	Lot	1	6,957.00	6,957.00

BBT



8.0	INSTALLATION OF HT PANEL:				
8.1	Installation, testing & commissioning of sheet steel clad, dust and vermin proof floor mounted and free standing type HT switchgear as detail in item no. 2.0 including carrying the equipment, making the necessary foundation & all necessary fittings, fixings, accessories as required and all direction of the Engineer-in-charge.	Set	1	6,957.00	6,957.00
9.0	INSTALLATION OF 2000KVA TRANSFORMER:				
9.1	Installation, testing & commissioning of 2000KVA transformer as detail in item no. 3.0 including carrying the equipment, making the necessary foundation, repair the foundation during carrying and all necessary fittings, fixings, accessories as required and direction of the Engineer-in-charge.	Set	1	8,696.00	8,696.00
10.0	INSTALLATION OF LT PANEL:				
10.1	Installation, testing & commissioning of LT switchgear of metal enclose detail in item no. 4.0 suitable for 415V, 3-phase, 4-wire, 50Hz, operation complete with all wiring & gutter space for maximum size cable and entrance suitable space for maximum size cable & entrance suitable for both top and bottom entry. Cost for necessary required local copper busbar, nuts, bolts, washers, colour insulation (1000VAC) tubes/ PIB tapes etc for connecting BBT & LT panels must be inclusive of this items. All metal parts must be bonded to suitable ground points. The item including carrying the equipment, making the necessary foundation, trench making with cover & all necessary fittings, fixings, accessories per required and all direction of the Engineer-in-charge.	Sets	6	5,217.00	31,302.00
11.0	INSTALLATION OF 600 KVAR AUTOMATIC PFI PLANT:				
11.1	Installation, testing & commissioning of 600KVAR Automatic PFI plant as detailed in item no. 5.0 with necessary interconnections with the LT panel including carrying the equipment, making necessary foundation, trench making with cover & all necessary fittings, fixings, accessories required as per drawings, specifications & direction of Engineer-in-charge.	Set	2	6,957.00	13,914.00
12.0	INSTALLATION OF BUSBAR TRUNKING:				
12.1	Installation, testing & commissioning of 3200A TP+N+PE Busbar Trunking System with all its accessories as detail in items no.6.1,6.2 & 6.3 as per specifications, manufacturer's drawings & direction of the Engineer-in-charge. The rate should be enclosed of all require installation materials for this item including the cost of connecting cables, necessary civil works line cutting & breaking of walls/ columns/floor, mending the same with plastering & painting (approved colour) as per instruction of the Engineer-in-charge.	Lots	3	95,847.00	287,541.00
12.2	Installation, testing & commissioning of 1600A TP+N+PE (Riser) Busbar Trunking System with all its accessories as detail in item no.6.4 & 6.5 as per specifications, manufacturer's drawings & direction of the Engineer-in-charge. The rate should be enclosed of all require installation materials for this item including the cost of connecting cables, necessary civil works line cutting & breaking of walls/ columns/ceiling/ floor, mending the same with plastering & painting (approved colour) as per instruction of the Engineer-in-charge.	Lots	2	113,708.00	227,416.00
13.0	CABLE WORKS:				
13.1	Supply, installation, testing & commissioning of following size cable from reputed manufacturer's having ISO9001 certified company, approved quality & BSTI approved in cable trench/pipes for connecting the 11KV line of DESCO with 11KV panels & the transformer HT terminal with H.T This rate is inclusive of trench/ sheet steel cable tray making, heat shrink cables, pit making, brick cable cover, sheet steel trench cover necessary 150mm dia C-class PVC/ GI pipes for road crossing etc.as per shown in the drawings.				
13.1.1	3C- 185mm ² XLPE 11KV Cable	M	60	10,436.00	626,160.00
13.1.2	1C-185mm ² XLPE 11KV Cable	M	160	3,801.00	608,160.00

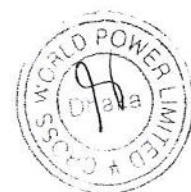
BBT Installation
BBT Installation



13.2	Supply, installation, testing & commissioning of LT cable from reputed manufacturer's having ISO9001 certified company, approved quality & BSTI approved of following sizes cable in trench/ G.I. pipe/ PVC pipe/ tray including termination of connection at both ends as per drawing & specification. This rate is inclusive of cable glands etc. as per site requirements & as shown in the drawings.				
13.2.1	1C-300mm2 XLPE	M	1000	3,628.00	3,628,000.00
13.2.2	1C-240mm2 XLPE	M	110	2,927.00	321,970.00
13.2.3	1C-185mm2 XLPE	M	310	2,270.00	703,700.00
13.2.4	1C-95mm2 XLPE	M	80	1,179.00	94,320.00
13.3.5	1C-50 mm2 NYY	M	500	665.00	332,500.00
13.3.6	1C-25 mm2 BYA(ECC)	M	125	307.00	38,375.00
13.2.7	1C-95mm2 BYA (ECC)	M	80	1,105.00	88,400.00
14.0	CABLE TRAY/LADDER:				
14.1	Supply, installation, fitting & fixing of cable tray/ladder made of 18SWG galvanized sheet steel/ angle bar, flat bar of approved quality of following sizes complete with necessary hangers, supports, cover junction box, hangers, clamps, bends, nuts, bolts, washer & all other accessories as per drawing, specifications & direction of the Engineer-in-charge.	M	150	2,262.00	339,300.00
14.1.1	300mm width				
15.0	EARTHING SYSTEM:				
15.1	Supply and installation of 38.10mm dia GI pipe of best & approved quality Earth Electrode having 6.35mm dia holes across the dia at 305mm interval securely bonded with 2X2/0SWG copper conductor, washer, nuts, bolts etc. sunk upto a depth to attain a Earth resistance of minm. 1(one) ohm (for each electrode) including blind socket for water pouring facility etc. complete as per direction of the Engineer in-charge.	Sets	10	9,669.00	96,690.00
15.2	Construction of 600X600X600mm earth inspection pit with R.C.C cover as per drawing & instruction of the Engineer-in-charge.	Sets	10	10,857.00	108,570.00
15.3	Supply & installation of solid copper wire earthing lead 2X210SWG in 38mm dia G.I. pipe and termination of connections at both ends as per drawing & specifications.	M	450	1,400.00	630,000.00
15.4	Supply, installation, testing & commissioning of following sizes cable from reputed manufacturers having ISO9001 certified company & BSTI approved of following sizes cable for grounding the neutral of transformers & generators, equipment's to required sizes Equip-potential bars including G.I pipe & termination of connection with termination kits at both ends as per direction of Engineer-in-charge.				
15.4.1	1C-300mm2 NYY for neutral of transformer	M	50	3,900.00	195,000.00
15.4.2	1C-300mm2 NYY for Equip-potential bar to various equipment's	M	200	3,900.00	780,000.00
15.4.3	Equip-potential earth bar(100mmX20mmX600mm) with all other facilities for cable connection.	Sets	5	2,137.00	10,685.00
16.0	FIRE EXTINGUISHER:				
16.1	Supply and installation of wall mounted fire extinguisher type BCEF complete with charge and fixing accessories at the location shown on the drawing as per specification and direction of the Engineer-in-charge	Sets	8	4,414.00	35,312.00
17.0	SUPPLY & INSTALLATION OF RUBBER MAT:				
17.1	Supply, fittings & fixing of minimum 10mm thick perforated rubber mat hooking up with each other and approved quality suitable for use as electrical insulation of the floor and complete with all other necessary accessories per required & direction of Engineer-in-charge.	sqm	40	1,090.00	43,600.00
18.0	Miscellaneous charges for obtaining HT power from DESCO i/c supply fittings, fixing of 11KV Lightning arrester & dropout fuse (if require), issuance of RMU & KWHr. meter and others accessories as required for bringing 11KV power from DESCO's cable/overhead line with necessary connections with HT panel i/c taking permission from Electrical Licensing Board of Bangladesh, Civil Service & Fire Brigade dept. for energization of substation & permission for road cutting from concerned dept./authority & mending good the damages after laying the cable. The security money, legal deposit money for deposit work by DESCO & DNCC & Licensing Board fee, Civil Service & Fire Brigade dept. fees and Dhaka North City Corporation charges will be directly paid to Bangladesh Bank Treasury on submission of deposit slip/city corporation cost memo by the Contractor. <u>The contractor will not include in this item the amount of security deposit, demand note for deposit work by DESCO & DNCC, HT metering fees & Licensing Board fee etc.</u> The contractor shall be responsible for communicating with DESCO, Dhaka North City Corporation, Civil Service & Fire Brigade dept & Licensing Board in time and shall submit application forms and complete all other formalities on behalf of Client till the sub-station is commissioned and handed over to the Client.	Lot	1	967,742.00	967,742.00

Cable = 6441585 (BOT)

Earthing work 1820945

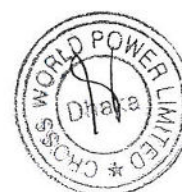


19.0	SUPPLY INSTALLATION OF 3 NOS. 650KVA DIESEL GENERATOR SET:				
19.1	Supply, installation, testing & commissioning of 3(three) nos. 650KVA (prime) rating in accordance with ISO 3045/ 1, ISO 8528/1, BS 5514, AS 2789 & DIN 6271, 415V, 3-phase diesel generator sets, individual generator's control panels & 3200A TP+N auto change over control system, auto paralleling, auto synchronizing & auto load sharing panel, automatic load shedding, Master Control Panel, radiators of enough quantities, 6nos. Anti-Vibrating spring to be fitted with base-frame & civil foundation of the Diesel Generator sets, 3nos. 1250A 4P MCCB/ACB auxiliary relays, hospital type silencer, exhaust pipes up to roof or a level which will be accepted by the Environmental dept, exploration dept., base frame in-built-daily fuel tanks, 3-days storage fuel tank i/c necessary fuel inlets Pump, feeding pumps for each generator's base-in-built daily tank from main storage 3-days tank, fuel lines with M.S lines of 1. inch dia, & 2.50 inch dia i/c solenoid valves and all other accessories. The combined dba level of 3nos. D.G sets with foreign canopy shall not be more than 82dba at 1-meter apart from canopy as per drawings, specification & direction of the Engineer-in-charge.	Lot	1	25,935,797.00	25,935,797.00
19.2	SUPPLY & INSTALLATION OF GENERATOR'S SYNCHRONIZING PANEL: Supply, installation, testing & commissioning of sheet steel clad, free standing, floor mounting LT panel with powder coated painting according to IEC439-1 for 415V, 3-phase, 4-wire, 50Hz operation complete with all wiring accessories, hard drawn electrolytic copper busbars of appropriate ratings & equipped with the following : Incoming: 3X1250A, 50KA, TP motorized ACB with micro processor based operating built-in-adjustable overload, adjustable short circuit protection, ON-OFF & Trip indicating auxiliary contacts. Outgoing: 1X3200A, 50KA, TP motorized ACB with micro processor based operating built-in-adjustable overload, adjustable short circuit protection, ON-OFF & Trip indicating auxiliary contacts & having provisions for BBT connection. 3-Current Transformer ratio: 3200/5A, with adequate accuracy and burden. 1-Complete Power Network Analyzer with RS485 Port for BMS 1-Push button "ON/OFF". 3-Indicating lamps ON/OFF/TRIP. 1X630A, 50KA, TP MCCB with electronic micro processor based, built in adjustable overload & adjustable short circuit protection, ON-OFF & Trip indicating auxiliary contacts, rotary handle with pad lock facilities, provision for data management interface module, diagnostic & parameterization software & box terminal.	Lot	1	5,015,000.00	5,015,000.00
19.3	SUPPLY INSTALLATION OF 630 A TP+N AUTOMATIC CHANGE OVER SWITCH: Supply, installation, testing & commissioning of 630A TP+N auto-matic change over switch with 630A 4-Pole MCCB/ACB, relays, timer & other accessories i/c the powder coated free standing sheet steel enclosure (14SWG) etc as per specification & direction of the Engineer-in-charge. This Fire Mode COS panel will be work in case of fire & when there will be no power in the main LT panel.	Lot	1	1,549,950.00	1,549,950.00

Grand Total Including VAT & AIT 82,203,210.00

In Word : Taka Eight Core Twenty Two Lac Three Thousand Two Hundred ten only

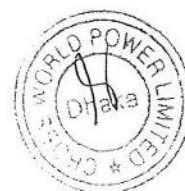
Prepared by Vitti Sthapati Brindo Ltd.



Schedule of Items, Bill of Quantities for Supply, Installation, Testing & Commissioning of

20Kwp Solar Power (grid-tie) system for EXIM BANK

Item No.	Description of Items	Unit	Quantity	Quoted Rate in Tk (Figs. & words)	Total Rate in Tk (Figs. & words)
1.0	INSTALLATION, TESTING & COMMISSIONING OF SOLAR SYSTEM				
1.1	Supply and installation of Solar Panel with all necessary fittings 20Kwp solution Module type: Poly -crystalline Module Size: 100 Nos panel of 250Wp or higher DC System Voltage: to suit inverter specification, Max 1000V dc Certificate: IEC, UL, TUV	1 complete set of panels	100	7,197.00	719,700.00
1.2	Supply and installation of inverter with DC disconnecting switch Type: Grid Tie type Power capacity: 10,000W (minimum) Max. DC Voltage: 1000V DC Nominal Voltage: 230V MPP Voltage range: 445- 850 V AC Nominal Power: 12000W AC Voltage range: 400V, 3-phase, 50Hz±3 Harmonics: < 4% Maxm Efficiency ≥ 96% to 98.2% (Bidder may propose alternatively) Distortion factor ≤ 1.8%	Sets	2	133,860.00	267,720.00
1.3	Supply & installation of steel structure made of hot dip galvanized MS Angles for panel, including civil work	Lot	1	273,477.00	273,477.00
1.4	Supply and installation of DC (XLPE Insulated flexible cable, suitable for solar integration, not less than 2x4rm-2x56/0.30mm) & AC cables and accessories with cable tray, civil works including making necessary changes to the existing power distribution system of the building. Certification required: BSTI, BASEC, ISO 9001:2000.	Lot	1	98,955.00	98,955.00
1.5	Supply and installation of DC Isolation Boxes, IP-65 weather proof Galvanized MS Boxes/ poly-carbonate. IP65, suitable for out-door installation, complete with d.c string, circuit breaker, surge protection and capable of breaking full load current.	Lot	1	51,817.00	51,817.00
1.6	Supply and installation of AC combiner Boxes, IP- 65 weather proof Galvanized MS Boxes/ poly-carbonate. IP65, suitable for out-door installation, complete with d.c string, circuit breaker, surge protection and capable of breaking full load current.	Lot	1	64,771.00	64,771.00
1.7	Supply and installation of synchronization device, monitoring device, load controlling device etc. for complete functionality of the system.	Lot	1	86,361.00	86,361.00
1.8	Supply and installation of Galvanized MS Boxes/polycarbonate distribution board IP65, suitable for outdoor installation, complete with rated incoming & outgoing circuit breakers, 2nos. KWHr meter, surge protective devices with surge counter surge protective devices with surge counter recorder & capable of breaking full load current.	Lot	1	11,890.00	11,890.00
1.9	Testing and commissioning operation & maintenance manual, system electrical schematic, roof layout design proposal.	Lot	1	22,099.00	22,099.00
Grand Total Including VAT & AIT					1,596,790.00



TECHNICAL SPECIFICATIONS

1 **11 KV HT SWITCHGEAR (VCB) :**

Set

1

This specification cover the supply of 11KV indoor, metal enclosed switchgear according to IEC publication-298 The medium voltage switchgearpanel shall be used for secondary distribution sub-station upto 12KV and suitable for an ambient temperature of 45 deg.C and rated rupture capacity of 350 MVA complete with all accessories, diagrams, levels, wirings & terminals. The 11 KV, 350 MVA rated switchboard would comply compulsory electricity regulations by standards. All cubicles are fitted with security interlocks and earthing switch.

Technical Data :

Service voltage : 11KV
 Rated voltage : 12KV
 Rated current of VCB : 630A

Insulation level :

Impulse withstand voltage 1.2/50 micro-sec. : 75KV (Peak)
 Power frequency withstand voltage/1 min. : 28KV rms.

The equipment proposed under this offer has been designed, manufactured & tested in accordance with the following applicable IEC standards.

- common clause for high voltage switchgear standards
- high voltage switchgear in metallic enclosure
- high voltage ac circuit breakers
- ac switches and earthing switches
- high voltage switches
- high voltage combined switch/fuse for ac current
- current transformers
- voltage transformers
- high voltage fuses
- control monitoring

The panel shall comprise of :

630A,12KV,25KA ,50Hz triple pole , withdrawable type vacuum circuit breaker with motor/manually operated spring charged mechanism with tripping coil & auxiliary contacts.

Set 1

Cast resin insulated dry type 11KV double core current transformer, ratio : 150/5/5A.

Core 1 : 10VA, class 0.5M5 for metering

Set 3

Core 2 : 15VA, class 10P10 for protection

Dry type cast resin insulated potential transformer for open delta connection.

Ratio : 11000/110V

Set 2

Burden : 50VA, Class : 0.5

Protection, Measurement and control unit :

Microprocessor based Protection unit having

'- Overcurrent (ANSI code 50/51) &

'- Earth fault (50N/51N) protection

Set 1

The tripping characteristics of the protection unit shall be of IDMT nature with a setting possibility to IDMT & defferent tripping curves.

1-3-Phase, 3-wire, two-part-time -of- the-day KWH meter with indicating 'PEAK' and 'OFF PEAK' energy with maximum demand indicator in KW with time integrating period of 30 minutes Quartz locked a synchronous 24-hour time switch for double tariff operation of KWH meter.

Ampere Meter (0-150A) with Selector Switch

Set 1

Voltmeter (0-15)KV with Selector Switch

Set 1

6A TP MCB for PT secondary protection.

Set 1

ON/OFF Push button.

Set 1

Indicating Lamp

Pcs 5

Panel Heater with thermostat

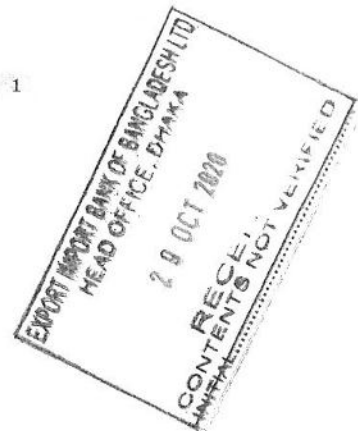
Set 1

Earth Switch

Set 1

VCB Brand : ABB, Italy.

HT Panel will be assembled by Cross World Power Ltd , Bangladesh

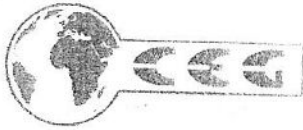


TECHNICAL SPECIFICATION OF HT SWITCHGEAR (VCB)

SI	Product	Unit Price	Qty	Total Price
1	<p>12kV 630A, 25kA with female socket, 58 Pole connector</p> <p>Model: Vmax/W 12.06.25 P150 Country of manufacturing : ITALY Or VD4/P 12.06.25 P150</p> <p>Standard accessories: OPENING SMART COIL 110...127 V DC/AC CLOSING SMART COIL 110...127 V DC/AC 16 C.AUX K&N FIG.34 MOTOR OPERATOR SUPPLY VOLTAGE 220V 50HZ</p>			



Offer Reference : ABB/CWG/2020/02		Date 29.10.2020	Rev0
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Date: October 28, 2020

HT COMPONENTS

Current Transformer

Cast resin insulated dry type 11KV double core current transformer,
Ratio: 125/5/5A.

Core 1 : 10VA, class 0.5M5 for metering

Core 2 : 15VA, class 10P10 for protection

Brand : CGS

Origin : Italy

Potential Transformer

Dry type cast resin insulated potential transformer for open delta connection.
Ratio : 11000/110V

Burden : 50VA, Class : 0.5

Brand : CGS

Origin : Italy

IDMT Relay

Protection, Measurement and control unit :

Microprocessor based Protection unit having

'Overcurrent (ANSI code 50/51) &

' Earth fault (50N/51N) protection

The tripping characteristics of the protection unit shall be
of IDMT nature with a setting possibility to IDMT &
different tripping curves.

Brand: Siemens.

Model: 7SR10

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PRODOTTO IN ITALIA - 19/04/2017

CROSS WORLD POWER LTD.



Ensuring Power Since 1983

SPECIFICATION OF BUSBAR TRUNKING SYSTEM:

Low impedance, low reactance, factory assembled, type tested, totally enclosed, non-ventilated
Contacts of plug-in tap off box shall be plated by Silver bus way system conforming to following data:

Brand

Origin

i. Standard / Certification

ii. Max. ambient temperature

iii. Degree of protection

iv. Colour

v. Rated insulation voltage

vi. Frequency

vii. Rated current at 40 deg. C

viii. Short Circuit Capacity (6 - cycle)

ix. Rated short time withstand

a) Current (KA) (t = 1sec)

x. Busbar Material

xi. Busbar cross section (mmxmm)

xii. Insulation

xiii. Special features

xiv. Enclosure

: EAE

: Turkey

: IEC 61439-6 & EN 60439-2,

KEMA/DEKRA, UL, Fire,

Siesmic Tested ISO 9001 &

suitable for use in Installation

Conforming to IEC 364.

: 40° Deg.C

: IP 55

: Approved Colour (as IEC)

: 1000V

: 50Hz

: As per schedule

: 264KA~176KA

: 120KA~80KA

: AL Conductors are with

Bimetallic coated at joints.

: 3200A = 2x(6x160),

1600A = 6x160

: Epoxy Coated +Mylar (Class-

B, 130 deg C).

: Single bolt clamping &

sandwich principle.

: Aluminium enclosure

1 3200A (TPN+PE), AL, 4W, IP55 BBT - 1 (TR to LT Panel - 1)

3200A busbar trunking system with all necessary bends, expansion units, closed type transformer connection units, distribution board connection units, fixing brackets, aluminum enclosure etc.	1	LOT
---	---	-----

2 3200A (TPN+PE), AL, 4W, IP55 BBT - 2 (LT-1 to LT-2/ATS)

3200A Busbar Trunking system with necessary distribution board (LT) connection units, bends, fixing brackets etc.	1	LOT
---	---	-----

3 3200A (TPN+PE), AL, 4W, IP55 BBT - 3 (LT-2 to Gen. Panel)

3200A Busbar Trunking system with necessary distribution board (LT) connection unit, bends, fixing brackets etc.	1	LOT
--	---	-----

4 1600A (TPN+PE), AL, 4W, IP55 BBT - 4 (Riser -1)

1600A Busbar Trunking system from Substation room to L-13 with 15nos. (TP+N+PE) Tap-off-boxes. Having 1no.200A TP MCCB (36KA), 13nos.125A TP MCCB (36KA), 1no. 1DOA TP MCCB (36KA), with adjustable overload protection &adjustable short circuit release.	1	LOT
--	---	-----

5 1600A (TPN+PE), AL, 4W, IP55 BBT - 5 (Riser -2)

1600A Busbar Trunking system from Substation room to & Lift machine room with 17nos. (TP+N+PE) Tap-off-boxes. Having 1no. 500A TP MCCB(50KA), 1no. 200A TP MCCB (36KA), 15nos. 100A TP MCCB (36KA) with adjustable overload protection & adjustable short circuit release.	1	LOT
--	---	-----





TECHNICAL SPECIFICATION OF 11 KV AUTO VOLTAGE REGULATOR (AVR) :

1 150A, 11KV Auto Voltage Regulator(AVR):

Set 1

Supply, Installation, Testing & Commissioning of type tested 150A, 6.35KV, 3Nos(1Set) of single phase indoor/outdoor type Automatic Voltage Regulator (AVR) in sealed tank design as per technical specification with the following data. The AVR comply with the latest requirements of BPDB. The work shall be completed with 11KV By-Pass switch including all necessary accessories to complete the installation..

Technical Data has following:

Output voltage: 11KV, 50Hz, 3-Phase.

Rated Voltage: 11KV, 3-Phase/6.35KV, 1-Phase.

Rated Frequency: 50Hz.

Rated Current: 150A

Basic Insulation Level(BIL): 95KV

Rated range of regulation: +/- 10% in 32nos, equal steps.

sealed tank design: Yes

Cooling: Self

Temperature Rise: Upto 65deg.C without increase the oxidation rate of

Oil. Provision for 240VAC, 50Hz test input voltage for testing of the voltage

regulator with external power supply : Yes

Micro -Processor Based control panel: Yes

Non-PCB oil for the voltage regulator: Yes

Accuracy class of regulator: Yes.

Installation: Outdoor.

Voltage Regulators shall be supplied with following spares:

6Nos. Fuses

2Nos. Position Indicator Glass

2Nos Oil sight Gauge Glass

1No. Digital control panel

IP rating: 65

Response to stable in sec: 5 to 10sec.

Brand: Howard, U.S.A

1.2 BY PASS SWITCH

Set 1

Sheet steel clad, powder coated,dust & vermin proof, free standing, floor mounting, indoor type 11KV By pass Switch panel boards having self quenching, single phase two position device LBS type with 20KA(1 Sec) and isolating or de-energizing of Auto Voltage regulator as per following technical data/specification: 1 Set= 3 Nos.) and Surge Arrester.

Maximum design voltage : 15.5KV

Basic Insulation Level (BIL): 95KV

Rated Continus current : 630A

Momentary ratings: Disconnect blades 40KA

By Pass blade 30KA

IP Rating : 23

Brand: CWPL, Bangladesh.



TECHNICAL SPECIFICATIONS

1 11 KV HT SWITCHGEAR (VCB) :

Set 1

This specification cover the supply of 11KV indoor, metal enclosed switchgear according to IEC publication-298 The medium voltage switchgearpanel shall be used for secondary distribution sub-station upto 12KV and suitable for an ambient temperature of 45 deg.C and rated rupture capacity of 350 MVA complete with all accessories, diagrams, levels, wirings & terminals. The 11 KV, 350 MVA rated switchboard would comply compulsory electricity regulations by standards. All cubicles are fitted with security interlocks and earthing switch.

Technical Data :

Service voltage : 11KV
Rated voltage : 12KV
Rated current of VCB : 630A

Insulation level :

Impulse withstand voltage 1.2/50 micro-sec. : 75KV (Peak)
Power frequency withstand voltage/1 min. : 28KV rms.

The equipment proposed under this offer has been designed, manufactured & tested in accordance with the following applicable IEC standards.

- common clause for high voltage switchgear standards
- high voltage switchgear in metallic enclosure
- high voltage ac circuit breakers
- ac switches and earthing switches
- high voltage switches
- high voltage combined switch/fuse for ac current
- current transformers
- voltage transformers
- high voltage fuses
- control monitoring

The panel shall comprise of :

630A,12KV,25KA ,50Hz triple pole , withdrawable type vaccum circuit breaker with motor/manually operated spring charged mechanism with tripping coil & auxiliary contacts.

Set 1

Cast resin insulated dry type 11KV double core current transformer, ratio : 150/5/5A.

Core 1 : 10VA, class 0.5M5 for metering

Set 3

Core 2 : 15VA, class 10P10 for protection

Dry type cast resin insulated potential transformer for open delta connection.
Ratio : 11000/110V

Set 2

Burden : 50VA, Class : 0.5

Protection,Measurement and control unit :

Microprocessor based Protection unit having

'- Overcurrent (ANSI code 50/51) &

'- Earth fault (50N/51N) protection

Set 1

The tripping characteristics of the protection unit shall be of IDMT nature with a setting possibility to IDMT & defferent tripping curves.

1-3-Phase, 3-wire, two-part-time -of- the-day KWH meter with indicating 'PEAK' and 'OFF PEAK' energy with maximum demand indicator in KW with time integrating period of 30 minutes Quartz locked a synchronous 24-hour time switch for double tariff operation of KWH meter.

Ampere Meter (0-150A) with Selector Switch

Set 1

Voltmeter (0-15)KV with Selector Switch

Set 1

6A TP MCB for PT secondary protection.

Set 1

ON/OFF Push button.

Set 1

Indicating Lamp

Pcs 5

Panel Heater with thermostat

Set 1

Earth Switch

Set 1

VCB Brand : ABB, Italy.

HT Panel will be assembled by Cross World Power Ltd , Bangladesh



2 **LT SWITCHGEAR**

Set

1

Sheet steel clad powder coated (14 B 16.5W6), dust and vermin proof, free standing, floor mounting, 415V, 50 Hz, Indoor type LT Switchgear Panel with 3200A Hard Drawn Copper Busbar

Set of components required for the manufacture of LT Panel comprising :-

INCOMING:

LT PANEL -1

3200A, 65KA, TP fixed type ACB with closing solenoid and store -energy spring charged operating mechanism and solid state microprocessor controlled adjustable thermal overload and short-circuit releases with following accessories:

Pcs

1

1 X Auxilliary Contact

1 X Closing Coil

1 X Gear motor for spring charge

1 X Under Voltage Release

Pcs

3

3200/5A Current Transformer 10/5VA, Class-1.

Pcs

1

Power Network Analyzer with RS485 Port for BMS

Pcs

3

Phase Indicating lamp RED/YELLOW/BLUE.

Pcs

3

Breaker ON , OFF, TRIP Indication lamp.

Pcs

2

ON & OFF Push Button .

Pcs

1

1x6A,TP MCB for the protection of control circuit.

Pcs

3

1x2A,SP MCB for the protection of control circuit.

LT PANEL -2

3200A, 65KA, TP withdrawable type ACB with closing solenoid and store -energy spring charged operating mechanism and solid state microprocessor controlled adjustable thermal overload and short-circuit releases with following accessories:

Pcs

2

1 X Auxilliary Contact

1 X Closing Coil

1 X Gear motor for spring charge

1 X Under Voltage Release

Pcs

6

3200/5A Current Transformer 10/5VA, Class-1.

Pcs

2

Multifunction Meter

Pcs

6

Phase Indicating lamp RED/YELLOW/BLUE.

Pcs

6

Breaker ON , OFF, TRIP Indication lamp.

Pcs

4

ON & OFF Push Button .

Pcs

2

1x6A,TP MCB for the protection of control circuit.

Pcs

3

1x2A,SP MCB for the protection of control circuit.

Set

1

Electrical Interlock

OUTGOING:

LT PANEL-3

1250A, 65KA, TP fixed type ACB with closing solenoid and store -energy spring charged operating mechanism and solid state microprocessor controlled adjustable thermal overload and short-circuit releases with following accessories:

Pcs

2

1 X Auxilliary Contact

1 X Closing Coil

1 X Gear motor for spring charge

1 X Under Voltage Release.





LT PANEL-4

1600A, 65KA, TP fixed type ACB with closing solenoid and store -energy spring charged operating mechanism and solid state microprocessor controlled adjustable thermal overload and short circuit releases with following accessories:

1 X Auxiliary Contact	Pcs	1
1 X Closing Coil		
1 X Gear motor for spring charge		
1 X Under Voltage Release,		
1600/5A Current Transformer 10/5VA, Class-1,	Pcs	3
Multifunction Meter	Pcs	1
1x6A,TP MCB for the protection of control circuit,	Pcs	1

LT PANEL-5

1600A, 65KA, TP fixed type ACB with closing solenoid and store -energy spring charged operating mechanism and solid state microprocessor controlled adjustable thermal overload and short-circuit releases with following accessories:

1 X Auxiliary Contact	Pcs	1
1 X Closing Coil		
1 X Gear motor for spring charge		
1 X Under Voltage Release,		
1600/5A Current Transformer 10/5VA, Class-1,	Pcs	3
Multifunction Meter	Pcs	1
1x6A,TP MCB for the protection of control circuit,	Pcs	1

LT PANEL-6

630A, 50KA, TP MCCB with electronic micro-processor based, built in adjustable overload & adjustable short circuit protection.ON-OFF & Trip indicating auxiliary contacts, rotary handle with pad lock facilities , provision for data management interface module, diagnostic & parameterization software & box terminal.

500A, 50KA, TP MCCB with electronic micro-processor based, built in adjustable overload & adjustable short circuit protection.ON-OFF & Trip indicating auxiliary contacts, rotary handle with pad lock facilities, provision for data management interface module, diagnostic & parameterization software & box terminal.	Pcs	1
300A,36KA, TP MCCB with built in adjustable overload & adjustable short circuit protection, ON-OFF & Trip indicating auxiliary contact, rotary handle & box terminal.	Pcs	1
250A, 36KA, TP MCCB with built in adjustable overload & adjustable short circuit protection,ON-OFF & Trip indicating auxiliary contacts,rotary handle & box terminal.	Pcs	1
200A, 36KA, TP MCCB with built in adjustable overload & adjustable short circuit protection, rotary handle with padlocking facilities & box terminals.	Pcs	1
160A, 36KA, TP MCCB with built in adjustable overload & adjustable short circuit protection, rotary handle with padlocking facilities & box terminals.	Pcs	2
63A, 25KA, TP MCCB with built in adjustable overload & adjustable short circuit protection, rotary handle with padlocking facilities & box terminals.	Pcs	5
160KA SPD	Pcs	1

BUSBAR Details

3200A Common Busbar TPN + 1/2E

Enclosure As Standard
General Accessories

BREAKER BRAND : SIEMENS; Czech Republic.
ACB Model : 3WL
MCCB Model : 3VT
BRAND : SIEMENS.

Manufacturer: SIEMENS AG, Leipzig, Germany.

Assembling Plant: CEG ELETTRONICA INDUSTRIALE SpA (System integrator of Siemens) , ITALY





4 600KVAR AUTO/MANUAL PFI PLANT

Set 1

Supply of 600KVAR 415volt, 3-phase, 50Hz automatic power factor improvement plant complete with TP busbars and earth block, micro processor controlled auto power factor correction relay with digital PF reading display, capacitor bank, contactor, fuse, ON indicators for every stage of capacitor bank (except directly connected one) etc. the locally factory assembled in 16SWG sheet steel clad, Type Tested Assembling, dust & vermin proof, free standing, floor mounting, epoxy resin powder coat painted cabinet, contactors, capacitor bank, relays, discharge resistor, fuse etc. Panel consists of:

- 3nos. 415V, 1250A hard drawn electrolytic copper Busbar.
- 1-12 steps digital micro-processor based power factor correction relay with in built power factor meter.
- 1-12.5KVAR TP Power capacitor bank, rated 415V, 50Hz with built-in/separate discharge coil for connection directly with line through fuse
- 1-12.5KVAR TP Power capacitor bank, rated 415V, 50Hz with built in/separate discharge resistor.
- 3-25KVAR TP Power capacitor bank, rated 415V, 50Hz with built in/separate discharge resistor.
- 6-50KVAR TP Power capacitor bank, rated 415V, 50Hz with built in/separate discharge resistor.
- 2-100KVAR TP Power capacitor bank, rated 415V, 50Hz with built in/separate discharge resistor.
- 1no. 415V, 25Amps, 50Hz. Auto TP magnetic contactor with AC3 duty.
- 3nos. 415V, 50Amps, 50Hz. Auto TP magnetic contactor with AC3 duty.
- 6nos. 415V, 100Amps, 50Hz. Auto TP magnetic contactor with AC3 duty.
- 2nos. 415V, 200Amps, 50Hz. Auto TP magnetic contactor with AC3 duty.
- 3nos. 415V, 30Amps HRC fuses with Fuse Base. 9nos. 415V, 60Amps HRC fuses with Fuse Base. 18nos. 415V, 100Amps HRC fuses with Fuse Base. 6nos. 415V, 200Amps HRC fuses with Fuse Base. 1-Auto/Manual selector switch.

BREAKER BRAND : SIEMENS; Czech Republic.

ACB Model : 3WL

MCCB Model : 3VT

ENCLOSURE BRAND : SIEMENS.

Manufacturer: SIEMENS AG, Leipzig, Germany.

Assembling Plant: CEG ELETTRONICA INDUSTRIALE SpA (System integrator of Siemens) , ITALY

5 SYNC PANEL

Set 1

Sheet steel clad powder coated (14 & 16SWG), dust and vermin proof, free standing, floor mounting, 415V, 50 Hz, Indoor type Panel with 3200A Hard Drawn Copper Busbar.

Set of components required for the manufacture of Panel comprising :-

INCOMING:

1250A, 65KA, TP fixed type ACB with closing solenoid and store -energy spring charged operating mechanism and solid state microprocessor controlled adjustable thermal overload and short-circuit releases with following accessories:

1 X Auxilliary Contact

1 X Closing Coil

1 X Gear motor for spring charge

1 X Under Voltage Release

1250/5A Current Transformer 10/5VA, Class-1.

Phase Indicating lamp RED/YELLOW/BLUE.

Breaker ON, OFF, TRIP Indication lamp.

Emergency Push Button

1x6A, TP MCB for the protection of control circuit.

SYNC Controller

Pcs	3
Pcs	9
Pcs	9
Pcs	9
Pcs	3
Pcs	3
Set	3

OUTGOING

3200A, 65KA, TP fixed type ACB with closing solenoid and store -energy spring charged operating mechanism and solid state microprocessor controlled adjustable thermal overload and short-circuit releases with following accessories:

1 X Auxilliary Contact

1 X Closing Coil

1 X Gear motor for spring charge

1 X Under Voltage Release

Pcs	1
-----	---

3200/5A Current Transformer 10/5VA, Class-1.

Multifunction Meter including RS -485

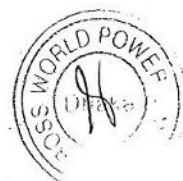
Phase Indicating lamp RED/YELLOW/BLUE.

Breaker ON, OFF, TRIP Indication lamp.

1x6A, TP MCB for the protection of control circuit.

1x2A, SP MCB for the protection of control circuit.

Pcs	3
Pcs	1
Pcs	3
Pcs	3
Pcs	1
Pcs	1



630A, 50KA, TP MCCB with electronic micro-processor based, built in adjustable overload & adjustable short circuit protection.ON-OFF & Trip indicating auxiliary contacts, rotary handle with pad lock facilities , provision for data management interface module, diagnostic & parameterization software & box terminal.

Pcs 1

BUSBAR Details

3200A Common Busbar TPN + 1/2 E Cu Busbar.

Enclosure As Standard

General Accessories

BREAKER BRAND : SIEMENS; Czech Republic.

ACB Model : 3WL

MCCB Model : 3VT

CONTROLLER BRAND : DEEP SEA, UK

ENCLOSURE BRAND : SIEMENS.

Manufacturer: SIEMENS AG, Leipzig, Germany.

Assembling Plant: CEG ELETTRONICA INDUSTRIALE SpA (System integrator of Siemens) , ITALY

6 ATS

Set 1

Sheet steel clad powder coated (14 & 16SWG), dust and vermin proof, free standing, floor mounting, 415V, 50 Hz, Indoor type Panel with 630A Hard Drawn Copper Busbar.

Set of components required for the manufacture of Panel comprising :-

INCOMING:

2

630A,4P,36KA,415V,50Hz, MCCB with having adjustable overcurrent & magnetic short circuit protection

Pcs 2

630A MC

Pcs 6

630/5A Current Transformer 10/5VA, Class-1.

2

Multifunction Meter including RS -485

Pcs 6

Phase Indicating lamp RED/YELLOW/BLUE.

Pcs 3

1x6A,TP MCB for the protection of control circuit.

Pcs 1

Electrical Interlock

Pcs

Pcs

BUSBAR Details

630A Common Busbar TPN +1/2E

Enclosure As Standard

General Accessories

BREAKER BRAND : SIEMENS; Czech Republic.

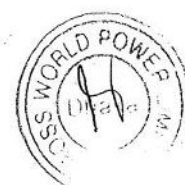
MCCB Model : 3VT

Magnetic Contactor Model : 3RT

ENCLOSURE BRAND : SIEMENS.

Manufacturer: SIEMENS AG, Leipzig, Germany.

Assembling Plant: CEG ELETTRONICA INDUSTRIALE SpA (System integrator of Siemens) , ITALY



TECHNICAL OFFER

Date: September 12, 2020

To
Additional Managing Director
Export Import Bank of Bangladesh Limited
Symphony, Plot # SE(F) : 9, Road #142
Gulshan Avenue, Dhaka - 1212

Technical offer for Supply, Installation, Testing & Commissioning of 1 x 2000 KVA, 11/0.415 KV Sub-Station & 3 x 650 KVA (Prime rated) Diesel Generator set with foreign canopy and 20 KWp Solar Power (grid - tie) system of " EXIM TOWER " at Plot No. 15, Road No. 15, Block No. CWS (C), Ward No. 19, Gulshan - 1, Dhaka -1212

Dear Sir,

We thank you very much for the above enquiry and are pleased to submit our following **TECHNICAL OFFER** for your kind perusal:

01. ITEMS SPECIFICATION:

A). TEMPEST (ALLAM MARINE LTD.) ALLAM IS A ISO 8528 CERTIFIED COMPANY of in UK. **TEMPEST Diesel Generating Set Model PL 650** to produce **Prime Output of 650 KVA** at 1500 rpm, 50 Hz, 3 phase, 4 wire, 415/230 volts at 0.8 power factor. Other details are as follows:

- | | |
|--------------------------|--|
| a. Generator Brand | : TEMPEST |
| b. Generating set Model | : PL 650 |
| c. Manufacturers Name | : Allam Marine Ltd |
| d. Country of origin | : UK |
| e. Country of Assembling | : UK |
| f. Country of Shipment | : UK |
| g. Generator Capacity | : 650 KVA (Prime) |
| h. Supply System | : 3 - Phase, 4 - wire, 400/230V, 0.8 P.F, 50Hz |
| i. Ambient Temperature | : 40° C (Radiator 50° C) |



CROSS WORLD POWER LTD.

Cross-world



Ensuring Power Since 1983

- j. Gen-set's Dimension & Weight : 340 cm x 154 cm x 227 cm / 4700 Kgs (Open Set)
- k. Base Fuel Tank : Base fuel tank having capacity of 1539 Litres
- j. 3 - D operation Fuel Tank : Main Storage fuel tank for three days operation of 4 nos. Diesel Generators , daily fuel tank and made of sheet steel minimum thickness of 10 SWG and all other accessories as per specification .

Other details are as per attached catalogues.

DIESEL ENGINE : World renowned PERKINS Radiator cooled, Four stroke, Multi Cylinder Industrial diesel engine model 2806A – E18TAG2 complete with air, fuel and oil filters. The Engine is of USA origin. Other details are as follows :

- a. Engine Model : 2806A – E18TAG2
- b. Manufacturers name : Perkins
- c. Country of origin : USA
- d. Number of cylinder/stroke : Six cylinder/4 stroke
- e. Cylinder Arrangement : Vertical in -line
- f. Governor Type : Electronic
- g. Induction System : Turbocharged and air to air charge cooled
- h. Speed/frequency : 1500 RPM/50 Hz
- i. Cooling System : Water cooled
- j. Bore & Stroke : 145 mm X 183 mm
- k. Displacement (cc) : 18100 cc
- l. Compression ratio : 14.5 : 1
- m. Fuel System : Mechanically actuated electronically controlled unit fuel injectors with full authority electronic control .
Governing to ISO 8528 -5 class G2 with isochronous capability . Replaceable ECOplus fuel filter elements with primary filter / water separator .
- n. Fuel Consumption : Load % : 100 % 75 % 50 %
L / Hr : 132 97 66
- o. Total lubricant capacity : 62 liters
- p. Total coolant capacity : 61 liters
- q. Weight of engine : Dry : 2050 Kg



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Ensuring Power Since 1983

- r. Starting Device : Self Starter Motor with 24V Battery with charging Dynamo (35A) with Auto charger .
- s. Cooling System (Radiator) : Circulated by a centrifugal pump with 50° C tropical radiator & blower fan .
- t. Exhaust Silencer : Residential type Silencer.

Further details are as per attached Engine catalogue.

(ii). **ALTERNATOR : LEROY - SOMER** industrial brushless AC Alternator Model TAL 047F. All other details are as follows:

- a. Brand/Origin : LEROY -SOMER /CZECH REPUBLIC
- b. Frequency : 50 Hz
- c. Phase : 3 Phase
- d. Output (Volts) : 415 volts (Line to line)
- e. Cooling : Air cooling
- f. Protection : Industrial brushless design screen protected, fan ventilated, drip-proof, self exciting in accordance with IP21/IP 23
- g. Insulation Type : Class "H "
- h. Voltage Regulator : Automatic Voltage Regulator (AVR)
- i. Voltage Regulation : $\pm 0.5\%/\pm 1\%$ power factor between 0.8 lagging & unity

Further details are as per attached Alternator catalogue .

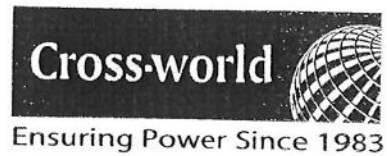
Control Module :

The Deep Sea Electronics (DSE), UK control system (DSE8610) or Equivalent is any easy to use multi-generator load share system, designed to synchronizing up to 32 generators including electronic and non-electronic engines. The DSE8610 monitors the generator and indicates operational status and fault conditions, Automatically starting or stopping the engine on load demand fault conditions.

- CONTROL MODULE TYPE : Auto start (AMF) digital control module
- OPERATION : Operation of the module is via push button mounted on the from panel with STOP, AUTO and MANUAL position etc.
- DIGITAL INSTRUMENTS : Ammeter, Voltmeter, Frequency meter, run hour meter, Oil pressure, Water Temperature etc.
- ALARM INDICATOR : Under /Over volts, Under/over speed, under/over



CROSS WORLD POWER LTD.



		Frequency, low Oil Pressure High Engine Temperature, Fail to Start and Loss of speed sensing etc
LOAD TRANSFER TIME	:	Adjustable, Delay on start 1 to 25 sec, Delay on transfer 1 to 70 sec.
Engine cooling time	:	5 minutes maximum
Phase failure relay	:	Digital option & control for Main's upper lower out off voltage setting and adjustable hysteresis voltage sensing option etc.

All other details are as per attached Allam's /DSE Catalogue

Master Control Panel : Technical specifications and options of Master Control panel are available in Generator set mounted Synchronizing Panel .

- a. Panel Type : Set mounted
- b. Control Circuit : PLC (Programmable Logic Controller)
- c. Meter : i. Bus bar voltmeter x 1 & phase selector switch
ii. Bus bar Frequency meter
- d. Lamp : i. Synchronizing Lamp x 2
ii. Standby to start , Generator 1, 2 & 3
- e. Switch : i. Incoming Selector Switch
ii. Synchro scope selector switch
iii. Load demand selector switch

Sound Attenuated Canopy : Imported (UK) built Acoustic Enclosure will reduce the sound level to 80 dBA @ 1 meter

TRAINING: We will provide training to your operator of the Generating set as per Manufacturer's manual and literature.

PACKING: Internationally approved "Shrink Wrapped" packing.

