

	TENDER SPECIFICATION	Doc. No.	REG1920-20190437
		Part-I	TS
Rudrapur	GROUP : REG(Renewable Energy Group)	Rev no	00

**TECHNICAL SPECIFICATIONS FOR SUPPLY & INSTALLATION OF
DIESEL GENERATOR (DG) SYNCHRONIZATION KIT AT CSML-
KOCHI**




Signature and seal of Bidder

	TENDER SPECIFICATION	Doc. No.	REG1920-20190437
		Part-I	TS
	Rudrapur GROUP : REG(Renewable Energy Group)	Rev no	00

1. PRODUCT INTRODUCTION:

Solar Power Plants face challenges when Power from Solar Power Plant flows to Diesel Generator as it harms the alternator, or sometimes results in mechanical damage. It can also increase the bill of the customer (where net metering is not available or is not allowed)

Vendor has to have a field proven solution which

- Prevents backflow of solar power to diesel generator.
- Maintains diesel generator at minimum 30%.

The conditions for Solar DG Sync arise when load drops to less than Power Produced by Solar Power Plant [e.g. on Saturday, Sundays and other holidays]. This could also happen during normal day when load is less than power produced by solar power plant [like during lunch time or during shift change or immediately after a power source change over].

Every few milliseconds Solar Synchronizer should do the following -

- Monitors Power demand of DG / Grid power data is collected, bidirectional.
- Monitors Power being produced currently by Solar Power Plant.
- Calculates if Power Produced currently is greater than Current Power Demand of Local Loads
- Commands Solar Power Plant to produce power equal to the local demand
- Should be capable of giving control command to switch On fixed, normally non-essential, loads to consume power, reducing the wastage of Solar power via minimum 4 NO contacts.

2. PRODUCT FEATURES:

Proportionally Controls and prevents solar power export from PV inverters, if and when needed,

- Should Work with most of the reputed Solar Inverters Manufacturers like, SMA, Schneider, ABB, Delta, Kaco, Sungrow, Kehua-Tech, Fronious etc.
- Should be capable of being used for multiple Inverters simultaneously
- Detects and controls excess solar power available.
- Electrically Isolated Communication connection to PV Inverters.
- RAMP up / down the Solar Power production depending on need on real time basis.
- Data Logging, with Cloud, is available as a *built in* feature,
- **Solar Synchronizer** does DG Solar Synchronizing. It helps to run DG at minimum of 30% load, in line with recommended by the DG set manufacturer.
- **Solar Synchronizer** prevents export of solar power to DG and / or Grid, ensuring solar power is used within premises.

Signature
3/11/20

	TENDER SPECIFICATION	Doc. No.	REG1920-20190437
		Part-I	TS
	Rudrapur GROUP : REG(Renewable Energy Group)	Rev no	00

- **Solar Synchronizer** can also do a T.O.D. export prevention / enablement to Grid, if so required.
- **Solar Synchronizer** helps to protect a DG against any back feed current, which could seriously damage the alternator or even the generator.
- **Solar Synchronizer** is not restricted by the number of inverter or DG or distance between them. In case number of DG / Inverter is high, suitable number of plug in cards can be added to the system.

Description	Type of Control	Automatic Mode	By Pass Mode	Manual Mode	Critical Mode
Condition when Mode is active		Normal Mode of Operation / Control	When RPR Protection is bypassed	In Case Communication / Controller Fail Signal is Detected	In case Reverse Power flowing in DG Breaker detected is greater than the outer value limit acceptable to DG
From the time Reverse Power is detected in DG Breaker to the time Command received by All including the farthest installed Inverter	Time Response with Digital Bus Control	< 15 Seconds	Disabled, RPR will not function for next 24 Hours	Operator Dependent	< 1 Seconds
	Time Response with Communication Bus Control	< 1 Min	Disabled, RPR will not function for next 24 Hours	NA	NA
		Reverse Power Indication Light	Disabled Indication Light On	Reverse Power Indication Light	Reverse Power Indication Light




Signature and seal of Bidder

	TENDER SPECIFICATION	Doc. No.	REG1920-20190437
		Part-I	TS
	Rudrapur GROUP : REG(Renewable Energy Group)	Rev no	00

Technical Descriptors	
IP Protection Class – IP54	Enclosure Material - Sheet Steel (powder coated)
Environmental conditions- 0°C to 50°C & 5% to 95% Relative Humidity.(R.H)	Mounting Location –Indoors
Installations Options - Wall mounting	Power Interface - Phases: 3 phase
Control Voltage Range - 200-270V AC; 50/60Hz	
Measurement Accuracy - $\leq 2\%$	Power Consumption - Max 10W to 100 W
Power Supply - Phase A	Communication - RS485
Ramp up/ramp down - Isolated digital output	Aux Load Control Output - 240 VAC 1A / 24 VDC 1A
Touch Screen HMI,(min) 5.4 Inch	Compatible with PC based software

फाइन

अलोक

	TENDER SPECIFICATION	Doc. No.	REG1920-20190437
		Part-I	TS
Rudrapur	GROUP : REG(Renewable Energy Group)	Rev no	00

3. Site Information

Site1: AGIS Building

Sl. No	Item		UoM
1	Total Nos. of DG.	02 (160 KVA Each)	Nos.
2	If the DGs are Synchronized and work in parallel Answer "Yes" OR if they work One at a time or work together but supply to different areas Answer "No"	No	
3	DG Outgoing Cable Size (sq. mm / Copper or Aluminum / No. of Runs)	400/Aluminum/Single	
4	Total No. of Inverters.	1	Nos
5	Distance of Inverters from Sol.SYNC or Sol.CON	As per requirement	Mtrs
6	Distance of DG Panel to Inverters	As per requirement	Mtrs
7	Make of Inverters.	Kaco	
8	Rating of Inverters.	20 KW	
9	RMS Make & Model	Power AMR	

Site2: Corporation Main office

Sl. No	Item		UoM
1	Total Nos. of DG.	01 (160 KVA Each)	Nos.
2	If the DGs are Synchronized and work in parallel Answer "Yes" OR if they work One at a time or work together but supply to different areas Answer "No"	No	
3	DG Outgoing Cable Size (sq. mm / Copper or Aluminum / No. of Runs)	400/Aluminum/Single	
4	Total No. of Inverters.	1	Nos
5	Distance of Inverters from Sol.SYNC or Sol.CON	As per requirement	Mtrs
6	Distance of DG Panel to Inverters	As per requirement	Mtrs
7	Make of Inverters.	Kaco	
8	Rating of Inverters.	20 KW	
9	RMS Make & Model	Power AMR	

फिनायल
अर्हता

Signature and seal of Bidder

	TENDER SPECIFICATION	Doc. No.	REG1920-20190437
		Part-I	TS
Rudrapur	GROUP : REG(Renewable Energy Group)	Rev no	00

4. Scope of Bidder

- A. Commissioning and Integration of hardware listed below for Back Feed Protection System Solar Power Plant when running with DG,
- B. Installation guidance on phone and email,
- C. Testing and Handover of System,
- D. Control and Communication cable as per site requirement
- E. Supply Back Feed Protection Control Panel having
 - a. Back Feed Protection Controller Hardware enclosed in a Fully Engineered IP 54, Powder Coated Panel with all accessories
 - b. back Feed Protection Controller Run Time Software customized to configuration,
- F. DG Power Meter with suitable communication interface – 02 Nos.
- G. Data Logging, with Cloud, is available as a *built in* feature,
- H. **Reverse Power Relay(RPR) with shunt release coil and CTs**

Features List

- A. Feedback Management of solar power to DG/Grid.
- B. DG synchronizing to run DG's at minimum 30% of rated capacity as set (once) when commissioning is in progress.
- C. Load Management as per given requirement.

Sl. No	Item	UOM
01	Supply of Solar Synchronizer (Standard) Solar Back feed Management Panel with separate RPR	02 Set

फिना
अवधि

Signature and seal of Bidder

	TENDER SPECIFICATION	Doc. No.	REG1920-20190437
		Part-I	TS
Rudrapur	GROUP : REG(Renewable Energy Group)	Rev no	00

NIT Terms & Condition

1. **Price basis:** Firm i.e. from date of Purchase Order to completion of I&C.
2. **Delivery:** Supply and I&C of solar synchronizer system shall be done within 30 days from PO date.
3. **Term of Delivery:** Free On Road (FOR) destinations/Site at CSML-Kochi.

Site Address: Cochin Smart Mission Limited,
9th Floor, Revenue Tower,
Park Avenue, Kochi-682011
Kerala (India).

4. **Payment terms:**

On Supply: 100% of the payment shall be released after supply and Installation of the item at site.

Note: Payment shall be released within 45 days from the date of submission of verified bill subject to acceptance of material.

Following documents will be required along with the invoice.

1. Invoice copy 4 Nos
2. LR Copies of supplied materials
3. O&M (02 Set), Warranty certificate & Guarantee Certificate
4. BHEL/Customer issued installation certificate.

5. **GENERAL TERMS AND CONDITIONS:**

- a) All the materials Dispatch to site should have proper paper work like Dispatch certificate, Invoice etc. duly verified & signed by BHEL representative to be submitted to BHEL for payment.
- b) Any miscellaneous materials that have not been mentioned specifically in the specification/tender which are required for Installation of DG Sync shall be deemed to be included in the specification and shall be supplied by the Bidder without any extra charges. Any scope of activities which are not specifically mentioned in this specification but required for the Installation of DG sync for safe, trouble free, normal operation shall be provided at no extra cost by the Bidder, unless explicitly excluded in the specification.
- c) The design and operational features of the equipment offered shall also comply with the provisions of latest issue of the Indian Electricity Rules and other statutory regulations.

Signature and seal of Bidder

Signature
3/1/2020

 Rudrapur	TENDER SPECIFICATION	Doc. No.	REG1920-20190437
		Part-I	TS
	GROUP : REG(Renewable Energy Group)	Rev no	00

- d) The installation should strictly conform to this specification. All the works shall be executed strictly as per the direction of BHEL engineer at site.

6. DRAWINGS & MANUALS:

- Two sets of Engineering, electrical drawings and Installation and O&M manuals are to be submitted to BHEL along with material.
- Approved ISI and reputed makes for equipment be used.

7. WARRANTIES AND GUARANTEES

The Bidder shall warrant that the goods supplied under this contract are new, unused, of the most recent or latest technology and incorporate all recent improvements in design and materials. The bidder shall provide warrantee covering the rectification of any and all defects in the design of equipment and materials including spare parts for a period of 5 years from the date of commissioning. The successful bidder has to transfer all the Guarantees/ Warrantees of the different components to the Owner of the project. The responsibility of operation of Warrantee and Guarantee clauses and Claims/ Settlement of issues arising out of said clauses shall be joint responsibility of the Successful bidder and the owner of the project and BHEL will not be responsible in any way for any claims whatsoever on account of the above.

Guarantee:

The supplier shall guarantee among other things the following:

- Satisfaction of technical and other parameters mentioned in the specification and contract.
- Quality and strength of materials used in the manufacture of the equipment considering the applicable codes of practice and regulation.
- Adequate factors of safety for all parts of the equipment to withstand the mechanical and/ or electrical stresses developed therein under specific operating conditions.
- Performance data furnished/ specified for the equipment should be actually obtainable when the equipment is installed and tested at site.

- Note: During the warranty period bidder has to provide Name, address, mobile number and email address of the service Centre to be contacted in case of failure or complaint and complaint should be attended within 72 hours.**

8. Packing:

The following Packing and Marking clause will form part of the contract placed on successful Bidder –

- The Bidder shall provide packing and preservation of the equipment and spares/goods contracted so as to ensure their safety against damage in the conditions of land, sea and air transportation, transshipment, storage and weather

Signature and seal of Bidder

Handwritten signature and date 5/11/22

	TENDER SPECIFICATION	Doc. No.	REG1920-20190437
		Part-I	TS
Rudrapur	GROUP : REG(Renewable Energy Group)	Rev no	00

hazards during transportation, subject to proper cargo handling. The Seller shall ensure that the stores are packed in containers, which are made sufficiently strong, and with seasoned wood. The packing cases should have hooks for lifting by crane/fork lift truck. Tags with proper marking shall be fastened to the special equipment, which cannot be packed.

(ii) The Bidder must ensure that sturdy packing is used to withstand rough handling during transit by rail/road. In case the contractor fails to meet the qualitative requirements for packing, he must make good all losses arising out of his failure to meet contractual obligations. The contractor will be responsible for internal damages if any, when outwardly there is no damage to the package.

(iii) One copy of the packing list/ invoice in English and pre-dispatch inspection certificate shall be inserted in each cargo package, and the full set of the packing lists shall be placed in Case No.1 painted in a yellow colour preferably.

Marking: Each package shall be marked with warning inscriptions: Top, do not turn over, category of cargo, etc.

Pring

आवक

Signature and seal of Bidder

	GENERAL CONDITIONS OF CONTRACTS (GCC) Procurement of Goods and Services from indigenous Suppliers		
Rudrapur	BHEL CFP RUDRAPUR, MATERIALS MANAGEMENT DEPT.	Rev No.	00

- 1. Term of Delivery:** Free On Road (F.O.R) destinations. Packing & Forwarding, Freight & Insurance are in supplier's scope.
- 2. Delivery period:** Bidder shall supply material within the delivery period specified in respective NITs. However, in case of quoting longer delivery period, a loading of 0.5% per week shall be applicable on quoted price. In case of delivery period being too long and not able to fulfill BHEL requirement, offer of supplier shall be liable for rejection.
- 3. Payment terms:** 100% within 45 days from the date of receipt subject to acceptance of material. In case of any discrepancy in material, BHEL shall generally indicate the discrepancy within 15 days from the date of delivery of goods or the rendering of services, and payment shall be made within 45 days from the day of removal of such discrepancy. Any minor deviation in the above payment term if accommodated by BHEL, will attract loading at the rate of "[Base rate i.e. Prime Lending Rate of State Bank of India (as applicable on the date of techno-commercial bids opening) + 6%] for the period of relaxation sought by bidders.
- 4. Liquidated Damages for delayed delivery:** In case of delay in execution of contract/purchase order beyond the delivery period stipulated in the said contract/purchase order, a penalty of 0.5% on the value of delayed portion of supply (inclusive of basic rate, taxes, duties, freight & insurance as applicable) per week of delay shall be levied on Supplier.

Maximum limit of Liquidated damages shall be **10% of total purchase order value (inclusive of basic rate, taxes, duties, freight & insurance as applicable)**. In case of quoting any deviation from the above LD clause, **the offer shall be loaded in comparison statement for un-accepted portion of LD, maximum up to 10% of total purchase order value (inclusive of basic rate, taxes, duties, freight & insurance as applicable)**. **GST shall also be charged on LD amount as per applicable rate and tax invoice shall be issued by BHEL.**

Note :

- In case of any amendment or revision in contract/Purchase order, the LD shall be linked to the amended / revised Purchase Order / Contract value and delivery / completion time / schedule, as applicable.
- If, delay is not attributable to the supplier, delay analysis with documentary evidence may be submitted by the supplier at the earliest but not later than six months from the end of the financial year in which the payment is withheld.

Signature and seal of Bidder

Handwritten signature and date 21/07/22

	GENERAL CONDITIONS OF CONTRACTS (GCC) Procurement of Goods and Services from indigenous Suppliers		
Rudrapur	BHEL CFP RUDRAPUR, MATERIALS MANAGEMENT DEPT.	Rev No.	00

Based on the above details / documents submitted by the supplier, BHEL shall take final decision and if considered appropriate by BHEL, withheld amount (full or part as the case may be) shall be released, otherwise, full or balance withheld amount shall be treated as deduction of Liquidated Damages (LD) towards delayed delivery.

Liquidated Damages = 0.5 % X Delay in Nos. of Weeks X Quantity *(Basic Rate + P&F + Freight + Other charges, if any + Taxes & Duties) + Applicable GST

1. **Bank Guarantee:** if specifically mentioned in NIT, a **Contract Execution Bank Guarantee(CEBG)** of **5% of the Purchase Order value** shall be submitted within 02 weeks from the date of release of Purchase Order date. CEBG shall be valid until the project completion date with further notice period of three months. After completion of project, the same shall be converted into **Performance Bank Guarantee** for the warranty period with a further claim period of 3 months. Format of BG is enclosed.

In case of being mentioned only **Performance Bank Guarantee(PBG)** in NIT, a **Bank Guarantee(PBG)** of **5% of the Purchase Order value** shall be submitted along with invoice after supply of materials.

2. **Reverse Auction:** BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-Submission of 'Process compliance form or Online sealed bid' by the agreed bidder (s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com). The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates. *If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant*

Signature and seal of Bidder