



**CHAMUNDESHWARI ELECTRICITY SUPPLY CORPORATION LIMITED,
MYSORE**

(A Government of Karnataka Undertaking)

Telephone : Office of the

Email ID:

Ref No :.....

Date:.....

To,
(Name & address of the applicant)

.....
.....

Madam/Sir,

Sub: Submission of Technical details in respect of your application registered for installingkWp SRTPV system.

Ref: Application Reg. No..... dtd:

You are requested to select a reputed system installer and furnish the technical details of all the equipments proposed to be used in SRTPV system as per format enclosed along with relevant test reports and certificates for communicating approval for installation of SRTPV system as per following guidelines:

1. You have to use the inverter from MNRE approved inverter manufacturers only. The list of MNRE approved inverter manufacturers is available at the CESC/MNRE website. Only those inverters which meet all the required IS/IEC standards shall be eligible for installation.
2. All the other components of Solar RTPV system shall comply with applicable IS/IEC standards. (List attached).
3. Bi-directional meter shall be purchased from CESC, Mysore approved vendors and to be fixed at net-metering point.
4. Technical Standards for interconnection can be obtained from CESC's website.
5. You have to upgrade infrastructure (service line, meter with CT, transformer etc.) if required, at your own cost.
6. Further information may be obtained from www.cescmysore.org/www.mnre.gov.in.

Yours faithfully,

AEE/Executive Engineer(Ele)

O&M **sub-div/division.....**
CESC

Technical Specifications of SRTPV system

Item / System	Applicable BIS /Equivalent IEC Standards / Applicable MNRE Specifications		
	Standard Description	Standard Number	
Solar PV modules	Modules		
	i	Crystalline Silicon Terrestrial PV modules Thin film Terrestrial PV modules	IEC 61215/IS14286 IEC 61646
	ii	Solar PV module safety qualification requirements	IEC 61730 (P1 - P2)
	iii	PV modules to be used in a highly corrosive atmosphere (Coastal area etc,) must qualify Salt Mist corrosion Testing	IEC 61701/ IS 61701
	Each PV module must use RFID tag which must contain the following information as per MNRE requirements: i. Name of the manufacturer of PV Module ii. Name of the manufacturer of Solar Cells Iii Date and year of manufacture (separately for solar cells and module) iv. Peak wattage, Im, Vm and FF for the module v. Unique Sl. No. and model no. of the module vi. Date and year of obtaining IEC PV module qualification certificate vii Name of the test lab issuing IEC certificate WARRANTY: PV modules used in solar power system must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10years and 80% at the end of 25years		
Grid tied inverters	i	Environmental Testing	IEC 60068-2 (1, 2,14,30) / Equivalent BIS Std.
	ii	Efficiency Measurements	IEC 61683
	iii	Product safety standard	IEC - 62109-1 (2010/4) IEC - 62109-2 (2011/6)
	iv	Grid Connectivity standard and test procedure for islanding prevention measures for utility/interconnected PV inverters	IEC 61727 IEEE 1547 IEEE 1547.1
	v	Electromagnetic compatibility &Electro Magnetic Interference	IEC 61000-6-3>16 Amps IEC 61000-6-4<16 Amps
	vi	Ingress protection	IP 65 (for outdoor)/ IP 21 (for indoor) As per IEC 529
		<ul style="list-style-type: none"> for testing i,ii,vi beyond 10KVA self- certification by manufacturers are acceptable <ul style="list-style-type: none"> In case if the Charge controller is not built in the inverter, IEC 62093 test is required separately for Charge controller. 	

Cables	i	General Test and Measuring Method PVC insulated cables for working voltage up to and including 1100 V and UV resistant for outdoor installation	IEC 60227 / IS 694 IEC 60502 / IS 1554 (Part. I & II)
Earthing	i	Grounding	IS 3043
Switches/ Circuit Breakers/ Connectors	i	General Requirements Connectors - safety A.C. /D.C.	IEC 60947 part I,II, III / IS 60947 Part I,II,III / EN 50521
Junction Boxes/ Enclosures for Charge Controllers/ Luminaries	i	General Requirements	IP 65 (for outdoor)/ IP 21 (for indoor) As per IEC 529

Specifications for Inverter

Specifications of Inverter	
Parameters	Detailed Specifications
Nominal Voltage	230V / 415V
Voltage range	+ 10% -20% at nominal voltage
Operating frequency range	50 Hz (47.5 to 52 Hz)
Waveform	Sine Wave
Harmonics	AC side total harmonic current distortion < 5%
Ripple	DC voltage ripple content shall be not more than 1%.
Efficiency	Efficiency shall >95%
Losses	Maximum losses in sleep mode: 2W per 5kW Maximum losses in stand-by mode: 10W
Casing protection levels	Degree of protection: Minimum IP-21 for internal units and IP 65 for outdoor units
Temperature	Should withstand from -10 to +60 deg Celsius
Humidity	Should withstand up to 95% (relative humidity)
Operation	Completely automatic including wake up, synchronization (phase-locking) and shut down
MPPT	MPPT range must be suitable to individual array voltages in power packs
Protections	Over voltage; both input & output
	Over current; both input & output
	Over/Under grid frequency
	Over temperature
	Short circuit
	Lightening
	Surge voltage induced at output due to external source
Recommended LED indications	Inverter ON
	Grid ON
	Inverter Under / Over Voltage
	Inverter Overload
	Inverter Over Temperature
Recommended LCD Display on Front Panel	Accurate displays on the front panel:
	DC input voltage
	DC current
	AC Voltage (all 3 phases)
	AC current (all 3 phases)
	Ambient temperature
	Instantaneous & cumulative output power
Daily DC energy produced	
Communication interface	RS485 / RS 232

Technical Standards for Interconnection

Sl. No.	Parameters	Requirements	Reference
1.	Overall Conditions of Service	Reference to regulations	Conditions for Supply of Electricity of Distribution Licensees in the State of Karnataka
2.	Overall Grid Standards	Reference to regulations	Central Electricity Authority (Grid Standards) Regulations 2010
3.	Equipment	Applicable industry standards	IEC standards/IS
4.	Safety and Supply	Reference to regulations, Chapter III (General Safety Requirements)	Central Electricity Authority (Measures of Safety and Electricity Supply) Regulations, 2010 and subsequent amendments
5.	Meters	Reference to regulations and additional conditions issued by the Commission.	Central Electricity Authority (Installation & Operation of Meters) regulations 2006 and subsequent amendments
6.	Harmonic Current	Harmonic current injections from a generating station shall not exceed the limits specified in IEEE 519	IEEE 519 relevant CEA (Technical Standards for Connectivity of the distributed generation resource) regulations 2013 and subsequent amendments
7.	Synchronization	Photovoltaic system must be equipped with a grid frequency synchronization device, if the system is using synchronizer inherently built into the inverter than no separate synchronizer is required.	Relevant CEA (Technical Standards for Connectivity of the distributed generation resources) regulations 2013 and subsequent amendments.
8.	Voltage	The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage. beyond a clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid.	

9.	Flicker	Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards, if any
10.	Frequency	When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side up to 0.2 sec), the Photovoltaic system shouldn't energize the grid and should shift to island mode
11.	DC Injection	Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point. or 1% of rated inverter output current into distribution system under any operating conditions
12.	Power Factor	While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained
13.	Islanding and Disconnection	The Photovoltaic system in the event of voltage or frequency variations must island/ disconnect itself within IEC standard on stipulated period
14.	Overload and Overheat	The inverter should have the facility to automatically switch off in case of overload or overheating and should restart when normal conditions are restored

Relevant CEA regulations 2013 and subsequent if any, (Technical Standards for Connectivity of the distributed generation resource)