



**MACFAST**<sup>TM</sup>  
Igniting wisdom since 2001

**MAR ATHANASIOS COLLEGE FOR ADVANCED STUDIES TIRUVALLA  
(MACFAST)  
Thiruvalla - 689101**

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# **WHEELING TO THE GRID**

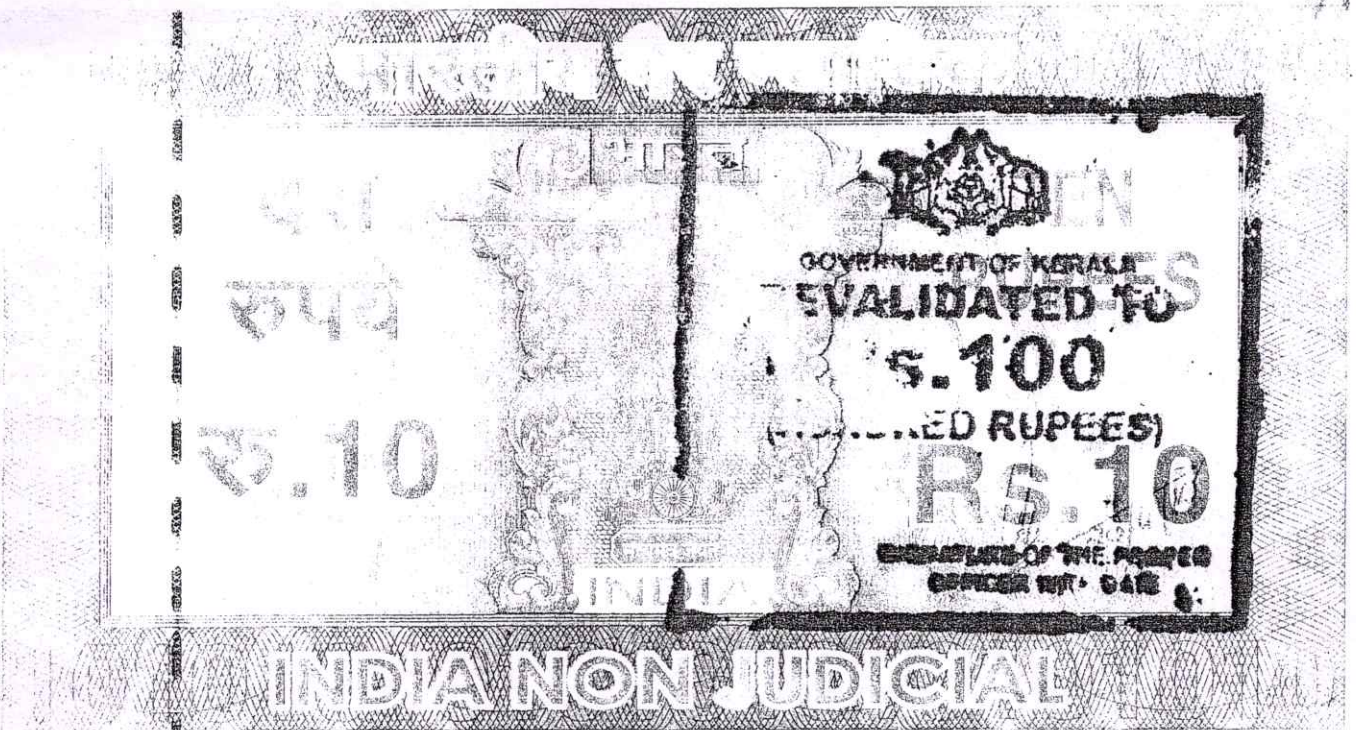


### WHEELING TO THE GRID

The solar energy produced from 100 KW solar plant will be exported to the KSEB grid after the college consumption. On holidays, full energy will be exported. This reduces the energy expenditure.



**Wheeling to the Grid**



15AA 504333

**Agreement for Connecting Solar Energy System to the Distribution System of the licensee**

**( HT Agreement No. 04/2012-13/dt.14.06.2012 – LCN 32/6144 )**

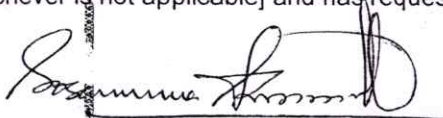
**HT Solar Agreement No. 02/2018-19/dtd.21.05.2018**

This Memorandum of Agreement is made on this **21st day of May 2018** at Electrical Circle, Pathanamthitta between **Fr.Dr.Cherian J Kottayil, Principal, MACFAST, Thiruvalla** eligible consumer (hereinafter referred to as 'consumer') residing at **Kottayil, Perumpetty, Pathanamthitta** as first party.

AND

the Kerala State Electricity Board Limited, a company incorporated under the Indian Companies Act, 1956 (Central Act 1 of 1956) having its registered office at Vidyuthi Bhavanam, Pattom, Thiruvananthapuram, represented by **Smt.Sosamma Kuruvilla, Deputy Chief Engineer, Electrical Circle, Pathanamthitta** hereinafter referred to as 'KSEB Limited" (which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors, representatives and assignees) as second party, of the agreement;

Whereas, the consumer has installed a solar energy system at the premises owned and possessed by him or owned by and possessed by the consumer under a valid lease agreement [strike out whichever is not applicable] and has requested KSEB Limited to provide connectivity to the said plant;

  
**DEPUTY CHIEF ENGINEER**  
Electrical Circle, KSEB Ltd  
Pathanamthitta

No. 3372  
9.5.2018 18/16/18 as per M/2018  
21/5/2018

  
**FR. DR. CHERIAN J KOTTAYIL**  
PRINCIPAL, MACFAST  
THIRUVALLA-689 101



15AA 504334

And whereas, the KSEB Limited agrees to provide to the consumer, a **Solar Plant Identification Number (SPIN) 4617-0003** as scheduled in the agreement for the electricity generated from the above plant having **capacity 100 kWp** as per conditions of this agreement and the regulations or orders issued by the Kerala State Electricity Regulatory Commission from time to time;

And whereas the consumer has, in addition to those automatic and inbuilt isolation devices within inverter and external manual relays, installed a manually operated isolating switch and associated equipment with sufficient safeguards between the solar energy system and the distribution system of KSEB Limited to prevent injection of electricity from his solar energy system to the distribution system of the licensee when the distribution system is de-energized;

And whereas, the consumer has assured that in case of a power outage in the system of KSEB Limited his/her plant will not inject power into the distribution system of the licensee and has produced separately the documents substantiating this assurance which form part of this agreement, as if incorporated herein;

And whereas, the consumer has undertaken that all the equipment connected to the distribution system comply with relevant international (IEEE/IEC) or Indian standards (BIS) and that installations of electrical equipment comply with the relevant provisions of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010;

And whereas, the consumer undertakes that he/she is in possession of all the necessary approvals and clearances, including sanction from Electrical Inspector, as specified in relevant regulations for connecting the solar energy system to the distribution system for commissioning the solar energy system;

*[Handwritten Signature]*

DEPUTY CHIEF ENGINEER  
Electrical Circle, KSEB Ltd  
Pathanamthitta

Sl. No: 3373  
9-5-2018

*[Handwritten Signature]*  
22/2/2018



And whereas. the consumer has deposited an amount of Rs.1,00,000/- (Rupees One Lakh only) by Cash/DD as per receipt No. 46170180212102180 dated 12.02.2018 at Electrical Section office Thiruvalla as security deposit for the installation of solar meter and net meter and shall remit the meter rent charged by the KSEB Limited at the rates approved by the Kerala State Electricity Regulatory Commission from time to time for the satisfactory fulfillment of this agreement. [strike out this portion if the meter is provided by the consumer at his/her cost];

And whereas the consumer has provided the solar meter and the net meter at his/her cost, which has been tested, certified and installed by KSEB Limited.[strike out this portion if the meter is provided by the KSEB Limited].

Now, therefore, both the parties hereby agree as follows:-

1. The net-metering connection shall be governed by the provisions contained in the Kerala State Electricity Regulatory Commission (Grid Interactive Distributed Solar Energy Systems) Regulations, 2014 as amended from time to time and also subject to the condition that the solar energy system meets the requirements as per the provisions contained in Central Electricity Authority (Technical Standard for Connectivity of the Distributed Generation Resources) Regulations. 2013.
2. KSEB Limited shall have the sole authority to decide based on the results of necessary studies, the interface/interconnection point to the solar energy system.
3. If the consumer's solar energy system either causes damage to and/or produces adverse effects affecting other consumers or assets of KSEB Limited the consumer will have to disconnect solar energy system immediately from the distribution system upon direction from the KSEB Limited and correct the defect at his own expense prior to reconnection.
4. KSEB Limited shall have access to the metering equipment and disconnecting means for solar energy system in all required situations.
5. KSEB Limited shall have the right to disconnect solar energy system from the distribution system of the licensee in emergency, if it is found that at that point in time providing service through the net metering system is not safe to the grid as a whole.
6. (a) The consumer indemnifies KSEB Limited for the damages or adverse effects, if any from the negligence or intentional defective operation in the connection and operation of the solar energy system of the consumer;  
(b) The KSEB Limited indemnifies the consumer for the damages or adverse effects, if any, from the negligence or intentional defective operation in the connection and operation of the distribution system of KSEB Limited.
7. KSEB Limited shall not be liable for delivery to or realization by the eligible consumer of any fiscal or other incentives provided by the Central/State Government or any other authority;
8. All the commercial settlements under this agreement shall follow the provisions of the Kerala State Electricity Regulatory Commission (Grid Interactive Distributed Solar Energy Systems) Regulations. 2014.
9. The consumer may terminate this agreement after giving thirty days' (30 days) clear notice in writing to the authorised authority of the Licensee.

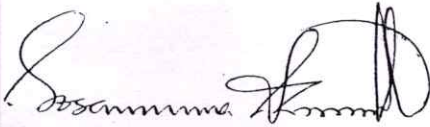
  
**DEPUTY CHIEF ENGINEER**  
Electrical Circle, KSEB Ltd  
Pathanamthitta



  
**Fr. Dr. CHERIAN J KOTTAYIL**  
PRINCIPAL, MACFAST  
TIRUVALLA- 689 101

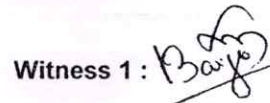
10. KSEB Limited has the right to terminate this agreement at any point in time after giving 30 days' prior notice. if consumer breaches any terms of this agreement and in cases where such breaches could be rectified and the same are not provided/informed within 30 days of written notice from KSEB Limited about the breach.
11. The consumer agrees that upon termination of this agreement, he must disconnect the solar energy system from distribution system of KSEB Limited in a timely manner to the satisfaction of KSEB Limited.
12. The consumer shall have the right to bank and use the electricity generated and injected in excess over his/her full consumption into the distribution system of the licensee by the solar energy system. subject to the conditions specified in the Kerala State Electricity Regulatory Commission (Grid Interactive Distributed Solar Energy Systems) Regulations, 2014.
13. The consumer shall have the right to open access for wheeling the electricity generated in excess by 500 units over the consumption by the solar energy system, installed in the premises of the consumer detailed under item II of the schedule attached and shall be used in the premises owned by the consumer and in the order of preference as detailed under item III of the attached schedule.
14. The licensee shall within seven days from the date of execution of this agreement commission the solar energy system.
15. The licensee shall pay for the net energy banked by the consumer at the end of the settlement period at the average pooled purchase cost of electricity as approved by the Commission for that year, as provided for in the Kerala State Electricity Regulatory Commission (Grid Interactive Distributed Solar Energy Systems) Regulations, 2014.

In witness whereof the said Fr.Dr. Cherian J Kottayil, Principal, MACFAST, Thiruvalla (1st party) and the said Smt.Sosamma Kuruvilla, Deputy Chief Engineer, Electrical Circle, Pathanamthitta (2nd party) have hereunto signed at the day and year first above written.

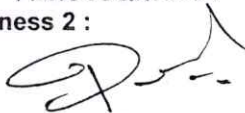


Signature (2nd party)  
DEPUTY CHIEF ENGINEER  
Electrical Circle, KSEB Ltd  
Pathanamthitta

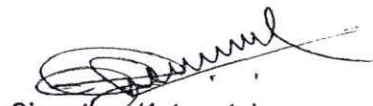
Witness 1:

  
Baiju Thomas  
ASST. EXECUTIVE ENGINEER  
ELECTRICAL CIRCLE  
PATHANAMTHITTA

Witness 2:

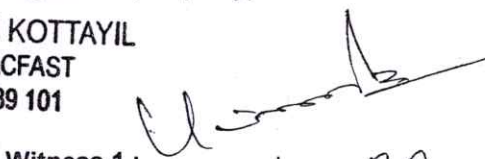
  
PRAKASH. U  
SE, EC PTA.




  
Signature (1st party)

Fr. Dr. CHERIAN J KOTTAYIL  
PRINCIPAL, MACFAST  
TIRUVALLA- 689 101

Witness 1:

  
Aimalan PR  
Poolkhenkattu Malayil (H)  
Mazhath Po Thiruvalla.

Witness 2:

  
Sunny Thomas  
Pallickaparampil  
Valanjavattom Po  
Thiruvalla.

## SCHEDULE

- I. Particulars regarding the consumer at whose premises the solar energy system is installed:
- Name of consumer : Fr.Dr.Cherian J Kottayil, Principal, MACFAST, Thiruvalla
- Permanent address of the consumer : MACFAST, Thollasery, Thiruvalla
- Consumer number, code & Category : 1346170016581, 32/6144, HT II (B) General
- Voltage at which supply is availed : 11 KV
- Connected load /Contract Demand :100 KVA
- II. Details of Premises where the Solar energy system is installed :
- (i) Address of the premise where the Solar energy system is installed : Mar Athanasios College For Advanced Studies Thiruvalla, Thollasery, Thiruvalla.
- (ii) Solar meter details :
- (a) Meter no. and make :
- (b) Initial readings :
- (iii) Net meter details :
- (a) Meter no. and make :
- (b) Initial readings :
- (iv) Particulars of the solar energy system :

Sl.No.	Description	Data
i	Solar Plant Identification Number(SPIN)	4617-0003
ii	Capacity of Solar energy system	100 KWp
iii	Details of distribution Transformer to which the plant is connected	315 kVA, 11KV/433V
iv	Corporation / Municipality / Panchayath	Thiruvalla Municipality
v	Village & Survey number	Kuttapuzha, Block 8, Survey No. 826/3, Building No. XI-217(3)
vi	Location(attach a location map)	Attached





സോളാർ പ്ലാന്റ് കണക്ഷൻ റിപ്പോർട്ട്

സെക്ഷൻ : ..... THIRUVALLA .....

കൺസ്യൂമർ നമ്പർ : ..... 134617001658) ..... (13 അക്കം)

പേര് : ..... Max Athanasios College for Advanced Studies Tiruvalla .....

സ്റ്റീൻ നമ്പർ : ..... A61700003 .....

സോളാർ കപ്പാസിറ്റി : ..... 100 Kw ..... കിലോവാട്ട്

കണക്ട് ചെയ്ത ദിവസം : ..... 30 June 2018 .....

സോളാർ മീറ്റർ ഇന്നിഷ്യൽ റീഡിംഗ് : ..... 128 Kwh .....

നെറ്റ് മീറ്റർ ഇന്നിഷ്യൽ റീഡിംഗ് : ..... 507.4 Kwh .....

തീയതി

അസിസ്റ്റന്റ് എഞ്ചിനീയർ

പേര്

**SANTHOSH K.**  
**ASSISTANT ENGINEER**  
**K.S.E.B. LTD. ELECTRICAL SECTION**  
**THIRUVALLA**

ഒപ്പ്

**ASSISTANT ENGINEER**  
**ELECTRICAL SECTION**  
**THIRUVALLA**



പകർപ്പ്:

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ .....

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ .....

Government of Kerala  
Department of Electrical Inspectorate  
Office of the District Electrical Inspector  
Planthottathil Buildings, College Road  
Pathanamthitta 689 645.  
Phone: 0468 2223123, Email : [eipta@eikerala.gov.in](mailto:eipta@eikerala.gov.in)



An IS 15700 : 2005 Certified Department

**PROCEEDINGS OF THE ELECTRICAL INSPECTOR, PATHANAMTHITTA**

**Present: D. Muralaeddharan Nair**

- Sub:- Addition of MV Installation (Solar - power generation system) at the premises of M/S Mar Athanasious college of advanced studies, Tiruvalla- Sanction for energisation under the provisions of Reg.43(4) of Central Electricity Authority Regulations 2010 - orders issued
- Read: 1. Scheme submitted by M/S Voltamps Engg. Co, CA-153,Kochi, under the cover letter dt. 20-01-2012  
2. This office scheme approval No. B-180/2012/EIPT dt. 08-03-2012  
3. Completion report submitted by M/S Voltamps Engg. Co, CA-153,Kochi, under the cover letter No. VEC/495/2012-13 dt. 05-01-2013  
4. Inspection conducted on 18-01-2013

**Order No. B- 180/12/EIPT Dt 21-01-2013**

Sanction for energisation is hereby accorded under Reg. 43(4) of Central Electricity Authority Regulations 2010, for the electrical installations of the medium voltage Solar Power generation system-(details mentioned below) installed at the premises of M/S Mar Athanasious college of advanced studies, Tiruvalla, covered under the completion report cited as (3) above, subject to the following conditions

1. Any addition/ alteration in the existing installation should be carried out after getting prior approval/ sanction from the electrical inspector.

**DETAILS OF EQUIPMENTS**

Grid Tie Interactive inverter - Make - Leonics, 30 kVA  
Solar Charge controller - Leonics - 4 Nos., Sl. Nos.(1) 33014 -2 -0002 - 001  
(2) 33014 -2 -0002 - 002 (3) 33014 -2 -0002 - 003 (4) 33014 -2 -0002 - 004  
Total additional switch rating - 100 Amps  
Earth Electrodes - 1 No.



ELECTRICAL INSPECTOR

To ✓  
The Director,  
Mar Athanasious college of advanced studies, Tiruvalla

- Copy to: 1. M/S Voltamps Engg. Co, XXXIII/20A, Padivattom, Edappally, Kochi 682 024  
2. Asst. Engineer, KSEB, Tiruvalla  
3. Stock file  
4. 'B' Section  
5. 'C' Section.

**KERALA STATE ELECTRICITY BOARD LTD**

(Incorporated under the Indian Company Act, 1956)

(Registered office : Vydyuthi Bhavanam, Pattom, Thiruvananthapuram-695 004)

( CIN : U40100KL2011SGC027424, Website : www.kseb.in )

Office of the Assistant Executive Engineer  
Meter Testing Subdivision,  
110KV Substation Compound, Thekkemala.P.O,  
Kozhencherry - 689654

Mob : +91 9496011398  
E mail : mtsdvtla@gmail.com

DB 02 /SOLAR/MTSD/KZY/18-19/010

Dated: 16-04-2018

To

The Executive Engineer  
Electrical Division,  
Thiruvalla.

Sir,

Sub: Grid connectivity of 100 KW solar system installed under Ele. section, Thiruvalla – reg:-  
Ref: Letter No DB70/Solar /2017-18/1591 dated 19-03-2018 of the EE, Ele. Div., Thiruvalla.

Testing of 100 KW PV Inverter plant at the premise of M/S MACFAST, Thiruvalla (Consumer no. 16581, Electrical Section Thiruvalla) was carried out by Meter Testing wing on 03.04.2018 as per the directions given by Executive Engineer, Relay division Thiruvananthapuram. At the time of testing all the results were found satisfactory. The test result are forwarded to Executive Engineer, Electrical Division, Thiruvalla for recommendation.

The instrument used for analysing the parameters of PV Inverters is FLUKE (434 series) made Power Quality Analyser. Test Report attached herewith for reference.

Yours faithfully

Sd/-

Assistant Engineer in charge.  
Meter Testing Sub division,  
Kozhencherry.

Copy to

1. Assistant Engineer, Electrical section, Thiruvalla.



# KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Indian Companies Act 1956)

Registered office: Vidyuthi Bhavanam, Pattom, Thiruvananthapuram 695004, Kerala

Corporate Identity Number(CIN): U40100KL2011SGC027424, Website: www.kseb.in

Office of the Asst Executive Engineer, Electrical Sub Division, Thiruvalla

Mini Vidyuthi Bhavanam, Opposite KSRTC, Pin- 689101, Kerala.

Phone : ( O ) 0469- 2701340, 9446009500 Email: [aetvla@gmail.com](mailto:aetvla@gmail.com)

TIN - 32030760532, TAN -TVDK02281G

No.DB4/18-19/ESDTVLA/ 37

dt.08/05/2018

To

The Deputy Chief Engineer,  
Electrical Circle,  
Pathanamthitta.

Sir,

Sub:- Solar testing report – MACFAST – submitting of -regarding  
Ref:- DB-4/17-18/ESDTVLA/239 dated 15/03/2018 of this office

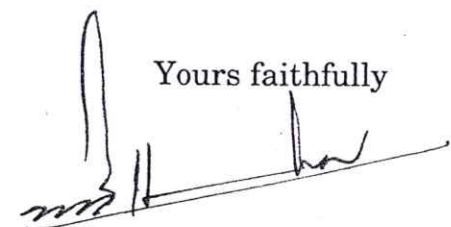
With reference to the above, the completion report received from MACFAST towards the subject work had already been sent from this office for arranging the solar panel testing by The Meter Testing Subdivision, Kozhencherry.

Meter subdivision unit, Kozhencherry completed their testing and submitted the report. For executing the agreement, being HT, at circle Office, I am forwading herewith the test report and details to be filled in the schedule of agreement.

I may also report that M/s MACFAST had remitted Rs. 1,00,000/- vide Receipt No. 46170180212102180 dated 12/02/2018 towards the registration fee.

This is for favour of information and further necessary action.

Yours faithfully

  
The Assistant Executive Engineer,  
Electrical Subdivision  
Thiruvalla.

Copy submitted to The Executive Engineer, Electrical Division, Thiruvalla,

Copy to 1) The Assistant Engineer, Electrical Section, Thiruvalla.

2) File

## SCHEDULE

I. Particulars regarding the consumer at whose premises  
the solar energy system is installed:

Name of consumer : Fr. Cheriyan J. Kottayil  
Permanent address of the consumer : MACFAST College ,  
THIRUVALLA  
Consumer number, code & Category : 1346170016581, HT  
Voltage at which supply is availed : 11KV  
Connected load / contract demand. : 368.4 / 100KVA

II. Details of Premises where the Solar energy system is installed:

i) Address of the premise where the  
Solar energy system is installed : MACFAST College ,  
THIRUVALLA

ii) Solar meter details :

- a) Meter no.and make :
- b) Initial readings :

iii) Net meter details

- a) Meter no.and make :
- b) Initial readings :

Particulars of the solar energy system

SI.No.	Description	Data
	Solar Plant Identification Number(SPIN)•	46170003
ii	Capacity of Solar energy system	100KW
iii	Details of distribution Transformer to which the plant is connected	HT - Pushpagiri feeder (Thiruvalla 66KV SS)
iv	Corporation / Municipality / Panchayath.	Thiruvalla Municipality

## ESSENTIAL TEST ON ROOF MOUNTED PV PLANTS

Name of Consumer : M/S MACFAST			Capacity: 20 KW 3Φ			
PV Model : Delta RPIM-20A		Sl.No:O4817600822WA	Consumer no: 16581 Elè. Section: Thiruvalla			
Sl No	Parameter	Condition as per CEA regulation	Set value	Test Result		
1	Harmonic Injection			R Phase	Y Phase	B Phase
	a. Voltage Harmonic	<3 %		2.10%	2.00%	2.00%
				(For 68% load)		
	b.Current harmonic (TDD)	<8 %		4.54%	3.92%	4.74%
2	Direct Current Injection	<0.5% of the full rated output at the interconnection point.		3.30%	4.60%	4.80%
3	Flicker	Pst <1, Plt <0.65		0.23	0.54	0.63
4	Fault in feeding circuit	Cease to energise		Plant cease to energise during fault conditions in the feeding circuit.		
5	Anti islanding on grid fail	PV inverter shall stop in milli seconds	2 secs	The PV Inverter stop in less than 2 sec		
6	Voltage and frequency sensing time delay function to prevent energising de energised circuit .	distributed generation source shall not reconnect the system unless voltage and frequency of the grid supply is stable for at least 60 seconds	60secs	The time measured is above 60 secs		

*Recommended*

*[Signature]*

## ESSENTIAL TEST ON ROOF MOUNTED PV PLANTS

Name of Consumer : M/S MACFAST				Capacity: 30 KW 3Φ		
PV Model : Delta RPIM-30A		Sl.No:O1717502558WZ	Consumer no: 16581 Ele. Section: Thiruvalla			
Sl No	Parameter	Condition as per CEA regulation	Set value	Test Result		
1	Harmonic Injection			R Phase	Y Phase	B Phase
	a. Voltage Harmonic	<3 %		2.10%	2.00%	2.00%
				(For 39% load)		
	b.Current harmonic (TDD)	<8 %		2.05%	2.48%	2.44%
2	Direct Current Injection	<0.5% of the full rated output at the interconnection point.		1.90%	2.06%	3.45%
3	Flicker	Pst <1, Plt <0.65		0.29	0.97	0.66
4	Fault in feeding circuit	Cease to energise		Plant cease to energise during fault conditions in the feeding circuit.		
5	Anti islanding on grid fail	PV inverter shall stop in milli seconds	2 secs	The PV Inverter stop in less than 2 sec		
6	Voltage and frequency sensing time delay function to prevent energising de energised circuit .	distributed generation source shall not reconnect the system unless voltage and frequency of the grid supply is stable for at least 60 seconds	60secs	The time measured is above 60 secs		

ESSENTIAL TEST ON ROOF MOUNTED PV PLANTS						
Name of Consumer : M/S MACFAST				Capacity: 50 KW 3Φ		
PV Model : Delta RPIM-50A		Sl.No:03617505144WH	Consumer no: 16581 Ele. Section: Thiruvalla			
Sl No	Parameter	Condition as per CEA regulation	Set value	Test Result		
1	Harmonic Injection			R Phase	Y Phase	B Phase
	a. Voltage Harmonic	<3 %		2.10%	2.00%	2.00%
	b.Current harmonic (TDD)	<8 %		(For 55% load)		
				2.31%	2.47%	3.08%
2	Direct Current Injection	<0.5% of the full rated output at the interconnection point.		2.09%	2.31%	2.53%
3	Flicker	Pst <1, Plt <0.65		0.09	0.58	0.78
4	Fault in feeding circuit	Cease to energise		Plant cease to energise during fault conditions in the feeding circuit.		
5	Anti islanding on grid fail	PV inverter shall stop in milli seconds	2 secs	The PV Inverter stop in less than 2 sec		
6	Voltage and frequency sensing time delay function to prevent energising de energised circuit .	distributed generation source shall not reconnect the system unless voltage and frequency of the grid supply is stable for at least 60 seconds	60secs	The time measured is above 60 secs		

*Recommended.*

*[Signature]*



# KERALA STATE ELECTRICITY BOARD LTD.

Thiruvalla Electrical Section - 4617

## SOLAR GRID FEASIBILITY REPORT

Consumer Number	1346170016581
Consumer Name	FR.CHERIYAN J KOTTAYIL
Section	Thiruvalla [4617]
Application Date	12-02-2018
Inspection Date	12-02-2018
HT Feeder	Pushpagiri [THIRUVALLA 66KV]
Average Load of HT Feeder in KW	1200.000
80% of Average Load of HT Feeder in KW	960.000
Capacity of Solar plant connected till now in KW	103.000
Remaining Capacity that can be connected in KW	857.000
Capacity of Solar plant demanded in KW	100.000
Is it feasible to connect to grid ?	Yes
Validity of this certificate	30 days

Please remit Rs.100000/- as registration fees of the scheme for installation of solar energy system. If you fail to do so within 30 days from the date of issue of this certificate you will lose your priority.

Please submit the following documents along with application for registration

- 1.Scheme approval from Electrical Inspectrote
- 2.Scheme for installation of the solar energy system (Single Line diagram)
- 3.Technical specifications as well as other particulars of the grid-tied inverter, manually operated isolating switch,solar meter and net meter
- 4.Type Test Certificates for MCB,ELCB, fuse, inverter,etc issued by the laboratories accredited by the National Accreditation Board For Testing and Calibration Laboratories (NABL) or by such other institutions at international level for the testing and calibration of electrical equipment



ASSISTANT ENGINEER  
ELECTRICAL SECTION  
THIRUVALLA