Technical Manual: Interface Charge Controller

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1. Main Background

If the customer has already invested in a domestic Inverter and battery set and now wants to switch to Solar power, he/she may use our system to integrate Solar PV charging in a simple and cost efficient manner.

Product being a add –on to existing domestic Inverters offers a very cost efficient way of converting an existing domestic Inverter (already owned by the customer) into Solar power conditioning unit (Solar Inverter+ Battery charge controller)

Thus with this revolutionary system, already made investment can be made more value for money by adding Solar Photovoltaic charging(using Solar modules which customer needs to purchase) to conventional AC Grid charging, while the customer can continue to use already existing domestic Inverter and Inverter batteries.

2. Objective

a. To promote Solar Energy and thus contributing to the environment.

b. To make Solar more affordable.

c. To develop and manufacture an easy to install/maintain system that work with existing domestic Inverter/storage batteries.

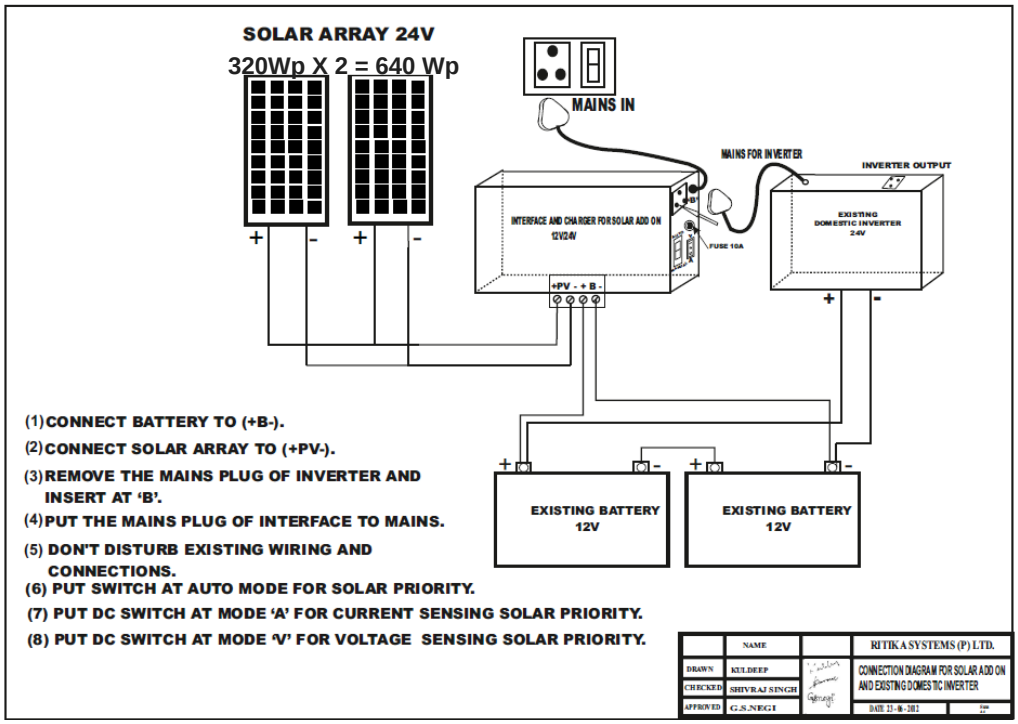
d. To keep battery charge level healthy at all times.

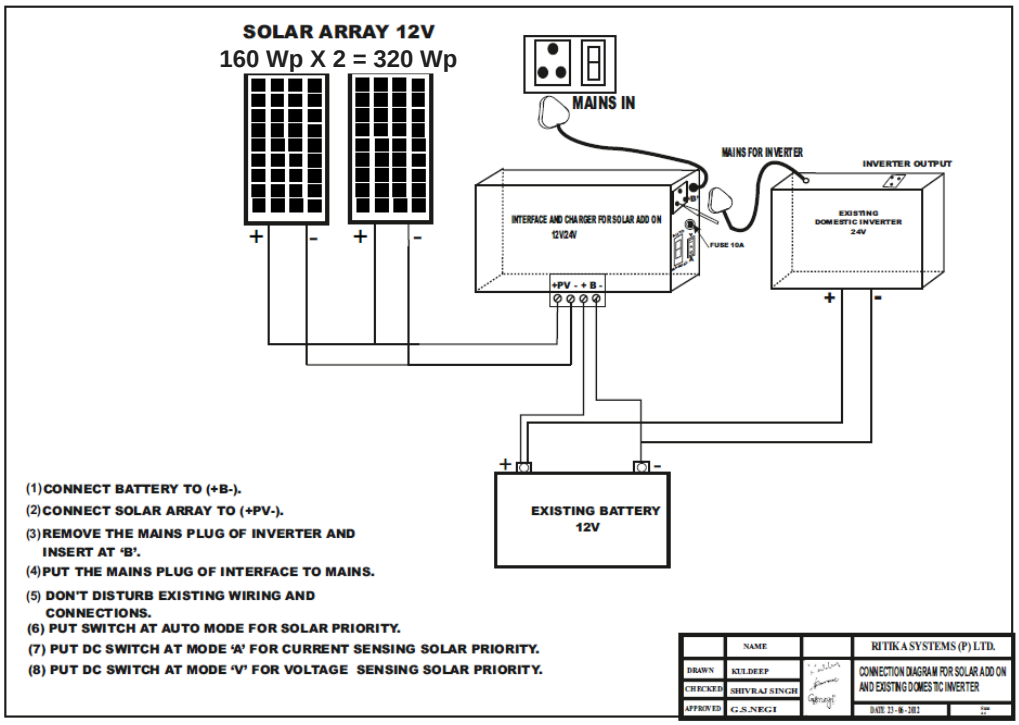
e. To give preference to Solar PV charging. This helps in reducing AC grid electricity units consumed by the customer.

Solutions from other manufactures do exist but their system is formed only by adding a basic battery charge controller which is non intelligent design in which Solar PV charging is not given any preference over AC Grid charging, hence free energy from Solar is not fully utilized. With

our invention, Solar PV is always given priority to charge the batteries. This reduces utility (electricity) bill also.

3. Block Diagram





4. Working

a. It provides the facility to charge battery through Solar or using AC grid when battery Voltage falls below preset level.

b. The Interface connects the load automatically to the Grid power and also charges the battery using AC Grid as well as by Solar.

c. During Day Time:- when batteries are charged to the preset levels, the Interface automatically cuts AC grid power from the system and load will run through the Inverter (using stored battery charge) and Solar.Hence during Day time, The system is designed to give priority to Solar power and use Grid power only when the Solar power is insufficient to charge the batteries or battery charge is insufficient to meet the load requirement.

d. During Night Time:- The Inverter becomes normal domestic Inverter. This is required because if it continues to function as a Solar Inverter, AC load will run on battery (through Inverter) till the battery becomes low.Now, If AC grid is available, battery will get charged but immediately if AC Grid mains fails and the battery is in low charge state, the Inverter output will not be available.Hence DURING NIGHT TIME the system work as normal domestic Inverter

S.No	Battery	PV	Mains (AC)	Inverter
1	12Vor24V (Automatic)	12V or 24V/40A (Automatic)		12V or 24V
2	Battery Voltage Normal	PV - Available PV Chg. Yes (priority) If PV Current > (2A to 2.5A) If PV Current < (2.5A to 2A)	Mains – Available Mains Chg. Off Mains Chg. On	 Load Online Load Offline
3	Battery Voltage Low	PV - Available PV Chg. Yes	Mains – Available Mains Chg. Yes	Load Offline
4	Battery Voltage Normal	PV - Not Available or PV Current < (2A to 2.5A)	Mains – Available Mains Chg. Yes	Load Offline
	Battery Voltage Normal	PV- Not Available	Mains Fail	Inverter On

5. Test Results

S.No.	Battery	PV	Mains	Inverter Operation
1.	Battery Voltage Normal	PV Current < (2.5A to 2A) PV Current > (2 A to 2.5A)	Mains Chg. ON Mains Chg. Off	Offline Online
2	Battery Voltage Low	PV Chg. ON	Mains Chg. ON	Offline

	11.2V/22.4V			
3	**Battery Voltage Reach 13.8V/27.6V**	**PV Chg. ON (14.4/28.8 ±0.2)V**	**Mains Chg. Off**	**Online**
4.	**Night**	**PV Voltage Low**	**Mains Chg. ON**	**Offline (Normal Inverter)**

6. Modes

a. Auto Manual Switch Mode

Auto Mode – in Auto Mode Interface Charger works according to the condition of DC switch 2

Manual Mode – in Manual Mode Solar Interface Charger will charge battery in parallel with grid charging through Inverter. **(OPTIONAL)**

b. DC Switch

In Current Mode if PV Chg. Current is < (2A to 2.5A), Interface Charger connects Grid to Inverter and charges battery through grid and Solar. If PV Current >(2A to 2.5A) the Interface Charger disconnect grid of Inverter and gives Solar priority. If battery Voltage decreases below preset level ie (11.2V +/- 0.2V), the Interface Charger connect grid to Inverter and charges battery through grid and PV up to preset level of battery ie. (13.8V+/- 0.2V) and disconnect grid. At night Inverter works as normal Inverter.

In Voltage Mode if battery Voltage decreases below preset level ie (11.2V +/- 0.2V) the Interface Charger connect grid to Inverter and charges battery through grid and PV up to preset level of battery ie. (13.8v+/-0.2v) and disconnect grid. At night Inverter works as normal Inverter. **(OPTIONAL)**

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