

In-Diya™

Battery Charging Station

A step towards a brighter life



**Installation Manual
and
User Guide**

Schneider
Electric

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Specifications subject to change without further notice

Greetings!

Dear Customer,

Thank you for purchasing the Schneider Electric Battery Charging Station. We are confident that you will find satisfaction in the performance, quality and the functional beauty achieved through our human-engineering concept. Please read and understand this manual carefully before use, for better installation and performance of the Battery Charging Station. The Customer Care center and your dealer are available to assist you if further queries were to arise.

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About Schneider Electric BIPBOP* Program

Schneider Electric has developed a sustainable program to bring safe, clean electricity to the people who need it the most worldwide.

With a strong willingness to involve local communities and local stakeholders in each country, the BIPBOP program addresses three key issues to provide sustainable access to electricity

- > lack of appropriate equipment through the development of an adequate offer
- > lack of financial resources available for innovative energy entrepreneurs through funding
- > skills and expertise shortage through technical and business training

This strategy builds upon a profitable and responsible vision and is called BIPBOP – an acronym standing for **Business, Innovation and People at the Base of the Pyramid****

* BIPBOP is the name of an internal Schneider Electric program

** BOP, for Base Of the Pyramid, is the expression commonly used to refer to people with the lowest income on a global scale in a given country.

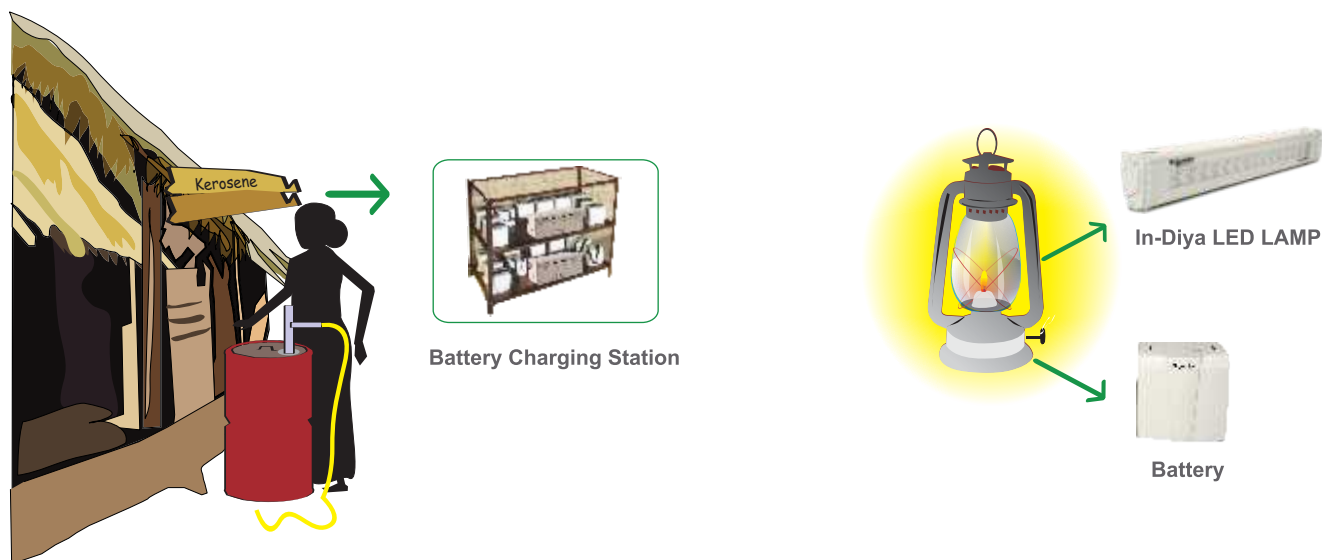
Schneider Electric Battery Charging Station

Affordable and reliable lighting for people without access to electricity

Worldwide 1.6 billion people or 300 households, have no access to electricity***. Those who are connected to the grid keep facing scheduled and unscheduled power cuts, leaving them with few hours of electric power available every day. People who do not have access to electricity spend US\$ 4-6 monthly for lighting using kerosene lamps. Even those who have grid connection use kerosene lamps or candles during unavailability of power from grid, as they cannot afford to buy Uninterrupted Power Supply. However, kerosene lamps generate green house gases like CO₂ and emit hazardous fumes, which is the root cause of many diseases among its users.

The Battery Charging Station from Schneider Electric helps the underprivileged to access a safe, reliable and green source of light at an affordable price. In areas where the grid has not reached, the battery charging station can be installed to enjoy efficient source of lighting from solar energy.

*** Source: world development indicators - World Bank



The Battery Charging Station consists of a battery charger which can charge 10 numbers of 12 V, 5 Ah Sealed Maintenance Free (SMF) batteries simultaneously. It can be powered by a Solar Panel/Grid Supply or both. In remote areas where grid power is not available, the Battery Charging Station can be powered by 100% solar power. A single 12 V, 5 Ah SMF battery can power the Schneider Electric LED based light for 8 hours for 90 LED and 15 hours for 45 LED.

There is an option to use a 12 V, 60 Ah reservoir battery, which will be able to charge 10 numbers of batteries for a single charge, in case of cloudy days (when powered by solar panels) or in case of power failure (when powered by Mains supply).

Battery Charging Station: A Social Business Model

A local entrepreneur invests and owns the battery charging station, in order to run it, the entrepreneur charges the batteries at the charging station and delivers them to the customers who have purchased a Schneider Electric In-Diya™ LED lamp. He will supply the batteries to customers on rent at a nominal amount. Everyday, the local entrepreneur collects the discharged batteries and charges them at his charging station.

1 Battery Charging Station run by local entrepreneur



2 Transport of batteries



4 Happy customer



3 Delivery of battery to the customer by entrepreneur



Benefits of the Battery Charging Station



The Battery Charging Station helps in providing light to those who

- > do not have light today because they are living in a no grid area
- > cannot afford to connect to grid

The Battery Charging Station is owned by an individual entrepreneur or a self help group who will run it in a profitable manner and can earn their livelihood by renting the charged batteries at the charging station.

People who cannot afford the initial investment for an individual solar home lighting system or grid connection can have access to reliable lighting by purchasing In-Diya™ LED Lamp and taking battery on rent.



During rainy season or cloudy weather, there is a provision to charge the batteries through a diesel generator or from the grid.

When all the batteries in the charging station are charged, the extra energy from solar energy is stored in a reservoir battery bank of 12 V, 60 Ah. The additional battery (reservoir) can provide one day's back-up when the weather is cloudy.



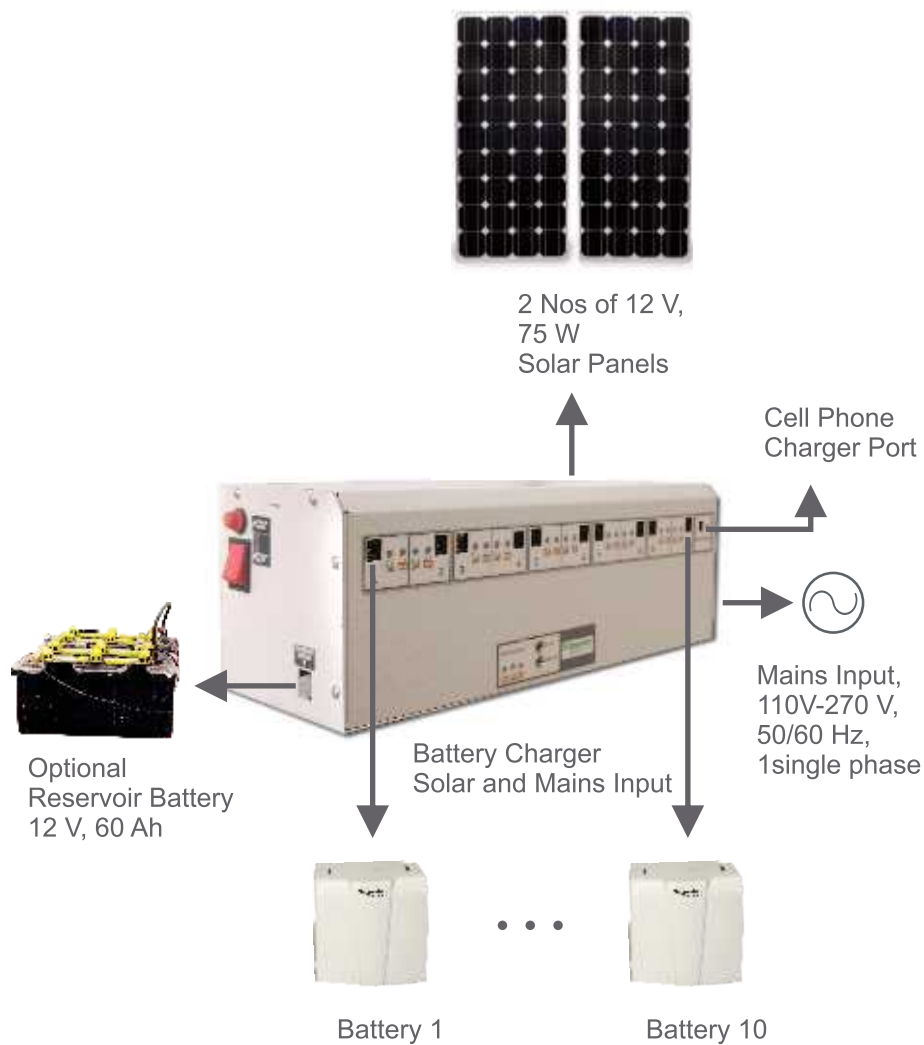
Through Battery Charging Stations, people have access to safe, reliable, and green lighting, which will not cause health hazards.



The Battery Charging Station supports socio-economic activities:

- > School children and college students can study at night
- > Income-generating activities can be carried out during the evening (eg. handicrafts, weaving, selling in night markets etc.)
- > People can use the lamps for social events like festivals and marriages

Architecture of the Battery Charging Station




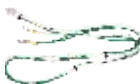







How to Scale-up the Battery Charging Station

Number of customers	Number of solar powered battery chargers	Number of 12 V, 75 Wp solar panels	Number of 12 V, 5 Ah batteries in the charging station	Charging time (hours per day)
5	1	1	1 to 5	6 - 8
10	1	2	1 to 10	6 - 8
20	2	4	1 to 20	6 - 8
30	3	6	1 to 30	6 - 8

Bill of Materials

Battery Charging Station with one battery charger for charging 10 batteries

Serial #	Description	Schneider Electric Product reference number		Quantity
1	Solar Panel 12 V, 75 Wp	AEH-PV08-75W		2
2	Module mounting structure for ground installation of 12 V, 75 W solar panels	To be purchased locally		2
3	Battery Charger - Solar and Mains Input	AEC-BC01-5A		1
	Reservoir battery cable			1
	10 numbers of charging cables			10
4	Backup for LED Lamp 12 V, 5 Ah	AEH-B06-4.5AH		10
5	Reservoir battery 12 V, 60 Ah	To be purchased locally		1
6	Cable from solar panel to battery charger 2 core, 4 sq mm	To be purchased locally		1
7	In-Diya LED Lamp or In-Diya LED Lamp (S)	AEH-LP04-5W or AEH-LB11-2.5W		10

Notes

- > When connected to grid, solar panels are optional
- > Reservoir battery is optional
- > LED lamp (see serial number 7) has to be purchased by the customer or the entrepreneur
- > The desired length of the cable (2 core 4 sq mm) from solar panel to the battery charger can be procured as per the site requirement
- > The cable connecting the solar panel to battery charger needs to be purchased locally, as the length depends on the site condition

Specifications of Components of the Battery Charging Station

1. Solar panels (AEH-PV08-75W)

Maximum power (Pmax)	: 75 Wp
Maximum voltage (Vmp)	: 17.2 V
Maximum current (Imp)	: 4.36 A
Open circuit voltage (Voc)	: 21.49 V
Short circuit current (Isc)	: 4.52 A
Operating temperature	: - 40° to + 85°C
Dimensions (LxBxH)	: 665 mm x 30 mm x 1005 mm
Weight	: 8 kg



2. Module mounting structure to be purchased locally

Weight : 8 kg



Hot dipped Galvanized Module Mounting Structure (MMS) for 75Wp Module (1005x680x30mm)

GI pole to mount MMS	1" dia / 3ft	1No
Stainless steel nuts and bolts with plain & spring washer to mount solar module on to the MMS	M8	4Nos
Clamps to fix MMS on the wall / wooden log	Suitable for 1" dia pole	3Nos
Nails to fix MMS on the wall / wooden log	2" nails	6Nos

3. Battery Charger - Solar and Mains Input (AEC-BC01-5A)

Solar input voltage	: 16-21 V, DC
AC main input	: 110-270 V, 50/60 ϕ Hz, 1
Reservoir battery	: 12 V, 60 Ah
Number of reservoir charging ports	: 10 numbers
Number of mobile charging port	: 1 number
Dimensions (LxBxH)	: 395 mm x 237 mm x 68 mm
Weight	: 3.77 kg



> Reservoir battery cable

Specification	: 18 AWG
Length	: 1 m



> Battery charging cables

Specification	: 1.5 sq mm
Length	: 1 m



Note : Reservoir battery cable and battery charging cables are provided along with the solar powered battery charger

Specification of Components of the Battery Charging Station

4. SMF batteries (AEH-B06-4.5AH)

Battery voltage	: 12 V
Capacity	: 5 Ah
Battery type	: SMF
Dimensions (LxBxH)	: 132 mm x 132 mm x 85 mm
Weight	: 2.15 kg



5. Reservoir battery

Battery voltage	: 12 V
Capacity	: 60 Ah
Battery type	: Lead Acid
Dimensions (LxBxH)	: 410 mm x 173 mm x 210 mm
Weight	: 28 kg



Note: If a 2 day autonomy is needed for Battery Charging Station, use 12 V, 120 Ah instead of 12 V, 60 Ah.

Also:

In-Diya LED Lamp

AEH-LP04-5W or AEH-LB11-2.5W

Lamp voltage	: 12 V DC
Dimensions (LxBxH)	: 318 mm x 52 mm x 60 mm
Weight	: 0.41 kg

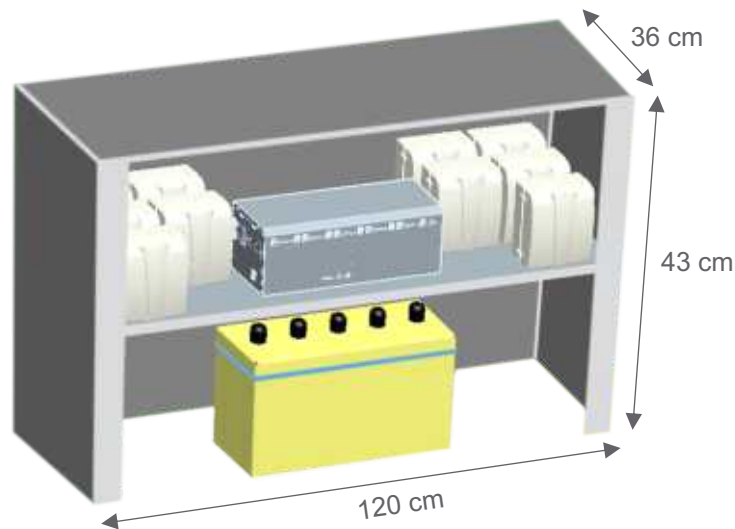


Installation of the Battery Charging Station

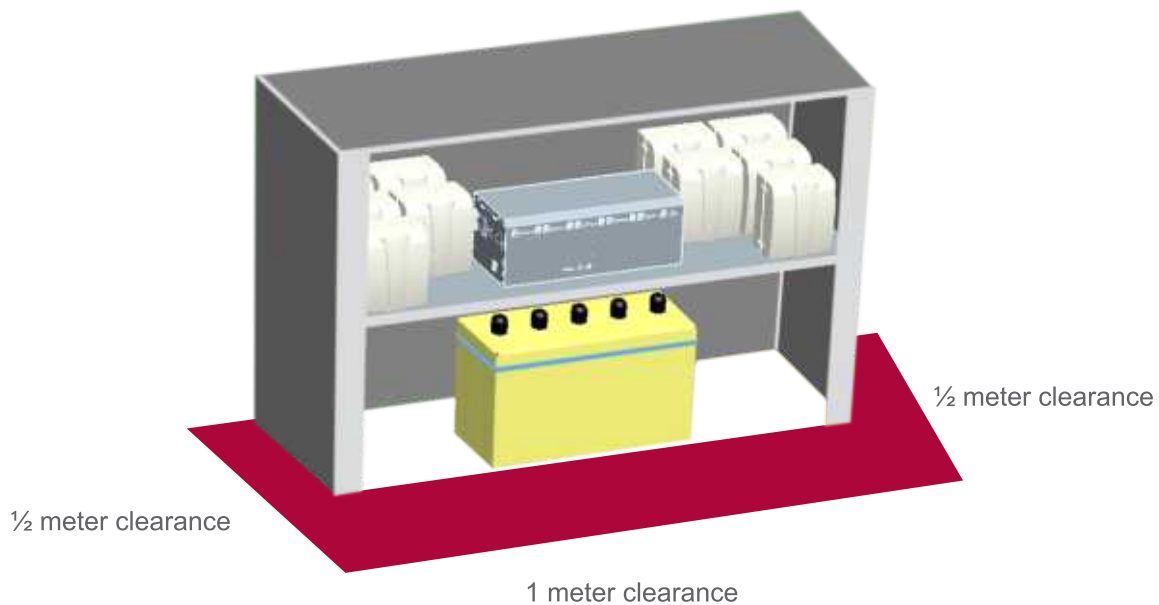
> Installation of the battery charging station with one battery charger

1. Space required to install

- > 1 battery charger
- > 10 numbers of batteries
- > 1 reservoir battery (optional)



2. Floor area requirement



3. Safety requirement

- > The room where the battery charger and batteries are installed must be well ventilated
- > There should not be any flammable material inside the room
- > The room should be clean and free from water leakage
- > The battery charger and the batteries must be kept indoor

> Space required to install 12V, 75Wp solar panel (AEH-PV08-75W)



> Installation of solar panel

1. Installation of solar panel on roof

Place the module mounting structure (To be purchased locally) on the roof and clamp the pole of the module mounting structure to the wall

Screw the solar panel to the module mounting structure

The solar panel should face towards south at an angle 25 to 30 degrees, to receive maximum sunlight throughout the day



Note: Module mounting structure for rooftop mounting needs to be made locally

2. Installation of solar panel on ground *

Install the module mounting structure

Screw the solar panel to the module mounting structure




* Select shadow free area for solar panel installation

> Connection of solar cable to the solar panel



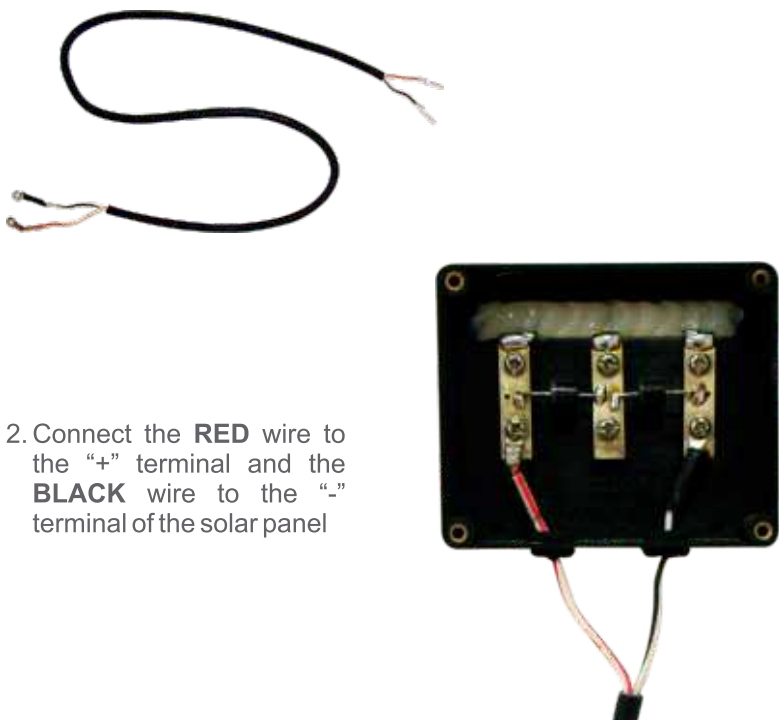
Solar Panel Front Solar Panel Rear

Junction Box




1. Open the junction box

This section shows the initial setup. On the left, two views of a solar panel are shown: the front with its grid of cells and the rear with a white backing. A black junction box is mounted on the top of the rear panel, indicated by a green arrow and a label. On the right, the junction box is shown open, revealing three metal terminals. A grey arrow points from the rear panel view to the open junction box view.



2. Connect the **RED** wire to the “+” terminal and the **BLACK** wire to the “-” terminal of the solar panel



3. Close the junction box after having connected the wire

This section shows the wiring process. On the left, a black cable with two wires (one red, one black) is shown. Below it, the junction box is shown with the red wire connected to the leftmost terminal and the black wire connected to the middle terminal. On the right, the rear panel is shown with the junction box closed and the wires extending from it. A grey arrow points from the wiring view to the rear panel view.

> Connection of solar panel to the battery charger

1. Turn OFF the AC main switch



2. Turn OFF the reservoir battery switch



3. Connect the **RED** wire from solar panel to the “+” terminal of the battery charger, and the **BLACK** wire from solar panel to the “-” terminal of the battery charger



4. Turn ON the mains switch and check the solar LED indication



- > If it is not glowing, then check the connections
- > If it is glowing, then the solar installation is successful

In case of battery charger powered by main supply, check the AC LED indication

- > If it is not glowing, then check if the main switch is ON
- > If it is glowing, then the installation using main supply is successful

> Installation of the Battery Charging Station with multiple battery chargers

Follow the procedures mentioned from pages 10 to 13

> Connection of batteries to the battery charger

1. Connect one end of the battery charging cable to the battery charger



2. Connect the other end of the battery charging cable to the battery



3. Repeat the above two steps for all the batteries
4. After connecting all the batteries for the first time, charge them continuously for 24 hours

Operating the Battery Charging Station

To switch ON the battery charger, when

> Powered from solar



Turn ON the “AC & Solar ON/OFF” switch which is on the right-hand side of the battery charger



Observation 1: “Solar ON” green LED glows to indicate that solar power is available

Observation 2: Orange LED glows to indicate that the chargers are ready to charge the batteries



> Powered from grid (mains supply)



Turn ON the “AC & Solar ON/OFF” switch which is on the right-hand side of the battery charger



Observation 1: “Solar ON” red LED glows to indicate that AC mains power is available

Observation 2: Orange LED glows to indicate that the chargers are ready to charge the batteries



> Powered from both solar and grid (mains supply)



Turn ON the “AC & Solar ON/OFF” switch which is on the right-hand side of the battery charger



Observation 1: Both “AC ON” red LED and “Solar ON” green LED glow, indicating that solar and grid (mains supply) power are available

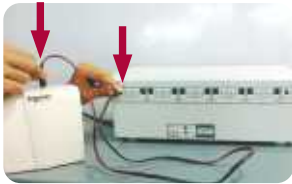
Observation 2: Orange LED glows to indicate that the chargers are ready to charge the batteries



Connecting the SMF Battery for Charging

> Follow the below steps

Step 1: Connect one end of the battery charging cable to the battery charger and the other end to the (SMF) battery as shown below



Step 2: Repeat step 1 for all the 10 batteries

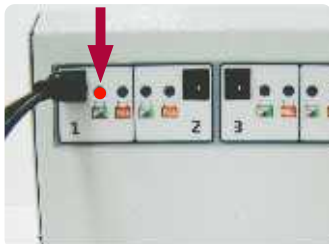


Step 3: Operation of reservoir battery: Turn ON the “Reservoir ON/OFF” switch, which is on the left-hand side of the battery charger



> To know the charge status of the batteries being charged

Observation 1: Green LED ON indicates that the battery is charging



Observation 2: Orange LED ON indicates that the battery is full



> To know the status of the reservoir battery

When this LED is **green**: Reservoir battery is being charged



When this LED is **red**: Reservoir battery is low





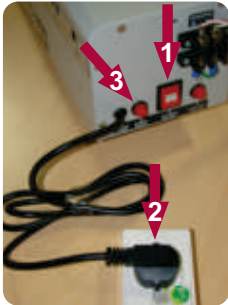




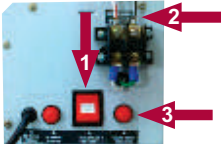
When this LED is **green**: Reservoir battery is charging the SMF batteries













When this LED is **orange**: Reservoir battery is fully charged



Basic Troubleshooting

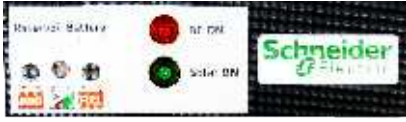
SI #	Problem	Diagnosis	Solution
1	<p>The battery charger is not getting powered by AC mains when (AC & Solar ON/OFF) switch is turned ON</p> <p> : AC ON LED is not glowing</p> 	1 Check whether the “AC & Solar ON/OFF” switch is turned ON	If the “AC & Solar ON/OFF” switch is not ON, switch it ON
		2 Check for the proper connection of AC mains power plug to the grid	Connect the power plug correctly if it is not connected properly
		3 Check the fuse (AC input)	
2	<p>The battery charger is getting powered but the batteries are not getting charged</p> <p> : Green LED is not glowing</p> 	Check for the proper connection of the battery charging cable from battery charger to battery	Connect the battery charging cable, if not connected properly
3	<p>The battery charger is not getting powered by solar power when the (AC & Solar ON/OFF) switch is turned ON</p> <p> : Green LED is not glowing</p> 	1 Check whether the “AC & Solar ON/OFF” switch is turned “ON”	If the “AC & Solar ON/OFF” switch is not ON, switch it ON
		2 Check for the proper connection of solar input cable, red wire to positive terminal and black wire to negative terminal of the battery charger	Connect the solar cable properly if it is reversely connected
		3 Check for the fuse (solar input)	

Basic Troubleshooting




SI #	Problem	Diagnosis	Solution
4	<p>The battery charger is getting powered by solar, but the batteries are not getting charged</p> <p> : Green LED is not glowing</p> 	<p>Check for the proper connection of the battery charging cable from battery charger to battery</p> 	<p>Connect the battery charging cable, if it is not connected properly</p>
5	<p>The reservoir battery is not charging the small SMF batteries</p> <p> : No reservoir battery indication</p> 	<p>Check for the “Reservoir ON/OFF” switch. Switch must be turned ON for the reservoir battery</p>  <p>Check for the proper connection of the reservoir battery cable from battery charger to reservoir battery</p>  <p>Check for the reservoir battery blown fuse</p> 	<p>Switch ON the “Reservoir ON/OFF” switch</p> <p>Connect the reservoir battery cable, if it is not connected properly</p> <p>If the fuse has blown, replace it with a 12A fuse</p>
	<p> : The red LED is glowing: reservoir battery is low</p> 		<p>Charge the reservoir battery for 24 hours</p>

Status of Indicator LEDs

> Power availability indication





	Solar ON (GREEN)	AC ON (RED)
When AC is present	OFF	ON
When solar is present	ON	OFF
When AC & solar are present	ON	ON

> Battery charging indication when powered by solar or by mains supply

	 Charging LED (GREEN)	 Full LED (YELLOW)
When a drained battery is connected to the battery charger	ON	OFF
When a partially charged battery is connected to the battery charger	ON	OFF
When a fully charged battery is connected to the battery charger	OFF	ON












Note: "Charging LED is ON" implies that the battery is getting charged

> Reservoir battery charging indication when powered by solar or by Mains supply

	 Boost LED (GREEN)	 Charging LED (GREEN) (RED)		 Full LED (YELLOW)
When power from grid and solar is NOT available	ON	OFF	Red LED glows if reservoir battery is low	OFF
When power from grid and solar is available	OFF	Green LED glows when all the SMF batteries are fully charged → The reservoir battery then gets charged	OFF	Yellow LED glows if the reservoir battery is fully charged

Note: Reservoir battery charges the SMF batteries whenever power from solar and grid is not available

Important Safety Instructions and Precautions

 Do	 Don'ts
<p>Make sure the ground connection is done in the mains supply </p> <p>Check the reservoir battery fluid level often to prevent gas buildup. Distilled water is recommended for the refill * </p> <p>Keep reservoir terminals clean from corrosion for best electrical contact </p> <p>Install the battery charger and batteries in a well-ventilated room </p> <p><small>* In case you are using reservoir battery</small></p>	<p>Do not install the Battery Charging Station outdoor </p> <p>Do not expose the battery and battery charger to water or rain, fire or smoke, any chemicals or corrosive agents </p> <p>Do not touch the system with wet hands </p> <p>Do not cover the system </p> <p>Do not open the battery charger </p>

Maintenance Instructions

To help maximize the power output, gently clean the surface of the solar panels frequently with a wet cloth.

Warranty Terms and Conditions for the Battery Charging Station

The warranty card entitles the purchaser of a Battery Charging Station to the following warranty:

- > 10 (ten) years on solar panel
- > 1 (one) year on batteries
- > 1 (one) year on Battery Charger - Solar and Mains Input

This warranty is valid only for manufacturing defects and does not cover defects due to external damages such as

- > Improper operation, maintenance or modifications
- > Natural calamities such as fire, flood, lightning or other acts of God
- > Breakage of plastic components, including the product housing

This warranty is **MADE VOID** if

- > The warranty sticker is tampered with or removed
- > The warranty card is misplaced
- > The product is opened and serviced by any person not authorized by Schneider Electric

For parts replaced during servicing, only the remaining warranty period of the original product applies.

For sales in India: Any disputes arising with reference to the interpretation of these Warranty terms & conditions shall be subject to the jurisdiction of the Civil courts in New Delhi.

For international sales: Please contact your local dealer.

Warranty Card

This warranty card is valid only if it is filled in completely, signed and stamped by the dealer on the date of purchase

WARRANTY CARD	
Variants	<input type="checkbox"/> AEH-PV08-75W Solar panel(12 V, 75 Wp) <input type="checkbox"/> AEC-BC01-5A Battery Charger - Solar and Mains Input <input type="checkbox"/> AEH-B06-4.5AH Backup for LED lamp (12 V,5Ah)
Serial Number	
Name of the Dealer Supplier	
Address	
Date of Purchase	
Dealer's Signature and Stamp	

For sales in India:

Customer Care Centre
Schneider Electric India Pvt. Ltd

Toll Free: 1800 180 17 07 / 1800 103 00 11

General Number: 0124 4222040

Fax Number: 0124 4222042

Email: in-care@in.schneider-electric.com

Web: www.schneider-electric.co.in

For international sales:

Please contact your local dealer.

Our range of products for the Base of the Pyramid market includes:

AEH-LP01-SBG-5W	: LED Solar Lighting System – Mains Input
AEH-LB01-2.5W	: LED Lamp for Solar Home System – 2.5W
AEH-LP02-G-5W	: LED Lamp Mains Input
AEH-LP03-BG-5W	: LED Lamp with backup – Mains Input
AEH-LP04-5W	: LED Lamp – 5W
AEH-LP05-SB-5W	: LED Solar Home Lighting System – 5W
AEH-B06-4.5AH	: Backup for LED Lamp
AEH-B07-4.5AH	: Backup for LED Lamp with cell phone charger
AEH-LP07-5W	: LED Lamp for Solar Home System – 5W
AEH-PV08-75W	: Solar Panel 12V, 75Wp
AEH-LB11-2.5W	: LED Lamp – 2.5W
AEH-LP13-SB-2.5W	: LED Solar Home Lighting System – 2.5W
AEH-SCC01-3A	: Solar Charge Controller – 3A
AEH-SCC02-3A	: Solar Charge Controller with USB – 3A
AEC-BC01-5A	: Battery Charger - Solar and Mains Input
AEH-SHS01-10W2L	: Solar Home System – 2 Lamps

Make the most of your energy™

