



INSTRUCTION MANUAL

-- Joe-100 Series --

Waterproof Lead-based Battery Charger (IP68)



Model:

12V / 7A → 121-06702-500I

Model:

24V / 3.5A → 121-12352-500I

Dear Customer!

Thank you very much for your trust in us and our product.

Please read these operating instructions carefully **before** start of operation.

Mainland Energy Conversion LTD

1. Safety Rules and General Warnings

- ATTENTION: Avoid explosive gases, open flames and sparks – look for enough air ventilation while charging!
EXPLOSION RISK!!
- ATTENTION: The charger is exclusively designed for rechargeable Lead-based batteries and must not be used for other purposes. Please consider the charging instructions from the battery manufacturer before charging!
- DO NOT OPEN! Repair work must only be accomplished by authorized companies or specialized technical staff.
- Persons, which are not able to use the device in a safe way, because of their physical, sensory or mental competence, or because of their inexperience, should not use the charger without control or instruction of a skilled person. Look that the children don't play with the charger.
- If the mains connection of the device is damaged, you have to change it, with an original connection which is available at the manufacturer.
- Never place the device on top of the battery while charging!
- Protect against direct solar radiation.
- In case of obvious damage or malfunction immediately disconnect the device from mains supply and protect against unintended reconnection.
- The DC cable cannot be cut or shortened.

2. General Information

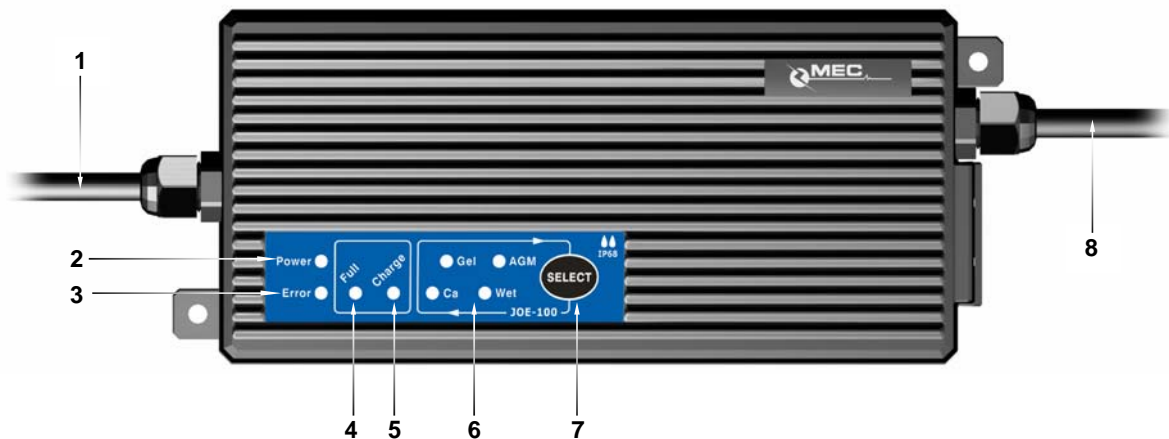
This waterproof Lead Acid Battery Charger was especially developed for the use in abominable environment, and in situations where water may be present. It is able to charge any lead-based battery, including Gel-, AGM-, Wet- and Ca- battery types, to utilize a 5-step charging program and safely function in a fully automatic mode. The output of the charger is electronically protected against short circuit, reverse polarity connection and deeply discharged batteries. Coloured LEDs on the top case are used to indicate charging status, errors, and selected mode of charging.

3. Special Features

- Battery type (Gel-, AGM-, Wet-, Ca - Battery) and power supply mode selectable;
- Distinctive warning of battery being in a state of deep discharge;
- Signalling of possible connection problems with battery terminals;
- Output power is reduced automatically at high temperatures;
- Indicating a non-chargeable ('dead battery') condition;
- Remote battery temperature sensing / charge voltage compensation;
- LEDs to indicate operation and charging status;
- 5-step charging technology with automatically restart charging;
- Short circuit and reverse polarity protection;
- Automatic Shut-off at too high temperature;
- Convection cooled;

4. Product Figure

- | | | |
|--------------------|----------------------|-----------------------|
| 1. DC-output cable | 4. Green Full-LED | 7. Select mode Button |
| 2. Green Power-LED | 5. Yellow Charge-LED | 8. AC-input Cable |
| 3. Red Error-LED | 6. Battery type-LED | 9. Extractable Hook |



5. How to select battery type and power supply mode

Connect to the mains, the Battery Type LED (Gel, AGM, Wet, Ca) shows the selected battery type. Press and hold (LED starts to flash fast) the Select button until the type LED (Gel, AGM, Wet, Ca) starts blinking slow. Now you will be able to select the battery type by pressing the Select button.

Battery type mode: When the correct battery type is selected. Press and hold the Select button again and release when Battery Type LED (Gel, AGM, Wet, Ca) stops blinking. If you don't perform this last step no change to the original battery type selection will be made.

Power supply mode: When the 4 LEDs (Gel, AGM, Ca, Wet) of battery type blinking slow. Press and hold the Select button again and release when Battery Type 4 LEDs (Gel, AGM, Ca, Wet) stop blinking. If you don't perform this last step no change to the original battery type selection will be made.

6. Operation

ATTENTION:

- Before operation please make sure that neither the power cable nor the charger including the charging cable show any damage and make sure that the mains supply complies with the specification.
- Please consider the charging instructions from the battery manufacturer before charging.

I. Connect the charger to the battery and start charging:

- a) Connect the power cable of the charger with the mains supply.
- b) Select the battery type.
- c) Connect the charging cable with the plug of the battery.

The charging process starts automatically and runs through the following five charging phases:

1. charging phase: wake-up

This charging step is indicated by **blinking alternately of the Charge-LED(5) and Full-LED(4)**.

(Explanation for this function: During the wake-up phase, the battery voltage between 2V and 6V for 12V battery, between 8V and 15V for 24V battery, and this battery has been discharged deeply. If the battery voltage lower than 6V for 12V battery and 15V for 24V battery after the charger uses pulse to wake-up the battery with 70 cycles, the charger will stop work, maybe the battery has been damaged before charging.)

2. charging phase: soft start

This charging step is indicated by **blinking slowly of the Charge-LED(5)**.

(Explanation for this function: During the soft start phase, the battery voltage between 6V and 12V for 12V battery, between 15V and 24V for 24V battery, the charger uses small current to charge battery, in order to extend battery lifetime.)

3. charging phase: constant current

This charging step is indicated by **blinking slowly of the Charge-LED (5)**.

(Explanation for this function: During the constant current phase, the battery is being charged to 80% of its capacity.)

4. charging phase: constant voltage

This charging step is indicated by **blinking quickly of the Charge-LED (5)**.

(Explanation for this function: During the constant voltage phase the battery is being charged to its maximum capacity.)

5. maintain phase: float charging

This charging step is indicated by **constant lighting of the Full-LED (4)**.

(Explanation for this function: the battery has reached its full capacity. The charger can now be disconnected from the battery (see pt. II disconnection the charger) or remain at the battery in float-charge mode.

II. Disconnect the charger from the battery:

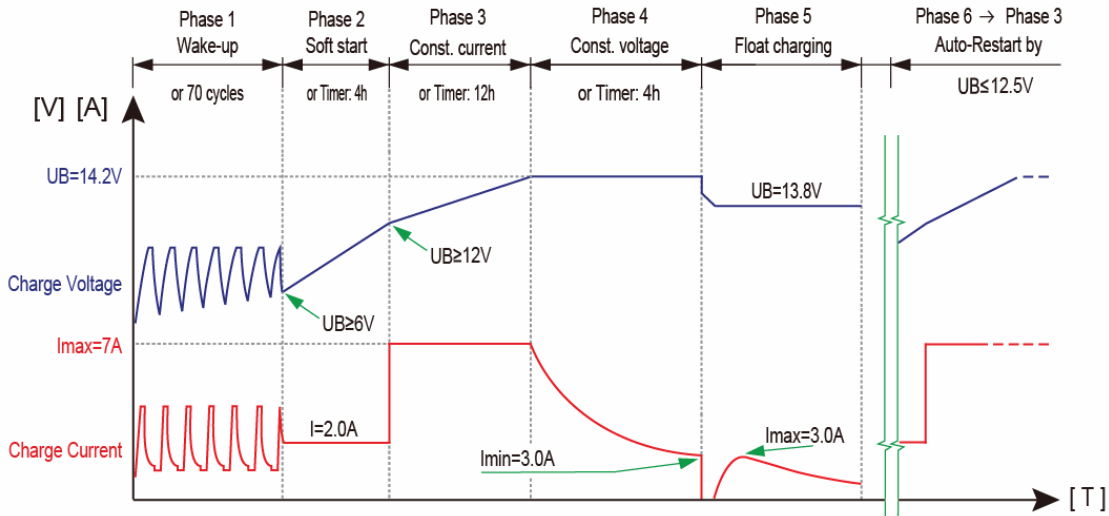
- a) Disconnect the charger from the mains supply;
- b) Disconnect the charger from the battery;

Charging advice:

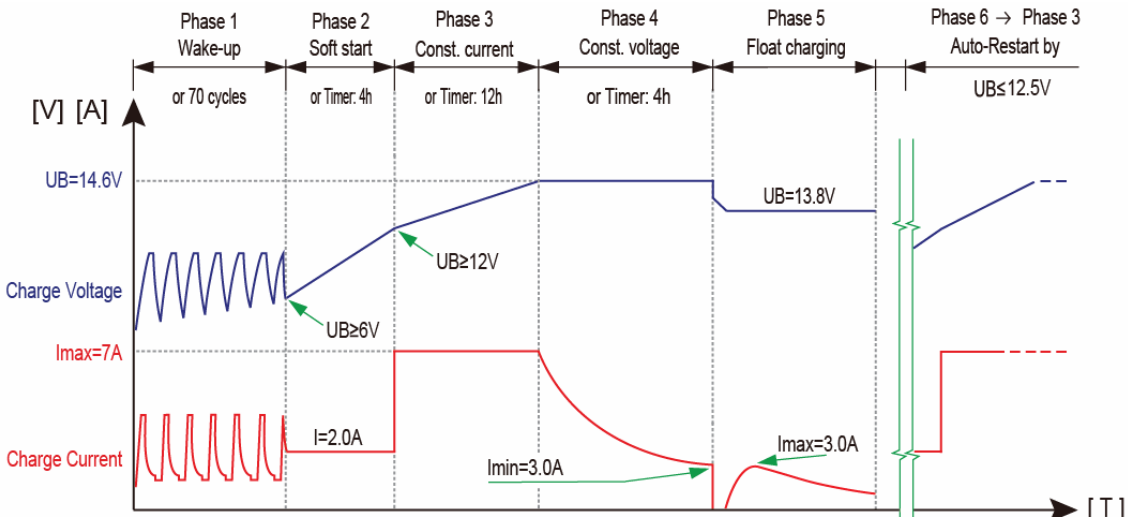
- If the charger will be disconnected from the battery during the charging process, the charge current will be interrupted immediately. In that case please disconnect the charger from the mains supply. For starting a new charging process please comply with the relevant points (see pt.I)
- For increasing the lifetime of a battery please do not stop a charging process before the battery charge full.

7. Charging curve

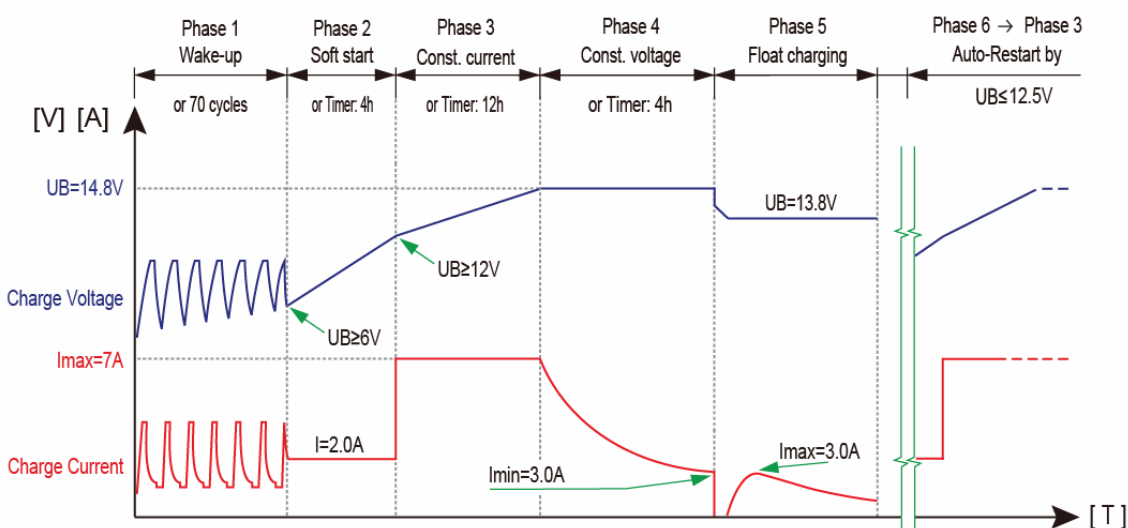
A. Gel for 12V battery:



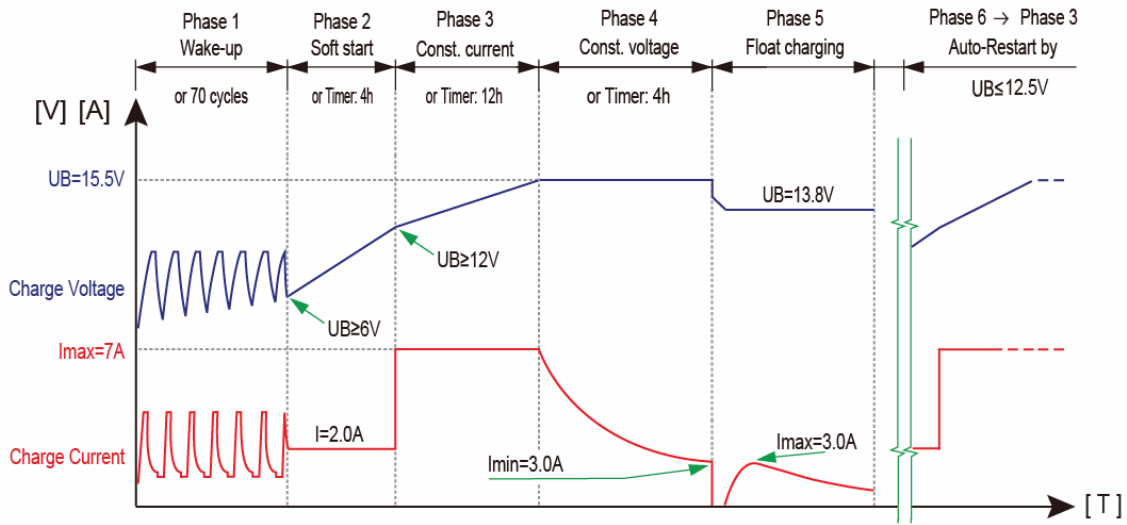
B. AGM for 12V battery:



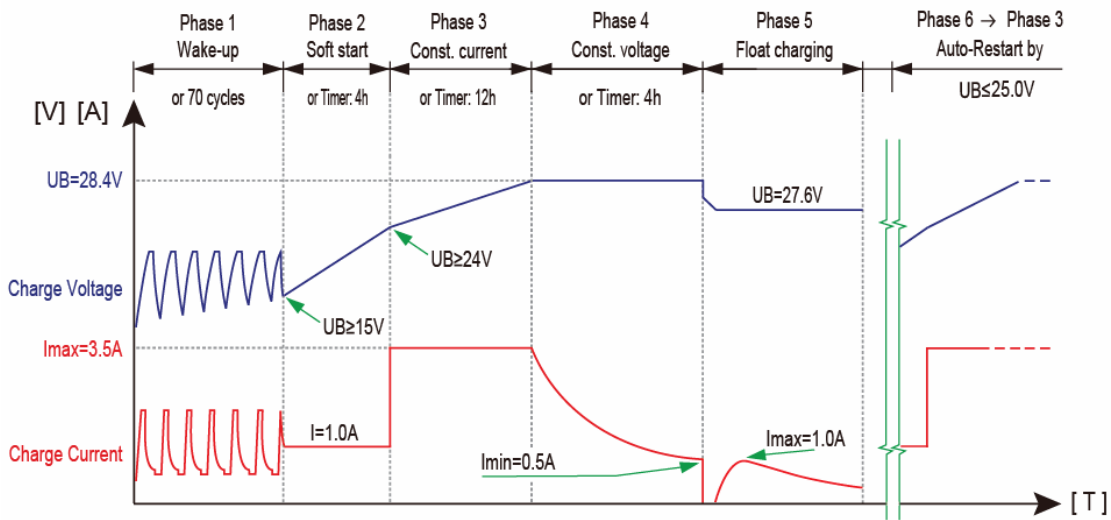
C. Wet for 12V battery:



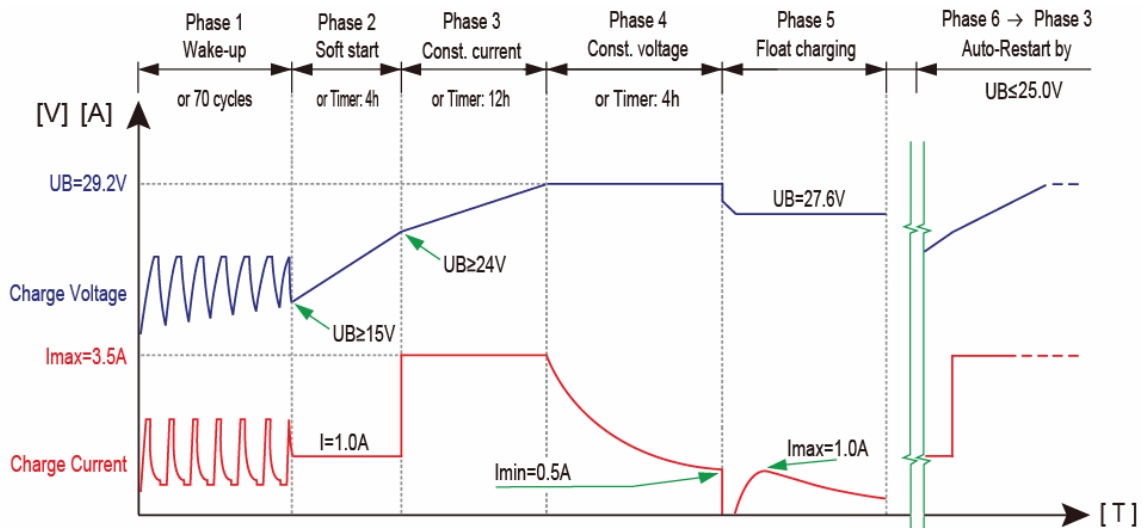
D. Ca for 12V battery:



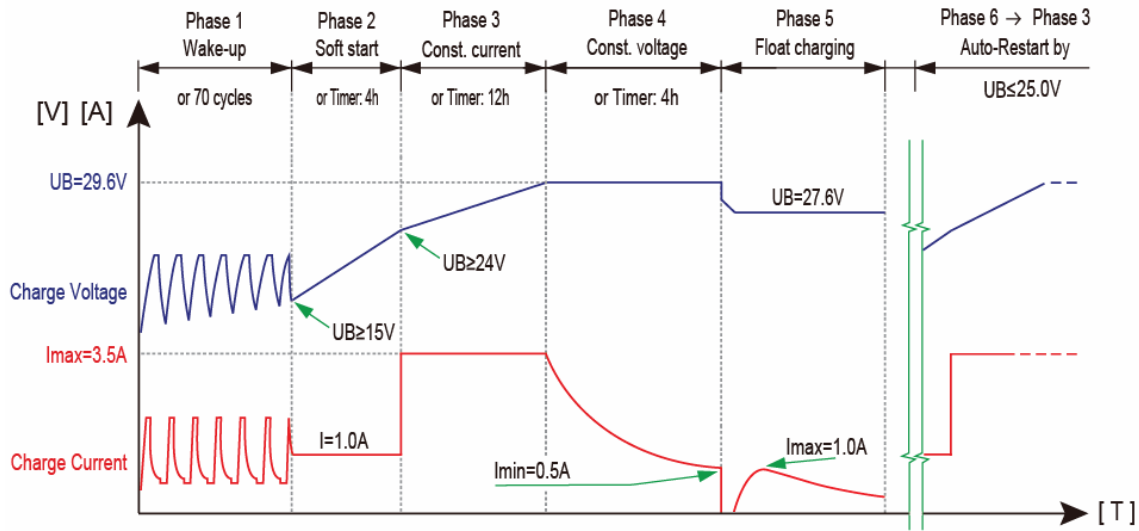
E. Gel for 24V battery:



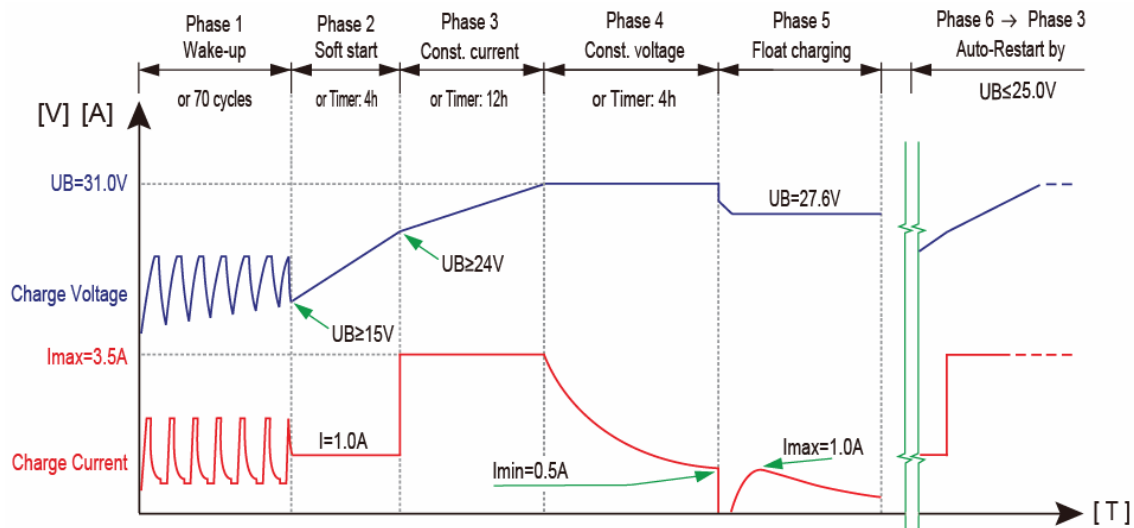
F. AGM for 24V battery:



G. Wet for 24V battery:



H. Ca for 24V battery:



8. Errors and Troubleshooting

No have LED lights after connected the mains:

- Check if connected the battery;
- Check if the mains plug is correctly plugged in;
- Check if mains cable is defective;

Red Error-LED blinking:

Error LED blinking times	Error message
1	"Dead" battery.
2	Battery temperature is too low.
3	Battery temperature is too high.
4	Charger temperature is too high as charging.
5	Battery voltage is too high, or wrong battery is connected.
6	Button short circuit.

9. Technical Specifications

Joe-100 Series		
Version	12V / 7A	24V / 3.5A
AC Input	180-264V / 50-60Hz	
Charging current	7A	3.5A
Output power max.	109W	109W
Cooling	Convection cooled	
Start charging voltage	2V	8V
Restart charging voltage	12.5V	25V
Efficiency	>87% at 230V	>89% at 230V
Back current drain	< 0.5Ah / month	
Grade of waterproof	IP68	
Certifications	CE	
Temperature range	0°C – 40°C	
Dimensions / Weight	180 x 85 x 45mm / ~850g	
Rec. battery capacity	20 – 90Ah	9 – 40Ah
MEC Art-No.:	121-06702-500I	121-12352-500I

10. Advice for Disposal



It is prohibited to dispose the charger into the house- and residual waste removal (WEEE-Richtlinie 2002/96/EG und EAG-VO) , it must be disposed at the according collection points. For the protection of our environment please inform yourself at your communal administrative agency about your nearest disposal point.



The charger equates to the RoHS-directive 2002/95/EG, for the restriction of the use of certain hazardous substances in electrical and electronic equipment.



11. Disclaimer of Warranty

- Mainland Energy Conversion LTD guarantees replacement or repair of chargers that are recognized as defective within 2 years under common environmental conditions. The validation of the warranty time starts with the delivery date from the manufacturer. Mainland Energy Conversion LTD is limiting the free guaranteeing to working hours and spare parts only.
- For damages caused by non-observance of the operating instructions, inappropriate start up or handling as well as reconstructions and modifications of the device, the warranty claim expires and Mainland Energy Conversion LTD assumes no liability for consequential damage to property or persons!
- Repair work must only be accomplished by authorized companies or professional staff!

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