



# MPPT Solar Charge Controller

## MCL Series

12V/24V/48V(Auto) 30A – 60A

48V/96V(Auto) 80A – 100A



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## PRODUCT INTRODUCTION

This MPPT solar charge controller adopts advanced DSP digital control technology, it is the intelligent, cost-effective choice for low-power applications that require maximum charging efficiency. There is advanced MPPT control algorithm to minimize the maximum power point loss rate and loss time, and can quickly track to the maximum power point of the photovoltaic array in any environment to obtain the maximum energy. In general, this MPPT solar charge controller is designed with three-stage battery charging algorithm for fast, efficient, and safe battery charging to extend battery lifespan significantly and improve system performance. With many comprehensive protections, like overcharging, over discharging, reverse connection for PV solar panel and battery, it can avoid damaging due to installation errors and system failures. This MPPT solar charge controller also features multifunctional LCD with communication ports for remote battery temperature and voltage measurement. It is widely used in many fields such as RVs, communication base stations, household systems and field monitoring.

## PRODUCT FEATURES



High Efficiency



12V/24V/48V or 48V/96V  
automatic detection



Support many types batteries



Scientific battery management method

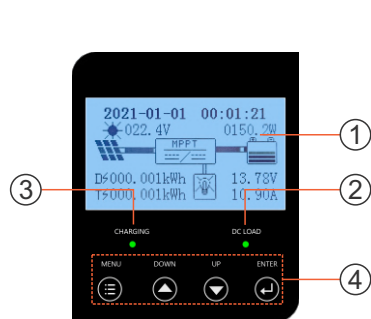


LCD Display + Communication Interface

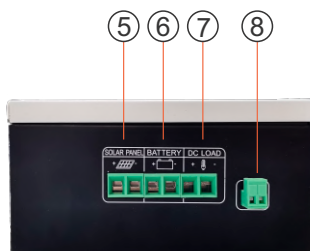


Multi-protections

1. Wide DC voltage input range, suitable for various common solar panel specifications.
2. Compatible for PV systems in 12V, 24V, 48V or 96V.
3. Select low power consumption chip to reduce static standby energy consumption and reduce energy loss.
4. Three-stage charging optimizes battery performance.
5. Maximum efficiency up to 98%
6. DSP control technology
7. Automatic battery voltage detection
8. Ability to output in parallel to power DC loads
9. Support wide range of batteries, like lead acid batteries including wet, AGM, gel batteries and lithium-ion batteries.
11. With temperature compensation function
12. Real-time power statistics function

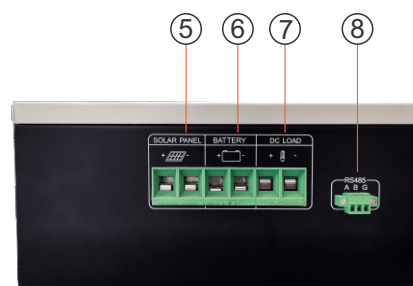


1. LCD Display
2. DC Load Indicator
3. Charging Indicator



(30A)

4. Function Buttons
5. Solar Module Connection Terminal
6. Battery Connection Terminal

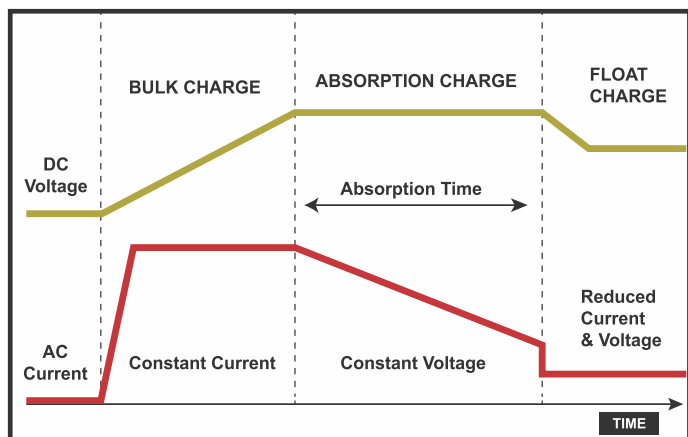


(40A-100A)

7. DC Load Connection Terminal
8. RS485 Interface

## CHARGING LOGIC

This unit charge controller has a 3-stage battery charging algorithm for a rapid, efficient and safe battery charging.



## Bulk Charge:

This algorithm is used for day to day charging. It uses 100% of available solar power to recharge the battery and is equivalent to constant current.

## Absorption Charge:

When the battery has charged to the Absorption voltage set-point, it undergoes an absorption stage which is equivalent to constant voltage regulation to prevent heating and excessive gassing in the battery.

## Float Charge:

After Absorption Charge, the controller will reduce the battery voltage to a float voltage set point. Once the battery is fully charged, there will be no more chemical reactions and all the charge current would turn into heat or gas. Because of this, the charge controller will reduce the voltage charge to smaller quantity, while lightly charging the battery. The purpose for this is to offset the power consumption while maintaining a full battery storage capacity. In the event that a load drawn from the battery exceeds the charge current, the controller will no longer be able to maintain the battery to a Float set point and the controller will end the float charge stage and refer back to bulk charging.

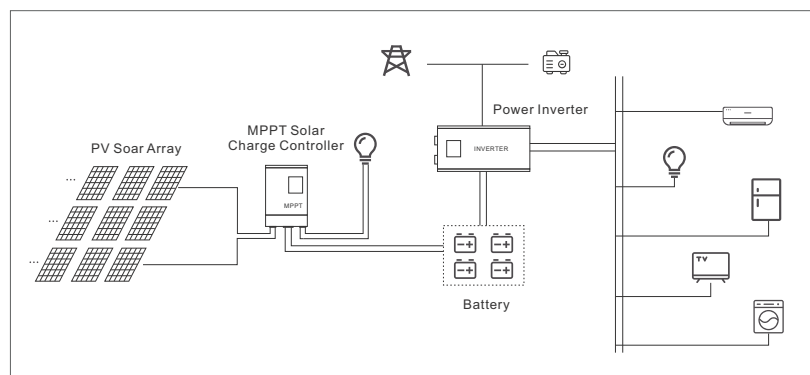
## Solar Power System Connection:

Power Inverter + Battery + Solar Panels + Grid + Application Loads



## Setting UP Off Grid Solar System

The MPPT solar charge controller regulates the charging and discharging of the battery, and controls the PV solar panels and the battery's power output to the load according to the power demand of the load, which is the core part of the whole photovoltaic power system.



## SELECTION GUIDE

MCL Series (30A-100A)

| Model   |     | MCL3048  | MCL4048    | MCL5048 | MCL6048 | MCL8048<br>MCL8096  | MCL10048<br>MCL10096 |
|---|-----|--|------------|---------|---------|---------------------|----------------------|
| MPPT Efficiency                               |     | ≥99.5%   |            |         |         |                     |                      |
| System Voltage                                |     | 12V/24V/48V(Auto)  |            |         |         | 48V/96V             |                      |
| Dimension(mm)                                 |     | 234x170x89   | 275x190x90 |         |         | 359x240x114         |                      |
| Net Weight(KG)                                |     | 2.2  | 3.2        |         |         | 7.2                 |                      |
| INPUT   |     |  |            |         |         |                     |                      |
| Max. PV Input Voltage                         |     | 170VDC   |            |         |         | 225VDC              |                      |
| MPPT Operating Voltage Range                  | 12V | 18VDC-150VDC   |            |         |         | -                   |                      |
|   | 24V | 34VDC-150VDC   |            |         |         | -                   |                      |
|   | 48V | 65VDC-150VDC   |            |         |         | 65VDC-150VDC        |                      |
|   | 96V | -  |            |         |         | 130VDC-180VDC       |                      |
| Low Voltage Protection                        | 12V | 16VDC  |            |         |         | -                   |                      |
|   | 24V | 30VDC  |            |         |         | -                   |                      |
|   | 48V | 60VDC  |            |         |         | 60VDC               |                      |
|   | 96V | -  |            |         |         | 120VDC              |                      |
| High-voltage Protection                       |     | 175VDC   |            |         |         | 230VDC              |                      |
| PV Rated Input Power                          | 12V | 428W   | 570W       | 713W    | 855W    | -                   | -                    |
|   | 24V | 856W   | 1140W      | 1426W   | 1710W   | -                   | -                    |
|   | 48V | 1712W  | 2280W      | 2852W   | 3420W   | 4560W               | 5700W                |
|   | 96V | -  | -          | -       | -       | 9120W               | 11400W               |
| DC LOAD OUTPUT                                |     |  |            |         |         |                     |                      |
| Load Voltage                                  |     | Same as battery voltage, but 96VDC system without DC output load   |            |         |         |                     |                      |
| Load Current                                  |     | 20A  |            |         |         |                     |                      |
| CHARGE  |     |  |            |         |         |                     |                      |
| Battery Type                                  |     | Sealed Lead Acid, Gel, Flooded, Lithium-ion, User-defined  |            |         |         |                     |                      |
| Charging Mode                                 |     | Three-stage: CC (Constant current) - CV (Constant voltage) - CF (Float charge)   |            |         |         |                     |                      |
| Float Charging Voltage<br>(Lead Acid Default) | 12V | 13.8VDC (Settable)   |            |         |         | -                   |                      |
|   | 24V | 27.6VDC(Settable)  |            |         |         | -                   |                      |
|   | 48V | 55.2VDC(Settable)  |            |         |         | 55.2VDC(Settable)   |                      |
|   | 96V | -  |            |         |         | 110.4VDC(Settable)  |                      |
| Boost Charging Voltage<br>(Lead Acid Default) | 12V | 14.5VDC(Settable)  |            |         |         | -                   |                      |
|   | 24V | 29.0VDC(Settable)  |            |         |         | -                   |                      |
|   | 48V | 58.0VDC(Settable)  |            |         |         | 58.0VDC (Settable)  |                      |
|   | 96V | -  |            |         |         | 116.0VDC (Settable) |                      |
| SYSTEM  |     |  |            |         |         |                     |                      |
| Protection Function                           |     | Input low/over voltage, input/output polarity reverse connection, short circuit, over temperature, battery shedding etc. |            |         |         |                     |                      |
| Display                                       |     | LED + LCD  |            |         |         |                     |                      |
| Communication                                 |     | RS485 (optional)   |            |         |         |                     |                      |
| ENVIRONMENT                                   |     |  |            |         |         |                     |                      |
| Relative Humidity                             |     | 5% ~ 90% RH (Non-condensing)   |            |         |         |                     |                      |
| Altitude                                      |     | < 3000m  |            |         |         |                     |                      |
| Operating Temp.                               |     | -20℃~+40℃  |            |         |         |                     |                      |
| Protection Level                              |     | IP21   |            |         |         |                     |                      |

Product specifications are subject to change without further notice.

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