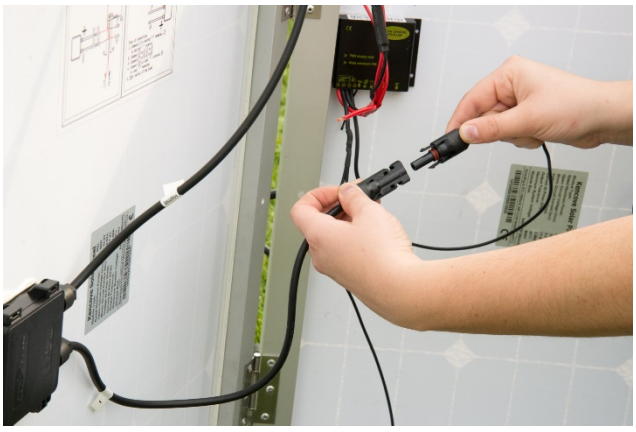
# MSP100KP User's Manual

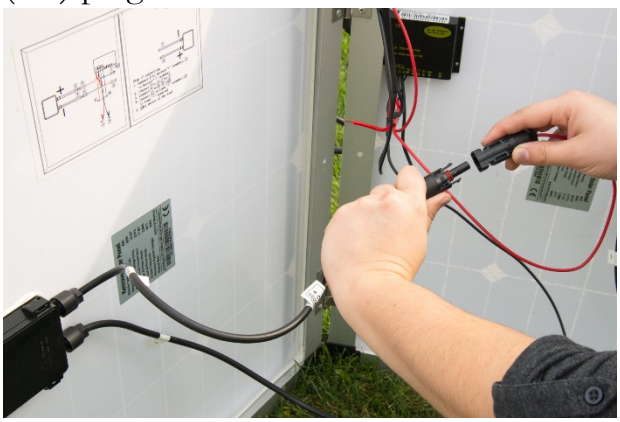
**Step 1:** Connect the positive (red) alligator clip from the charge controller to the positive terminal on the battery.

**Step 2:** Connect the negative (black) alligator clip from the charge controller to the negative terminal on the battery.

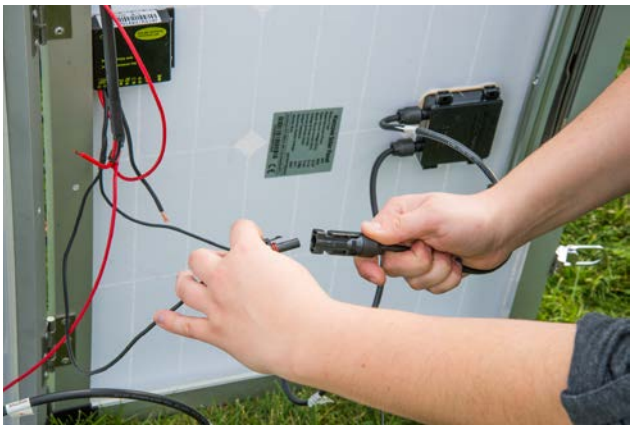
**Step 3:** Connect Panel A's negative (bottom) plug to the charge controller's negative (black) plug.



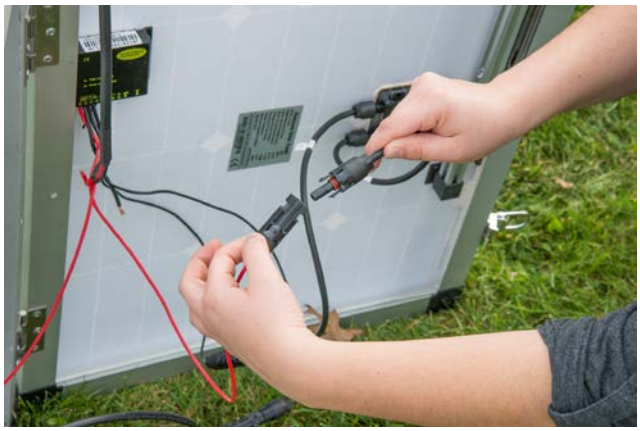
**Step 4:** Connect Panel A's positive (top) plug to the charge controller's positive (red) plug.



**Step 5:** Connect Panel B's negative (top) plug to the charge controller's negative (black) plug.

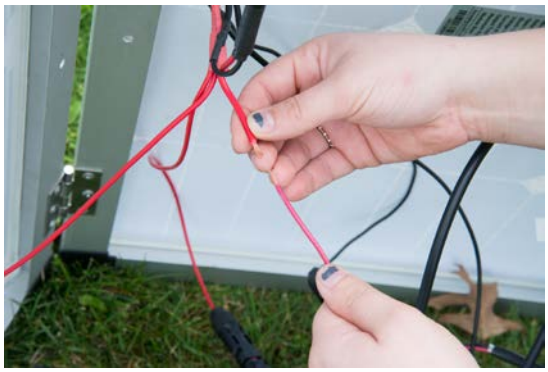


**Step 6:** Connect Panel B's positive (bottom) plug to the charge controller's positive (red) plug.

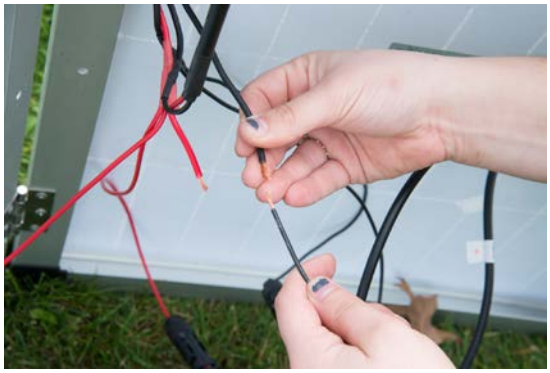


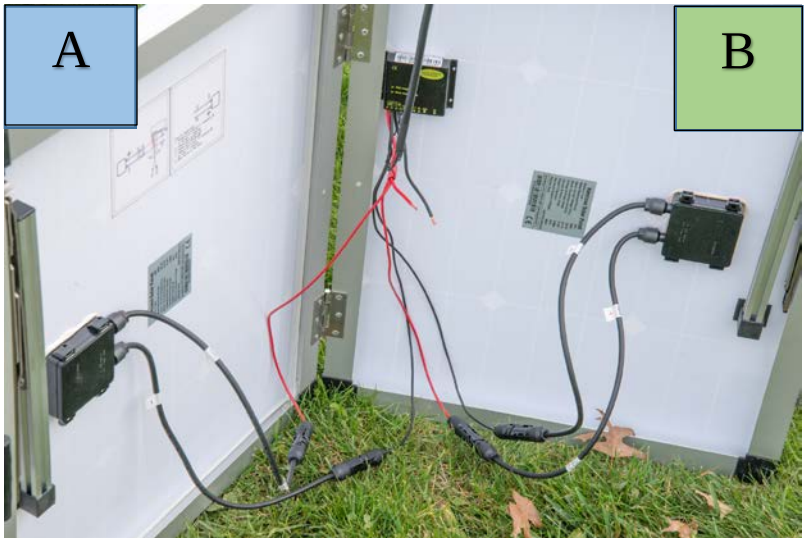
*Remove the alligator clips from the energizer, and mark the positive and negative wires prior to removal. Strip the insulation from the wire ends. Splice the alligator clip ends to the corresponding charge controller load wires.

**Step 7:** Connect the positive (red) load wire from the charge controller to the positive (red) alligator clip on the positive terminal of the energizer.



**Step 8:** Connect the negative (black) load wire from the charge controller to the negative (black) alligator clip on the negative terminal of the energizer.






**Panel A** **Panel B**

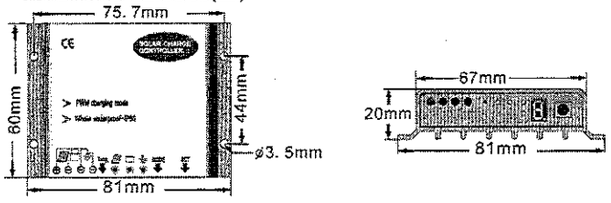
# Solar Intelligent Charging Controller
# Operation instruction manual

## Ⅰ. Main features

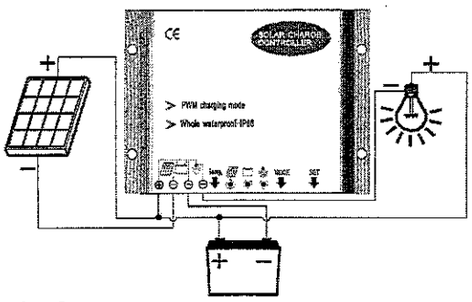
1. IP 68 waterproof level and aluminum outer shell is able to effectively prevent various kinds of corrosion.
2. Automatic identification of 12V/24V system voltage
3. LED digital display and waterproof key-operated operations, which makes use simple and convenient
4. Ternary form charging algorithm to equally charge storage battery every week, which can effectively prevent battery from imbalance and vulcanization so that service life of battery can be prolonged.
5. Five working modes which make it convenient to use the product on various kinds of road lamps and monitoring devices.
6. Externally installed temperature sensor is capable of high-accurate temperature compensation.
7. Parameter settings can be stored if there is power failure. No need for repeated setting. Usage is simple and convenient.
8. Various kinds of status indication
9. Protection against over-charge, over-discharge and overload, protection against electronic short circuit and reverse connection
10. TVS lightning protection

## Ⅱ. Installation and wiring

1. Installation of controller should be stable and dimensions are as follows:
   Overall dimension: 81×60×20(mm)
   Installation dimension: 44×75.7(mm)
   Installation hole diameter: 3.5(mm)




2. JAseries controller can work under 12V or 24V voltage. Please connect storage battery at first for use. Controller will automatically identify voltage of storage battery and start to work. If it is the 12V system, the nixie tube will show '0'. If it is the 24V system, the nixie tube will show '1'.
3. **Connecting pole '+': controller is designed with share positive pole. Please connect the positives of storage battery, photocell and load to the positive pole end (red line) together respectively.**
4. Connecting pole '-'of storage battery: if connection is right, indicator lamp of controller will twinkle. Otherwise, please check the connection.
5. Connecting pole '-'of solar panel: if connection is right, indicator lamp of solar panel will twinkle. Otherwise, please check the connection.
6. Connecting pole '-'of load: connect the wire of load to the load output end of controller. Current should not exceed the rated current of controller. Wiring diagram is as follows:




## Ⅲ. Suggestions for use

1. Controller can identify voltage of storage battery when being powered on. Please connect storage battery at first and ensure the installation is reliable.
2. Controller will become hot during running. Therefore, it is suggested to install it in a ventilated environment.
3. Controller will test the ambient temperature and charge the storage battery. Therefore, try to place the storage battery and the controller in same environment.
4. Use cables with enough capacities for connection to avoid excessive consumption on circuits which may result in wrong judgment of controller.
5. Controller is designed with share positive poles. If grounding needs to be connected, please use positive pole.
6. It is important to fully charge the storage battery, at least once a month. Otherwise, battery will suffer from permanent damage. Only when power that enters into the batter is more than that used by the load can the battery be fully charged. When configuring the system, please keep that point in mind.

## Ⅳ. Status indications

| LED lamp | Indications | Status | Functions |
|---|---|---|---|
| | Being charged | Long-term Off | There is no voltage on battery panel |
| | | Fast twinkling | There is voltage on battery panel |
| | | Slow twinkling | Being charged — Fast charge |
| | | Flashes twice | Being charged — Slowly filling |
| | | Long-term On | Charging is complete |
| | Storage Battery | Long-term On | Storage battery works normally |
| | | Long-term Off | Storage battery is not connected |
| | | Slow twinkling | Storage battery is undervoltage |
| | | Fast twinkling | Storage battery is excessively discharged |
| | | Flashes twice | Overpressure of system |
| | Load | Long-term On | Load is open |
| | | Long-term Off | Load is close |
| | | Slow twinkling | Overload protection |
| | | Fast twinkling | Short circuit protection |

## Ⅴ. Introduction of modes and table of settings

JA series controller has five working modes. Table of settings is as follows:

1. Purely light-operated (0): When there is no sunlight, the light intensity will fall to the starting point. The controller will affirm the starting signal after a delay of 3S. Load will be opened as per set parameters to start working. When there is sunlight, the light intensity will rise up to the starting point. The controller will close output after confirming closing signal in a delay of 1 minutes and the load will stop working.
2. Light-operated + time-controlled (1－9): Starting process is same to that of pure light control. The load will automatically close when it works to the preset time. Set time will be 1 to 14 hours.
3. Manual mode (5): Under this mode the user can control the on and off of load by keys no matter it is day or night. This mode is suitable to occasions in need of special loads or for debugging.
4. Debug mode (6): It is used for system debug. If there is light signal, load will be closed. If there is no light signal, load will be opened. It is convenient for checking the correctness of the system during installation and debugging.
5. Long-term On mode (7): If being powered on, the load will be under the output status all the time. This mode is suitable for loads in need of 24-hour power supply.

| LED Display | Mode | LED Display | Mode |
|---|---|---|---|
| 0 | Purely light-operated | 9 | Light-operated + time-controlled for 9 hours |
| 1 | Light-operated + time-controlled for 1 hour | 10 | Light-operated + time-controlled for 10 hours |
| 2 | Light-operated + time-controlled for 2 hours | 11 | Light-operated + time-controlled for 11 hours |
| 3 | Light-operated + time-controlled for 3 hours | 12 | Light-operated + time-controlled for 12 hours |
| 4 | Light-operated + time-controlled for 4 hours | 13 | Light-operated + time-controlled for 13 hour |
| 5 | Light-operated + time-controlled for 5 hours | 14 | Light-operated + time-controlled for 14 hours |
| 6 | Light-operated + time-controlled for 6 hours | 5 | Manual mode |
| 7 | Light-operated + time-controlled for 7 hours | 6 | Debug mode |
| 8 | Light-operated + time-controlled for 8 hours | 7 | Long-term On mode |

## Ⅵ. Methods for setting

Press a key for more than 5s the nixie tube will start to twinkle and the system will enter into debug mode. Release the key and then press the key again, figures of nixie tube will change one digit each time until digits shown on the nixie tube match the digits corresponding to the mode the user has selected. Wait until the nixie tube twinkling again to finish the setting process.

## Ⅶ. Safety suggestions

1. Please do not immerse the controller into corrosive liquid. Otherwise, controller may be damaged and harmful gas may be generated.
2. When connecting 24V system, terminal voltage of battery panel may surpass the human body safety voltage. If operations are needed, insulating tools should be used and hands must be dry.
3. If storage battery is connected in reverse, the controller would not be damaged. However, there may be output of negative voltage at the load end which may damage your load equipments. Pay attention to avoid such things.
4. In 24V system, if one end of storage battery or solar battery panel is connected in reverse, controller may very likely be damaged.
5. There is a great deal of power stored in the storage battery. Therefore, short circuit of storage battery must not happen in any case. We suggest tandem connection of fuses on storage battery.
6. Storage battery may generate combustible gas and therefore should be far away from sparks.
7. Please make sure that children are far away from the storage battery and the controller.
8. Please follow the safety suggestions given by the battery manufacturer.

## Ⅷ. Instructions for parameters

| Model | JA12V/24V05A-L/H | JA12V/24V10A-L/H | JA12V/24V15A-L/H |
|---|---|---|---|
| System voltage | 12V/24V | | |
| System current | 5A | 10A | 15A |
| No-load loss | < 5mA | | |
| Solar energy input voltage | < 55V | | |
| Overvoltage protection | 16.5V/33.0V | | |
| Over-voltage recovery | 15.0V/30.0V | | |
| Equal charging voltage | 14.4V/28.8V(25℃), duration:1h | | |
| Ascending charging voltage | 14.6V/29.2V(25℃), duration:1h | | |
| Float charging voltage | 13.8V/27.6V (25℃) | | |
| Return voltage during charging | 13.2V/26.4V (25℃) | | |
| Return voltage for over-discharging | 12.6V/25.5V | | |
| Undervoltage | 12.0V/24.0V | | |
| Over-discharging voltage | 11.1V/22.2V | | |
| Temperature compensation | -5.0mv/℃/2V; | | |
| Light-control voltage | Light-control open 2V; light-control close 7V | | |
| Light-control judgment time | 1min | | |
| Overload and short circuit protection | 1.25 times of rated current: 30s;<br>1.5 times of rated current: 5s overload protection activity;<br>≥3 times of rated current: short circuit protection | | |
| Working temperature | -35℃ to +65℃; | | |
| Protection level | IP68 | | |
| Weight | 160g | | |
| Dimensions | 81×60×20(mm)(L×W×H) | | |

## Ⅸ. Problems and solutions

| Phenomena | Problems and solutions |
|---|---|
| There is sunlight but indicator lamp of battery panel is not on. Wait for 1 minutes | Please check the wiring of photocell and the contact. |
| Indicator lamp of storage battery twinkles Flashes twice | Overvoltage of the system; please check whether voltage of the storage batter is too high. |
| Indicator lamp of battery is not on | Power supply to storage battery fails. Please check the connection of storage battery. |
| Indicator lamp of storage battery twinkles fast and there is output | Storage battery is over discharged. Charge the battery fully. |
| Indicator lamp of load twinkles slowly and there is no output | Power of load exceeds rated power. Press the key for one time after reducing the use of electric equipments. |
| Indicator lamp of load twinkles fast and there is no output | Load is under short circuit. After removing fault, press the key once for a time or wait until the next day. |
| Indicator lamp of load is on permanently and there is no output | Please check whether connections of electric equipments are correct and reliable. |
| Other phenomena | Check the reliability of wiring and the automatic identification of 12V/24V system. |

**The above information is subject to change without prior notice.**