

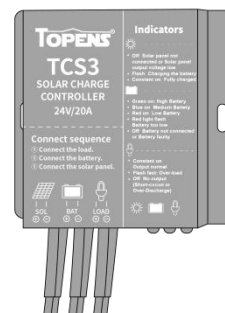
TOPENS[®]

TCS3

Solar Charge Controller User Manual

Product Description

The TCS3 is specially designed for solar charge control and battery discharge management in automatic gate opener systems. It features multiple safety protections for the battery, including overcharge protection, over-discharge protection, overload protection, short-circuit protection, and reverse polarity protection.



1 SPECIFICATIONS

Rated Charging Current: 2A	Rated Discharging Current: 20A
Overcharging Voltage: 30V	Discharge Stop Voltage: 18V
Discharge Reconnect Voltage: 21V	Waterproof Degree: IP67
Working Temperature: -20°C~ +50°C (0°F to 120°F)	
Compatible Solar Panel Open Circuit Voltage: 30~50VDC (Max. 240W)	
Rated Voltage of Applicable Battery: 24VDC (2 pcs 12V batteries connected in series)	

2 WHAT'S IN THE BOX

- ◆ 1 x Solar Charge Controller

3 IMPORTANT NOTES

- ◆ The cable that comes with the solar charge controller is 12cm (4.7") long and 1.5 mm² (15 AWG).
- ◆ If the load current is 20A, for the "BAT" and "LOAD" terminals, at least 2 mm² (14AWG) cables should be used when the extension length is shorter than 30 meters (100 feet). For 30 meters (100 feet) extension, it is strongly recommended to use 5 mm² (10AWG) cable, and for 46 meters (150 feet), 8 mm² (8AWG) cable is recommended. For the "SOL" terminal, at least 0.82 mm² (18AWG) cable should be used when the extension length is shorter than 30 meters (100 feet). For 30 meters (100 feet) to 46 meters (150 feet) extension, it is strongly recommended to use 1.3 mm² (16AWG) cable.
- ◆ The extension cable is required but NOT included.
- ◆ The solar charge controller requires a minimum battery voltage of 10V for activation. It will not charge or activate if connected to a dead or zero-voltage battery. Keep the battery cable as short as possible to minimize energy loss.
- ◆ The solar charge controller works with a wide range of 24VDC batteries, such as marine / automotive type batteries or lead acid / GEL / AGM / flooded (deep cycle) batteries. Kindly note that it is not compatible with most lithium-ion batteries, except for LiFePO4 batteries.
- ◆ The solar charge controller supports a maximum solar panel power of 240W, exceeding this limit can cause damage to it.

- ◆ The solar charge controller is designed exclusively for regulating solar panels. Never connect any other charging source to the charge regulator.

4 WIRE CONNECTION WITH TOPENS GATE OPENER

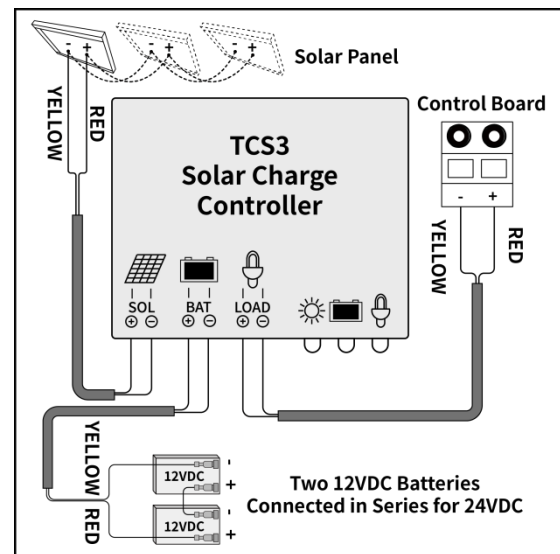
Notes:

- ◆ The solar panels should be connected in parallel.
- ◆ Please refer to your gate opener installation manual for detailed wire connection.
- ◆ Ensure correct polarity during installation to prevent damage: the red wire is positive (+), and the yellow wire is negative (-).

For DKC500S/DKC1100S/DKC2000S/DKR500ST /DKR1100ST Gate Openers

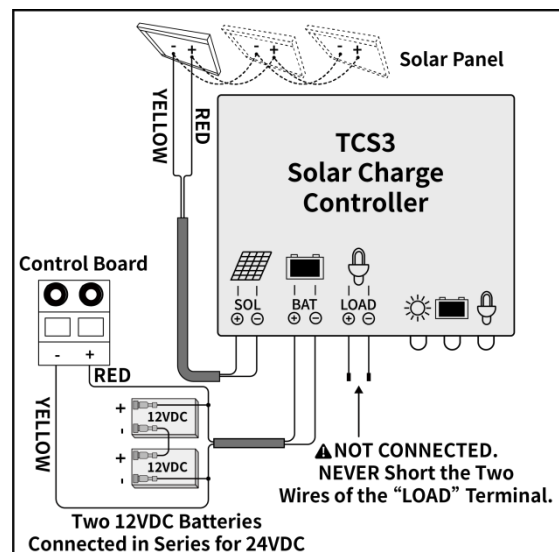
① BY SOLAR PANELS AND BATTERIES ONLY

- ◆ Connect the LOAD wires of the solar charge controller to the 24VDC power input terminals on the gate opener control board.
- ◆ Connect the BAT wires of the solar charge controller to the batteries.
- ◆ Connect the SOLAR wires of the solar charge controller to the solar panels.



② BY AC ELECTRICITY, SOLAR PANELS AND BACK-UP BATTERIES

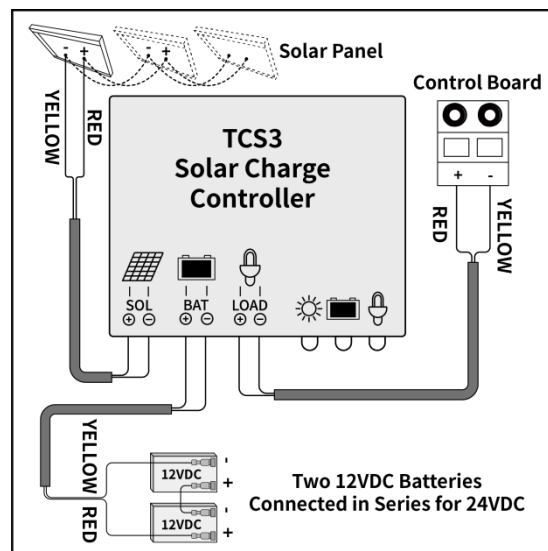
- ◆ Tape the LOAD wires of the solar charge controller to prevent a short circuit.
- ◆ Connect the BAT wires of the solar charge controller and the wires connecting to the batteries in parallel (Do NOT connect the batteries).
- ◆ Connect the parallel wires to the 24VDC power input terminals on the gate opener control board.
- ◆ Connect the batteries to the 24VDC power input terminals on the control board.
- ◆ Connect the SOLAR wires of the solar charge controller to the solar panels.
- ◆ Connect the power cord to the gate opener AC electricity input terminals.
- ◆ Plug the power cord into an electrical outlet.



For TOPENS A8/A3S/A5S/A8S/AD5S/AD8S Gate Openers

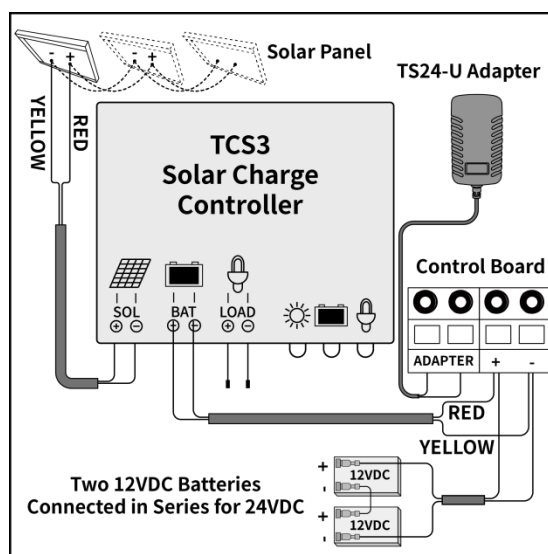
❶ BY SOLAR PANELS AND BATTERIES ONLY

- ◆ Connect the LOAD wires of the solar charge controller to the 24VDC power input terminals on the gate opener control board.
- ◆ Connect the BAT wires of the solar charge controller to the batteries.
- ◆ Connect the SOLAR wires of the solar charge controller to the solar panels.



❷ BY THE ADAPTER, SOLAR PANELS AND BATTERIES

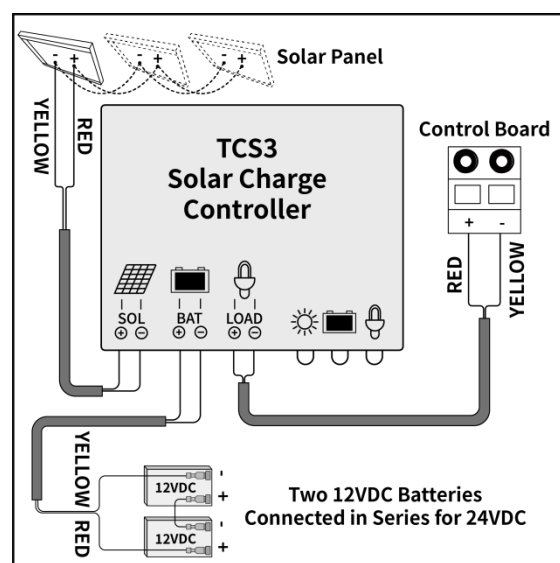
- ◆ Tape the LOAD wires of the solar charge controller to prevent a short circuit.
- ◆ Connect the BAT wires of the solar charge controller to the 24VDC power input terminals on the gate opener control board.
- ◆ Connect the batteries to the 24VDC power input terminals on the gate opener control board.
- ◆ Connect the SOLAR wires of the TCS3 solar charge controller to the solar panels.
- ◆ Connect the TS24-U adapter to the “ADAPTER” terminals of the control board, regardless of the polarity of the wires.
- ◆ Plug the TS24-U adapter into an electrical outlet.



For TOPENS AT602/AT1202/KD702 Gate Openers

BY AC ELECTRICITY, SOLAR PANELS AND BACK-UP BATTERIES

- ◆ Connect the LOAD wires of the solar charge controller to the 24VDC power input terminals on the gate opener control board.
- ◆ Connect the BAT wires of the solar charge controller to the batteries.
- ◆ Connect the SOLAR wires of the solar charge controller to the solar panels.
- ◆ Connect the power cord to the control board.
- ◆ Plug the power cord into an electrical outlet.



5 INDICATORS ON THE SOLAR CHARGE CONTROLLER

Indicator Icon	Indicator Type	Indicator Status	Meaning
	Solar Indicator	Off	Solar panel not connected or solar panel output voltage is lower than 24V
		Flash	Charging the battery
		Constant on	Fully charged
		Green on	High battery
		Blue on	Medium battery
	Battery Indicator	Red on	During discharge, the indicator LED will turn red when the battery voltage falls below 23V During charging, the indicator LED will stay red until the battery voltage rises to 24V
		Red flash	During discharge, the indicator LED will flash red when the battery voltage falls below 18V During charging, the indicator LED will flash red when the battery voltage falls below 21V
		Off	Battery not connected or battery faulty
	Load Indicator	Constant on	Output normal
		Flash fast	Over-load
		Off	No output (short-circuit or over-discharge)

Note: If the load exceeds the controller's capacity more than three seconds, the controller will cut the output and the load indicator LED will flash rapidly five times (approximately 4 seconds) then off. The controller will continue to detect the load current, once the load returns to a safe level, the output will be restored and the LED will light up normally. If a short circuit occurs at the output, please re-power the controller to ensure normal operation.

Feedback & Review

Your comments and suggestions are important to us as they help us provide the best possible service. Should you have any need to contact us, the info below will help you get in touch:



TOPENS Website
www.topens.com

Contact Us:

E-mail: support@topens.com

Kindly include your purchase channel, order #, gate information, issue description and your contact information. All your concerns will be replied within 24 hours.

Tel: +1 (888) 750 9899 (Toll Free USA & Canada)