



## ■ Features

- Can be connected to both PV、battery and load
- Support multiple battery types
- MPPT with up to 99.9% efficiency
- Support solar panel 2 in series/more in parallel
- Complete charge and discharge protection mechanism
- Natural cooling
- 3 years warranty

## ■ Applications

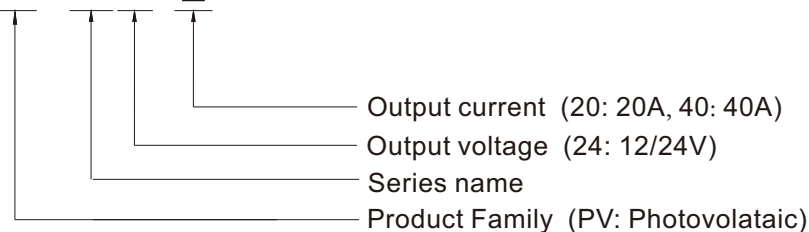
- Home photovoltaic
- Power for farms and ranches
- Communication base station
- Power for rural
- Island photovoltaic

## ■ Description

The PV-ML series is an MPPT solar controller that uses maximum power point tracking technology to optimize the power output of solar panels in real time. It automatically monitors monitors changes in light conditions to ensure maximum energy extraction in all environments, increasing charging efficiency by 20% to 30%. The charge is widely used in home, commercial and portable solar systems and is compatible with a variety of battery types to ensure that users can charge quickly and efficiently, and promote the wider application of clean energy.

## ■ Model Encoding

PV - ML24 - □













# MPPT Solar Controller

# PV-ML24 series






## SPECIFICATION

MODEL		PV-ML24-20	PV-ML24-40
OUTPUT	BATTERY TYPE	Lead-acid / Li-ion / User Defined	
	RATED BATTERY VOLTAGE	12V/24Vdc	
	NO LOAD POWER CONSUMPTION	1.2W	
	BATTERY VOLTAGE RANGE	9~35Vdc	
	RATED LOAD VOLTAGE	Equal to battery voltage 12V / 24V	
	RATED CHARGING CURRENT	20A	40A
	RATED LOAD CURRENT	20A	
	MAX. CAPACITIVE LOAD	10000uF max	
	LOAD WORKING MODE	Light control, Light control + Time control, Manual control (default), Debugging mode, Normal open	
	MPPT CHARGING MODE	Buck	
INPUT	MAX.VOLTAGE OF OPEN CIRCUIT	100Vdc	
	MPPT VOLTAGE RANGE	Battery voltage +2V~75V	
	MAX.PV INPUT POWER	260W / 12 Battery; 520W / 24 Battery	550W / 12V Battery; 1100W / 24V Battery
	MAX.CHARGING CONVERSION EFFICIENCY	≤98%	
	MPPT TRACKING EFFICIENCY	>99%	
PROTECTION	OVER DISCHARGE	11.1V*N(N=1 for 12V Battery , N=2 for 24V Battery)	
	OVER DISCHARGE RESET	12.6V*N(N=1 for 12V Battery , N=2 for 24V Battery)	
	OVER VOLTAGE	Protection type : Shut down, clamping by zener diode	
	BATTERY REVERSE CONNECTION	Protected internal reverse detection, No damage, re-power on to recover after fault condition is removed	
	PHOTOVOLTAIC INPUT REVERSE CONNECTION	Protected internal reverse detection, No damage, re-power on to recover after fault condition is removed	
	REVERSE CHARGING	The internal circuit detects the current, Shut down, re-power on to recover after fault condition is removed	
FUNCTION	COMMUNICATION	RS232	
ENVIRONMENT	WORKING TEMP.	-35~+45℃	
	WATERPROOF LEVEL	IP32	
	VIBRATION	10~500Hz, 2G 10min./1 cycle, 60min. each along X, Y, Z axes	
SAFETY & EMC	SAFETY STANDARDS	EN IEC 62109-1:2010	
	EMC EMISSION	Parameter	Standard
		Conducted	EN IEC 61000-6-3
		Radiated	EN IEC 61000-6-3
	EMC IMMUNITY	Parameter	Standard
		ESD	EN 61000-4-2
		RF field susceptibility	EN 61000-4-3
		EFT	EN 61000-4-4
		Surge	EN 61000-4-5
		Conducted	EN 61000-4-6
		Magnetic Field	EN 61000-4-8
OTHERS	DIMENSION	1.4Kg	2Kg
	PACKING	210*151*59.5mm	238*173*72.5mm

## ■ LED Indicators

		PV array indicator	Indicating the controller's current charging mode.
		BAT indicator	Indicating the battery's current state.
		LOAD indicator	Indicating the loads' On/ Off and state.
		ERROR indicator	Indicating whether the controller is functioning normally.

### ➤ PV array indicator

No.	Graph	Indicator state	Charging state
①	 BULK	Steady on	MPPT charging
②	 ACCEPTANCE	Slow flashing (a cycle of 2s with on and off each lasting for 1s)	Boost charging
③	 FLOAT	Single flashing (a cycle of 2s with on and off lasting respectively for 0.1s and 1.9s)	Floating charging
④	 EQUALIZE	Quick flashing (a cycle of 0.2s with on and off each lasting for 0.1s)	Equalizing charging
⑤	 CURRENT-LIMITED	Double flashing (a cycle of 2s with on for 0.1s, off for 0.1s, on again for 0.1s, and off again for 1.7s)	Current-limited charging
⑥		Off	No charging

### ➤ BAT indicator:

Indicator state	Battery state
Steady on	Normal battery voltage
Slow flashing (a cycle of 2s with on and off each lasting for 1s)	Battery over-discharged
Quick flashing (a cycle of 0.2s with on and off each lasting for 0.1s)	Battery over-voltage





### ➤ LOAD indicator:

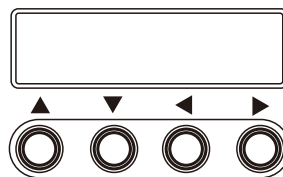
Indicator state	Load state
Off	Load turned off
Quick flashing (a cycle of 0.2s with on and off each lasting for 0.1s)	Load overloaded/ short-circuited
Steady on	Load functioning normally

### ➤ ERROR indicator:

Indicator state	Adnormality indication
Off	System operating normally
Steady on	System malfunctioning

## ■ Key Operations

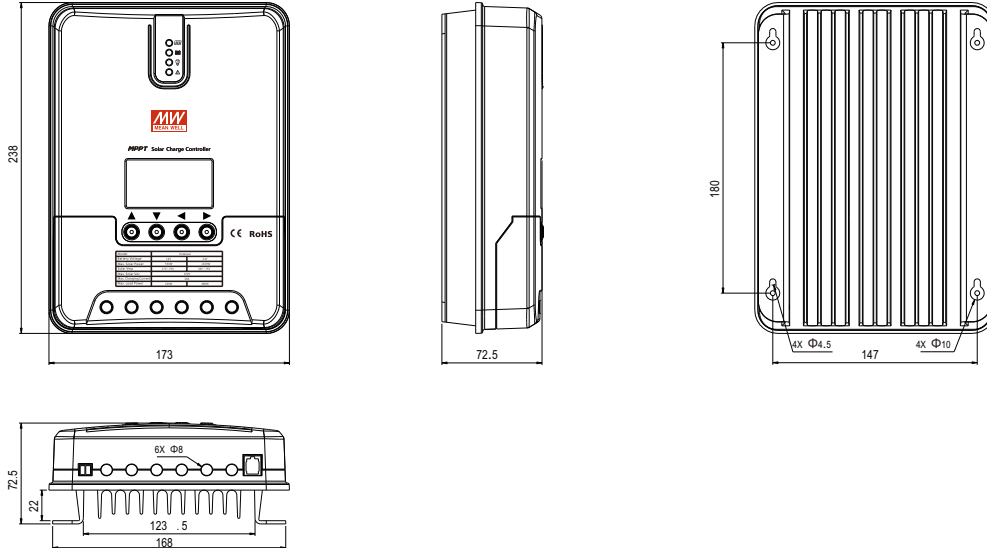
	Up	Page up; increase the parameter value in setting
	Down	Page down; decrease the parameter value in setting
	Return	Return to previous menu (exit without saving)
	Set	Enter into sub-menu; set/save Turn on/off loads (in manual mode)



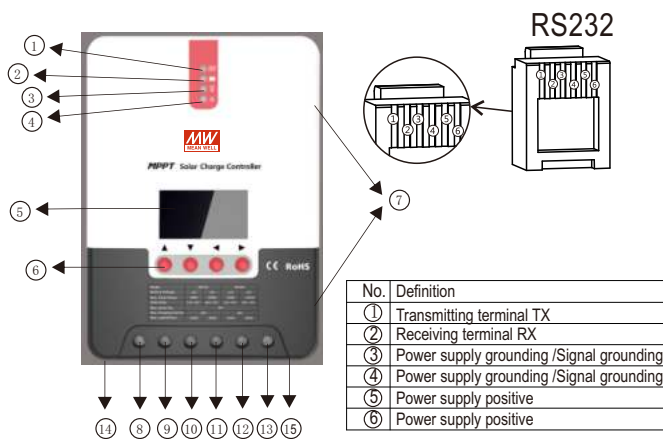
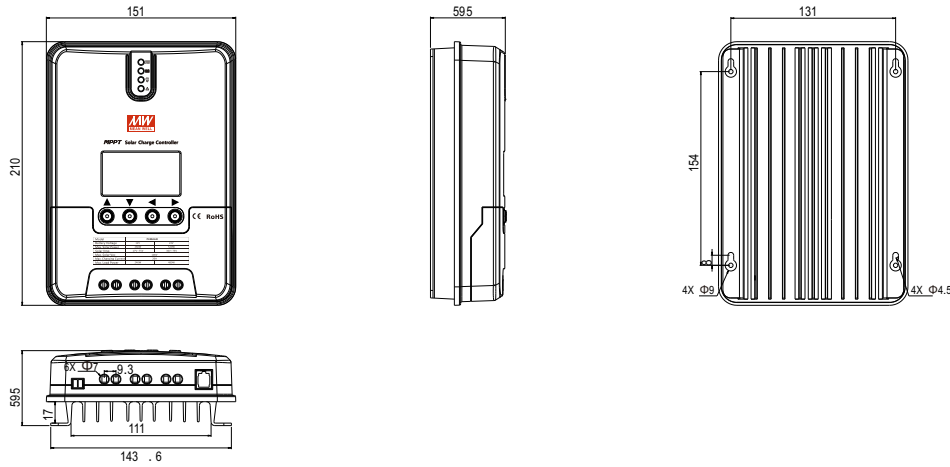
## Mechanical Specification

(Unit:mm,tolerance $\pm 1$ mm)

PV-ML24-40:



PV-ML24-20:



Product appearance and interfaces

No.	Item	No.	Item
①	Charging indicator	⑩	Battery "+" interface
②	Battery indicator	⑪	Battery "-" interface
③	Load indicator	⑫	Load "+" interface
④	Abnormality indicator	⑬	Load "-" interface
⑤	LCD screen	⑭	External temperature sampling interface
⑥	Operating keys	⑮	RS232/RS485 communication interface
⑦	Installation hole		
⑧	Solar panel "+" interface		
⑨	Solar panel "-" interface		