Enermax ROSC40
Solar PV water heater

Datasheet

	ROSC40-544E ROSC40-544A	ROSC40-54443E ROSC40-54443A
Storage capacity	500 L	
Empty weight	80 kg	93 kg
Filled weight	580 kg	593 kg
Height	1658 mm	
Width	790 mm	
Depth	790 mm	
Hot water delivery	—	
Standing heat loss	1.4 kWh	
Number of heat exchange coils	1	2
Material of heat exchange coils	Stainless steel	
Length of heat exchange coils	44 m	44 m/43 m
Maximum storage temperature	85°C	
Maximum water pressure	600 kPa (inlet), 1 MPa (heating element), atmospheric (tank storage volume)	
Inlet & outlet connection diameter	25 mm, external thread	
Inner & outer shell material	Polypropylene	
WaterMark license	WM-020095	
ELECTRICAL		
Total efficiency	>99%	
AC	Two heating units. Per heating unit: 220–240 V, 8.7 A, 2000 W max, 50–60 Hz	
Heating capacity	4000 W for models ending in 'E'. Power relay for external heat source for models ending in 'A'.	
Fuse	16 A (per heating unit)	
Stand-by power	0 W in DC operation, 2 W in AC operation (per heating unit)	
DC (Solar PV)	Two heating units. Per heating unit: 100–360 V, 10 A max, 3600 W max	
Connectors	Original MC4, 2 strings (one per heating unit)	
Max short circuit current	15 A (per heating unit)	
Number of MPP trackers	2 (one per heating unit)	
Power rating	2000 W per heating unit at 25°C ambient temperature, derating when overheating	
Recommended PV array	4–8 polycrystalline PV panels with 60 cells in a string array, per heating unit	
MPP-matching efficiency	99.80%	
Topology	Transformerless	
Over-voltage category for each input	Category 2	
Earth fault alarm	Yes, built-in	
ENVIRONMENTAL		
Ambient operating temperature	0–50°C (not suitable for heavy frost)	
Type of protection	IP54	
Environmental category	Outdoor	
Pollution degree	2	
Relative humidity rating	0–99% (not condensing)	
Cooling	Convection	
Maximum altitude	600 m above sea level	
Element housing	Element housing should not be exposed to constant sun/weather conditions	
Water quality	*Suitable for use with potable water only within the following maximum allowable conditions:* pH(6.5–8.0), TDS (600 mg/L), total hardness (200 mg/L), chlorides (150 mg/L, magnesium (10 mg/L), calcium (20 mg/L), sodium (150 mg/L), iron (1 mg/L)	
OTHER		
Warranty	10 years (tank), 3 years (heat-exchange coils), 2 years (heating unit), 1 year (other parts/labour)	
PCE device	STCs on the PV array installation may be available	
Product standards	AS/NZS 60335.2.21:2013+A1, AS/NZS 60335.1:2011+A1+A2+A3, IEC 62109-1:2010	
Country of manufacture	Germany (tank), Austria (heating element and electrical). Assembled in Australia.	

Enermax ROSC40
Solar PV water heater

PV information

The PV array should not be functionally earthed. Positive and negative lines of the PV array must not be earthed at any time. Otherwise an earth fault error will occur.

Metal frame and support structure of the PV panels shall be earthed according to AS 5033.

A switch-disconnector (DC isolator) is required adjacent to, within 3m of, and in line of sight to, the Enermax ROSC40.

Additionally a switch-disconnector (DC isolator) *may* be required adjacent to the PV array according to applicable standards and codes.

Note: Switch-disconnectors (DC isolators) must have: marked on/off, be lockable in the off position, and be load breaking.

Note: PV panels, wiring, and switch-disconnectors (DC isolators) are not included with the purchase of an Enermax ROSC40.

Note: These instructions should be replicated for each heating unit.

PV ARRAY DESIGN RULES

UPPER VOLTAGE LIMIT EXAMPLE

$$V_{oc\ \mathrm{STC}} = 37.3\,\mathrm{VDC}$$
$$V_{oc}\ \text{temp. coeff} = -0.33\,\%/^{\circ}\mathrm{C}$$
$$\Delta T\ \text{at}\ -15\,^{\circ}\mathrm{C} = -40\,^{\circ}\mathrm{C}$$
$$-40\,^{\circ}\mathrm{C} \times -0.33\,\%/^{\circ}\mathrm{C} = +13.2\,\%$$
$$V_{oc\ \max} = V_{oc\ \mathrm{STC}} + 13.2\,\% = 42.22\,\mathrm{VDC}$$
$$42.22\,\mathrm{V} \times 8\,\text{panels in series} = 337\,\mathrm{VDC} < 360\,\mathrm{VDC}$$

DC voltage is in range.

Note: Panel characteristics at lowest possible temperature are decisive. If voltage exceeds 360 VDC, unit may be damaged.

Current will be limited to 10 A.

Note: Over-current will not damage unit!

LOWER VOLTAGE LIMIT EXAMPLE

$$R_{\text{heating rod}} = 15\,\Omega$$
$$I_{mpp\ \mathrm{STC}} = 8.26\,\mathrm{ADC}$$
$$I_{sc}\ \text{temp. coeff} = +0.033\,\%/^{\circ}\mathrm{C}$$
$$\Delta T\ \text{at}\ 65\,^{\circ}\mathrm{C} = 40\,^{\circ}\mathrm{C}$$
$$40\,^{\circ}\mathrm{C} \times 0.033\,\%/^{\circ}\mathrm{C} = 1.32\,\%$$
$$I_{mpp\ \max} = I_{mpp\ \mathrm{STC}} + 1.32\,\% = 8.37\,\mathrm{ADC}$$
$$V_{mpp\ \max} = V_{mpp\ \mathrm{STC}} - 13.2\,\% = 32.4\,\mathrm{VDC}$$

$$\text{minimum voltage} = 8.37\,\mathrm{ADC} \times 15\,\Omega = 125\,\mathrm{VDC}$$
$$\text{minimum num. of panels} = 125\,\mathrm{VDC}/32.4\,\mathrm{VDC} = 4$$

Note: Panel characteristics at highest possible temperatures are decisive. MPP tracking range is 100–360 V. The higher the current, the more voltage is required to utilise the current.

If voltage is less than 100 V, the unit will not work. If the voltage/15 is less than the current, the unit will not run at MPP.