

User's Guide

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FMG-1000-SK
Solar Panel



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The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

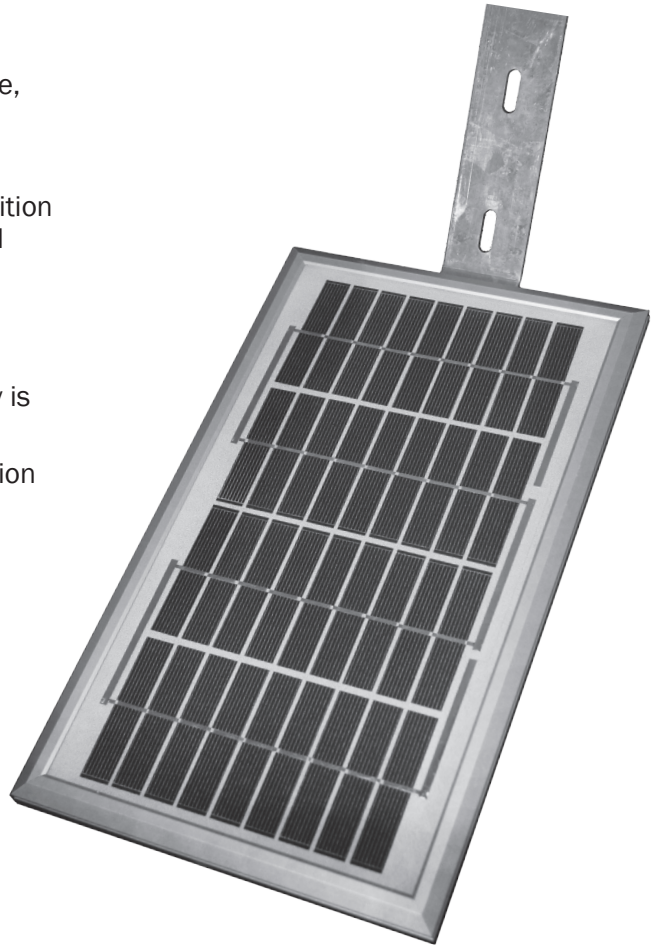
WARNING: These products are not designed for use in, and should not be used for, human applications.

FEATURES

- Includes 5 watt solar panel, mounting hardware, and 12V solar charge controller
- Reliable, maintenance-free operation
- Powers many flow meter products with the addition of a low cost 22-33 Amp-hour Sealed Lead Acid battery

APPLICATIONS

- Remote metering applications where electricity is unavailable
- Back-up power supply for uninterrupted operation



GENERAL INFORMATION

The FMG-1000-SK solar panel makes it possible to use Omega flowmeters in remote applications where a reliable source of electricity is not available or practical. The FMG-1000-SK is intended for use with a standard 12V, 22-33 Amp-hour Sealed Lead Acid battery (not included). It comes standard with a

charge controller and corrosion-resistant mounting hardware. The FMG-1000-SK can also be used to provide up to a 40-day back-up power supply for periods of darkness.

SPECIFICATIONS *

Electrical	Current	290 mA (typical at design operating point)
	Voltage	17 V (typical at design operating point)
Dimensions	Height	14.2"
	Width	8.5"
	Weight	4 pounds (solar panel and mounting bracket)
Mounting	Bracket, band clamps and mounting hardware for 1-1/2 or 2 inch vertical pipe	
Operating Temperature Range	-40° F to +158° F (-40° C to +70° C)	
Charge Controller	High efficiency series PWM regulator with temperature compensation and built-in lightning protection	

**Specifications subject to change*

BATTERY SELECTION

For powering mechanical meters along with display electronics, use a 12V Sealed Lead Acid (SLA) deep-cycle battery with a minimum capacity of 22 Amp-hours. This should provide a conservative 40 day backup with maximum battery service life. Marine/RV grade deep-cycle batteries or automotive batteries may be used but must be upsized in Amp-hour capacity by two times and four times respectively to achieve the same battery service life in most applications.

For powering low power (<50mA) magnetic flow meters, use only deep-cycle SLA batteries (not marine/RV or automotive grade batteries) with a minimum capacity of 33 Amp-hours. In climates where meters are operating in full pipe mode much of the time with extended periods of cloudy days, oper-

ating continuously through the year, or in latitudes above 50 degrees, the required battery Amp-hour capacity should be reviewed before selection.

In summary, the minimum recommended battery capacity, as described above, will be adequate in most climates and applications. However, under marginal conditions, a larger capacity battery may provide superior reliability, better battery service life and lower life-cycle costs.

LOCATION

The solar panel should be oriented as much as possible toward the midday sun. Locate where there is no significant shading of the solar panel. The Solar Charge Controller and Sealed Lead Acid (SLA) battery should be located in close physical and thermal proximity. Both must be shaded from direct sunlight to minimize temperature differences between them which will greatly diminish the battery service life. Also insulate the bottom of the battery if heat could be absorbed from the surface (concrete, metal etc.) on which the battery is resting. Also take measures to prevent accumulation of moisture (rain, snow, ice, flooding) between the battery terminals which could discharge the battery.

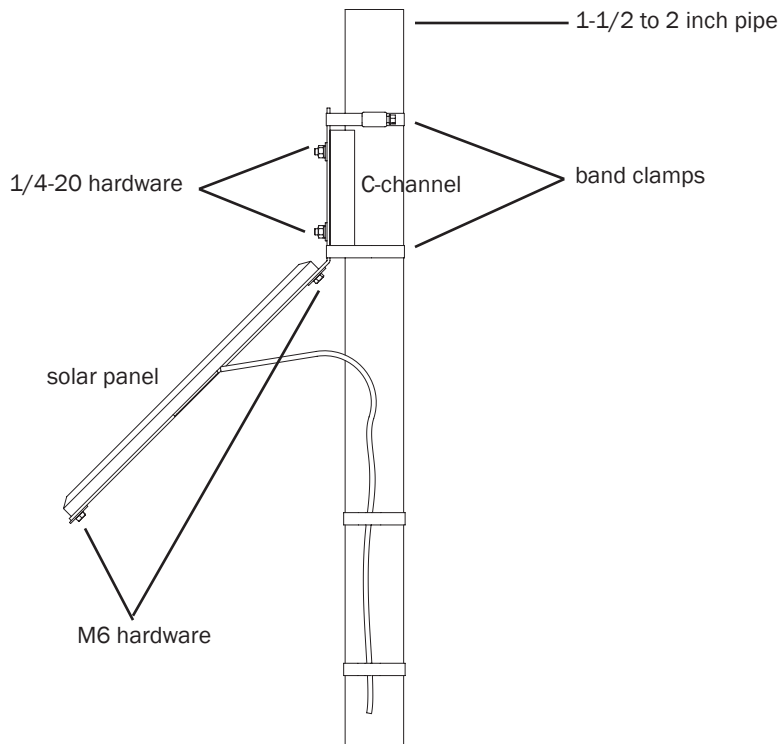
If the battery and Solar Charge Controller are housed in an enclosure, the outside must be white or shiny metallic to minimize solar heat build up inside that is seriously detrimental to the service life of the battery. Even light colors (such as the standard ANSI 61 Gray) can elevate the interior of the enclosure by 40F (22C.) If other colors are used, the enclosure must be shaded from direct sunlight or painted glossy white. In addition, because even sealed batteries could vent if the Solar Charge Controller fails, for safety reasons the enclosure should be vented, particularly if it contains other electrical equipment.

INSTALLATION

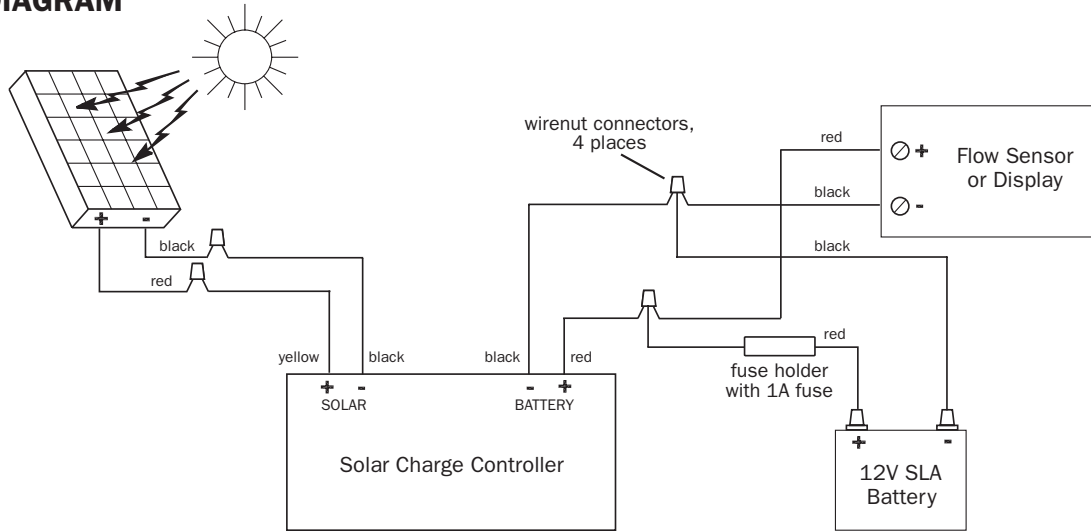
The solar panel is designed to mount to either a 1-1/2 to 2 inch diameter vertical pipe. First attach the 45 degree angle bracket to the panel with the two M6 bolts, flat washers and nuts provided as shown. Be sure to position the bracket to the side of the black cable cover rather than over it to avoid stressing the panel. (At latitudes above 50 degrees performance may be improved by bending the bracket so that the angle of the panel to the horizontal is increased to approximately the local latitude plus 15 degrees. To avoid damage to the panel, do this before bolting the bracket to the panel.) Next use the two sets of 1/4-20 bolts, nuts, flat and lock washers to attach the angle bracket to the pipe mount C-channel. Then attach the entire assembly to the pipe using

the two band clamps as shown. Turn the panel to face true (not magnetic) south in the northern hemisphere or north in the southern hemisphere before tightening the clamps securely.

Connect the solar charge controller, flow meter and battery as shown in the wiring diagram. Clean battery terminals and secure connections to the battery using grease or other means of preventing corrosion. For safety, an in-line fuse holder should be installed at the positive battery connection with a 1 Amp time lag (slow-blow) fuse. In unprotected locations a weather-proof fuse holder (such as Bussmann HFB-R) and outdoor-rated wirenuts should be used.



WIRING DIAGRAM



MAINTENANCE

Periodic cleaning of the solar panel glass is recommended to remove dust accumulation. Snow and ice may need removal if it remains more than 2 weeks. Installing the panel at a steeper than 45 degree angle may make this unnecessary in

most areas. Battery service life for good quality SLA batteries should be 4-6 years. Actual maintenance replacement interval will depend on local conditions and criticality of data.





WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

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1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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