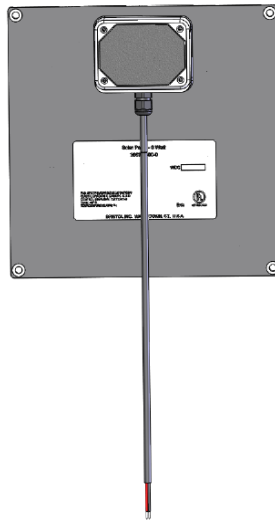


FB1100/FB1200 Flow Computer 6W Solar Panel Field Replacement Guide



For Part Numbers (Kits):

- 396773-01-0

Device Safety Considerations

▪ Reading these Instructions

Before operating the device, read these instructions carefully and understand their safety implications. In some situations, improperly using this device may result in damage or injury. Keep this manual in a convenient location for future reference. Note that these instructions may not cover all details or variations in equipment or cover every possible situation regarding installation, operation, or maintenance. Should problems arise that are not covered sufficiently in the text, immediately contact Customer Support for further information.

▪ Protecting Operating Processes

A failure of this device – for whatever reason -- may leave an operating process without appropriate protection and could result in possible damage to property or injury to persons. To protect against this, you should review the need for additional backup equipment or provide alternate means of protection (such as alarm devices, output limiting, fail-safe valves, relief valves, emergency shutoffs, emergency switches, etc.). Contact Remote Automation Solutions for additional information.

▪ Returning Equipment

If you need to return any equipment to Remote Automation Solutions, it is your responsibility to ensure that the equipment has been cleaned to safe levels, as defined and/or determined by applicable federal, state and/or local law regulations or codes. You also agree to indemnify Remote Automation Solutions and hold Remote Automation Solutions harmless from any liability or damage which Remote Automation Solutions may incur or suffer due to your failure to ensure device cleanliness.

▪ Grounding Equipment

Ground metal enclosures and exposed metal parts of electrical instruments in accordance with OSHA rules and regulations as specified in *Design Safety Standards for Electrical Systems*, 29 CFR, Part 1910, Subpart S, dated: April 16, 1981 (OSHA rulings are in agreement with the National Electrical Code). You must also ground mechanical or pneumatic instruments that include electrically operated devices such as lights, switches, relays, alarms, or chart drives.

Important: Complying with the codes and regulations of authorities having jurisdiction is essential to ensuring personnel safety. The guidelines and recommendations in this manual are intended to meet or exceed applicable codes and regulations. If differences occur between this manual and the codes and regulations of authorities having jurisdiction, those codes and regulations must take precedence.

▪ Protecting from Electrostatic Discharge (ESD)

This device contains sensitive electronic components which be damaged by exposure to an ESD voltage. Depending on the magnitude and duration of the ESD, it can result in erratic operation or complete failure of the equipment. Ensure that you correctly care for and handle ESD-sensitive components.

System Training

A well-trained workforce is critical to the success of your operation. Knowing how to correctly install, configure, program, calibrate, and trouble-shoot your Emerson equipment provides your engineers and technicians with the skills and confidence to optimize your investment. Remote Automation Solutions offers a variety of ways for your personnel to acquire essential system expertise. Our full-time professional instructors can conduct classroom training at several of our corporate offices, at your site, or even at your regional Emerson office. You can also receive the same quality training via our live, interactive Emerson Virtual Classroom and save on travel costs. For our complete schedule and further information, contact the Remote Automation Solutions Training Department at 800-338-8158 or email us at education@emerson.com.

Ethernet Connectivity

This automation device is intended to be used in an Ethernet network which **does not** have public access. The inclusion of this device in a publicly accessible Ethernet-based network is **not recommended**.

Removing/Replacing the 6W Solar Panel

Refer to the table below for the correct field replacement part number.

Item	Field Replacement Kit Part Number
6W Solar Panel (does not include mounting hardware)	396773-01-0

Ambient Temperature Range

May be used up to a *maximum* ambient temperature of 80°C and a *minimum* ambient temperature of –40°C; refer to the data plate attached to the device for ambient temperature.

Required Tools

- 1/4-inch flat-head screwdriver (for attaching/detaching aluminum tilt brackets)
- 1/ 8-inch flat head screwdriver (for wiring +SPIN/–SPIN terminals with 5.08mm pitch terminal block connections)
- 3/32-inch flat-head screwdriver (for wiring +SPIN/–SPIN terminals with 3.81 mm pitch terminal block connections [only for FB1200 Flow Computer with 6-channel expansion I/O])
- Hexagonal torque wrenches Ranges must include 10 to12 in-lbs (1.1 to 1.4 N-m) and 28 to 30 in-lbs (3.2 to 3.4 N-m).

WARNING

EXPLOSION HAZARD – Substitution of any components may impair suitability for Class 1, Division 1 or Class I, Division 2.

WARNING

EXPLOSION HAZARD – Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

DANGER

EXPLOSION HAZARD: Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.

DANGER

EXPLOSION HAZARD: Never remove end cap(s) in a hazardous location. Removing end cap(s) in a hazardous area could result in an explosion.



Important

If this equipment is used in a manner not specified by the manufacturer, the protection provided by equipment may be impaired.

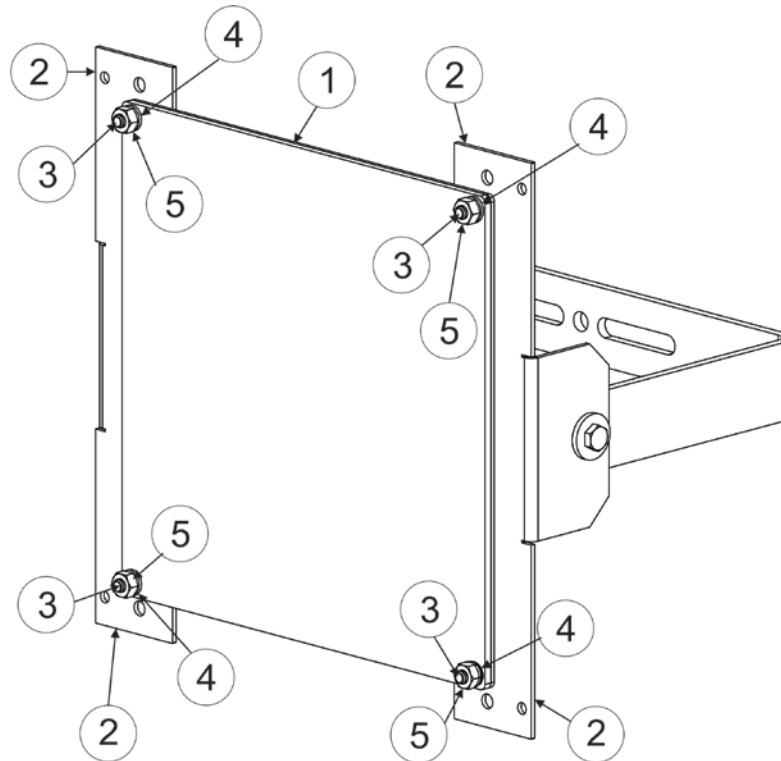
Removing/Replacing the Solar Panel

UL Listed 6W Solar Panel Field Installed Accessory Kit for Use in Class I, Division 2, Groups A, B, C, and D

- Flow Computer 6W Solar Panel Field Installed Accessory Kit Part No. 396773-01-0 for use with UL Listed Model Series FB1100 and FB1200.

The procedure for replacing the 6W solar panel on the FB1100/FB1200 re-uses the existing mounting hardware provided with the original solar panel. Save any mounting hardware/screws/nuts/washers from the original.

Solar Panel Bracket Assembly



- 1 6V, 6W solar panel
- 2 aluminum tilt bracket (2)
- 3 10-32 x 1/2 pan head screw (4).
- 4 #10 lock washer (4)
- 5 10-32 hex nut (4)

1. Carefully detach the old solar panel from the aluminum tilt brackets by unscrewing the pan head screws (Item 3) from the hex nuts (Item 5) and washers (Item 4) using a 1/4-inch slotted screwdriver. Save the screws, nuts, and washers.
2. Attach the new (replacement) solar panel to the aluminum tilt brackets (item 2) using the saved hex nuts, screws, and washers.
3. Torque hex nuts (Item 5) to 10 to 12 in-lbs. (1.1 to 1.4 N-m).
4. Apply Loctite #222 to hex nuts after torquing.
5. Wire connections between the solar panel and the flow computer (see [Wiring Connections](#)).

6. Set the tilt angle of the panel for maximum solar exposure (see *Setting the Tilt Angle*).

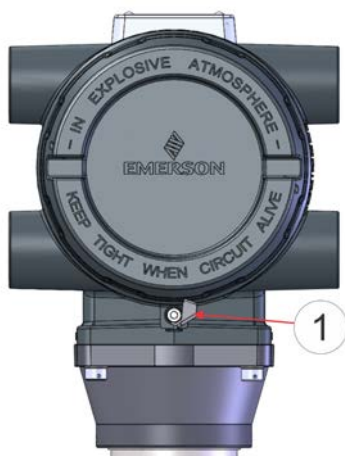
Removing/Replacing the Rear End Cap (for Access to Wiring)

DANGER

EXPLOSION HAZARD: Never remove end cap(s) in a hazardous location. Removing cover(s) in a hazardous location could result in an explosion.

1. Remove the retaining clamp assembly on the rear end cap (if present) using a 3 mm hexagonal wrench.

Retaining Clamp Assembly



1 Retaining Clamp Assembly

2. Grasp the end cap.

Rear End Cap



3. Unscrew the end cap turning it counterclockwise until the cover comes off. Set it aside in a safe location.

Note

If you need more leverage place a long screwdriver or other appropriate tool across the two notches in the cover to act as a pry bar.

Rear End Cap Removal



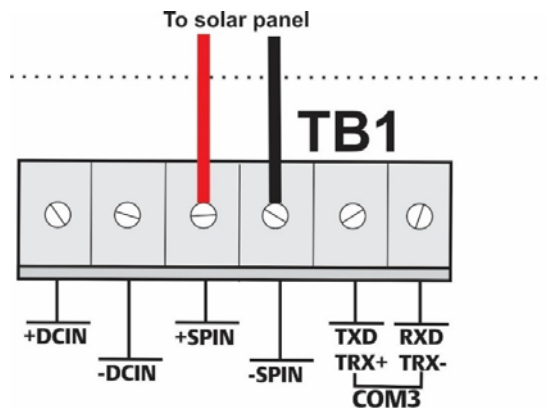
4. When replacing the end cap, carefully align the end cap threads with the threads of the enclosure and replace the rear end cap. Screw the end cap clockwise (eight full turns) until it is tightly sealed to the enclosure. End caps must have at least 8 full threads engaged upon reassembly.
5. If applicable, tighten the retaining clamp using the screw and washer onto the end cap using a 3mm hexagonal wrench. When tightening, torque to 10 to 12 in-lbs. (1.1 to 1.4 N-m).

Wiring Connections

Disconnect old wires from +SPIN and –SPIN terminals using a flat-head screwdriver (1/8 inch for 5.08 pitch terminal block connections or 3/32 inch for 3.81 mm pitch terminal block connections).

Make new connections from the solar panel to the +SPIN and –SPIN terminals using standard copper wire (#18 AWG minimum).

Wiring for Solar Panel



Restriction

The solar panel and lead acid battery combination cannot be used with ATEX/IECEx applications.

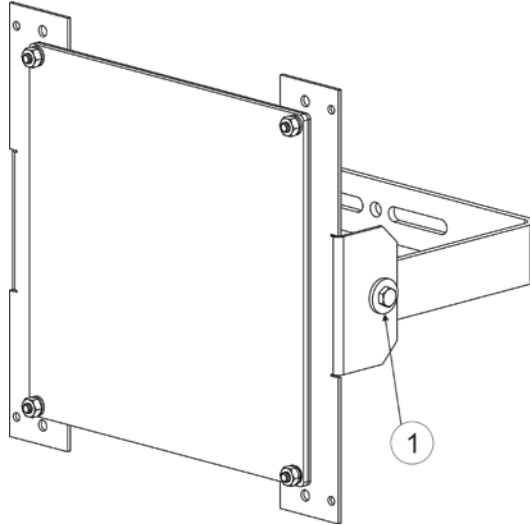
Note

Wire in accordance with Article 501.10(B) of the National Electrical Code.

Adjusting the Tilt Angle

The mounting brackets allow you to adjust the solar panel for maximum solar exposure. You can adjust the swivel of the panel by adjusting the U-bolt with a hex wrench.

Adjusting Solar Panel Tilt Angle



1 Tilt angle adjustment – Torque to 28-30 in-lbs. (3.2 to 3.4 N-m)

- Point the solar panel surface due south (in the northern hemisphere) or due north (in the southern hemisphere) at an angle determined by the latitude of the site. The table below shows the angle (from horizontal) at which you should install the solar panel to maximize annual energy output. At most latitudes, you can improve performance by reducing the angle during the summer and increasing the angle during the winter. If no seasonal adjustments in panel direction are needed, then adjust the position for the worst-case December-January angle.

Solar Panel Tilt Angle

Latitude	Installation Angle
0 to 4°	10° from horizontal
5 to 20°	Add 5° from the local latitude
21 to 45°	Add 10° from the local latitude
46 to 65°	Add 15° from the local latitude
66 to 75°	80° from horizontal

- Solar insolation is the amount of solar energy in hours received each day by an optimally tilted panel during the worst month of the year. An insolation rating of one hour means that the site, on average, would receive one hour of solar energy at the panel's rated power level (1000W/m² per day). This rating varies from less than one hour in northern Canada to more than six hours in the Sahara Desert.

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