

MAMBA

General Duty Solar Junction Box



making solar simple.



442+

443+

663

884



Additional Accessories & Mounting Options Available

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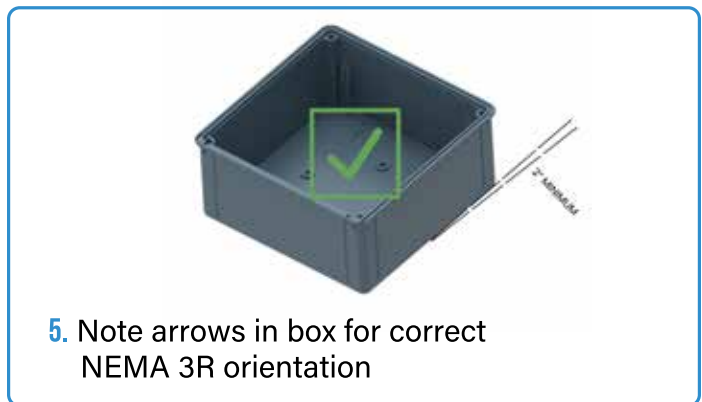
1. Mount enclosure with screws in the four (4) mounting locations.

2. Minimum screw diameter is #10, maximum is 1/4"

3. Always pre-drill for fasteners larger than #10 that do not have a drill point



4. Mount back wall between vertical and 2 degree pitch.



5. Note arrows in box for correct NEMA 3R orientation

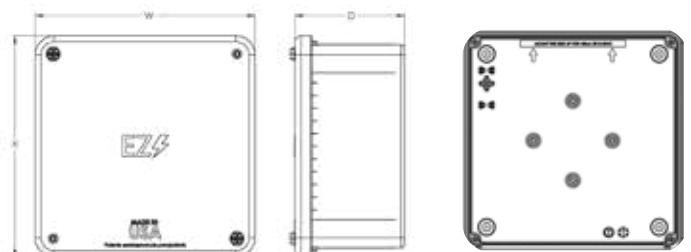


6. Attach the lid with (4) #10 hex head lid screws. **Captive screws, secure lid screws before use.**

Mounting angles are to ensure weep holes are clear

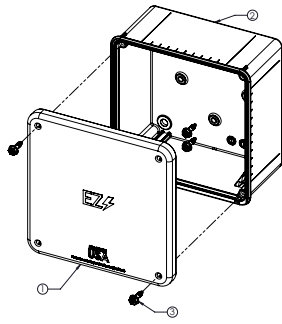
* Mamba may be installed fully flat if elevated off surface (e.g. rail mounted)

Item No.	Height (in)	Width (in)	Depth (in)
MAMBA 442+	5.02	5.02	2.25
MAMBA 443+	5.02	5.02	3.25
MAMBA 663	6.52	6.52	3.25
MAMBA 884	8.52	8.52	4.25



Interior of Mamba

A. Materials Included



Item No.	Qty	Description
1	1	MAMBA-LID-XXX
2	1	MAMBA-BASE-XXX
3	4	#10-16 x 3/4" HFHSS LID SCREWS 2 PRE-INSTALLED

B. Wiring and Proper Use

The Mamba Line is an outdoor PV junction box. All wires are to be copper conductors with insulation rated to 75°C or higher. To ensure dependable long-term connection it is required to use outdoor rated, UL 514B, NEMA 3R approved fittings and/or strain reliefs. The Mamba does not come with fittings, wire nuts, din-rail or terminal blocks due to site-specific needs. It is the responsibility of the installer to specify the proper accessories for the installation. Follow the installation instructions from the fittings, strain reliefs, din-rails, terminal blocks and grounding block manufacturer and follow the National Electrical Code, ANSI/NFPA 70 wiring methods and guidelines. When using terminal blocks, wiring shall be in conformance to wire bending space as listed in UL1741 or as shown in Table 2.

The Mamba is nonconductive and therefore does not need to be grounded. However, this also means the box cannot be used to maintain an electrical bond between fittings. Ensure all proper jumpers or other bonding mechanisms are in place per NEC. The PV system grounding shall be installed per the requirements of Sections 690.41 through 690.47 of the National Electrical Code, ANSI/NFPA 70, UL1741 and is the responsibility of the installer.

When installing a conduit hub, the hub shall be connected to the conduit before the hub is connected to Mamba.

To maintain the Mamba's 3R rainproof rating, the enclosure lid must close freely without interference from wires and be secured with the provided screws to 15-20 lb-in. Failure to properly close the lid can lead to excessive water ingress leading to an electrical short and possibly a fire.

C. System Specifications and Ratings

Mamba Specifications:

- Maximum Voltage: 1,500 Volts
- Maximum Current: 80 Amps (120 Amps for 884)
- Allowable Wire: 14 AWG – 6 AWG (14-2/0 for 884)
- Spacing: Please maintain a spacing of at least ½" between uninsulated live parts and fittings for conduit, armored cable, and uninsulated live parts of opposite polarity.
- Enclosure Rating: Type 3R
- Roof Slope Range: 2-90 degrees (reference images in "Mamba Mounting")
- Max Side Wall Fitting Size: See Max Fitting Size Chart
- Ambient Operating Conditions:
(-35°C) - (+75°C)
- Compliance:
 - UL1741, CSA C22.2 No. 290
 - Approved wire connectors: must conform to UL1741

MAX FITTING SIZE	
Mamba Model	Max Fitting Size (in)
442+	3/4"
443+	1-1/2"
663	1-1/2"
884	2"

- System Marking: Intertek Symbol and File # 5029623
- Periodic Re-inspections: If re-inspections yield loose components, loose fasteners, or any corrosion between components, components that are found to be affected are to be replaced immediately.

Table 1: Typical Wire Size, Torque Loads and Ratings

	1 Conductor	2 Conductor	Torque				
			Type	NM	Inch Lbs	Voltage	Current
ABB ZS6 terminal block	10-24 awg	16-24 awg	Sol/Str	0.5-0.7	6.2-8.85	600V	30 amp
ABB ZS10 terminal block	6-24 awg	12-20 awg	Sol/Str	1.0-1.6	8.85-14.16	600V	40 amp
ABB ZS16 terminal block	4-24 awg	10-20 awg	Sol/Str	1.6-2.4	14.6-21.24	600V	60 amp
ABB M6/8 terminal block	8-22 awg		Sol/Str	.08-1	8.85	600V	50 amp
Ideal 452 Red <small>WING-NUT Wire Connector</small>	8-18 awg		Sol/Str	Self-Torque	Self-Torque	600V	
Ideal 451 Yellow <small>WING-NUT Wire Connector</small>	10-18 awg		Sol/Str	Self-Torque	Self-Torque	600V	
Ideal, In-Sure <small>Push-In Connector Part #39</small>	10-14 awg		Sol/Str	Self-Torque	Self-Torque	600V	
WAGO, 2204-1201	10-20 awg	16-24 awg	Sol/Str	Self-Torque	Self-Torque	600V	30 amp
WAGO, 221-612	10-20 awg	10-24 awg	Sol/Str	Self-Torque	Self-Torque	600V	30 amp
Dottie DRC75	6-12 awg		Sol/Str	Snap-In	Snap-In		
ESP NG-53	4-6 awg		Sol/Str		45	2000V	
	10-14 awg		Sol/Str		35		
ESP NG-717	4-6 awg		Sol/Str		45	2000V	
	10-14 awg		Sol/Str		35		
Brumall 4-5,3	4-6 awg		Sol/Str		45	2000V	
	10-14 awg		Sol/Str		35		

Table 2: Minimum wire-bending space for conductors through a wall opposite terminals in mm (inches)

Wire size, AWG or kcmil (mm ²)	Wires per terminal (pole)			
	1 mm (inch)	2 mm (inch)	3 mm (inch)	4 or More mm (inch)
14-10 (2.1-5.3)	Not Specified	-	-	-
8 (8.4)	38.1 (1-1/2)	-	-	-
6 (13.3)	50.8 (2)	-	-	-

WARNING! STOP IMPORTANT SAFETY INSTRUCTIONS

READ ALL INSTRUCTIONS AND SAFETY WARNINGS PRIOR TO INSTALLATION



NOTE: SAVE THESE INSTRUCTIONS

This manual contains important instructions that shall be followed during installation and maintenance of the system. This manual should be stored near the product's installation and must be available at all times. This product is intended for operation in an environment having a maximum temperature of 75°C.

This product is only to be installed by qualified personnel. These installation instructions are for qualified personnel only and the instructions herein are provided for those individual(s) only. To reduce the risk of electric shock, injury or death, all wiring and connections must be performed by qualified personnel. Do not perform any installation or service other than that to which you are qualified to perform. Protect you and all persons and property during installation and servicing of this equipment.

If you have any doubt concerning your competence or expertise, consult a qualified expert to perform the installation.

Lethal voltages are present during the installation, operation and service of this equipment. Proper precautions must be taken at all times to ensure the safety of the service personnel.

At all times follow state and federal occupational safety and health administration (OSHA) guidelines and regulations.

Utilize proper Personal Protective Equipment (PPE) as required per national and local regulations as well as for installation best practices.

Ensure the electrical installation is in accordance with the National Electrical Code (NEC), ANSI, NFPA 70, all local electrical codes, and with the authority having jurisdiction. If there are any contradictions between the NEC and this document, follow the NEC requirements.

Install, operate, and use this product in a manner consistent with the instructions provided. Failure to follow the procedures indicated may result in roof leaks, property damage, or consequential damage.

- Ensure all electrical conductors are at zero voltage potential before installing or servicing this unit.
- Never break contact on a circuit without using the appropriate disconnect device.
- Follow established lockout-tagout procedures for all electrical conductors prior to servicing.
- Photovoltaic systems produce potentially lethal electrical energy when exposed to light. Use all appropriate procedures to de-energize the photovoltaic system and the conductors leaving the system prior to service.
- Ensure all wires are in good service condition. Nicked, pinched, or damaged wires can lead to electrocution or cause a fire.
- Be aware of and work away from power lines. Contact with power lines could result in electrocution, personal injury, or death.
- When disconnecting source or supply circuits, provide sufficient time as stated in the power electronics manufacturer's instruction manual in order to ensure discharge of all conductors in the circuit.
- Always verify the integrity and proper installation of the electrical components prior to energizing electrical circuits.
- Non-metallic enclosures do not provide grounding means between conduit connections if used. The use of grounding hubs and jumper wires are required.
- Grounding must be sized per NEC requirements and is the responsibility of the installer.
- Wear safety equipment rated for a minimum of 600V or as required for the specific site conditions.
- Disconnect all conductors from the array prior to making or breaking connections within this product or within any other point of the circuit.
- Activating the AC and/or DC disconnect switch within a circuit does not shut off potential electrical energy or voltage from the photovoltaic panels. Ensure the photovoltaic array is disconnected and there is zero voltage potential on the conductors being installed before servicing this product.
- Do not use this equipment in a manner other than that outlined in these instructions. Doing so may cause personal injury or death.
- Check all wiring and connections for integrity and proper installation prior to energizing the circuit.
- Always de-energize the DC and AC circuits prior to installation or service. Neglecting to do so could result in property damage, personal injury or death.
- If any part of this product becomes damaged, remove and discard the entire unit, and replace with a new one. Failure to do so could result in fire, property damage, personal injury, electrocution, or death.
- When disconnecting the inverter, allow 15 minutes for all electrical storage components to discharge before servicing any conductors in that circuit.
- Do not install if the roof is wet, frosted, or covered by ice or snow.
- Whenever drilling into an attic space, ensure that no electrical wires, conduit or electrical components are on the other side. Failure to note electrical equipment locations could lead to damage which could result in electrocution, personal injury or death.
- Do not use the product to anchor fall protection equipment.
- When determining ambient operating temperature, system designer must take into account external sources of heat such as irradiance from the sun or the environmental conditions under which the product is installed such as under a PV module. Exceeding the temperature rating could cause electrical failure or arcing that could result in property damage, fire, electrocution, personal injury or death.
- The installation of this product requires working on roofs. Follow applicable safety regulations and best practices to avoid falling from the work area. Take steps to prevent objects from falling off the roof.
- Never work alone. Someone should always be in range of your voice or close enough to come to your aid in the event of an accident.
- Remove all rings, bracelets, necklaces, watches or other metal equipment that could become energized while working with electrical conductors and equipment.
- If modules are required to be removed or lifted during JB servicing, ensure the system is designed such that the removal of the module will not disturb or break the system ground path. In addition, ensure the lifted module maintains its ground during servicing. Failure to follow these instructions could produce a shock hazard leading to personal injury or death.
- Use a very sharp cutting tool to drill through the box walls and floor then clean all burrs.

Easy Solar Products, Inc. assumes no responsibility for the failure of an architect, contractor, installer, or building owner to comply with all applicable laws, building codes and requirements, and adequate safety precautions.