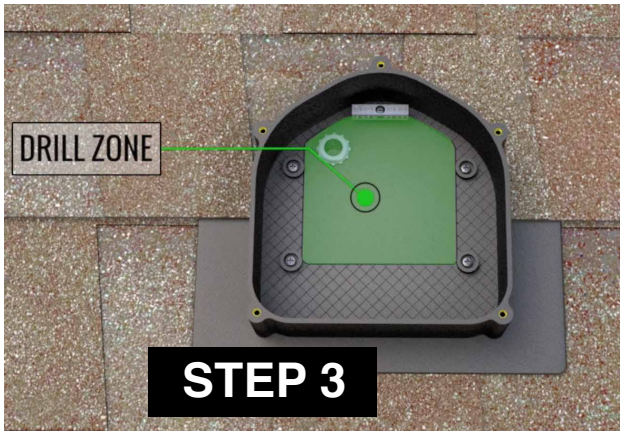
JB-1.2, JB-1.XL
Quick Start Guide

making solar simple.

Determine location for JB-1 on the roof surface. **USE THE LID AS A GUIDE**, and place the top of the lid 0-2” from the bottom of the 2nd course of shingles and trace the outline of the lid on the 1st course of shingles.



Within the Drill Zone, add the appropriately sized hole(s) into the attic. Apply sealant to the underside following the sealant guide. After fittings, connections are complete, finish by installing the lid.

WATCH INSTALLATION VIDEO

JB-1.2, JB-1.XL Installation Manual

PV Junction Box for Composition/Asphalt Shingle Roofs

making solar simple.

A. Step-by-Step Instructions

1. Determine location for JB-1 on the roof surface. **USE THE LID AS A GUIDE**, and place the top of the lid 0-2” from the bottom of the 2nd course of shingles and trace the outline of the lid on the 1st course of shingles.

2. Cut the roofing material to the shape of the lid outline, use a roofing bar to loosen shingles and remove nails that would interfere with the JB-1 flashing.

3. Slide the JB-1 into place. Using a drill bit, drill through the box & roof simultaneously within the approved ‘Drill Zone’. Verify, penetration hole is on either side of a rafter but not over or through a rafter/truss.

4. Remove the JB-1 and drill appropriately sized holes in the box and decking for required conductor fittings. Clean off all burs.

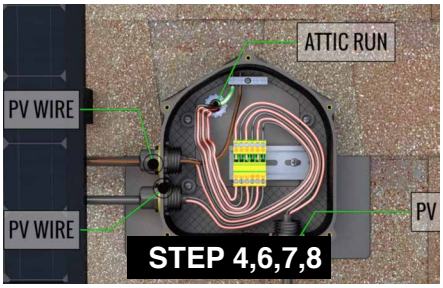
5. Apply roofing sealant to the underside of the flashing following the sealant indentation guide.

6. Slide the JB-1 into place. Secure the JB-1 to the roof decking using (4) #10 x 1-1/4” Phillips pan head screws provided, torque to 15-20 lb-in.

7. Install outdoor-rated, UL 514B, NEMA 3R approved fittings and/or strain reliefs to the EAST, WEST and SOUTH side walls of JB-1 and complete wiring installation. Up to 1” raintight fittings are all acceptable. Keep fittings a minimum of ¼” above the flashing. Clean off all burs.

   CAUTION: BONDING BETWEEN CONDUIT CONNECTIONS IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION

8. Populate the JB-1 using the appropriate wire connectors, terminal blocks, or other needed components that are suitable for the intended purpose.



9. When connections are complete finish by installing the lid using (5) #8 x 3/4” Phillips pan head screws provided. Hand tighten until head touches lid top.

B. Materials Included

JB-1.2

a. (1) JB-1.2 Body
b. (1) JB-1.2 Lid
c. (1) Neutral Bar and Din Rail
d. (6) #8 x 3/4" Phillips pan head screw
e. (6) #10 x 1-1/4" Phillips pan head screw

JB-1.XL

a. (1) JB-1.XL Body
b. (1) JB-1.XL Lid
c. (1) Neutral Bar and Din Rail
d. (6) #8 x 3/4" Phillips pan head screw
e. (4) #10 x 1-1/4" Phillips pan head screw

C. Wiring and Proper Use

The JB-1 is an outdoor PV rooftop junction box used on Composition/Asphalt Shingle Roofs. 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 JB-1 does not come with fittings, wire nuts, din-rail, terminal blocks or grounding 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 JB-1 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 JB-1.

To maintain the JB-1's 3R rainproof rating of 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.

D. System Specifications and Ratings

JB-1.2 Specifications:

- Maximum Voltage: 1,000 Volts
- Maximum Current: 80 Amps
- Allowable Wire: 14 AWG – 6 AWG
- 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: 2.5 – 12:12
- Max Side Wall Fitting Size: 1"
- Max Floor Pass-Through Fitting Size: 1"
- Ambient Operating Conditions: (-35°C) - (+75°C)
- Compliance:
  - UL1741
  - Approved wire connectors: must conform to UL1741

JB-1.XL Specifications:

- Maximum Voltage: 1,000 Volts
- Maximum Current: 120 Amps
- Allowable Wire: 14 AWG – 6 AWG
- 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: 2.5 – 12:12
- Max Side Wall Fitting Size: 1"
- Max Floor Pass-Through Fitting Size: 1"
- Ambient Operating Conditions: (-35°C) - (+75°C)
- Compliance:
  - UL1741
  - Approved wire connectors: must conform to UL1741

- System Marking: Intertek Symbol and File # 5019942
- 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 bock	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 WING-NUT Wire Connector	8-18 awg		Sol/Str	Self Torque	Self Torque	600V	
Ideal 451 Yellow WING-NUT Wire Connector	10-18 awg		Sol/Str	Self Torque	Self Torque	600V	
Ideal, In-Sure Push-In Connector Part #39	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		Wires per terminal (pole)							
		1		2		3		4 or More	
kcmil	(mm2)	mm	(inch)	mm	(inch)	mm	(inch)	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 items 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-ener gize 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 form 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 of 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 conduc tors 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 arching 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 burs.

Easy Solar Products, LLC 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