SCHLETTER
The Solar Mounting Group

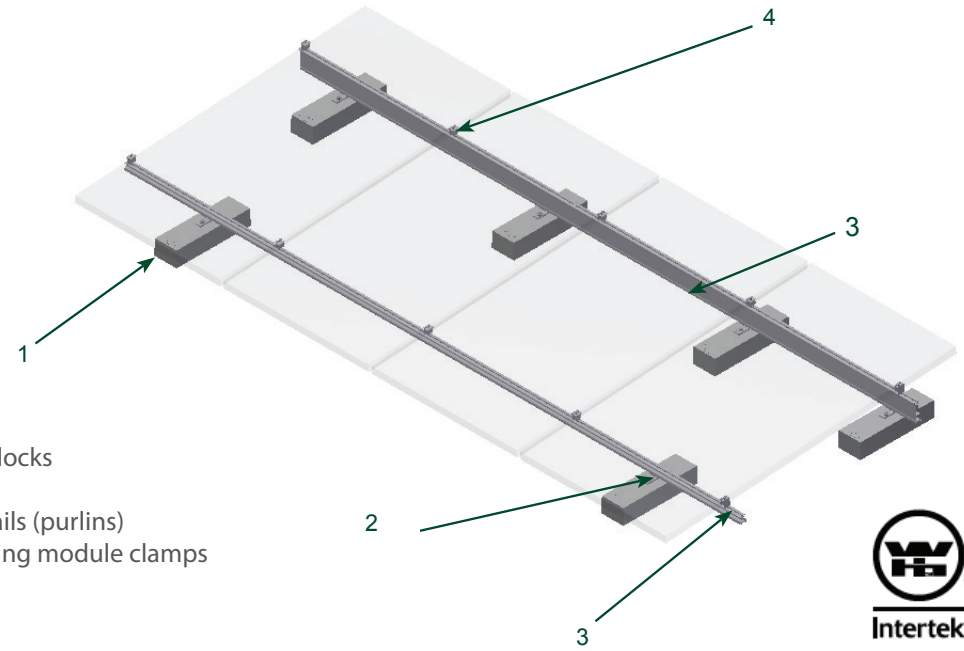
Fix-EZ

Designed for flat roof applications, the multifunction Fix-EZ solar mounting system mounts solar photovoltaic (PV) modules on roof tops with minimal load and materials, thereby reducing installation time and costs. The Fix-EZ is specifically designed to meet or exceed applicable IBC, ASCE, and UL standards.

Features

- Conforms to UL 2703[1]
- Certified to ULC/ORD Std C1703
- Fire class resistance rating: Class A when used with Type I or Type II photovoltaic modules in landscape orientation only[2]
- Multiple module tilt options available[3]
- Portrait or landscape module orientation[4]
- Ballast block included
- Includes **Rapid5K™** grounding module clamps
- Wind tunnel tested
- Optional wire management
- 30 Amp fuse series rating

Provided as a complete mounting system, the Fix-EZ includes several multifunction components to maximize functionality and minimize cost. Ballast blocks act as ballast weight as well as system support. Module mounting rails support modules[5] and act as windbreak with Rapid5K™ module clamps securely holding modules in place while bonding/grounding them to the system. The following is a guide to properly install a Fix-EZ in order to meet design and test standards.[6]



Key Components[7]

1. Concrete ballast blocks
2. Adjustable L-foot
3. Module support rails (purlins)
4. Rapid5K™ grounding module clamps

Intertek ETL CLASSIFIED Intertek

[1]The Fix-EZ is evaluated for electrical bonding only. The Fix-EZ meets all IBC and ASCE requirements for structural loading; it was not evaluated for loading under UL 2703.

[2]Special consideration needs to be taken during design phase if system requires protective fire barrier.

[3]Module tilt will vary depending on module manufacturer's connection requirements: tilt options range from 7 degrees to 15 degrees

[4]Maximum number of modules shall not exceed maximum system voltage.

[5] This racking system may be used to ground and/or mount a PV module complying with UL1703 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included manual.

[6] Installer is responsible for verifying that photovoltaic system meets applicable NEC standards.

[7] Individual parts and components may vary from system-to-system. Please reference system specific drawings.

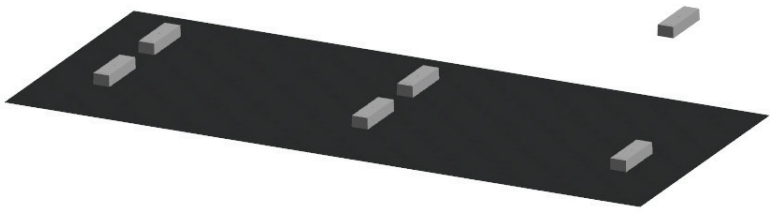
Installation Tool List

- Tape measure
- Chalk line
- Indelible marker
- Inclinometer
- Carpenters square
- Pliers
- Torx® bit (TX40)
  for Rapid5k™ module clamps
- Hex head wrench
  for standard module clamps
- 3/8" drive socket
  for self-drilling screws
- Drill bit
  check hardware to determine drill bit size
- Torque wrench
- Wrench and/or socket
  for all bolted connection
- Rubber mallet
  for installation of end caps
- Ratchet and/or rechargeable power drill
- Chop saw

Mounting the Individual Assembly Groups

1. Position Ballast Blocks/Rail Supports

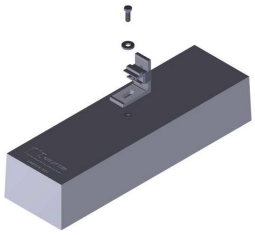
- Protective roof pad recommended, but not included as standard system component.[8]
- Ballast blocks/support (169015-001) should be placed according to project ballast map which consists of five zones: yellow, blue, red, green, and white (yellow requiring the highest ballast, white the least).



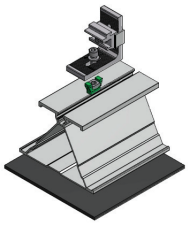
Place ballast blocks as specified in project specific layout

2. L-Foot Connection

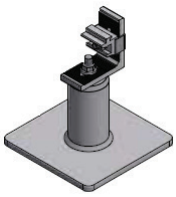
- Connect pre-assembled Rapid^{2+} Angle with KlickTop (119026-002) to threaded insert on top of ballast block using included hex head screw and washer.
- Repeat step for all ballast blocks/ rail supports.



Attach L-foot connection and secure using 3/8" bolt and washer



S2 rail and Rapid2+ angle assembly (169015-006)



Rail support and Rapid2+ Angle assembly (169015-003)

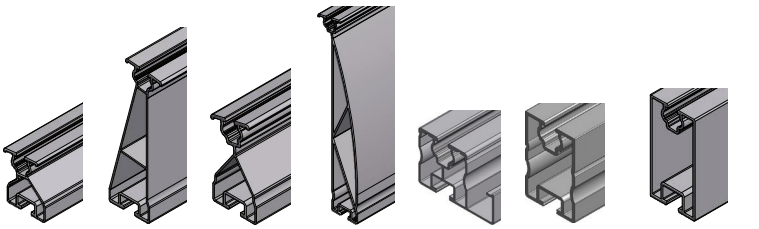
3. Rail/Splice Options for Fix-EZ Application

- FixZ series

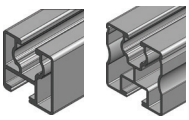
  Top channel: M8
  Bottom channel: M10

- Eco05, Solo05, Profi05, ProfiPlus05, ProfiPlus XT

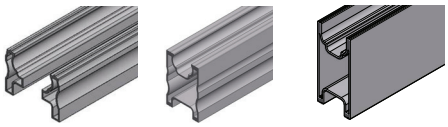
  Top channel: M8
  Bottom channel: M10



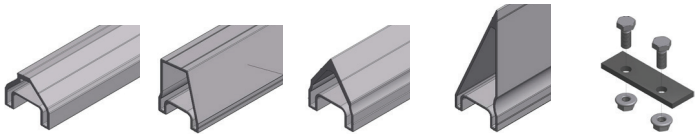
FixZ-7 Front | FixZ-7 Rear | FixZ-15 Front | FixZ-15 Rear | Profi05 | ProfiPlus05 | ProfiPlus XT



Eco05 | Solo05



Solo05/Profi05 internal splice | ProfiPlus internal splice | ProfiPlus XT Internal Splice



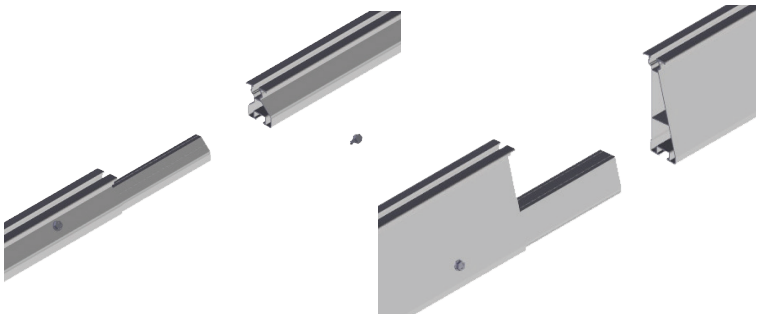
FixZ-7 front internal splice | FixZ-7 Rear internal splice | FixZ-15 Front internal splice | FixZ-15 Rear internal splice | Eco05 connector plate

[8]Due to the variety of roofing material, protective padding composition will vary based on substrate compatibility. Consult certified roofing contractor for best practices.

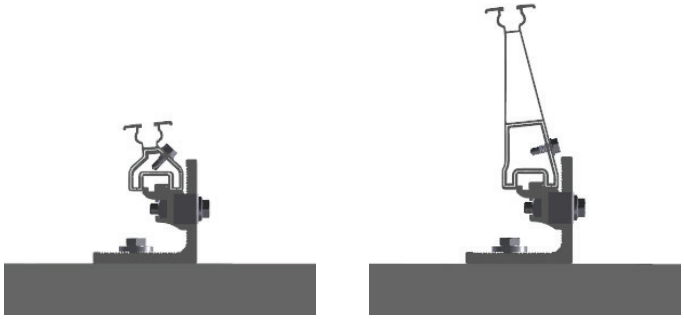
A. Portrait

4. Connect Module Support Rails (Portrait)

- If project calls for splices, connect front and rear rails with provided splice kits which include necessary hardware.
- To connect rail lengths to assembled ballast block and L-foot connection, simply position rail groove over protrusion of KlickTop™ and press into place, tighten Torx® screw.
- Repeat for all front and rear rails.



Insert portion of internal splice into one rail, insert exposed end of splice into second rail and secure with one self-drilling screw per side

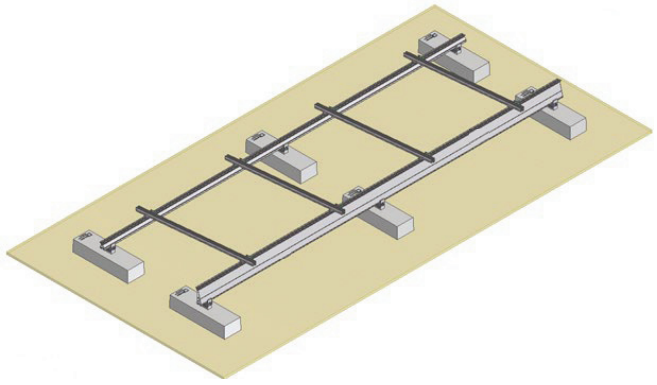


Position bottom of rail over KlickTop and press into place, tighten Torx screw

B. Landscape

4. Connect Module Support Rails and Cross Rails (Landscape)

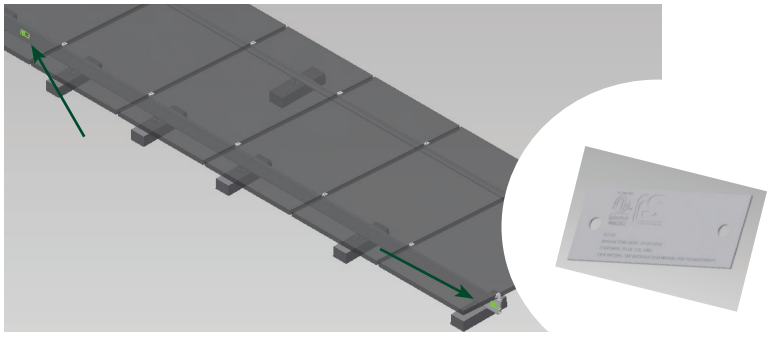
- Install front and rear rails.
- Attach KlickTop mounting clamp to front and rear rail in locations specified in system specific drawing.
- Align cross rail and hook bottom channel onto KlickTop.
- Repeat for all cross rails until end of row.
- See page 8 for fire barrier installation



Attach KlickTop to front and rear rail; slide bottom of cross rail onto KlickTop; tighten bolt to secure cross rail

5. Listing Requirement

- **IMPORTANT!** Listing requires one label be placed on all rear rails.

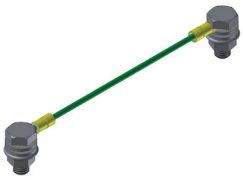


Attach labels to rails using self-drilling screws

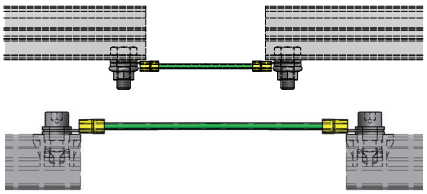
Optional Accessories

1. Bonding Jumper

- Electrically bonds adjacent systems forming a continuous ground path.
- Connects directly to FixZ rail.
- Available in 6-inch to 48-inch lengths.
- Used for expansion joints or other breaks in racking system.



Bonding jumper



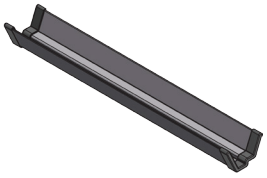
Bonding jumper connects directly to the top channel of purlin using M8 hardware and bottom channel using M10 hardware

2. Cable Management

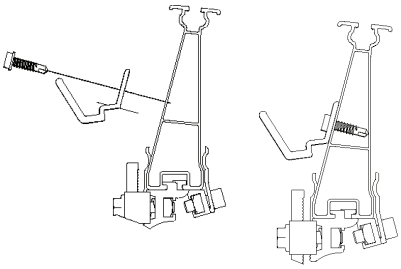
- If cable management was ordered with the system, install before modules are in place.
- To install ProKlip-Multi 8, gently press into receiving channel on top of rear or front rail.
- ProKlips are positioned in the space between FixZ rail and back of module, which is created by module frame.
- If using cable duct, secure trays on outer portion of rear rails for convenient placing of cables.

ProKlip-Multi 8
(129065-008)

Attach ProKlip-Multi 8 to M8 top channel, typically one per module



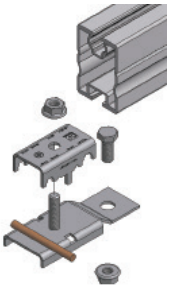
Cable duct
(128014-000)

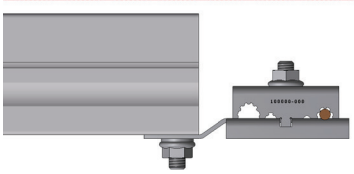


Attach cable duct to rear module rail using self-drilling screws spaced two feet apart

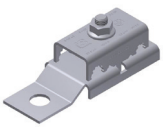
3. Overcurrent Protection Device (grounding)

- Accommodates stranded or solid copper wire (2 gauge to 14 gauge).
- Must use bare copper wire to connect to the grounding wire; remove at least two inches of insulation to expose copper wire.
- Connects to bottom M10 rail channel.

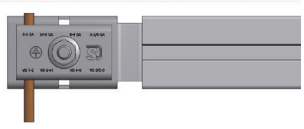




Loosen or remove top portion of grounding lug and insert grounding wire into appropriate groove



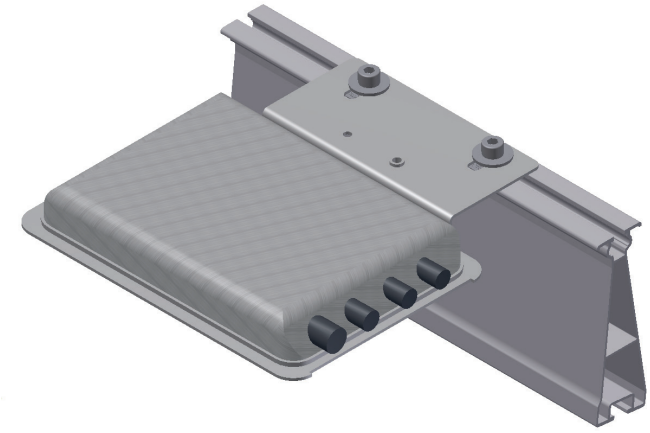
Grounding lug
(Part #135003-003)



Grounding wire must extend through grounding lug by at least 1/4 inch

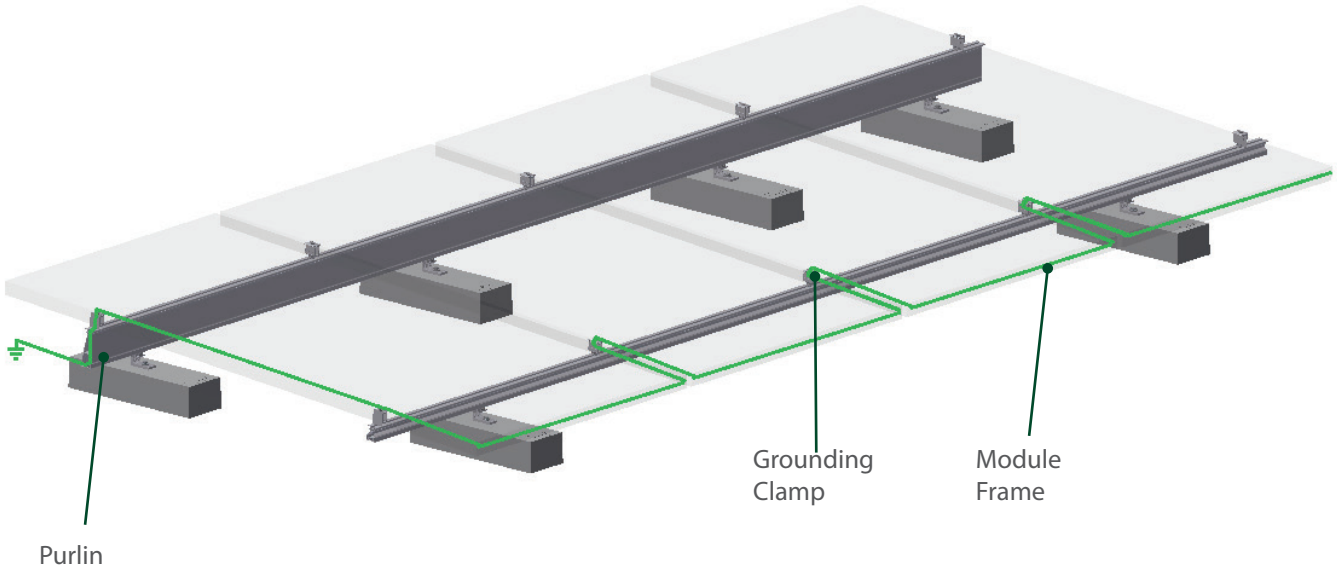
4. Micro-Inverter

- Mark approximate centers of each module on the rack assembly for micro-inverter placement
- Mount one micro-inverter at each marked location using the provided hardware mounting kits
- Allow a minimum of 20mm between roof and bottom of inverter. Allow a distance of 25mm between back of module and top of inverter
- Torque to the appropriate value
  Enphase: 9 N-m (80-85 in-lbs)
  Darfon: 9 N-m (80 in-lbs)
  AEconversion: 15 N-m



Attach micro-inverter to top channel of rail using provided hardware kits

Ground Path Diagram

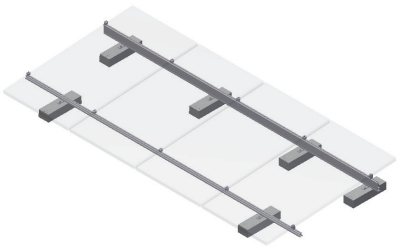


Module Mounting

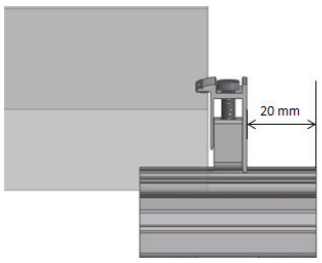
A. Portrait

1. Position Modules

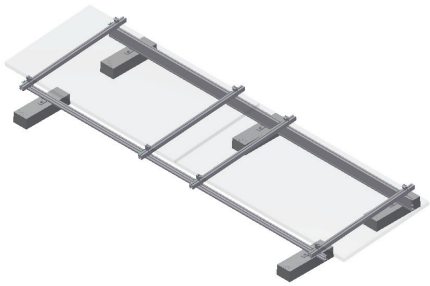
- Position end clamps approximately 20 mm from end of rail.
- Position first module and secure with prepositioned end clamps; do not fully tighten.
- Attach middle clamps to rail on the exposed side of first module.
- Place second module and secure using middle clamp; do not tighten.
- Repeat until end of row, then secure exposed side with end clamps.
- Torque to specification.



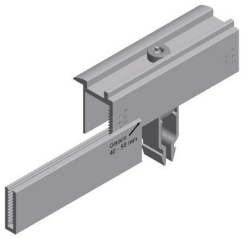
Fix-EZ in portrait orientation



Position end clamps approximately 20mm from end of rail



Fix-EZ in landscape orientation

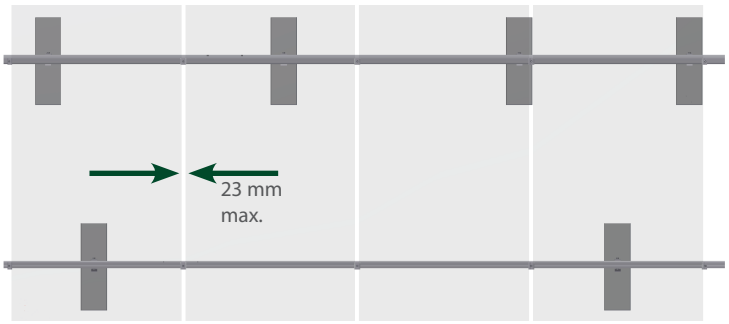


If adjustable end clamps are provided, slide attachment on to desired height.

B. Landscape

1. Position Modules

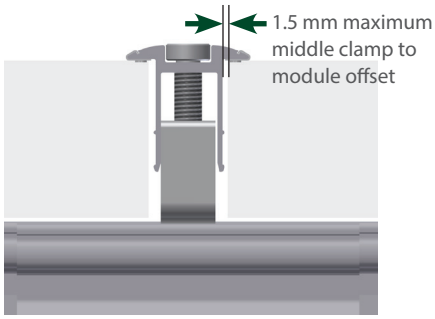
- If project calls for fire barrier, see page 8 for fire barrier and module installation.
- Attach end clamps approximately 20 mm from ends of top rail.
- Position module and secure using end clamps.
- Repeat until end of row.



Allowable gaps between modules

2. Secure Modules

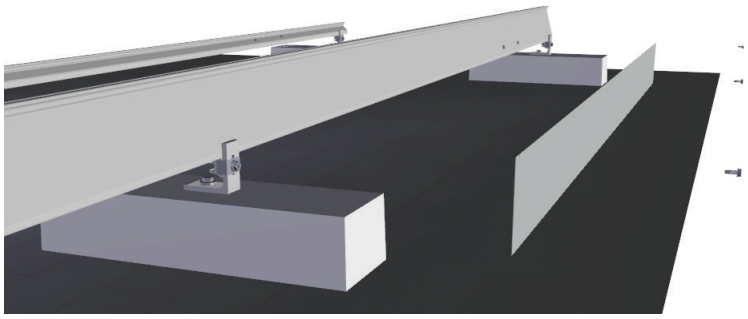
- Verify that the module clamp is fully engaged on the rail and is aligned with the module frame.
- Secure in place to specified torque.
- Please observe the clamping points specified by the module manufacturer.
- Use of impact driver is not recommended.



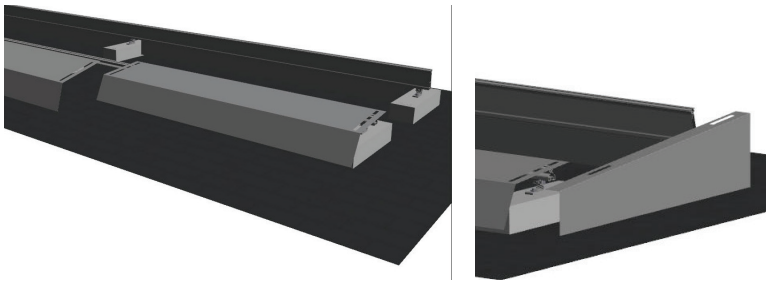
Fire Barrier

1. Fire Barrier

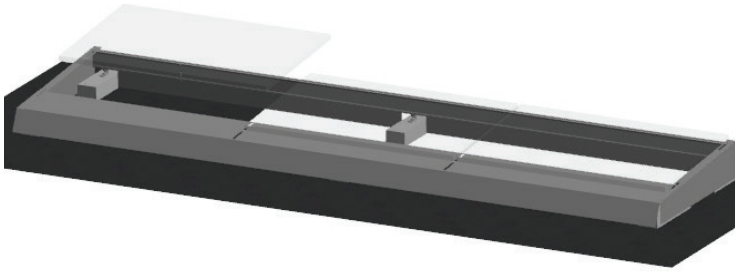
- Provides for a Class A fire rating when used with Type I or Type II modules.
- **IMPORTANT!** Only available in system designed with one row of module in landscape orientation.
- Required in systems installed on roofs with slopes less than 9.5 degrees (not for use on roofs with slopes greater than 9.5 degrees).
- Maximum opening between fire barrier and roof deck is one inch.
- Ensure correct dimension of the side alignment of module and rail.
- Only required in perimeter of array.
- Assembly is to be mounted over a fire resistant roof covering rated for the application.



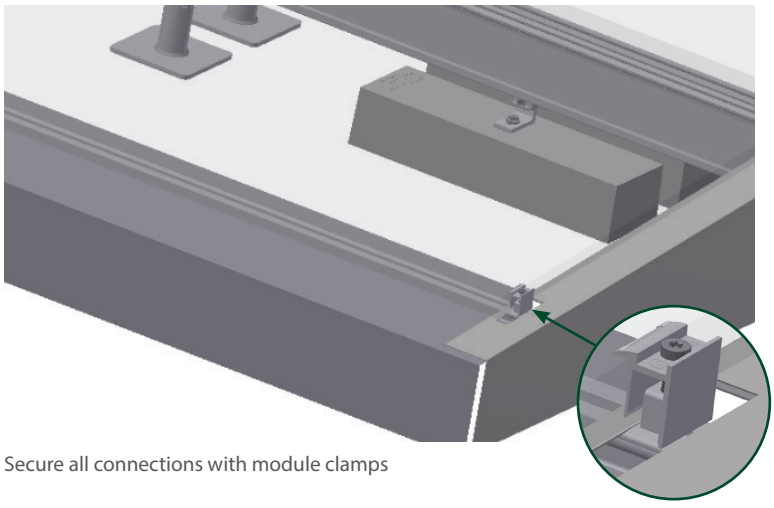
Attach rear barrier on rail with self-drilling screws



Place front barrier on top of front rail, repeat until end of row; then place side skirt on both ends of array (barrier pieces will overlap)



Position modules



Secure all connections with module clamps

Torque Specifications and Tolerances

Systems are specifically designed for each project. Please reference the specific project drawing for allowable tolerances and recommended torque for each size of bolt used in the system.

In the event of deviation from approved drawings, contact Schletter immediately.

Torx Bolt for Rapid5K Module Clamps	14 N-M	10.5 FT-LBS
M6 and 1/4" Bolt	6 N-M	4.5 FT-LBS
M8 and 5/16" Bolt	14 N-M	10.5 FT-LBS
M10 and 3/8" Bolt	30 N-M	23 FT-LBS
M12 and 1/2" Bolt	50 N-M	37 FT-LBS
M16 and 5/8" Bolt	121 N-M	89 FT-LBS
M20 and 3/4" Bolt	244 N-M	180 FT-LBS
Note: Recommended speed for installation of self-drilling 1/4" diameter is 1200-1800 RPMS.		

Equipment Grounding

- Many PV installations contain more than one mounting system. Such cases call for electrically bonding each of the different mounting systems. Since individual racks are fully bonded units it is only necessary to connect individual racks together from one single point to another single point.[9] Only use stainless steel hardware when connecting harnesses or jumpers to the mounting system. Take care to prevent copper wires from directly contacting aluminum surfaces as this will cause corrosion. For this purpose, Schletter offers a bonding jumper on page 5.

- The PV INSTALLER of Schletter's electrically bonded Fix-EZ system must provide the components necessary for the final connections to the grounding electrode system. Typically the installation will incorporate a grounding electrode (ground rod), appropriately sized copper wire, rated wire connectors, and grounding lugs which are rated for this purpose. The PV INSTALLER must follow all manufacturers' installation literature. Installation must comply with all applicable NEC/CSA sections including but not limited to; NEC 250 (Grounding and Bonding), NEC 690 (Solar Photovoltaic Systems), CSA 22.1 (Safety Standard for Electrical Installations), and all other applicable state and local electrical code requirements.

- PV INSTALLER shall be fully responsible for all connections between Schletter's bonded Fix-EZ system and PV grounding electrode system.

- Equipment grounding conductors shall be no less than 14AWG (copper) or 12AWG (aluminum).

- Equipment grounding conductors can be connected to any exposed metallic portion of rack system provided that:

  a. connection area is sufficiently sized
  b. dissimilar metals are not in direct contact
  c. connection does not interfere with other components
  d. connection is protected from damage

[9]Schletter recommends two bonding jumpers connect separate systems for redundancy.

Torx® is a registered trademark of the Camcar Corp. division of Textron Industries.

Maintenance

- Yearly inspection of system should be conducted to maintain optimal performance.
- Visually inspect for signs of damage, wear, corrosion, or movement. Replace any affected components immediately.
- Check for loose wiring
- Check mechanical details of the structure:

  -At least 2% of bolted connections must be checked using a calibrated torque wrench. The torque wrench must have a display or be a click type torque wrench.

  -Torque wrench should be set at 50% of the intended tightening torque. Check is successful if the bolt cannot be loosened.

  -If >10% of the checked bolted connections are loose, the check has to be increased by a factor of five.

  -If more than 10% of connections are still loose, all bolted connections much be checked.

  -Tighten to specified torques

- Requirements per ASME B107 and AISC
- **WARNING: Risk of death by electric shock**
- Maintenance should only be performed by qualified personnel.

Safety Precautions

Follow proper installation and safety procedures at all times. Edges of parts may be sharp. Follow proper lifting guidelines as well as rooftop safety procedures.

For more information on Fix-EZ, please contact us at:

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Windsor, ON N8X 4L3
Call: (519) 946 - 3800
Fax: (519) 946 - 3805
mail.canada@schletter-group.com

Approved Module Manufacturers

Bonding and Grounding

Canadian Solar
- CS6X-310|315|320P
- CS6X-P-FG
- CS6K-P-FG
- CS6K-M
- CS6K-M AB
- CS6P-P
- CS6P-P-SD
- CS6V-M

ET Solar
- ET-M660 285|280|275|270|265 BB
- ET-M660 290|285|280|275|270 WW|WB
- ET-M672 340|335|330|325|320 BB
- ET-M672 345|340|335|330|325 WW|WB
- ET-P660 265|260|255|250 BB
- ET-P660 270|265|260|255 WW|WB
- ET-P672 315|310|305|300 BB
- ET-P672 320|315|310|305 WW|WB

Hanwha Q Cells
- Q.PRO BFR G4|G4.1|G4.3
- Q.PLUS BFR G4.1
- Q.PRO G4
- Q.PLUS G4
- Q.PRO L G4.1
- Q.PLUS L G4.1|G4.2
- Q.PEAK-G4.1|G4.1/MAX
- Q.PEAK BLK G4.1
- Q.PEAK L G4.2

Heliene
- Heliene 36|60|72|96M
- Heliene 36|60|72|96P

Hyundai Solar
- HiS-M310|315|320|325TI
- HiS-S330|335|340|345|350TI
- HiS-M250|255|260|265RG
- HiS-S265|270|275RG

Jinko Solar
- JKM275P-60
- JKM330P-72
- Eagle 60|72
- Eagle PERC
- Eagle Black 60|72
- JKM275PP-60-V
- JKM330PP-72-V
- JKM270P-60-V
- JKM320P-72-V
- Eagle MX JK07A|JK07B
- JKM265PP-60

Kyocera
- KD260|265GX-LFB2
- KU260|265|270-6MCA
- KU315|320-7ZPA
- KU260-6MPA

LG
- LGxxxN1C-G4
- LGxxxN1W-G4
- LGxxxS1C-G4
- LGxxxS1W-G4
- LGxxxN1K-G4
- LGxxxN2C-B3
- LGxxxN2W-B3
- LGXXXN1C-A5
- LGXXXS1C-A5
- LGXXXN2W-A5
- LGXXXS2W-A5

REC Solar
- REC245|250|255|260|265|270PE
- REC245|250|255|260PE BLK2
- REC300|305|310|315|320PE72
- REC265|270|275|280|285TP
- REC330|335|340TP72

SolarWorld
- Sunmodule SW 80 MONO RHA
- Sunmodule SW 150 POLY R6A
- Sunmodule SW 150 MONO R6A
- Sunmodule SW 100 POLY RGP
- Sunmodule Plus SW 280-295 MONO
- Sunmodule Plus SW 285-300 MONO (5-busbar)
- Sunmodule Plus SW 280-290 MONO BLACK (5-busbar)
- Sunmodule Plus SW 275-290 MONO BLACK
- Sunmodule Pro-Series SW 260 POLY WOB
- Sunmodule Protect SW 275-280 MONO BLACK
- Sunmodule SW 320-325|340-350 XL MONO

Talesun
- TP660|672M
- TP660|672P
- TP660|672P(H)
- TD660M
- TD660P
- Hipro M295+ TP660M
- Hipro M350+ TP672M
- PID ZERO TP672M
- FEATHER 2.0 TP660P

Trina
- TSM-PD14
- TSM-PD05
- TSM-PD05.08
- TSM-PD05.05
- TSM-DD14A(II)
- TSM-PEG5
- TSM-PEG5.07
- TSM-PEG14
- TSM-PEG40.07

Yingli Green Energy
- YL300C|295C|290C|285C|280C|275 C-30b
- YL290D|285D|280D|275D|270D-30b
- L340D|335D|330D|325D|320D|315D-36b
- YL275P|270P|265P|260P|255P|250P-29b
- YL260P|255P|250P|245P|240P-29b
- YL325P|320P|315P|310P|305P|300P-35b

Approved Micro-Inverters

Enphase
- M215
- M250

Darfon
- G320

AEconversion
- INV500-90