



FixRL INSTALLATION MANUAL

SCHLETTER

FixRL MOUNTING FEATURES

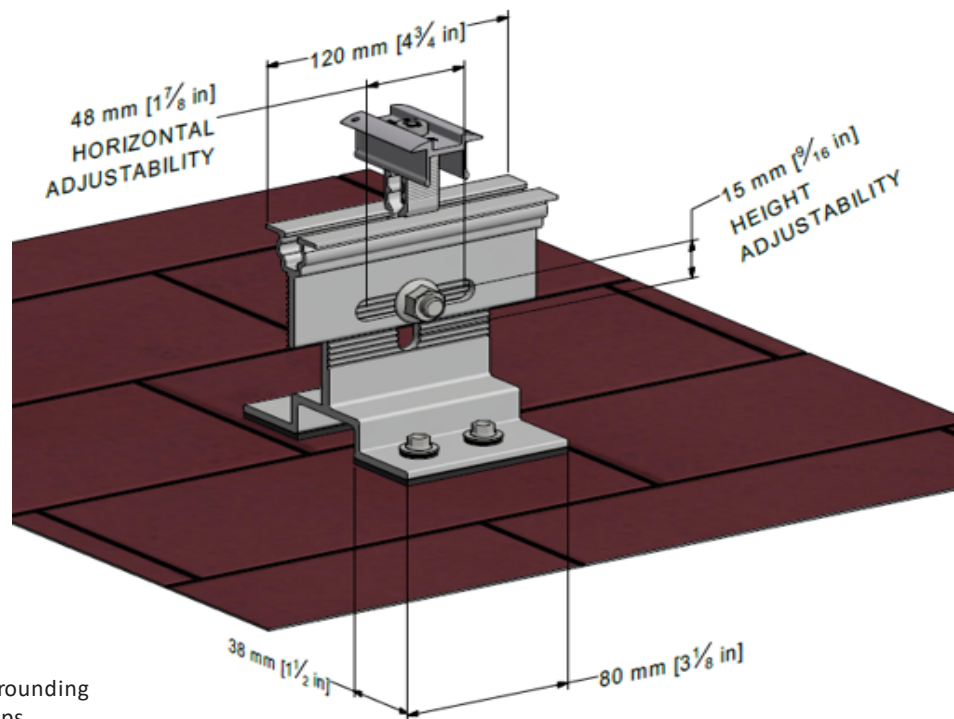
Fix-RL

The Schletter Fix-RL is a solar mounting system for roof mount photovoltaic (PV) installations and is designed to be a penetrating solution supporting modules in portrait or landscape orientation.¹ The Fix-RL is specifically designed to meet or exceed applicable IBC and UL standards.

Features

- Conforms to UL 2703²
- Certified to ULC/ORD Std C1703
- Certified to LTR AE-001
- Fire class rating: Class A when used with Type 1 and Type 2 photovoltaic modules³
- Fully preassembled kit for asphalt shingle roofs
- Attaches directly to the roof sheathing, minimum thickness 7/16" (11.11mm)
- Horizontal 1 7/8" (48mm) and vertical 9/16" (15mm) adjustability
- Applicable on roofs with a tilt up to 45° (gable) or 30° (mono slope)
- Included sealing washers and pre-installed butyl tape prevent water leakage
- No expansion joints necessary for rows up to 12 m
- Maximum array size 12 x 12 panels
- Engineered for horizontal and vertical installation
- Extended top rail available for integration of cable management/micro inverter/optimizer attachment

Each Fix-RL is custom designed to meet specific structural load requirements.⁴ Included in the Fix-RL are Rapid5K or Rapid 16 grounding module clamps specifically designed to secure and bond the frame of a PV module.⁵ While individual components and structural sections will vary between designs, the primary assemblies and installation methods will remain the same. During installation, fully assemble the system before securing bolts to the final torque. The following is a guide to properly install a Fix-RL in order to meet design standards.⁶



Key Components

1. Fix-RL (pre-assembled)
2. Butyl-tape (attached)
3. Rapid5K™ or Rapid16 grounding mid/end module clamps

¹ Maximum number of modules shall not exceed maximum system voltage.

² The Fix-RL is evaluated for electrical bonding only. The Fix-RL meets all IBC and ASCE requirements for structural loading; it was not evaluated for loading under UL 2703.

³ Special consideration needs to be taken during design phase if system requires protective fire barrier.

⁴ Individual parts and components will vary from system-to-system. Please reference system specific drawings.

⁵ This racking system may be used to ground and/or mount a PV module complying with UL 1703 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.















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



INSTALLATION TOOL LIST

Tools Needed to Install Fix-RL

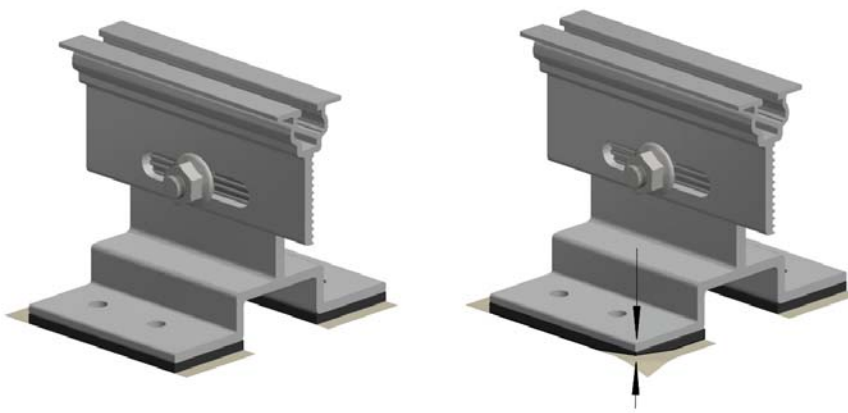
Ensure all tools on checklist are assembled before starting installation.

Installation Tools		✓
	Tape measure	
	Chalk line	
	Permanent marker	
	Inclinometer	
	Carpenter's square	
	Pliers	
TX40 	Torx® bit (TX40) for Rapid5k™ module clamps	
6 mm 	Hex head wrench for standard module clamps	
3/8" 	3/8" drive socket for self-drilling screws	
	Drill bit: check hardware to determine drill bit size	
	Torque wrench	
 13 mm 15 mm 17 mm 18 mm	Wrench and/or socket for all bolted connections	
	Rubber mallet for installation of end caps	
	Ratchet and/or rechargeable power drill	

MOUNTING INSTRUCTIONS

Mounting and Sealing

- Owner/Installer must ensure that sheathing is in excellent condition and can support the additional loads
- Shingles must be in sound condition, dry and free of any damage or debris to ensure flush contact with butyl tape
- Service temperature range of the butyl tape is -40°F to 190°F (-40°C to 88°C).
- Application temperature = service temperature, must follow installation instructions according to butyl tape data sheet (page 12)
- Butyl tape must not be installed on seam, gap or overlying shingles
- Wood screws must be fastened vertically to ensure tightness of sealing washer
- Screw threads must fully penetrate roof sheathing
- While Schletter offers components that can help to seal penetrations, responsibility for sealing penetrations lies with the installer



**Press firmly on the corner
before removing the paper!**

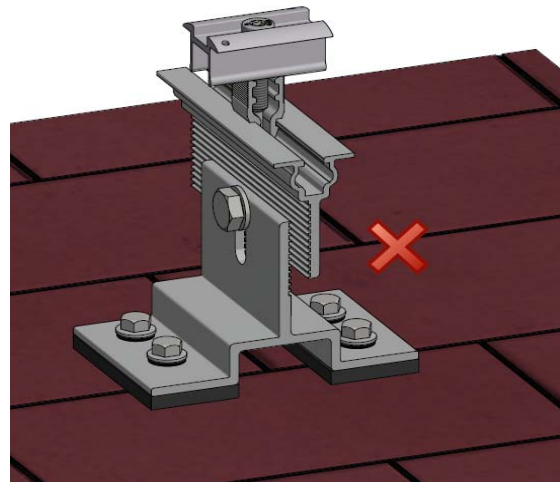
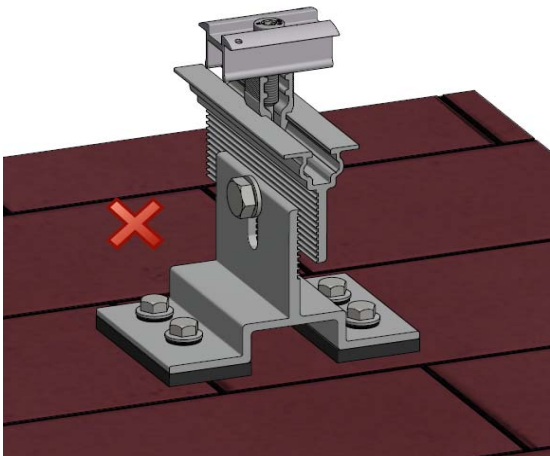
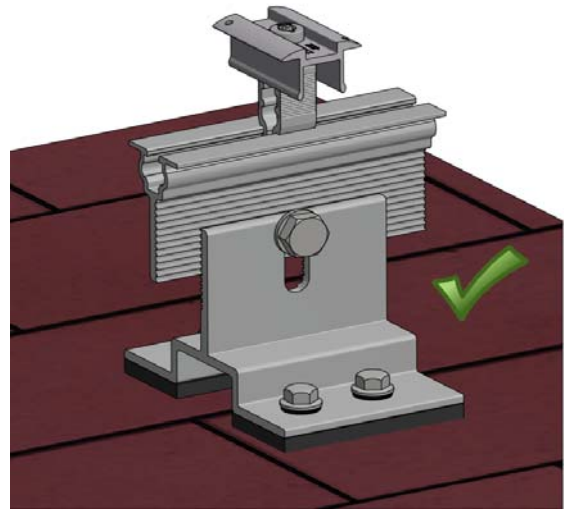
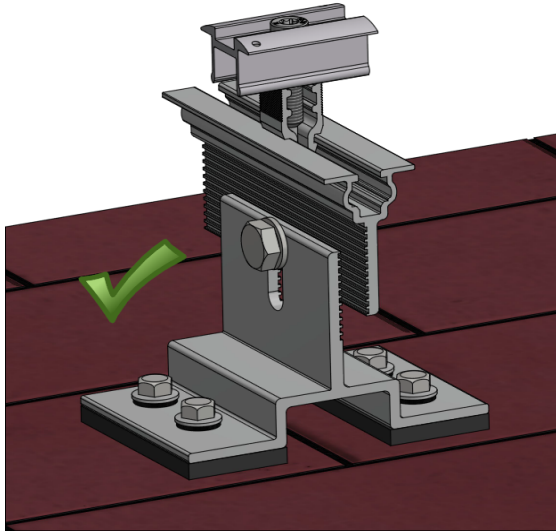
If you don't press firm enough,
the paper will not peel off the
butyl tape.

The small footprint of the base (1 ½" x 3 1/8" or 38 mm x 80 mm) allows for a quick installation, even on architectural shingles. In order to overcome height differences of shingles, use 1-2 additional pieces of butyl tape on one side of the base.

Once the protective paper is removed, place FixRL firmly onto the shingle, do not remove and reposition, since this might prevent water sealing.



MOUNTING INSTRUCTIONS



MOUNTING INSTRUCTIONS

Clamp Installation and Module Mounting

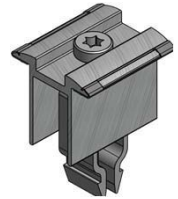
- Use only GROUNDING mid and end clamps
- Module clamps are to be installed in the center of the base
- Modules may be installed in both portrait and landscape orientation
- Clamps are only to be installed on the long side of the module
- If you have problems clicking the claw of the clamp into the rail channel, use a rubber mallet to push the claw in
- Use of impact driver is not recommended
- Torx bolt for module clamp is 15 N-M (10.5 FT-LBS)



Rapid16
Grounding
Middle Clamp



Rapid16
Grounding
End Clamp

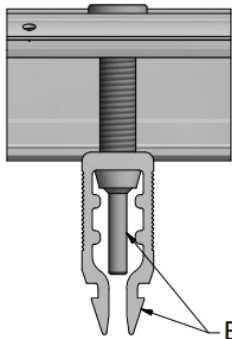


Rapid5K
Grounding
Middle Clamp



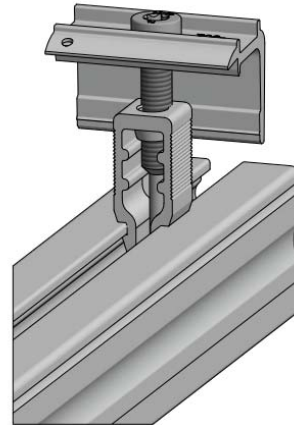
Rapid5K
Grounding
End Clamp

Step 1



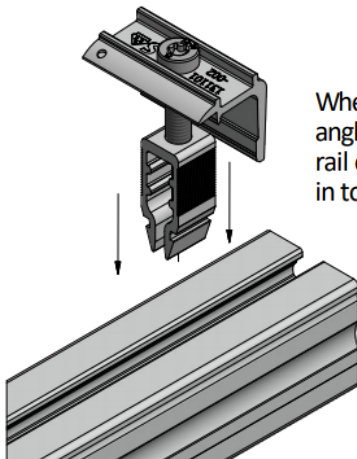
Before installing module clamp, be sure screw peg is clear of the mounting claw (torx screw may need to be loosened)

Step 3



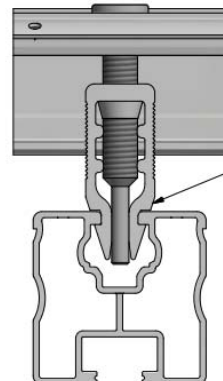
Once clamp is positioned in place, tighten torx screw to 15 N-M (10.5 FT-LBS)

Step 2



When installing slightly angle clamp and press in to rail channel until it is clicked in to place

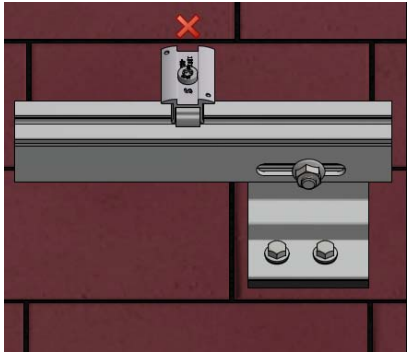
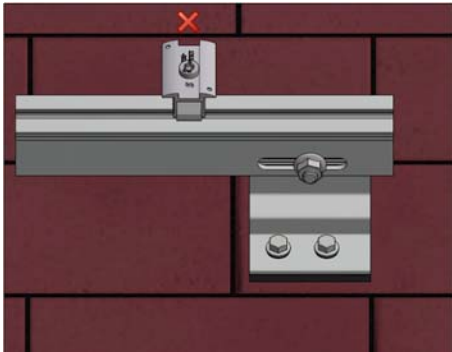
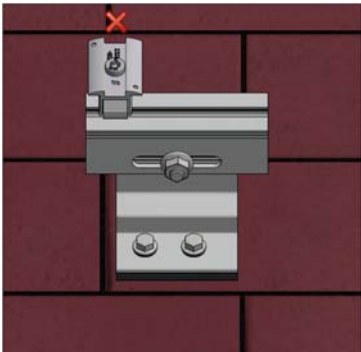
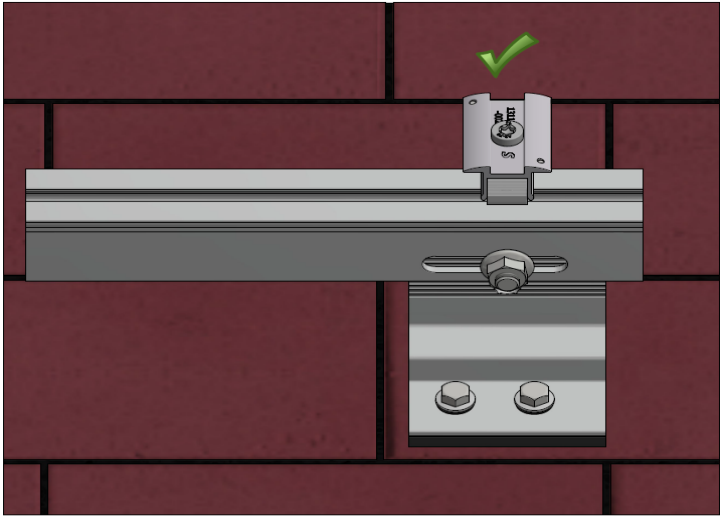
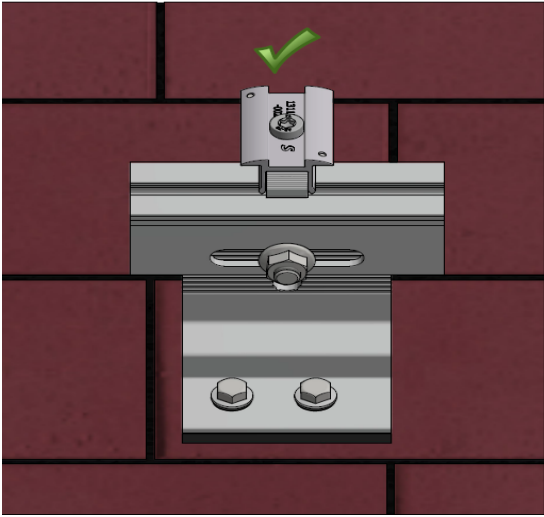
Step 4



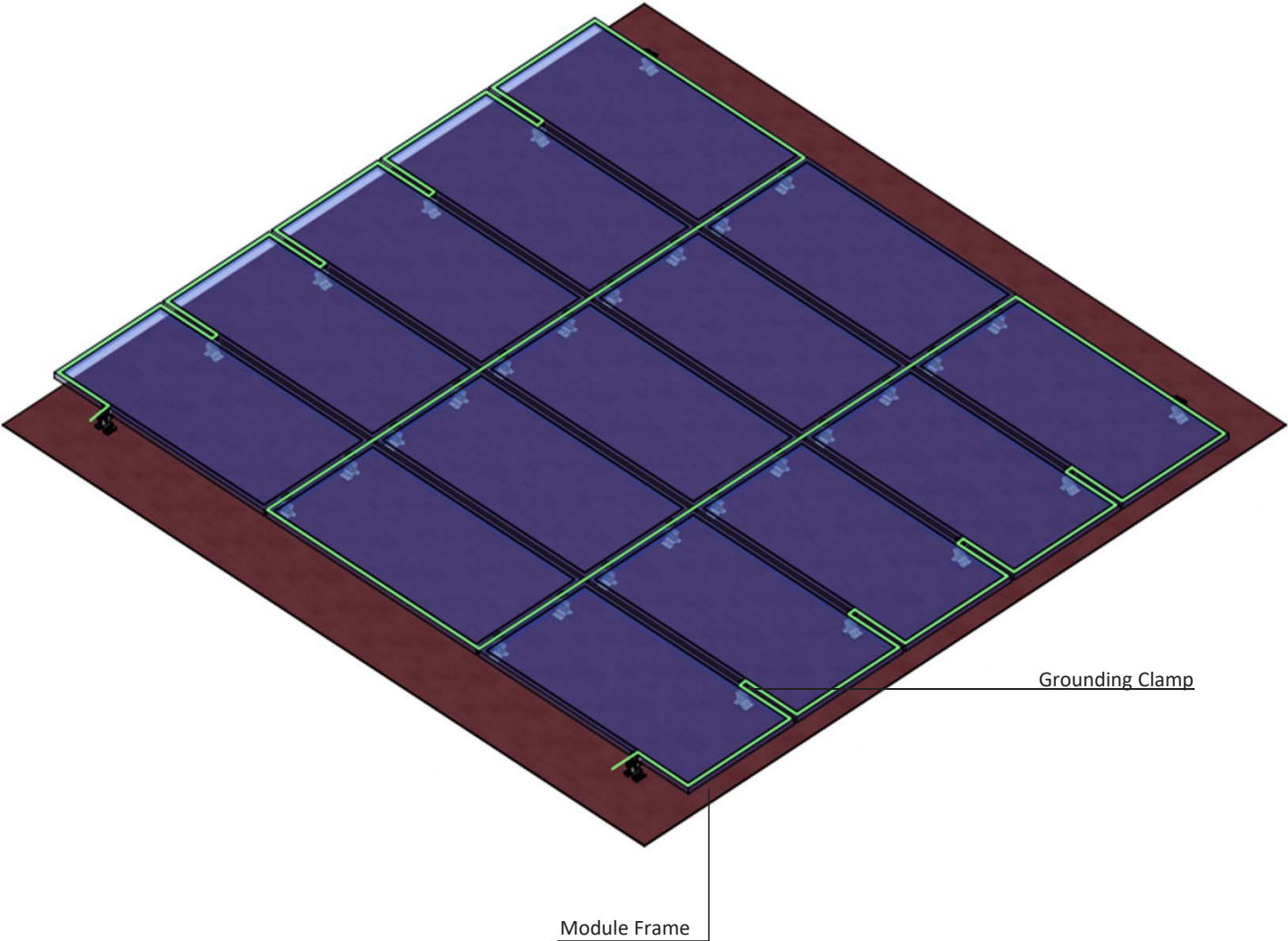
Clamp is now properly installed

MOUNTING INSTRUCTIONS

Module Clamp Location



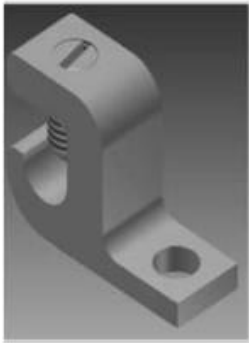
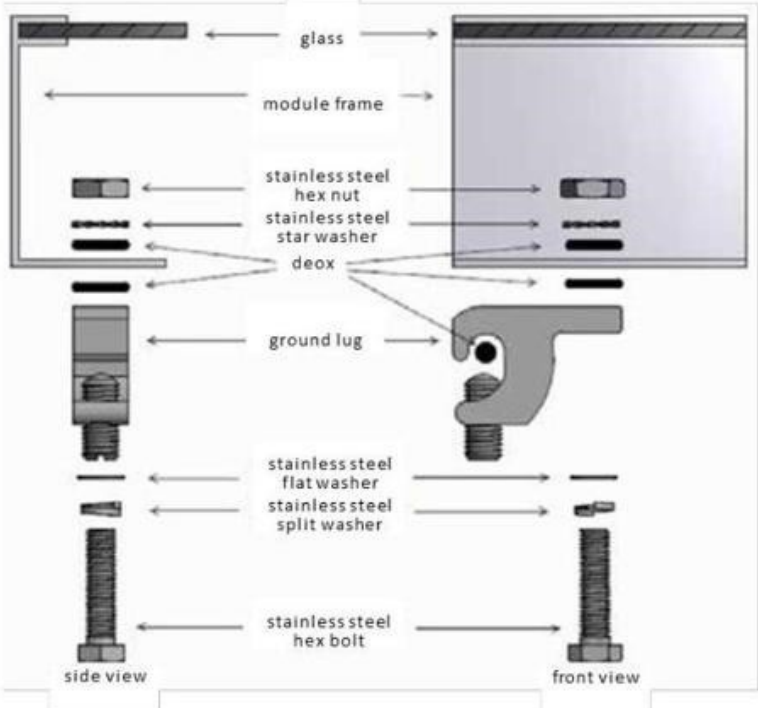
GROUNDING PATH DIAGRAM



Overcurrent Protection Devices (grounding)

ILSCO GROUNDING PATH INSTALLATION INSTRUCTION

GBL-4SS, Ground Lug Installation Instructions for Photo Voltaic Applications



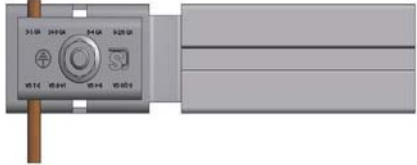
GBL-4SS

Grounding Lug 135003-003

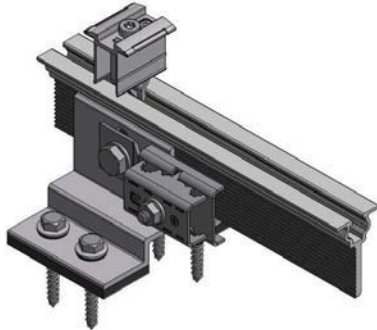
- Accommodates stranded or solid copper wire (2 gauge to 14 gauge)
- Must use bare copper wire to connect to the grounding wire; remove at least two inches of insulation to expose copper wire
- Connects to the screw at the connection of the top and bottom of assembly



• Grounding lug (Part#135003-003)



- Grounding wire must extend through grounding lug



OPTIONAL ACCESSORIES

Optional Accessories

1. Bonding Jumper

- Electrically bonds adjacent rows/arrays forming a continuous grounding path
- Connects directly to top channel
- Available in 6-inch to 48-inch lengths



Bonding jumper

2. Extended Rail for Cable Management or Micro Inverter / Power Optimizer Attachment

- Extended rail is used for the attachment of micro inverter or optimizer
- Cable mounting kit is installed directly into rail channel



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 Module Clamps: 15 N-M (10.5 FT-LBS)
M10 and 3/8" Bolt Torque: 30 N-M (23 FT-LBS)

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.⁷ 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.
- The PV INSTALLER of Schletter's electrically bonded Fix-RL 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-RL 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:
 - Connection area is sufficiently sized
 - Dissimilar metals are not in direct contact
 - Connection does not interfere with other components
 - Connection is protected from damage

⁷Schletter recommends two bonding jumpers connect separate systems for redundancy.

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

MAINTENANCE

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
- 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 more than 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 must 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.

Pitched Roof Solar Mount Tape

Pitched Roof Solar Mount tape is a butyl, pressure sensitive high performance tape specifically for solar mounting applications on pitched roof. This product is compatible with a wide range of roofing materials and designed for installation and performance in wide range of temperatures.

Technical Data

Property	Typical Value	Test Method
Service Temperature Range	-40°C to 88°C (-40°F to 190°F)	
Tensile Strength	80 kPa	ASTM D412, Die C
Peel Adhesion	2 N/mm	FLTM BU 112-02, Method A
Adhesive Strength	1.5 N/mm	FLTM BU 112-02, Method C
Burn Rate	0.99 in/min	FMVSS 302
Elongation	800%	ASTM D412, Die C

Instructions

The substrate must be thoroughly dry before installation. A completely dry surface is critical to long-term performance, use of hot-air or a torch is recommended for any substrate showing obvious moisture. For this application, the application temperature of the substrate and tape is not critical to performance, if the product is immediately placed in compression by installation of the system.

To install: remove the protective release liner immediately prior to application, being careful not to contaminate the surface covered by the liner. Apply the part without entrapping air between the tape and the substrate. Install racking application as the next step using torque specified by the racking manufacturer.

Dimension and Packaging:

Individual Piece: 38 mm x 80 mm

Box: 38 mm (1.5") x 80 mm (3.1") (die-cut)

Dimension and Packaging:

Storage material in original unopened packaging at temperatures between 20°C to 50°C (68°F to 120°F). Shelf life is 24 months when stored as recommended.

Dimension and Packaging:

Prior to working with this or any product consult product label and Safety Data Sheet (SDS) for necessary health and safety precautions and disposal considerations.

APPENDIX I

UL 2703 Qualified Modules for use with the following Schletter racking systems:

Fix-RL, Flushmount, FixGrid 18, FixGrid18-100, PvMax, G-Max

Revision Date: 30-Sep-20

Manufacturer	Model
Boviet Solar	BVM6612
Canadian Solar	CS6X-P-FG
	CS6X-P
	CS6V-M
	CS6U-P
	CS6U-M
	CS6U
	CS6P-P-SD
	CS6P-P
	CS6P-M
	CS6K-P-FG
	CS6K-P
	CS6K-MS
	CS6K-M AB
	CS6K-M
	CS6K
	CS5A-M
	CS3W-PB-AG
	CS3W-P
	CS3W-MS
	CS3W-MB-AG
	CS3W
	CS3U-PB-AG
	CS3U-P
	CS3U-MS
	CS3U-MB-AG
	CS3U
	CS3L-P
	CS3L-MS
	CS3L
	CS3K-PB-AG
	CS3K-P
	CS3K-MS
	CS3K-MB-AG
	CS3K
	CS1Y-MS


CS1U-MS
CS1K-MS
CS1H-MS

ET Solar

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

Hanwha Q Cells

320|315|310|305 WW|WB
L-G2
L-G3
L-G4
Q.PEAK DUO BLK-G5
Q.Peak DUO BLK-G6
Q.Peak DUO G6
Q.Peak DUO LG6
Q.PEAK DUO-G5.X
Q.PEAK DUO-G5
B.LINE PRO L G4.1
B.LINE PLUS L G4.2
B.LINE PRO L G4.2
B.LINE PLUS BFR G4.1
B.LINE PRO BFR G4.1
Q.PEAK BLK G4.1/TAA
Q.PEAK L G4.2 / 4.5
Q.PEAK-G4.1|G4.1/MAX
Q.PLUS BFR G4.1/ TAA or MAX
Q.PLUS G4
Q.PLUS L G4.1|G4.2
Q.PRO BFR
G4|G4.1|G4.3|G4.4 Q.PRO G4
Q.PRO L G4.1
Q.PRO L G4.2
Q.PRO L G4.5
Q.PEAK DUO BLK-G5/SC
Q.PEAK DUO BLK-G6+
Q.PEAK DUO BLK-G6+ /TS
Q.PEAK DUO BLK-G6+/AC
Q.PEAK DUO BLK-G6+/SC
Q.PEAK DUO BLK-G7
Q.PEAK DUO BLK-G8
Q.PEAK DUO BLK-G8+
Q.PEAK DUO G6+/AC
Q.PEAK DUO L-G5
Q.PEAK DUO L-G5.1



Q.PEAK DUO L-G5.2
Q.PEAK DUO L-G5.3
Q.PEAK DUO L-G6
Q.PEAK DUO L-G6.1
Q.PEAK DUO L-G6.2
Q.PEAK DUO L-G6.3
Q.PEAK DUO L-G6.4
Q.PEAK DUO L-G6.5
Q.PEAK DUO L-G6.6
Q.PEAK DUO L-G6.7
Q.PEAK DUO L-G7
Q.PEAK DUO L-G7.1
Q.PEAK DUO L-G7.2
Q.PEAK DUO L-G7.3
Q.PEAK DUO L-G7.4
Q.PEAK DUO L-G7.5
Q.PEAK DUO L-G7.6
Q.PEAK DUO L-G7.7
Q.PEAK DUO L-G8
Q.PEAK DUO L-G8.1
Q.PEAK DUO L-G8.2
Q.PEAK DUO L-G8.3
Q.PEAK DUO L-G8.3/BFF
Q.PEAK DUO L-G8.3/BFG
Q.PEAK DUO ML BLK-G9
Q.PEAK DUO ML BLK-G9+
Q.PEAK DUO ML-G9
Q.PEAK DUO ML-G9+
Q.PEAK DUO XL-G9
Q.PEAK DUO XL-G9.1
Q.PEAK DUO XL-G9.2
Q.PEAK DUO XL-G9.3
Q.PEAK DUO-G5
Q.PEAK DUO-G5/SC
Q.PEAK DUO-G6
Q.PEAK DUO-G6/SC
Q.PEAK DUO-G6+
Q.PEAK DUO-G6+/SC
Q.PEAK DUO-G7
Q.PEAK DUO-G8
Q.PEAK DUO-G8+
Q.PLUS DUO L-G5
Q.PLUS DUO L-G5.1
Q.PLUS DUO L-G5.2
Q.PLUS DUO L-G5.3 B10B68:B138

Heliene

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

Heliene MAX HOMEPV Black 350
Heliene MAX Series 430
Helien 72 M G1

Hyundai Solar

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

Jinko Solar

Eagle 60|72
Eagle Black 60|72
Eagle MX JK07A|JK07B
Eagle PERC
JKM265PP-60
JKM270P-60-V
JKM275P-60
JKM275PP-60-V
JKM320P-72-V
JKM330P-72
JKM330PP-72-V
JKM390/395/400/405/410M-72HL-V
JKMxxxM-60HBL
JKMxxxM-72HL-TV
JKMxxxM-7RL3-TV
JKMxxxM-7RL3-V

Kyocera

KD260|265GX-LFB2
KU260|265|270-6MC
A KU260-6MCA
KU315|320-7ZPA

LG

LGxxxN1C-A5
LGxxxN1C-G4
LGxxxN1K-G4
LGxxxN1W-G4
LGxxxN2C-B3
LGxxxN2W-A5
LGxxxN2W-B3
LGxxxS1C-A5
LGxxxS1C-G4
LGxxxS1W-G4
LGxxxS2W-A5
LGxxxN2T-A5
LGxxxN1T-V5
LGxxxN2T-V5
LGxxxQ1C-V5
LGxxxQ1K-V5
LGxxxA1C-V5

LGxxxN2T-J5
LGxxxN1C-V5
LGxxxN1K-V5
LGxxxN1C-N5
LGxxxN1C-A6
LGxxxN1K-L5
LGxxxN1K-A6
LGxxxQ1C-A6
LGxxxQ1K-A6
LGxxxN2W-L5
LGxxxN2W-E6
LGxxxN2T-E6
LGxxxN2T-L5

Longi

LR6-60PE 300-320M
LR6-60HPH xxx M
LR6-72BP 355-375M
LR6-72HPH xxx M
LR6-72PH xxx M
LR4-72HBD 415-435M
LR4-72HBH
420-440M
LR4-72HBD xxx M
LR4-60HBD xxx M
LR4-72HPH/HIH xxx M
LR4-60HPH/HIH xxx M
LR4-60HPB/HIB xxx M

Philadelphia Solar

PS-M60
PS-M60(BF)
PS-M72
PS-M72(BF)
PS-P60
PS-P72

Phono Solar

PS xxx P-20/U
PS xxx PH-20/U
PS xxx M-20/UH
PS xxx MH-20/UH

REC Solar

PEAK Energy Series REC245|250|255|260|265|270PE
PEAK Energy BLK2 Series REC245|250|255|260PE
BLK2 TWINPEAK SERIES REC265|270|275|280|285TP
PEAK Energy 72 Series REC300|295 - 315PE
TWINPEAK REC330|335|340TP72
TWINPEAK 2 BLK2 SERIES RECxxxTP2 BLK2
TWINPEAK 2 SERIES
TWINPEAK 2S 72 Series RECxxxTP2S 72
REC Alpha - RECxxxAA



REC Alpha 72 - RECxxxAA 72
REC Alpha Black - RECxxx Black
REC N-Peak-RECxxxNP
REC N-Peak-RECxxxNP Black
REC TP2SM72-RECxxxTP2SM72
Twin Peak 3M - RECxxxTP3M
Twin Peak 3M - RECxxxTP3M Black

Risen

RSM60-6-270M-290M/5BB

Silfab

Silfab-SIL-330-BL
Silfab-SIL-330-NL
Silfab-SIL-380-NT
Silfab-SIL-400 HU
Silfab-SIL-400-HL-B

Solaria

PowerXT-400R-PM
PowerXT-400R-PM-AC

SolarWorld

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

SUNPOWER

SPR-X21-xxx-COM

Suntech

STPxxxS – A60U/Wfhb
STPxxxS - A72U/Vfh
STPxxxS - A72U/Vnh
STPxxxS-24/Vfw

Talesun

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

Trina

TSM-xxx PA05.08
TSM-DE14A
TSM-DD14A
TSM-PD05
TSM-PD05.05
TSM-PD05.08
TSM-xxx DD05A.05(II)
TSM-xxx PD05.08
TSM-xxx PD05.10
TSM-PD14
TSM-PE14
TSM-PEG14
TSM-PEG40.07
TSM-PEG5
TSM-PEG5.07
TSM-DD06M.05(II)
TSM-DE06H
TSM-DE06M
TSM-DE15H
TSM-DE15M
TSM-DE18M
TSM-DEG06H
TSM-DEG06M
TSM-DEG15HC.20(II)
TSM-DEG15M.20(II)
TSM-DEG15MC.20(II)
TSM-DEG18MC.20(II)
TSM-PE06H
TSM-PE15H
TSM-PEG06H
TSM-PEG15H.20

WattPower

Glacier Series G3
WP-xxxM/G3-60H-V (325|330|335|340PC)

Yingli Green Energy

YL260P|255P|250P|245P|240P-29b
YL275P|270P|265P|260P|255P|250P-29b
YL290D|285D|280D|275D|270D-30b
YL300C|295C|290C|285C|280C|275C-30b
YL325P|320P|315P|310P|305P|300P-35b
YL340D|335D|330D|325D|320D|315D-36b

ZNShine

ZXM6-60-xxx_M
ZXM6-H120-xxx_M
ZXM6-H144-xxx_M
ZXM6-HLD120-xxx_M
ZXM6-HLD144-xxx_M
ZXM6-HLDD144-xxx_M
ZXM6-LD60-xxx_M
ZXM6-LD72-xxx_M
ZXM6-LDD72-xxx_M
ZXM6-NH120-xxx_M
ZXM6-NH144-xxx_M
ZXM6-NHLD120-xxx_M
ZXM6-NHLD144-xxx_M
ZXM6-NHLDD120-xxx_M
ZXM6-NHLDD144-xxx_M
ZXP6-72-xxx_P
ZXP6-H144-xxx_P
ZXP6-HLD120-xxx_P
ZXP6-HLD144-xxx_P
ZXP6-LD72-xxx_P

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