

The Schletter **FS System** for ground mount photovoltaic (PV) installations is specifically designed to meet or exceed applicable IBC, ASCE, and UL standards. For more information on the FS System, please see system brochure.

FS System Features

1. ETL classified to UL 2703, 1703¹
2. Electrically bonded unit²
3. 20 amp series fuse rating
4. Pre-assembled components
5. Fully integrated and modular components

The FS System is capable of accommodating nearly any framed or frameless PV module currently on the market. Each FS System is custom designed to meet specific structural load requirements³. Included in the FS System are clamps (**Rapid²⁺™** Grounding Clamp) specifically designed to secure the frame of a PV module to the FS System. In turn, the components and assemblies that comprise an FS System form an electrically bonded unit. While individual components and structural sections will vary between designs, the primary assemblies and installation methods will remain the same.

During installation do not secure bolts to the final torque until the system is fully assembled. The following is a guide to properly install an FS System in order to meet design and test standards.

Each installation step contains drawings detailed as follows:

1. Individual parts broken down into their components. Referred to as “EXPLODED COMPONENTS VIEW”
2. Pre-assembled components shown in their relative position to one another. Referred to as “EXPLODED ASSEMBLIES VIEW”
3. The completed installation step with assembled parts. Referred to as “ASSEMBLED VIEW”

¹The FS System is evaluated for electrical bonding only .The FS System meets all IBC and ASCE requirements for structural loading; it has not been evaluated for loading under UL 2703.

² Installer is responsible for verifying that system meets applicable NEC and CSA standards

³ Individual parts and components will vary from system to system. Please reference system specific drawings.

STEP 1: INSTALLATION OF FOUNDATION POSTS

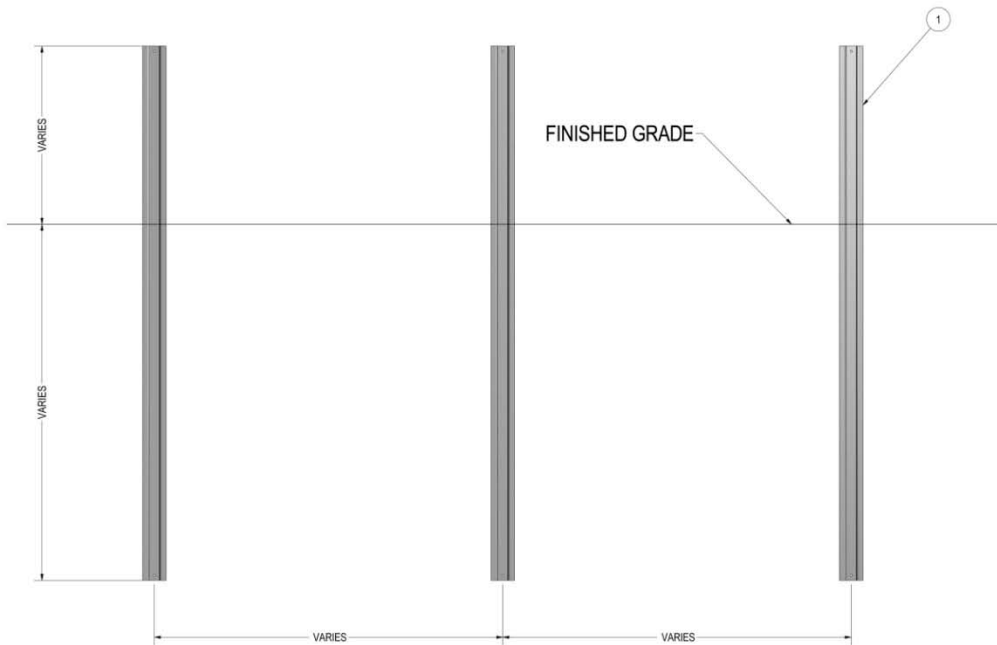
These instructions do not cover details of the ram-driven installation of support posts. Installation procedures may vary depending on terrain and other features that are out of the scope of these instructions. Take care to make sure system installation is within specified tolerances.

PARTS LIST		
ITEM	QTY	PART NUMBER DESCRIPTION
1	3	440302 Foundation Post FG8

STEP 1: INSTALLATION OF SUPPORT POSTS

TORQUE:
 M8 BOLT TORQUE IS 18 N·M (13 FT·LBS)
 M10 BOLT TORQUE IS 41 N·M (30 FT·LBS)
 M12 BOLT TORQUE IS 70 N·M (52 FT·LBS)

INSTALLATION TOLERANCES:
 LATERAL POST PLACEMENT IS $\pm 5.0^\circ$
 TOTAL LATERAL DEVIATION OF POSTS WITHIN AN ARRAY IS $\pm 5.0^\circ$
 POST HEIGHT VARIATION TOLERANCE IS $\pm 0.40^\circ$
 POST VERTICALITY TOLERANCE $< 2.0^\circ$ IN ALL DIRECTIONS
 POST ROTATIONAL TOLERANCE $< 2.0^\circ$
 ARRAY TILT ANGULAR TOLERANCE $\pm 1.0^\circ$



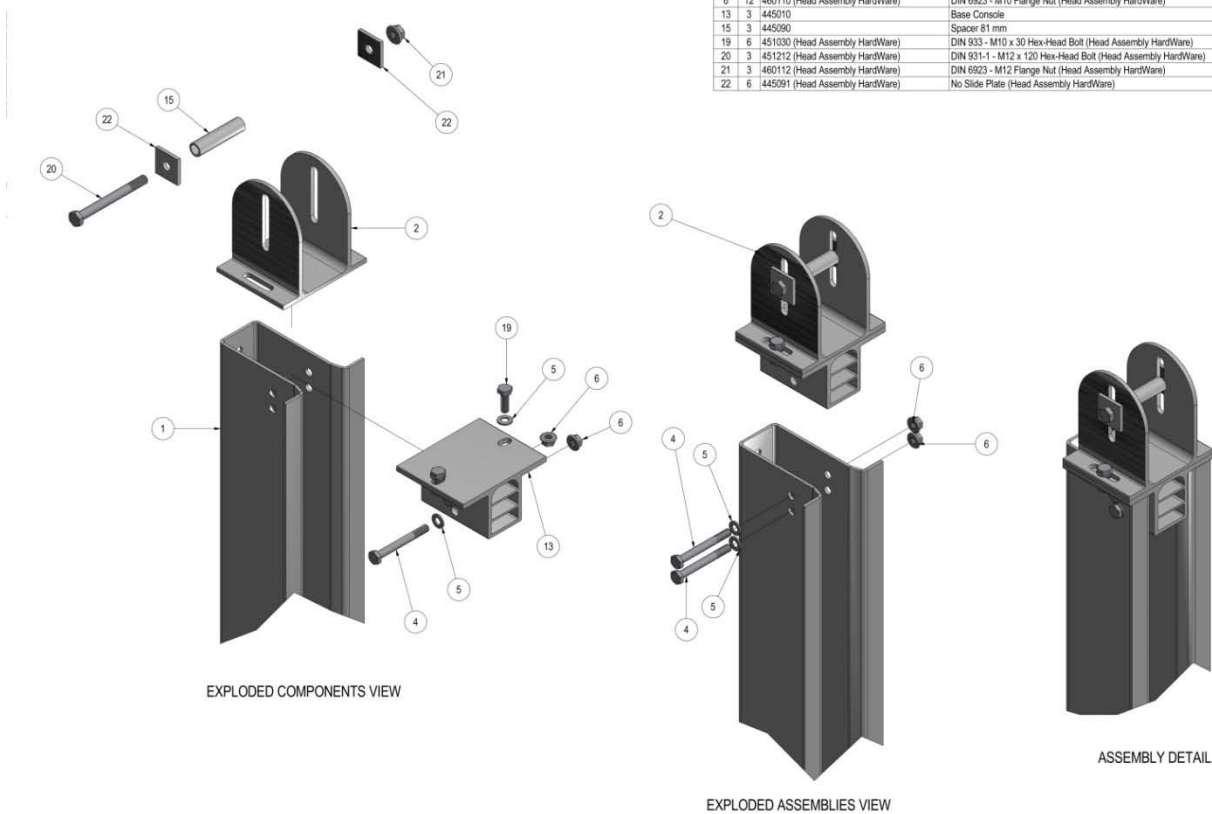
STEP 2: HEAD-PIECE ASSEMBLY IS BOLTED TO FOUNDATION POST

- a. Place head-piece onto foundation post
- b. Bolt head-piece in place using supplied hardware

STEP 2: HEAD PIECE ASSEMBLY IS BOLTED TO SUPPORT

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		PARTS LIST	
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	440302	Foundation Post FGB
2	3	445005	Head Assembly
4	6	451090 (Head Assembly Hardware)	DIN 931-1 - M10 x 90 Hex-Head Bolt (Head Assembly Hardware)
5	12	461110 (Head Assembly Hardware)	DIN 125-A - 10.5 Washer (Head Assembly Hardware)
6	12	460110 (Head Assembly Hardware)	DIN 6923 - M10 Flange Nut (Head Assembly Hardware)
13	3	445010	Base Console
15	3	445090	Spacer 81 mm
19	6	451030 (Head Assembly Hardware)	DIN 933 - M10 x 30 Hex-Head Bolt (Head Assembly Hardware)
20	3	451212 (Head Assembly Hardware)	DIN 931-1 - M12 x 120 Hex-Head Bolt (Head Assembly Hardware)
21	3	460112 (Head Assembly Hardware)	DIN 6923 - M12 Flange Nut (Head Assembly Hardware)
22	6	445091 (Head Assembly Hardware)	No Slide Plate (Head Assembly Hardware)

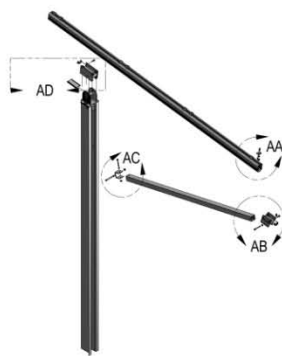


STEP 3: GIRDER & STRUT ASSEMBLY IS SET IN PLACE

- Position girder and strut assembly to rest on top of the head-piece assembly
- Bolt lower portion of strut to foundation post
- IMPORTANT!** Insert locking wedge (Part # 445092) into base console (Part # 445010)
- Verify that assemblies are set in place square

STEP 3: GIRDER & STRUT ASSEMBLY IS SET IN PLACE

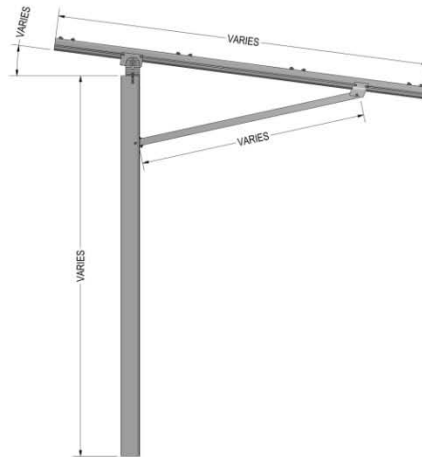
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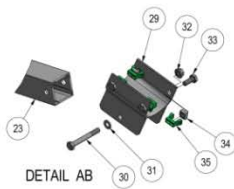
EXPLODED COMPONENTS VIEW



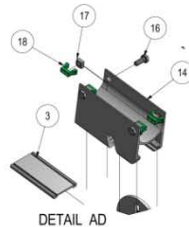
EXPLODED ASSEMBLIES VIEW



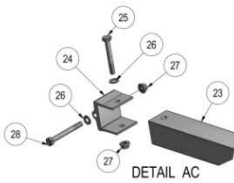
ASSEMBLED VIEW



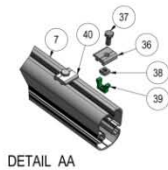
DETAIL AB



DETAIL AD



DETAIL AC



DETAIL AA

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	3	440302 Foundation Post FG8
3	3	445092 Wedge
7	3	440344-P4 Binder T4
13	3	445010 Base Console
23	3	445060 Strut FS
24	3	445050 Strut Shoe
25	3	451080 (Strut Shoe HardWare) DIN 931-1 - M10 x 80 Hex-Head Bolt (Strut Shoe HardWare)
26	6	461110 (Strut Shoe HardWare) DIN 125-A - 10.5 Washer (Strut Shoe HardWare)
27	6	460110 (Strut Shoe HardWare) DIN 6923 - M10 Flange Nut (Strut Shoe HardWare)
28	3	451050 (Strut Shoe HardWare) DIN 931-1 - M10 x 90 Hex-Head Bolt (Strut Shoe HardWare)
29	3	445040 Strut Console
30	3	451080 (Strut Console HardWare) DIN 931-1 - M10 x 80 Hex-Head Bolt (Strut Console HardWare)
31	3	461110 (Strut Console HardWare) DIN 125-A - 10.5 Washer (Strut Console HardWare)
32	3	460110 (Strut Console HardWare) DIN 6923 - M10 Flange Nut (Strut Console HardWare)
33	12	451025 (Strut Console HardWare) DIN 933 - M10 x 25 Hex-Head Bolt (Strut Console HardWare)
34	12	460310 (Strut Console HardWare) DIN 557 - M10 Square Nut (Strut Console HardWare)
35	12	430025 (Strut Console HardWare) M10 - Kick Component (Strut Console HardWare)
36	12	440156-40 Mounting Clamp
37	24	451025 (Mounting Clamp HardWare) DIN 933 - M10 x 25 Hex-Head Bolt (Mounting Clamp HardWare)
38	24	460310 (Mounting Clamp HardWare) DIN 557 - M10 Square Nut (Mounting Clamp HardWare)
39	24	430025 (Mounting Clamp HardWare) M10 - Kick Component (Mounting Clamp HardWare)
40	12	440157-40 Mounting Clamp

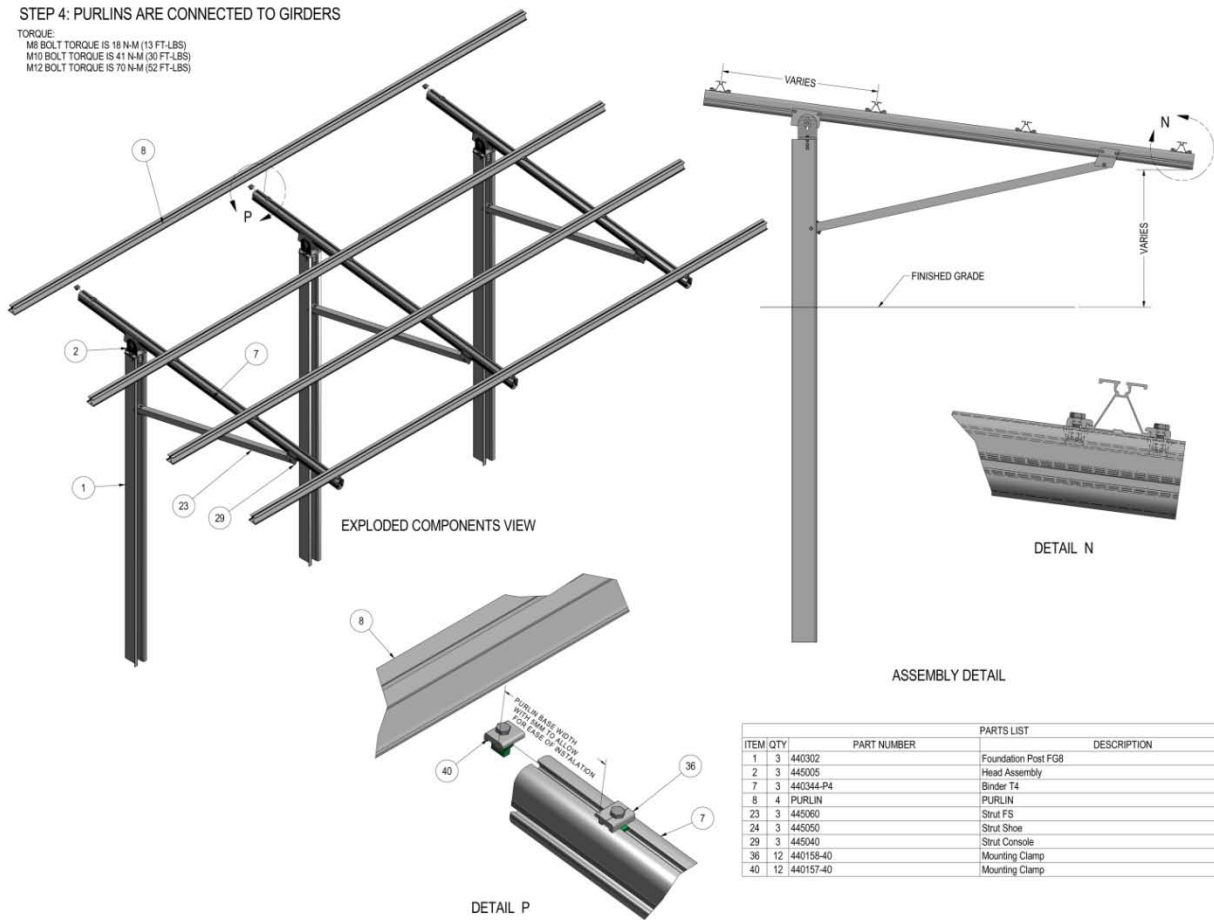
STEP 4: PURLINS ARE CONNECTED TO GIRDERS

The connection locations of purlins to girders are factory set. Do not loosen lower mounting clamp (Part # 440158-40)

- Align purlin as shown on system specific drawings
- Slide lip of rail under mounting clamp (Part # 440158-40)
- Verify that rail is positioned correctly
- Secure purlin in place by tightening down upper mounting clamp (Part # 440157-40)

STEP 4: PURLINS ARE CONNECTED TO GIRDERS

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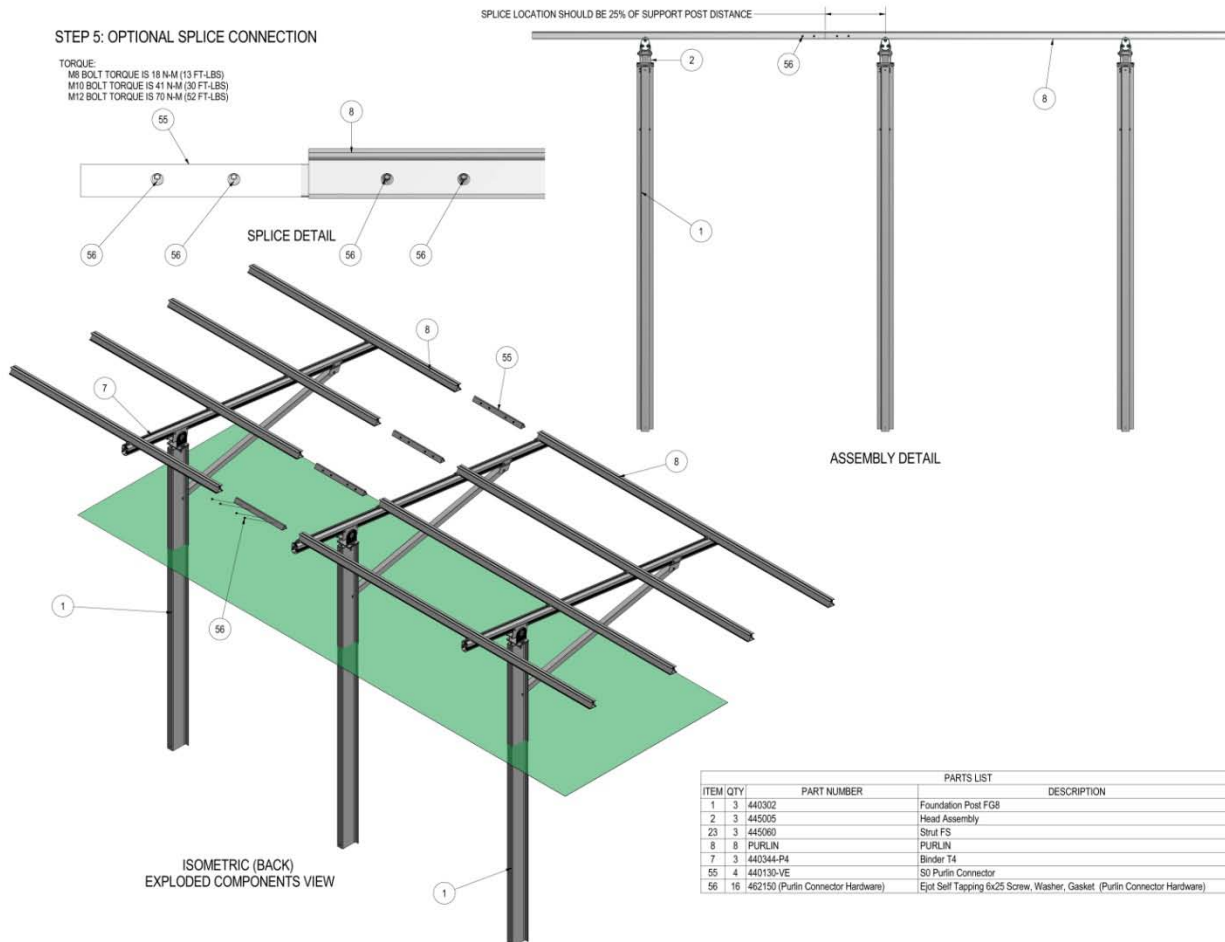


ITEM QTY	PART NUMBER	PARTS LIST	DESCRIPTION
1	3	440302	Foundation Post FGB
2	3	445005	Head Assembly
7	3	440344-P4	Binder T4
8	4	PURLIN	PURLIN
23	3	445060	Strut FS
24	3	445050	Strut Skoe
29	3	445040	Strut Console
36	12	440158-40	Mounting Clamp
40	12	440157-40	Mounting Clamp

STEP 5: OPTIONAL SPLICE CONNECTION

Often, it is necessary to join two shorter purlins together in order to form a longer section. In such cases purlins have a specific splice insert used to join two pieces together. (If splices are not used, continue to Step 6.) Splices should be approximately located at the quarter points of a given span.

- Attach first purlin to girder as stated in Step 4:
- Insert splice piece halfway into the end of first purlin section and secure in place using self drilling screws (Part # 462150).
- Loosely attach second purlin section to girder and slide over splice piece that is connected to first purlin. Secure in place using self drilling screws (Part # 462150).
- Verify purlin is installed in correct location as specified on the project drawings
- Secure assembled purlin in place by tightening upper mounting clamp (Part # 440157-40)



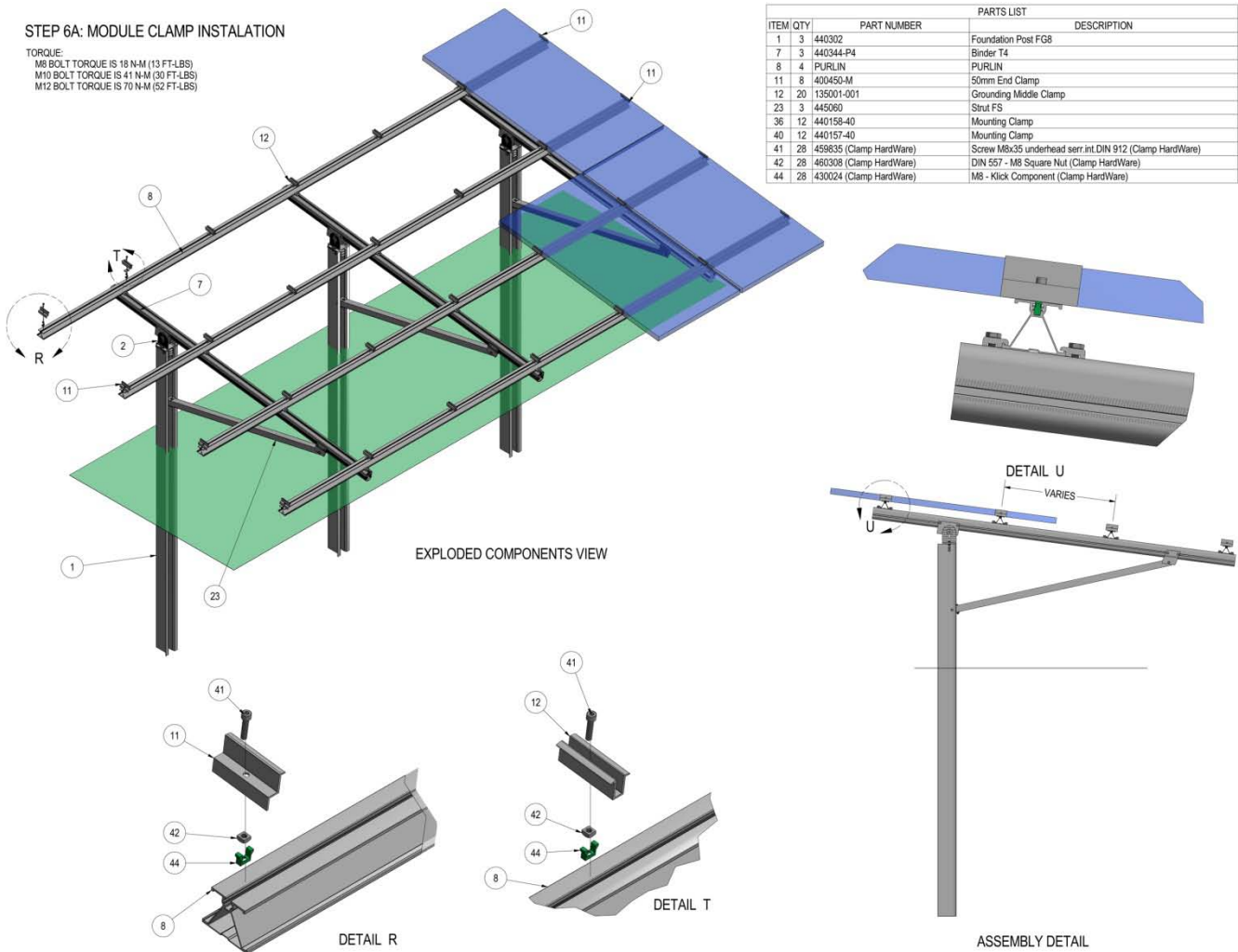
STEP 6A: MODULE CLAMP INSTALLATION

Schletter grounding middle clamps ensure that PV modules are both physically secured and electrically bonded to the mounting system. Grounding clamps contain two stainless steel pins that pierce the anodized layer of a PV module frame. This forms an electrical bond between the frame and the purlin to which the module is attached. Take care to verify that clamping locations fall within allowable ranges, provided by the module manufacturer.

- Locate approximate locations of grounding clamps
- Insert M8 Klick™ component (Part # 430024) into purlin
- Insert M8 square nut (Part # 460308) into M8 Klick component, ensuring the rounded side of the nut is facing down
- Position PV module as specified on project drawings
- Secure in place by affixing the grounding middle clamp to the M8 nut with an M8 bolt
- Secure ends of modules in place with end clamps in the same manner as explained in steps a-e above.

STEP 6A: MODULE CLAMP INSTALLATION

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ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	440302	Foundation Post FGB
7	3	440344-P4	Binder T4
8	4	PURLIN	PURLIN
11	8	400450-M	50mm End Clamp
12	20	135001-001	Grounding Middle Clamp
23	3	445090	Strut FS
36	12	440158-40	Mounting Clamp
40	12	440157-40	Mounting Clamp
41	28	459835 (Clamp Hardware)	Screw M8x35 underhead serr int.DIN 912 (Clamp Hardware)
42	28	460308 (Clamp Hardware)	DIN 557 - M8 Square Nut (Clamp Hardware)
44	28	430024 (Clamp Hardware)	M8 - Klick Component (Clamp Hardware)

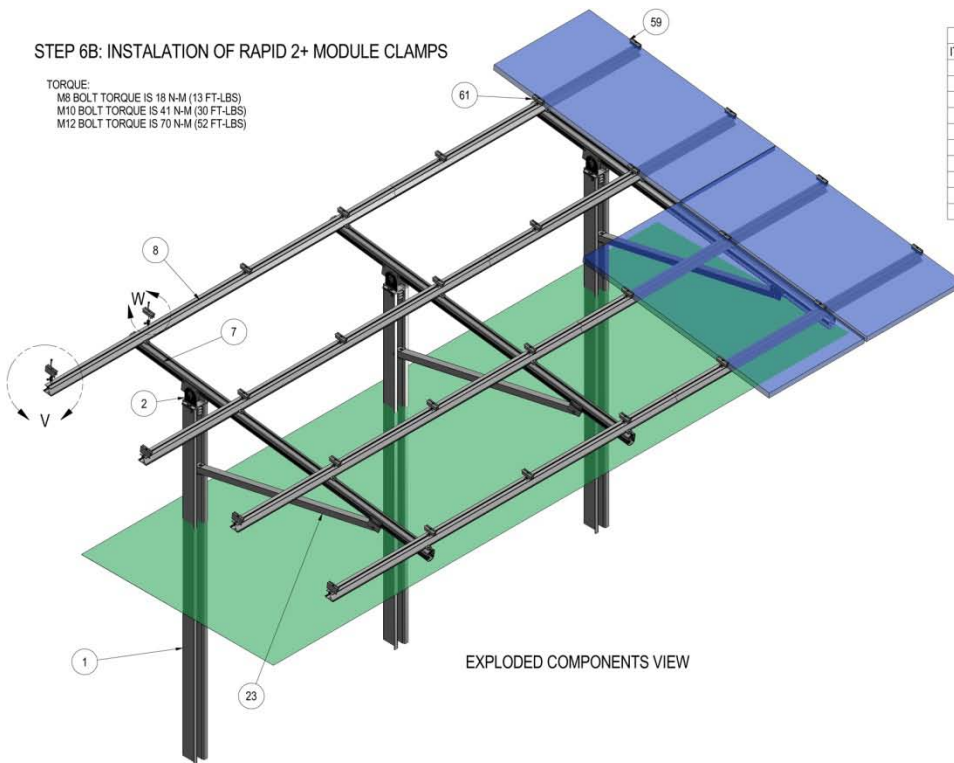
STEP 6B: MODULE CLAMP INSTALLATION

Schletter Rapid²⁺ grounding middle clamps ensure that PV modules are both physically secured and electrically bonded to the mounting system. Rapid²⁺ grounding clamps contain two stainless steel pins that pierce the anodized layer of a PV module frame, forming an electrical bond between the frame and the purlin to which the module is attached. Rapid²⁺ clamps are fully assembled units that snap into the purlin. Take care to verify that clamping locations are within allowable ranges.

- Locate approximate location of grounding clamps
- Insert Rapid²⁺ clamp into rail
- Align modules as required
- Secure Rapid²⁺ grounding middle clamp
- Secure ends of modules using Rapid²⁺ end clamps in same manner as steps a-d

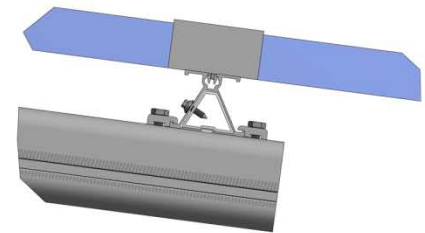
STEP 6B: INSTALLATION OF RAPID 2+ MODULE CLAMPS

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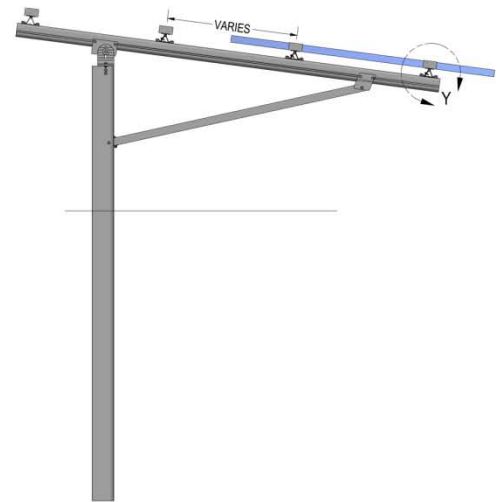


EXPLODED COMPONENTS VIEW

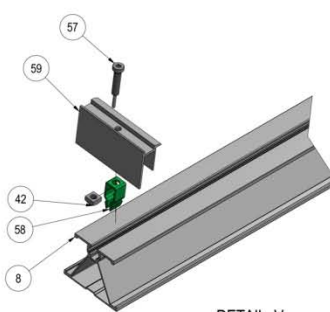
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	440302	Foundation Post FG8
2	3	445005	Head Assembly
7	3	440344-P4	Binder T4
8	8	PURLIN	PURLIN
42	28	460308 (Clamp Hardware)	DIN 557 - M8 Square Nut (Clamp Hardware)
57	28	464008-055 (Clamp Hardware)	M8 x 55 Torx (Clamp Hardware)
58	28	430810-001 (Clamp Hardware)	VERSION C (Clamp Hardware)
59	8	430850-m	Rapid End Clamp +2 50mm Assembly
60	40	430030-001 (Clamp Hardware)	Grounding Pin (Clamp Hardware)
61	20	135002-001	Grounding Rapid Mid Clamp +2 40-50mm Assembly



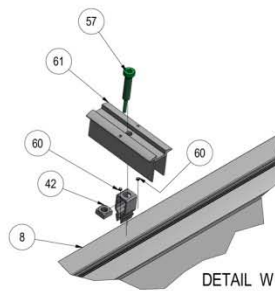
DETAIL Y



ASSEMBLY DETAIL



DETAIL V



DETAIL W

This concludes the installation guide portion of this document.

CONNECTING MULTIPLE RACKS

Many PV installations contain more than one mounting system. Such cases call for electrically bonding each of the different manufacturers mounting systems together. Since individual racks are fully bonded units it is only necessary to connect individual racks together from one single point to another single point. 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.

The PV INSTALLER of Schletter's electrically bonded FS mounting 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), Canadian Electrical Code Part 1, and all other applicable state, provincial, and local electrical code requirements.

PV INSTALLER shall be fully responsible for all connections between Schletter's bonded FS mounting system and PV grounding electrode system.

SAFETY⁴ PRECAUTIONS

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

⁴Mounting structure is comprised of stainless steel and aluminum components and is not evaluated for its fire rating.