TECHNICAL SUBMISSION

Project	Joseph Norton SEMH	Project Ref.	1420
Tech Sub Ref.	JNA-GAH-XX-XX-T-E-5039	Issued By	Ian Neal
Date	24/09/2025	Authorised	Senior CM

Technical Submission		**Photovoltaics**
SPECIFICATION COMPLIANCE	✓	**In compliance withJNA-CSD-ZZ-XX-T-E-0002-Electrical Services Specification-P02,**
DEROGATIONS	✓	**1, Roof No longer a Bauder Green Roof** **2 - PV Capacity increased from 95KwP to 125KwP**
CALCULATIONS PROVIDED	✓	**Calculations provided**

This technical submission has been issued by G&H Building Services Ltd for the approval of **Please provide a description of the specific product you are proposing and reference any supporting documentation/schedules as required*

Front Sheet
01 - Joseph Norton SEMH School JC 20.08.25
02 - DS-00008-1.0-EU Three Phase Inverter with synergy technology SE50K-SE100K
03 - se-three-phase-inverter-with-SPD-setapp-configuration-datasheet-12-2020
04a- LR7 54HVH 475 490M Explorer 0 490w Panels
04b - stringing-report-8976524127157319
04c - Power Optimizer S1000-S1200 Increased Power Input
05 - se_firefighter_gateway
06 - FS_Pro_10-EW-IFP_EN_InstallationGuide - North Wing
07 - FS_Pro_10-S_IFP_EN_InstallationGuide - Main and South Wing
JNA-GAH-01-ZZ-D-E-6901-Roof PV Layout-P02
JNA-GAH-01-ZZ-D-E-6902-Roof IP Mounting Positions-P01

Information Required From	Marcos Losada
Latest Date Required	**15/10/2025**

Comments

STATUS A*	**STATUS B***	**STATUS C***

Response From	
Response Date	

*highlight as required

G & H
Firlands Mill, South Parade
Leeds
United Kingdom

Contact person:
James Caiger
Phone: 0345 609 0334
E-Mail: james.caiger@wearegandh.com

Project Name: Joseph Norton SEMH
Offer no.: ES128

23/09/2025

Your PV system from G & H

Address of Installation



Project Description:
On roof PV

Project Overview



Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System

Climate Data	Huddersfield, GBR (2001 - 2020)	
Values source	Meteonorm 8.2(i)	
PV Generator Output	125.44	kWp
PV Generator Surface	512.9	m²
Number of PV Modules	256	
Number of Inverters	3	

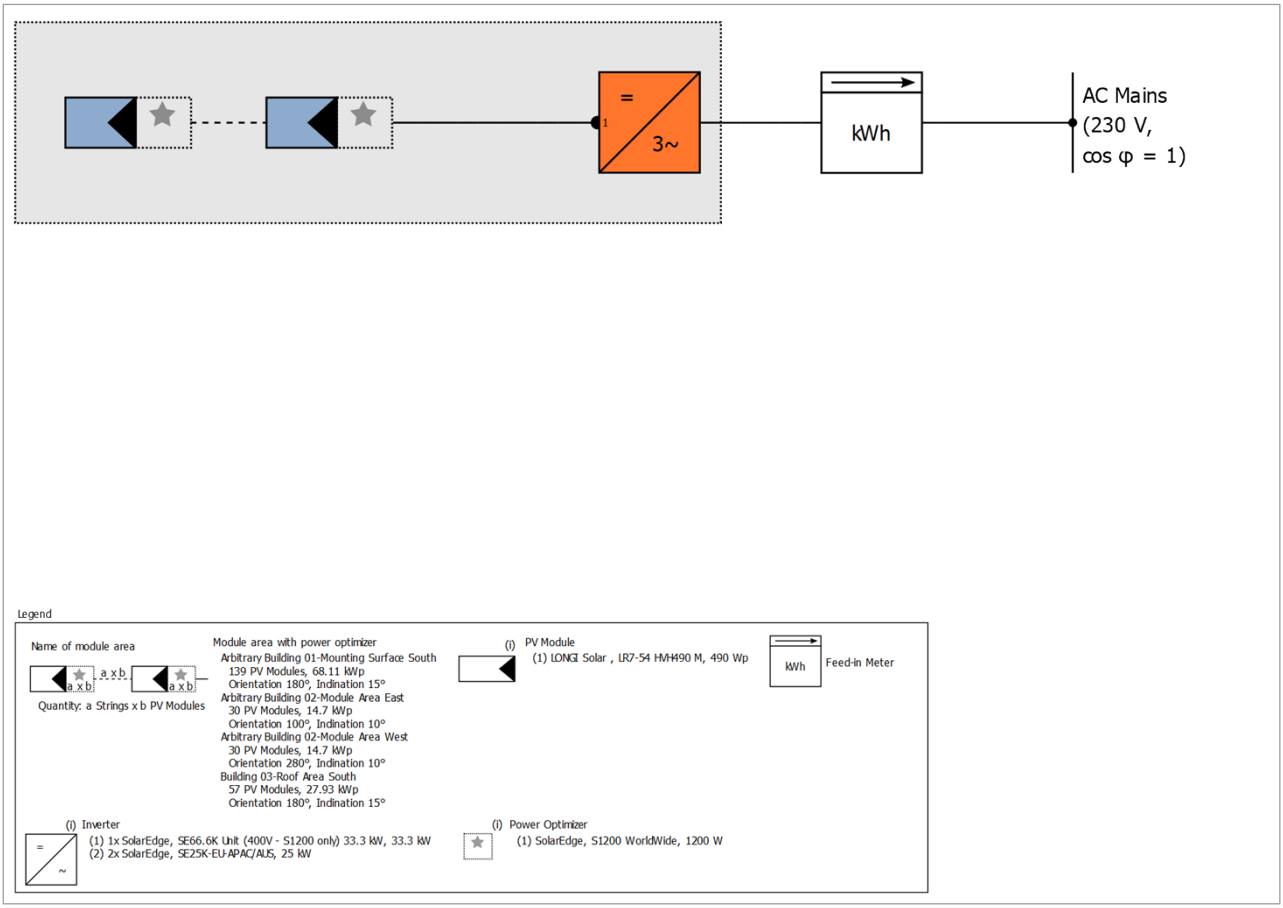


Figure: Schematic diagram

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	3D, Grid-connected PV System

Climate Data

Location	Huddersfield, GBR (2001 - 2020)
Values source	Meteonorm 8.2(i)
Data resolution	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Module Areas

1. Module Area - Arbitrary Building 01-Mounting Surface South

PV Generator, 1. Module Area - Arbitrary Building 01-Mounting Surface South

Name	Arbitrary Building 01-Mounting Surface South	
PV Modules	139 x LR7-54 HVH490 M (v1)	
Manufacturer	LONGI Solar	
Inclination	15	°
Orientation	South 180	°
Installation Type	Mounted - Roof	
PV Generator Surface	278.5	m²



Figure: 1. Module Area - Arbitrary Building 01-Mounting Surface South

2. Module Area - Arbitrary Building 02-Module Area East

PV Generator, 2. Module Area - Arbitrary Building 02-Module Area East

Name	Arbitrary Building 02-Module Area East	
PV Modules	30 x LR7-54 HVH490 M (v1)	
Manufacturer	LONGI Solar	
Inclination	10	°
Orientation	East 100	°
Installation Type	Mounted - Roof	
PV Generator Surface	60.1	m²

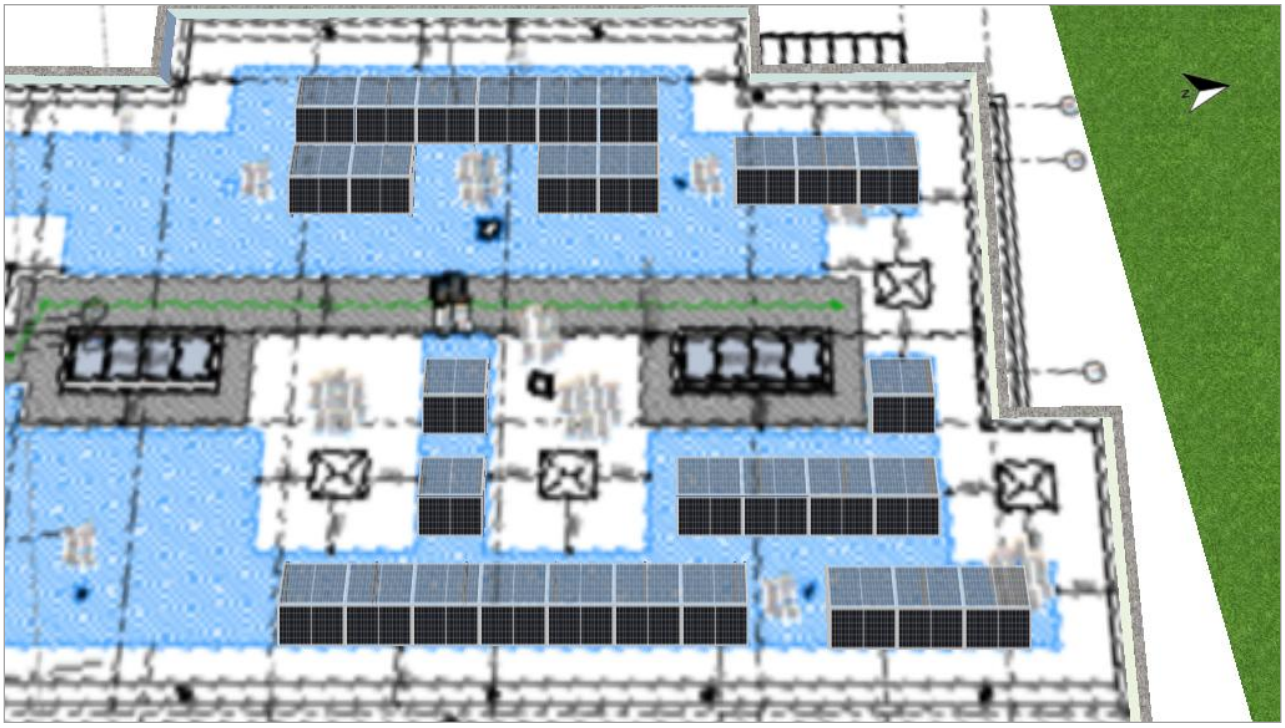


Figure: 2. Module Area - Arbitrary Building 02-Module Area East

3. Module Area - Arbitrary Building 02-Module Area West

PV Generator, 3. Module Area - Arbitrary Building 02-Module Area West

Name	Arbitrary Building 02-Module Area West	
PV Modules	30 x LR7-54 HVH490 M (v1)	
Manufacturer	LONGI Solar	
Inclination	10	°
Orientation	West 280	°
Installation Type	Mounted - Roof	
PV Generator Surface	60.1	m²

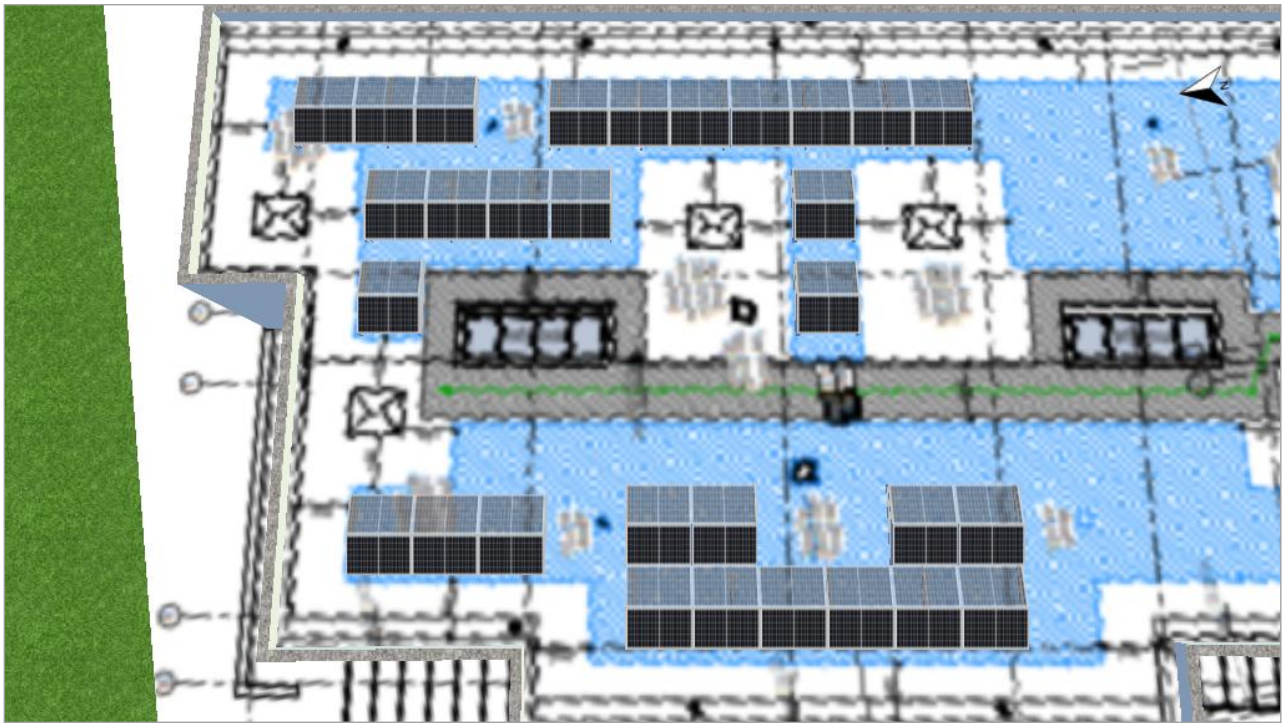


Figure: 3. Module Area - Arbitrary Building 02-Module Area West

4. Module Area - Building 03-Roof Area South

PV Generator, 4. Module Area - Building 03-Roof Area South

Name	Building 03-Roof Area South
PV Modules	57 x LR7-54 HVH490 M (v1)
Manufacturer	LONGI Solar
Inclination	15 °
Orientation	South 180 °
Installation Type	Mounted - Roof
PV Generator Surface	114.2 m²

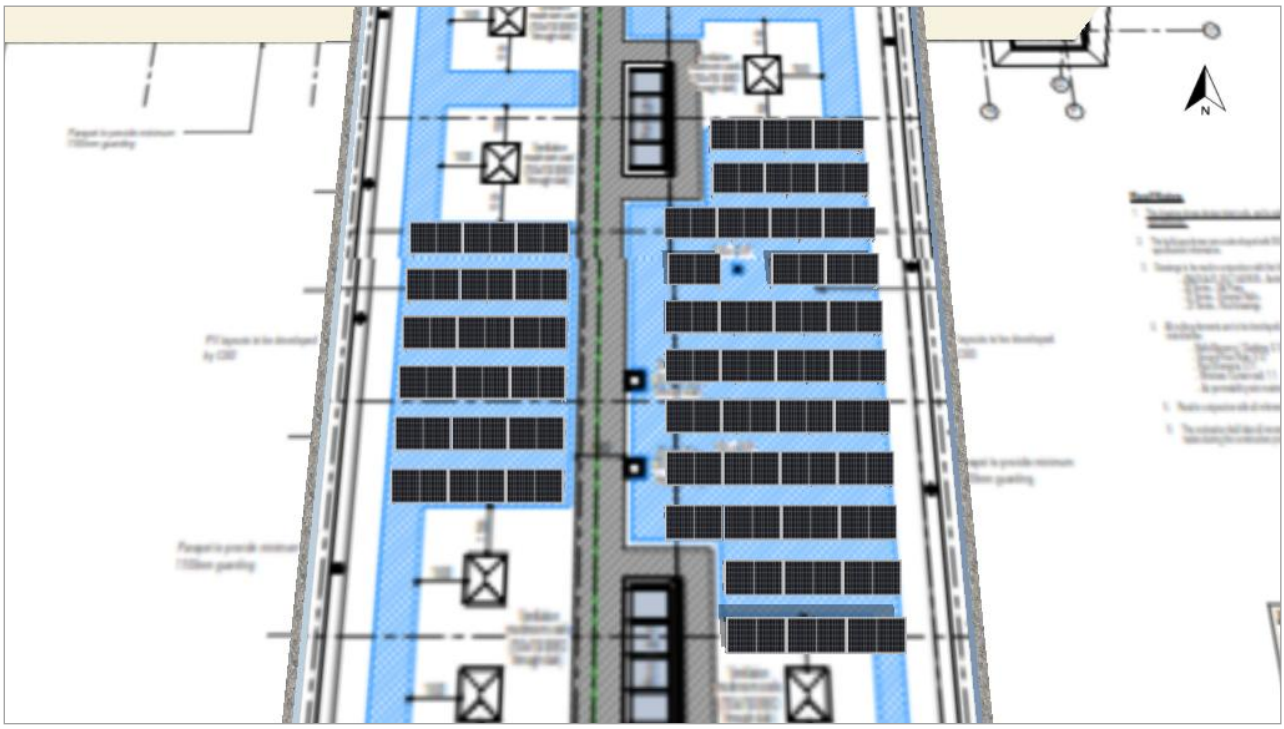


Figure: 4. Module Area - Building 03-Roof Area South

Horizon Line, 3D Design

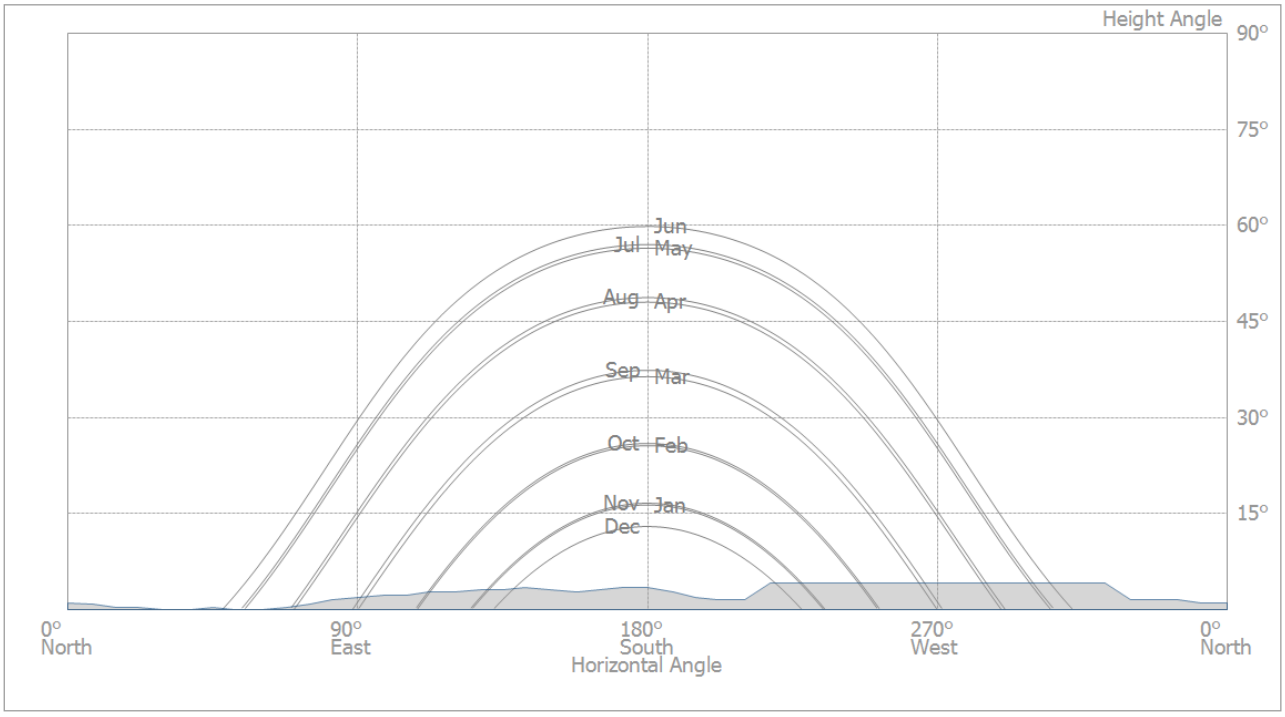


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Area	Arbitrary Building 01-Mounting Surface South
Inverter 1	
Model	SE66.6K Unit (400V - S1200 only) 33.3 kW (v1)
Manufacturer	SolarEdge
Quantity	1
Sizing Factor	204.5 %
Configuration	MPP 1:
	4 x 28☆ [1 x 1] || 1 x 27☆ [1 x 1]
Power Optimizer	139x SolarEdge, S1200 WorldWide (v1)

Configuration 2

Module Areas	Arbitrary Building 02-Module Area East + Arbitrary Building 02-Module Area West
Inverter 1	
Model	SE25K-EU-APAC/AUS (v2)
Manufacturer	SolarEdge
Quantity	1
Sizing Factor	117.6 %
Configuration	MPP 1:
	1 x 15☆ [1 x 2] || 1 x 15☆ [1 x 2]
Power Optimizer	30x SolarEdge, S1200 WorldWide (v1)

Configuration 3

Module Area	Building 03-Roof Area South
Inverter 1	
Model	SE25K-EU-APAC/AUS (v2)
Manufacturer	SolarEdge
Quantity	1
Sizing Factor	111.7 %
Configuration	MPP 1:
	1 x 14☆ [1 x 2] ||
	1 x 14☆ [1 x 2] + 1 x 1☆ [1 x 1]
Power Optimizer	29x SolarEdge, S1200 WorldWide (v1)

AC Mains

AC Mains

Number of Phases	3
Mains voltage between phase and neutral	230 V
Displacement Power Factor (cos phi)	+/- 1

Simulation Results

Results Total System

PV System

PV Generator Output	125.44	kWp
Spec. Annual Yield	858.09	kWh/kWp
Performance Ratio (PR)	80.68	%
Yield Reduction due to Shading	4.3	%
Grid Export	107,700	kWh/Year
Grid Export in the first year (incl. module degradation)	107,700	kWh/Year
Standby Consumption (Inverter)	61	kWh/Year
CO_2 Emissions avoided	40,903	kg / year

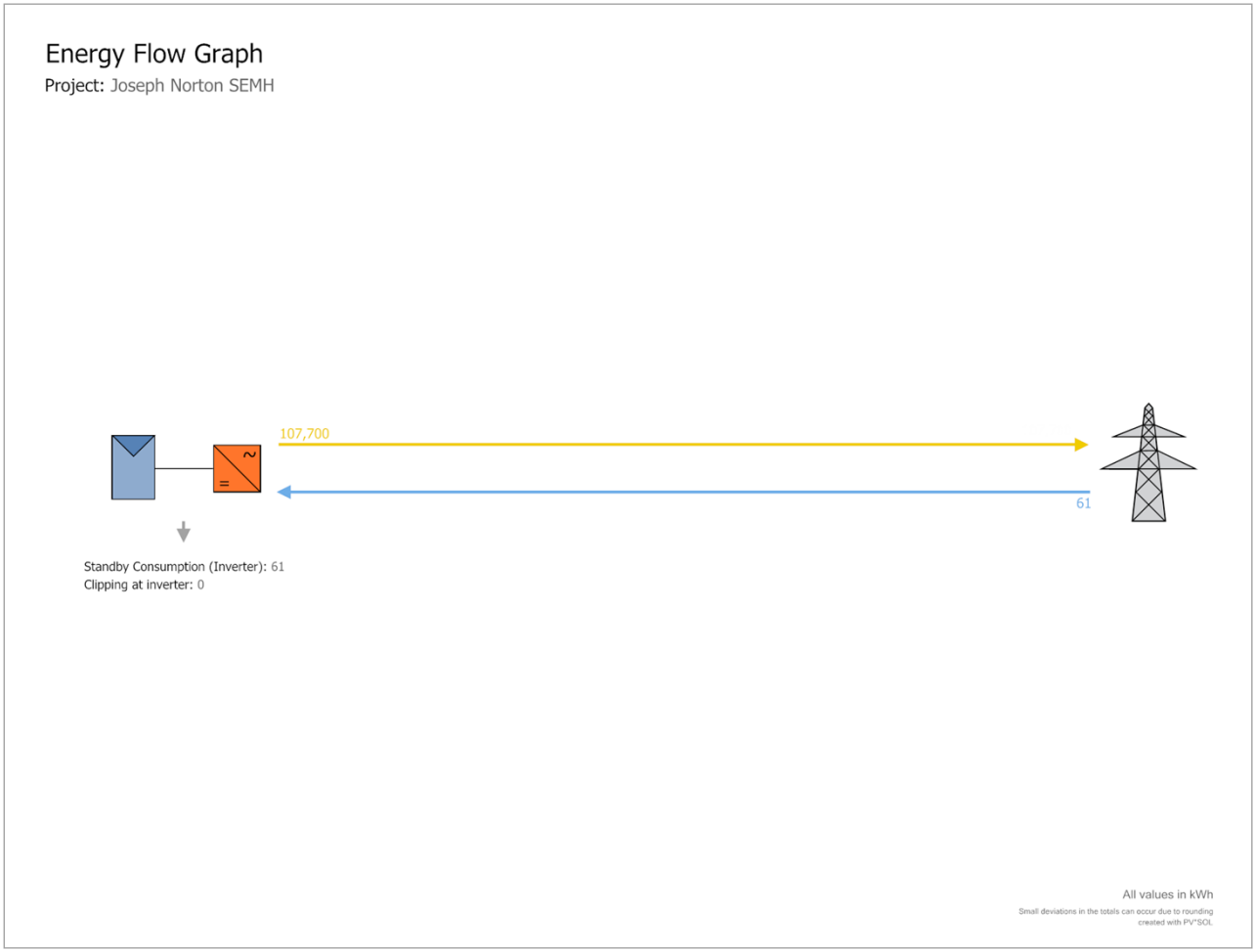


Figure: Energy flow

Plans and parts list

Circuit Diagram

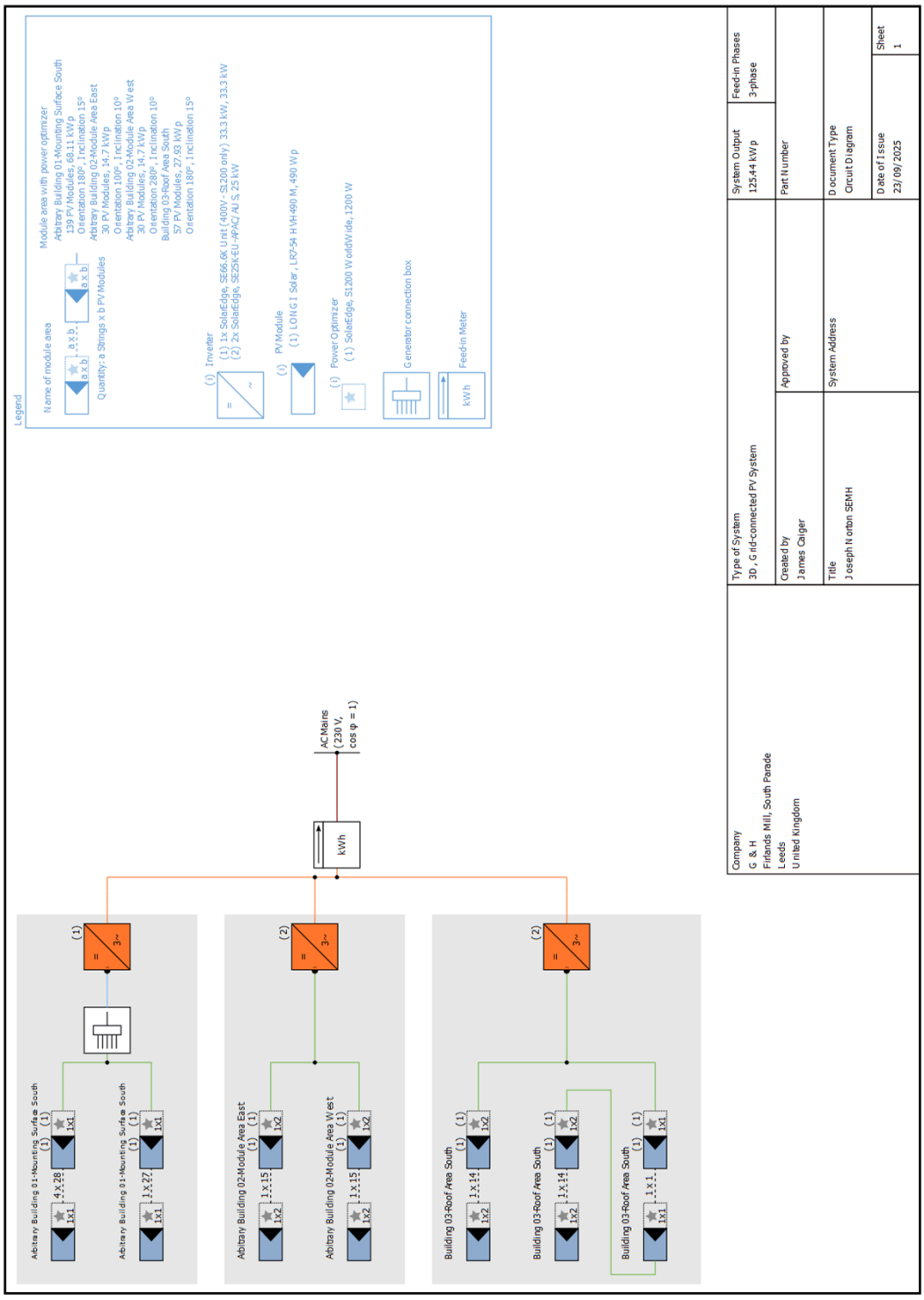


Figure: Circuit Diagram

Overview plan

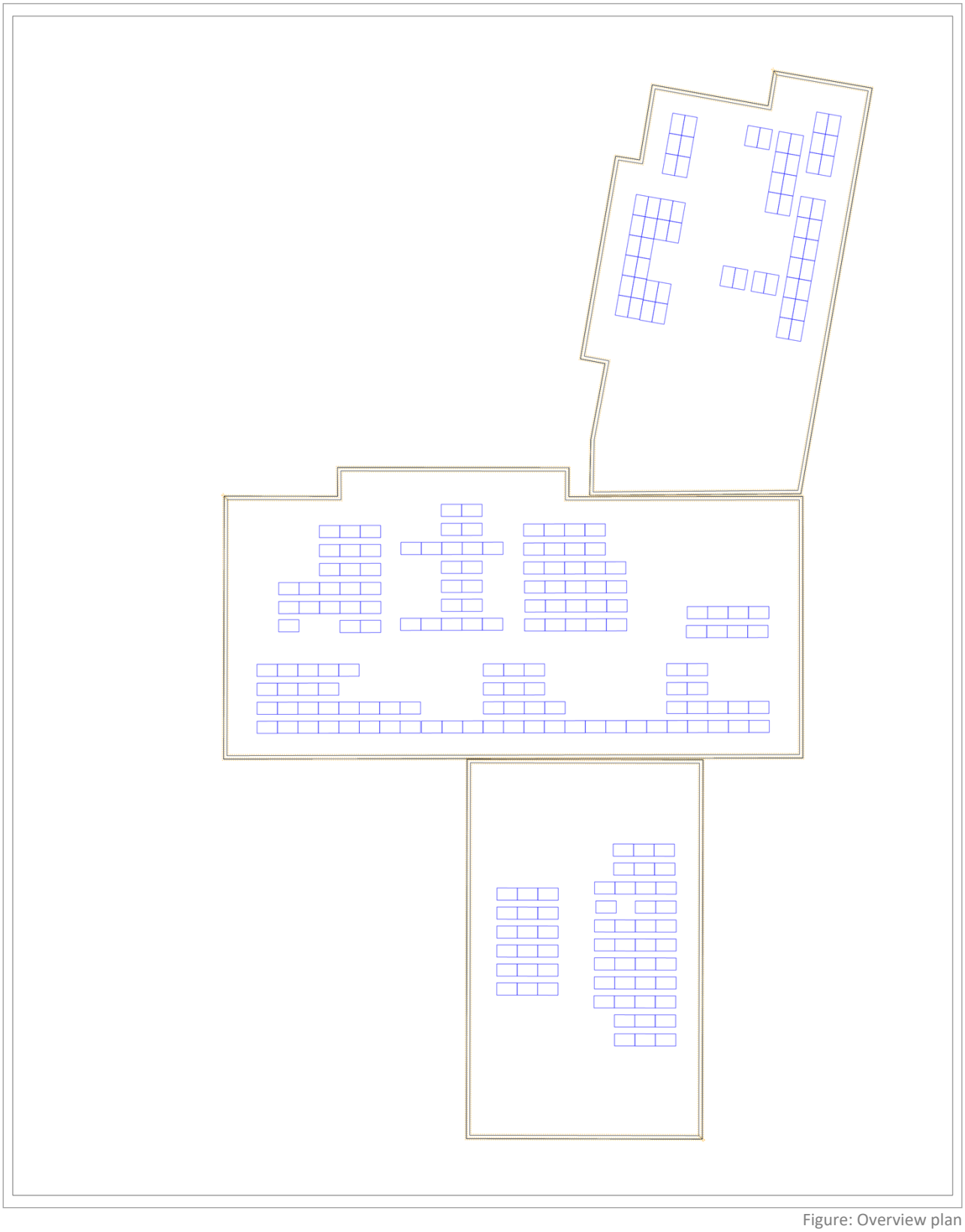


Figure: Overview plan

Dimensioning Plan

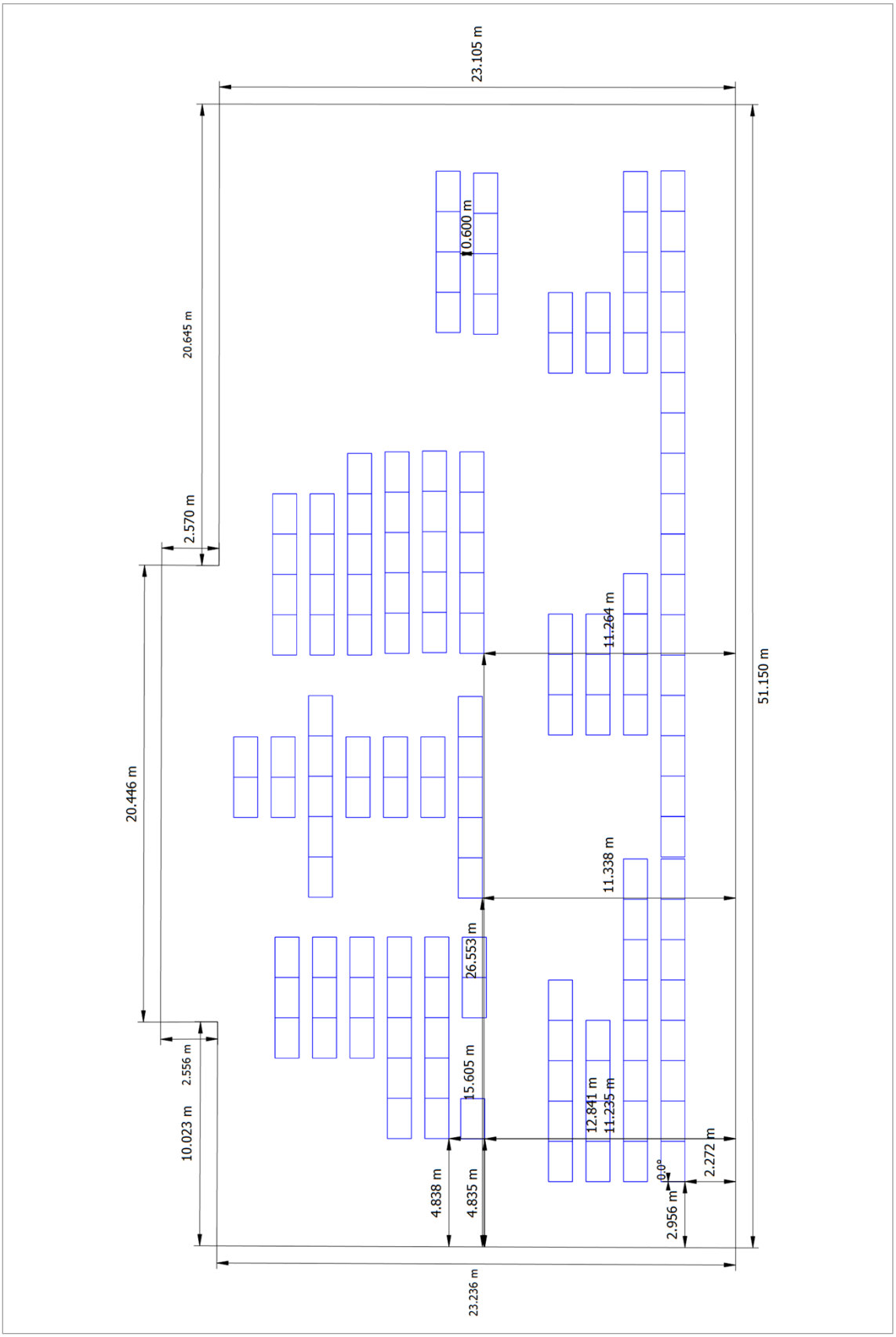


Figure: Arbitrary Building 01 - Mounting Surface South

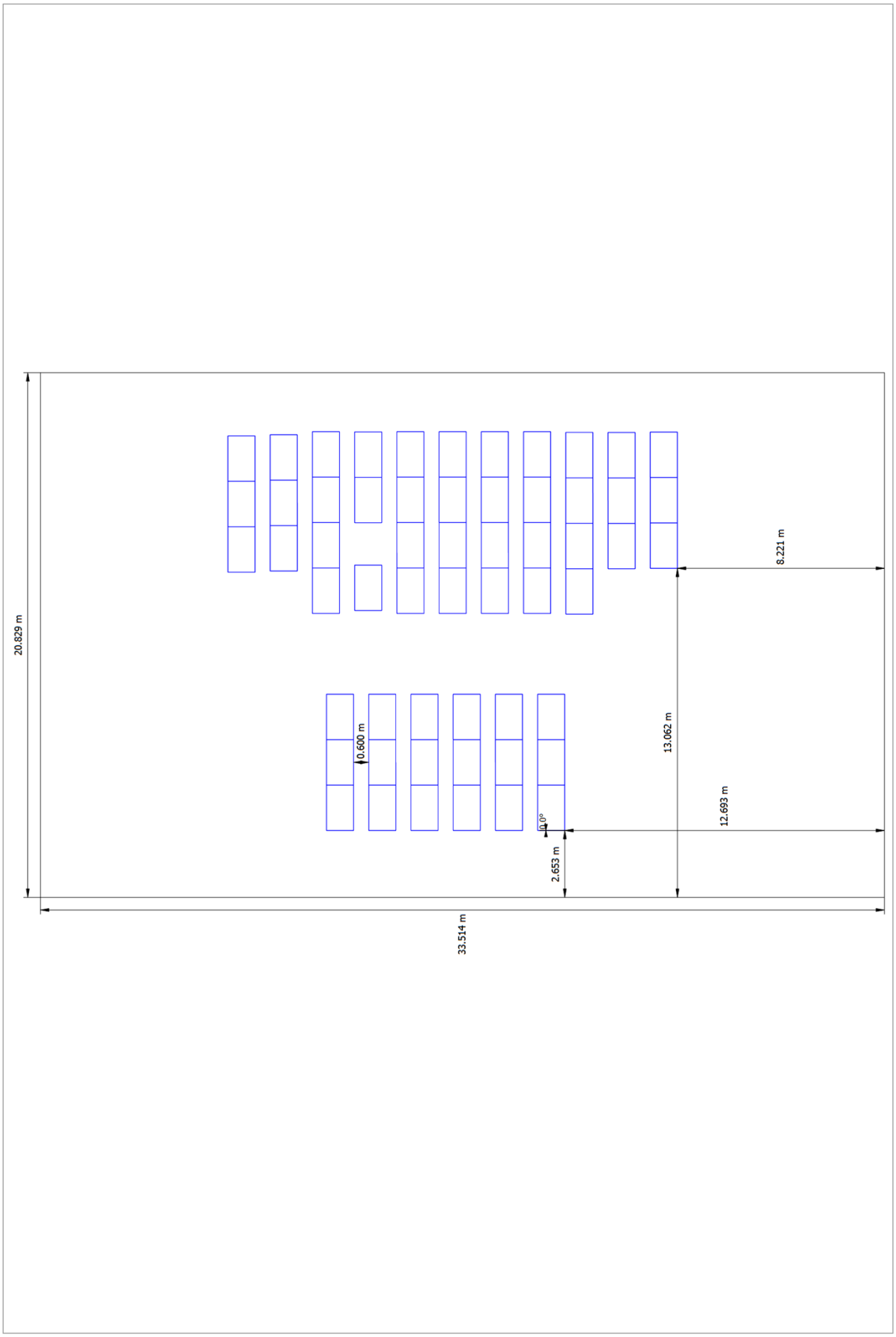


Figure: Building 03 - Roof Area South

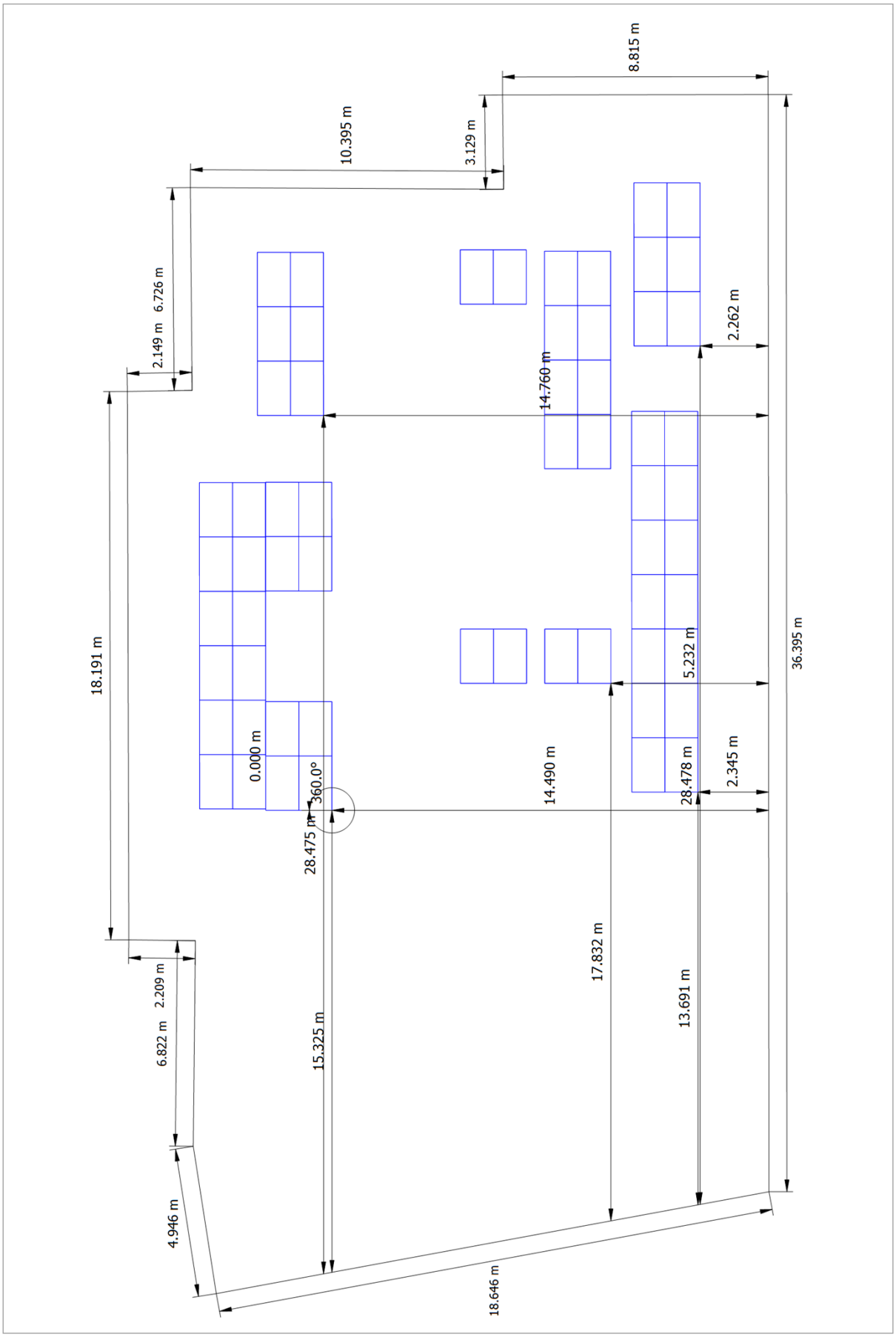


Figure: Arbitrary Building 02 - Mounting Surface East

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		LONGI Solar	LR7-54 HVH490 M	256	Piece
2	Inverter		SolarEdge	SE66.6K Unit (400V - S1200 only) 33.3 kW	1	Piece
3	Inverter		SolarEdge	SE25K-EU-APAC/AUS	2	Piece
4	Power Optimizer		SolarEdge	S1200 WorldWide	198	Piece
5	Components			Feed-in Meter	1	Piece

Three Phase Inverter with Synergy Technology
for Europe

SE50K / SE66.6K / SE90K / SE100K

INVERTERS



Powered by unique pre-commissioning process for rapid system installation

- Pre-commissioning feature for automated validation of system components and wiring during the site installation process and prior to grid connection
- Easy 2-person installation with lightweight, modular design (each inverter consists of 2 or 3 Synergy Units and one Synergy Manager)
- Independent operation of each Synergy Unit enables higher uptime and easy serviceability
- Built-in thermal sensors detect faulty wiring ensuring enhanced protection and safety
- Built-in arc fault protection and optional rapid shutdown
- Built-in PID mitigation for maximized system performance
- Monitored* and field-replaceable surge protection devices, to better withstand surges caused by lightning or other events: integrated RS485 and Type 2 DC SPDs, optional Type 2 AC SPD
- Optional integrated DC safety switch eliminates the need for external DC isolators
- Built-in module-level monitoring with Ethernet or cellular communication for full system visibility

*Applicable only for DC and AC SPDs

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Three Phase Inverter with Synergy Technology for Europe

SE50K / SE66.6K / SE90K / SE100K

Applicable to Inverter with Part Number	SExxK-xxx0Ixxxx				
	SE50K[1]	SE66.6K	SE90K	SE100K	
OUTPUT					
Rated AC Active Output Power	50000[2]	66600	90000	100000	W
Maximum AC Apparent Output Power	50000[2]	66600	90000	100000	VA
AC Output Voltage — Line to Line / Line to Neutral (Nominal)	380 / 220 ; 400 / 230				Vac
AC Output Voltage — Line to Line Range / Line to Neutral Range	304 - 437 / 176 - 253 ; 320 - 460 / 184 - 264.5				Vac
AC Frequency	50/60 ± 5%				Hz
Maximum Continuous Output Current (per Phase)	72.5	96.5	130.5	145	Aac
AC Output Line Connections	3W + PE, 4W + PE				
Supported Grids	WYE: TN-C, TN-S, TN-C-S, TT, IT; Delta: IT				
Maximum Residual Current Injection[3]	200		300		mA
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes				
Total Harmonic Distortion	≤ 3				%
Power Factor Range	+/-0.8 to 1				
INPUT					
Maximum DC Power (Module STC) Inverter / Synergy Unit	75000 / 37500	100000 / 50000	135000 / 45000	150000 / 50000	W
Transformer-less, Ungrounded	Yes				
Maximum Input Voltage DC+ to DC-	1000				Vdc
Nominal Input Voltage DC+ to DC-	750				Vdc
Maximum Input Current	2 x 36.25	2 x 48.25	3 x 43.5	3 x 48.25	Adc
Reverse-Polarity Protection	Yes				
Ground-Fault Isolation Detection	167kΩ Sensitivity per Synergy Unit[4]				
Maximum Inverter Efficiency	98.3				%
European Weighted Efficiency	98				%
Nighttime Power Consumption	< 8		< 12		W
ADDITIONAL FEATURES					
Supported Communication Interfaces[5]	2 x RS485, Ethernet, Wi-Fi (optional), Cellular (optional)				
Smart Energy Management	Export Limitation				
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection				
Arc Fault Protection	Built-in, User Configurable (According to UL1699B)				
Rapid Shutdown	Optional (automatic upon AC Grid Disconnect)				
PID Rectifier	Nighttime, built-in				
RS485 Surge Protection (ports 1 + 2)	Type II, field replaceable, integrated				
DC Surge Protection	Type II, field replaceable, integrated				
AC Surge Protection	Type II, field replaceable, optional				
DC Fuses (Single Pole)	25A, optional				
DC Disconnect Switch	Optional				
STANDARD COMPLIANCE					
Safety	IEC-62109-1, IEC-62109-2, AS3100				
Grid Connection Standards[6]	EN50549-1, EN50549-2, VDE-AR-N 4105, VDE-AR-N 4110, VDE V 0126-1-1, CEI 0-21, CEI 0-16, TOR Erzeuger Typ A+B, G99 Type A+B, G99 (NI) Type A+B, VFR 2019				
Emissions	IEC61000-6-2, IEC61000-6-3 Class A, IEC61000-3-11, IEC61000-3-12				
RoHS	Yes				

(1) Available in some countries. Refer to: https://www.solaredge.com/sites/default/files/se_inverters_supported_countries.pdf
(2) 49990 in the UK
(3) If an external RCD is required, its trip value must be ≥ 200mA for SE50K/SE66.6K; ≥ 300mA for SE90K, SE100K
(4) Where permitted by local regulations
(5) For specifications of the optional communication options, visit https://www.solaredge.com/products/communication or the Resource Library webpage: https://www.solaredge.com/downloads#, to download the relevant product datasheet
(6) For all standards and certificates download, refer to Certifications category on Resource library page: https://www.solaredge.com/downloads#/

Three Phase Inverter with Synergy Technology for Europe

SE50K / SE66.6K / SE90K / SE100K

Applicable to Inverter with Part Number	SExxK-xxx0Ixxxx				
	SE50K	SE66.6K	SE90K	SE100K	
INSTALLATION SPECIFICATIONS					
Number of Synergy Units per Inverter	2		3		
AC Wire Cross Section and Outer Diameter: Line/PE (Aluminum or Copper)	Cross section up to 120 / 70 mm^2; outer diameter 30-50 / 12-20 mm				
DC Input: Inverter / Synergy Unit(7)(8)	8 / 4 MC4 pairs		12 / 4 MC4 pairs		
	Gland, 2 pairs / 1 pair, Cross section up to 50 mm^2, aluminum or copper Cable outer diameter 12-20 mm		Gland, 3 pairs / 1 pair, Cross section up to 50 mm^2, aluminum or copper Cable outer diameter 12-20 mm		
Dimensions (H x W x D)	Synergy Unit: 558 x 328 x 273 Synergy Manager: 360 x 560 x 295				mm
Weight	Synergy Unit: 32 Synergy Manager: 18				kg
Operating Temperature Range	-40 to +60(9)				˚C
Cooling	Fan (user replaceable)				
Noise	< 67				dBA
Protection Rating	IP65 — outdoor and indoor				
Mounting	Brackets provided				

(7) DC input is available with MC4 or Gland connection under the inverter part number. For more information, contact SolarEdge
(8) Only MC4 connectors manufactured by Staubli are approved for use
(9) For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note.pdf

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CE RoHS

Three Phase Inverter
For Europe

SE25K / SE30K / SE33.3K

INVERTERS



Specifically designed to work with power optimizers

- Fixed voltage inverter for superior efficiency (98.3%) and longer strings
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Small, lightest in its class, and easy to install
- Integrated type 2 DC surge protection, to better withstand surges caused by lightning or other events
- Optional RS485 and type 2 AC surge protection
- Built-in module-level monitoring with Ethernet, wireless or cellular communication for full system visibility
- Advanced safety features - integrated arc fault protection and optional rapid shutdown
- IP65 for outdoor and indoor installations
- Optional integrated DC Safety Unit - eliminates the need for external DC isolators
- Future-proofed for SolarEdge energy storage solutions

solaredge

/ Three Phase Inverter
For Europe
SE25K / SE30K / SE33.3K

Applicable to inverters with part number	SEXXK-RWX0IXXXX			
	SE25K	SE30K	SE33.3K	
OUTPUT				
Rated AC Active Power Output	25000	29990	33300	W
Maximum AC Apparent Output Power	25000	29990	33300	VA
AC Output Voltage - Line to Line / Line to Neutral (Nominal)	380 / 220 ; 400 / 230			Vac
AC Output Voltage - Line to Line / Line to Neutral	304 - 437 / 176 - 253 ; 320 - 460 / 184 - 264.5			Vac
AC Frequency	50/60 ± 5%			Hz
Maximum Continuous Output Current (per Phase)	36.25	43.5	48.25	Aac
AC Output Line Connections	3W + PE, 4W + PE			
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes			
Total Harmonic Distortion	≤ 3			%
Power Factor Range	+/-0.8 to 1			
Maximum Residual Current Injection[1]	100			mA
INPUT				
Maximum DC Power (Module STC)	37500	45000	49950	W
Transformer-less, Ungrounded	Yes			
Maximum Input Voltage DC+ to DC-	1000			Vdc
Nominal Input Voltage DC+ to DC-	750			Vdc
Maximum Input Current	36.25	43.5	48.25	Adc
Reverse-Polarity Protection	Yes			
Ground-Fault Isolation Detection	167kΩ Sensitivity[2]			
Maximum Inverter Efficiency	98.3			%
European Weighted Efficiency	98			%
Nighttime Power Consumption	< 4			W
ADDITIONAL FEATURES				
Supported Communication Interfaces	2 x RS485, Ethernet, Wi-Fi (optional)[3], Cellular (optional)			
Smart Energy Management	Export Limitation			
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection			
Arc Fault Protection	Integrated, User Configurable (According to UL1699B)			
Rapid Shutdown	Optional[4] (Automatic upon AC Grid Disconnect)			
RS485 Surge Protection	Optional			
DC Surge Protection	Type II, field replaceable, integrated			
AC Surge Protection	Type II, field replaceable, optional			
DC SAFETY UNIT (OPTIONAL)				
2-pole Disconnection	1000V / 48.25A			
DC Fuses (Single Pole)	Optional, 25A			
Compliance	UTE-C15-712-1			
STANDARD COMPLIANCE				
Safety	IEC-62109, AS3100			
Grid Connection Standards[5]	VDE-AR-N-4105, AS-4777, EN50438, CEI-021, VDE 0126-1-1, CEI-016, EN50549-1, EN50549-2, VDE-AR-N-4110, TOR Erzeuger Typ A, G99, G99 (NI), VFR 2019			
Emissions	IEC61000-6-2, IEC61000-6-3 Class A, IEC61000-3-11, IEC61000-3-12			
RoHS	Yes			
INSTALLATION SPECIFICATIONS				
AC Output Gland Diameter / Line cross section / PE cross section	Cable diameter 19-28 mm / 4 - 16 mm^2 / 4 - 16 mm^2			
DC Input[6]	4 MC4 pairs			
DC Input with Safety Unit [6][7]	4 MC4 pairs			
	4 Strings: Gland: Cable outer diameter 5 - 10 mm / Wire cross section 2.5 - 16 mm^2			
Dimensions (H x W x D)	550 x 317 x 273			mm
Dimensions with Safety Unit (H x W x D)	836 x 317 x 300 (DC MC4); 819 x 317 x 300 (DC Gland)			mm
Weight	32			kg
Weight with Safety Unit	36.5			kg
Operating Temperature Range	-40 to +60[8]			°C
Cooling	Fan (user replaceable)			
Noise	< 62			dBA
Protection Rating	IP65 - outdoor and indoor			
Mounting	Brackets provided			

(1) If an external RCD is required, its trip value must be ≥ 100mA
(2) Where permitted by local regulations
(3) Wi-Fi connectivity requires connection of an additional Wi-Fi component, ordered separately. For more details ask your SolarEdge sales person or refer to: https://www.solaredge.com/products/communication
(4) Inverters with rapid shutdown part number: SExxK-xxRxxxxxx
(5) For all standards refer to Certifications category in Downloads page: http://www.solaredge.com/groups/support/downloads
(6) DC input is available with MC4 or Gland connectors under the inverter part number. For more information, contact SolarEdge
(7) Only MC4 connectors manufactured by Stäubli are approved for use
(8) For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note.pdf

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CE RoHS

Hi-MO X10 Explorer

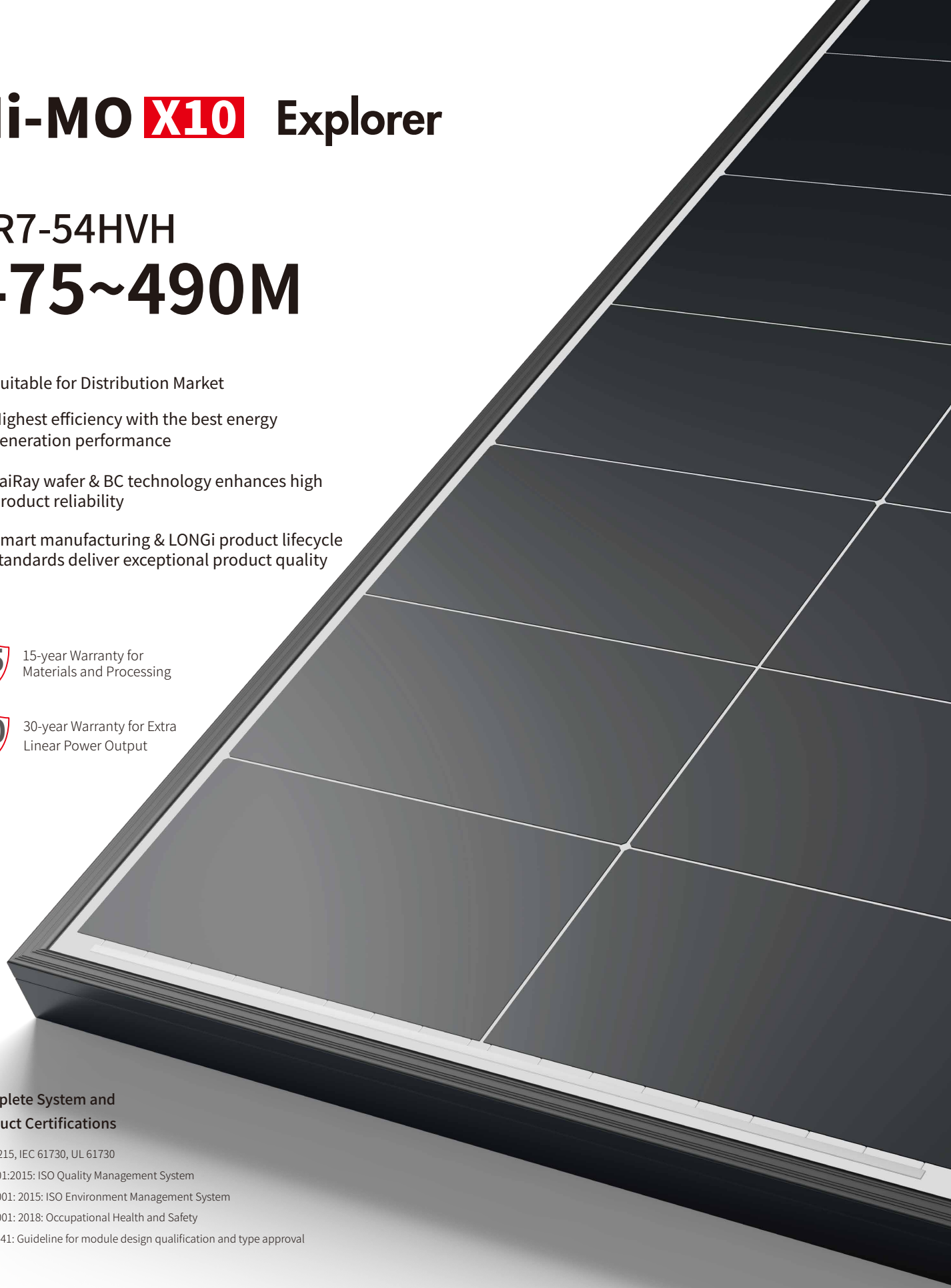
LR7-54HVH

475~490M

- Suitable for Distribution Market
- Highest efficiency with the best energy generation performance
- TaiRay wafer & BC technology enhances high product reliability
- Smart manufacturing & LONGi product lifecycle standards deliver exceptional product quality

15 15-year Warranty for Materials and Processing

30 30-year Warranty for Extra Linear Power Output



Complete System and Product Certifications

IEC 61215, IEC 61730, UL 61730

ISO9001:2015: ISO Quality Management System

ISO14001: 2015: ISO Environment Management System

ISO45001: 2018: Occupational Health and Safety

IEC62941: Guideline for module design qualification and type approval

LONGi

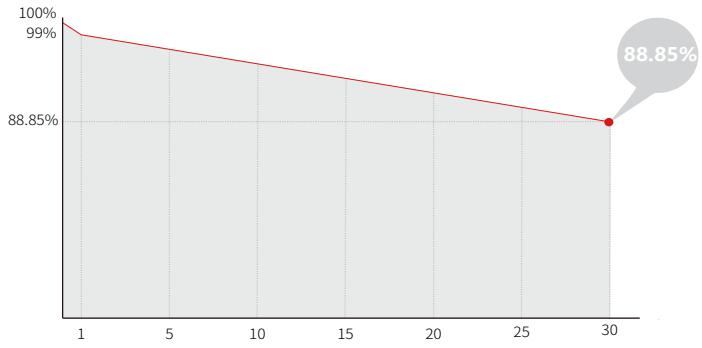
Hi-MO X10 Explorer

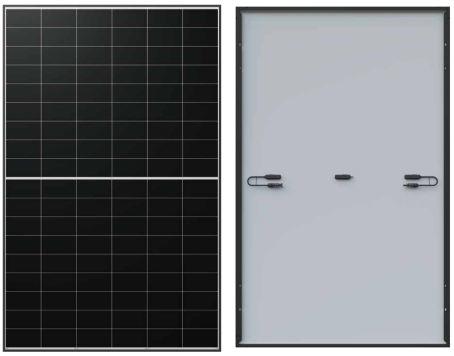
LR7-54HVH 475~490M

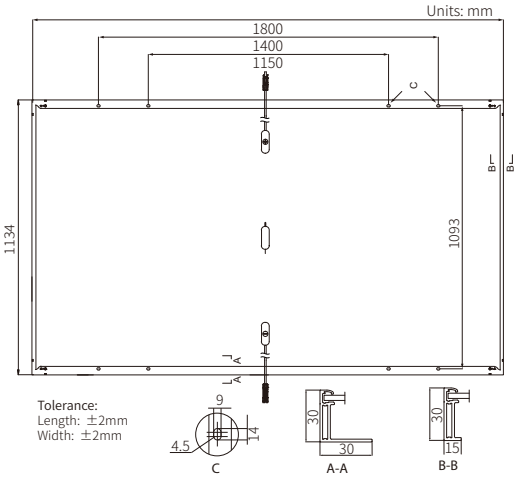
24.0%	0~3%	<1%	0.35%	BC-CELL
MAX MODULE EFFICIENCY	POWER TOLERANCE	FIRST YEAR POWER DEGRADATION	YEAR 2-30 POWER DEGRADATION	LOWER OPERATING TEMPERATURE

Additional Value

30-Year Power Warranty







Mechanical Parameters

Cell Orientation	108 (6×18)
Junction Box	IP68, three diodes
Output Cable	4mm², +400, -200mm/±1200mm length can be customized
Glass	Single glass, 3.2mm coated tempered glass
Frame	Anodized aluminum alloy frame
Weight	21.6kg
Dimension	1800×1134×30mm
Packaging	36pcs per pallet / 216pcs per 20' GP / 864pcs per 40' HC

Electrical Characteristics

STC : AM1.5 1000W/m² 25°C NOCT : AM1.5 800W/m² 20°C 1m/s Test uncertainty for Pmax: ±3%

Module Type	LR7-54HVH-475M		LR7-54HVH-480M		LR7-54HVH-485M		LR7-54HVH-490M	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	475	362	480	365	485	369	490	373
Open Circuit Voltage (Voc/V)	40.18	38.18	40.29	38.29	40.40	38.39	40.52	38.51
Short Circuit Current (Isc/A)	15.03	12.08	15.13	12.16	15.23	12.24	15.33	12.32
Voltage at Maximum Power (Vmp/V)	33.16	31.52	33.28	31.63	33.40	31.74	33.51	31.85
Current at Maximum Power (Imp/A)	14.33	11.49	14.43	11.57	14.53	11.65	14.63	11.73
Module Efficiency(%)	23.3		23.5		23.8		24.0	

Operating Parameters

Operational Temperature	-40°C ~ +85°C
Power Output Tolerance	0 ~ 3%
Maximum System Voltage	DC1500V (IEC)
Maximum Series Fuse Rating	25A
Nominal Operating Cell Temperature	45±2°C
Protection Class	Class II
Fire Rating	IEC Class C

Mechanical Loading

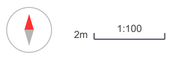
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

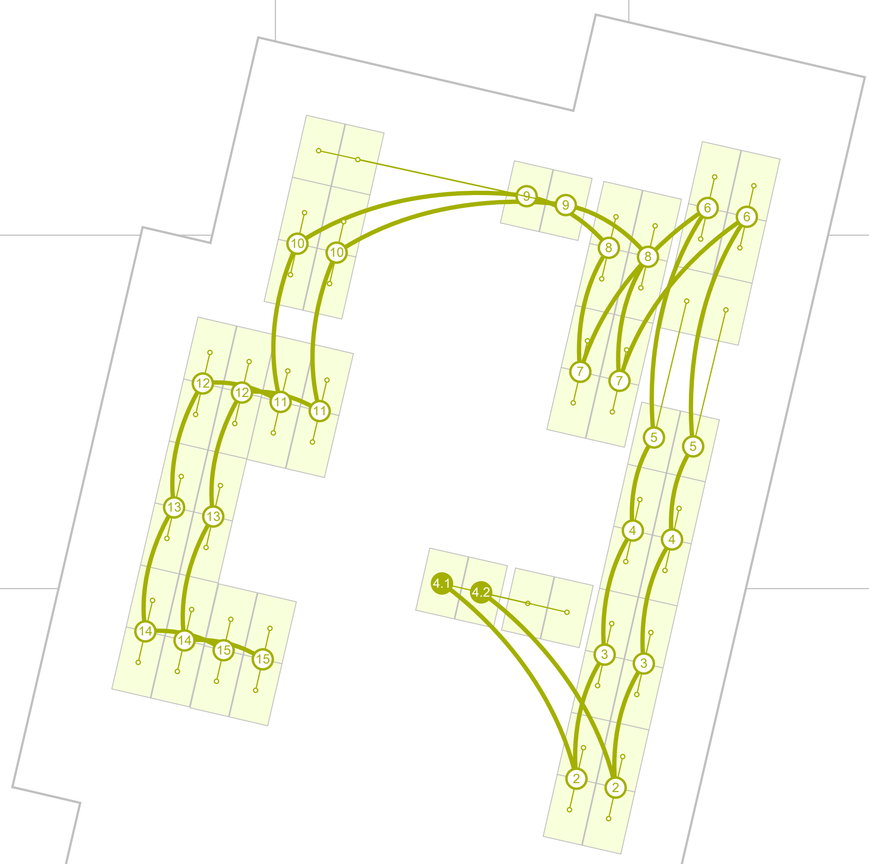
Temperature Ratings (STC)

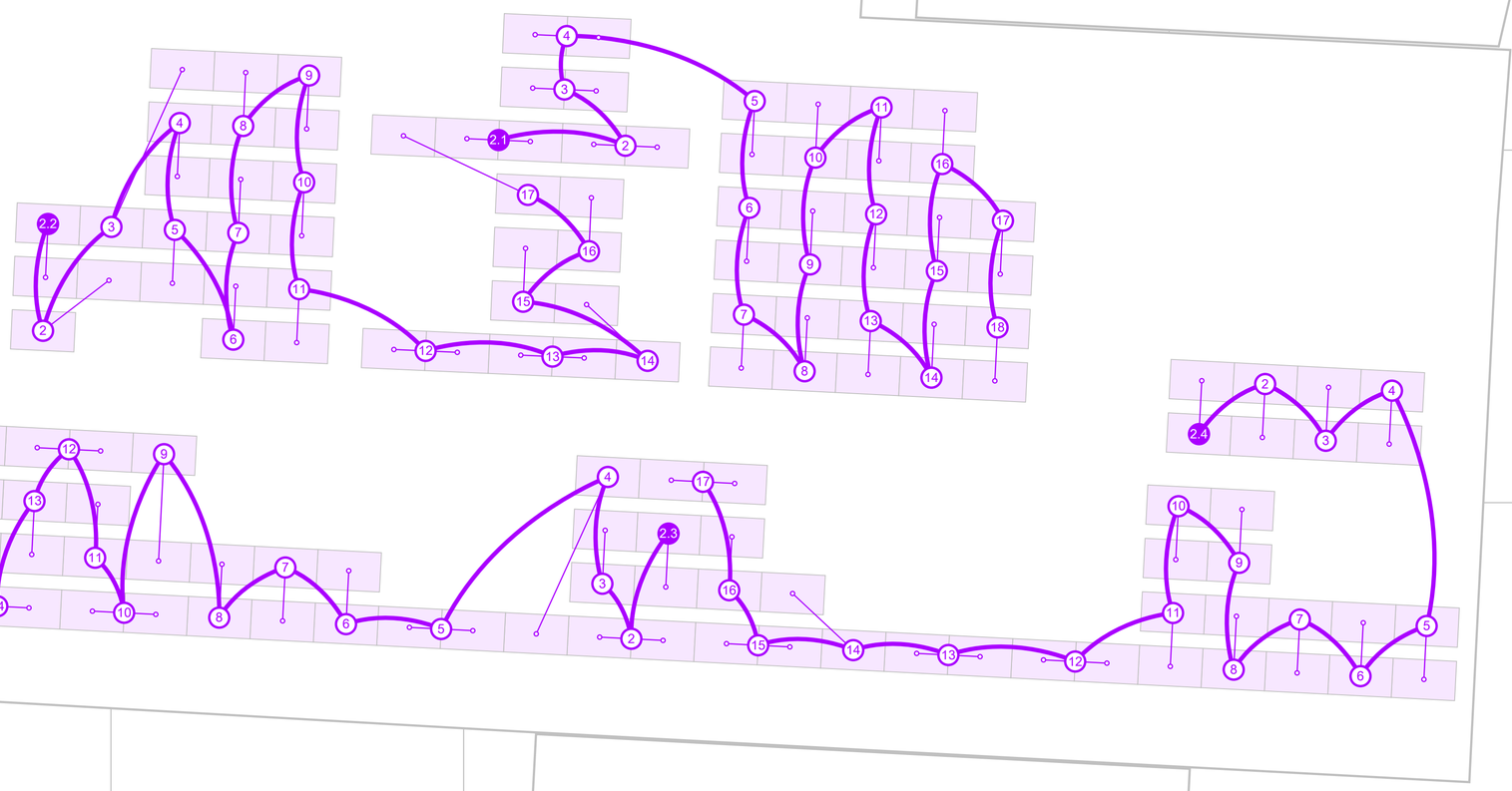
Temperature Coefficient of Isc	+0.050%/°C
Temperature Coefficient of Voc	-0.200%/°C
Temperature Coefficient of Pmax	-0.260%/°C

LONGi

Specifications included in this datasheet are subject to change without notice.
LONGi reserves the right of final interpretation. (20241118 BGV02 Draft)









solaredge | G&H

JOSEPH NORTON SEMH SCHOOL
STRING DESIGN REPORT

Address: Tenter Hill Lane 32, Huddersfield, HD2 1EJ, United Kingdom | Ashley Skillington | Sep 10, 2025

2 SE50K Synergy Manager 127%

Center:

2.1 18 x S1200 36

2.2 17 x S1200 34

Left:

2.3 18 x S1200 35

2.4 17 x S1200 34

3 SE20K 131%

3.1 15 x S1200 29

3.2 14 x S1200 28

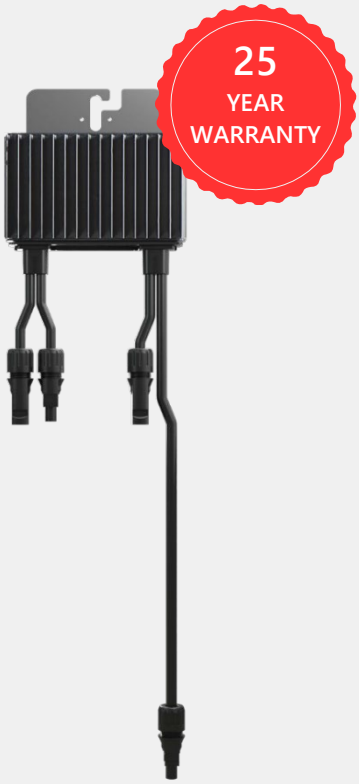
4 SE20K 126%

4.1 15 x S1200 30

4.2 15 x S1200 30

Power Optimizer

S1000 / S1200



POWER OPTIMIZERS

SolarEdge's most advanced, cost-effective Power Optimizer for commercial and large field installations

- **Greater Energy Yields**
  - High efficiency (99.5%) with module-level MPPT, for maximized system energy production and revenue, and fast project ROI
  - Supports high power and bifacial PV modules, and high string current for more power per string
- **Maximum Protection with Built-In Safety**
  - Designed to automatically reduce high DC voltage to touch-safe levels, upon grid/inverter shutdown, with SafeDC™
  - Includes SolarEdge Sense Connect, allowing continuous monitoring to detect overheating due to installation issues or connector-level wear and tear
- **Lower BoS Costs**
  - Flexible system design enables maximum space utilization and up to 2x longer string lengths, 50% less cables, fuses and combiner boxes
  - Supports connection of two PV modules in series with easy cable management and fast installation times
- **Simpler O&M**
  - Module-level system monitoring enabling pinpointed fault detection and remote, time-saving troubleshooting

solaredge

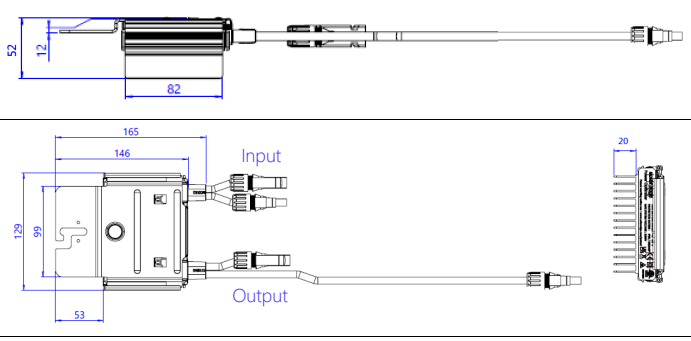
/ Power Optimizer

S1000 / S1200

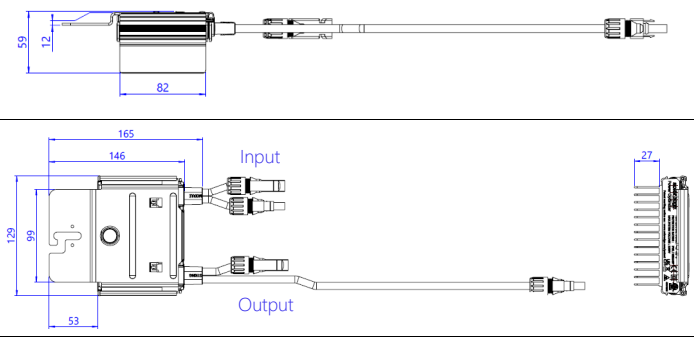
Power Optimizer Model (Typical Module Compatibility)	S1000 (for up to 2 x high power or bifacial modules)	S1200	Units
INPUT[1]			
Rated Input DC Power[2]	1050	1260	W
Absolute Maximum Input Voltage (Voc)	125		Vdc
MPPT Operating Range	12.5 – 105		Vdc
Maximum Continuous Input Current	15		Adc
Maximum Short Circuit Current (Isc) of Connected PV Module	20		Adc
Maximum Efficiency	99.5		%
Weighted Efficiency	98.8		%
Overvoltage Category	II		
OUTPUT DURING OPERATION			
Maximum Output Current	18	20	Adc
Maximum Output Voltage	80		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer	1±0.1		Vdc
STANDARD COMPLIANCE			
EMC	FCC Part 15, IEC 61000-6-2, and IEC 61000-6-3 – Class B, EN 55011		
Safety	IEC 62109-1 (class II safety), UL 3741		
Material	UL 94 V-0, UV Resistant		
RoHS	Yes		
Fire Safety	VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Compatible SolarEdge Inverters	All commercial three phase inverters		
Maximum Allowed System Voltage	1000		Vdc
Dimensions (W x L x H)	129 x 165 x 52 / 5.08 x 6.49 x 2.047	129 x 165 x 59 / 5.08 x 6.49 x 2.32	mm / in
Weight (including cables)	1064 / 2.3	1106 / 2.4	gr / lb
Input Connector	MC4[3]		
Input Wire Length	Short Input: 0.1 / 0.32 Long Input: 1.3 / 4.26[4]	Short Input: 0.1 / 0.32 Long Input: 1.6 / 5.24[4]	m / ft
Output Connector	MC4		
Output Wire Length	(+) 4.7 (-) 0.10 / (+) 15.41 (-) 0.32	(+) 5.3 (-) 0.10 / (+) 17.38 (-) 0.32	m / ft
Operating Temperature Range[5]	-40 to +85 / -40 to +185		°C / °F
Protection Rating	IP68 / NEMA6P		
Relative Humidity	0 – 100		%
Maximum Operating Altitude	2000		m

(1) For detailed Power Optimizer/PV module compatibility guidelines, refer to the Application Note – Power Optimizer Compatibility with PV Modules.
(2) Rated power of the module at STC will not exceed the power optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.
(3) For other connector types please contact SolarEdge.
(4) For S-Series models with long input cables (1.3m / 4.26ft or 1.6m / 5.24ft), the Sense Connect feature is only enabled on the output cable connectors.
(5) For ambient temperatures above +65°C / +149°F power derating is applied. Refer to the Temperature Derating Technical Note for details.

S1000 Mechanical Drawing



S1200 Mechanical Drawing



* When installing SolarEdge power optimizers, maintaining clearance is required. Refer to the Power Optimizer Clearance Application Note for more details.

/ PV System Design

S1000

PV System Design Using a SolarEdge Inverter[1][2][3]		230/400V Grid SE15K[4]	230/400V Grid SE16K[5], SE17K[5], SE25K*	230/400V Grid SE27.6K*	230/400V Grid SE30K*	230/400V Grid SE33.3K*	277/480V Grid SE40K*	Units
Compatible Power Optimizers		S1000						
Minimum String Length	Power Optimizers	14	14	14	15	14	15	
	PV Modules	27	27	27	29	27	29	
Maximum String Length	Power Optimizers[6]	30	30	30	30	30	30	
	PV Modules	60	60	60	60	60	60	
Maximum Continuous Power per String [W]		13,950	13,500	13,950	15,300	13,500	15,300	W
Maximum Allowed Connected Power per String[7]		1 string: 16,200 2 strings or more: 18,950	1 string: 15,750 2 strings or more: 18,500	1 string: 16,200 2 strings or more: 18,950	1 string: 17,550 2 strings or more: 20,300	2 strings: 15,750 3 strings or more: 18,500	1 – 2 strings: 17,550 3 strings or more: 20,300	
Parallel Strings of Different Lengths or Orientations		Yes						
Maximum Difference in Number of Power Optimizers Allowed Between the Shortest and Longest String Connected to the Same Inverter Unit		5 Power Optimizers						

*The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Synergy Technology inverter.
(1) S1000 cannot be mixed with S1200 in the same string. For P-series compatibility please refer to the SolarEdge Power Optimizer Inter-Compatibility Technical Note.
(2) For each string, a Power Optimizer may be connected to a single PV module if:
1) Each Power Optimizer is connected to a single PV module (the entire string has a 1:1 configuration).
2) It is the only Power Optimizer connected to a single PV module.
(3) For SE15K and above, the minimum STC DC connected power should be 11KW.
(4) SE15K is compatible with S1000 only in India.
(5) SE16K and SE17K are compatible with S1000 only in Taiwan, South Africa, India, and Israel.
(6) When connecting to inverters that support Rapid Shutdown, each string must contain fewer than 28 power optimizers to meet NEC Rapid Shutdown requirements.
(7) To connect more STC power per string, design your project using SolarEdge Designer.

S1200

PV System Design Using a SolarEdge Inverter[8][9][10]		230/400V Grid SE15K[11]*	230/400V Grid SE16K[12], SE17K[12], SE25K*	230/400V Grid SE27.6K*	230/400V Grid SE30K, SE33.3K[13]	277/480V Grid SE40K*	Units
Compatible Power Optimizers		S1200					
Minimum String Length	Power Optimizers	14	14	14	15	15	
	PV Modules	27	27	27	29	29	
Maximum String Length	Power Optimizers[14]	30	30	30	30	30	
	PV Modules	60	60	60	60	60	
Maximum Continuous Power per String [W]		15,500	15,000	15,500	17,000	17,000	W
Maximum Allowed Connected Power per String[15]		1 string or more: 20,500	1 string: 17,250 2 strings or more: 20,000	1 string: 17,750 2 strings or more: 20,500	1 string: 19,250 2 strings or more: 23,000	1 – 2 strings: 19,250 3 strings or more: 23,000	
Parallel Strings of Different Lengths or Orientations		Yes					
Maximum Difference in Number of Power Optimizers Allowed Between the Shortest and Longest String Connected to the Same Inverter Unit		5 Power Optimizers					

*The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Synergy Technology inverter.
(8) S1200 cannot be mixed with any other power optimizer in the same string.
(9) For each string, a Power Optimizer may be connected to a single PV module if:
1) Each Power Optimizer is connected to a single PV module (the entire string has a 1:1 configuration).
2) It is the only Power Optimizer connected to a single PV module.
(10) For SE15K and above, the minimum STC DC connected power should be 11KW.
(11) SE15K is compatible with S1200 only in India.
(12) SE16K and SE17K are compatible with S1200 only in Taiwan, South Africa, India, and Israel.
(13) To connect an S1200 power optimizer with an SE33.3K inverter, you must toggle the Fixed String Voltage from 750Vdc to 850Vdc via SolarEdge SetApp. For details, see this application note.
(14) When connecting to inverters that support Rapid Shutdown, each string must contain fewer than 28 power optimizers to meet NEC Rapid Shutdown requirements.
(15) To connect more STC power per string, design your project using SolarEdge Designer.

SolarEdge is a global leader in smart energy technology. By leveraging world-class engineering capabilities and with a relentless focus on innovation, SolarEdge creates smart energy solutions that power our lives and drive future progress.

SolarEdge developed an intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. The SolarEdge DC optimized inverter maximizes power generation while lowering the cost of energy produced by the PV system.

Continuing to advance smart energy, SolarEdge addresses a broad range of energy market segments through its PV, storage, EV charging, UPS, and grid services solutions.

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Cautionary Note Regarding Market Data and Industry Forecasts: This brochure may contain market data and industry forecasts from certain third-party sources. This information is based on industry surveys and the preparer's expertise in the industry and there can be no assurance that any such market data is accurate or that any such industry forecasts will be achieved. Although we have not independently verified the accuracy of such market data and industry forecasts, we believe that the market data is reliable and that the industry forecasts are reasonable.

CE

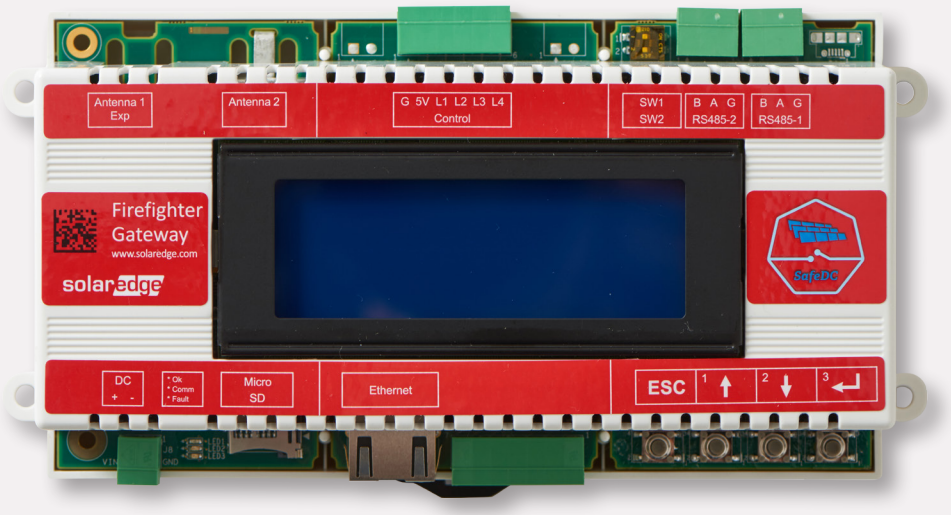


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SolarEdge Firefighter Gateway

SE1000-CCG-F

COMMUNICATION



Central safety management for the SolarEdge system

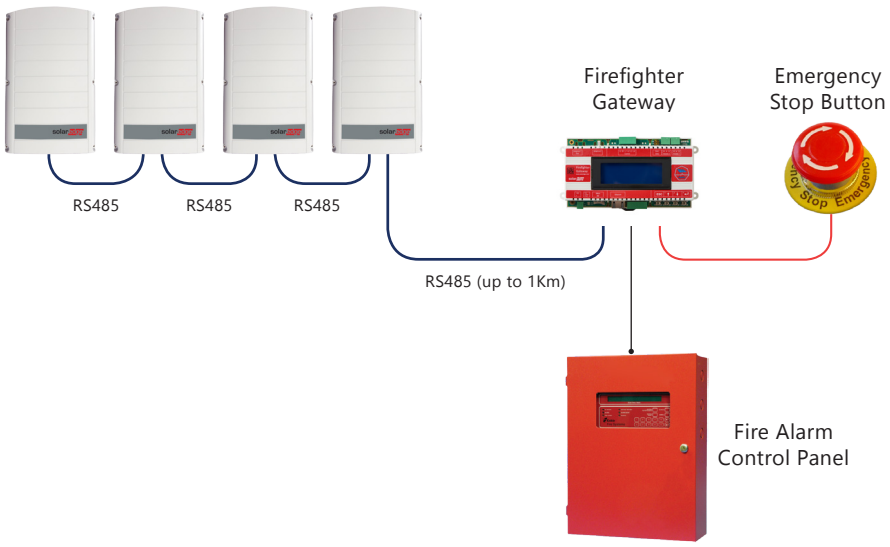
- Manual & automatic system DC Shutdown
- Real-time indication of system DC voltage for safety assurance
- Emergency stop button for the entire PV system
- Notification to SolarEdge monitoring platform on system shutdown
- Easy installation - DIN rail and wall mount

/ SolarEdge Firefighter Gateway

SE1000-CCG-F

POWER		
Power Supply - DIN Rail	Included, 100-240VAC, EU/UK/US/AU interchangeable, 2-pin plug	
Supply Voltage	9-14	Vdc
Connector Type	Terminal block	
Power Consumption	<2	W
COMMUNICATION INTERFACES		
Ethernet Interface	10/100-BaseT	
Wireless Connections	ZigBee module [1], GSM [1] [2]	
Fire Alarm Control Panel Interface	2 alarm inputs, 5V, GND [3]	
SolarEdge Inverters	RS485	
ENVIRONMENTAL		
Operating Temperatures	-20 to 60 / -4 to 140	°C / °F
Protection Rating	IP20 Indoor	
MECHANICAL		
Mounting Type	DIN Rail / Wall mount	
Dimensions (L x W x H)	161.6 X 90 X 62 / 6.36 x 3.54 x 2.44	mm / Inch
Weight	0.5 / 1.1	kg / lbs
STANDARD COMPLIANCE		
Safety	UL60950-1, IEC-60950-1	
EMC	FCC Part 15 class B, IEC61000-6-2, IEC61000-6-3	

[1] Sold separately - see individual product specs for supported regions
[2] EU only
[3] Emergency stop button is not supplied by SolarEdge



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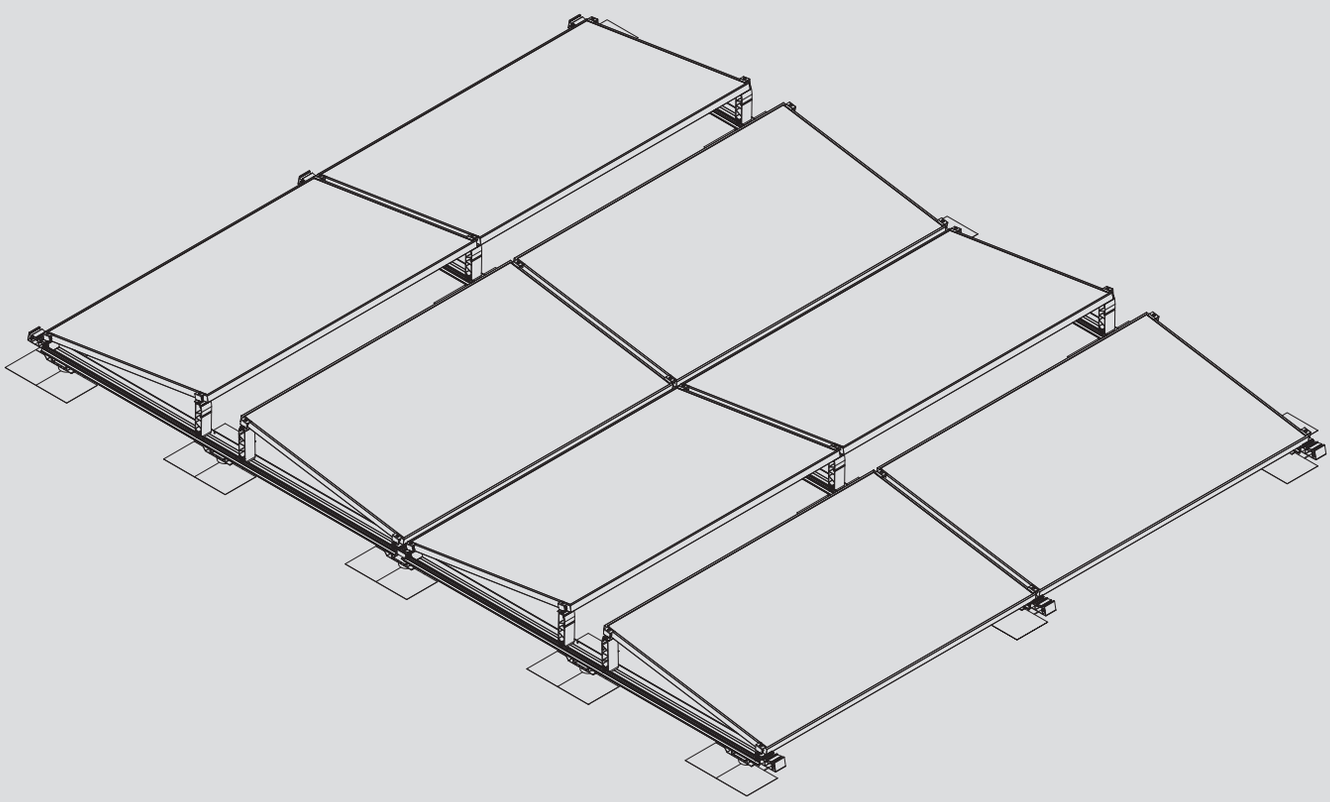
CE RoHS

solaredge

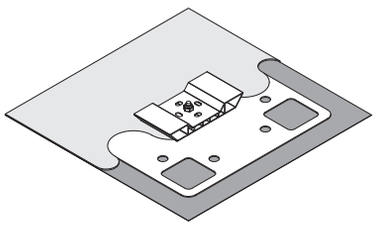
Renusol Europe GmbH

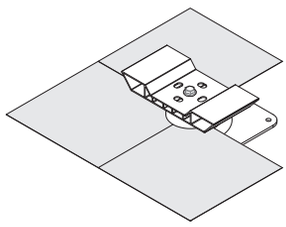
Renusol FS Pro 10-EW IFP

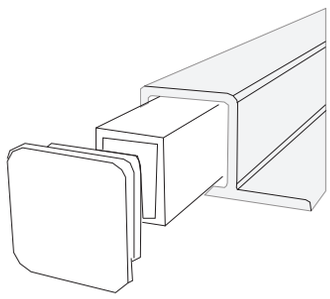
EN | Installation Manual

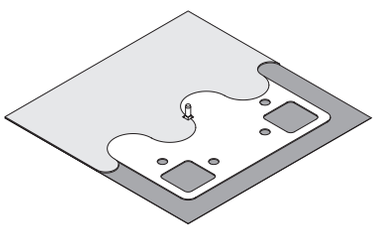


Preface for Installation with Fixed Elements









EN | Application

Mounting system for the installation of framed PV modules on flat roofs with a roof pitch of up to 5°–10° with roof penetration.

Before Installation

The Renusol FS Pro is fastened with third-party products (Nicholson Rooftrack, Solmont, Ejot-Ejotbar, etc.) to withstand wind loads. The required fastening depends on the underlying roof structure and must be determined in consultation with the third-party supplier.Use the Renusol PV Configurator to verify whether mounting option A is structurally suitable, considering regional conditions. Depending on the third-party product used, the connection method to the Renusol substructure may vary.

In the Renusol FS Pro 10-EW IFP mounting system, the module is secured at the corner areas of the short module side. It must be checked on-site whether the clamping area specified by the module manufacturer is maintained and that the permissible module loads are not exceeded.

Drainage holes in PV module frames must remain unobstructed and must not be covered by the mounting system. The roof surface must be free of snow, ice, and dirt before installation.

When installing, observe applicable regulations, current technical standards, and occupational safety guidelines.

A prerequisite for proper use is always a suitable substructure that can absorb the acting forces (weight load, wind, and snow load). The roof covering must be suitable for screwing and subsequent bonding or welding.

Wind Report

The suction and pressure coefficients have been determined through wind tunnel tests.

Applicable Documents

"General Installation, Maintenance, and Assembly Instructions", "Warranty Conditions and Disclaimer."

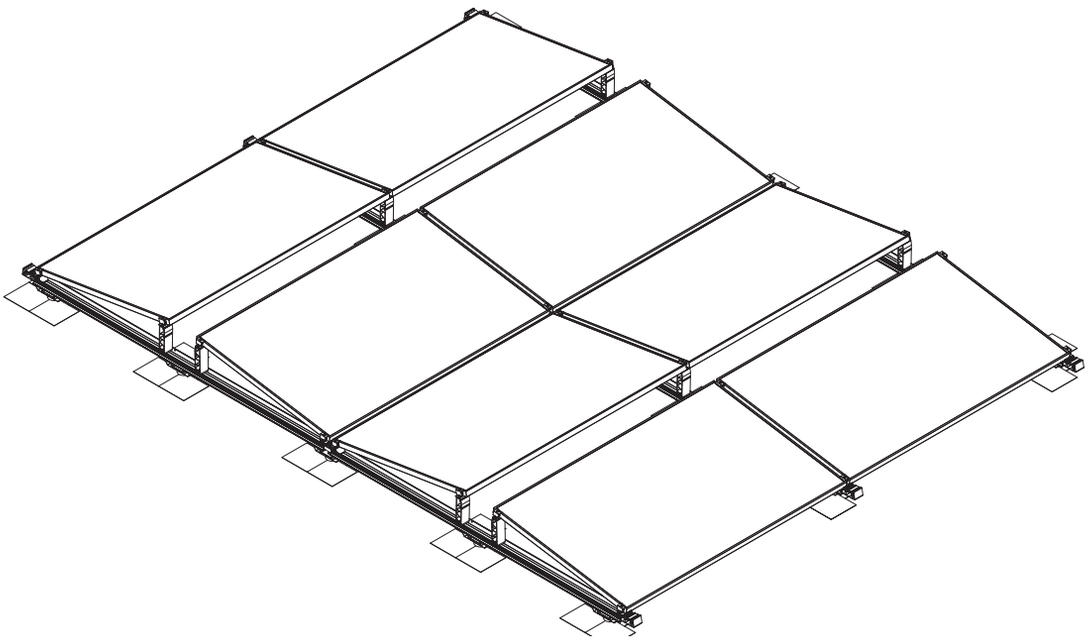
These documents are available at unter www.renusol.com

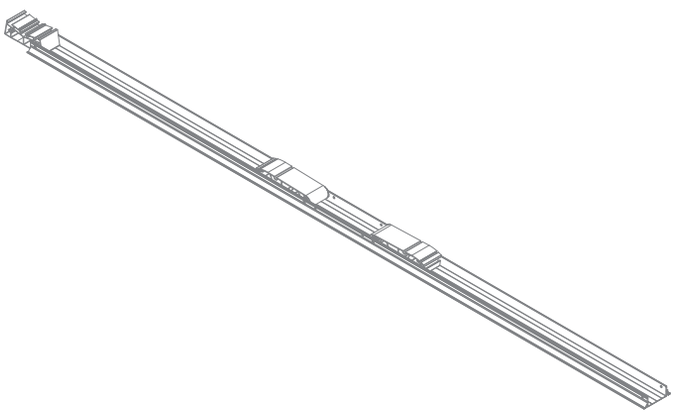
Warranty and Liability

The Renusol warranty is valid only when using the original Renusol FS Pro complete system in compliance with the warranty conditions. For statutory defect liability/warranty, please refer to Renusol's General Terms and Conditions.

www.renusol.com

Renusol FS Pro 10-EW-IFP Bill of Materials

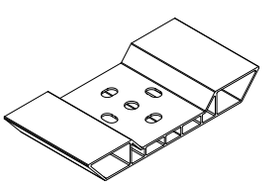




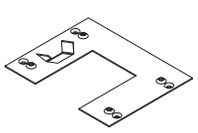
R520243
FS Pro 10-EW Base Rail 2300 (Set) IFP

R520245
FS Pro 10-EW Base Rail 2380 (Set) IFP

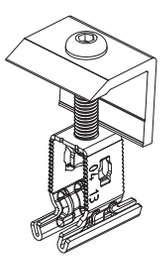
R500264
FS Pro IFP Mounting Bracket



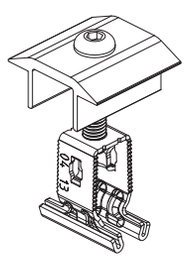
R900268 (optional)
P-Clip Potential equalization



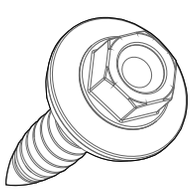
R420081 / R420081-BE
End clamp+
End clamp+ (black)



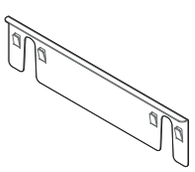
R420082 / R420082-BE
Middle clamp+
Middle clamp+ (black)



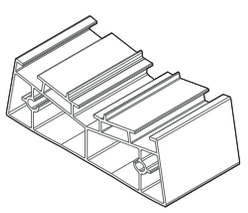
R400301
Self drilling screw 5,5 x 25 SW8 E16



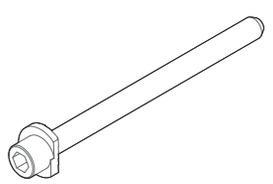
R500261
FS Pro Potential equalisation clip EW



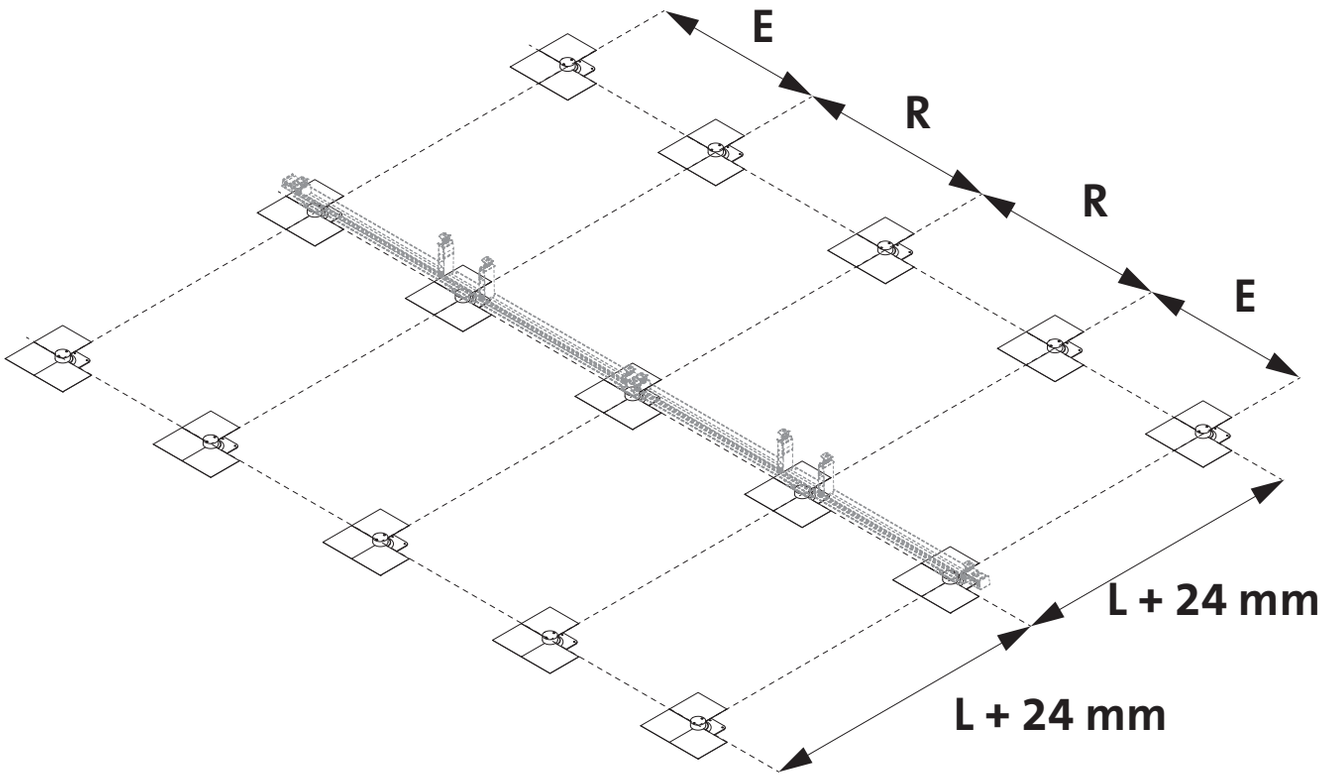
R500232
FS Pro 10-EW Eave support



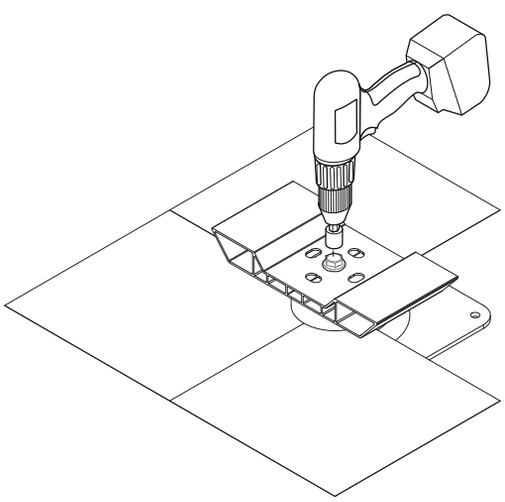
R500227
FS Pro Securing bolt



1.A | **Mounting Variant A**



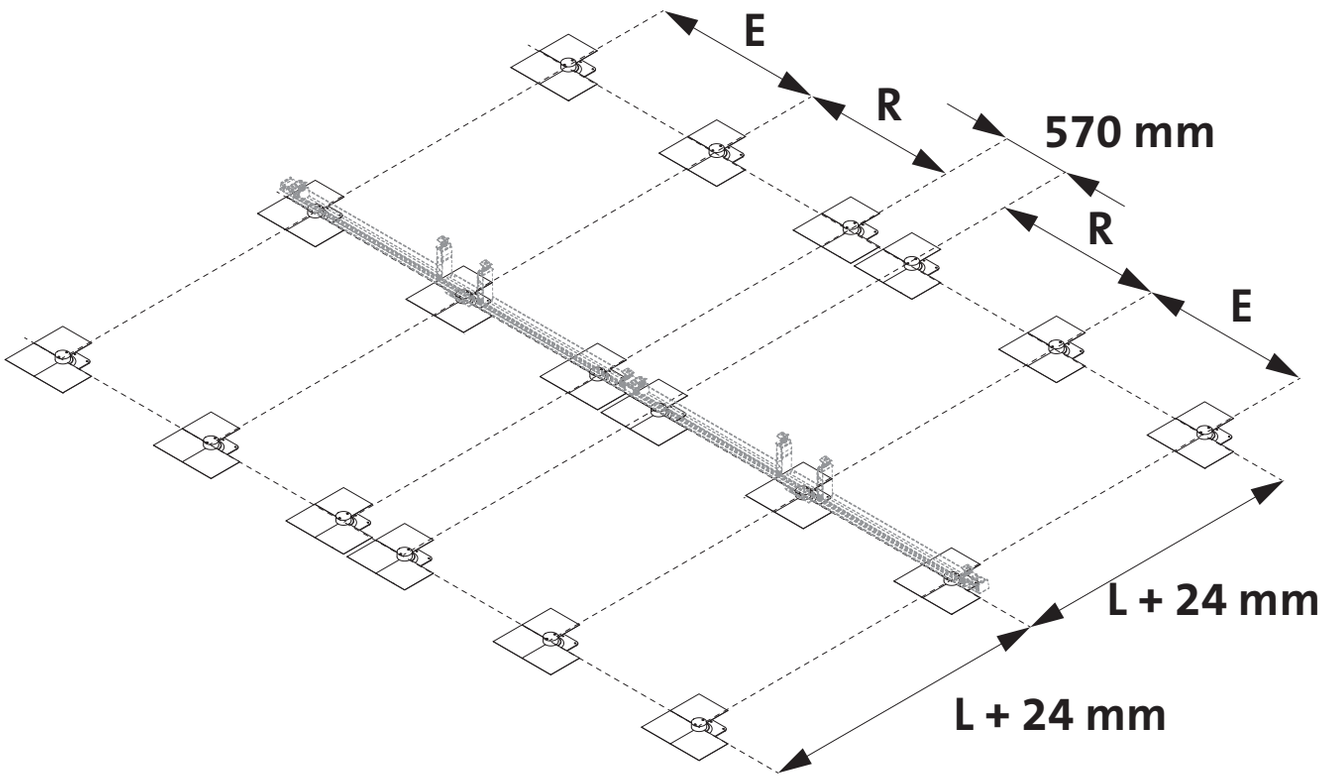
The spacing (R) is continuously repeated except for the offset IFPs at the beginning and end (E).

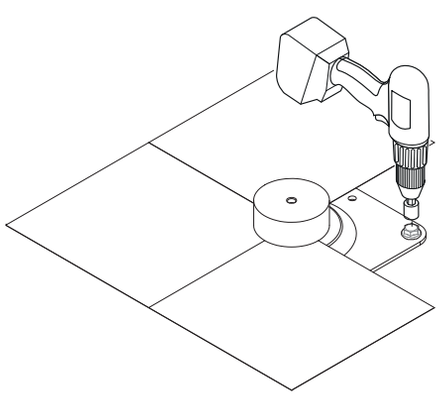


For the installation of the third-party product, the instructions in the respective manufacturer's manual must be observed and followed. Pay particular attention to the installation guidelines and recommendations regarding waterproofing and foil compatibility, which are also the responsibility of the third-party supplier.

For sample dimensions, you will find reference attachments at the end of the document.

1.B | **Mounting Variant B**





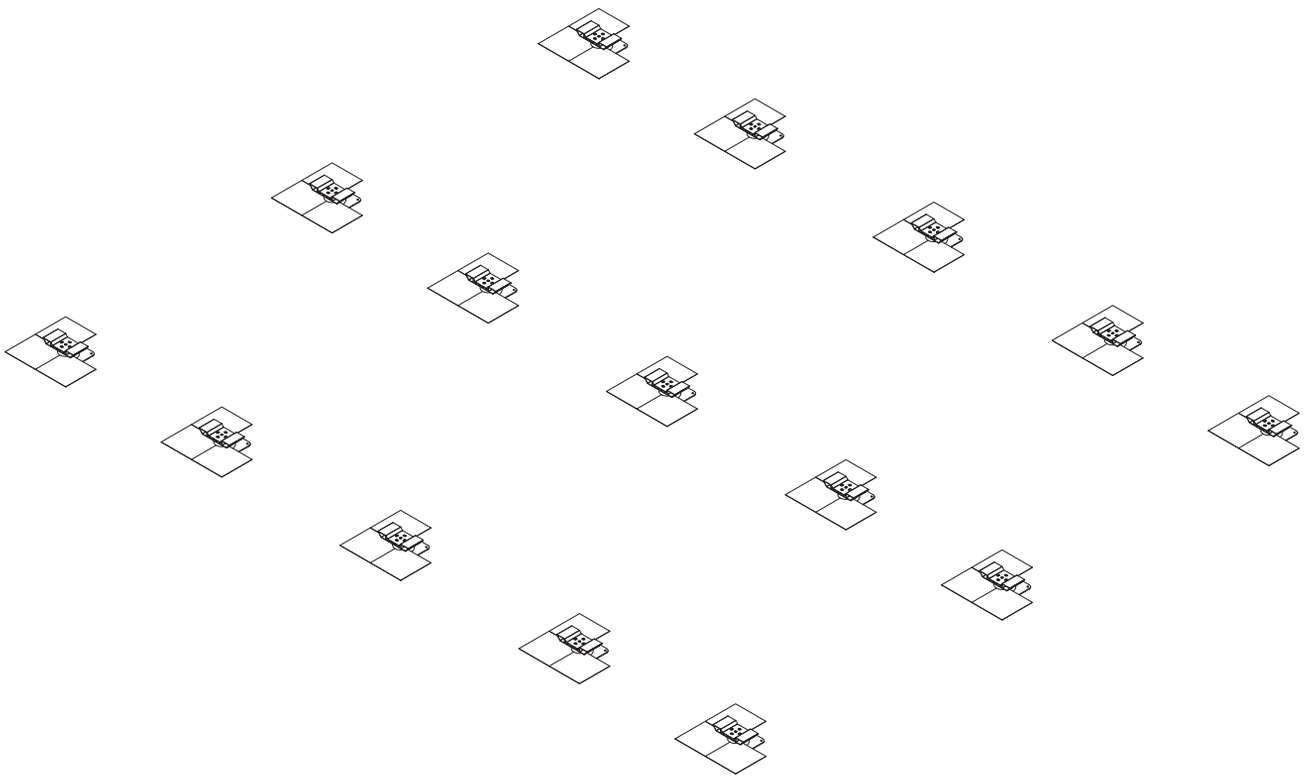
The spacing (R) is continuously repeated, except for the offset IFPs at the beginning and end (E).

For the installation of the third-party product, the instructions in the respective manufacturer's manual must be observed and followed. Pay particular attention to the installation guidelines and recommendations regarding waterproofing and foil compatibility, which are also the responsibility of the third-party supplier.

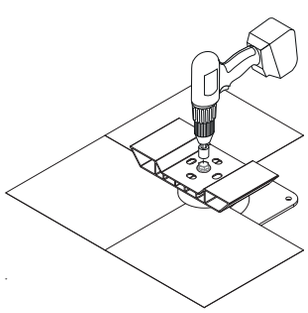
For sample dimensions, you will find reference attachments at the end of the document.

Since the dimensions (570 mm) depend on the foil surface of the third-party product, they may vary. Please check the local conditions accordingly.

2.A/B Mounting Variants A & B



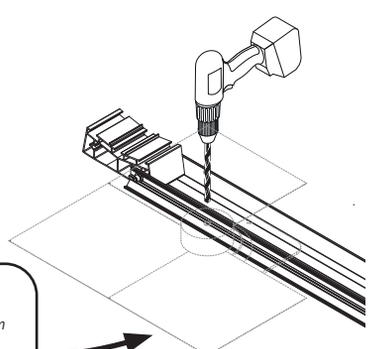
A.



Mounting Variant A:

Fastening is done using the IFP anchor bolt. Ensure that the M10 serrated lock bolt is tightened to 51 Nm.

B.

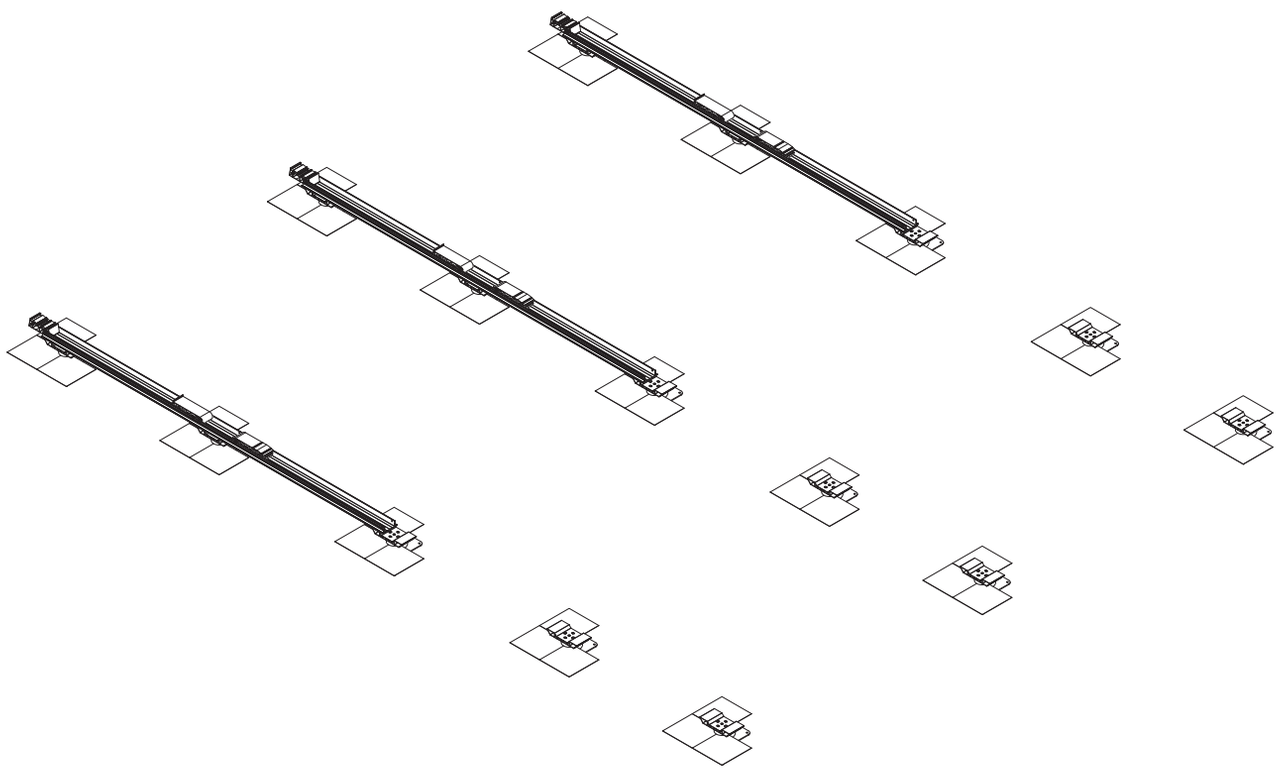


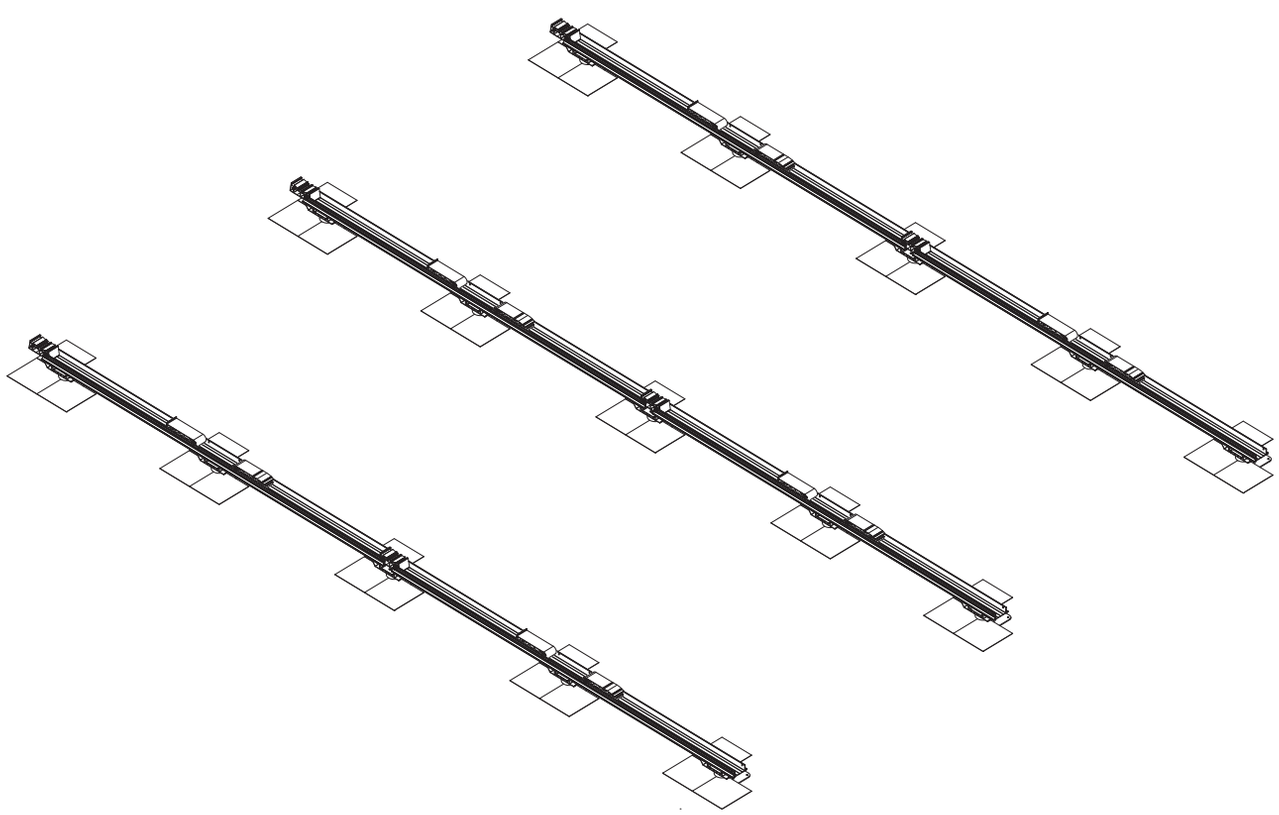
Displayed for Illustration Purposes.
Do not drill on the third-party product!

Mounting Variant B:

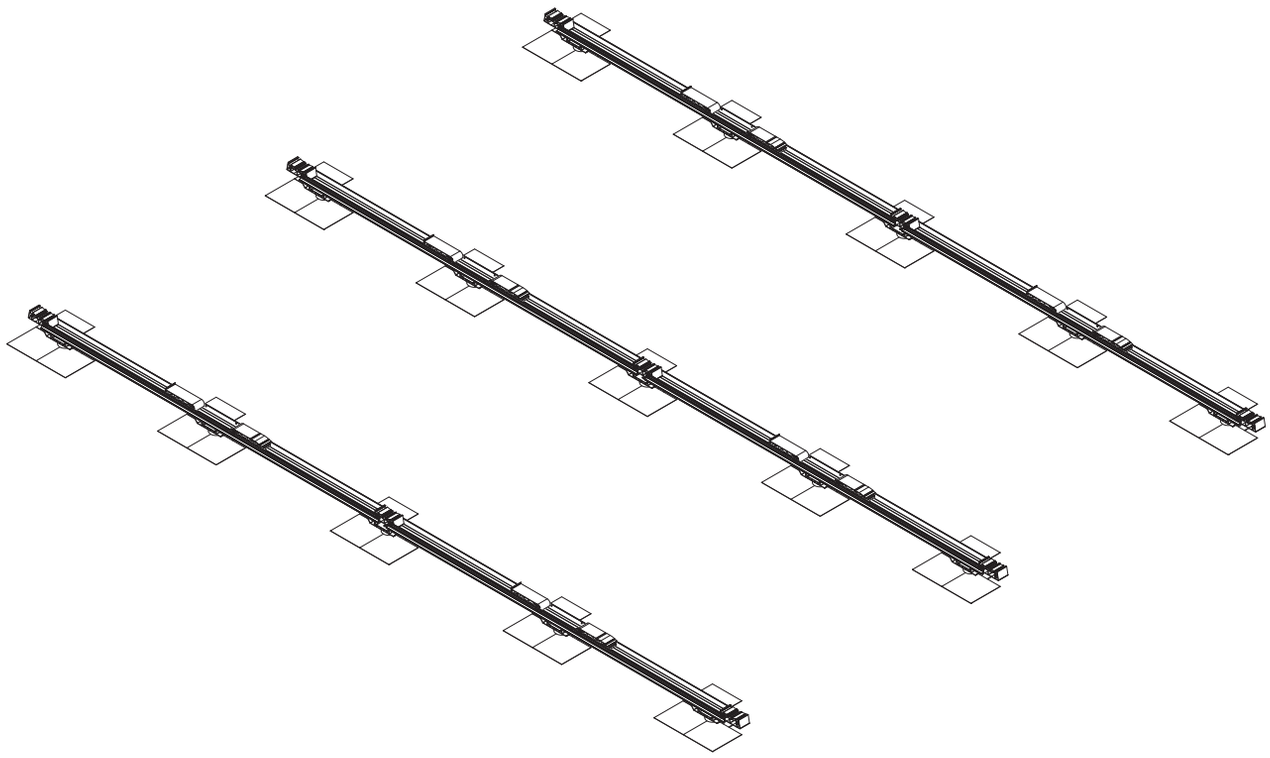
Fastening is done using a metric screw directly on the rail. Pre-drill in the center groove with a 10.4–11 mm drill bit. Ensure that the M10 screw is tightened to 51 Nm.

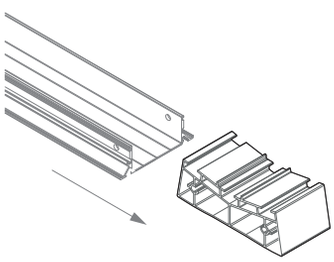
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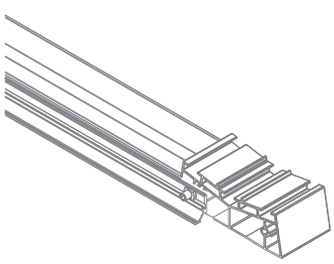


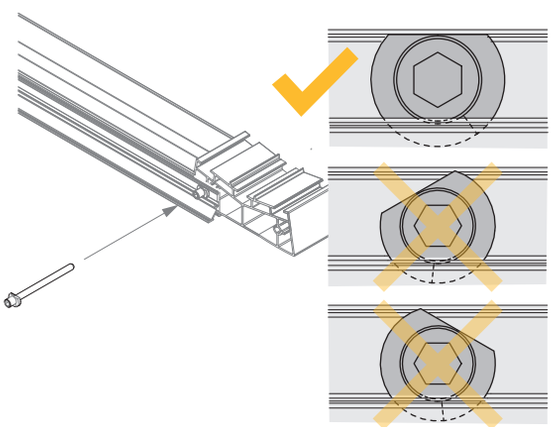


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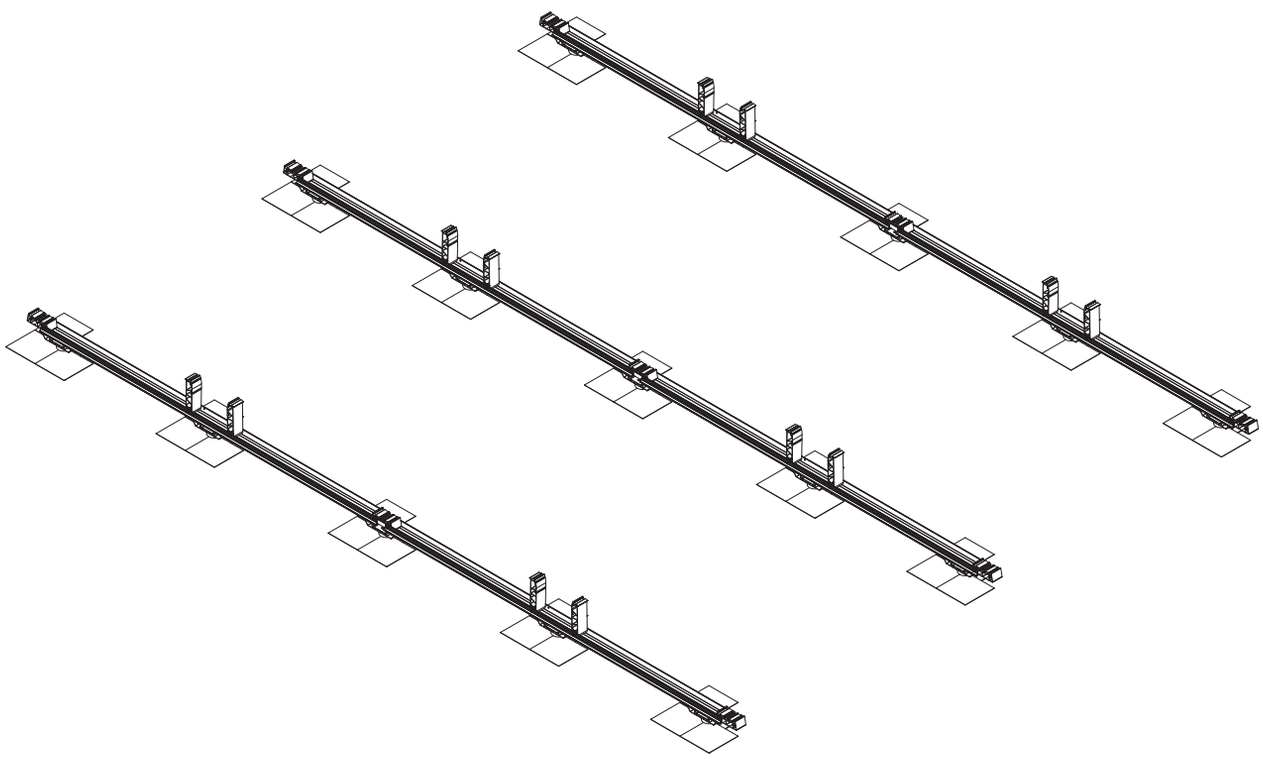


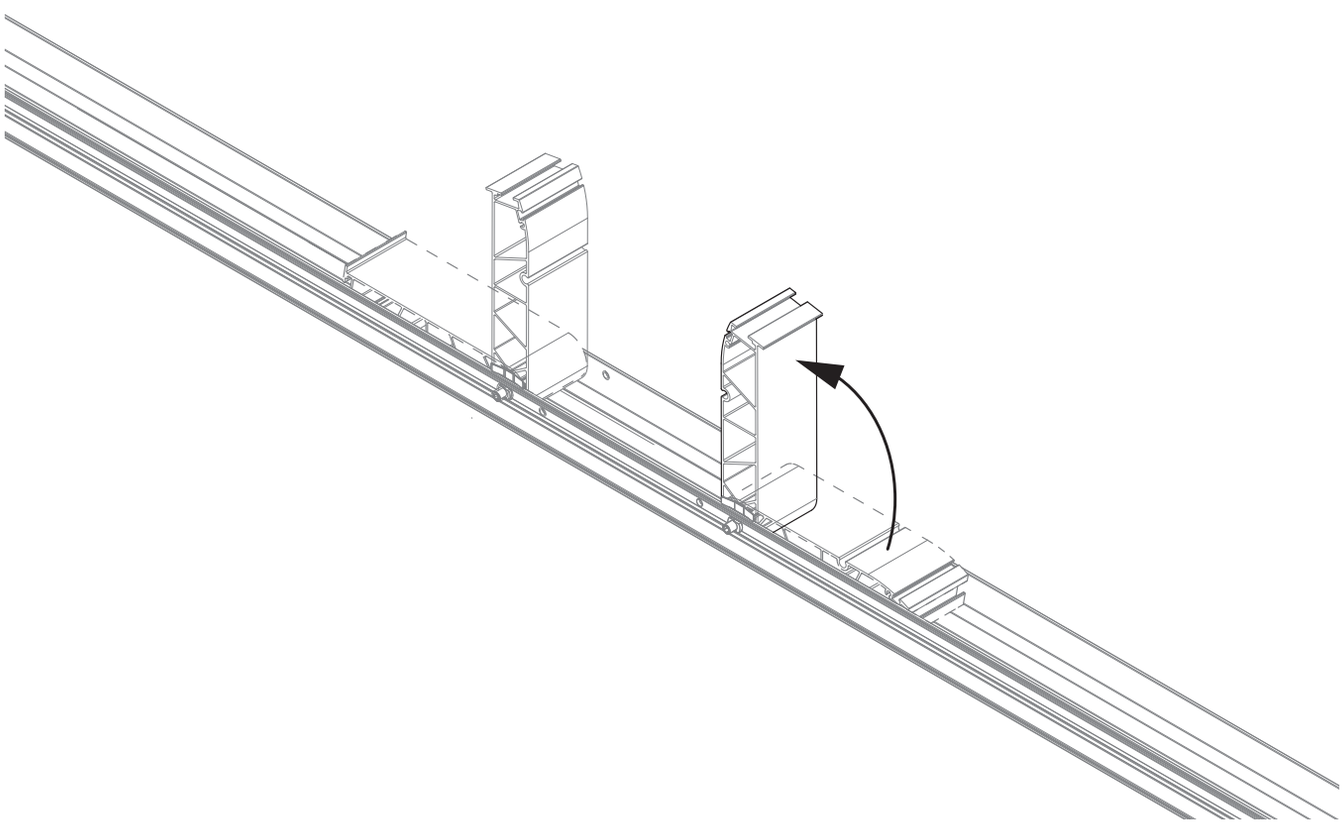




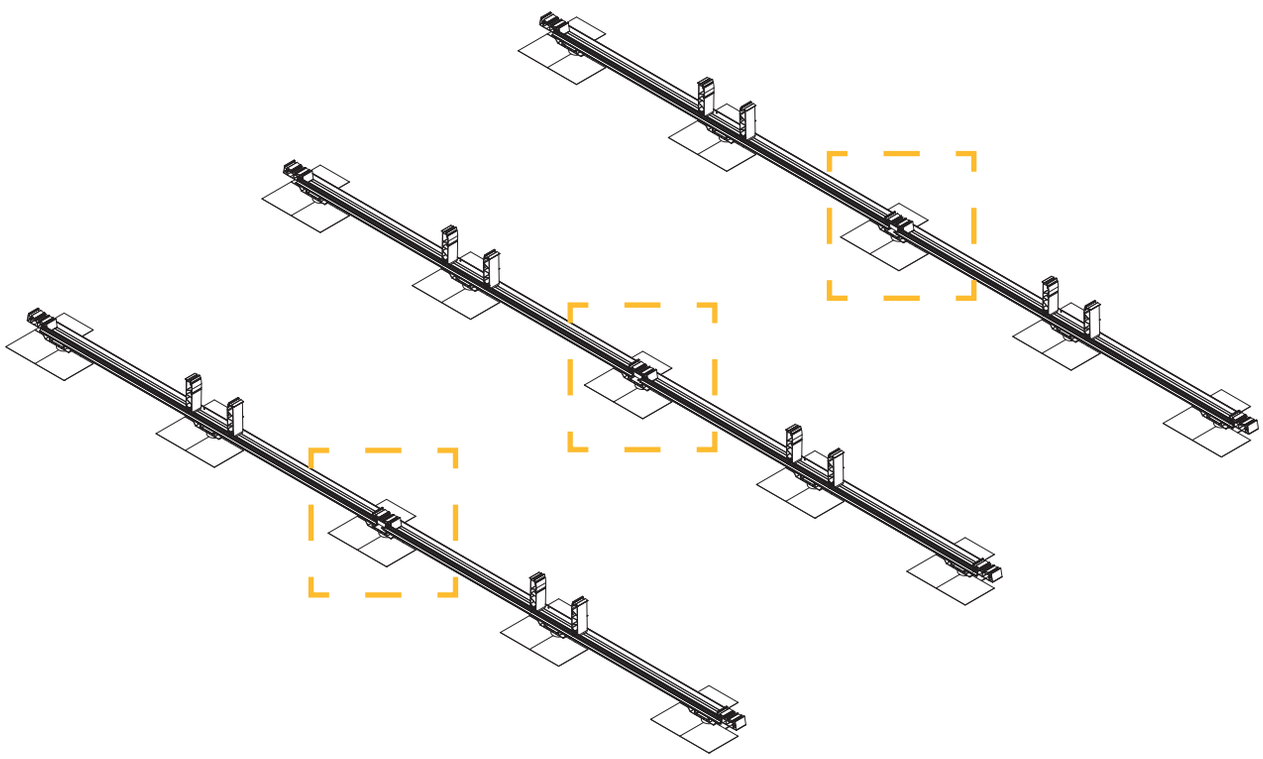


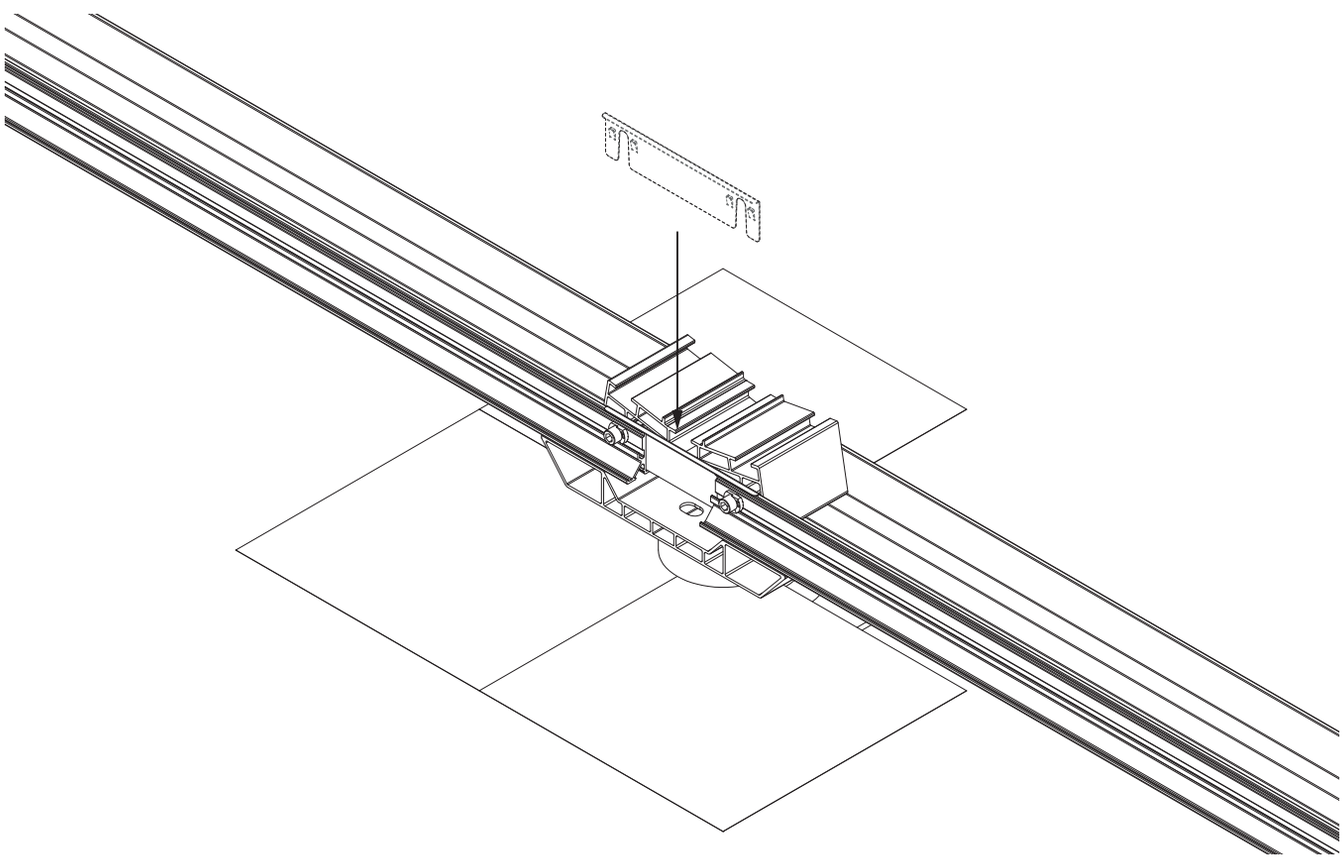
5.





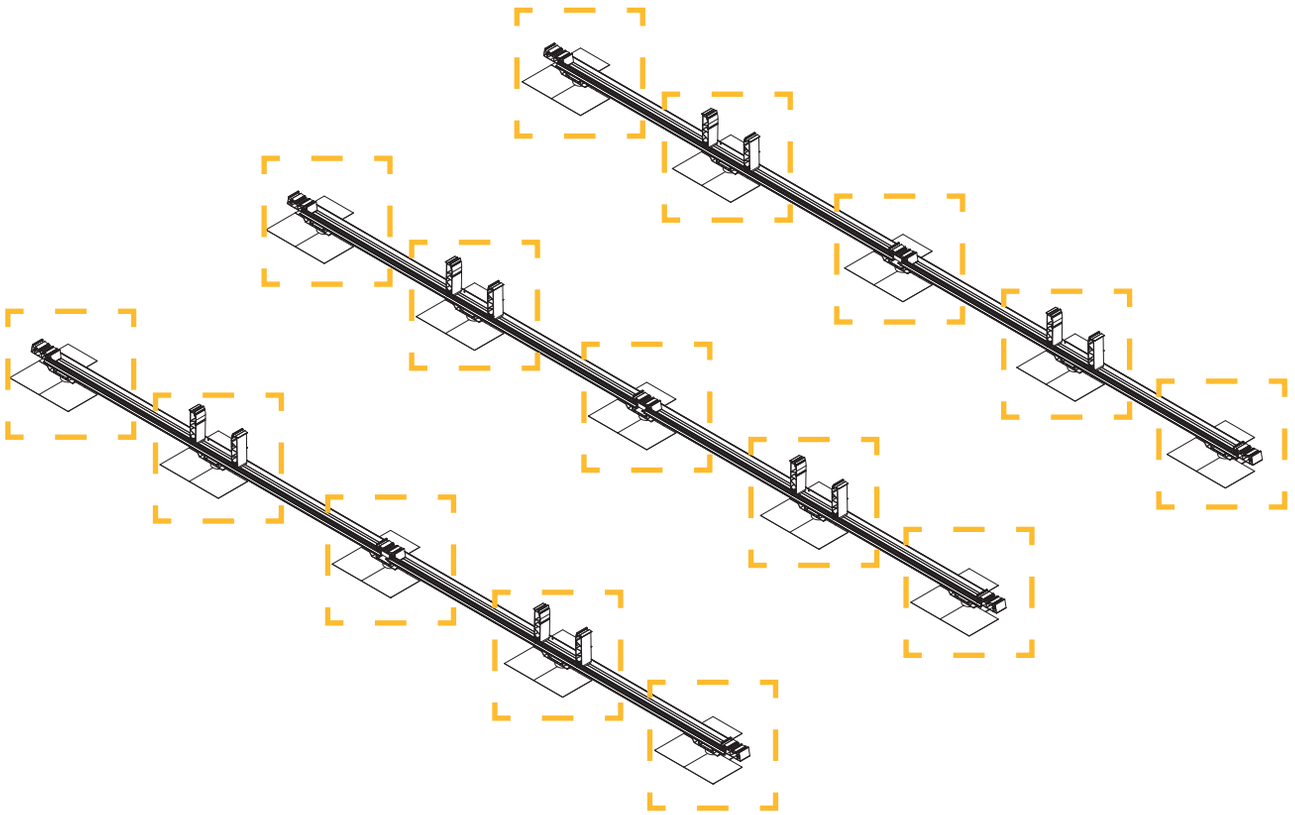
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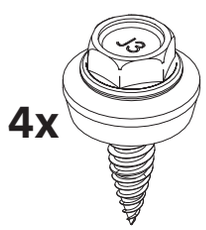


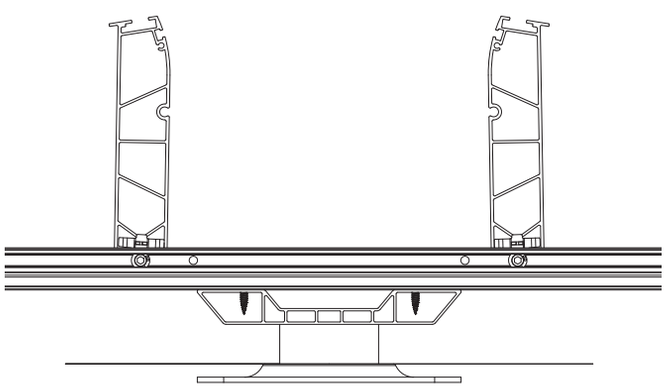


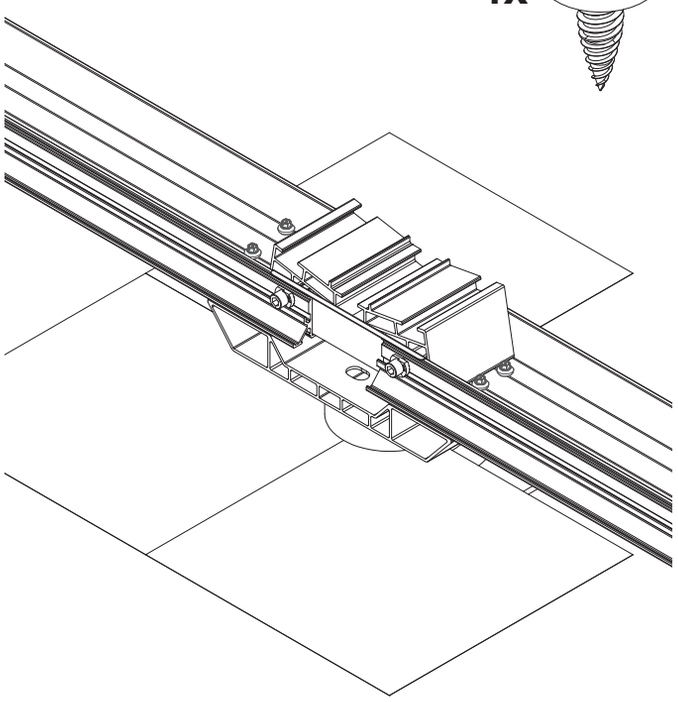
7.A

Mounting Variant A

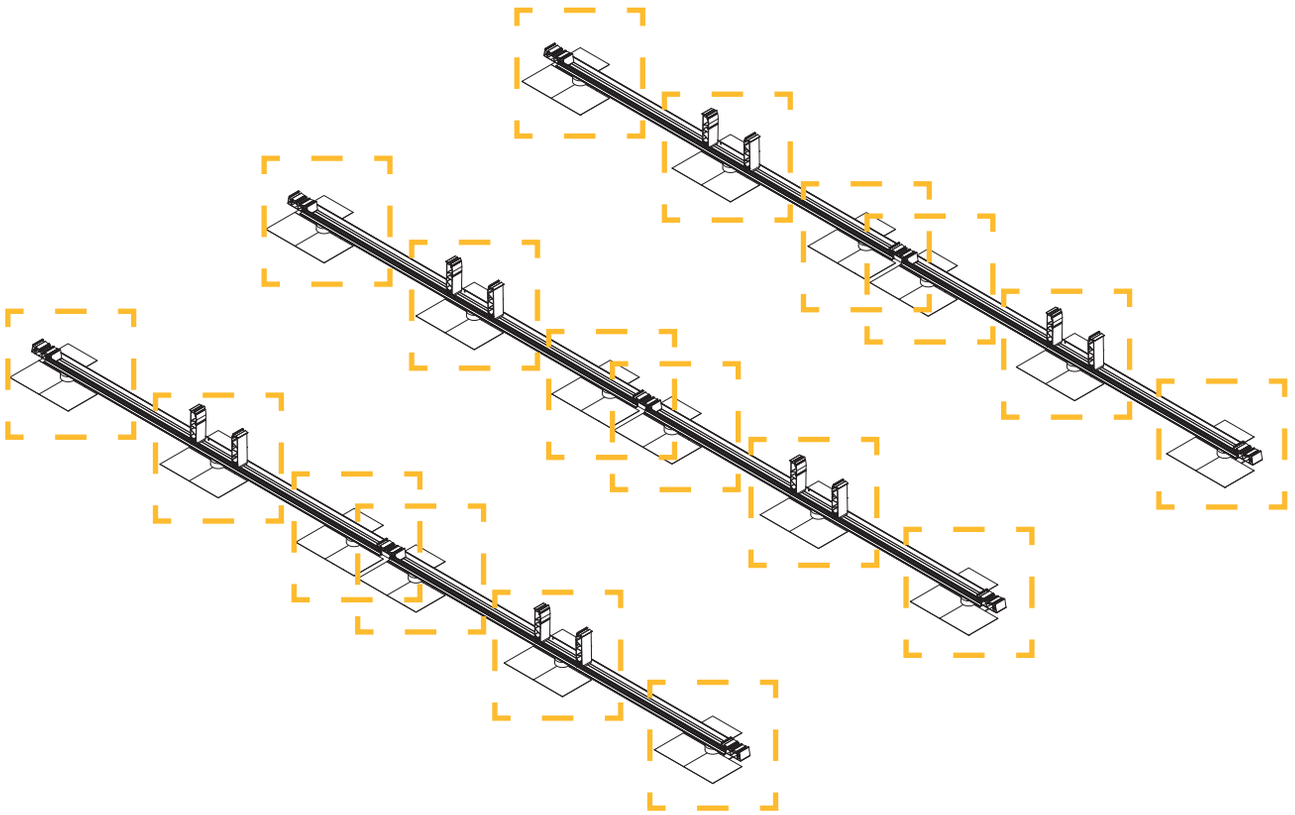


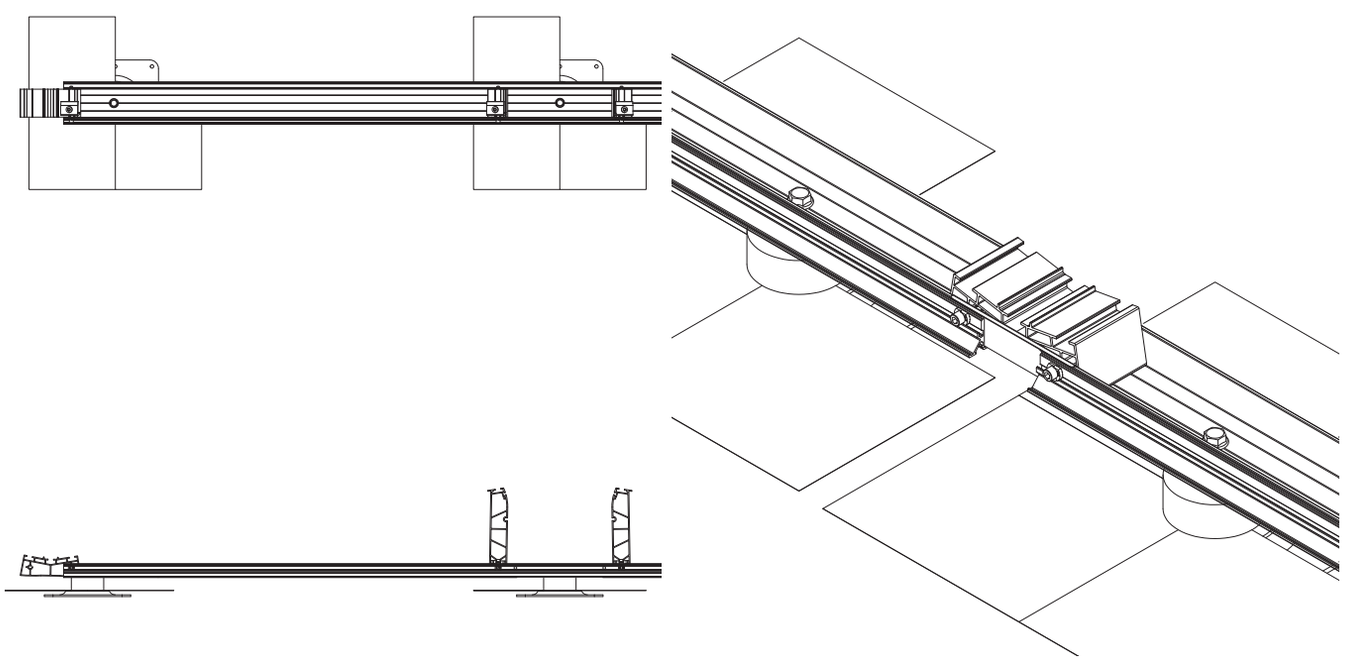




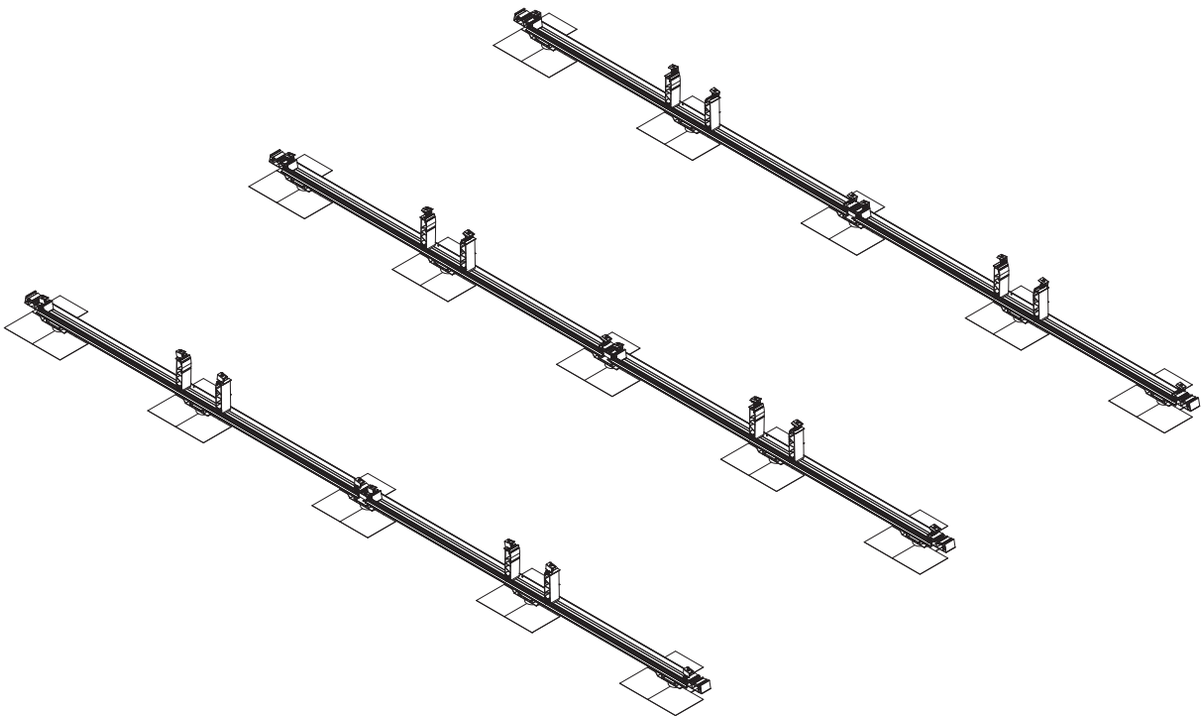


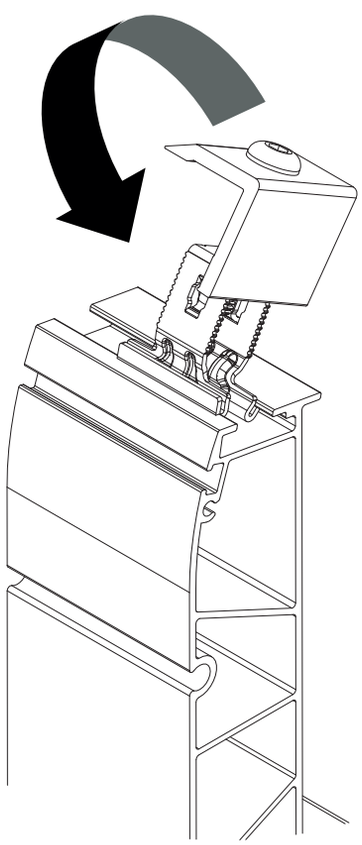
7.B Mounting Variant B



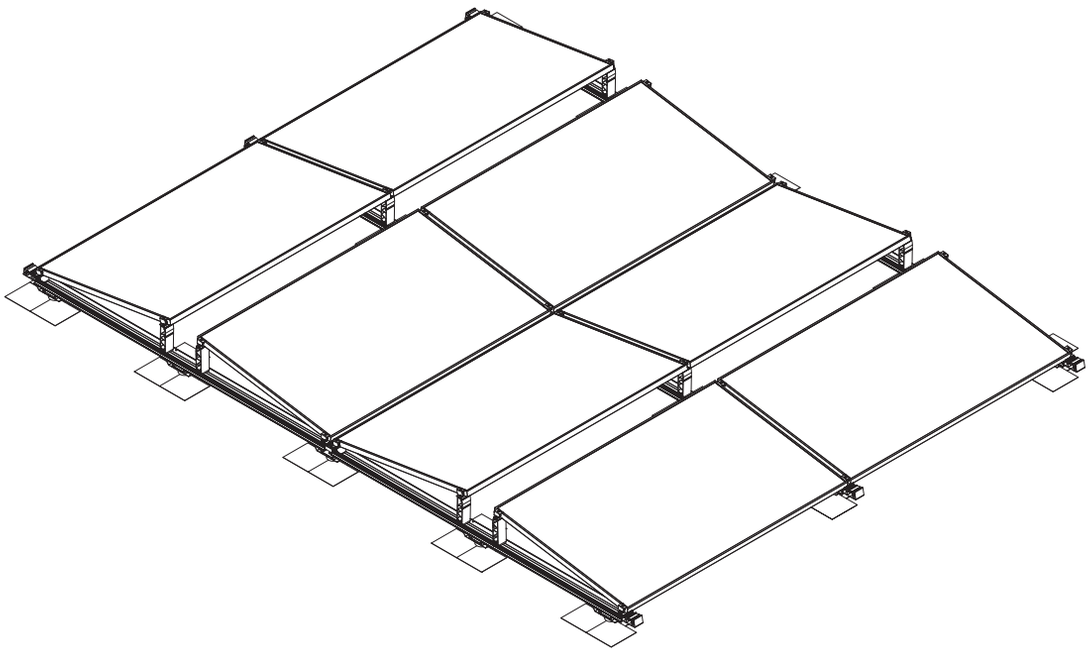


8.

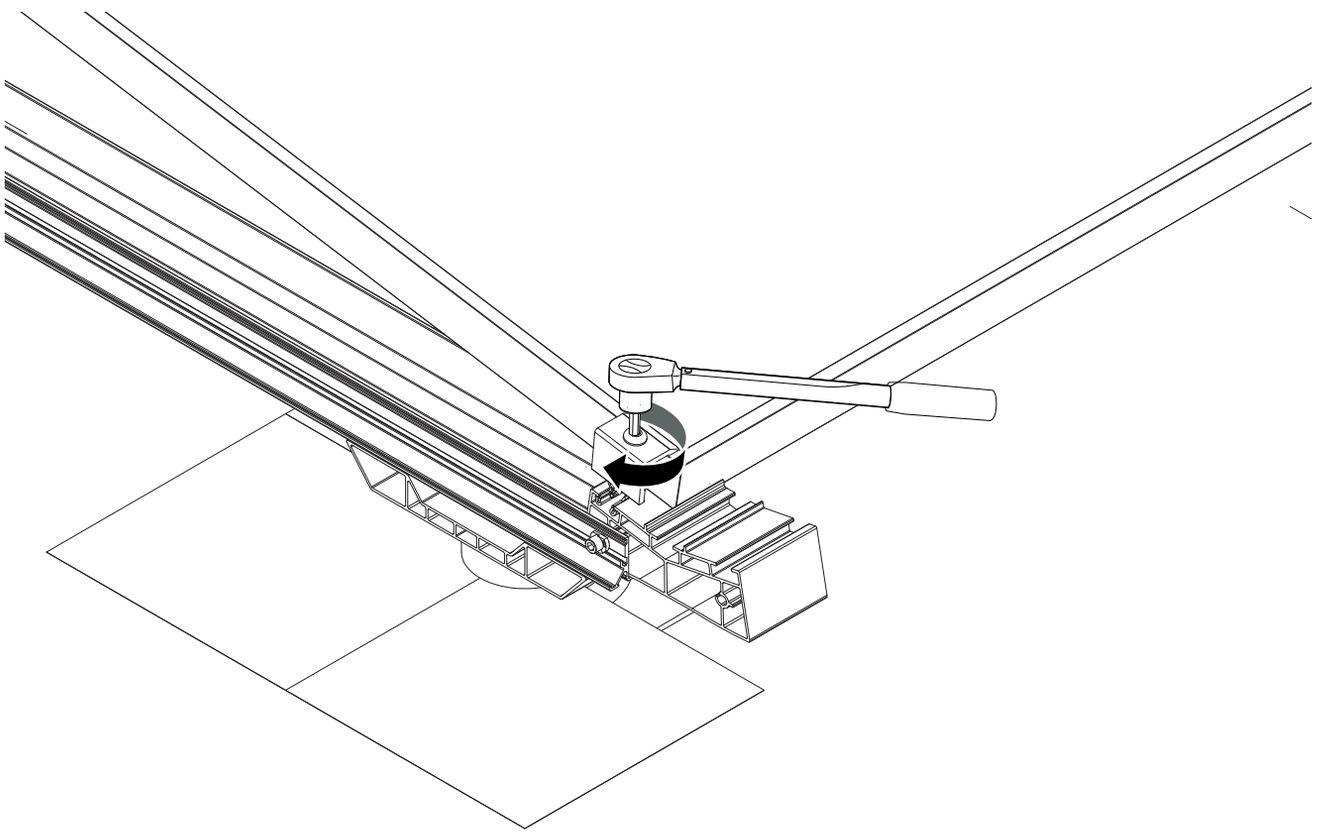




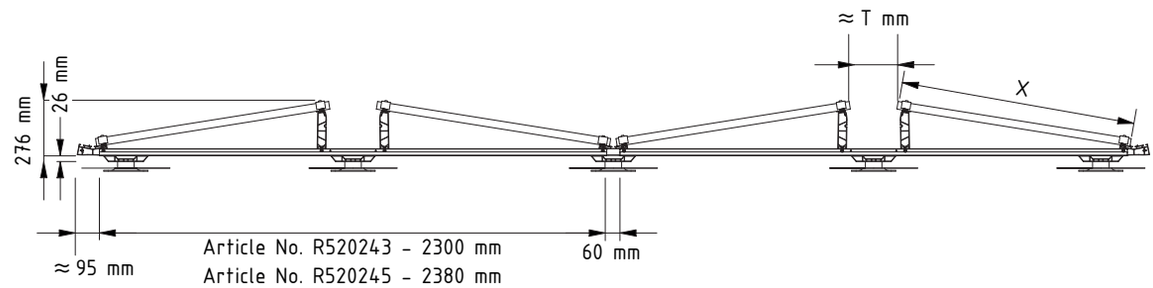
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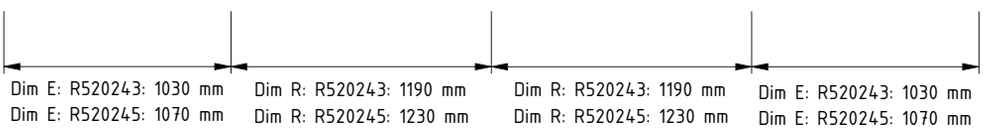


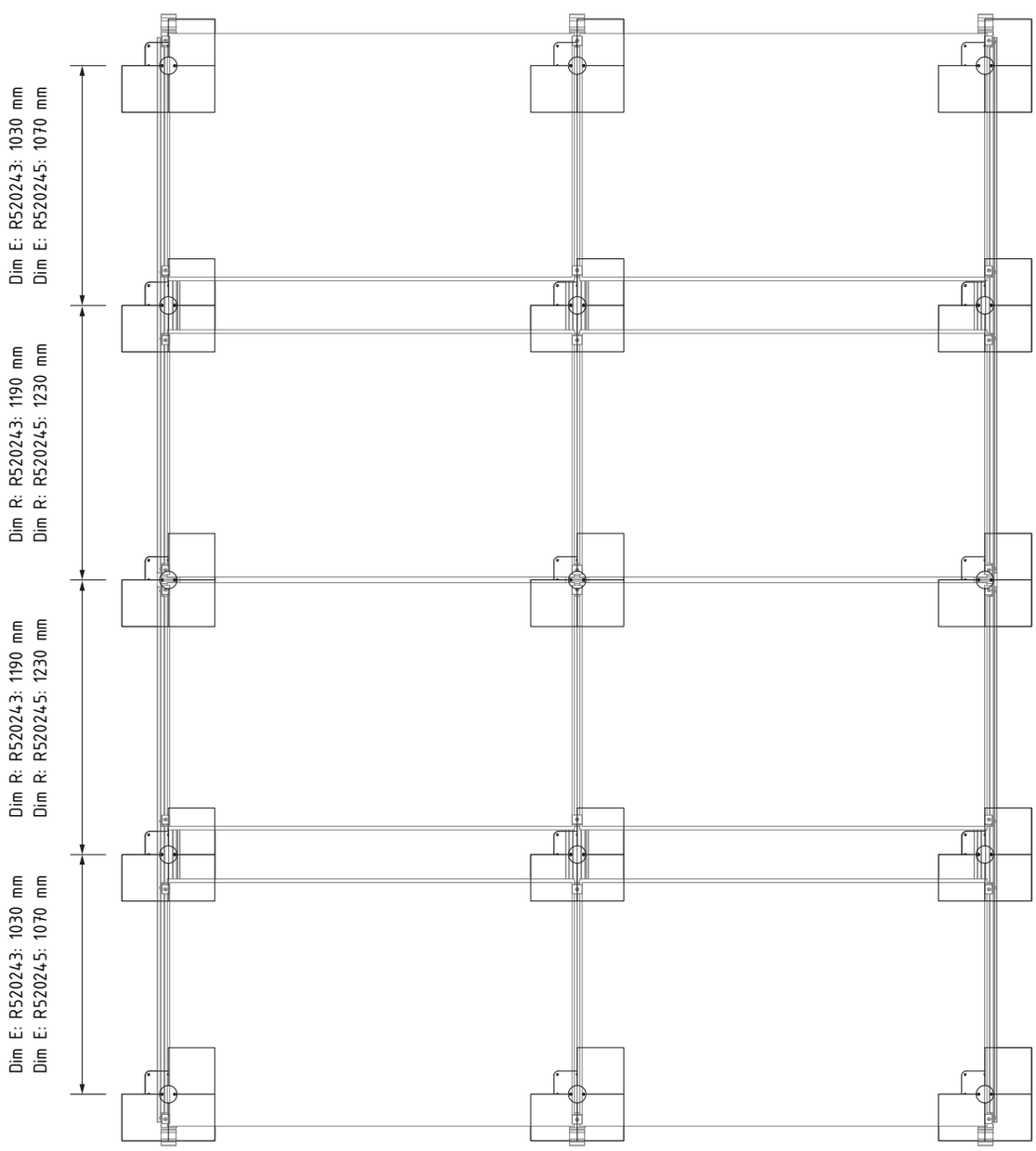
10 Nm

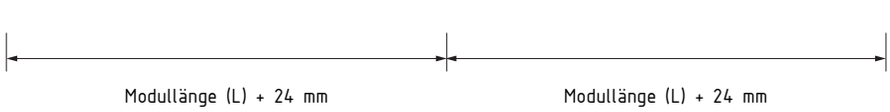


Mounting Variant A
Example of fastener positioning for a 2x4 field

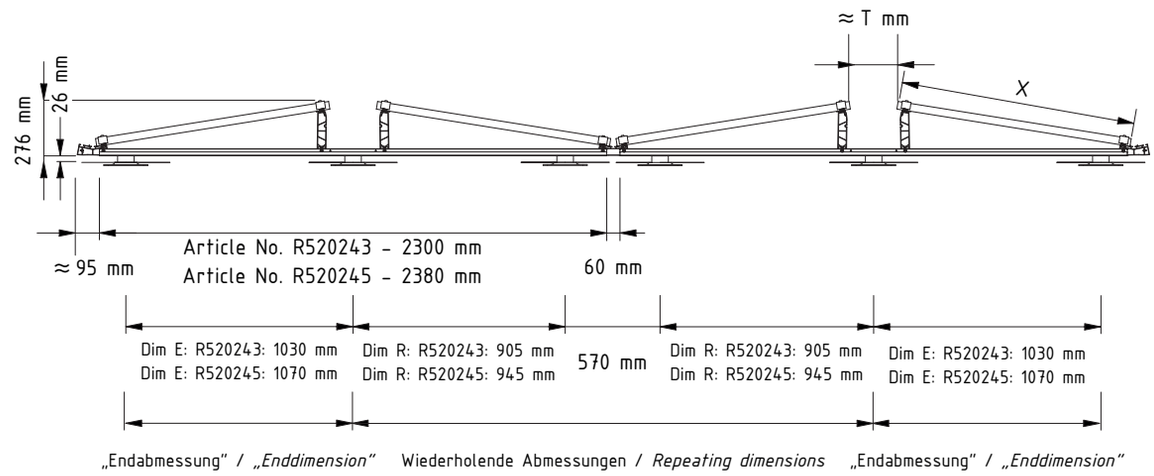


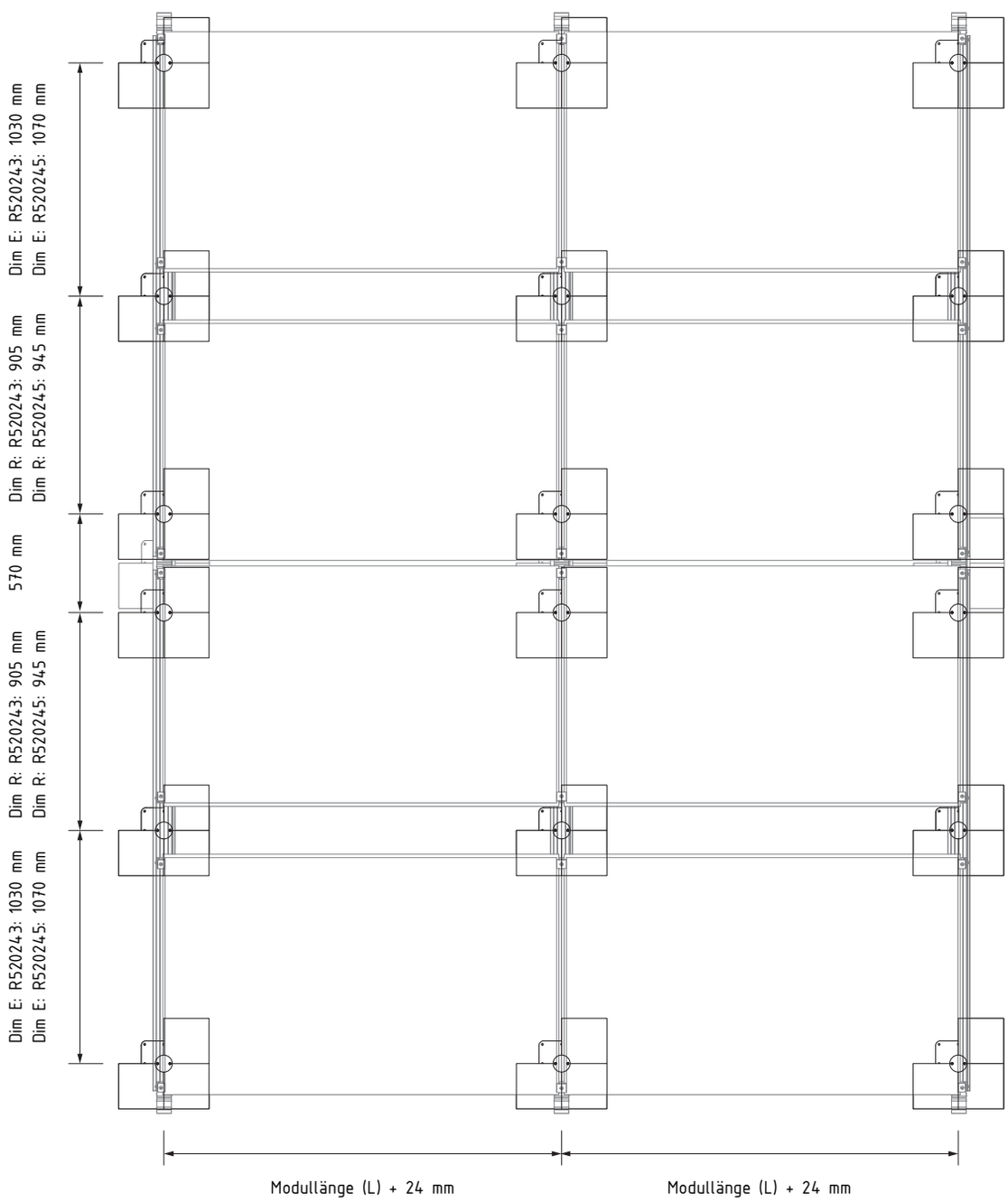






Mounting Variant B
Example of fastener positioning for a 2x4 field





Renusol Europe GmbH

www.pv-configurator.com

DE | Abbildungen und Texte entsprechen dem aktuellen technischen Stand bei Drucklegung, Änderungen vorbehalten.

GB | The images and texts in these instructions relate to the latest technology at the time of printing, subject to modifications.

FR | Les illustrations et textes sont conformes à l'état de la technique au moment de mise sous presse. Sous toutes réserves de modifications.

IT | Figure e testi corrispondono allo stato più attuale della tecnica al momento dell'ordine di stampa. Con riserva di modifiche.

ES | Las imágenes y los textos se corresponden al estado actual de la técnica en el momento de la impresión, reservado el derecho a las modificaciones.

NL | Afbeeldingen en teksten voldoen aan de actuele stand van de techniek op het moment van ter perse gaan. Wijzigingen voorbehouden.

DK | Afbildninger og tekster overholder den tekniske stand ved trykningen, der tages forbehold for ændringer.

SE | Bilder och texter motsvarar den nuvarande tekniska tillstånd vid tidpunkten för tryckning, med förbehåll för ändringar.

CZ | Vyobrazení a texty odpovídají aktuálnímu technickému stavu při odevzdání do tisku. Změny vyhrazeny.

PL | Ilustracje i teksty odpowiadają stanowi techniki aktualnemu w chwili oddania instrukcji do druku. Zastrzega się prawo do zmian.

LT | Spausdinami paveikslėliai ir tekstas atitinka naujausią technikos lygį. Pasiliekame teisę į pakeitimus.

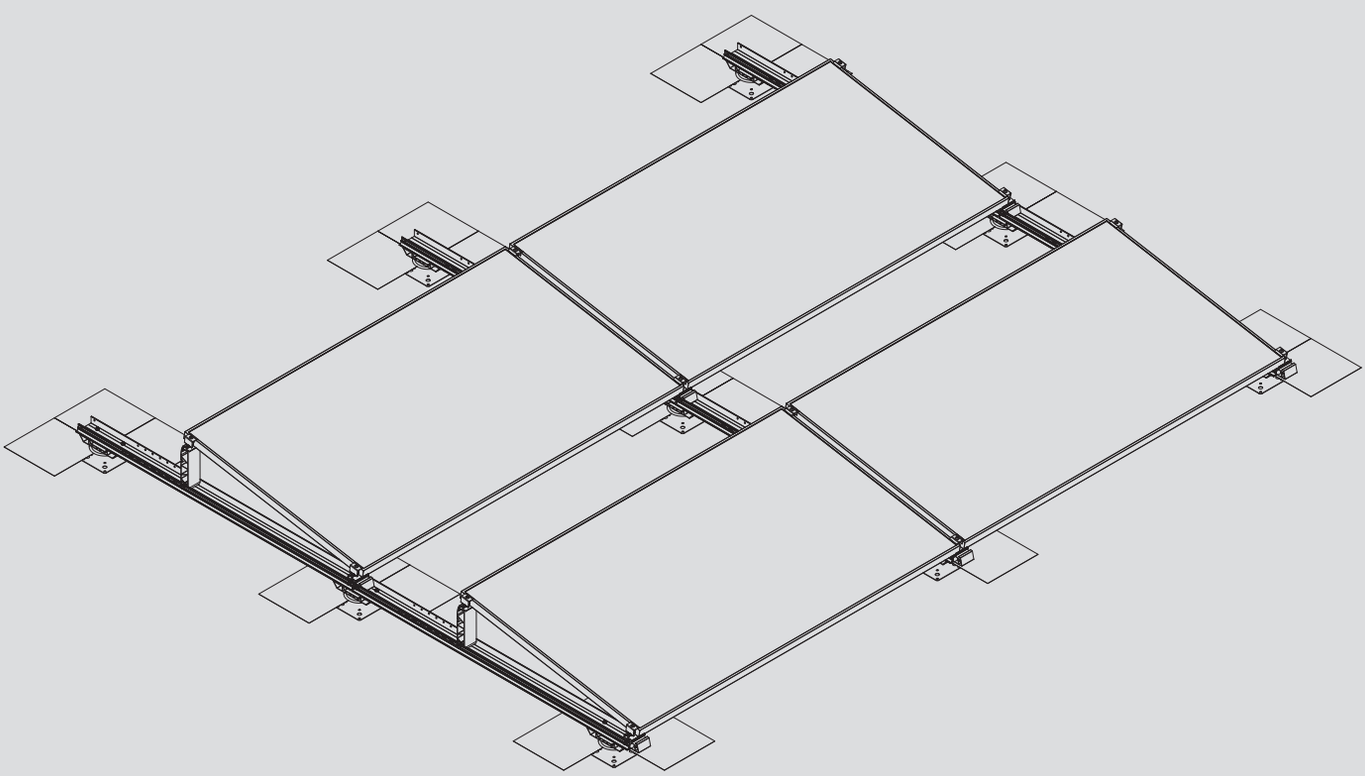
HU | Az ábrák és a szövegek a nyomtatás időpontjában rendelkezésünkre álló legfrissebb műszaki ismereteknek felelnek meg; a módosítások jogát fenntartjuk.

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51063 Köln
Deutschland
Telefon: +49 221 788707-0
E-Mail: info@renusol.com
www.renusol.com

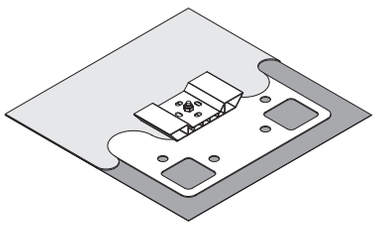
Renusol Europe GmbH

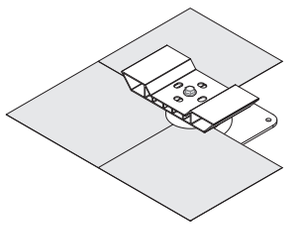
Renusol FS Pro 10-S IFP

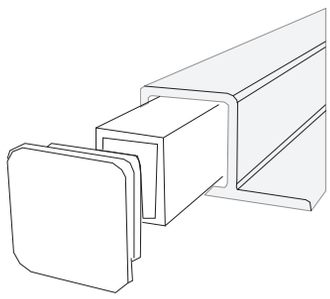
EN | Installation Guide

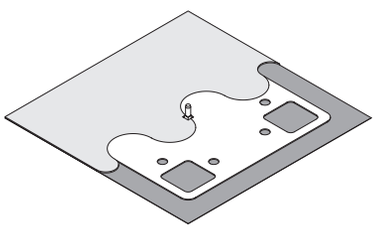


Preface to the Installation with Fixed Elements









EN | Usage

Mounting system for the installation of framed PV modules on flat roofs with a roof inclination of up to 5°-10° with roof penetration.

Before installation

The Renusol FS Pro is screwed with third-party products (Nicholson Rooftrack, Solmont, Ejot-Ejotbar, etc.) to withstand wind loads. The required fastening depends on the underlying roof structure and must be determined in consultation with the third-party provider. Check with the Renusol PV Configurator whether installation variant A is statically suitable, considering regional conditions. Depending on the third-party product used, the type of connection to the Renusol substructure may differ.

In the Renusol FS Pro 10-S IFP mounting system, the module is attached at the corner area of the short module side. It must be checked on-site whether the clamping area specified by the module manufacturer is maintained and whether the permissible module loads are not exceeded.

Drainage holes in the PV module frame must be kept clear and must not be covered by the mounting system. The roof surface must be free of snow, ice, and dirt for installation. Observe the applicable regulations, state-of-the-art technology, and current occupational safety guidelines during installation.

A suitable substructure that can absorb the occurring forces (weight load, wind, and snow load) is always a prerequisite for proper use. The roof covering must be suitable for screwing and subsequent bonding or welding.

EN | Wind Report

The suction and pressure coefficients have been determined in wind tunnel tests.

Applicable Documents

"General Installation, Maintenance, and Assembly Instructions," "Warranty Conditions and Disclaimer."

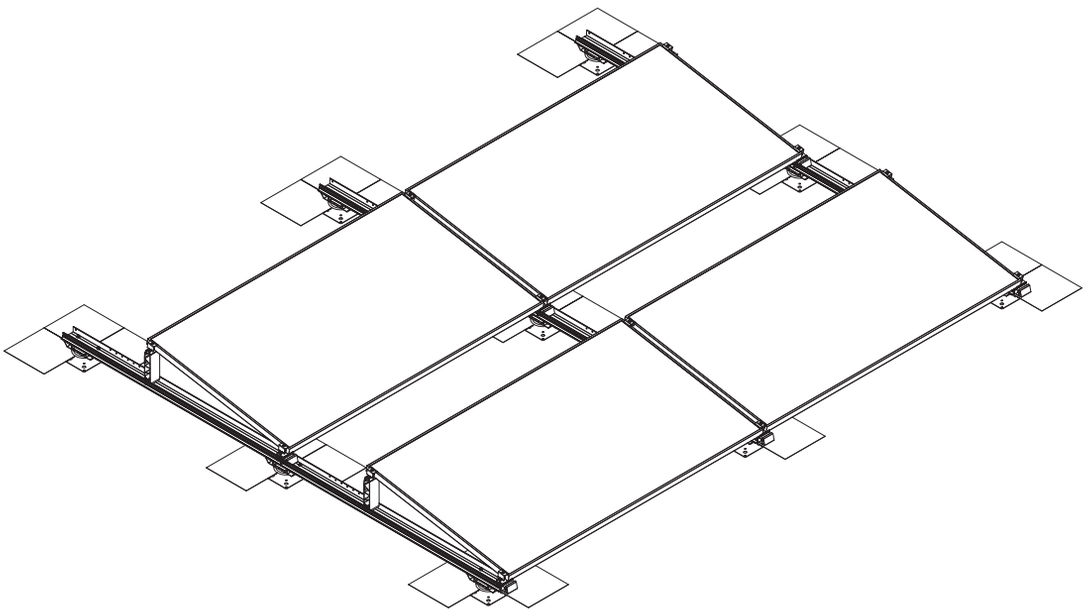
These documents are available at www.renusol.com.

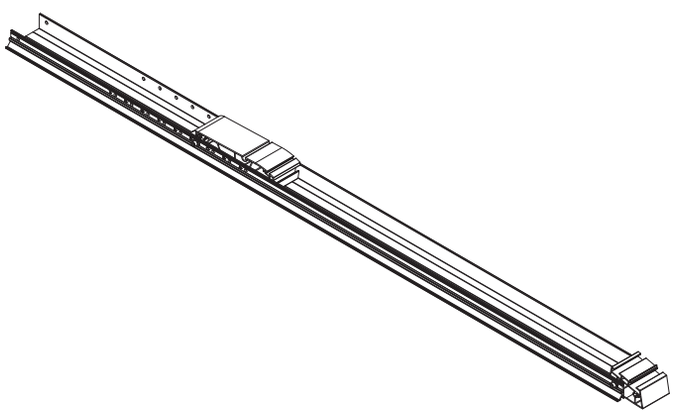
Warranty and Guarantee

Renusol's warranty applies only when using the original Renusol FS Pro complete system in compliance with the warranty conditions. For statutory defect liability/warranty, please refer to Renusol's General Terms and Conditions.

www.renusol.com

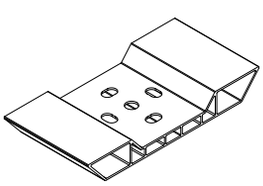
Renusol FS Pro 10-S-IFP Bill of Materials



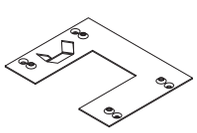


R520240
FS Pro 10-S Base rail 1500 (Set) IFP

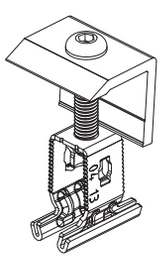
R500264
FS Pro IFP Mounting Bracket



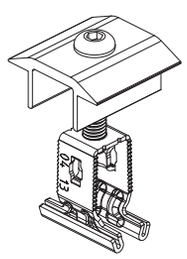
R900268 (optional)
P-Clip Potential equalization



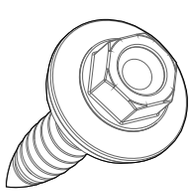
R420081 / R420081-B
End clamp+
End clamp+ (black)



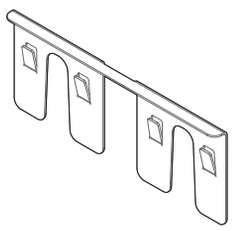
R420082 / R420082-B
Middle clamp+
Middle clamp+ (black)



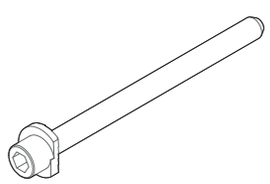
R400301
Self drilling screw 5,5 x 25 SW8
E16



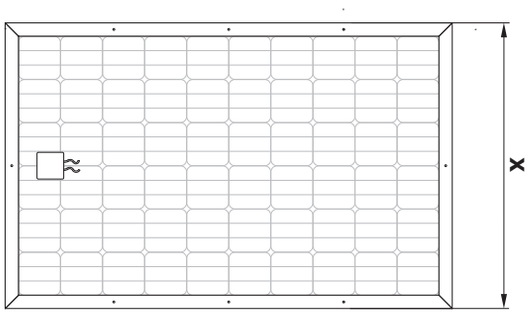
R500260
FS Pro Potential equalisation clip S



R500227
FS Pro Securing bolt



Preface

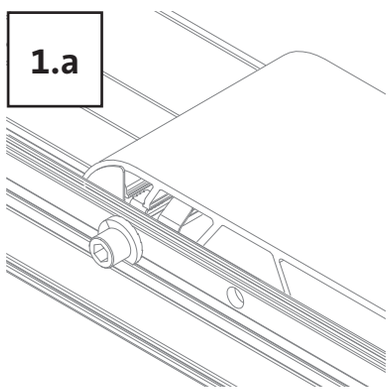


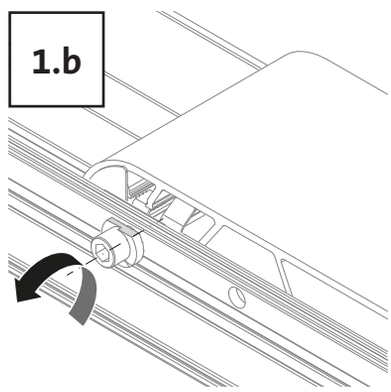
EN | Usage

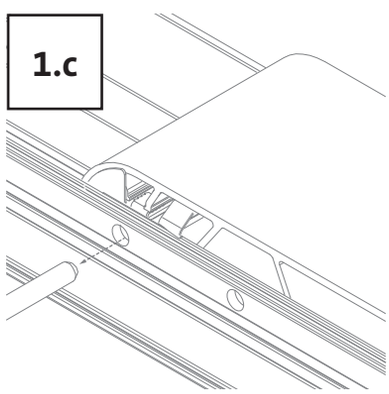
The ridge support is pre-assembled for modules with a width between 1110-1150 mm.

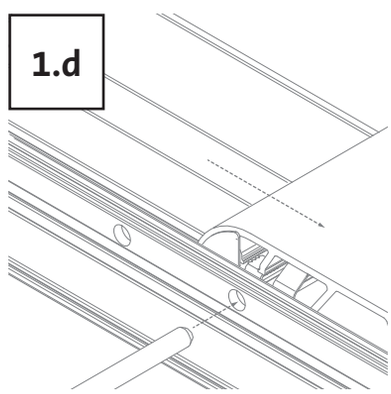
If your module dimensions differ, please reposition the ridge support as shown in Step 1 a-d.

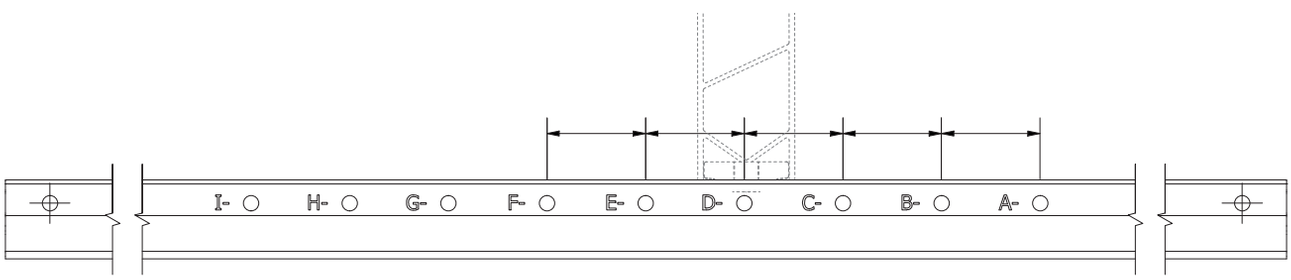
The support must be repositioned in a horizontal position.





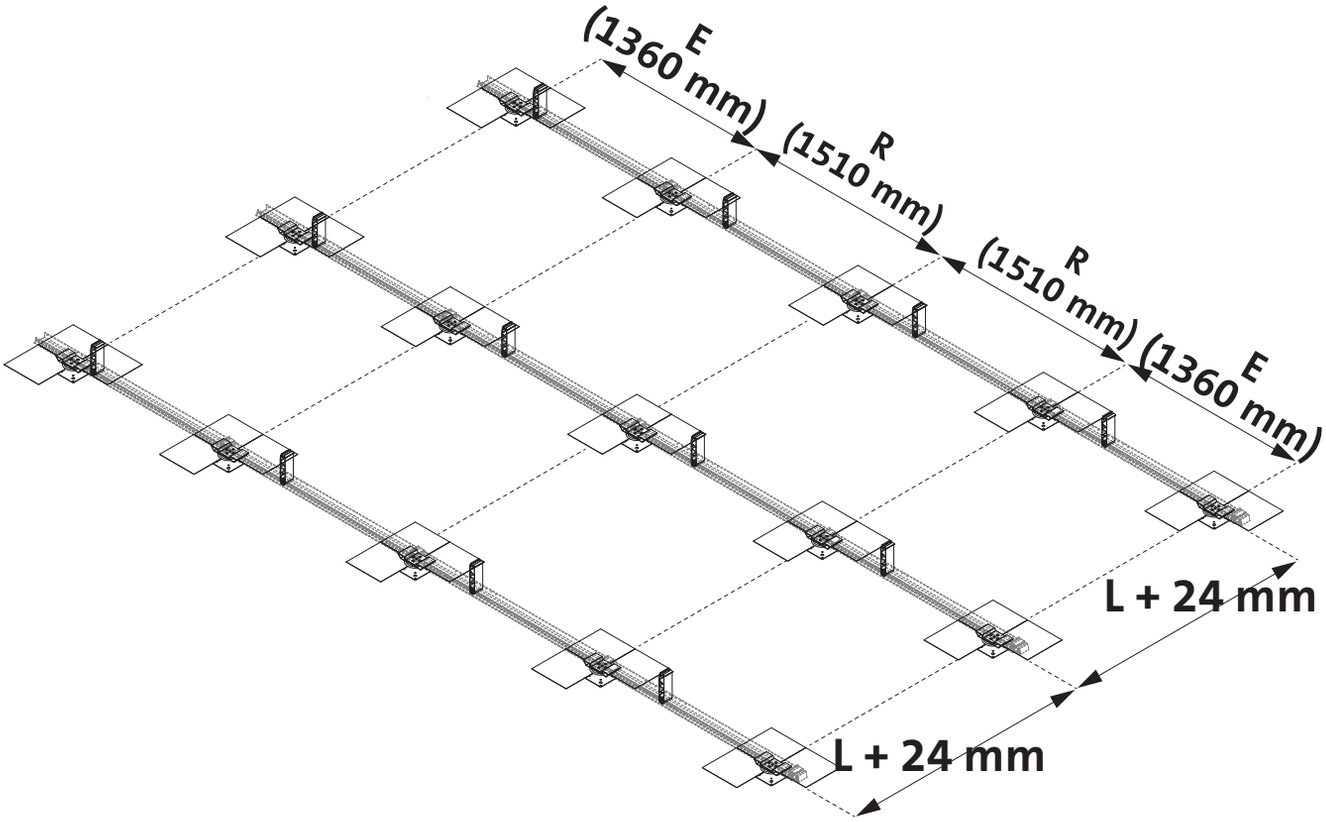


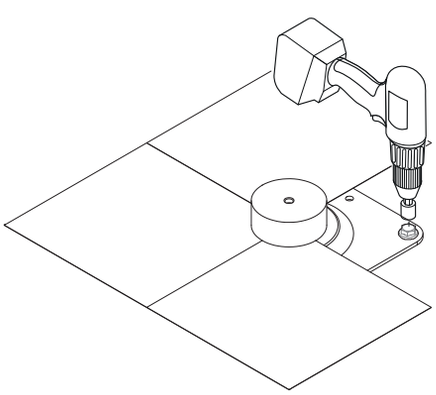


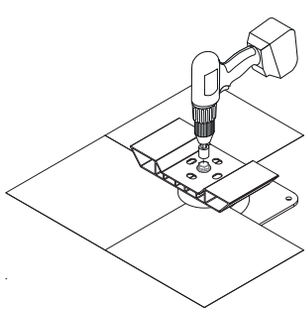


Module Width	Ridge Support
990-1030 mm	*A*
1030-1070 mm	*B*
1070-1110 mm	*C*
1110-1150 mm	*D*
1150-1190 mm	*E*
1190-1230 mm	*F*

1.B | **Installation Variant A**





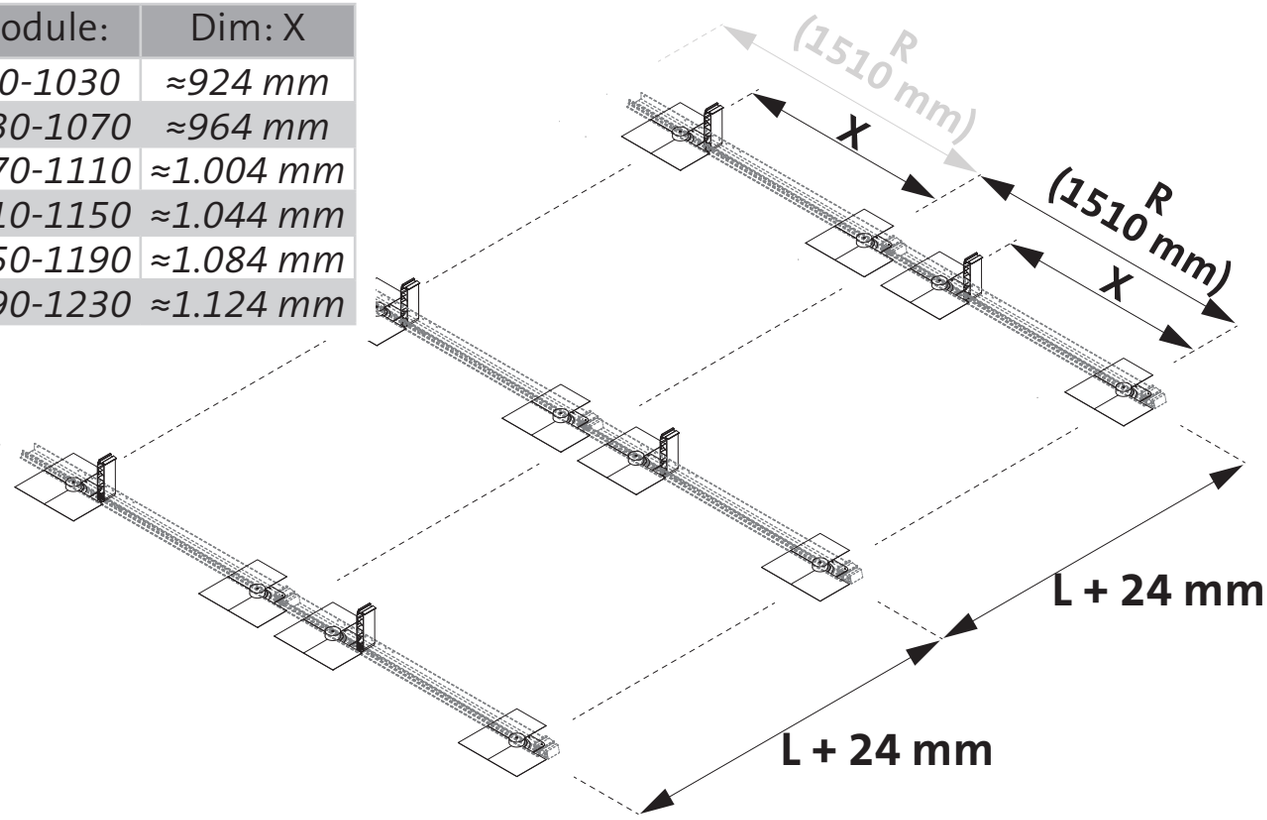


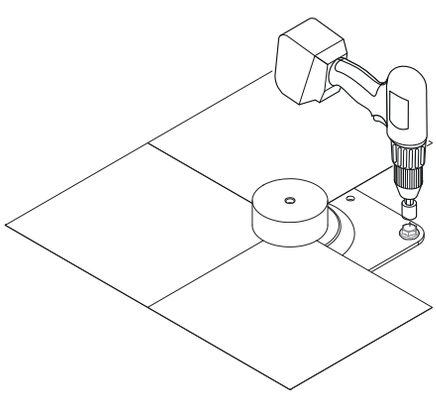
The distance (R) is continuously repeated except for the recessed IFPs at the end (E).

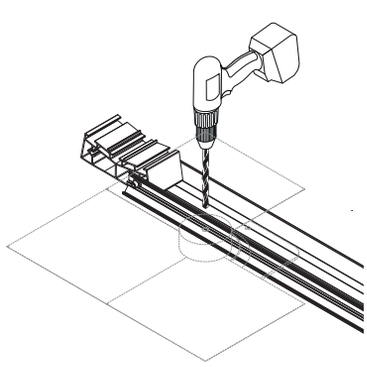
For the installation of the third-party product, the instructions in the respective manufacturer's manual must be followed and complied with. Pay particular attention to the installation instructions and recommendations regarding waterproofing and foil compatibility, which are also the responsibility of the third-party provider.

1.B | **Installation Variant B**

Module:	Dim: X
990-1030	*≈924 mm*
1030-1070	*≈964 mm*
1070-1110	*≈1.004 mm*
1110-1150	*≈1.044 mm*
1150-1190	*≈1.084 mm*
1190-1230	*≈1.124 mm*





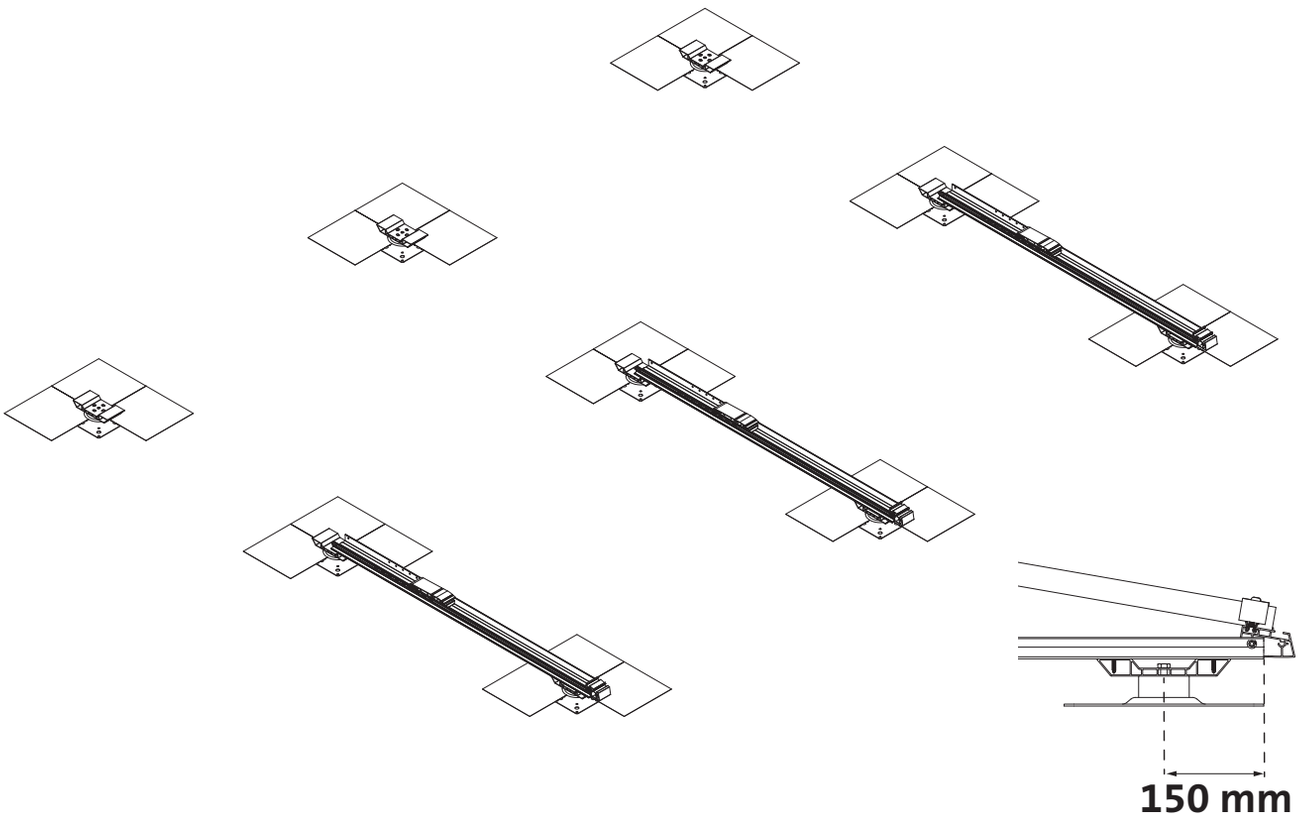


The row spacing (R) is continuously repeated. The dimension X depends on the module width and the associated position of the ridge support.

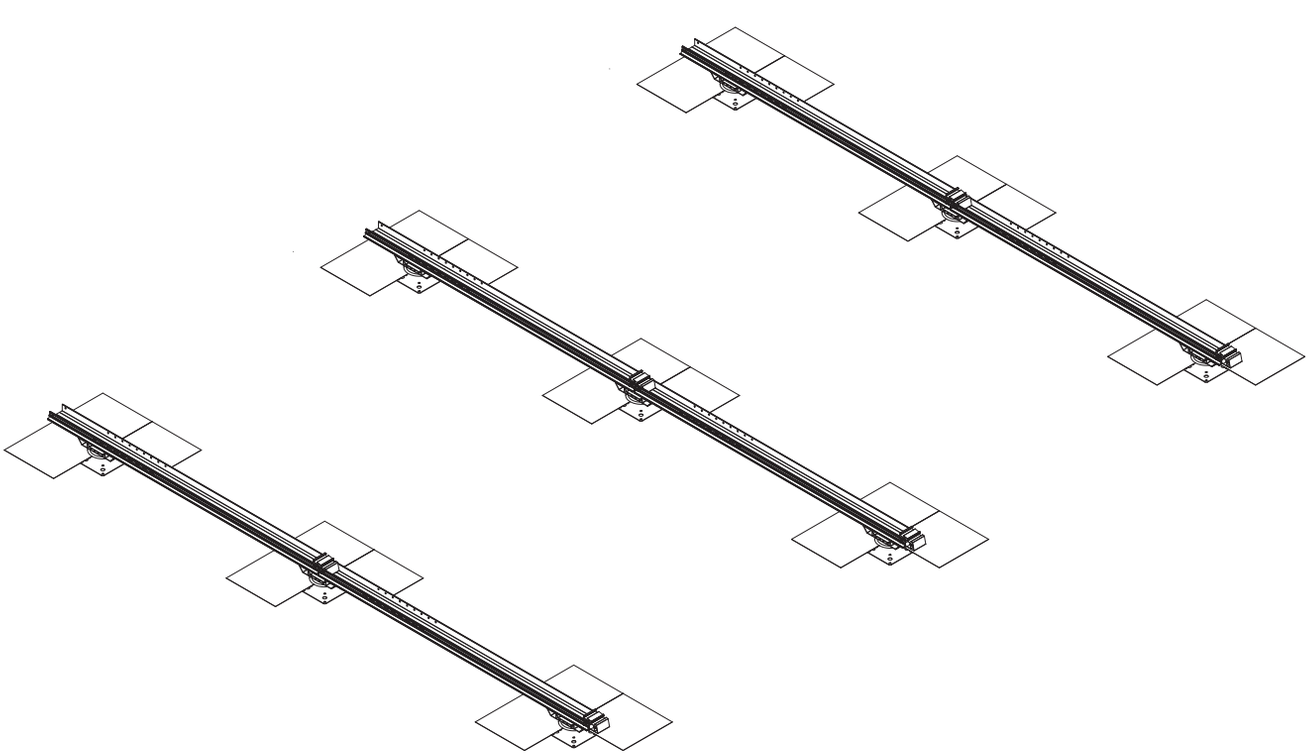
For the installation of the third-party product, the instructions in the respective manufacturer's manual must be followed and complied with. Pay particular attention to the installation instructions and recommendations regarding waterproofing and foil compatibility, which are also the responsibility of the third-party provider.

Fastening is done using a metric screw directly on the rail. Pre-drill in the center groove with a 10.4–11 mm drill bit. Ensure that the M10 screw is tightened to 51 Nm.

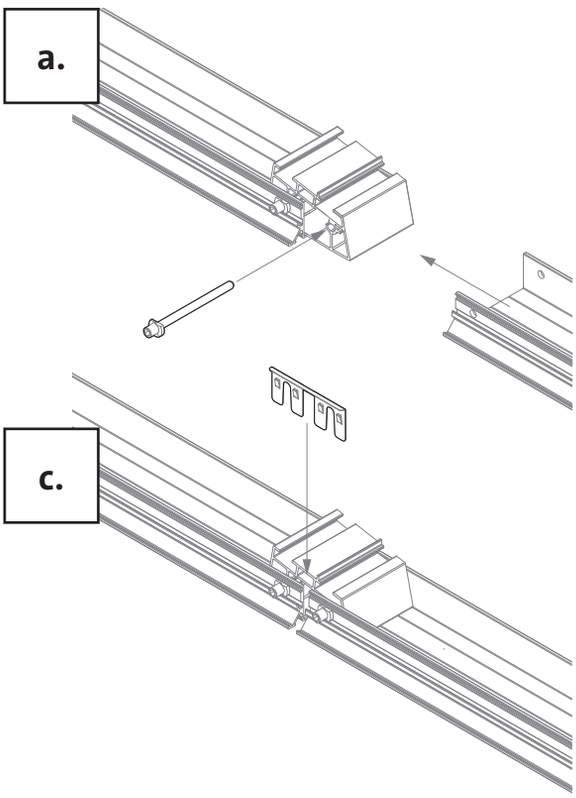
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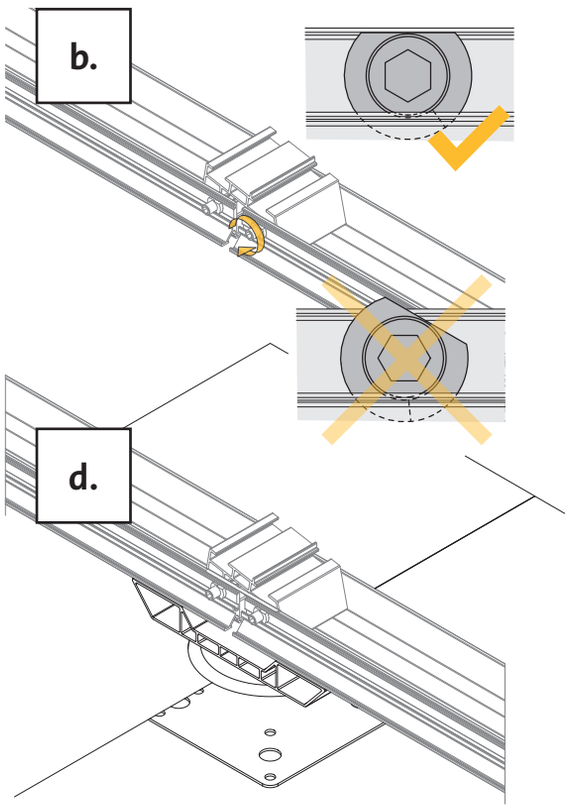


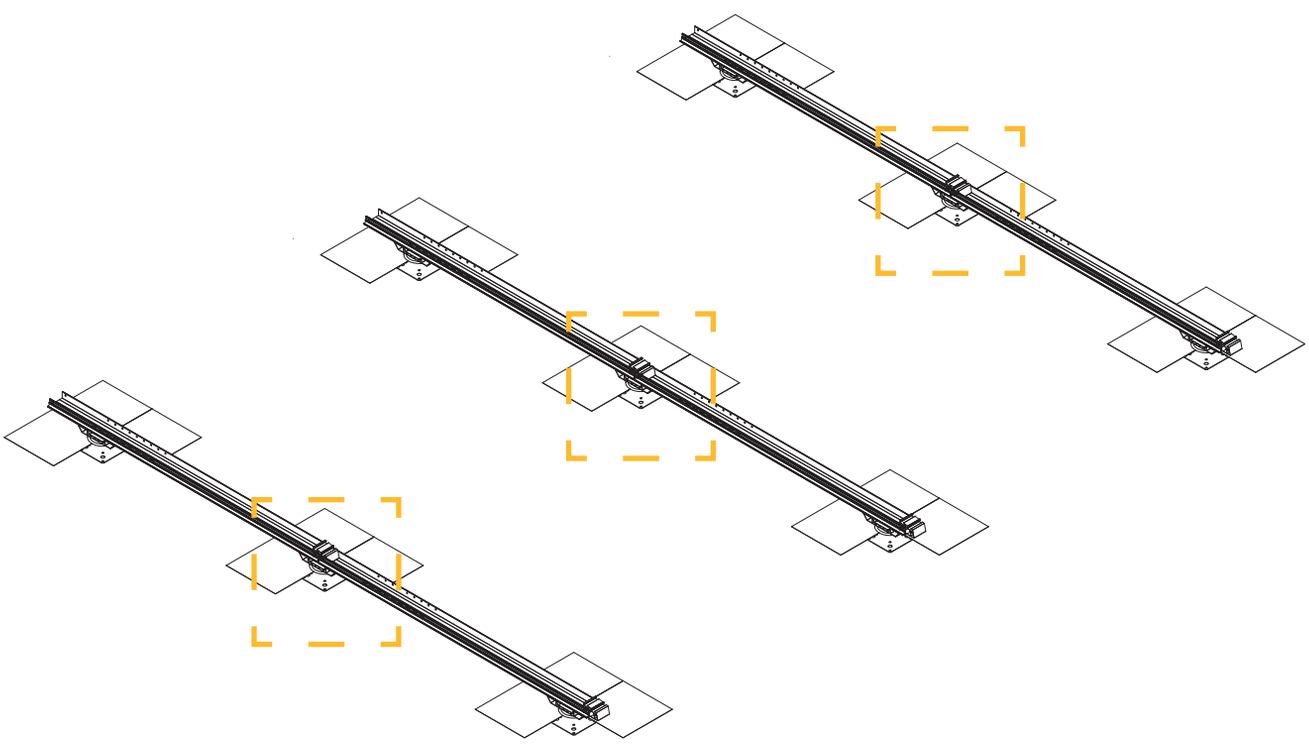
2.2



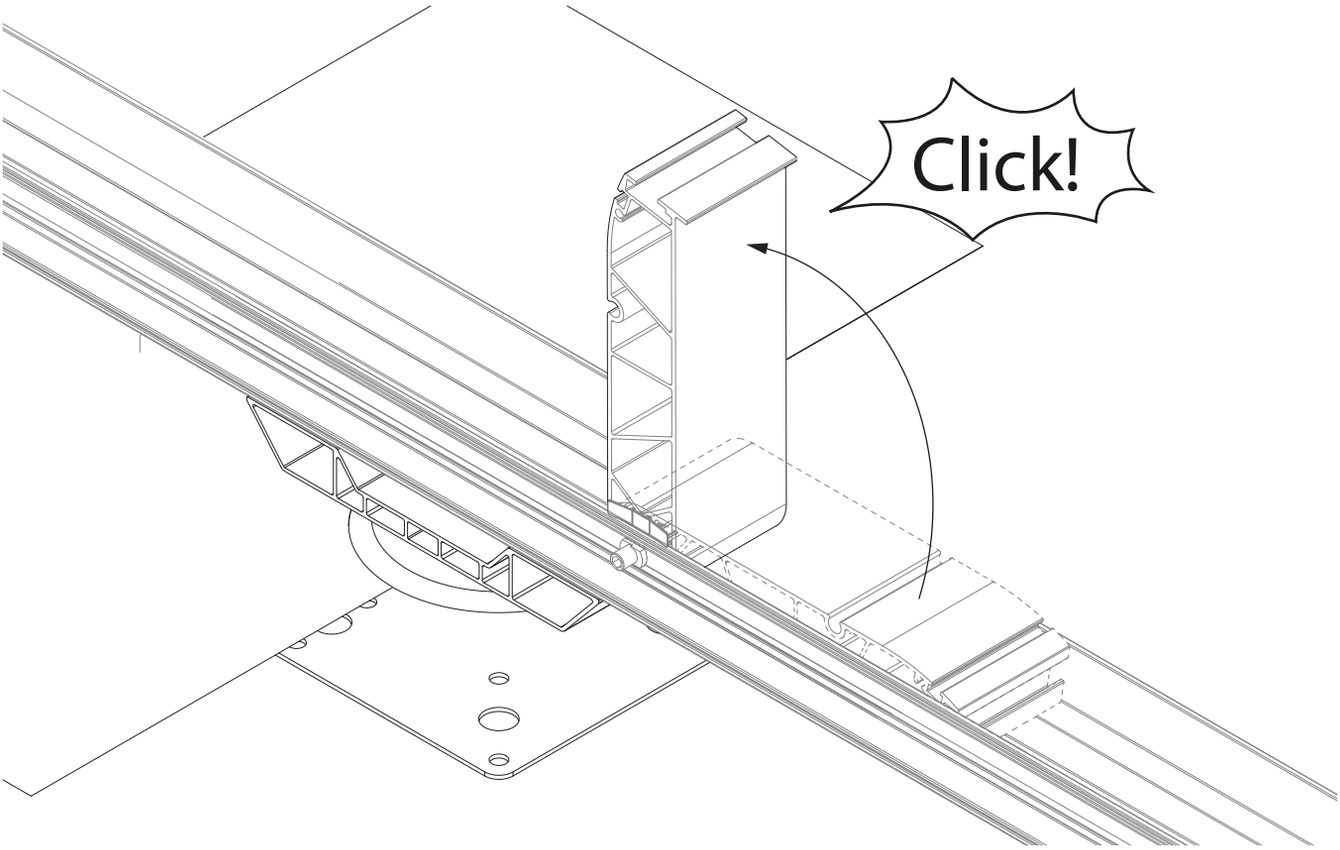
2. Rail Connection

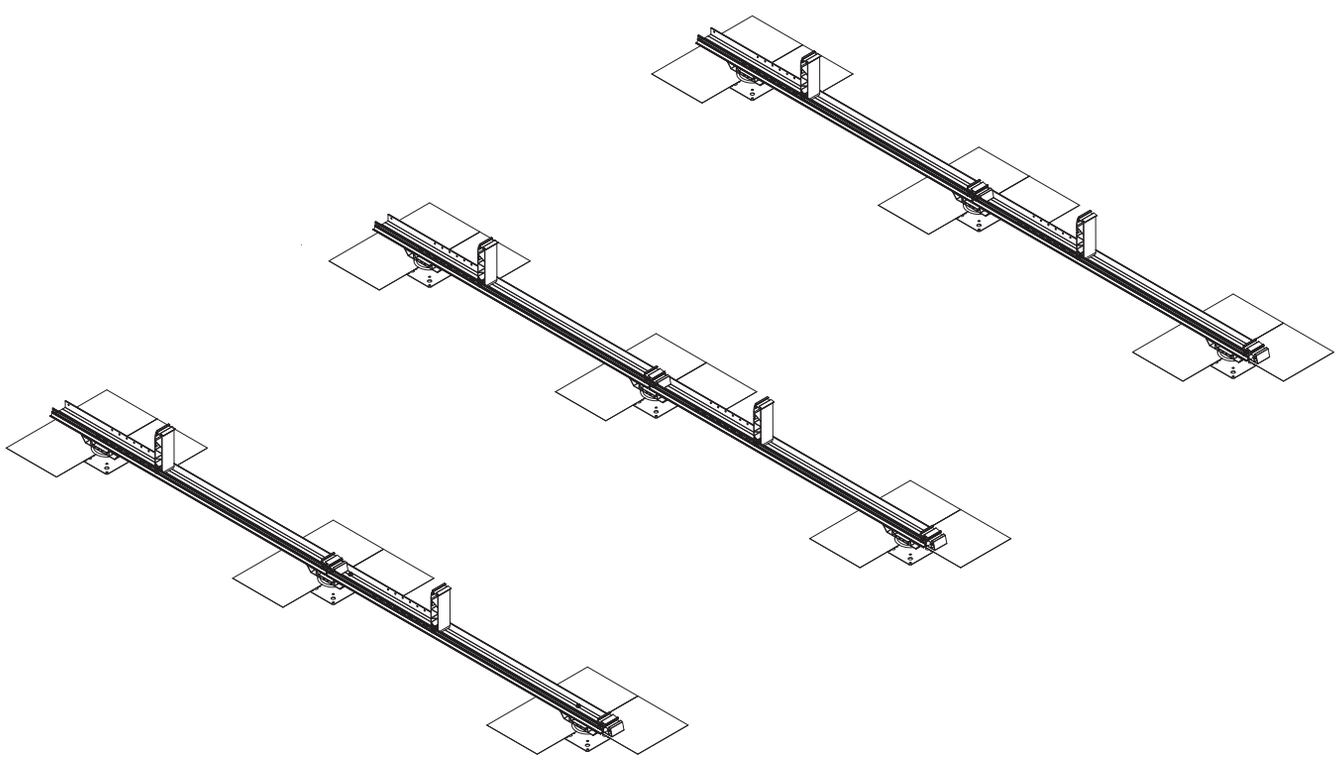




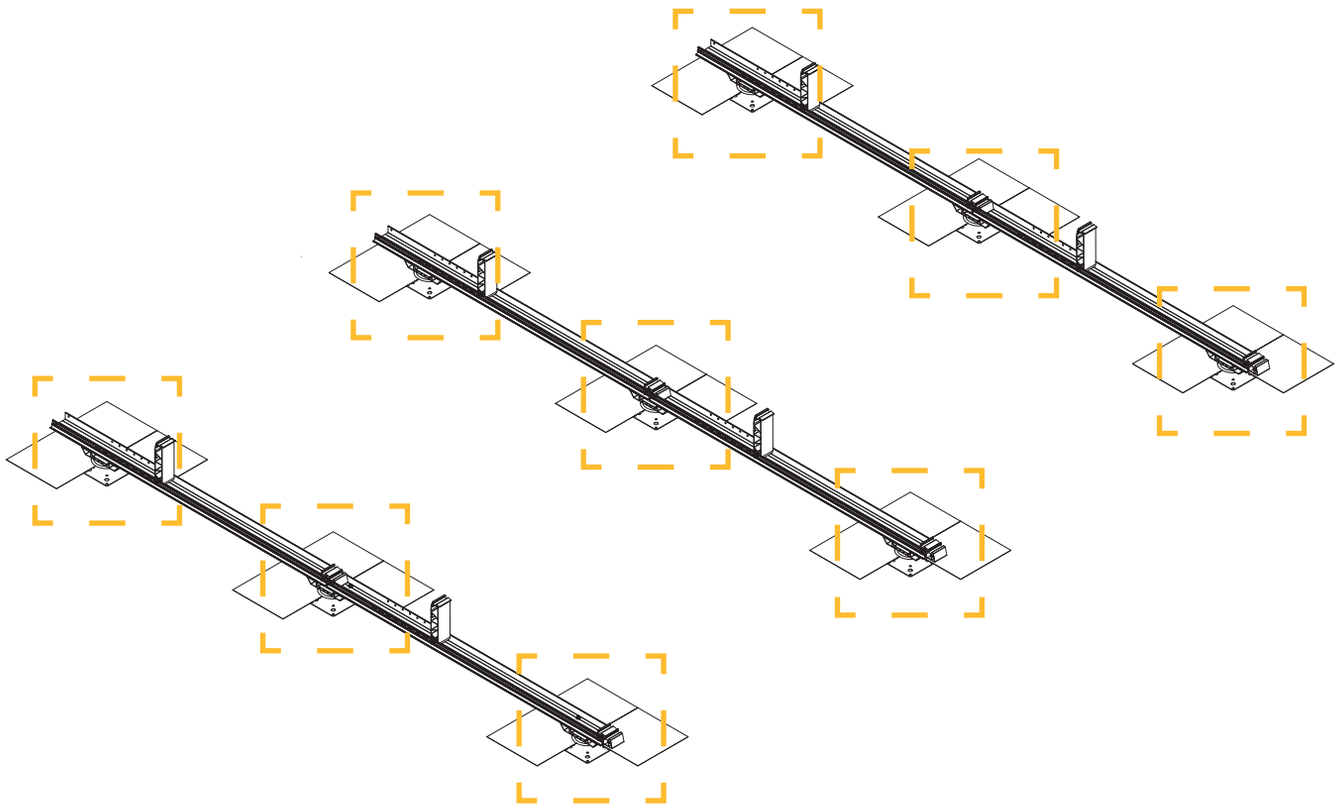


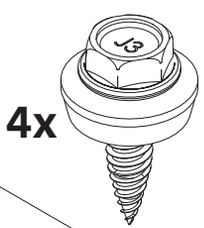
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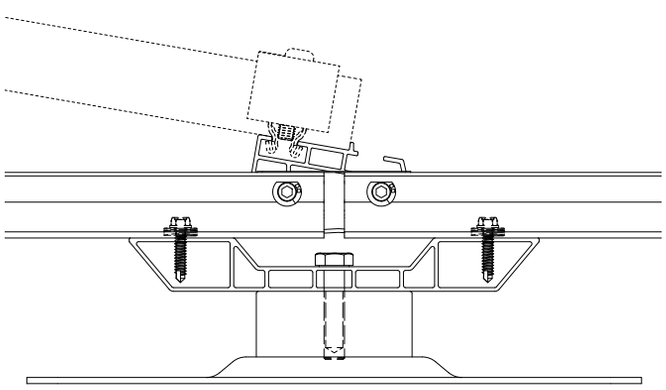


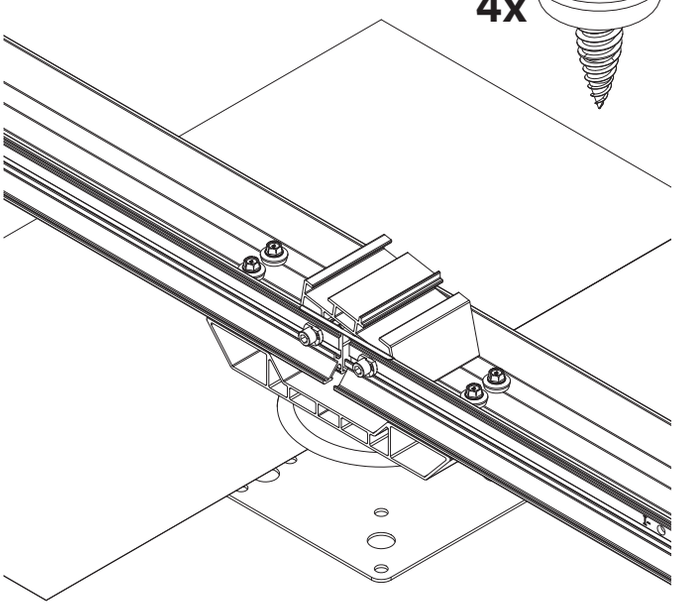


4.A Installation Variant A

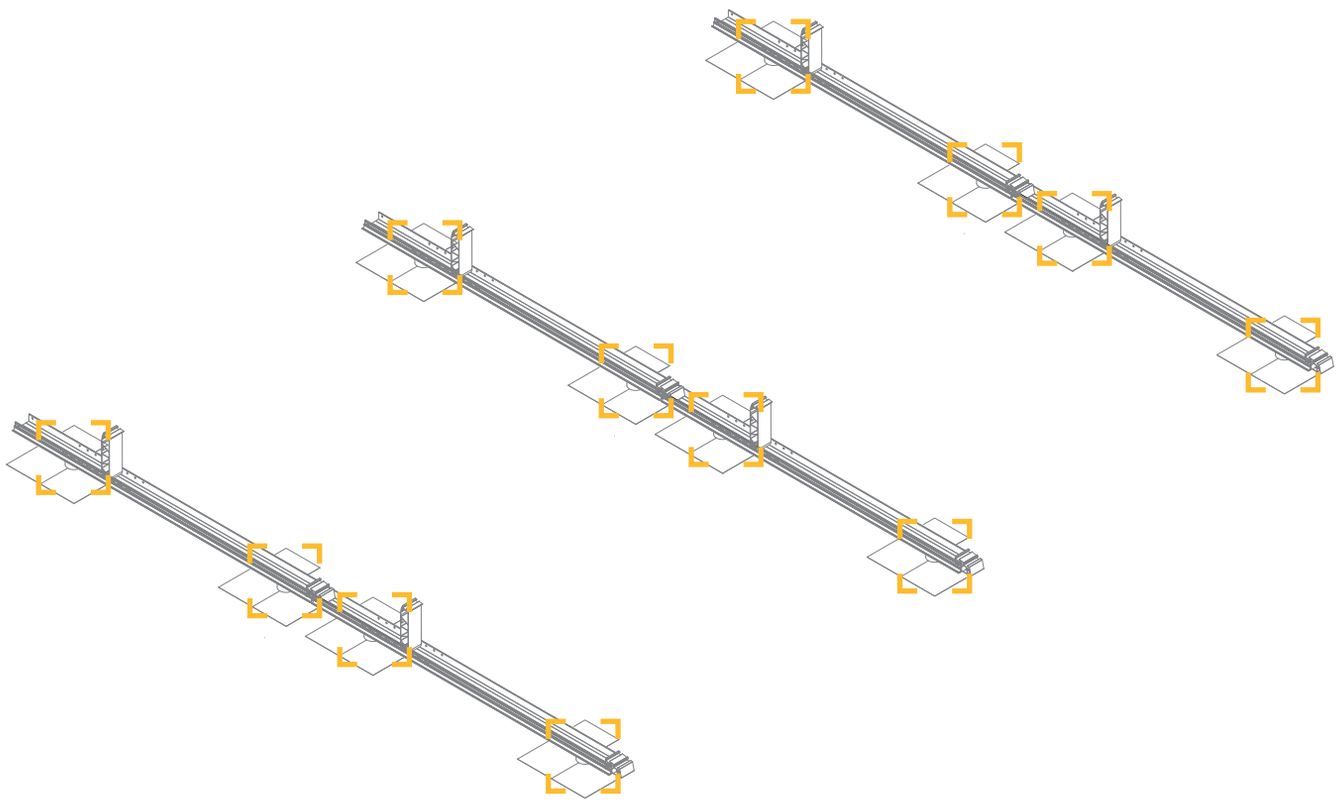


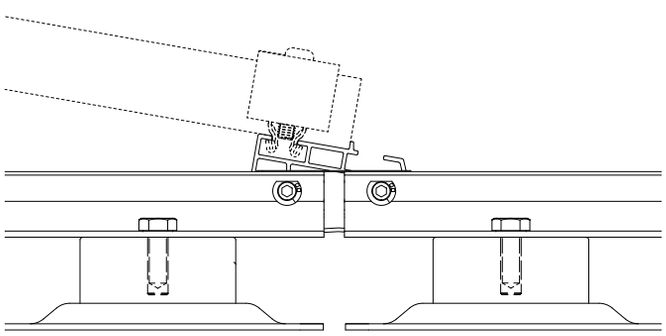


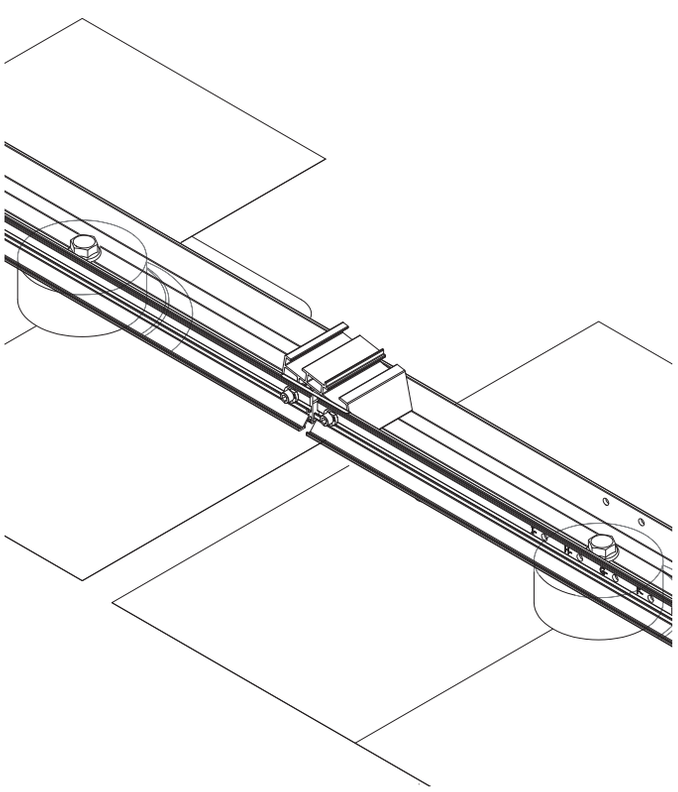




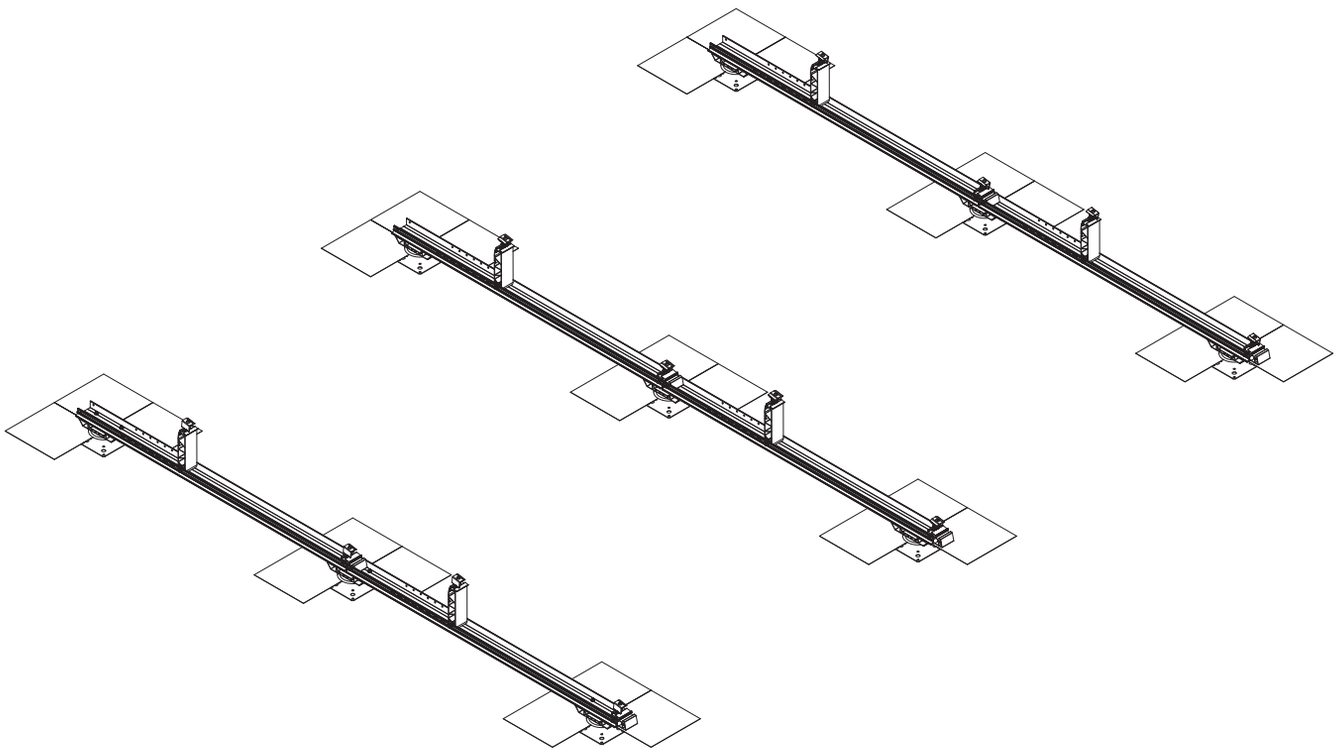
4.B Installation Variant B

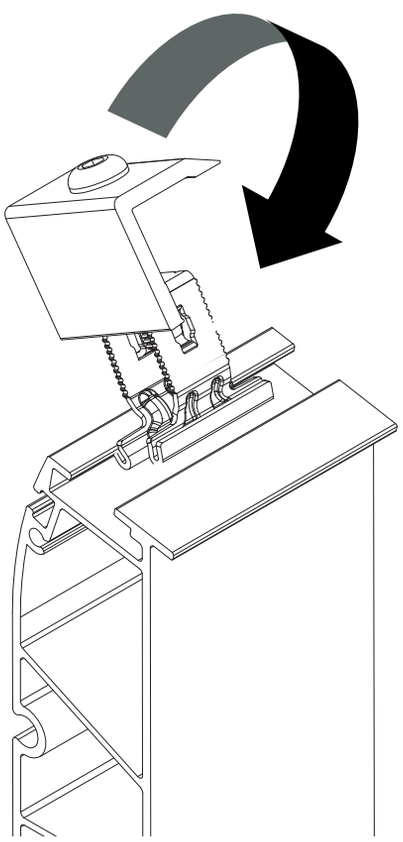




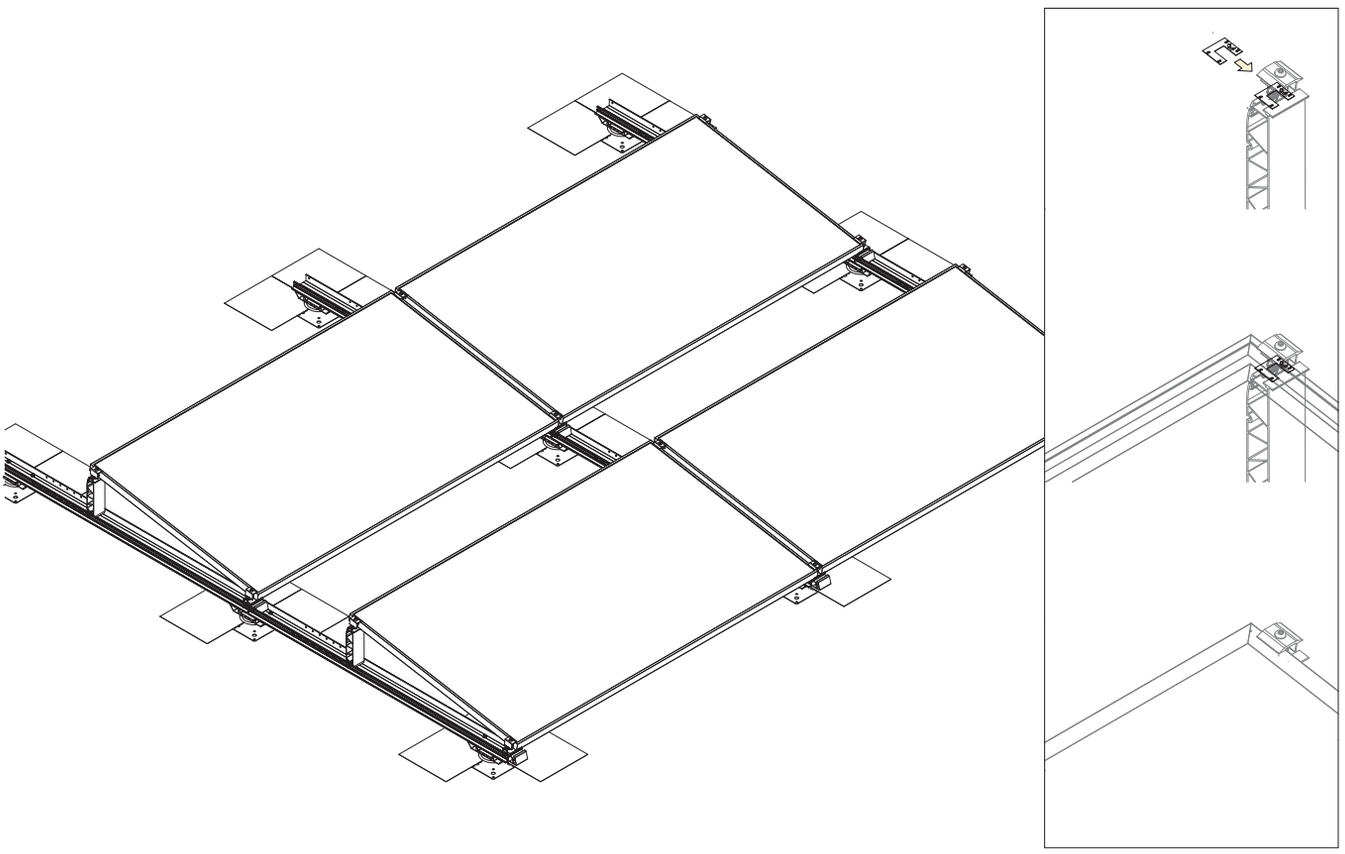


5.



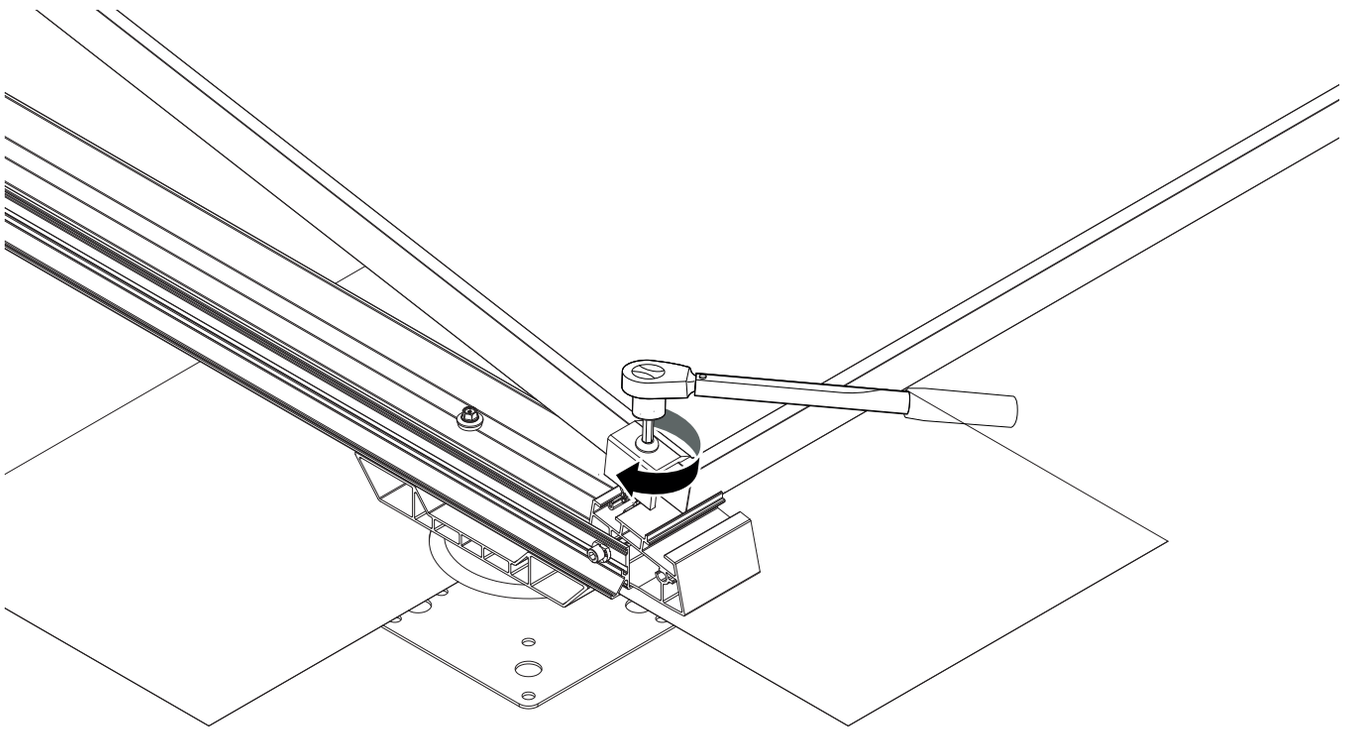


7. Potential Equalization (optional) - Article Number R900268



9. ⚠ 10 Nm

10 Nm 



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DE | Abbildungen und Texte entsprechen dem aktuellen technischen Stand bei Drucklegung, Änderungen vorbehalten.

GB | The images and texts in these instructions relate to the latest technology at the time of printing, subject to modifications.

FR | Les illustrations et textes sont conformes à l'état de la technique au moment de mise sous presse. Sous toutes réserves de modifications.

IT | Figure e testi corrispondono allo stato più attuale della tecnica al momento dell'ordine di stampa. Con riserva di modifiche.

ES | Las imágenes y los textos se corresponden al estado actual de la técnica en el momento de la impresión, reservado el derecho a las modificaciones.

NL | Afbeeldingen en teksten voldoen aan de actuele stand van de techniek op het moment van ter perse gaan. Wijzigingen voorbehouden.

DK | Afbildninger og tekster overholder den tekniske stand ved trykningen, der tages forbehold for ændringer.

SE | Bilder och texter motsvarar den nuvarande tekniska tillstånd vid tidpunkten för tryckning, med förbehåll för ändringar.

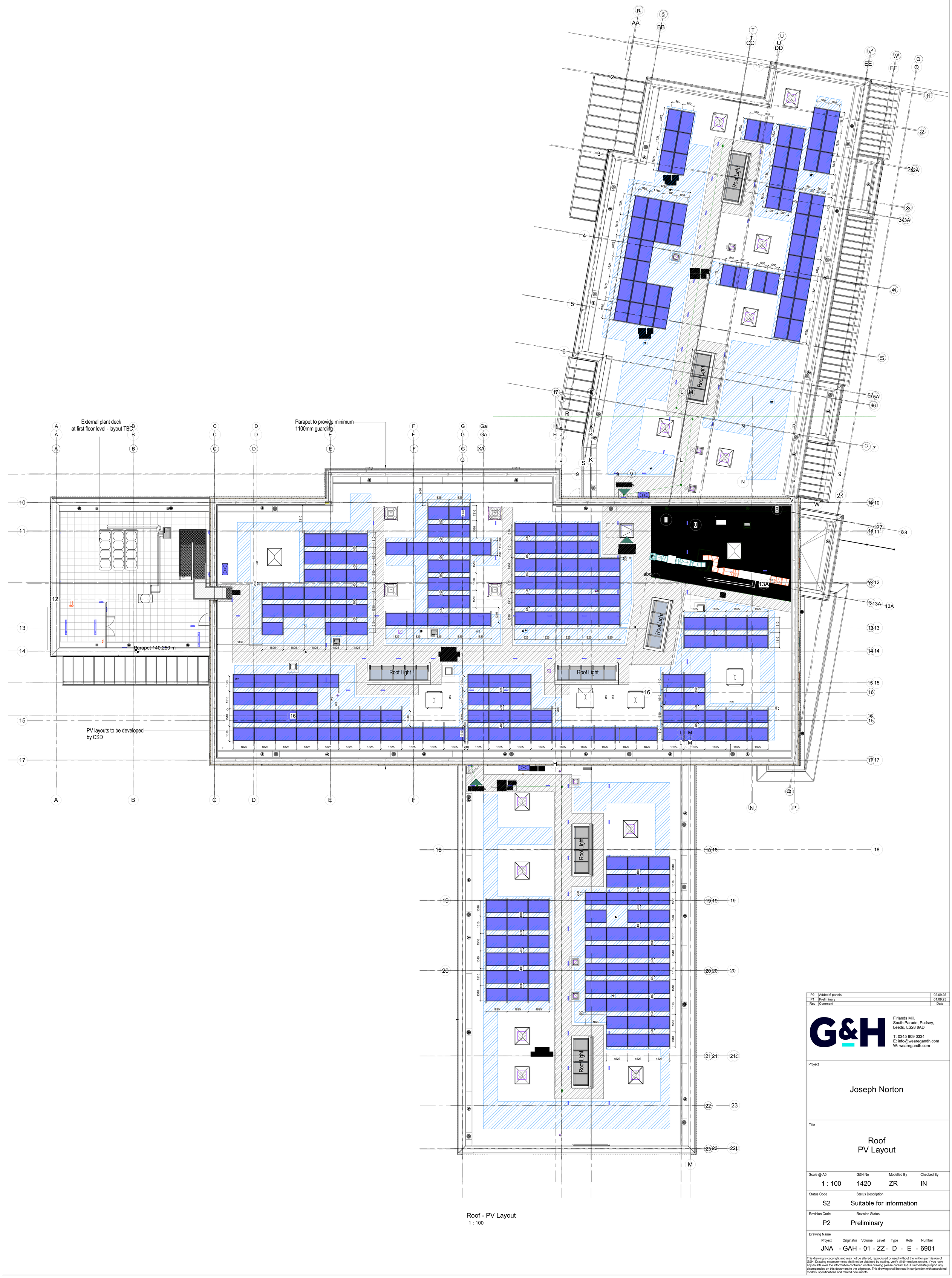
CZ | Vyobrazení a texty odpovídají aktuálnímu technickému stavu při odevzdání do tisku. Změny vyhrazeny.

PL | Ilustracje i teksty odpowiadają stanowi techniki aktualnemu w chwili oddania instrukcji do druku. Zastrzega się prawo do zmian.

LT | Spausdinami paveikslėliai ir tekstas atitinka naujausią technikos lygį. Pasiliekame teisę į pakeitimus.

HU | Az ábrák és a szövegek a nyomtatás időpontjában rendelkezésünkre álló legfrissebb műszaki ismereteknek felelnek meg; a módosítások jogát fenntartjuk.

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E-Mail: info@renusol.com
www.renusol.com



Roof - PV Layout
1 : 100

Rev	Comment	Date
P2	Added 6 panels	02.09.25
P1	Preliminary	01.09.25

G&H

Firlands Mill,
South Parade, Pudsey,
Leeds, LS28 8AD

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E: info@wearegandh.com
W: wearegandh.com

Project

Joseph Norton

Title

Roof
PV Layout

Scale @ A0	G&H No	Modelled By	Checked By
1 : 100	1420	ZR	IN

Status Code	Status Description
S2	Suitable for information

Revision Code	Revision Status
P2	Preliminary

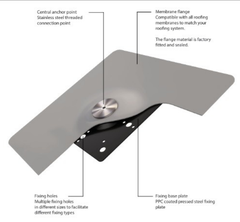
Drawing Name

Project	Originator	Volume	Level	Type	Role	Number
JNA	- GAH -	01 -	ZZ -	D -	E -	6901

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Legend

- Nicholson fixing plates (supply and installation by WCL)



External plant deck
at first floor level - layout TBC

Parapet to provide minimum
1100mm guarding

Parapet 140.250 m

PV layouts to be developed
by CSD

Roof Light

P1	Preliminary	01.09.25
Rev	Comment	Date

G&H

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Project

Joseph Norton

Title

Roof
IP Mounting Positions

Scale @ A0	G&H No	Modelled By	Checked By
1 : 100	1420	ZR	IN

Status Code	Status Description
S3	Suitable for review & comment

Revision Code	Revision Status
P1	Preliminary

Drawing Name

Project	Originator	Volume	Level	Type	Role	Number
JNA	- GAH -	01 -	ZZ -	D -	E -	6902

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