



Swiftwater
ELECTRIC & SOLAR

SOLAR PROPOSAL

OWNER OPERATED, HOMEOWNER PREFERRED



360-746-0859 | Info@swiftwaterelectricandsolar.com
swiftwaterelectricandsolar.com

LOCALLY OWNED
LOCALLY BUILT
WASHINGTON PROUD



WELCOME TO SWIFTWATER

SERVING OUR COMMUNITY SINCE 2005

BASED IN BELLINGHAM, WITH OFFICES IN FRIDAY HARBOR & ELLENSBURG

MASTER ELECTRICIAN

30+ YEARS
EXPERIENCE

LOCAL BUSINESS

OUR PEOPLE

We pay a living wage and create an environment where employees want to stay. That continuity is how we keep the deepest install expertise in the region on every job — the same hands that wired your neighbor's array will be the ones on yours.

OUR APPROACH

We design every system around **your** roof, **your** load profile, and **your** financial goals. Our installs are done in-house by W-2 electricians, not subcontracted crews, so every wire, panel, and conduit is held to one standard. We carry every project from design through commissioning and stand behind the workmanship for the life of the system.

Now, let's take a look at your proposal...

SOLAR PROPOSAL

CUSTOMER

Odd Fellows Hall

LOCATION

112 Haven Rd, Eastsound, WA 98245

PREPARED BY

Kevin O'Connor

Prepared August 12, 2026 · Pricing valid through September 11, 2026

Utility: OPALCO

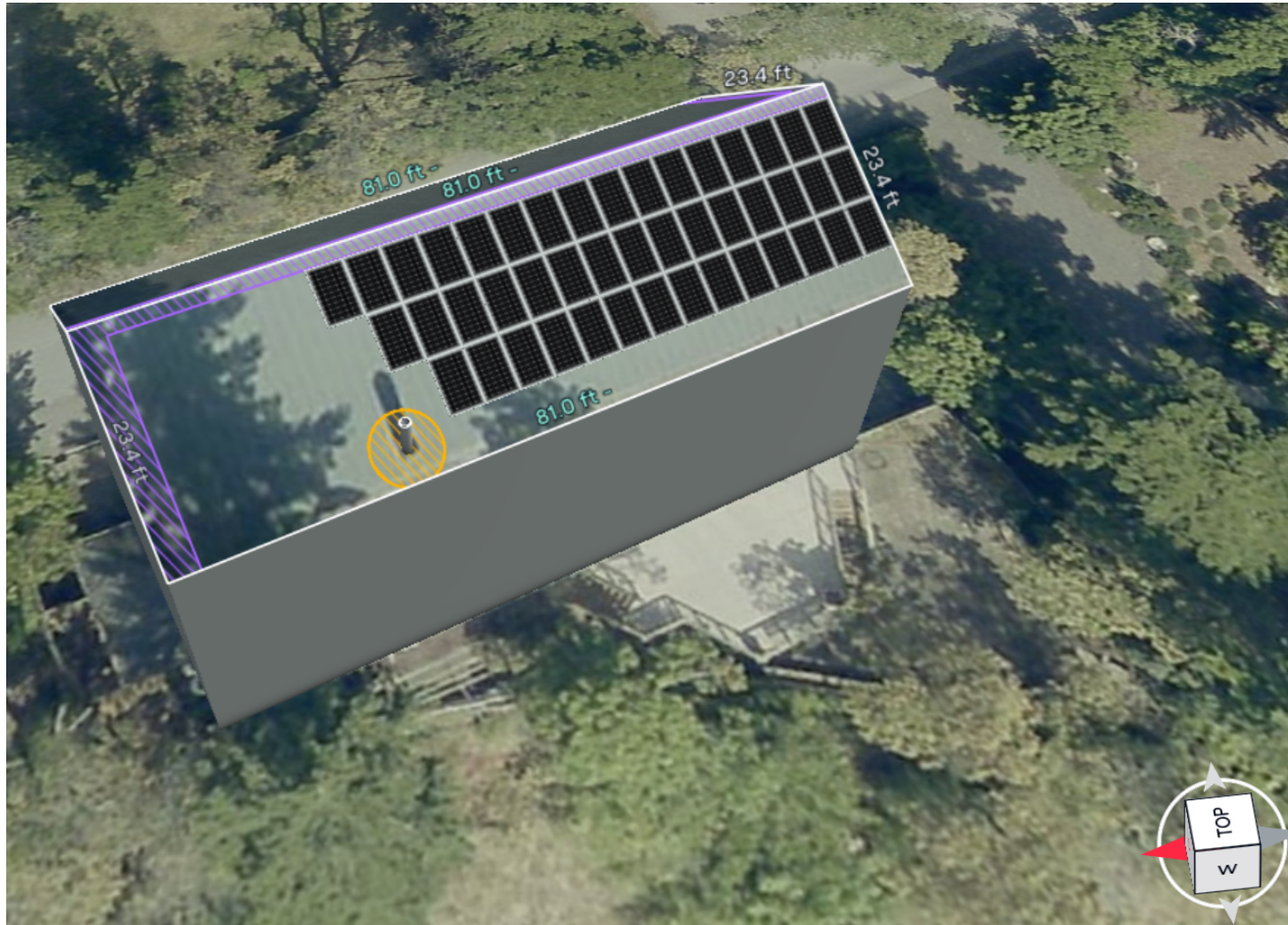
Utility rate: \$0.15 · Solar rate: \$0.07/kWh

Roof: Standing Seam Metal

SYSTEM DETAILS		COST BREAKDOWN	
System size	19.80 kW	Solar cost	\$55,479
Annual production	19,092 kWh	Battery cost	\$32,200
Annual usage	20,036 kWh	Tax credit	-\$22,192
Annual offset	95%	Sales tax (exempt)	\$0
Modules	45 × Hyundai 440	Total cost	\$65,488
<i>Module warranty</i>	<i>87% @ year 30</i>	Solar cost per watt	\$2.80
Inverters	23 × Tigo RSD	Net cost per watt	\$1.68
FINANCING		SAVINGS & RETURN	
Loan type	OPALCO	Monthly savings	\$235
Interest rate	3.00%	Annual savings	\$2,824
Loan term	10 years	Cash payback period	23.2 years
Monthly payment	\$542	Annual ROI	10.7%
BATTERY			
Type	2× Franklin Apower S	Avg monthly payment	\$189
ENVIRONMENTAL IMPACT			
CO ₂ sequestered	388.7 acres/yr	Avoided emissions	36,921 gal equiv.
25-year savings*			\$129,991
<i>*Based on historical projected utility rate increases</i>			
THE COST OF DOING NOTHING			
25-year cost without solar			\$129,991
25-year cost with solar			\$33,288
YOU SAVE			\$96,703

SOLAR DESIGN

Odd Fellows Hall



MODULES

INVERTERS

SYSTEM SIZE

YEAR 1 PRODUCTION

45 × Hyundai 440

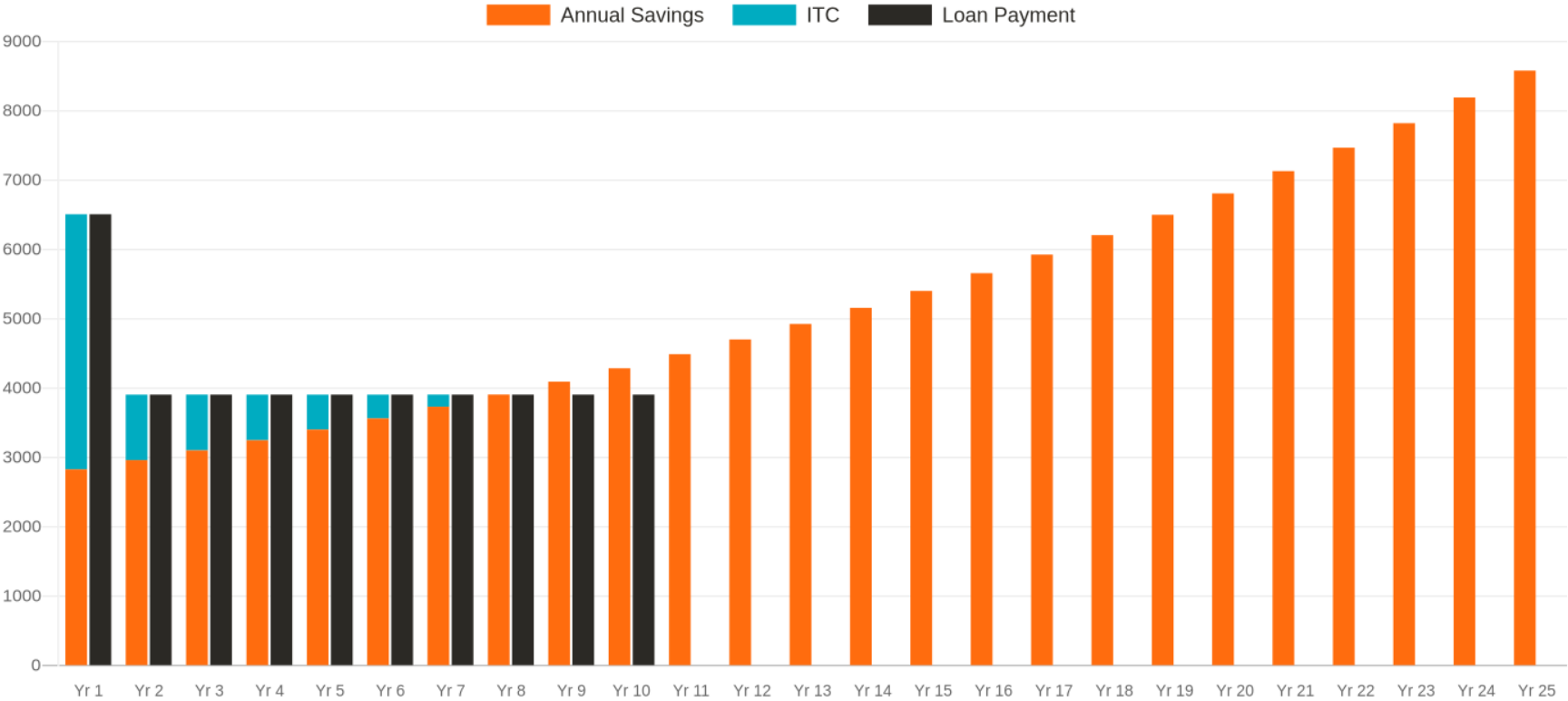
23 × Tigo RSD

19.80 kW

19,092 kWh

25-YEAR FINANCIAL PROJECTION

Odd Fellows Hall



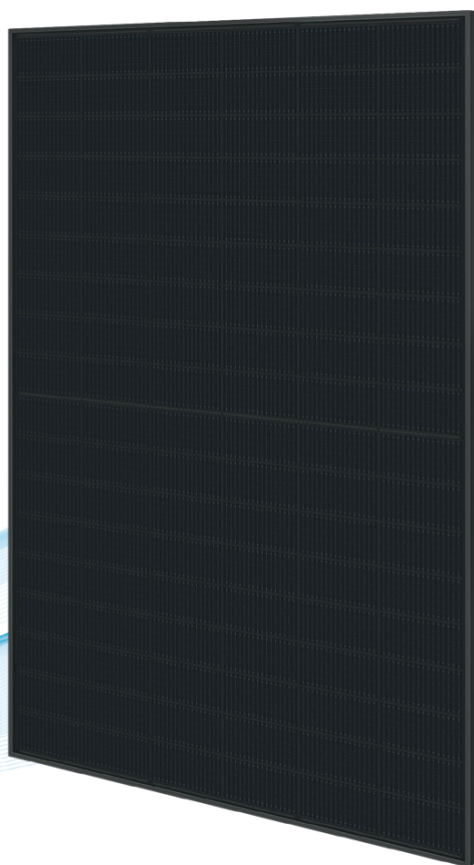
SOLAR LOAN		25-YEAR PROJECTION		ENVIRONMENTAL IMPACT		COST OF DOING NOTHING	
Interest	3.00%	Warrantied Savings	\$129,991	CO ₂ (acres/yr)	389	25-Yr without solar	\$129,991
Term (years)	10	Annual ROI	10.7%	Avoided emissions (gal)	36,921	25-Yr with solar	\$33,288
Annual payment	\$6,504					YOU SAVE	\$96,703
		YEAR 1 TAX REFUND					
BATTERY		Remaining after loan cover	\$15,082				
Annual payment (net)	\$2,265						

HD HYUNDAI SOLAR MODULE

NF(BK) Series

Premium N-Type TOPCon Module

HiN-T430NF(BK) | HiN-T435NF(BK) | HiN-T440NF(BK)



22.53%
High Efficiency



High-End
TOPCon
Technology



Higher
Bifaciality



Long-Term
Reliability



Compatible
with Carport
Applications



For Residential
(Full Black Design)

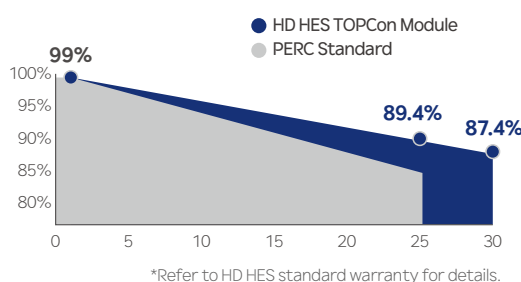
HD Hyundai's Warranty Provisions

25
YEARS

- 25-Year Product Warranty
- Materials and workmanship

30
YEARS

- 30-Year Performance Warranty
- First year degradation: 1%
- Linear warranty after initial year: with 0.4%p annual degradation, 87.4% is guaranteed up to 30years



Certification



- ISO 9001 : Quality management systems
- ISO 14001 : Environmental management systems
- ISO 45001 : Occupational health and safety management systems
- UL 61730: Photovoltaic (PV) module safety qualification (CSA)
- IEC 61701: Salt mist corrosion testing
- IEC 62716: Ammonia corrosion testing
- IEC 62804: Potential Induced Degradation (PID) testing
- IEC 60068-2-68: Sand and dust testing for environmental durability

Electrical Characteristics

HiN-TxxxNF(BK)		HiN-T430NF(BK)		HiN-T435NF(BK)		HiN-T440NF(BK)	
Item	Unit	BNPI		BNPI		BNPI	
Nominal output (Pmax)	W	430	476	435	482	440	488
Open circuit voltage (Voc)	V	38.4	38.4	38.6	38.6	38.8	38.8
Short circuit current (Isc)	A	14.25	15.79	14.32	15.87	14.39	15.94
Voltage at Pmax (Vmpp)	V	31.9	31.9	32.1	32.1	32.3	32.3
Current at Pmax (Impp)	A	13.48	14.94	13.56	15.01	13.63	15.10
Module efficiency	%	22.02	24.40	22.28	24.68	22.53	25.00
Power Class Sorting	W	0 ~ +5					
Temperature coefficient of Pmax	%/K	-0.30					
Temperature coefficient of Voc	%/K	-0.25					
Temperature coefficient of Isc	%/K	0.046					
Bifaciality	%	80%±10%					

*STC : Irradiance 1,000 W/m², cell temperature 25°C, AM=1.5 / Test uncertainty for Pmax ±3%; Voc ±3%; Isc ±3%
 **The electrical properties of BNPI are measured under the irradiance corresponding to 1000 W/m² on the module front and 135 W/m² on the module rear.

Additional Power Gain from rear side					
Pmpp gain	Pmpp[W]	Vmpp[V]	Impp[A]	Voc[V]	Isc[A]
5%	458	32.30	14.18	38.80	14.97
15%	493	32.30	15.27	38.80	16.12
25%	528	32.40	16.36	38.90	17.27

*Electrical characteristics with different rear power gain (reference to 440W)

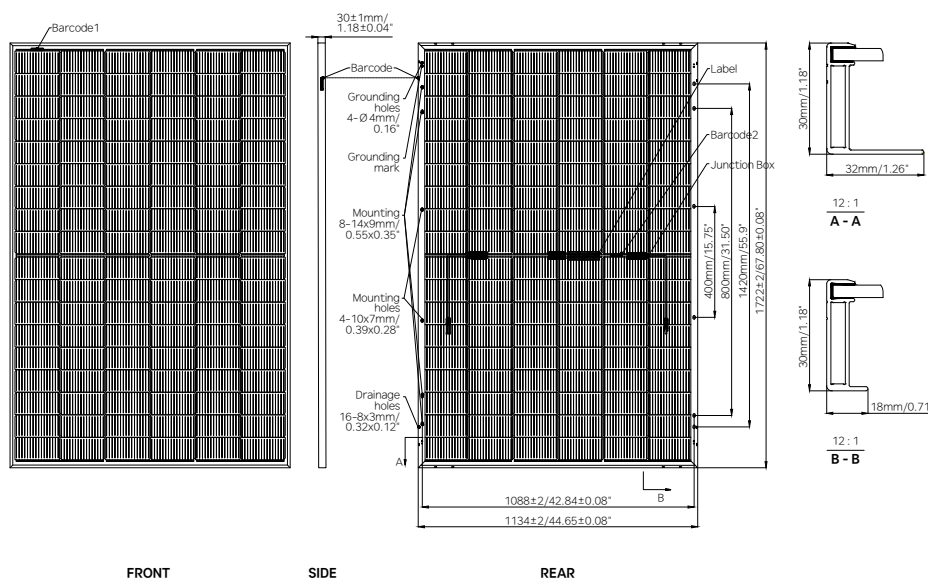
Mechanical Characteristics

Dimensions	1,722mm (L) x 1,134mm (W) x 30mm (H) (67.8in x 44.6in x 1.2in)
Weight	24.5 kg (50.01lbs)
Solar Cells	N-Type TOPCon, 108 (6x18) monocrystalline 16BB half-cut bifacial cells
Output Cables	Cable : (+)1,200mm(47.2in), (-)1,200mm(47.2in) / Customized length available Connector : Stäubli MC4 genuine Connector / Compatible, IP68
Junction Box	3-part, 3 bypass diodes, IP68 rated
Construction	Front : 2.0mm(0.08in) semi-tempered solar glass with high transmittance and anti-reflective coating Rear : 2.0mm(0.08in) semi-tempered solar glass
Frame	Anodized aluminum alloy

Shipping Configurations

Packing Direction	Vertical	Packing pallet weight (kg)	912
Container Size (HC)	40'	Modules Per Pallet (pcs)	36
Pallets Per Container	26	Modules Per Container (pcs)	936

Module Diagram (unit : mm)

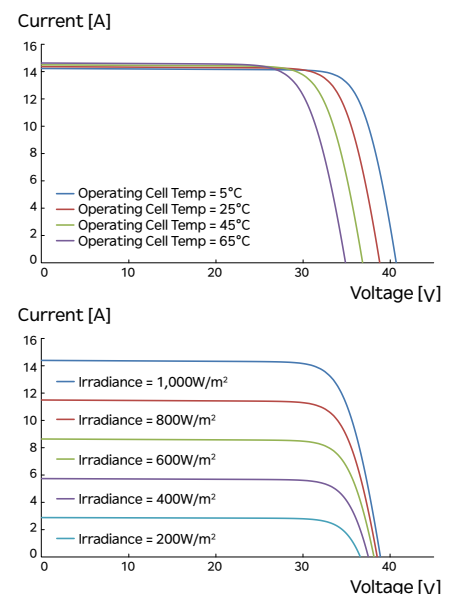


Installation Safety Guide

- Only qualified personnel should install or perform maintenance.
- Be aware of dangerous high DC voltage.
- Do not handle or install modules when they are wet.

Nominal Module Operation Temperature	44°C ± 2°C
Operating Temperature	-40°C~+85°C
Maximum System Voltage	DC 1,500 V
Maximum Reverse Current	30A
Maximum Test Load	Front 5,400Pa *See Installation Manual *Rear 5,400Pa
Fire Performance	Type 29

I-V Curves (HiN-T440NF(BK))





TS4-A-F (725 W)

Rapid shutdown

Tigo TS4-A-F enables code compliant Rapid Shutdown for high wattage modules up to 725 W, 22 A Isc.

The TS4-A-F complies with NEC 2017, 2020, and 2023 690.12 Rapid Shutdown specifications when installed with the Tigo RSS Transmitter or an inverter with a built-in Tigo certified transmitter. Option to upgrade to TS4-A-S for module-level monitoring and Multi-factor Rapid Shutdown capabilities.

Features

- Rated 725 W, 22 A I_{SC} / 16 A I_{MP} to accommodate high-power, high-current modules
- Simple, fast installation – snaps to a standard PV module frame or mounts to racking
- Automatic shutdown – PV array enters rapid shutdown mode in the event of AC grid loss
- Rapid shutdown – a UL Standards-certified component for photovoltaic rapid shutdown systems (PVRSS) worldwide
- Option to upgrade to TS4-A-S
- Works with thousands of different inverter models from more than 50 inverter brands
- 25-year warranty

Specifications

Electrical	
Input current (I_{MP}/I_{SC})	16 A/22 A
Input voltage range (V_{MP})	12 – 80 V
Maximum system voltage	1000 V/1500 V
Maximum output power (P_{MAX})	725 W
Maximum efficiency	99.6%
Recommended fuse rating	30 A
Rapid Shutdown	
TS4 conductor AWG	12
Rapid shutdown time limit	<30 sec.
PVRSE-controlled conductor limits	≤ 240 VA, ≤ 8 A, ≤ 30 V _{DC}
UL 1741-compliant PVRSE	Yes
Communications	Wireless 2.4GHz ¹ and/or PLC ²

¹ Using Tigo Access Point (TAP) and Cloud Connect Advanced (CCA)

² Using Tigo RSS transmitter power-line communications



Specifications

Connections

Connectors MC4/EVO2

For cable length details, refer to the ordering information below

Environmental

Operating temperature range -40 – 85 °C (-40 – 185 °F)

Storage temperature range -20 – 65 °C (-4 – 149 °F)

Maximum elevation 3000 m (9840 ft.)

Outdoor IP rating IP68

Mechanical

Dimensions (H/W/D) 139.7 x 138.4 x 22.9 mm
(5.4 x 5.5 x 0.9 in.)

Weight 520 g (1.15 lb.)

General

Standards compliance

FCC 15b, ETSI EN 301 489, CISPR 31, CSA 22.2,
IEC 62109, NEC 690.12 UL 1741 PVRSE/PVRSS

Warranty 25 years

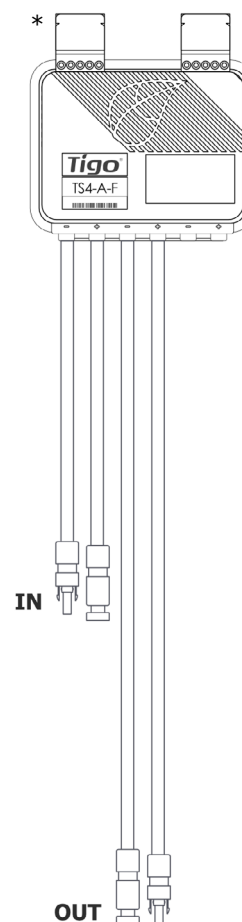
More Resources



Ordering Information

Part Number	Cable Lengths* IN/OUT	Connectors	V _{MAX}	Certifications UL/IEC
519-340112-2001	0.1/1.2 m	MC4		1500 V/1000 V
519-340612-2001	0.6/1.2 m	MC4		1500 V/1000 V
519-341220-2001	1.2/2.0 m	MC4		1500 V/1000 V
519-320112-2001	0.1/1.2 m	EVO2		1500 V/1500 V
519-320612-2001	0.6/1.2 m	EVO2		1500 V/1500 V
519-321220-2001	1.2/2.0 m	EVO2		1500 V/1500 V

* Refer to image. Cable lengths are +/- 0.05m.



S-5!®

The Right Way!®

The right way to attach almost anything to metal roofs!

S-5-S Clamp

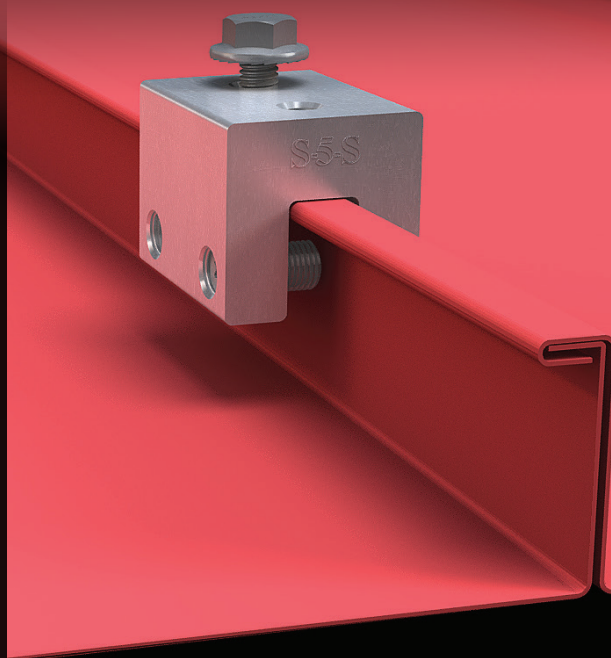
The S-5-S clamp was created specifically for popular snap-together profiles—including residential profiles by Taylor Metals and Easy Lock Standing Seam. For horizontal seams under .540 inches (like the Firestone UC4) the S-5-S or S-5-S Mini can be used to avoid the necessity of crimping the seam.

Its simple design and size make it perfect for use with S-5!® snow retention products and other heavy-duty applications. Installation is as simple as setting the patented round-point setscrews into the clamp, placing the clamp on the seam, and tightening them to the specified tension. Then, affix ancillary items using the bolt provided with the product. Go to www.S-5.com/tools for information and tools available for properly attaching and tensioning S-5! clamps.

S-5-S Mini Clamp

The S-5-S Mini is a bit shorter than the S-5-S and has one setscrew rather than two. The mini is the choice for attaching all kinds of rooftop accessories: signs, walkways, satellite dishes, antennas, rooftop lighting, lightning protection systems, solar arrays, exhaust stack bracing, conduit, condensate lines, mechanical equipment—just about anything!*

*S-5! mini clamps are not compatible with, and should not be used with S-5! SnoRail™/SnoFence™ or ColorGard® snow retention systems.



The S-5-S clamp was created specifically for popular snap-together profiles.

S-5-S and S-5-S Mini

888-825-3432 | www.S-5.com

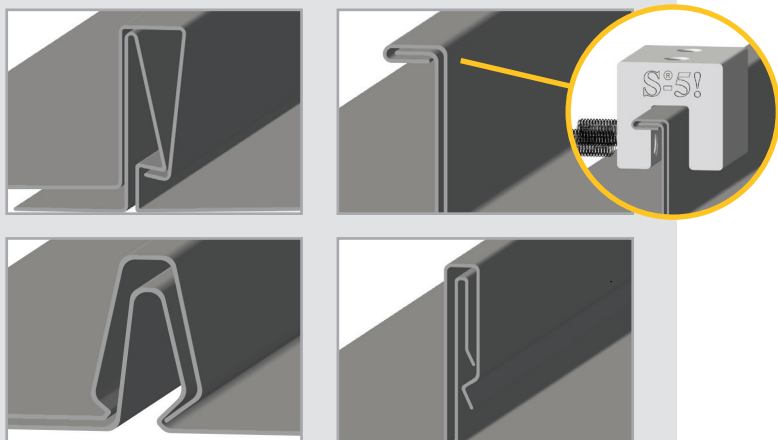
The strength of the S-5-S clamp is in its simple design. The patented setscrews will slightly dimple the metal seam material but not pierce it—leaving roof warranties intact.

The **S-5-S** and **S-5-S Mini** clamps are each furnished with the hardware shown to the right. Each box also includes a bit tip for tightening setscrews using an electric screw gun. A structural aluminum attachment clamp, the S-5-S is compatible with most common metal roofing materials excluding copper. All included hardware is stainless steel. Please visit www.S-5.com for more information including CAD details, metallurgical compatibilities and specifications.

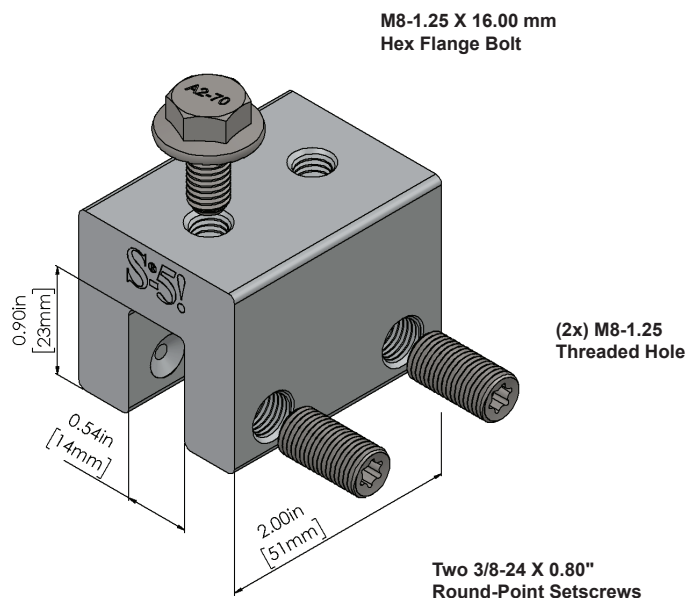
The S-5-S clamp has been tested for load-to-failure results on most major brands and profiles of standing seam roofing. The independent lab test data found at www.S-5.com can be used for load-critical designs and applications. S-5!® holding strength is unmatched in the industry. Profiles that are shaped as illustrated below will work with the S-5-S and S-5-S Mini. In order for the S-5-S or S-5-S Mini to fit these types of seams, the finished seam must:

- Be at least 1.00" high.
- Have a height distance less than or equal to 0.25" between the male portion of the panel and female portion of the panel.

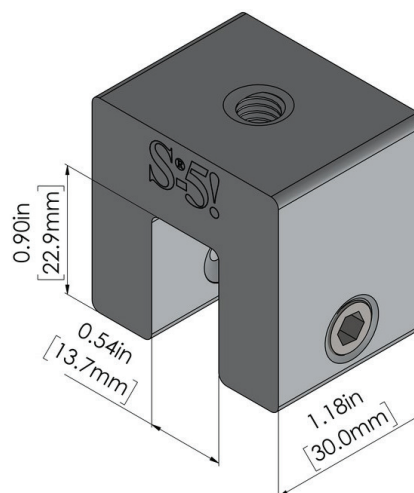
Example Profiles



S-5-S Clamp



S-5-S Mini Clamp



Please note: All measurements are rounded to the second decimal place.

S-5!® Warning! Please use this product responsibly!

Products are protected by multiple U.S. and foreign patents. Visit the website at www.S-5.com for complete information on patents and trademarks. For maximum holding strength, setscrews should be tensioned and re-tensioned as the seam material compresses. Clamp setscrew tension should be verified using a calibrated torque wrench between 160 and 180 inch pounds when used on 22ga steel, and between 130 and 150 inch pounds for all other metals and thinner gauges of steel. Consult the S-5! website at www.S-5.com for published data regarding holding strength.

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S-5! aggressively protects its patents, trademarks and copyrights. Version 081721.

Distributed by

aPower S

Complete solar and battery system

The aPower S is a battery storage device with integrated inverters to support a direct connection to solar (PV) panels. The front wiring design makes installation easier and more efficient.

The aPower S also supports parallel AC-coupled connection with FranklinWH aPower 2 batteries to expand power and capacity for homes at the same time. It can be flexibly deployed according to customer requirements. Excellent load adaptability provides the best backup experience to users.

aPower S has a 15 kWh capacity, which can provide whole home backup with a single battery. It provides a 60 MWh throughput or 15-year warranty, helping users to easily achieve reliable energy independence and freedom over the long term.



- ✓ Four built-in MPPTs
- ✓ 15 A per MPPT
- ✓ RTE 90.5%
- ✓ Safer LFP battery cell chemistry
- ✓ Built-in hybrid inverter
- ✓ 15 kWh per unit, up to 225 kWh (15 units) per aGate
- ✓ Max 11.5 kW continuous / 15 kW peak for 10 seconds
- ✓ Built-in heating blanket ensures reliable cold-weather performance
- ✓ Stable operations in extreme 131° F (55° C)
- ✓ IP67 weather protection

PERFORMANCE SPECIFICATIONS

Name	aPower S
SKU	APRS-10K15V1-US
Nameplate Model	aPower S-10
Certification / CEC Listing Name	aPower Syyy
Battery Chemistry	Lithium Iron Phosphate (LFP)
Usable System Energy	15 kWh ¹ per unit, up to 15 units per aGate
Aggregate Warrantied Throughput	60 MWh
Max Real Power (Charge)	8 kW continuous ²
Max Real Power (Discharge)	
- With PV Input	11.5 kW continuous ²
- Battery Only	10 kW continuous ²
Nominal AC Voltage	120 / 240 V, 120 / 208 V, 60 Hz
Coupling	Hybrid-Coupled
Phase	2 W+N+PE
Round Trip Efficiency (Solar – Battery – Load)	90.5% ¹
Solar to Home / Grid – CEC Efficiency	97.5% ³
Maximum Short-Circuit Current Rating	10 kA
Work Modes	Self-Consumption Time of Use Emergency Backup

Noise Emission	30 dBA Typical 45 dBA Maximum
Flood Resistance (IP67)	Up to 29" from the aPower S base
AC Metering	Revenue Grade (+/- 0.5%, ANSI C12.20)
Safety Protections	Integrated arc fault circuit interrupter(AFCI), Isolation Monitor Interrupter
User Interface	FranklinWH App
Warranty ⁴	15 years or 60 MWh throughput

Solar Technical Specifications

Maximum Solar STC Input	20 kW
Withstand Voltage	600 Vdc
PV DC Input Voltage Range	60 – 600 Vdc
PV DC MPPT Voltage Range	90 – 480 Vdc
MPPTs	4
Maximum Current per MPPT (Imp)	15 A ⁵
Maximum Short Circuit Current per MPPT (Isc)	20 A
Maximum Power per MPPT	5 kW
Maximum Continuous Total MPPT Output	15 kW

PERFORMANCE SPECIFICATIONS

Power Rated

Nominal Output Power (AC)	5 kW	7.6 kW	9.6 kW	10 kW	11.5 kW
Maximum Apparent Power	5 kVA	7.6 kVA	9.6 kVA	11.5 kVA	11.5 kVA
Maximum Continuous Current	21 A	32 A	40 A	48 A	48 A
Overcurrent Protection Device	30 A	40 A	50 A	60 A	60 A
Maximum Continuous Input Power	5 kW	7.6 kW	8 kW	8 kW	8 kW
Power Factor	±1	±1	±1	±0.87	±1

COMPLIANCE INFORMATION

Certifications	UL9540; UL9540A; UL1973; UL1741; UL1741 SB; UL1741 PCS; UL 1741 Multimode; UL 1741 CRD; UL 3141; UL1699B; UL1998; UN38.3; IEEE 1547; IEEE 1547.1; CSA 22.2 No.107.1;
Seismic	AC 156, OSHPD, IEEE 693-2005 (high)
Environmental	California Proposition 65
Emissions	FCC Part 15 Class B, ICES 003

MECHANICAL SPECIFICATIONS

Dimensions (H x W x D)	45.2 in x 29.5 in x 11.8 in (1149 mm x 750 mm x 300 mm)
Weight, aPower S complete	388 lbs (176 kg)
Weight, without Cover	365 lbs (166 kg)
Mounting	Wall or floor mount
Cooling	Natural

1. At beginning of life: 3 kW charge/discharge power, 77° F (25° C).
2. At rated power of 11.5 kW.
3. Tested in accordance with the CEC-weighted efficiency approach.
4. For more details, please refer to the FranklinWH System Limited Warranty for End Users available in the Documentation Center on the FranklinWH website.
5. If the selected PV module has an IMPP exceeding 15 A, the MPPT will automatically limit the current to 15 A. The total open-circuit voltage must not exceed the maximum input voltage of 600 V.
6. The output performance is designed with reference to IEC 62040-3 (Uninterruptible Power Systems - Part 3; Method of specifying the performance and test requirements. A number of core indicators meet the requirements of high-performance UPS.

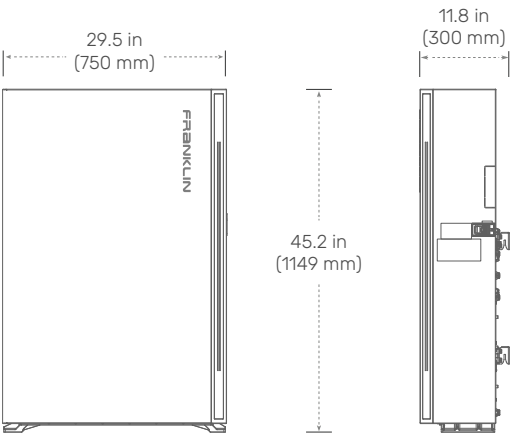
For aPower connection, use ONLY copper conductors, rated to a minimum of 194° F (90° C).

Off-Grid Specifications⁶

THDU	<1%
Voltage Regulation Accuracy	±1%
Frequency Accuracy	±0.1 Hz
Max Half-Wave Load Capability	5 kW ²
Max Peak Output Power	15 kW @ 10 S ²
Max Transient load capacity	25 kW @ 1 S ²
Load Imbalance Ratio	100%
Load Start Capability	185 A LRA ²

ENVIRONMENTAL SPECIFICATIONS

Enclosure Type	Type 3R
Ingress Protection	IP55 (Wiring) IP67 (Battery Pack & Inverter)
Operating Temperature	-4 °F to 122 °F (-20 °C to 50 °C) Operates up to 131 °F (55 °C) derated output
Operating Humidity (RH)	Up to 100% RH, condensing
Altitude	Maximum 9,843 ft (3,000 m)
Environment	Indoor / Outdoor



Note:
At launch, the aPower S will only be compatible with external RSD transmitter products. It is certified and listed as a Photovoltaic Rapid Shutdown System (PVRSS) when installed with approved equipment. For a list of compatible devices and installation requirements, please refer to the Documentation Center or contact engineering@franklinwh.com.

The aPower S (SKU: APRS-10K15V1-US) is available in the United States and Canada. For product availability in other regions, please visit our official website or contact a local authorized dealer.

