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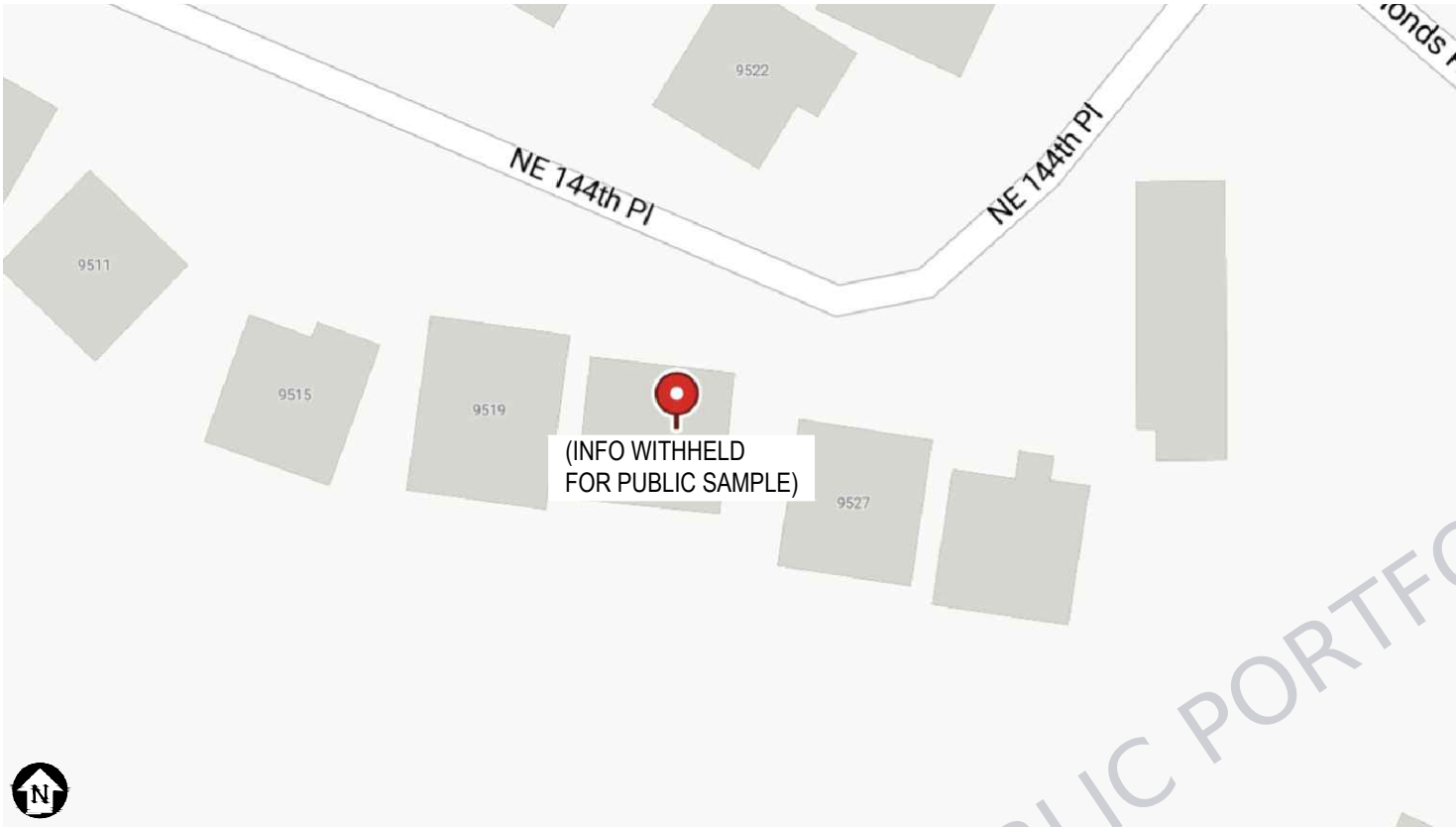
PROJECT DETAILS	
PROPERTY OWNER	(INFO WITHHELD FOR PUBLIC SAMPLE)
PROPERTY ADDRESS	(INFO WITHHELD FOR PUBLIC SAMPLE)
PARCEL ID	(INFO WITHHELD FOR PUBLIC SAMPLE)
AHJ	(INFO WITHHELD FOR PUBLIC SAMPLE)
ZONING	RESIDENTIAL
CONST. TYPE	FLUSH ROOF-MOUNTED PHOTOVOLTAIC ARRAY
OBSERVED CODES	2023 NATIONAL ELECTRICAL CODE (NEC) 2021 WASHINGTON ADMINISTRATIVE CODE (WAC) 2021 WASHINGTON STATE ENERGY CODE - RESIDENTIAL 2021 INTERNATIONAL CODES REVISED CODE OF WASHINGTON (RCW) WASHINGTON BUILDING CODE & STATE AMENDMENTS APPLICABLE CITY CODE WHEN PRESENT OSHA 29 CFR 1910.269 UNDERWRITERS LABORATORIES (UL) STANDARDS
STRUCT. METHOD	ASCE7-16

CONTRACTOR INFORMATION	
CONTRACTOR	(INFO WITHHELD FOR PUBLIC SAMPLE)
LICENSE NO.	(INFO WITHHELD FOR PUBLIC SAMPLE)
ADDRESS	(INFO WITHHELD FOR PUBLIC SAMPLE)
PHONE	(INFO WITHHELD FOR PUBLIC SAMPLE)
CONTRACTOR SIGNATURE	

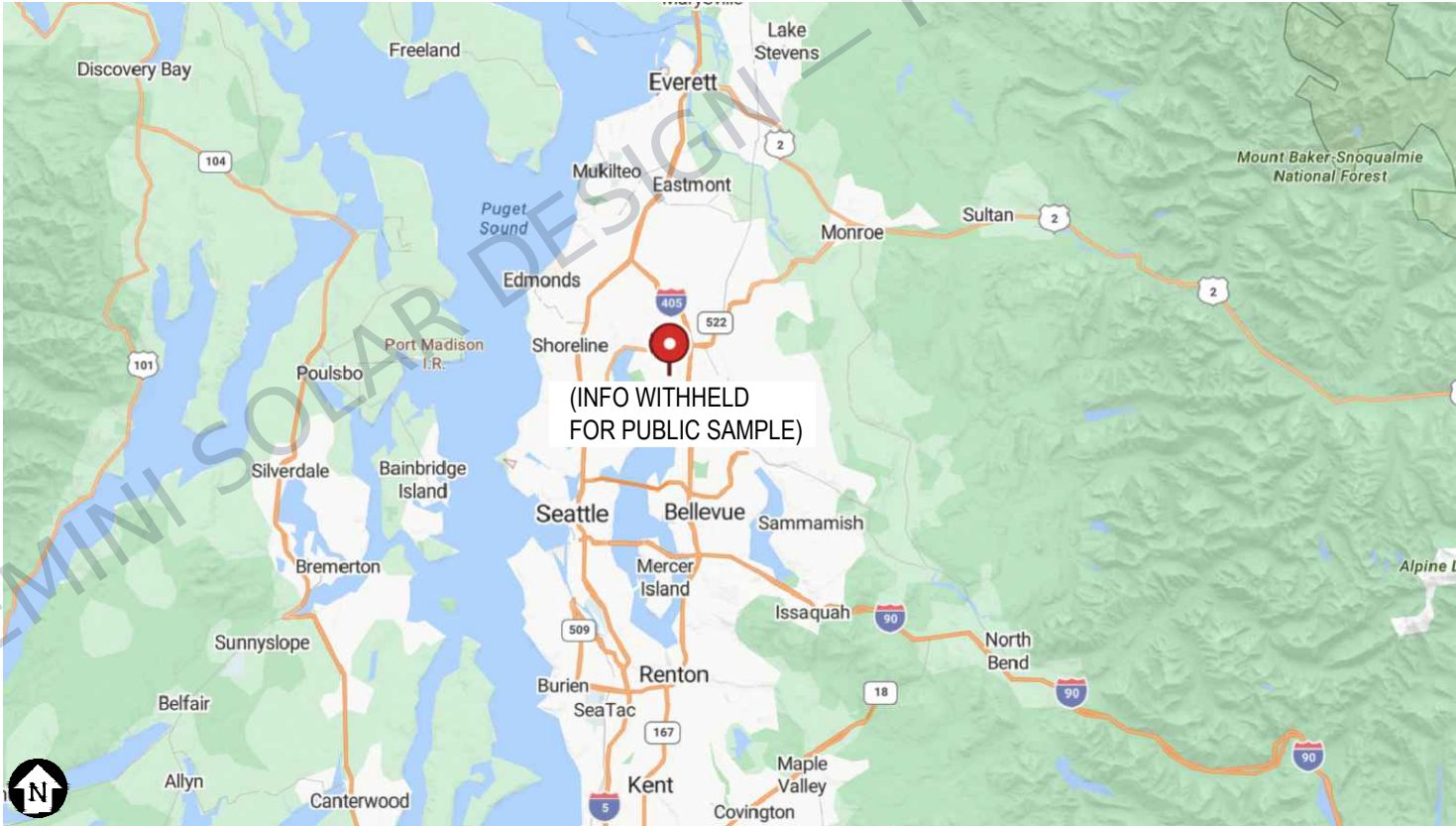
PLAN DESIGNER INFORMATION	
COMPANY	GEMINI SOLAR DESIGN, LLC.
NAME	SANJAY CHRISTOPHER MALLIPUDI
ADDRESS	495 HOWARD HEIGHTS ROAD FRESHWATER, CA 95503
PHONE	(609) 802-5743
PLAN DESIGNER SIGNATURE	Sanjay Mallipudi

SYSTEM DETAILS	
DC RATING OF SYSTEM	11.250W
AC OUTPUT CURRENT	48A @ 240VAC
PV MODULE	(25) AUXIN SOLAR AXN10M450Z
STRINGING CONFIGURATION	1 STRING OF 8 MODULES (MPPT #1) 1 STRING OF 8 MODULES (MPPT #2) 1 STRING OF 9 MODULES (MPPT #3)
BATTERY / INTEGRATED INVERTER	(1) FRANKLINWH aPOWER S

SITE SPECIFICATIONS	
UTILITY SERVICE	120 / 240VAC, 1-Ø, 3-WIRE
METER / MAIN COMBINATION PANEL (SERVICE-ENTRANCE)	200A / 2P MAIN BREAKER
ASHRAE EXTREME ANNUAL MEAN MINIMUM DENSITY DRY BULB TEMP.	-7°C
ASHRAE 2% ANNUAL DRY DENSITY BULB TEMP.	29°C
DESIGN WIND SPEED	110 MPH
DESIGN SNOW LOAD	25 PSF
WIND EXPOSURE CATEGORY	B
RISK CATEGORY	II



1 PLOT
PV-1 SCALE: NTS



2 LOCALE
PV-1 SCALE: NTS

CONSTRUCTION NOTES	
1	CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO INITIATING CONSTRUCTION.
2	CONTRACTOR SHALL REVIEW ALL MANUFACTURER INSTALLATION DOCUMENTS PRIOR TO INITIATING CONSTRUCTION.
3	ALL EQUIPMENT SHALL BE LISTED BY THE U.L. (OR EQUAL) AND LISTED FOR ITS SPECIFIC APPLICATION.
4	ALL EQUIPMENT SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.
5	ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6	ACCESS TO ELECTRICAL COMPONENTS OVER 150 VOLTS TO GROUND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL.
7	ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 VOLTS AND 90°C WET ENVIRONMENT, UNLESS OTHERWISE NOTED.
8	WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, CONTRACTOR SHALL SIZE THEM ACCORDING TO APPLICABLE CODES.
9	PV MODULES FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER G.E.C. PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEET.
10	PV MODULES RACKING RAIL SHALL BE BONDED TO BARE COPPER G.E.C VIA WEEB LUG, ILSCO GBL-4DBT LAY-IN LUG, OR EQUIVALENT LISTED LUG.
11	GROUNDING ELECTRODE CONDUCTOR (G.E.C) SHALL BE CONTINUOUS AND/OR IRREVERSIBLY SPLICED
12	ALL JUNCTION BOXES, COMBINER BOXES, AND DISCONNECTS SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION.
13	WORKING SPACE AROUND ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC SECTION 110.26.

SCOPE OF WORK DESCRIPTION	
THE PROPOSED SYSTEM IS A FLUSH ROOF MOUNTED PHOTOVOLTAIC ARRAY UTILIZING THE FRANKLINWH aPOWER S INTEGRATED DC STRING INVERTER, WITH APSYSTEMS MODULE LEVEL RAPID SHUTDOWN UNITS. THE FRANKLINWH aPOWER S ALSO FUNCTIONS AS A STORAGE BATTERY, WHICH SHALL BE CONFIGURED IN A WHOLE HOME BATTERY-BACKUP APPLICATION.	
THE PHOTOVOLTAIC (PV) SYSTEM IS TO BE INSTALLED ON THE RESIDENTIAL ZONED PROPERTY IN THE CITY OF KIRKLAND, KING COUNTY, WASHINGTON.	
THE ENERGY PRODUCED BY THE PV SYSTEM SHALL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ON-SITE ELECTRICAL EQUIPMENT VIA A LOAD-SIDE POINT OF INTERCONNECTION.	

(LOGO WITHHELD FOR SAMPLE)

(INFO WITHHELD)
PHONE: (INFO WITHHELD)
LICENSE NO. (INFO WITHHELD)

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

PROJECT INFO

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

PV-1



(LOGO WITHHELD FOR SAMPLE)

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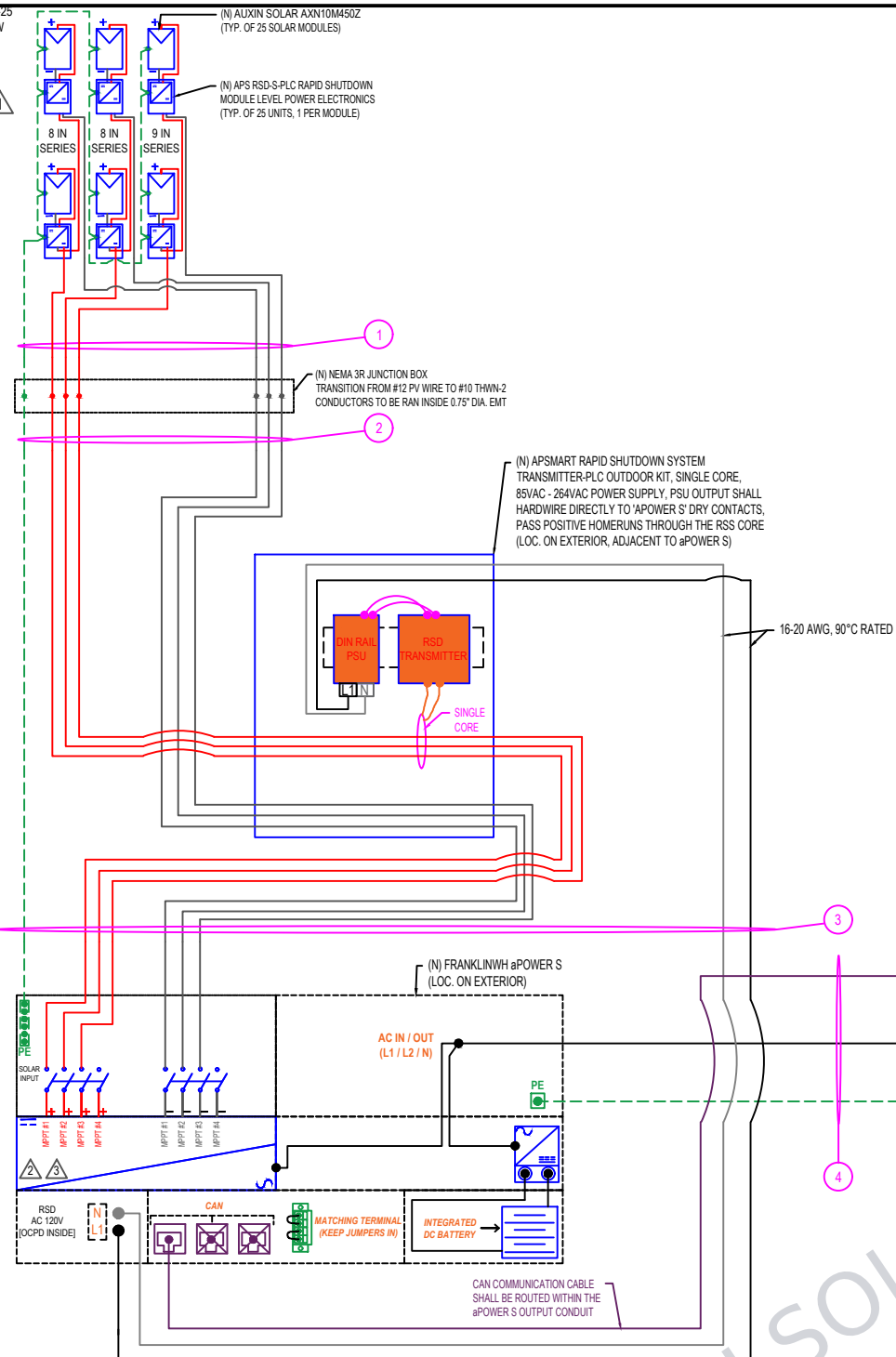
SITE PLAN

PROJECT NO: GSD-20260723-SCM
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DATE: 7/23/2026

PV-2



PM1-25
450W



EMERGENCY POWER OFF SWITCH WIRING INSTRUCTIONS

Install an optional Emergency Power Off Switch

When a system fault or abnormal event occurs, such as thermal runaway, battery over-voltage, or a component failure, it is essential to have a means to quickly disconnect the system from the grid and the battery to prevent further damage or injury. The external EPO switch is optional. Consult your local AHJ or safety officer regulations.

NOTE

If the external EPO switch is not connected to the FranklinWH System, the factory-installed EPO switch will remain in the "ON" position. The factory-installed EPO switch will remain in the "ON" position.

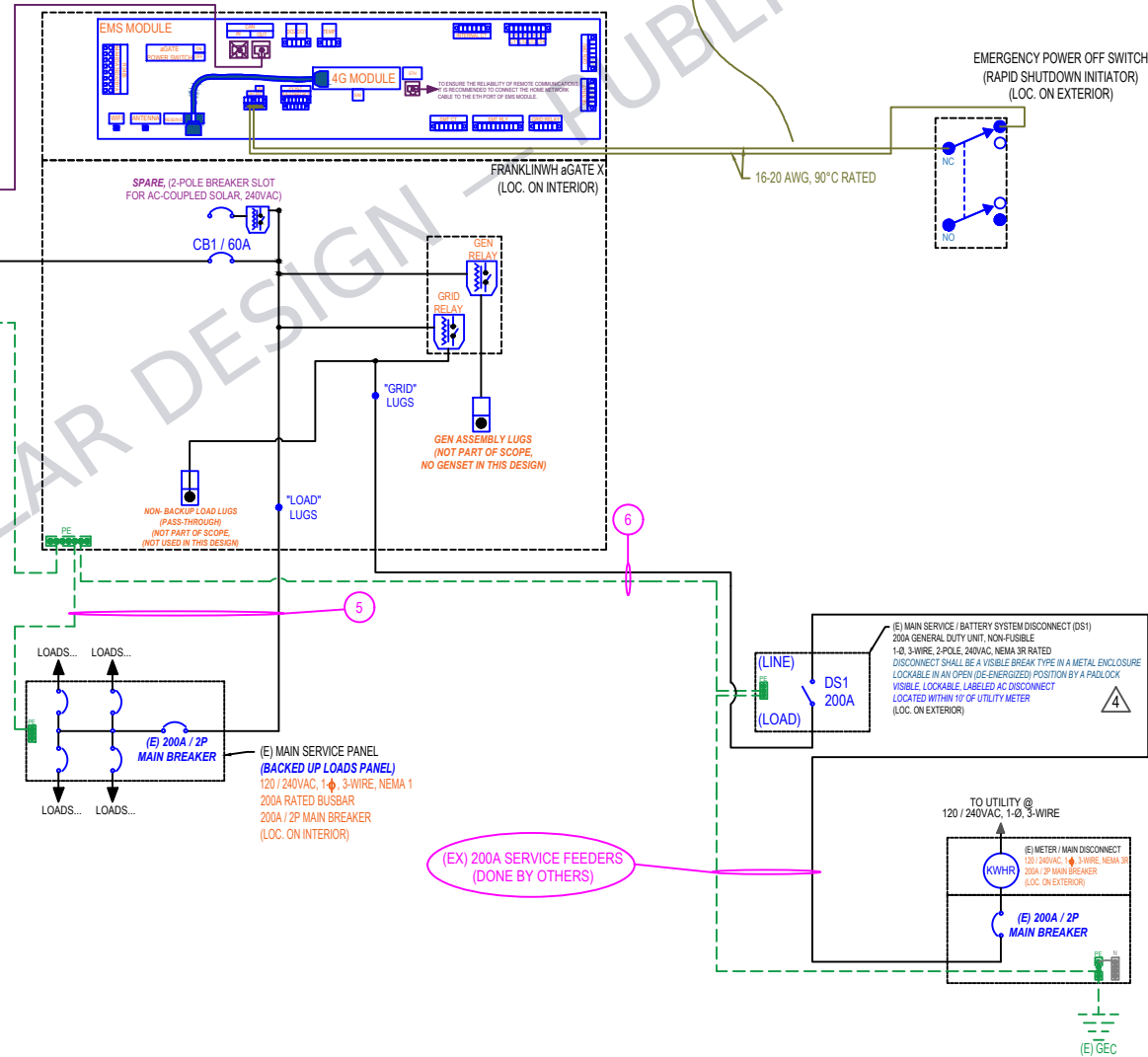
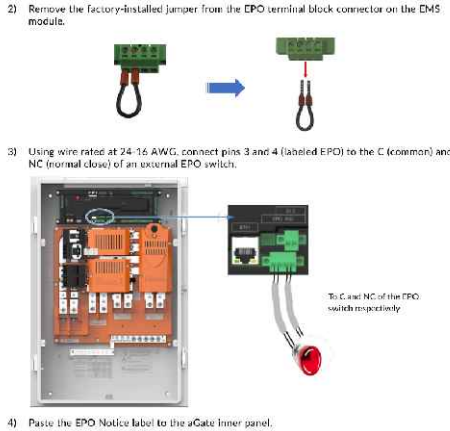
Conditions for EPO Switch Operation and Installation

- The external EPO switch must be labeled as "EPO" and be rated for 120V AC.
- The external EPO switch must be installed in a location accessible to the AHJ.
- The external EPO switch must be installed in a location accessible to the AHJ.
- The external EPO switch must be installed in a location accessible to the AHJ.
- The external EPO switch must be installed in a location accessible to the AHJ.

- 1) Make sure the external EPO switch is connected to the FranklinWH System. When the external EPO switch is connected, the factory-installed EPO switch will remain in the "ON" position.

WARNING

When the EPO switch is pressed, the EPO switch will disconnect the EPO switch from the FranklinWH System. The external EPO switch must be installed in a location accessible to the AHJ.



PLEASE FIND ALL RELEVANT TABLES,
SYSTEM DETAILS, AND DISCONNECT /
OCPD SCHEDULES ON SHEET PV-3B.

PLEASE FIND THE CORRESPONDING WIRE
& CONDUCTOR SCHEDULE ON SHEET PV-3C.

SEPARATE SHEETS WERE CREATED
DUE TO SPACE LIMITATIONS.

(LOGO WITHHELD FOR SAMPLE)

(INFO WITHHELD)

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11.25kW DC GRID-TIED SYSTEM

WITH BATTERY STORAGE

(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

SINGLE-LINE DIAGRAM

PROJECT NO: GSD-20260723-SCM

DRAWN BY: SCM

DATE: 7/23/2026

PV-3A

PV MODULE								
REF.	TYP.	MODULE	STC POWER	ISC	IMP	VOC	VMP	SERIES FUSE RATING
PM1-25	25	AUXIN SOLAR AXN10M450Z	450W	13.83A	12.95A	41.51V	34.76V	30A

BATTERY / INTEGRATED STRING INVERTER										
TYP.	MODEL	MAXIMUM CONTINUOUS CURRENT	AC VOLTAGE	MAXIMUM SOLAR STC INPUT	PV DC MPPT VOLTAGE RANGE	MPPTs	MAXIMUM SHORT CIRCUIT CURRENT PER MPPT (Isc)	USABLE SYSTEM ENERGY	POWER SCALABILITY	SOLAR TO HOME / GRID - CEC EFFICIENCY
1	FRANKLINWH aPOWER S	21A / 32A / 40A / 48A	240VAC	20,000W	90 - 480 VDC	4	20A	15 kWh PER UNIT	UP TO 15 aPOWER S UNITS PER aGATE X	97.5%

MODULE LEVEL RAPID SHUTDOWN (MLPE)									
TYP.	MODEL	NEC 690.12 COMPLIANT	INPUT OPERATING VOLTAGE RANGE	MAXIMUM CONT. INPUT CURRENT (IMAX)	MAXIMUM SHORT CIRCUIT CURRENT (ISC)	MAXIMUM SYSTEM VOLTAGE	MAXIMUM SERIES FUSE RATING	CABLE CROSS SECTION SIZE	
25	APS RSD-S-PLC RAPID SHUTDOWN	YES	8VDC - 80VDC	15A	25A	1000VDC / 1500VDC	30A	12 AWG	

SYSTEM SUMMARY	
ARRAY STC POWER	11,250W
ARRAY CIRCUITS	1 X 8 (MPPT #1) 1 X 8 (MPPT #2) 1 X 9 (MPPT #3)
ARRAY VMP @ STC (25°C)	278.08VDC (MPPT #1) 278.08VDC (MPPT #2) 312.84VDC (MPPT #3)
ARRAY VOC @ STC (25°C)	332.08VDC (MPPT #1) 332.08VDC (MPPT #2) 373.59VDC (MPPT #3)
MAXIMUM ARRAY VOC @ MIN. TEMP (-7°C)	358.0VDC (MPPT #1) 358.0VDC (MPPT #2) 402.8VDC (MPPT #3)
ARRAY INPUT CURRENT (Isc) @ STC	13.83A (MPPT #1) 13.83A (MPPT #2) 13.83A (MPPT #3)
CONTINUOUS AC OUTPUT CURRENT	48A @ 240VAC

SCHEMATIC NOTES	
1	MAXIMUM STRING VOLTAGE OF ARRAY AT DESIGN LOW TEMPERATURE OF -7°C WOULD BE 402.8VDC.
2	INTEGRATED DC DISCONNECT IS PROVIDED WITH INVERTER. DISCONNECT IS LISTED FOR USE WITH FRANKLINWH UL 1741 LISTED aPOWER S WITH INTEGRATED STRING INVERTER.
3	PHOTOVOLTAIC OUTPUT STRINGS ARE COMBINED INSIDE THE INVERTERS' DC INTEGRATED DISCONNECT.
4	THE AC DISCONNECT SHALL BE A VISIBLE, LOCKABLE, KNIFE SWITCH DISCONNECT AS PER THE UTILITY.

OTHER DESIGN NOTES	
1	LARGEST BACKED UP BREAKER IS < OR = TO 60A / 240VAC
2	ALL BATTERY BREAKERS TO BE SECURED UTILIZING APPROVED HOLD DOWNS

AC DISCONNECT SCHEDULE				
REF.	POLES	CURRENT RATING	FUSIBLE	MAX. VOLTAGE
MAIN SERVICE / BATTERY SYSTEM DISCONNECT (DS1) 2-POLE KNIFE TYPE (NON-FUSIBLE), GENERAL DUTY UNIT	2	200A	NO	240VAC

OCPD SCHEDULE				
REF.	TYP.	POLES	CURRENT RATING	MAX. VOLTAGE
CB1 (CIRCUIT BREAKER, FRANKLINWH aPOWER S)	1	2	60A	240VAC

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

SINGLE-LINE DIAGRAM

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

PV-3B

CONDUCTOR SCHEDULE WITH NEC ELECTRICAL CALCULATIONS																
ID	TYP	DESCRIPTION	CONDUCTOR	CONDUIT	NO. OF CURRENT CARRYING CNDRS. IN CNDT.	FILL %	RATED AMPS	OCPD	EGC	TEMP. CORR. FACTOR @ 90°C TEMP. RATING	FILL ADJ. FACTOR	CONT. CURRENT (Isc X 1.25)	MAX. CURRENT (Isc X 1.56)	TERMINAL RATING CHECK (ASSUME 75°C) SHALL EXCEED 1.25X CONT. CURRENT	BASE AMPACITY @ 90°C TEMP. RATING	CONDITIONS OF USE (COU) @ 90°C TEMP. RATING
1	3	DC CIRCUIT: SERIES STRING OUTPUT TO JUNCTION BOX	12 AWG PV WIRE COPPER	FREE AIR	N/A	N/A	13.83A (Isc)	N/A	6 AWG BARE COPPER	0.76 (51°C)	1.0	17.29A (Isc)	21.61A (I_sc)	25A ≥ 21.61A PASS	40A (IN FREE AIR)	30.4A (IN FREE AIR)
2	1	DC CIRCUIT (TRANSITIONED): JUNCTION BOX TO APSYSTEMS TRANSMITTER-PLC OUTDOOR KIT	10 AWG THWN-2 COPPER	0.75" DIA. EMT	6 3 X DC(+) 3 X DC(-)	27.8%	13.83A (Isc)	N/A	10 AWG THWN-2 COPPER	0.76 (51°C)	0.8	17.29A (Isc)	21.61A (I_sc)	35A ≥ 21.61A PASS	40A (IN CONDUIT)	24.32A (IN CONDUIT)
3	1	DC CIRCUIT (TRANSITIONED): APSYSTEMS TRANSMITTER-PLC OUTDOOR KIT TO FRANKLINWH aPOWER S (SOLAR DC TERMINAL BLOCK) APSYSTEMS TRANSMITTER-PLC OUTDOOR KIT TO FRANKLINWH aPOWER S (RSD 120V POWER SUPPLY DRY CONTACTS)	10 AWG THWN-2 COPPER 16 AWG THWN-2 COPPER	0.75" DIA. EMT	6 3 X DC(+) 3 X DC(-) (RSD PSU CIRCUIT IS NOT A CCC)	31.4%	13.83A (Isc)	INTEGRATED DC DISCONNECT WITHIN INVERTER	10 AWG THWN-2 COPPER	0.76 (51°C)	0.8	17.29A (Isc)	21.61A (I_sc)	35A ≥ 21.61A PASS	40A (IN CONDUIT)	24.32A (IN CONDUIT)
4	1	FRANKLINWH aPOWER S OUTPUT: FRANKLINWH aPOWER S TO FRANKLINWH aGATE X FRANKLINWH aPOWER S TO FRANKLINWH aGATE X (CAN COMMUNICATION CABLE)	6 AWG THWN-2 COPPER 16 AWG THWN-2 COPPER	0.75" DIA. EMT	3 (L1, L2, N) X 1 (CAN CABLE IS NOT A CCC)	32.6%	48A	60A / 2P (CB1)	10 AWG THWN-2 COPPER	1.0 (29°C)	1.0	48A	60A	65A ≥ 60A PASS	75A (IN CONDUIT)	75A (IN CONDUIT)
5	1	200A MAIN SERVICE PANEL (BACKED UP LOADS PANEL) OUTPUT: 200A MAIN SERVICE PANEL (BACKED UP LOADS PANEL) TO aGATE X ("LOAD LUGS")	2/0 AWG THWN-2 COPPER (L1 & L2) 1 AWG THWN-2 COPPER (NEUTRAL) (*FROM NEC TABLE 310.12)	2.00" DIA. SCH. 40 PVC	3 (L1, L2, N) X 1	19.8%	200A MAX. OUTPUT	200A / 2P MAIN OCPD (MAIN SERVICE, MAIN BREAKER)	6 AWG THWN-2 COPPER	1.0 (29°C)	1.0	200A MAX. OUTPUT	200A MAX. OUTPUT	200A ≥ 200A PASS (*FROM NEC TABLE 310.12)	200A (IN CONDUIT) (*FROM NEC TABLE 310.12)	200A (IN CONDUIT) (*FROM NEC TABLE 310.12)
6	1	200A MAIN SERVICE / BATTERY SYSTEM DISCONNECT (DS1) OUTPUT: 200A MAIN SERVICE / BATTERY SYSTEM DISCONNECT (DS1) OUTPUT TO aGATE X ("GRID LUGS")	2/0 AWG THWN-2 COPPER (L1 & L2) 1 AWG THWN-2 COPPER (NEUTRAL) (*FROM NEC TABLE 310.12)	2.00" DIA. SCH. 40 PVC	3 (L1, L2, N) X 1	19.8%	200A MAX. OUTPUT	200A / 2P NON-FUSED UTILITY DISCO.	6 AWG THWN-2 COPPER	1.0 (29°C)	1.0	200A MAX. OUTPUT	200A MAX. OUTPUT	200A ≥ 200A PASS (*FROM NEC TABLE 310.12)	200A (IN CONDUIT) (*FROM NEC TABLE 310.12)	200A (IN CONDUIT) (*FROM NEC TABLE 310.12)
ALL CONDUCTORS, OCPD SIZES AND TYPES SPECIFIED ACCORDING TO NEC ARTICLES 690.8(A)(1), NEC ARTICLE 240, AND NEC ARTICLE 690.7.																

A

PV-3C

SINGLE-LINE DIAGRAM
SCALE: N/A

(LOGO WITHHELD FOR SAMPLE)

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

SINGLE-LINE DIAGRAM

PROJECT NO: GSD-20260723-SCM
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PV-3C

OVERALL SYSTEM
RATED AC CURRENT

PHOTOVOLTAIC SYSTEM
AC DISCONNECT

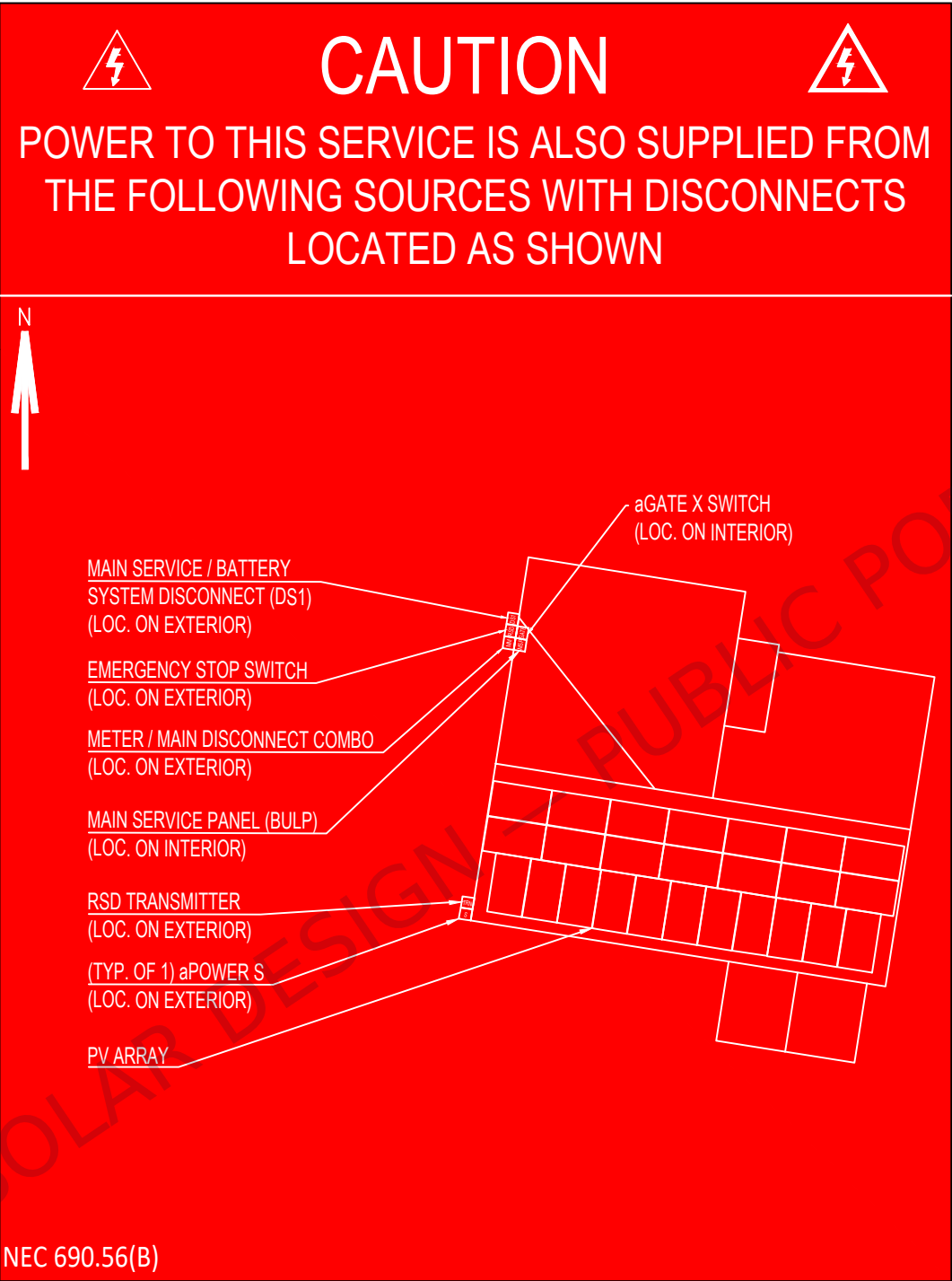
OPERATING CURRENT 48 AMPS
OPERATING VOLTAGE 240 VOLTS
NEC 690.14(C)(2) & NEC 690.54

NET METER

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH
TO THE "OFF" POSITION
TO SHUT DOWN CONDUCTORS
OUTSIDE THE ARRAY
CONDUCTORS WITHIN
THE ARRAY REMAIN
ENERGIZED IN SUNLIGHT

SITE OVERVIEW



RAPID SHUTDOWN
SWITCH FOR
SOLAR PV SYSTEM

WARNING

TRIPLE POWER SUPPLY
SOURCES: UTILITY GRID AND
PV SOLAR ELECTRIC SYSTEM AND
ENERGY STORAGE SYSTEM (ESS)

CURRENT OF BATTERY SYSTEM 48A
VOLTAGE OF BATTERY SYSTEM 240VAC

WARNING

BATTERY SYSTEM RAPID
SHUTDOWN SWITCH. TURN
DIAL TO OFF POSITION TO
SHUTDOWN ESS

WARNING

SOLAR / BATTERY SYSTEM DISCONNECT
PULL HANDLE DOWN TO MANUALLY
DISCONNECT FROM GRID POWER

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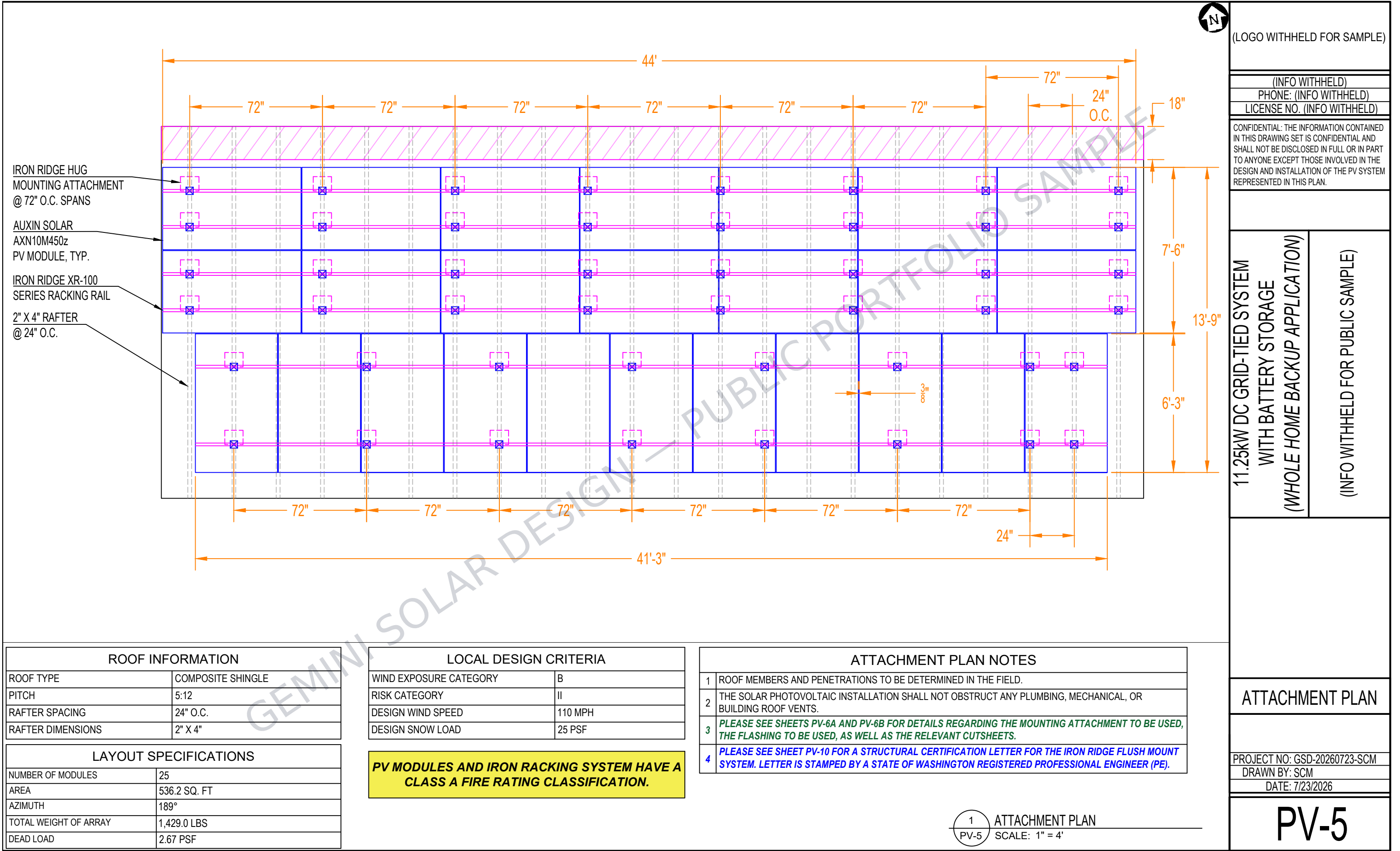
11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

PLACARDS

PROJECT NO: GSD-20260723-SCM
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PV-4



ROOF INFORMATION	
ROOF TYPE	COMPOSITE SHINGLE
PITCH	5:12
RAFTER SPACING	24" O.C.
RAFTER DIMENSIONS	2" X 4"

LAYOUT SPECIFICATIONS	
NUMBER OF MODULES	25
AREA	536.2 SQ. FT
AZIMUTH	189°
TOTAL WEIGHT OF ARRAY	1,429.0 LBS
DEAD LOAD	2.67 PSF

LOCAL DESIGN CRITERIA	
WIND EXPOSURE CATEGORY	B
RISK CATEGORY	II
DESIGN WIND SPEED	110 MPH
DESIGN SNOW LOAD	25 PSF

PV MODULES AND IRON RACKING SYSTEM HAVE A CLASS A FIRE RATING CLASSIFICATION.

ATTACHMENT PLAN NOTES	
1	ROOF MEMBERS AND PENETRATIONS TO BE DETERMINED IN THE FIELD.
2	THE SOLAR PHOTOVOLTAIC INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
3	PLEASE SEE SHEETS PV-6A AND PV-6B FOR DETAILS REGARDING THE MOUNTING ATTACHMENT TO BE USED, THE FLASHING TO BE USED, AS WELL AS THE RELEVANT CUTSHEETS.
4	PLEASE SEE SHEET PV-10 FOR A STRUCTURAL CERTIFICATION LETTER FOR THE IRON RIDGE FLUSH MOUNT SYSTEM. LETTER IS STAMPED BY A STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER (PE).

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

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ATTACHMENT PLAN

PROJECT NO: GSD-20260723-SCM
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PV-5



Tech Brief

QuickMount® HUG

The Respect Your Roof Deserves

When integrating with a home, solar attachments must be dependable for the lifetime of the rooftop. Due to recent innovations, many asphalt shingles have bonded courses. A mount that protects without the need to pry shingles can really speed things up.

Halo UltraGrip™ (HUG™) is here to respect the roof. Its Halo is a cast-aluminum barrier that encases the UltraGrip, our industrial-grade, foam-and-mastic seal. This allows HUG to accelerate the installation process and provide the utmost in waterproofing protection. Give your roof a HUG.™



UltraGrip™ Seal Technology
HUG UltraGrip utilizes a state-of-the-art seal design that uses a unique, foam-and-mastic combination. The foam-backed adhesive provides an entirely new flashing system that conforms and adheres to every nook and cranny of composition shingles, filling gaps and shingle step-downs (up to 1/8" in height).

Multi-Tiered Waterproofing
HUG utilizes a multi-tiered stack of components to provide revolutionary waterproofing protection. The Halo cast-aluminum, raised-perimeter foundation surrounds the UltraGrip base—a foam-backed mastic seal combination that prevents water intrusion by adhering and sealing with the shingle surface.

Halo UltraGrip™ is part of the QuickMount® product line.



Rafter & Deck Mounting Options
Mount HUG to the roof rafters, the roof deck, or both with our custom-engineered RD (rafter-or-deck) Structural Screw. The RD Structural Screw anchors HUG to the roof with an EPDM sealing washer, completing the stack of waterproofing barriers. See backside for more installation information.

Triple Rated & Certified to Respect the Roof™
UL 2703, 441 (27)
TAS 100(A)-95
Intertek

Adaptive, Rafter-Friendly Installation



Hit the rafter? Good to go!
When you find a rafter, you can move on. Only 2 RD Structural Screws are needed.

Miss the rafter? Try it again.
Place another screw to the left or right. If rafter is found, install 3rd and final screw.

Still no luck? Install the rest.
If more than 3 screws miss the rafter, secure six screws to deck mount it.

Trusted Strength & Less Hassle



25-Year Warranty
Product guaranteed free of impairing defects.

Structural capacities of HUG™ were reviewed in many load directions, with racking rail running cross-slope or up-slope in relation to roof pitch.

For further details, see the HUG certification letters for attaching to rafters and decking.

IronRidge designed the HUG, in combination with the RD Structural Screw to streamline installs, which means the following:

- No prying shingles
- No roof nail interference
- No pilot holes necessary
- No sealant (in most cases)
- No butyl shims needed

Attachment Loading

The rafter-mounted HUG has been tested and rated to support 1004 (lbs) of uplift and 368 (lbs) of lateral load.

Structural Design

Parts are designed and certified for compliance with the International Building Code & ASCE/SEI-7.

Water Seal Ratings

HUG passed both the UL 441 Section 27 "Rain Test" and TAS 100(A)-95 "Wind Driven Rain Test" by Intertek.

UL 2703 System

Systems conform to UL 2703 mechanical and bonding requirements. See Flush Mount Manual for more info.

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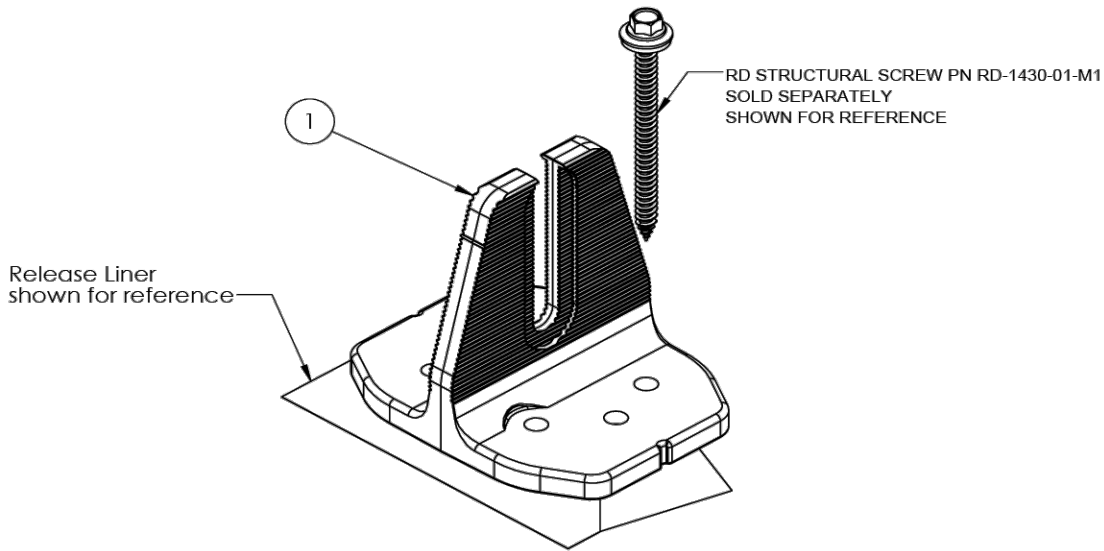
11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

MOUNTING DETAIL

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

PV-6A



Release Liner shown for reference

RD STRUCTURAL SCREW PN RD-1430-01-M1
SOLD SEPARATELY
SHOWN FOR REFERENCE

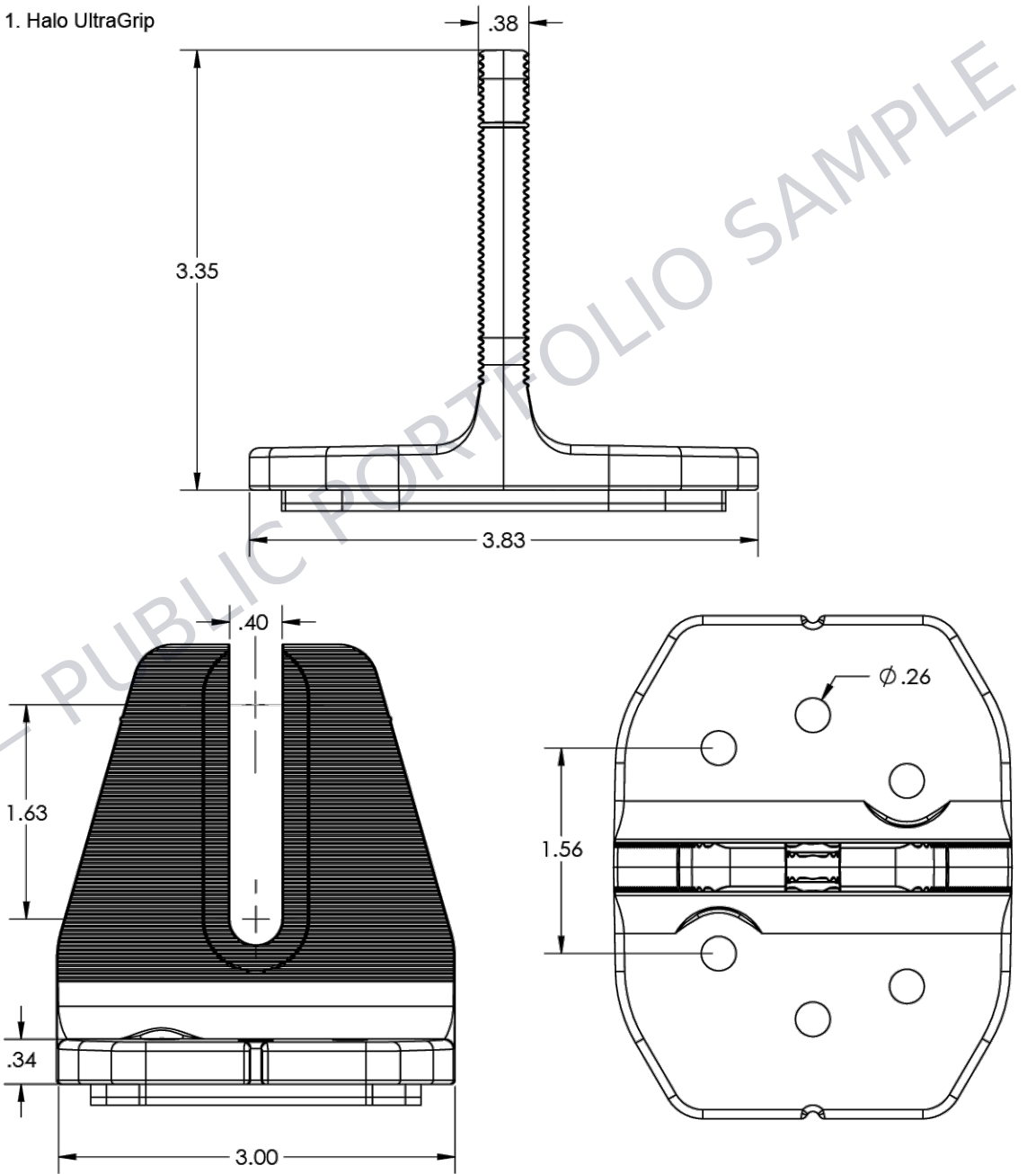
ITEM NO	DESCRIPTION	QTY IN KIT
1	QM Halo UltraGrip(Mill or Black)	1

PART NUMBER	DESCRIPTION
QM-HUG-01-M1	Halo UltraGrip - Mill
QM-HUG-01-B1	Halo UltraGrip - Black

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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

1. Halo UltraGrip



Side Elevation Dimensions: 3.35 (height), 3.83 (base width), .38 (flange thickness)

Front Elevation Dimensions: 1.63 (height), .40 (flange width), .34 (base thickness), 3.00 (base width)

Top View Dimensions: 1.56 (width), $\phi .26$ (hole diameter)

Property	Value
Material	300 Series Aluminium
Finish	Mill or Black

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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

MOUNTING DETAIL

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

PV-6B



Flush Mount System

Datasheet



Built for solar's toughest roofs.

IronRidge builds the strongest mounting system for pitched roofs in solar. Every component has been tested to the limit and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.



Strength Tested

All components evaluated for superior structural performance.



Class A Fire Rating

Certified to maintain the fire resistance rating of the existing roof.



UL 2703 Listed System

Entire system and components meet newest effective UL 2703 standard.



PE Certified

Pre-stamped engineering letters available in most states.



Design Assistant

Online software makes it simple to create, share, and price projects.



25-Year Warranty

Products guaranteed to be free of impairing defects.

XR Rails

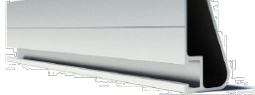
XR10 Rail



A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear and black finish

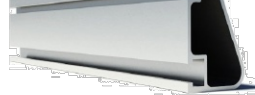
XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear and black finish

XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Bonded Splices

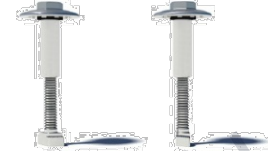


All rails use internal splices for seamless connections.

- Self-drilling screws
- Varying versions for rails
- Forms secure bonding

Clamps & Grounding

UFOs



Universal Fastening Objects bond modules to rails.

- Fully assembled & lubed
- Single, universal size
- Clear and black finish

Stopper Sleeves



Snap onto the UFO to turn into a bonded end clamp.

- Bonds modules to rails
- Sized to match modules
- Clear and black finish

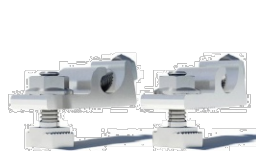
CAMO



Bond modules to rails while staying completely hidden.

- Universal end-cam clamp
- Tool-less installation
- Fully assembled

Grounding Lugs



Connect arrays to equipment ground.

- Low profile
- Single tool installation
- Mounts in any direction

Attachments

FlashFoot2



Flash and mount XR Rails with superior waterproofing.

- Twist-on Cap eases install
- Wind-driven rain tested
- Mill and black finish

Conduit Mount



Flash and mount conduit, strut, or junction boxes.

- Twist-on Cap eases install
- Wind-driven rain tested
- Secures 3/4" or 1" conduit

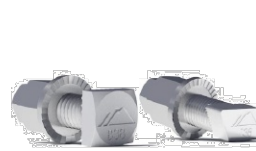
Slotted L-Feet



Drop-in design for rapid rail attachment.

- Secure rail connections
- Slot for vertical adjusting
- Clear and black finish

Bonding Hardware



Bond and attach XR Rails to roof attachments.

- T & Square Bolt options
- Nut uses 7/16" socket
- Assembled and lubricated

Resources



Design Assistant

Go from rough layout to fully engineered system. For free.

Go to IronRidge.com/design



NABCEP Certified Training

Earn free continuing education credits, while learning more about our systems.

Go to IronRidge.com/training

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

RACKING DATASHEET

PROJECT NO: GSD-20260723-SCM

DRAWN BY: SCM

DATE: 7/23/2026

PV-7

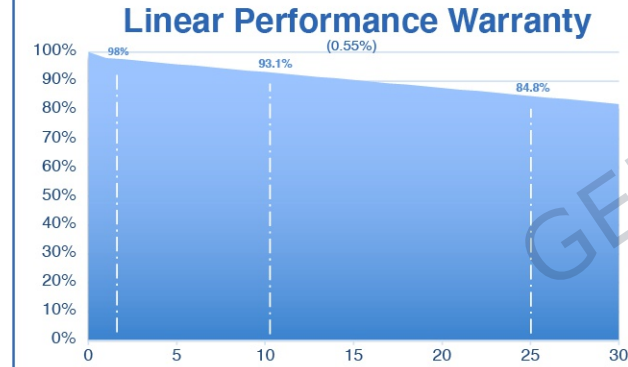
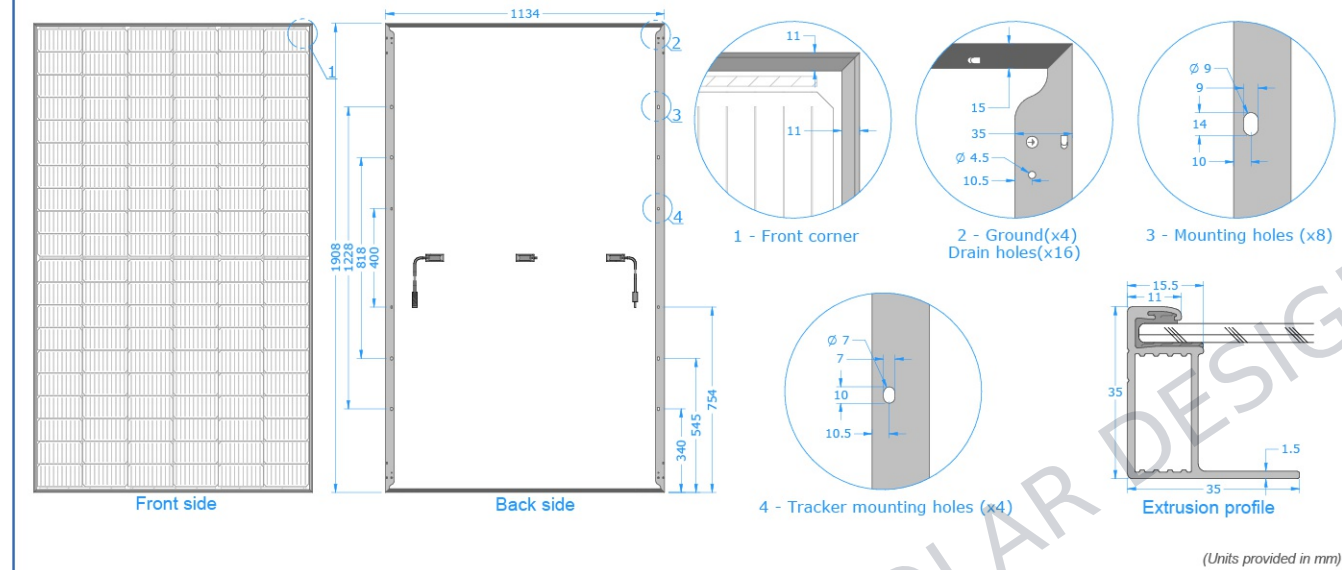


455W

Framed mono-facial single glass

Model Name	AXN10M440z	AXN10M445z	AXN10M450z	AXN10M455z
Maximum Power (+3%)	440	445	450	455
Voc (V)	41.14	41.33	41.51	41.71
Isc (A)	13.64	13.73	13.83	13.91
Vmp (V)	34.44	34.59	34.76	34.93
Imp (A)	12.78	12.87	12.95	13.03
Module Efficiency (%)	20.4%	20.6%	20.8%	21.0%
Series Fuse Rating	30A			
Junction Box Protection	IP68			
Maximum System Voltage	VDC1500			
Operating Temperature	-40°C to 85°C			
Module type	Mono or Bi-Facial			
Connector type	MC4 Compatible ⁱ			
Cable length	12AWG 1200mm ⁱⁱ			
Maximum snow/wind load	5400Pa(snow)/2400Pa(wind)			
Certification/Fire Type	UL61730 ⁱⁱⁱ ; UL1703 Fire Type 1			

i) Staubli MC4 connectors available upon request, ii) Cable length may be customized, iii) Additional certifications available upon request
"z" in the model name can be "B" for black backsheet or "W" for white backsheet



Mechanical Characteristics	
Frame	Anodized Aluminum (Silver and Black)
Dimension (L x W x D)	75.12" x 44.65" x 1.38" 1908mm x 1134mm x 35mm
Weight	24.04 kg/53.00 lbs
Pallet	26 pcs
Container	624pcs/40'; 832pcs/53'
Wind/Snow load	5400Pa(front)/2400Pa(rear)
Temperature Coefficients	
NOCT	45 °C
Short circuit current	+0.040%/C
Open circuit voltage	-0.244%/C
Max power output	-0.319%/C
Standard Test Conditions (STC)	
Irradiance	1000W/m ²
Module Temperature	25 °C
AM	1.50

Auxin Solar, 6835 Via Del Oro, San Jose, CA 95119, USA
+1 408 225-4380 (office)
salesusa@auxinsolar.com
www.auxinsolar.com



120 DC103123 v3.6
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PV MODULE DATASHEET
SCALE: NTS

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

MODULE DATASHEET

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

PV-8



8431 Murphy Drive
Middleton, WI 53562 USA
Telephone: 608.836.4400
Facsimile: 608.831.9279
www.intertek.com

Test Verification of Conformity

In the basis of the tests undertaken, the sample(s) of the below product have been found to comply with the requirements of the referenced specifications at the time the tests were carried out.

Applicant Name & Address:

IronRidge, Inc.
1495 Zephyr Ave.
Hayward, CA 94544
USA

Product Description:

Flush Mount System with XR Rails.

Ratings & Principle Characteristics:

Fire Class Resistance Rating:
-Flush Mount (Symmetrical). Class A Fire Rated for Low Slope applications when using Type 1, 2 and 3, listed photovoltaic modules. Class A Fire Rated for Steep Slope applications with Type1, 2 and 3, listed photovoltaic modules. Tested with a 5" gap (distance between the bottom the module frame and the roof covering), per the standard this system can be installed at any gap allowed by the manufacturers installation instructions. No perimeter guarding is required. This rating is applicable with any IronRidge or 3'rd party roof anchor.

Models:

IronRidge Flush Mount with XR Rails

Brand Name:

IronRidge Flush Mount

Relevant Standards:

UL 2703 (Section 15.2 and 15.3) Standard for Safety Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels, First Edition dated Jan. 28, 2015 Referencing UL1703 Third Edition dated Nov. 18, 2014, (Section 31.2) Standard for Safety for Flat-Plate Photovoltaic Modules and Panels.

Verification Issuing Office:

Intertek Testing Services NA, Inc.
8431 Murphy Drive
Middleton, WI 53562

Date of Tests:

08/27/2014 to 03/17/2015

Test Report Number(s):

101769343MID-001r1, 101769343MID-001a, 101915978MID-001 & 101999492MID-001ar1-cr1.

This verification is part of the full test report(s) and should be read in conjunction with them. This report does not automatically imply product certification.

Completed by:

Chris Zimbrich

Reviewed by:

Chad Naggs

Title:

Technician II, Fire Resistance

Title:

Technician I, Fire Resistance

Signature:

Signature:

Date:

05/25/2016

Date:

05/25/2016

This Verification is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense, or damage occasioned by the use of this Verification. Only the Client is authorized to permit copying or distribution of this Verification. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Verification are relevant only to the sample tested/inspected. This Verification by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

GFT-OP-11a (24-MAR-2014)



Background

All roofing products are tested and classified for their ability to resist fire.

Recently, these fire resistance standards were expanded to include solar equipment as part of the roof system. Specifically, this requires the modules, mounting hardware and roof covering to be tested together as a system to ensure they achieve the same fire rating as the original roof covering.

These new requirements are being adopted throughout the country in 2016.

IronRidge Certification

IronRidge was the first company to receive a Class A Fire Rating—the highest possible rating—from Intertek Group plc., a Nationally Recognized Testing Laboratory.

IronRidge Flush Mount and Tilt Mount Systems were tested on sloped and flat roofs in accordance with the new UL 1703 & UL 2703 test standards. The testing evaluated the system's ability to resist flame spread, burning material and structural damage to the roof.

Refer to the table below to determine the requirements for achieving a Class A Fire Rating on your next project.

System	Roof Slope	Module	Fire Rating*
Flush Mount 	Any Slope	Type 1, 2, & 3	Class A
Tilt Mount 	≤ 6 Degrees	Type 1, 2, & 3	Class A

*Class A rated PV systems can be installed on Class A, B, and C roofs.

Tech Brief

Class A Fire Rating

Fire Testing Process

Test Setup

Solar Modules

Solar modules are given a Type classification based on their materials and construction.

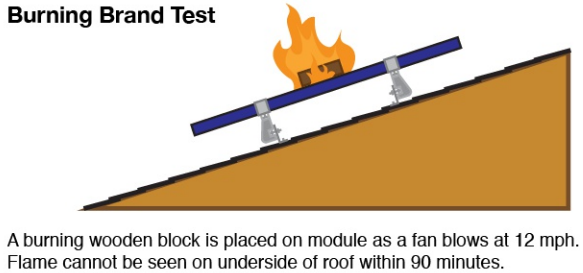
Mounting System

Mounting is tested as part of a system that includes type-tested modules and fire-rated roof covering.

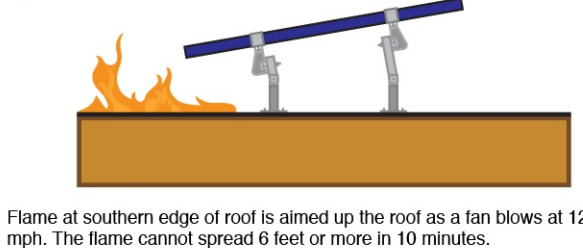
Roof Covering

Roof covering products are given a Fire Class Rating of A, B or C based on their tested fire resistance.

Burning Brand Test



Spread of Flame Test



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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

CLASS A FIRE RATING

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

PV-9



28357 Industrial Blvd.
Hayward, CA 94545
1-800-227-9523
IronRidge.com



28357 Industrial Blvd.
Hayward, CA 94545
1-800-227-9523
IronRidge.com

Attn: Sean McDonald, CEO, IronRidge Inc.
Date: May 31st, 2024

Re: Structural Certification and Span Tables for the IronRidge Flush Mount System

This letter addresses the structural performance and code compliance of IronRidge's Flush Mount System. The contents of the letter shall be read in its entirety before applying to any project design. The Flush Mount System is a proprietary rooftop mounting system used to support photovoltaic (PV) modules installed in portrait or landscape orientation and set parallel to the underlying roof surface. PV modules are supported by extruded aluminum XR Rails and secured to the rails with IronRidge mounting clamps. The XR Rails are side mounted to a selected roof attachment with 3/8" stainless steel bonding hardware and then attached directly to the roof structure or to a stanchion that is fastened to the underlying roof structure. Assembly details of a typical Flush Mount installation and its core components are shown in Exhibit EX-0015.

The IronRidge Flush Mount System is designed and certified to the structural requirements of the reference standards listed below, for the load conditions and configurations tabulated in the attached span tables.

- ASCE/SEI 7-16 Minimum Design Loads for Buildings and Other Structures (ASCE 7-16)
- 2021 International Building Code (IBC-2021)
- 2021 Washington State Building Code
- 2020 Aluminum Design Manual (ADM-2020)
- Report SEAOC (Structural Engineer Association of California) PV2-2017 Wind Design for Solar Arrays

The tables included in this letter provide the maximum allowable spans of XR Rails in the Flush Mount System for the respective loads and configurations listed, covering wind exposure categories B, C, & D, roof zones provided in ASCE 7-16 for gable & hip roof profiles, and roof slopes of 8° to 45°. The tabulated spans are applicable when the following conditions are met:

1. *Span* is the distance between two adjacent roof attachment points (measured at the center of the attachment fastener).
2. Each module shall be supported by 2 rails (2 rail system) or 3 rails (3 rail system). Spans are calculated based on 2 rail systems, and conservatively deemed acceptable for 3 rail systems.
3. The underlying roof slope, measured between the roof surface and horizontal plane, is 8° to 45°.
4. The *mean roof height*, defined as the average of the roof eave height and the roof ridge height measured from grade, does not exceed 30 feet.
5. A clearance from the underside of the array to the roof surface of 2" minimum shall be provided and the height of the array, the distance from the module top surface to the roof surface (defined as h_2), shall not exceed 10".
6. Module length and area shall not exceed the maximum values listed on the respective span tables.
7. All Flush Mount components shall be installed in a professional workmanlike manner per IronRidge's *Flush Mount Installation Manual* and other applicable standards for the general roof construction practice.

The span tables provided in this letter are certified based on the structural performance of IronRidge XR Rails only with no consideration of the structural adequacy of the chosen roof attachments, PV modules, or the underlying roof supporting members. It is the responsibility of the installer or system designer to verify the structural capacity and adequacy of the aforementioned system components in regards to the applied or resultant loads of any chosen array configuration. This letter certifies the IronRidge products referenced within this document and provides no determination of the project specific conditions including site loads, building profile, & roof zones, which remain the responsibility of the installer or system designer.

Sincerely,



Matthew S Kuzila, P.E.

Digitally Sealed 05.31.2024



STATE OF WASHINGTON ENGINEERING LETTER
SCALE: NTS

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

ENGINEERING LETTER

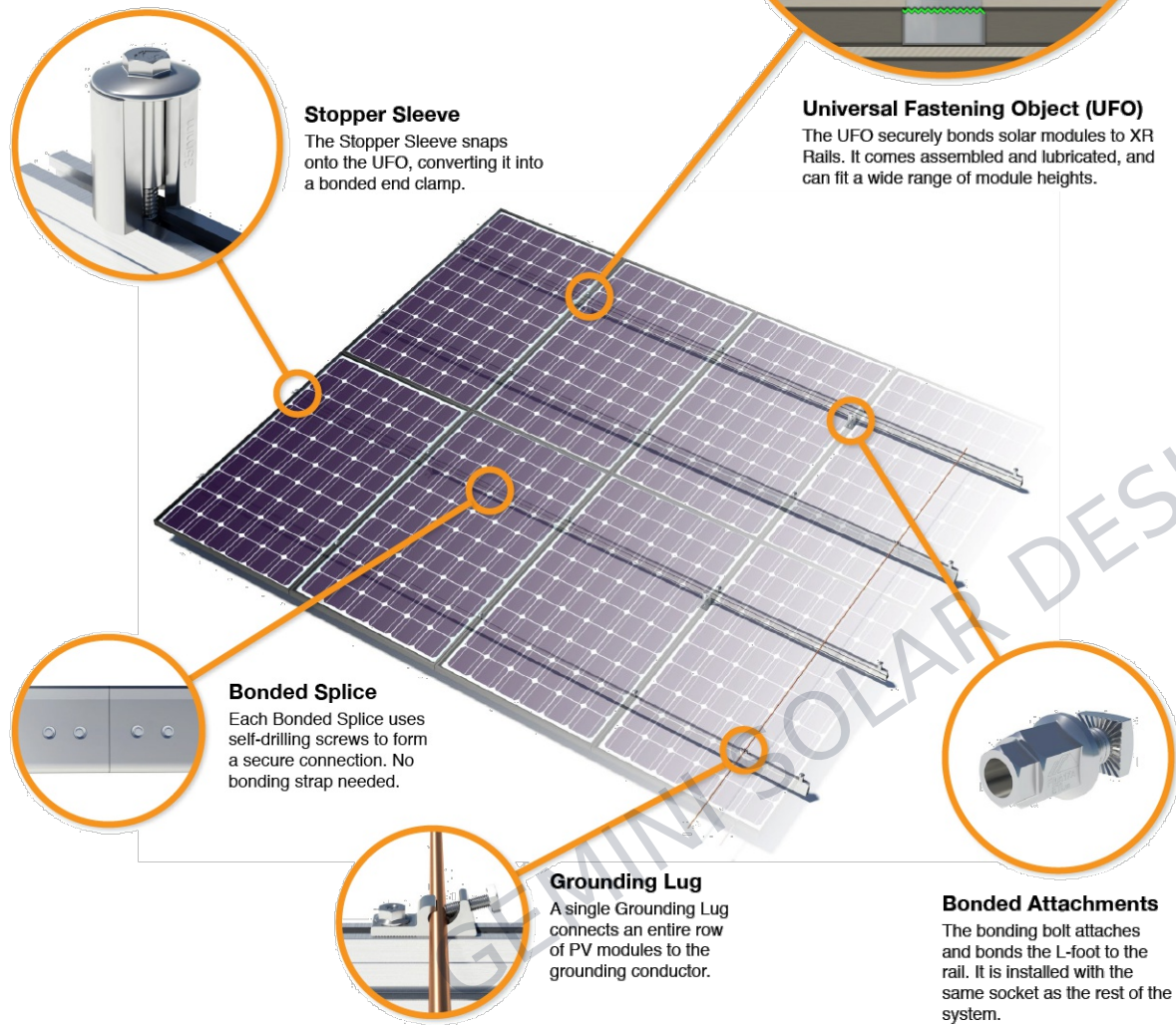
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PV-10

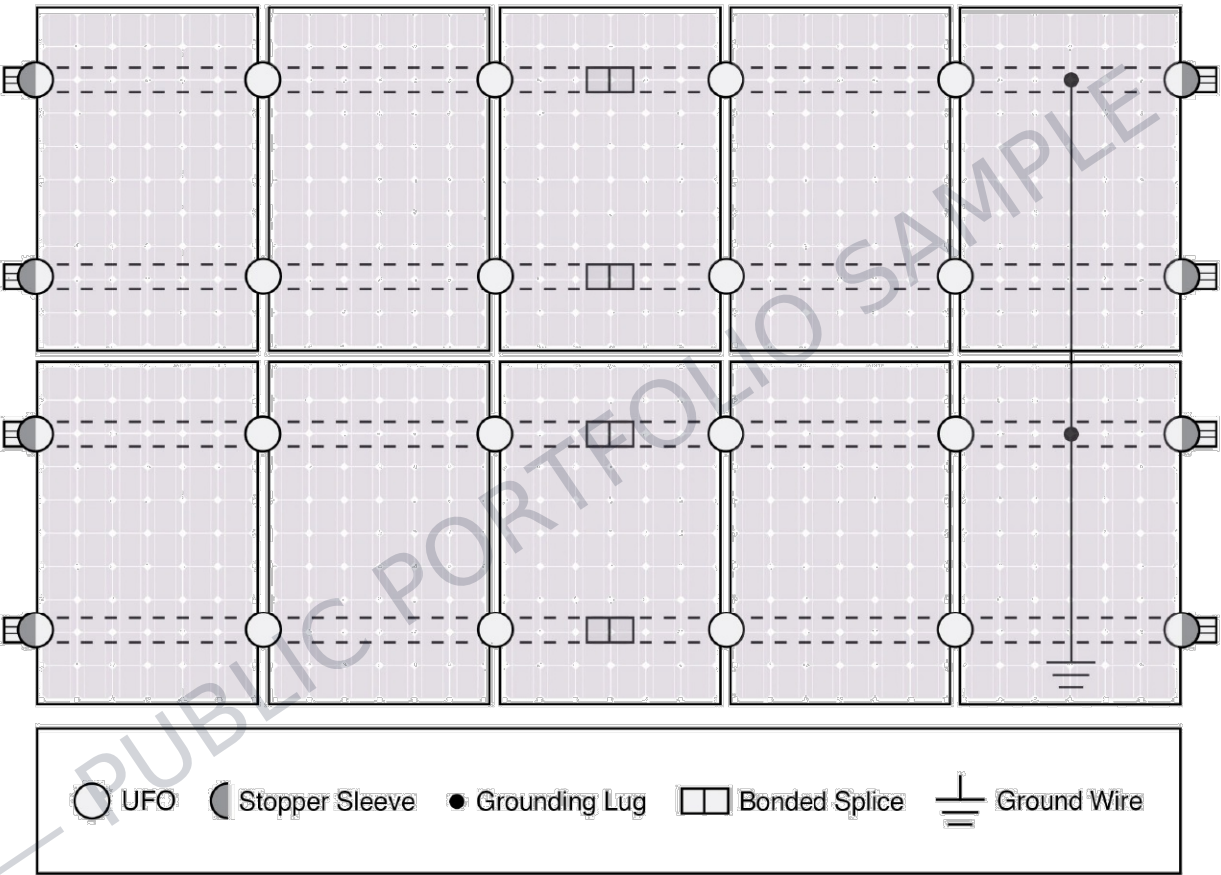
Simplified Grounding for Every Application

The UFO family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge XR Rails. All system types that feature the UFO family—Flush Mount, Tilt Mount and Ground Mount—are fully listed to the UL 2703 standard.

UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



System Diagram



Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

UL Certification

The IronRidge Flush Mount, Tilt Mount, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

[Go to IronRidge.com/UFO](https://www.ironridge.com/UFO)

Cross-System Compatibility			
Feature	Flush Mount	Tilt Mount	Ground Mount
XR Rails	✓	✓	XR1000 Only
UFO/Stopper	✓	✓	✓
Bonded Splice	✓	✓	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Enphase - M250-72, M250-60, M215-60, C250-72 Darfon - MIG240, MIG300, G320, G640 SolarEdge - P300, P320, P400, P405, P600, P700, P730		
Fire Rating	Class A	Class A	N/A
Modules	Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list.		

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

GROUNDING DETAILS

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

aGate

Intelligent energy management system

The aGate serves as the controller for all home power sources by interconnecting solar, grid, batteries, and a standby generator to supply electricity to the home. It seamlessly transitions the home supply from grid power to backup power so that always-on appliances, such as the refrigerator and network router, will not be affected when the grid goes down.

The aGate can be installed at the service entrance, connected to the main load center, or used as a load center.



Robust

- ✓ Micro-grid interconnect device (MID)
- ✓ EMS Integrated PV and grid metering
- ✓ UL1741 certified PCS function & 280A busbar to avoid Main Panel Upgrades
- ✓ 12-year limited warranty



Flexible

- ✓ Compatible with micro and string solar inverter
- ✓ Indoor and outdoor / wall-mounted



Hassle-free

- ✓ Precise control of electricity usage through Smart Circuits Module
- ✓ Standby generator integration via generator module
- ✓ Remarkable black start function ensures battery charge after a prolonged outage or extended trip
- ✓ Vehicle to loads (V2L) function to power essential home appliances during an emergency
- ✓ Commissioning through the aGate Wifi hotspot or Bluetooth



Easy installation

- ✓ Built-in design Smart Circuits and Generator Modules
- ✓ Conduit entry options from the bottom, left, or right



DATASHEET

PERFORMANCE SPECIFICATIONS

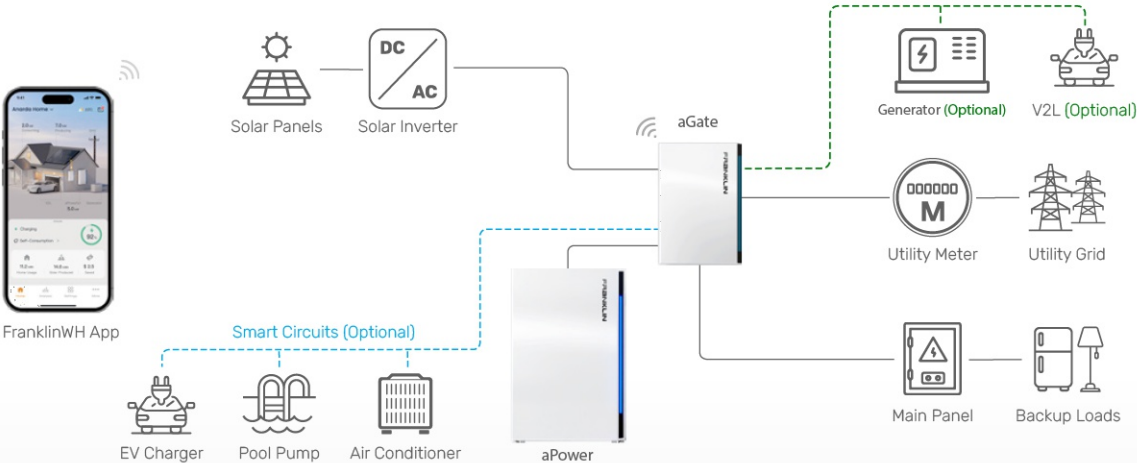
Model Number	aGate X
Coupling	AC-coupled
Nominal AC Voltage	120 / 208 V, 120 / 240 V, 60 Hz
Phase	2 W+N+PE
aPower Over Current Protection Device	125 A Max
Solar Input Over Current Protection Device	80 A Max
Backup Load Port Over Current Protection Device	200 A Max
Generator Over Current Protection Device ¹	200 A Max
Smart Circuits Over Current Protection Device ²	Opt. a 1 × 80 A Max @ 208 V / 240 V & 1 × 50 A Max @ 208 V / 240 V Opt. b 1 × 80 A Max @ 208 V / 240 V & 2 × 50 A Max @ 120 V
Maximum Supply Fault Current	22 kA
Busbar Rating	280 A
Work Modes	Self-Consumption, Time of Use, Emergency Backup
Communications	Ethernet / 4G / Wifi / Bluetooth
User Interface	FranklinWH App
Warranty	12-year limited

COMPLIANCE INFORMATION

Certifications	UL 1741, UL 1741 PCS, UL 67, UL 869A, UL 916, CAN / CSA C22.2 No. 107.1-16, CSA C22.2 No. 29, CSA C22.2 No. 0.19
Seismic	AC 156, OSHPD, IEEE 693-2005 (high)
Environmental	California Proposition 65 RoHS Directive 2011 / EU
Emissions	FCC Part 15 Class B, ICES 003

Franklin Home Power Solution

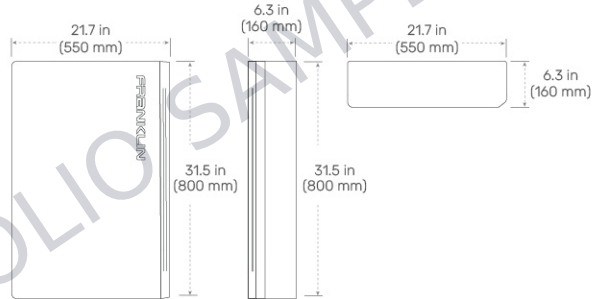
Whole Home Backup



Address: 1731 Technology Dr., Suite 530 San Jose, CA 95110 Telephone: +1 888-837-2655 Email: info@franklinwh.com Website: www.franklinwh.com
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MECHANICAL SPECIFICATIONS

Dimensions (H × W × D)	31.5 in × 21.7 in × 6.3 in (800 mm × 550 mm × 160 mm)
Weight	38.6 lb (17.5 kg)
Mounting	Wall mount



1. Generator Module is optional.
2. Smart Circuit Module is optional.

ENVIRONMENTAL SPECIFICATIONS

Enclosure Type	NEMA 3R
Operating Temperature	-4°F to 122°F (-20°C to 50°C)
Operating Humidity (RH)	Up to 100% RH, condensing
Altitude	Maximum 9,843 ft (3,000 m)
Environment	Indoor and outdoor rated

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

aGATE X DATASHEET

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

PV-12

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 ³
- Battery Only	10 kW continuous ³
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

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DATASHEET

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	21A	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

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

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

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

MECHANICAL SPECIFICATIONS

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



- At beginning of life: 3 kW charge/discharge power, 77° F (25° C).
- At rated power of 11.5 kW.
- Tested in accordance with the CEC-weighted efficiency approach.
- For more details, please refer to the FranklinWH System Limited Warranty for End Users available in the Documentation Center on the FranklinWH website.
- 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.
- 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).

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.

Address: 1731 Technology Dr., Suite 530 San Jose, CA 95110 Telephone: +1 888-837-2655 Email: info@franklinwh.com Website: www.franklinwh.com

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

aPOWER S DATASHEET

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

PV-13



Certificate of Compliance

Certificate: 80211057 Master Contract: 301950
Project: 80250174 Date Issued: 2025-05-20
Issued To: FranklinWH Energy Storage Inc.
8 The Green, Ste A
Dover, Delaware 19901
United States
Attention: Kevin Song

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.



Issued by: Ky Huang
Ky Huang

PRODUCTS
CLASS - C3701 08 - BATTERIES – Electrical Energy Storage System
CLASS - C3701 88 - BATTERIES – Electrical Energy Storage System - Certified to US Standard.

AC Li-ion Battery Energy Storage System (AC ESS), Models aPower Xyyy, aPower Syyy (“y” in the model name could be A-Z, 0-9, symbol “-” or blank, which is for market purpose only and no technical difference.). ESS Models aPower Xyyy and aPower Syyy are the same, except for the Power Conversion System they used with are different, refer to Report 80211051, Pro#80246154 for the details of the PCS.

Refer to following table for component of Pre-Engineered of Matched Component ESS.

Component	Function
Battery module	Part of aPower Xyyy, aPower Syyy
Power Conversion Equipment (PCS)	Part of aPower Xyyy, aPower Syyy
Wiring connection compartment	Part of aPower Xyyy, aPower Syyy
Smart switch (Power distribution unit)	Model aGate Xyyy, control of the operation of aPower Xyyy, aPower Syyy



Certificate: 80211057 Master Contract: 301950
Project: 80250174 Date Issued: 2025-05-20

Electrical Ratings:
Refer to below table for the ratings of the Battery Energy Storage System:

Rating/Model	ESS Model:
	aPower Xyyy, aPower Syyy
Main ESS Rating	
Output current (maximum continuous) for each power port (Amps)	AC port Output: 48A
Input current (maximum continuous) for each power port (Amps)	AC port Input: 38A
Output voltage (minimum and maximum) for each power port (Volts)	AC port Output: 120/240V, 120/208V (L1, L2, N)
Input voltage (minimum and maximum) for each power port (Volts)	AC port Input: 120/240V, 120/208V (L1, L2, N)
Power input (maximum continuous) for each power port (W/kW or VA/kVA)	AC port Input: 9200 VA (L-L)
Power output (maximum continuous) for each power port (W/kW or VA/kVA)	AC port Output: 5750 VA (L-N), 11500 VA (L-L)
Energy storage capacity (maximum) (Wh/kWh)	15kWh
Frequency (Hz) (Indicate if main input/output is DC)	AC port Input/Output: 60Hz
Number of phases for each power port	AC port Input or Output: split phase with neutral or without neutral
Input short-circuits current rating (SCCR) (A/kA)	950A
Maximum overcurrent protective device rating (Amps)	200A
Output available fault current and time duration (A/kA and Second/Mili-Second)	950A / 50ms

Other Rating	
ESS Identification	AC ESS
ESS Type	Multipart ESS
Operating ambient temperature (°C)	Inverter: -20°C ~ 50°C, derating above at +40°C. Battery System: 0°C ~ 50°C (Charge); -20°C ~ 50°C (Discharge)
Weight of system (kg)	aPower Xyyy: Approx. 162kg (PCS + Battery Module); aPower Syyy: Approx. 173kg (PCS + Battery Module); aGate Xyyy: Approx. 17.5kg (Smart switch)
Overall dimension of the system (mm)	aPower Xyyy, aPower Syyy: 750mm(W) × 1148mm(H) × 307.8mm(T); aGate Xyyy: 800mm(W) × 550mm(H) × 160mm(T)
Environmental rating of Enclosure	aPower Xyyy: IP67 for Battery Module and PCS, and IP56 for Connection compartment.

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11.25kW DC GRID-TIED SYSTEM
WITH BATTERY STORAGE
(WHOLE HOME BACKUP APPLICATION)

(INFO WITHHELD FOR PUBLIC SAMPLE)

UL 9540A COMPLIANCE

PROJECT NO: GSD-20260723-SCM
DRAWN BY: SCM
DATE: 7/23/2026

PV-14



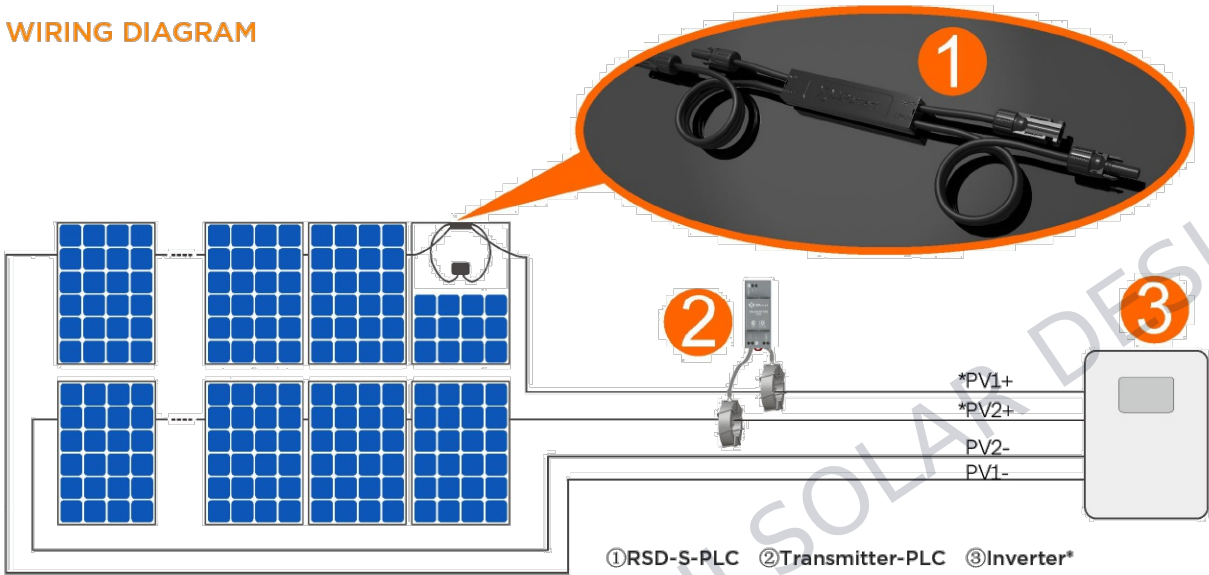
Raising the bar in innovative
DC MLPE solar power systems



RSD-S-PLC
RAPID SHUTDOWN DEVICE

- Meets NEC 2017, 2020&2023 (690.12) requirements
- Executes rapid shutdown of system when Transmitter-PLC signal is absent
- Meets SunSpec requirements

WIRING DIAGRAM



*Homerun only PV+ cable through core.
*If the inverter includes an integrated SunSpec-certified Rapid Shutdown Transmitter, remove the external transmitter-PLC in the wiring diagram.

The RSD-S-PLC meets SunSpec requirements, maintaining normal function by continually receiving a heartbeat signal from the APsmart Transmitter. The RSD executes rapid system shutdown when the Transmitter signal is absent. Users can manually execute rapid shutdown using Transmitter breaker switch.*⁽¹⁾⁽²⁾

⁽¹⁾ RSD-S-PLC does not have automatic shutdown function for arc detection. When the system is abnormal, the transmitter signal is cut off by pulling the gate, which triggers shutdown.
⁽²⁾ RSD-S-PLC is designed to reduce the risk of fire suppression but does not solve the risk of a arc fire.

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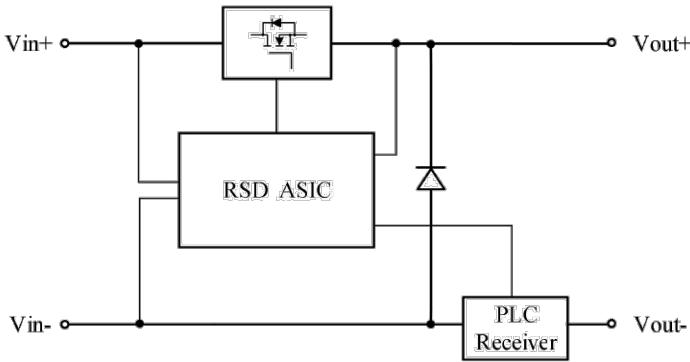
TECHNICAL DATA

MODEL	RSD-S-PLC
INPUT DATA (DC)	
Input Operating Voltage Range	8-80V
Maximum Cont. Input Current (Imax)	15A
Maximum Short Circuit Current (Isc)	25A
OUTPUT DATA (DC)	
Output Operating Voltage Range	8-80V
Maximum System Voltage	1000V/1500V
Maximum Series Fuse Rating	30A
MECHANICAL DATA	
Operating Ambient Temperature Range	-40°F to +185°F (-40 °C to + 85 °C)
Dimensions (without cable & connectors)	5.5" x 1.3" x 0.7"(140 mm x 32 mm x 18 mm)
Cable Length	Input 250mm/Output 1200mm
Cable Cross Section Size	UL12AWG
Connector	Input: Stäubli MC4 PV-KBT4&KST4 or Customized Output: APsystems specified or Customized
Enclosure Rating	NEMA Type 6P/IP68
Protection Temperature	100°C
FEATURES & COMPLIANCE	
Communication	PLC
Safety Compliance	NEC 2017, 2020&2023 (690.12); UL1741; CSA C22.2 No. 330-17; IEC/EN62109-1; 2PFG2305
EMC Compliance	FCC Part15; ICES-003;IEC/EN61000-6-1/-2/-3/-4



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WORKING SCHEMATIC DIAGRAM



ORDERING INFORMATION

415002	1500V UL, 1.2m cable, Stäubli MC4 PV-KBT4&KST4
4150XX*	1500V UL, 15A, 1.2m cable, Customized connector

*please see the RSD Series Ordering Information



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11.25kW DC GRID-TIED SYSTEM
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(WHOLE HOME BACKUP APPLICATION)

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RAPID SHUTDOWN

PROJECT NO: GSD-20260723-SCM
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PV-15A



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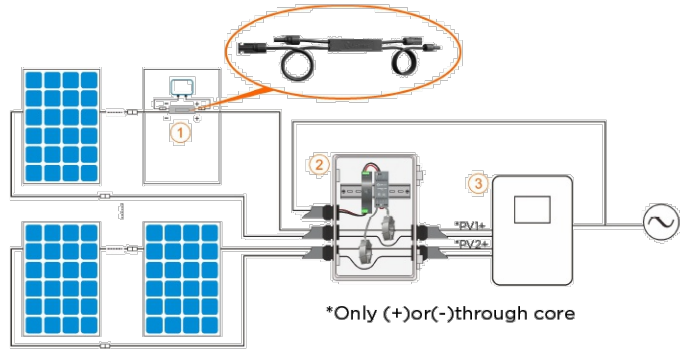
TRANSMITTER-PLC OUTDOOR KIT

- Meets NEC 2017&2020 (690.12) requirements
- Switching off Transmitter-PLC results in rapid shutdown of the output of PV modules
- Meets SunSpec requirements
- Equipped with single/dual core
- Optional 85-264VAC power supply
- Optional 180-550VAC power supply

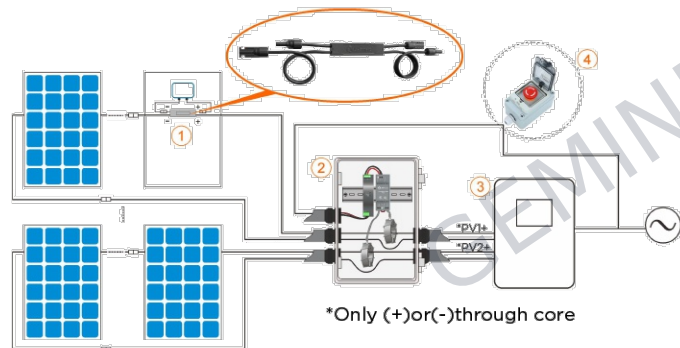
The APsmart Rapid Shutdown System Transmitter-PLC is part of a rapid shutdown solution when paired with APsmart RSD, a PV module rapid shutdown unit. While powered on, the Transmitter-PLC sends a signal to the RSD units to keep their PV modules connected and supplying energy.

RSD units automatically enter rapid shutdown mode when the Transmitter-PLC is switched off and resume energy production when power is restored to the Transmitter-PLC. This solution complies with NEC 690.12 specifications for 2017&2020 and supports the SunSpec signaling for rapid shutdown.

Transmitter-PLC Outdoor Kit includes a Transmitter-PLC with one or two cores, outdoor enclosure, 85-264VAC or 180-550VAC power supply. It could be used in residential or commercial project.

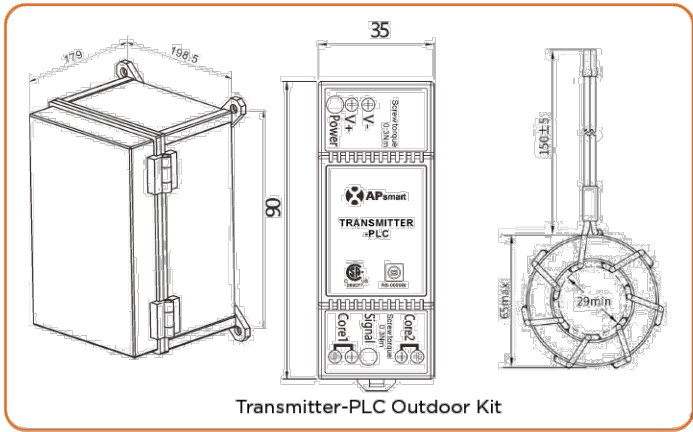


- ① RSD
- ② Transmitter-PLC Outdoor Kit
- ③ Inverter

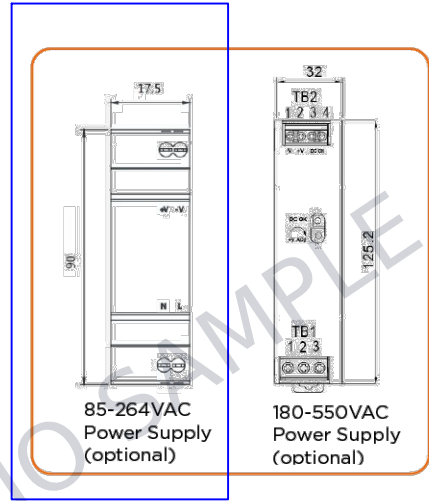


- ① RSD
- ② Transmitter-PLC Outdoor Kit
- ③ Inverter
- ④ Emergency stop button box (optional): Press the emergency stop button, the transmitter AC power supply is disconnected, the RSD closes the output, and the system rapid shutdown.

Rev2.6 2023-06-25



Transmitter-PLC Outdoor Kit



85-264VAC
Power Supply
(optional)

180-550VAC
Power Supply
(optional)

Main electrical data

Input Voltage	12 VDC
Input Current	0.8A
Communication	PLC

Power Supply

Residential (optional)	85-264VAC Input, 12VDC Output, 90 mm x 17.5 mm x 58.4 mm
Commercial (optional)	180-550VAC Input, 12VDC Output, 125.2 mm x 32 mm x 102 mm

Core data

Max. Current	150A Per core
Max. System Voltage	1500VDC
Internal Opening for Wires/Outside Dimensions	~29mm/65mm
Max. Supported PV Modules per String	30 modules

Max.Number Of Strings Per Core

DC Cable Diameter	Φ5.9mm	Φ6.35mm	Φ7mm	Φ8.6mm
Number Of Strings Per Core(without connector)	≤15	≤15	≤14	≤10

Environmental

Temperature	-40℃ ~ +60℃
-------------	-------------

Structure data

Dimensions (W x H x D)	198.5 mm x 298 mm x 179 mm
Enclosure Environmental Rating	IP65

Features & Compliance

Safety Compliance	NEC 2017&2020 (690.12); UL1741; CSA C22.2 No. 330-17
EMC Compliance	FCC Part15; ICES-003



ORDERING INFORMATION

408004	Single Core Transmitter-PLC-Outdoor Kit, 180-550VAC Power Supply
408005	Dual Core Transmitter-PLC-Outdoor Kit, 180-550VAC Power Supply
408006	Single Core Transmitter-PLC-Outdoor Kit, 85-264VAC Power Supply
408007	Dual Core Transmitter-PLC-Outdoor Kit, 85-264VAC Power Supply
408010	Single Core Transmitter-PLC-Outdoor Kit, 180-550VAC Power Supply, Emergency button
408011	Dual Core Transmitter-PLC-Outdoor Kit, 180-550VAC Power Supply, Emergency button
408012	Single Core Transmitter-PLC-Outdoor Kit, 85-264VAC Power Supply, Emergency button
408013	Dual Core Transmitter-PLC-Outdoor Kit, 85-264VAC Power Supply, Emergency button



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RAPID SHUTDOWN

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PV-15B