

Arche Solar Project

Case No. 20-0979-EL-BGN



Exhibit A

Manufacturer's Equipment Specifications



NX Gemini

Introducing the NEXTracker Two-in-Portrait Smart Solar Tracker

The NX Gemini™ two-in-portrait (2P) solar tracker optimizes lifetime value and performance, helping project developers and asset owners get the most from their power plant. Ideally suited for sites with challenging soils, high winds, and irregular boundaries, the ruggedized 2P tracker features a patent-pending distributed drive system for maximum stability in extreme weather, eliminating the need for dampers and producing virtually zero energy losses associated with stowing.

Capitalize with Highest Power Density Solar Tracker

NX Gemini's flexible 2P module configuration allows for the maximum number of modules per foundation, requiring only 60 meters and seven foundation posts to provide support for up to 120 modules on four 1500-volt strings. With the lowest number of foundations per megawatts on the solar tracker market today, NX Gemini helps reduce tracker installation costs on difficult sites.

Pair with TrueCapture and Bifacial for Maximum Performance

The 2P tracker can be equipped with either monofacial or bifacial PV modules and integrated with the entire NEXTracker software ecosystem, including the TrueCapture™ advanced smart control and energy yield enhancement platform. Incorporated into the NX Gemini design is the field-proven innovations found in NX Horizon™, such as independent-row architecture, intelligent control systems and wireless communications.

FEATURES AND BENEFITS

- Industry-leading 2P design with 7 foundation points per 120 module row
- Ideal for challenging soils
- Bifacial-optimized for maximum performance
- Patent-pending distributed drive system for maximum stability in high winds
- TrueCapture ready, gain up to 6% more energy
- Special rotation feature for high velocity module installation

“ The NEXTracker team has always collaborated with us during their product development process, resulting in trackers that are faster to build, compatible for more sites and easier to maintain. NX Gemini is a strong tracker option for sites with challenging topography and geotechnical conditions. ”

George Hershman, President of Swinerton Renewable Energy

GENERAL AND MECHANICAL

Tracking type	Horizontal single-axis, independent row	Tracking range of motion	±50°
String voltage	1,500 V _{DC}	Operating temperature range	Array powered: -20°C to 55°C (-4°F to 131°F) AC powered: -40°C to 55°C (-40°F to 131°F)
Typical row size	112 - 120 modules, depending on module string length	Module configuration	2 in portrait. 4 x 1,500 strings per standard tracker. Partial length trackers available.
Drive type	NX patent-pending self-locking, distributed drive	Module attachment	Self-grounding, electric tool-actuated fasteners standard. Clamping system optional.
Motor type	48 V brushless DC motor	Materials	Galvanized steel
Array height	Rotation axis elevation 1.9 to 2.5 m/ 6'2" to 8'2"	Allowable wind speed	Configurable up to 235 kph (145 mph) 3-second gust
Ground coverage ratio (GCR)	Typical range 28-50%	Wind protection	Intelligent wind stowing with self-locking, distributed drive system for maximum array stability in all wind conditions
Modules supported	Mounting options available for most utility-scale crystalline modules	Foundations	Standard W8 section foundation posts. Typically ~160 piers/MW
Bifacial features	Available with optimized central torque tube gap		

ELECTRONICS AND CONTROLS

Solar tracking method	Astronomical algorithm with backtracking. TrueCapture™ upgrades available for terrain adaptive backtracking and diffuse tracking mode
Control electronics	NX tracker controller with inbuilt inclinometer and backup battery
Communications	Zigbee wireless communications to all tracker rows and weather stations via network control units (NCUs)
Nighttime stow	Yes
Power supply	Array powered: NX Integrated DC pre-combiner & power supply AC powered: Customer-provided AC circuit

INSTALLATION, OPERATIONS AND SERVICE

PE stamped structural calculations and drawings	Included
Onsite training and system commissioning	Included
Installation requirements	Simple assembly using swaged fasteners and bolted connections. No field cutting, drilling or welding
Monitoring	NX Data Hub™ centralized data aggregation and monitoring
Module cleaning compatibility	Compatible with virtually all standard cleaning systems
DC string monitoring	Available with array-powered option
Warranty	10-year structural, 5-year drive and control components
Codes and standards	UL 3703, UL 2703, IEC 62817



Installer-friendly array height with construction rotation feature for faster, easier installation

NX Horizon

Smart Solar Tracking System

Serving as the backbone on over 20 gigawatts of solar power plants around the world, the NX Horizon™ smart solar tracker system combines best-in-class hardware and software to help EPCs and asset owners maximize performance and minimize operational costs.

Self-Powered System with Smart Performance Monitoring

NX Horizon's reliable self-powered motor and control system, balanced mechanical design and independent row architecture provide project design flexibility, while lowering operation and maintenance (O&M) costs. NX Horizon works in concert with the NX Data Hub platform, a utility-grade software that uses bidirectional communications to each and every tracker row in the power plant for continuous, real-time monitoring. In addition, NEXTracker's Digital O&M™ services provide real-time analytics and predictive maintenance to help manage operations and minimize O&M costs over the lifetime of the systems.

Flexible and Resilient by Design

With its self-aligning module rails and vibration-proof fasteners, NX Horizon can be easily and rapidly installed. The self-powered, decentralized architecture allows each row to be commissioned in advance of site power, and is designed to withstand high winds and other adverse weather conditions. On a recent 838 megawatt project in Villanueva, Mexico, these design features allowed for the project to go online nine months ahead of schedule.

TrueCapture and Bifacial Enabled

Incorporating the most promising innovations in utility scale solar, NX Horizon with TrueCapture™ smart control system can add additional energy production by up to six per cent. Further unlocking the advantages of independent-row architecture and the data collected from thousands of sensors across its built-in wireless network, the software continuously optimizes the tracking algorithm of each row in response to site terrain and changing weather conditions. NX Horizon can also be paired with bifacial PV module technology, which can provide even more energy harvest and performance. With bifacial technology, NX Horizon outperforms conventional tracking systems with over 1% more annual energy.

4 YEARS IN A ROW

Global Market Share Leader (2015-18)

25+ GW

Delivered on 5 Continents

BEST-IN-CLASS

Software Ecosystem and Global Services

UP TO 6%

Using TrueCapture Smart Control System

Quality and Reliability from Day One

Quality and reliability are designed and tested into every NX Horizon component and system across our supply chain and manufacturing operations. NEXTracker is the leader in dynamic wind analysis and safety stowing, delivering major benefits in uptime and long-term durability. NX Horizon is certified to UL 2703 and UL 3703 standards, underscoring NEXTracker’s commitment to safety, reliability and quality.

GENERAL AND MECHANICAL

Tracking type	Horizontal single-axis, independent row	Tracking range of motion	Options for ±60° or ±50°
String voltage	1,500 V _{DC} or 1,000 V _{DC}	Operating temperature range	Self powered: -30°C to 55°C (-22°F to 131°F) AC powered: -40°C to 55°C (-40°F to 131°F)
Typical row size	78 - 90 modules, depending on module string length	Module configuration	1 in portrait. 3 x 1,500V or 4 x 1,000V strings per standard tracker. Partial length trackers available.
Drive type	Non-backdriving, high accuracy slew gear	Module attachment	Self-grounding, electric tool-actuated fasteners
Motor type	24V brushless DC motor	Materials	Galvanized steel
Array height	Rotation axis elevation 1.3 to 1.8 m / 4’3” to 5’10”	Allowable wind speed	Configurable up to 200 kph (125 mph) 3-second gust.
Ground coverage ratio (GCR)	Configurable. Typical range 28-50%	Wind protection	Intelligent wind stowing with symmetric dampers for maximum array stability in all wind conditions.
Modules supported	Mounting options available for virtually all utility-scale crystalline modules, First Solar Series 6 and First Solar Series 4.	Foundations	Standard W6 section foundation posts
Bifacial features	High-rise mounting rails, bearing + driveline gaps and round torque tube		

ELECTRONICS AND CONTROLS

Solar tracking method	Astronomical algorithm with backtracking. TrueCapture™ upgrades available for terrain adaptive backtracking and diffuse tracking mode.
Control electronics	NX tracker controller with inbuilt inclinometer and backup battery.
Communications	Zigbee wireless communications to all tracker rows and weather stations via network control units (NCUs).
Nighttime stow	Yes
Power supply	Self powered: NX provided 30 or 60W Smart Panel AC powered: Customer-provided 120-240 V _{AC} circuit

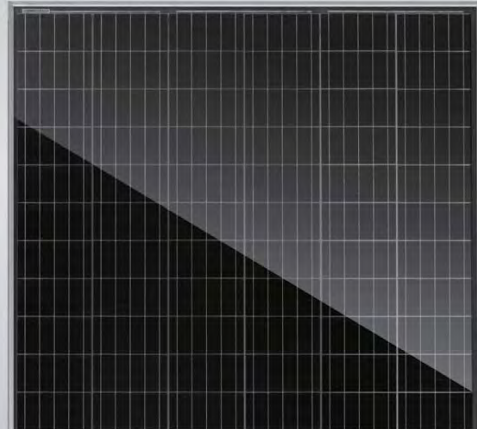
INSTALLATION, OPERATIONS AND SERVICE

PE stamped structural calculations and drawings	Included
Onsite training and system commissioning	Included
Installation requirements	Simple assembly using swaged fasteners and bolted connections. No field cutting, drilling or welding.
Monitoring	NX Data Hub™ centralized data aggregation and monitoring
Module cleaning compatibility	Compatible with NX qualified cleaning systems.
Warranty	10-year structural, 5-year drive and control components
Codes and standards	UL 3703, UL 2703, IEC 62817

Eagle Bifacial HC 72M G2 390-410 Watt

MONO PERC HALF CELL MODULE

Positive power tolerance of 0~+3%



- ISO9001:2008 Quality Standards
- ISO14001:2004 Environmental Standards
- OHSAS18001 Occupational Health & Safety Standards
- IEC61215, IEC61730 certified products

Nomenclature:

JKM400M-72HL-TV

Code	Cell	Code	Cell	Code	Certification
null	Full	null	Normal	T	Transparent backsheet
H	Half	L	Diamond		



KEY FEATURES



Innovative Solar Cells

5 busbar mono half cell technology



PID Free

World's 1st PID-free module



Higher Lifetime Power Yield

0.55% annual power degradation
30 year linear power warranty



Saving BOS Cost

Light-weight design for easy installation and low BOS cost



Higher power output

Module power increases 5-25% generally (per different reflective condition)
lower LCOE and higher IRR

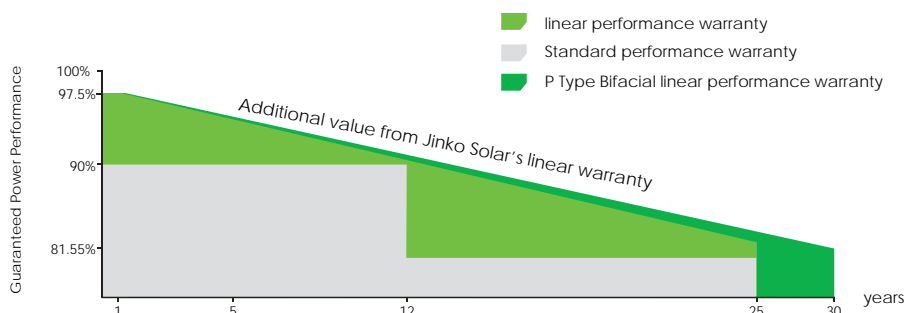


Better low-light performance

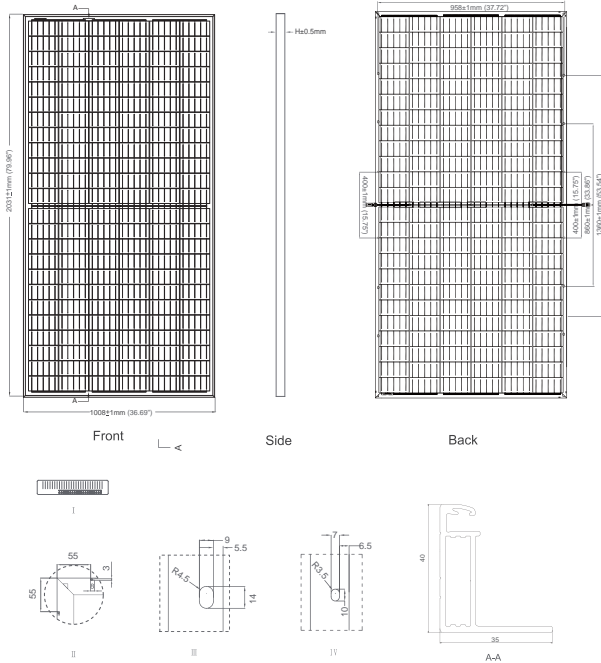
Excellent performance in low-light environments
(e.g. early morning, dusk, and cloud, etc.)

LINEAR PERFORMANCE WARRANTY

12 Year Product Warranty • 30 Year Linear Power Warranty
0.55% Annual Degradation Over 30 years



Engineering Drawings

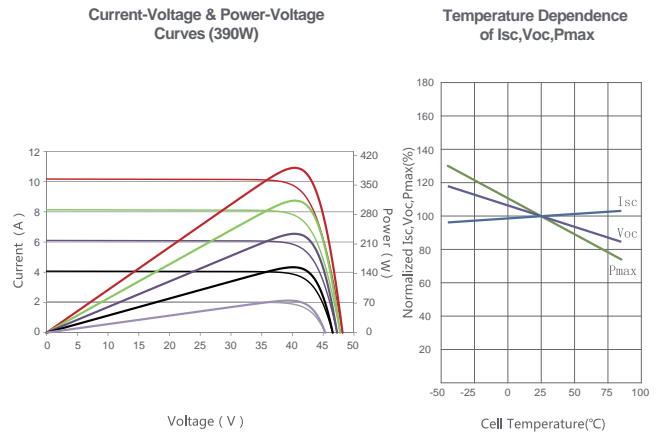


Packaging Configuration

(Two pallets = One stack)

27pcs/pallet, 54pcs/stack, 594pcs/40'HQ Container

Electrical Performance & Temperature Dependence



Mechanical Characteristics

Cell Type	Mono PERC Diamond Cell (158.75 x 158.75 mm)
No. of Half-cells	144 (6x24)
Dimensions	2031x1008x40mm (79.96x39.69x1.57 inch)
Weight	23.3 kg (51.3 lbs)
Front Glass	3.2mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP67 Rated
Output Cables	12 AWG, (+): 1400mm, (-): 1400mm or customized length
Fire Type	Type 1

SPECIFICATIONS

Module Type	JKM390M-72HL-TV		JKM395M-72HL-TV		JKM400M-72HL-TV		JKM405M-72HL-TV		JKM410M-72HL-TV	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	390Wp	290Wp	395Wp	293Wp	400Wp	297Wp	405Wp	301Wp	410Wp	304Wp
Maximum Power Voltage (Vmp)	39.62V	37.22V	39.83V	37.55V	40.01V	37.64V	40.19V	37.77V	40.38V	37.91V
Maximum Power Current (Imp)	9.84A	7.78A	9.92A	7.81A	10.00A	7.89A	10.08A	7.96A	10.16A	8.03A
Open-circuit Voltage (Voc)	48.14V	45.34V	48.26V	45.45V	48.35V	45.54V	48.45V	45.63V	48.56V	45.74V
Short-circuit Current (Isc)	10.17A	8.21A	10.23A	8.26A	10.32A	8.34A	10.42A	8.41A	10.51A	8.49A
Module Efficiency STC (%)	19.05%		19.29%		19.54%		19.78%		20.03%	
Operating Temperature (°C)	-40°C~+85°C									
Maximum System Voltage	1500VDC (IEC)									
Maximum Series Fuse Rating	25A									
Power Tolerance	0~+3%									
Temperature Coefficients of Pmax	-0.36%/°C									
Temperature Coefficients of Voc	-0.29%/°C									
Temperature Coefficients of Isc	0.048%/°C									
Nominal Operating Cell Temperature (NOCT)	45±2°C									
Refer. Bifacial Factor	70±5%									

BIFACIAL OUTPUT-REARSIDE POWER GAIN

		410Wp	415Wp	420Wp	425Wp	431Wp
5%	Maximum Power (Pmax)	410Wp	415Wp	420Wp	425Wp	431Wp
	Module Efficiency STC (%)	20.00%	20.26%	20.52%	20.77%	21.03%
15%	Maximum Power (Pmax)	449Wp	454Wp	460Wp	466Wp	472Wp
	Module Efficiency STC (%)	21.91%	22.19%	22.47%	22.75%	23.03%
25%	Maximum Power (Pmax)	488Wp	494Wp	500Wp	506Wp	513Wp
	Module Efficiency STC (%)	23.81%	24.12%	24.42%	24.73%	25.03%

* STC: Irradiance 1000W/m² Cell Temperature 25°C AM=1.5

NOCT: Irradiance 800W/m² Ambient Temperature 20°C AM=1.5 Wind Speed 1m/s

* Power measurement tolerance: ± 3%

IEC 60904-1, Photovoltaic devices - Part 1: Measurement of photovoltaic current-voltage characteristics

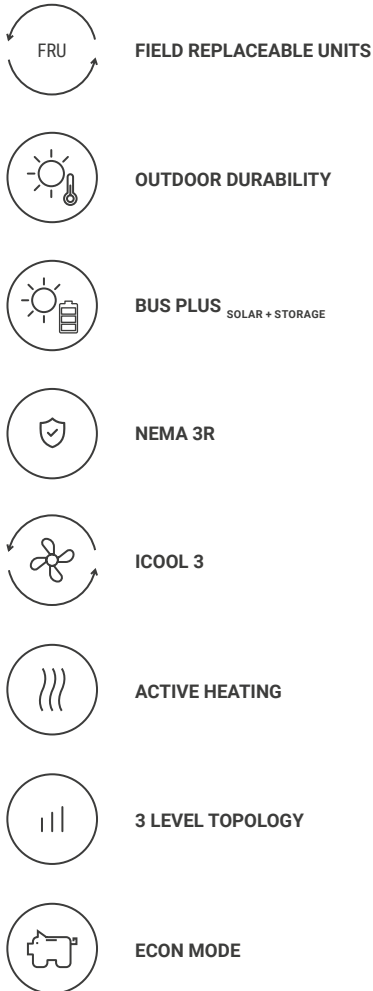
CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

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JKM390-410M-72HL-TV-F40-A2C1-US for customer



HEM

UTILITY SCALE MV CENTRAL STRING INVERTER



THE INNOVATIVE MEDIUM VOLTAGE CENTRAL STRING INVERTER

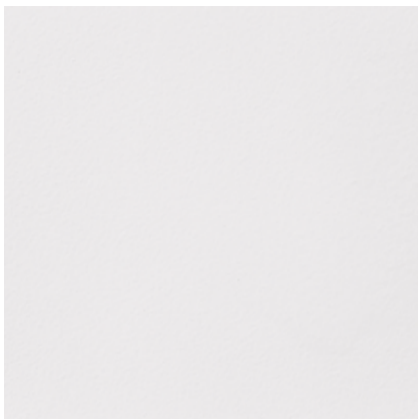
The Power Electronics HEM medium voltage inverter is designed for utility scale solar applications, that require the advantages of a central inverter solution but also the modularity of a string architecture. The HEM can reach up to a nominal power of 3.6 MVA, and offers a wide MPPT window. It also has the added advantage of having an integrated medium voltage transformer and switchgear.

The Bus Plus ready feature allows the connection of up to six Freemaq DC/DC converters. It is the most cost competitive solution for solar-plus-storage retrofits.

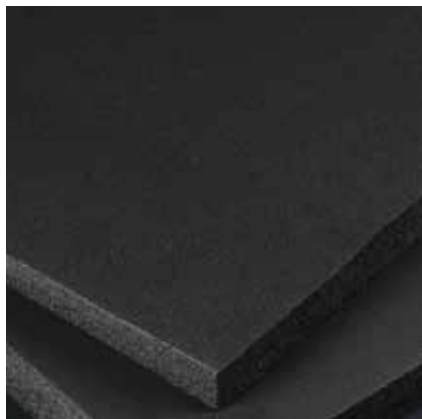
Its architecture, composed of six field replaceable units (FRU), is designed to provide the highest availability and optimize yield production. Its use in Utility Scale PV plants provides considerable savings in CAPEX, since having an integrated MV transformer and switchgear reduces the need of additional connections between the LV and MV sides.

Thanks to the Power Electronics iCOOL3 cooling system, the HEM is able to provide NEMA 3R degree of protection with an air cooling system, and as a result reducing OPEX costs. This product has been designed to be the lowest LCOE solution in the market for solar applications.

ROBUST DESIGN



Polymeric Painting



Closed-Cell Insulation



Galvanized Steel | Stainless Steel (Optional)

HEM inverter modules have a design life of greater than 30 years of operation in harsh environments and extreme weather conditions. HEM units are tested and ready to withstand conditions from the frozen Siberian tundra to the Californian Death Valley, featuring:

Totally sealed electronics cabinet protects electronics against dust and moisture.

Conformal coating on electronic boards shields PCBs from harsh atmospheres.

Temperature and humidity controlled active heating prevents internal water condensation.

C4 degree of protection according to ISO 12944.
Up to C5-M optional.

Closed-Cell insulation panel isolates the cabinet from solar heat gains.

Roof cover designed to dissipate solar radiation, reduce heat build-up and avoid water leakages.

The solid HEM structure avoids the need of additional external structures.

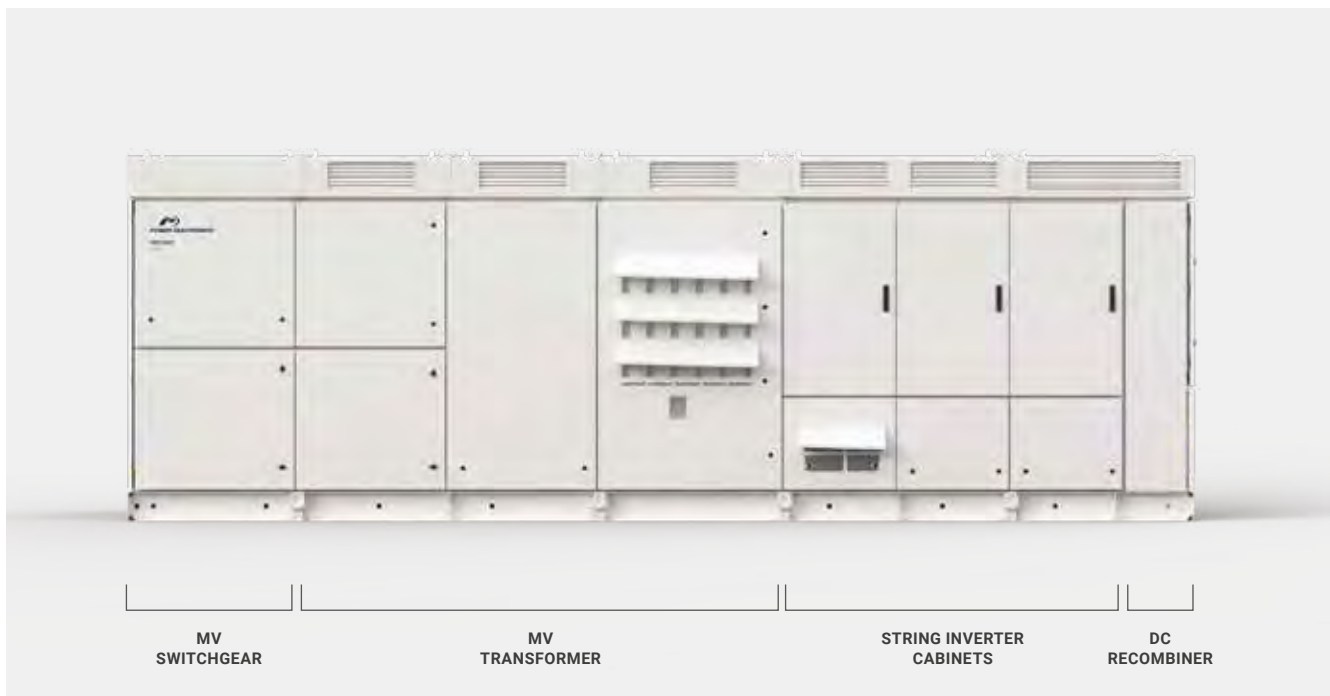
Random units selected to pass a Factory Water Tightness Test ensuring product quality.

NEMA 3R.

REAL TURN-KEY SOLUTION - EASY TO SERVICE

With the HEM, Power Electronics offers a real turn-key solution, including the MV transformer and switchgear fully assembled and tested at the factory. The HEM is a compact turn-key solution that will reduce site design, installation and connection costs, and therefore will minimize the LCOE.

By providing full front access the HEM series simplifies the maintenance tasks, reducing the MTTR (and achieving a lower OPEX). The total access allows a fast swap of the FRUs without the need of qualified technical personnel.



STRING CONCEPT POWER STAGES

The HEM combines the advantages of a central inverter with the modularity of the string inverters. Its power stages are designed to be easily replaceable on the field without the need of advanced technical service personnel, providing a safe, reliable and fast Plug&Play assembly system.

Following the modular philosophy of the Freesun series, the HEM is composed of 6 FRUs (field replaceable units), where all the power stages are physically joined in the DC side and therefore, in the event of a fault, the faulty module is taken off-line and its power is distributed evenly among the remaining functioning FRUs.



INNOVATIVE COOLING SYSTEM

Based on more than 3 years of experience with our MV Variable Speed Drive, the iCOOL3 system allows to get NEMA 3R degree of protection in an outdoor solar inverter. iCOOL3 delivers a constant stream of clean air to the FRUs and the MV transformer, being the most effective way of reaching up to NEMA 3R degree of protection, without

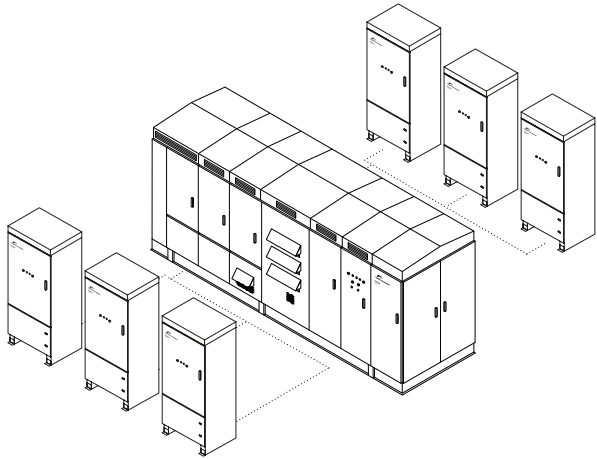
having to maintain cumbersome dust filters or having to use liquid-cooling systems, avoiding the commonly known inconveniences of it (complex maintenance, risk of leaks, higher number of components...), therefore resulting in an OPEX cost reduction and a LCOE improvement.



BUS PLUS READY - SOLAR + STORAGE

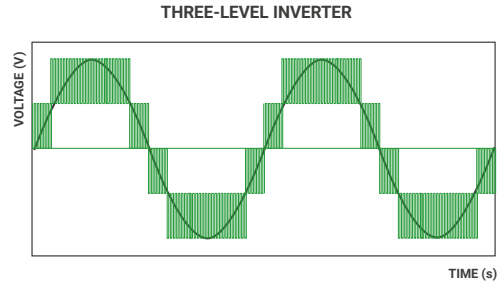
The Bus Plus feature allows the connection of up to six Freemaq DC/DC converters. It is the most cost competitive solution for solar-plus-storage retrofits. It prevents from additional connections out of the inverter between the DC/DC converters and the PV field. This solution provides considerable savings in CAPEX.

Power Electronics Freemaq DC/DC is a modular outdoor solution available from 500 kW to 3000 kW, fully compatible with different battery technologies and manufacturers. Freemaq DC/DC converter allows clipping energy recovery that will boost customer revenues and avoids the installation of additional station with a dedicated MV transformer.



MULTILEVEL TOPOLOGY

The multilevel IGBT topology is the most efficient approach to manage high DC link voltages and makes the difference in the 1,500 Vdc design. Power Electronics has many years of power design in both inverters and MV drives and the HEM design is the result of our experience with 3 level topologies. The 3 level IGBT topology reduces stage losses, increases inverter efficiency and minimizes total harmonic distortion. High efficiency to deliver the lowest LCOE.



VAR AT NIGHT

At night, in case of solar applications, the HEM inverter can shift to reactive power compensation mode. The inverter can respond to an external dynamic signal, a Power Plant Controller command or pre-set reactive power level (kVAR).

ACTIVE HEATING

At night, when the unit is not actively exporting power, the inverter can import a small amount of power to keep the inverter internal ambient temperature above -20°C, without using external resistors. This autonomous heating system is the most efficient and homogeneous way to prevent condensation, increasing the inverters availability and reducing maintenance. **PATENTED**

ECON MODE

This innovative control mode allows increasing the efficiency of the MV transformer up to 25%, reducing the power consumption of the plant and therefore providing considerable

savings. Available as an optional kit, this feature has a pay-back time of less than a few years, therefore resulting in the increase of the plant lifetime overall revenue.

EASY TO MONITOR

The Freesun app is the easiest way to monitor the status of our inverters. All our inverters come with built-in wifi, allowing remote connectivity to any smart device for detailed updates

and information without the need to open cabinet doors.

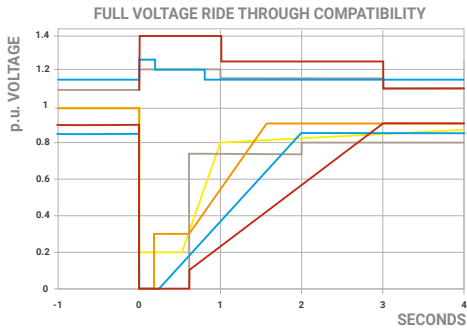
The app user-friendly interface allows quick and easy access to critical information (energy registers, production and events).

AVAILABLE INFORMATION	Grid and PV field data, inverter and power module data (voltages, currents, power, temperatures, I/O status...), weather conditions, alarms and warnings events, energy registers. Others.
FEATURES	Easy Wireless connection. Comprehensive interface. Real time data. Save and copy settings.
LANGUAGE	English, Spanish.
SYSTEM REQUIREMENTS	iOS or Android devices.
SETTINGS CONTROL	Yes.

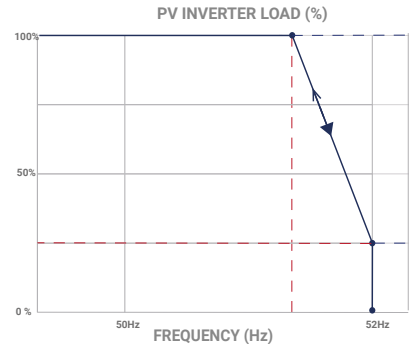


DYNAMIC GRID SUPPORT

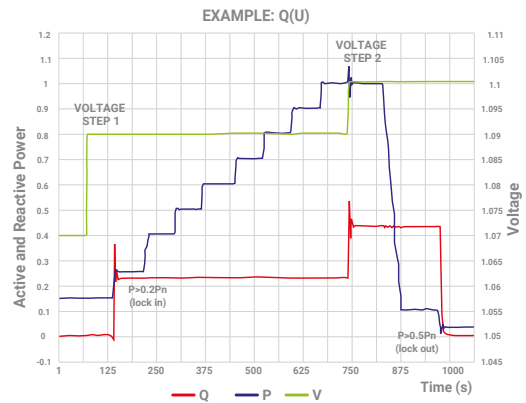
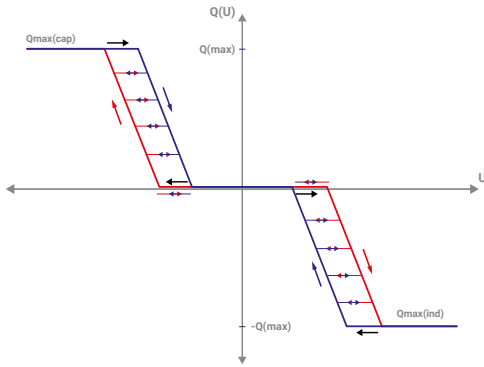
HEM firmware includes the latest utility interactive features (LVRT, OVRT, FRS, FRT, Anti-islanding, active and reactive power curtailment...), and can be configured to meet specific utility requirements.



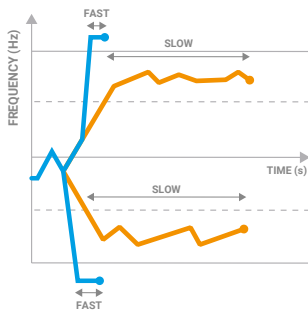
Low Voltage Ride Through (LVRT or ZVRT). Inverters can withstand any voltage dip or profile required by the local utility. In this situation, the inverter can inject current up to the nominal value.



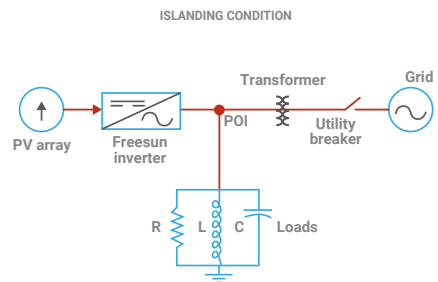
Frequency Regulation System (FRS). Frequency droop algorithm curtails the active power along a preset characteristic curve supporting grid stabilization.



Q(V) curve. It is a dynamic voltage control function which provides reactive power in order to maintain the voltage as close as possible to its nominal value.



Frequency Ride Through (FRT). Freesun solar inverters have flexible frequency protection settings and can be easily adjusted to comply with future requirements.



Anti-islanding. This protection combines passive and active detection methods that eliminate nuisance tripping and allow to comply with the IEC 62116 and IEEE 1547 standards.

FRONT VIEW



BACK VIEW



TECHNICAL CHARACTERISTICS

HEM

REFERENCE	FS3510M	
OUTPUT	AC Output Power (kVA/kW) @50°C ^[1]	3510
	AC Output Power (kVA/kW) @40°C ^[1]	3630
	Operating Grid Voltage (VAC)	34.5kV ±10%
	Operating Grid Frequency (Hz)	60Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE519
	Power Factor (cosine phi) ^[3]	0.5 leading ... 0.5 lagging adjustable / Reactive Power injection at night
INPUT	MPPt @full power (VDC)	934V-1310V
	Maximum DC voltage	1500V
	Number of PV inputs ^[2]	Up to 36
	Number of Freemaq DC/DC inputs ^[4]	Up to 6
	Max. DC continuous current (A) ^[4]	3970
	Max. DC short circuit current (A) ^[4]	6000
EFFICIENCY & AUXILIARY SUPPLY	Efficiency (Max) (η)	97.80% including MV transformer
	CEC (η)	97.51% including MV transformer
	Max. Power Consumption (KVA)	20
CABINET	Dimensions [WxDxH] (ft)	21.7 x 7 x 7
	Dimensions [WxDxH] (m)	6.6 x 2.2 x 2.2
	Weight (lb)	30865
	Weight (kg)	14000
	Type of ventilation	Forced air cooling
ENVIRONMENT	Degree of protection	NEMA 3R
	Permissible Ambient Temperature	-35°C to +60°C / >50°C Active Power derating
	Relative Humidity	4% to 100% non condensing
	Max. Altitude (above sea level) ^[5]	2000m
	Noise level ^[6]	< 79 dBA
CONTROL INTERFACE	Communication protocol	Modbus TCP
	Plant Controller Communication	Optional
	Keyed ON/OFF switch	Standard
PROTECTIONS	Ground Fault Protection	GFDI and Isolation monitoring device
	General AC Protection	MV Switchgear (configurable)
	General DC Protection	Fuses
	Overvoltage Protection	AC, DC Inverter and auxiliary supply type 2
CERTIFICATIONS	Safety	UL 1741, CSA 22.2 No.107.1-16
	Compliance	NEC 2017
	Utility interconnect	IEEE 1547.1-2005 / UL 1741 SA-Feb. 2018

[1] Values at 1.00·Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.

[2] Consult Power Electronics for other configurations.

[3] Consult P-Q charts available: $Q(kVAR)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[4] Consult Power Electronics for Freemaq DC/DC connection configurations.

[5] Consult Power Electronics for altitudes above 1000m.

[6] Readings taken 1 meter from the back of the unit.

TECHNICAL CHARACTERISTICS

HEM

REFERENCE	FS3430M	
OUTPUT	AC Output Power (kVA/kW) @50°C ^[1]	3430
	AC Output Power (kVA/kW) @40°C ^[1]	3550
	Operating Grid Voltage (VAC)	34.5kV ±10%
	Operating Grid Frequency (Hz)	60Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE519
	Power Factor (cosine phi) ^[3]	0.5 leading ... 0.5 lagging adjustable / Reactive Power injection at night
INPUT	MPPt @full power (VDC)	913V-1310V
	Maximum DC voltage	1500V
	Number of PV inputs ^[2]	Up to 36
	Number of Freemaq DC/DC inputs ^[4]	Up to 6
	Max. DC continuous current (A) ^[4]	3970
	Max. DC short circuit current (A) ^[4]	6000
EFFICIENCY & AUXILIARY SUPPLY	Efficiency (Max) (η)	97.76% including MV transformer
	CEC (η)	97.50% including MV transformer
	Max. Power Consumption (KVA)	20
CABINET	Dimensions [WxDxH] (ft)	21.7 x 7 x 7
	Dimensions [WxDxH] (m)	6.6 x 2.2 x 2.2
	Weight (lb)	30865
	Weight (kg)	14000
	Type of ventilation	Forced air cooling
ENVIRONMENT	Degree of protection	NEMA 3R
	Permissible Ambient Temperature	-35°C to +60°C / >50°C Active Power derating
	Relative Humidity	4% to 100% non condensing
	Max. Altitude (above sea level) ^[5]	2000m
	Noise level ^[6]	< 79 dBA
CONTROL INTERFACE	Communication protocol	Modbus TCP
	Plant Controller Communication	Optional
	Keyed ON/OFF switch	Standard
PROTECTIONS	Ground Fault Protection	GFDI and Isolation monitoring device
	General AC Protection	MV Switchgear (configurable)
	General DC Protection	Fuses
	Overvoltage Protection	AC, DC Inverter and auxiliary supply type 2
CERTIFICATIONS	Safety	UL 1741, CSA 22.2 No.107.1-16
	Compliance	NEC 2017
	Utility interconnect	IEEE 1547.1-2005 / UL 1741 SA-Feb. 2018

[1] Values at 1.00·Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.

[2] Consult Power Electronics for other configurations.

[3] Consult P-Q charts available: $Q(\text{kVar})=V(S(\text{kVA})^2-P(\text{kW})^2)$.

[4] Consult Power Electronics for Freemaq DC/DC connection configurations.

[5] Consult Power Electronics for altitudes above 1000m.

[6] Readings taken 1 meter from the back of the unit.

TECHNICAL CHARACTERISTICS

HEM

REFERENCE	FS3350M	
OUTPUT	AC Output Power (kVA/kW) @50°C ^[1]	3350
	AC Output Power (kVA/kW) @40°C ^[1]	3465
	Operating Grid Voltage (VAC)	34.5kV ±10%
	Operating Grid Frequency (Hz)	60Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE519
	Power Factor (cosine phi) ^[3]	0.5 leading ... 0.5 lagging adjustable / Reactive Power injection at night
INPUT	MPPt @full power (VDC)	891V-1310V
	Maximum DC voltage	1500V
	Number of PV inputs ^[2]	Up to 36
	Number of Freemaq DC/DC inputs ^[4]	Up to 6
	Max. DC continuous current (A) ^[4]	3970
	Max. DC short circuit current (A) ^[4]	6000
EFFICIENCY & AUXILIARY SUPPLY	Efficiency (Max) (η)	97.75% including MV transformer
	CEC (η)	97.48% including MV transformer
	Max. Power Consumption (KVA)	20
CABINET	Dimensions [WxDxH] (ft)	21.7 x 7 x 7
	Dimensions [WxDxH] (m)	6.6 x 2.2 x 2.2
	Weight (lb)	30865
	Weight (kg)	14000
	Type of ventilation	Forced air cooling
ENVIRONMENT	Degree of protection	NEMA 3R
	Permissible Ambient Temperature	-35°C to +60°C / >50°C Active Power derating
	Relative Humidity	4% to 100% non condensing
	Max. Altitude (above sea level) ^[5]	2000m
	Noise level ^[6]	< 79 dBA
CONTROL INTERFACE	Communication protocol	Modbus TCP
	Plant Controller Communication	Optional
	Keyed ON/OFF switch	Standard
PROTECTIONS	Ground Fault Protection	GFDI and Isolation monitoring device
	General AC Protection	MV Switchgear (configurable)
	General DC Protection	Fuses
	Overvoltage Protection	AC, DC Inverter and auxiliary supply type 2
CERTIFICATIONS	Safety	UL 1741, CSA 22.2 No.107.1-16
	Compliance	NEC 2017
	Utility interconnect	IEEE 1547.1-2005 / UL 1741 SA-Feb. 2018

[1] Values at 1.00·Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.

[2] Consult Power Electronics for other configurations.

[3] Consult P-Q charts available: $Q(kVAR)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[4] Consult Power Electronics for Freemaq DC/DC connection configurations.

[5] Consult Power Electronics for altitudes above 1000m.

[6] Readings taken 1 meter from the back of the unit.

TECHNICAL CHARACTERISTICS

HEM

REFERENCE	FS3270M	
OUTPUT	AC Output Power (kVA/kW) @50°C ^[1]	3270
	AC Output Power (kVA/kW) @40°C ^[1]	3380
	Operating Grid Voltage (VAC)	34.5kV ±10%
	Operating Grid Frequency (Hz)	60Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE519
	Power Factor (cosine phi) ^[3]	0.5 leading ... 0.5 lagging adjustable / Reactive Power injection at night
INPUT	MPPt @full power (VDC)	870V-1310V
	Maximum DC voltage	1500V
	Number of PV inputs ^[2]	Up to 36
	Number of Freemaq DC/DC inputs ^[4]	Up to 6
	Max. DC continuous current (A) ^[4]	3970
	Max. DC short circuit current (A) ^[4]	6000
EFFICIENCY & AUXILIARY SUPPLY	Efficiency (Max) (η)	97.71% including MV transformer
	CEC (η)	97.47% including MV transformer
	Max. Power Consumption (KVA)	20
CABINET	Dimensions [WxDxH] (ft)	21.7 x 7 x 7
	Dimensions [WxDxH] (m)	6.6 x 2.2 x 2.2
	Weight (lb)	30865
	Weight (kg)	14000
	Type of ventilation	Forced air cooling
ENVIRONMENT	Degree of protection	NEMA 3R
	Permissible Ambient Temperature	-35°C to +60°C / >50°C Active Power derating
	Relative Humidity	4% to 100% non condensing
	Max. Altitude (above sea level) ^[5]	2000m
	Noise level ^[6]	< 79 dBA
CONTROL INTERFACE	Communication protocol	Modbus TCP
	Plant Controller Communication	Optional
	Keyed ON/OFF switch	Standard
PROTECTIONS	Ground Fault Protection	GFDI and Isolation monitoring device
	General AC Protection	MV Switchgear (configurable)
	General DC Protection	Fuses
	Overvoltage Protection	AC, DC Inverter and auxiliary supply type 2
CERTIFICATIONS	Safety	UL 1741, CSA 22.2 No.107.1-16
	Compliance	NEC 2017
	Utility interconnect	IEEE 1547.1-2005 / UL 1741 SA-Feb. 2018

[1] Values at 1.00·Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.

[2] Consult Power Electronics for other configurations.

[3] Consult P-Q charts available: $Q(\text{kVar})=V(S(\text{kVA})^2-P(\text{kW})^2)$.

[4] Consult Power Electronics for Freemaq DC/DC connection configurations.

[5] Consult Power Electronics for altitudes above 1000m.

[6] Readings taken 1 meter from the back of the unit.

TECHNICAL CHARACTERISTICS

HEM

REFERENCE	FS3190M	
OUTPUT	AC Output Power (kVA/kW) @50°C ^[1]	3190
	AC Output Power (kVA/kW) @40°C ^[1]	3300
	Operating Grid Voltage (VAC)	34.5kV ±10%
	Operating Grid Frequency (Hz)	60Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE519
	Power Factor (cosine phi) ^[3]	0.5 leading ... 0.5 lagging adjustable / Reactive Power injection at night
INPUT	MPPt @full power (VDC)	849V-1310V
	Maximum DC voltage	1500V
	Number of PV inputs ^[2]	Up to 36
	Number of Freemaq DC/DC inputs ^[4]	Up to 6
	Max. DC continuous current (A) ^[4]	3970
	Max. DC short circuit current (A) ^[4]	6000
EFFICIENCY & AUXILIARY SUPPLY	Efficiency (Max) (η)	97.68% including MV transformer
	CEC (η)	97.47% including MV transformer
	Max. Power Consumption (KVA)	20
CABINET	Dimensions [WxDxH] (ft)	21.7 x 7 x 7
	Dimensions [WxDxH] (m)	6.6 x 2.2 x 2.2
	Weight (lb)	30865
	Weight (kg)	14000
	Type of ventilation	Forced air cooling
ENVIRONMENT	Degree of protection	NEMA 3R
	Permissible Ambient Temperature	-35°C to +60°C / >50°C Active Power derating
	Relative Humidity	4% to 100% non condensing
	Max. Altitude (above sea level) ^[5]	2000m
	Noise level ^[6]	< 79 dBA
CONTROL INTERFACE	Communication protocol	Modbus TCP
	Plant Controller Communication	Optional
	Keyed ON/OFF switch	Standard
PROTECTIONS	Ground Fault Protection	GFDI and Isolation monitoring device
	General AC Protection	MV Switchgear (configurable)
	General DC Protection	Fuses
	Overvoltage Protection	AC, DC Inverter and auxiliary supply type 2
CERTIFICATIONS	Safety	UL 1741, CSA 22.2 No.107.1-16
	Compliance	NEC 2017
	Utility interconnect	IEEE 1547.1-2005 / UL 1741 SA-Feb. 2018

[1] Values at 1.00·Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.

[2] Consult Power Electronics for other configurations.

[3] Consult P-Q charts available: $Q(kVAR)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[4] Consult Power Electronics for Freemaq DC/DC connection configurations.

[5] Consult Power Electronics for altitudes above 1000m.

[6] Readings taken 1 meter from the back of the unit.