

Union Ridge Solar

Exhibit A

Manufacturer's Equipment Specifications

Case No. 20-1757-EL-BGN



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 foundations 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

If 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

Horizontal single-axis, independent row	Tracking range of motion	±50°
1,500 v _{pc} 112 - 120 modules, depending on module string length	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)
NX patent-pending self-locking,	Module configuration	2 in portrait. 4 x 1,500 strings per standard tracker. Partial length trackers available.
48 V brushless DC motor	Module attachment	Self-grounding, electric tool-actuated fas- teners standard. Clamping system optional.
Rotation axis elevation	Materials	Galvanized steel
Typical range 28-50%	Allowable wind speed	Configurable up to 235 kph (145 mph) 3-second gust
Mounting options available for most utility-scale crystalline modules	Wind protection	Intelligent wind stowing with self-locking, distributed drive system for maximum array stability in all wind conditions
Available with optimized central torque tube gap	Foundations	Standard W8 section foundation posts. Typically ~160 piers/MW
	Horizontal single-axis, independent row 1,500 V _{DC} 112 - 120 modules, depending on module string length NX patent-pending self-locking, distributed drive 48 V brushless DC motor Rotation axis elevation 1.9 to 2.5 m/ 6'2" to 8'2" Typical range 28-50% Mounting options available for most utility-scale crystalline modules Available with optimized central torque tube gap	Horizontal single-axis, independent rowTracking range of motion1,500 V _{DC} Operating temperature range112 - 120 modules, depending on module string lengthOperating temperature rangeNX patent-pending self-locking, distributed driveModule configuration48 V brushless DC motorModule attachmentRotation axis elevation 1.9 to 2.5 m/ 6'2" to 8'2"MaterialsTypical range 28-50%Allowable wind speedMounting options available for most utility-scale crystalline modulesWind protectionAvailable with optimized central torque tube gapFoundations

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

rotation feature for faster, easier installation

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Hi-MO 5

LR5-72HBD **520~545M**

- Based on M10-182mm wafer, best choice for ultra-large power plants
- Advanced module technology delivers superior module efficiency
 M10 Gallium-doped Wafer
 Smart Soldering
 9-busbar Half-cut Cell
- Globally validated bifacial energy yield
- High module quality ensures long-term reliability



12-year Warranty for Materials and Processing

30

30-year Warranty for Extra Linear Power Output

Complete System and Product Certifications

IEC 61215, IEC 61730, UL 61730 ISO 9001:2008: ISO Quality Management System ISO 14001: 2004: ISO Environment Management System TS62941: Guideline for module design qualification and type approval OHSAS 18001: 2007 Occupational Health and Safety





Hi-MO 5

LR5-72HBD 520~545M



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Output Cable	4mm², positive 400 / negative 200mm length can be customized
Glass	Dual glass, 2.0mm coated tempered glass
Frame	Anodized aluminum alloy frame
Weight	32.3kg
Dimension	2256×1133×35mm
Packaging	31pcs per pallet / 155pcs per 20' GP / 558pcs per 40' HC

Units: mm 1133

Electrical Characteristics STC: AM1.5 1000W/m² 25°C Test uncertainty for Pmax: ±3%

Power Class	520	525	530	535	540	545	
Maximum Power (Pmax/W)	520	525	530	535	540	545	
Open Circuit Voltage (Voc/V)	48.90	49.05	49.20	49.35	49.50	49.65	
Short Circuit Current (Isc/A)	13.57	13.65	13.71	13.78	13.85	13.92	
Voltage at Maximum Power (Vmp/V)	41.05	41.20	41.35	41.50	41.65	41.80	
Current at Maximum Power (Imp/A)	12.67	12.75	12.82	12.90	12.97	13.04	
Module Efficiency(%)	20.3	20.5	20.7	20.9	21.1	21.3	

Operating Parameters

Operational Temperature	-40°C ~ +85°C	
Power Output Tolerance	0 ~ +5 W	
Voc and Isc Tolerance	±3%	
Maximum System Voltage	DC1500V (IEC/UL)	
Maximum Series Fuse Rating	30A	
Nominal Operating Cell Temperature	45±2°C	
Protection Class	Class II	
Fire Rating	UL type 29	
Bifaciality	70±5%	

Mechanical Loading

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

Temperature Ratings (STC)

Temperature Coefficient of Isc	+0.050%/°C
Temperature Coefficient of Voc	-0.284%/°C
Temperature Coefficient of Pmax	-0.350%/°C



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Specifications included in this datasheet are subject to change without notice. LONGi reserves the right of final interpretation. (20200104V12)

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<u>15</u> В-В



Application Note HEM & PCSM MV Transformer Information

Rev 03

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Revision Table					
Version		Date		Author	Update
1.0	Nov	02	2018	S Shah	
2.0	June	14	2019	S Castagno	Updated for HEM v2.0 models
3.0	Nov	9	2020	S Castagno	Included PCSM



1. Purpose:

The purpose of this document is to provide technical information on the MV Transformer (MVT) integrated into the Freesun HEM and Freemaq PCSM series inverters. The information is typical of the transformer manufacture's data. The scope of this document is for following models:

HEM Model Numbers:	PCSM Model Numbers*:
- FS3190M	- FP3190Mx
- FS3270M	- FP3270Mx
- FS3350M	- FP3350Mx
- FS3430M	- FP3430Mx
- FS3510M	- FP3510Mx
	(*"x" – no. of DC inputs for multi-input PCSM models)
Overview	

2. <u>Overview:</u>

The transformer is factory assembled into the inverter as part of the complete turn-key HEM/PCSM platform. The transformer protection is provided by an integrated MV switchgear at the 34.5kV terminals. A single transformer design is used for all HEM/PCSM models, tapped for each inverter LV configuration shown in section 6.



3. Transformer General Datasheet:

	PRIMARY WINDING	SECONDARY WINDING
No. of phases	3	3
Rating AF @50"C (kVA)	3510	3510
Rating AF @40°C (kVA)	3630	3630
Rated voltages (no load) (kV)	34,5 ±10%	0,66
Connections	Delta	Wye
Maximum system voltage (kV)	34,5	2,5
Power frequency withstand (kV)	70	10
Basic impulse level (kV)	150	20
Winding material	Aluminium	Aluminium
Type of insulation	Encapsulated	Impregnated
Insulation temperature class	19	H
Temperature rise (°C)	115	115

ELECTRICAL AND MECHANICAL PARAMETERS

Réference Standards	IEEE C57.12.01	
No-load losses (kW)	8.+15% tol.	
Load losses @120°C (kW)	27,5 +15% tol.	
Impedance voltage (%)	8,5 ±7,5% tol.	
Vector group	Dy1	
Frequency (Hz)	. Qà	
Cooling.	AF	
Ambient temperature (°C)	50°C	
Environmental, climatic, fire class	E2C2F1	
Temperature sensors	PTIDO	



4. Short Circuit Information

- Short circuit reactance: 8.5% (Typ.)
- Short circuit resistance: 0.78% (Typ.)
- X/R: 10.8 (Typ.)
- Zero Sequence Impedance (R & X): >9999 pu

5. <u>Routine Testing (sample can be provided upon request)</u>

- Standard: C57.12.01 and C57.12.91
- Turns ratio and phase displacement
- AC voltage withstand
- Induced AC Voltage
- Partial Discharge
- No load loss & current measurement
- Winding resistances
- Load loss and SC impedances

6. <u>Transformer Taps:</u>

6.1. Tap Configurations:

The transformer contains a total of 9 taps that will be factory configured by Power Electronics for each inverter's nominal LV voltage and 34.5kV at the HV terminals. The following tables show the nominal tap steps and MVT power capacity per inverter model. The taps are set by terminating jumpers across tap terminal per MVT nameplate.

6.2. MVT capacity in FS3190M/FP3190Mx - 600V

LV (Vac)	HV (Vac)	Capacity (kVA) (50C/40C)
600V	+5.0%	3190/3300
600V	+2.5%	3190/3300
600V	34.5k nom	3190/3300
600V	-2.5%	3190/3300
600V	-4.8%	3190/3300

6.3. MVT capacity in F\$3270M/FP3270Mx - 615V

LV (Vac)	HV (Vac)	Capacity (kVA) (50C/40C)
615V	+5.1%	3270/3380
615V	+2.5%	3270/3380
615V	34.5k nom	3270/3380
615V	-2.4%	3270/3380
615V	-4.7%	3270/3380



LV (Vac)	HV (Vac)	Capacity (kVA) (50C/40C)
630V	+5.1%	3350/3465
630V	+2.5%	3350/3465
630V	34.5k nom	3350/3465
630V	-2.3%	3350/3465
630V	-4.5%	3350/3465

6.4. MVT capacity in F\$3350M/FP3350Mx - 630V

6.5. MVT capacity in FS3430M/FP3430Mx – 645V

LV (Vac)	HV (Vac)	Capacity (kVA) (50C/40C)
645V	+4.9%	3430/3550
645V	+2.4%	3430/3550
645V	34.5k nom	3430/3550
645V	-2.3%	3430/3550
645V	-4.7%	3430/3550

6.6. MVT capacity in FS3510M/FP3510Mx - 660V

LV (Vac)	HV (Vac)	Capacity (kVA) (50C/40C)
660V	+4.7%	3510/3630
660V	+2.3%	3510/3630
660V	34.5k nom	3510/3630
660V	-2.5%	3510/3630
660V	-5%	3510/3630

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HEM

UTILITY SCALE MV CENTRAL STRING INVERTER



FIELD REPLACEABLE UNITS

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 payback 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

AVAILABLE INFORMATION	Grid and PV field data, inverter and power module data (voltages, currents, power, temperatures, I/O status), weather conditions, alarms and war- nings 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.

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).





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.



ISLANDING CONDITION



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.

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

POWER ELECTRONICS

FRONT VIEW



BACK VIEW



REFERENCE		F\$3510M
Ουτρυτ	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 IFFE519
	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]	Un to 36
	Number of Freemag 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) (n)	97.80% including MV transformer
	CEC (n)	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

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 (ŋ)	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

REFERENCE		F\$3350M
	AC Output Power (kVA/kW) @50°C [1]	3350
001101	AC Output Power (kVA/kW) @40°C ^[1]	3465
		34 54/ +10%
	Operating Grid Frequency (Hz)	60Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE510
	Power Factor (cosine phi) [3]	0.5 leading 0.5 leading adjustable / Reactive Power injection at night
INDUT	MPPt @full power (V/DC)	801/J-1310//
	Maximum DC voltage	1500V
		Lin to 36
	Number of Freemag DC/DC inputs ^[4]	
	Max, DC continuous current (Δ) [4]	3970
	Max. DC short circuit current (A) $[4]$	6000
FEFICIENCY & AUXILIARY SUPPLY	Efficiency (Max) (n)	97.75% including MV transformer
	CEC (n)	97.48% including MV transformer
	Max Power Consumption (KVA)	20
CABINET	Dimensions [WxDxH] (ft)	21.7 x 7 x 7
	Dimensions [WxDxH] (m)	66x22x22
	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

REFERENCE		F\$3270M
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

REFERENCE		ES3190M
	AC Output Power (kVA/kW) @50°C [1]	3190
	AC Output Power $(kVA/kW) @ 40^{\circ}C^{[1]}$	3300
		34.51/+10%
		60Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE510
	Power Factor (cosine phi) ^[3]	0.5 leading 0.5 leading adjustable / Reactive Power injection at night
INDIT	MPPt @full power (VDC)	8/0//-1310//
		1500V
	Number of Freemag DC/DC inputs [4]	
	Max DC continuous current (A) [4]	2070
	Max. DC continuous current (A) [4]	6000
	Efficiency (Max) (n)	0000
EFFICIENCE & AUXILIART SUFFLI		97.00% including MV transformer
	Max Power Consumption (K\/A)	20
CABINET	Dimensions [WyDyH] (ft)	20
OADINE I		<u> </u>
	Weight (lb)	20265
	Weight (kg)	14000
	Type of ventilation	Forced air cooling
ENVIRONMENT		NEMA 3R
ENVIRONMENT	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
		< 70 dRA
		Modbus TCP
	Plant Controller Communication	Ontional
	Keved ON/OFF switch	Standard
PROTECTIONS	Ground Fault Protection	GEDL and Isolation monitoring device
	General AC Protection	MV Switchgear (configurable)
	General DC Protection	Fuses
		AC DC Inverter and auxiliary supply type 2
CERTIFICATIONS	Safety	III 1741 CSA 22.2 No 107 1-16
	Compliance	NFC 2017
	Litility interconnect	IEFE 1547 1-2005 / III 1741 SA-Feb 2018
	otanty interconnect	TELE 10 17.1 2000 / DE 17 11 0A 1 (b. 2010

Values at 1.00-Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.
 Consult Power Electronics for other configurations.
 Consult P-Q charts available: Q(kVAr)=ν(S(kVA)²-P(kW)²).

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Summary: Application Exhibit A - Manufacturer's Equipment Specifications electronically filed by Teresa Orahood on behalf of Dylan F. Borchers