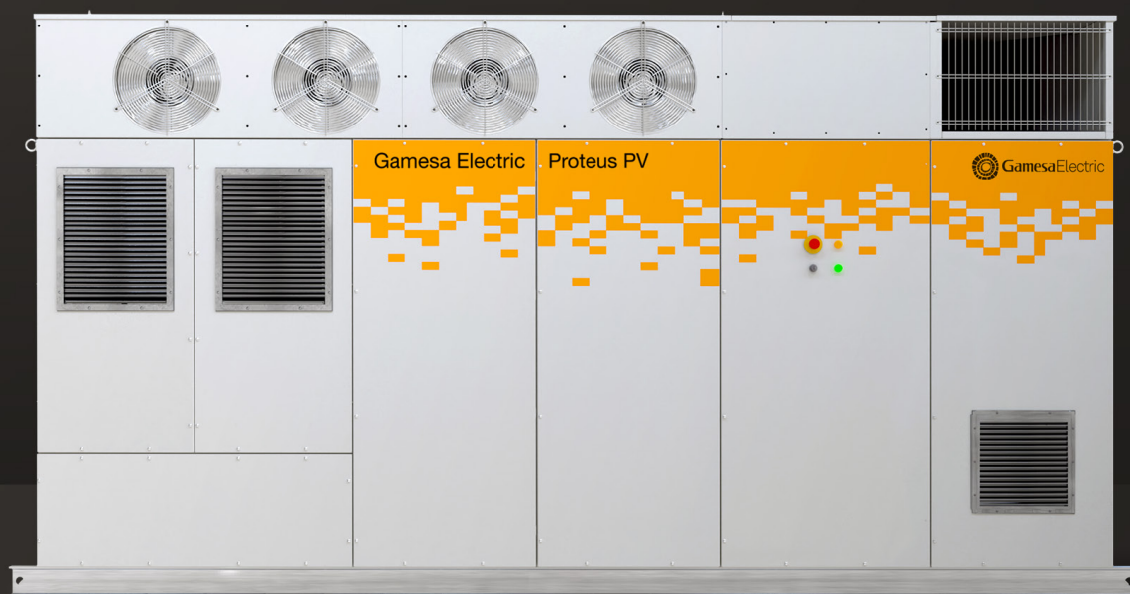


Product catalogue Solar & Storage

2025



INVERTERS

Gamesa Electric
Proteus PV Inverter

Gamesa Electric
Proteus PCS-E Inverter

STATIONS

Gamesa Electric
Proteus PV Station

Gamesa Electric
Proteus PCS-E Station

CONTROL

Gamesa Electric
Orchestra

Gamesa Electric

PV & Storage products

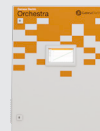
Gamesa Electric
Proteus PV Inverter



Gamesa Electric
Proteus PV Station



Gamesa Electric
Orchestra



Gamesa Electric
**Proteus PCS-E
Inverter**



Gamesa Electric
Proteus PCS-E Station





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P.08 Gamesa Electric Proteus PV

P.12 Medium Voltage Solutions

P.13 Gamesa Electric Proteus PV Station

P.17 Energy Storage Solutions

P.18 Gamesa Electric Proteus PCS-E

P.24 Energy Storage MV Solutions

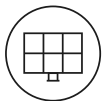
P.25 Gamesa Electric Proteus PCS-E Station

P.33 Power Plant Controller

P.34 Gamesa Electric Orchestra

Shaping
New
Energy

We speak energy



**+8.5 GW SOLAR &
STORAGE ENERGY**



**+62 GW
WIND POWER**



**+60
COUNTRIES**

Gamesa Electric is a worldwide leader in the design and manufacturing of electrical equipment, with extensive experience in photovoltaics, hydroelectric energy, electric traction, marine propulsion, wind power and energy storage applications, among others.

The company provides solutions globally to solve the most demanding market requirements for its customers. In the PV industry Gamesa Electric started back in 1993 with the first central inverter based in IGBTs, now the company has installed more than 8 GW of central PV and storage inverters worldwide. The latest offering of the company is Gamesa Electric Proteus inverters, a state-of-the-art product for maximum energy and versatility for utility scale projects.

Over 35 years of specialized in-house design experience in power electronics and a competitive product portfolio

have proven Gamesa Electric to be a pioneer in this market worldwide. This experience is in addition to the more than 90 years of expertise in manufacturing electric motors and generators.

As 100% of the larger Siemens Gamesa Renewable Energy, Gamesa Electric harnesses the technological, operational and financial advantages within the Corporation, including its network of maintenance services over five continents. This structure allows respond to the needs of its customers in the various sectors with flexibility and with optimal solutions.

Gamesa Electric

Our value chain



Design

Intelligent design based on the know-how of Siemens Gamesa Renewable Energy, market leader in renewable energy.



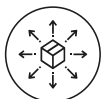
Manufacturing

Lean manufacturing process implementation across the company global footprint.



Quality

The highest standards of quality, all products are 100% tested before delivering to the customer, including full-load testing.



Logistics

An extensive logistic network and experience allows Gamesa Electric to deliver its products anywhere in the world.



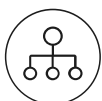
Start-up and commissioning support

Technical specialist are available worldwide to support its clients' project achieve on-time commercial operation.



Power Electronics

Robust, reliable solutions designed from expertise garnered by thousands of installed units, across hundreds of customers, in a wide range of sites locations and environments.



Grid connection

Engineering of solutions to optimize available grid connection as well as support for weak grid connections with enhanced performance capabilities in dynamic voltage and reactive power control, energy storage, harmonics cancellation and all other grid support functions.



O&M

Extensive catalog of services from training to turnkey packages ensure Gamesa Electric customer's assets operate reliably for their intended life.



Aftersales support

Support doesn't stop after the initial sale; the company supplies continual product upgrades, service bulletins and manuals so its products and customers stay current within the market.



Gamesa Electric

Photovoltaic Inverters

Efficiency and reliability
with optimum grid compliance

Gamesa Electric, reliability where it counts

Within the photovoltaic sector, Gamesa Electric specializes in best-in-class central inverters targeted to service large Commercial and Utility Scale Projects with its **double award-winning** Gamesa Electric Proteus PV. Our cutting-edge technology combined with substantial operational experience provides our customers with some of the most reliable and advanced inverters designed and manufactured today. These models are set to become a global benchmark within the field of large-scale plants thanks to their high reliability, innovative technical features, and competitive pricing. Building on more than 35 years of experience in the sector, Gamesa Electric's central inverters utilize proven designs and state-of-the-art technology needed to meet or exceed even the most stringent grid-connection codes under the most demanding environmental conditions. Gamesa Electric experience ensures the highest levels of quality, reliability and performance regardless of the photovoltaic plant grid connection, including weak grids.

LCoE oriented processes

Gamesa Electric has a comprehensive, LCoE* optimized, process for designing, manufacturing, operating and maintaining its central solar PV inverters. The development and application of cutting-edge technologies are balanced against a solutions cost optimized to maximum robustness, reliability and performance of all models. Research, development and innovation intertwined to form an essential DNA of all the processes and products offered by the company. This is continued throughout a product's value chain as the company strives to achieve higher satisfaction for its customers. The company product solutions are serviced by an extensive worldwide aftersales service network of employees and partners who understand the advanced control systems and product architecture, minimizing downtime.

*LCoE: Levelized Cost of Energy.



Key advantages

Utility Scale designed and proved.

Reliability and robustness derived from Siemens Gamesa Renewable Energy extensive experience as one of the leading manufacturers in the global wind power sector.

Extended operating range in terms of voltage, frequency, temperature, humidity and altitude, thus ensuring operation in even the most hostile of environments.

Better power quality. Current distortion and THD (Total Harmonic Distortion) management have been optimized with patented algorithms for selective harmonic cancellation.

Reactive power capacity and voltage control capabilities allow a photovoltaic plant mimic a conventional power generation plant. Extremely useful when dealing with strict country grid codes demanding different mode operations at PCC (point of interconnection/control).

Island and AC fault safeguarding to run the equipment in safe conditions.

Grid code compliance is standard. All units are designed to comply with the most stringent grid connection codes, in the most demanding of environmental conditions.

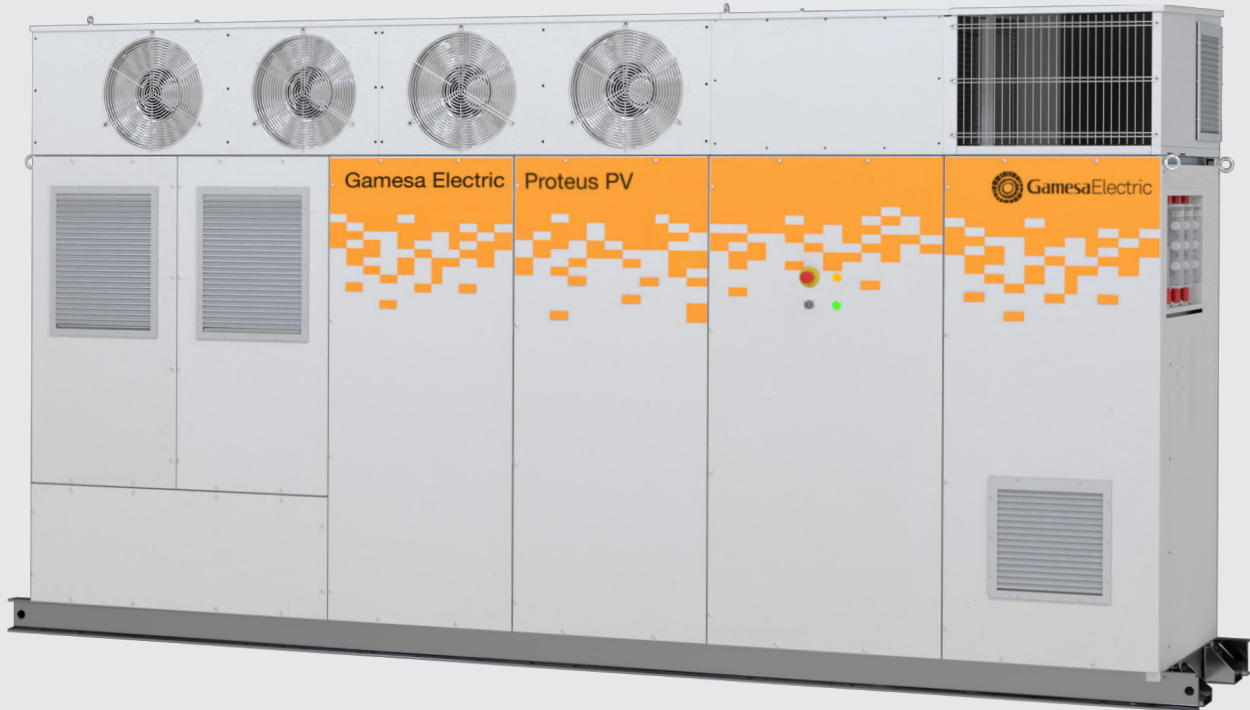
3rd party verified performance.

Maximum performance and efficiency maintained throughout the entire product range and conditions, not just under nominal conditions.

Broad range of DC input voltage compatible with the majority of the modules on the market.

Remote diagnosis and monitoring:

- › Webserver: remote monitoring.
- › Ethernet communication: permitting remote monitoring and intervention.



Gamesa Electric Proteus PV Inverters

Maximum energy and versatility
for utility-scale projects



FULL DATASHEET
[CLICK HERE](#)

Up to 200%
DC/AC ratio

THDi <1%

MPPT
efficiency
99.9%

Outdoor
solution

CoolBrid
Advanced liquid and
air cooling system

Heat exchangers

Compact design.
473 kVA/m³
(11.18 kVA/ft³)

Field-proven
and reliable CCU



Better LCoE

Largest single inverter
power block in the market
with 4,700 KVA

Fewer inverters per project
thus lower Capex and Opex

DC/AC ratio of up to 200%



Higher yield

Market-leading efficiency
with 99.45%

THDi < 1% which reduces
losses

Enhanced temperature
derating: keeping full power
up to 40°C [104°F]



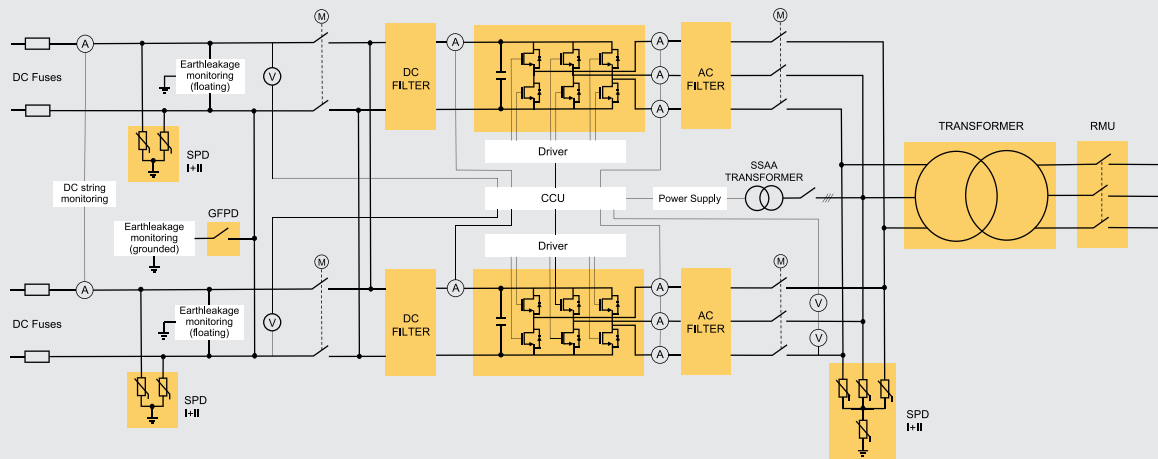
Built to last

Designed and manufactured
for a 30 year life span

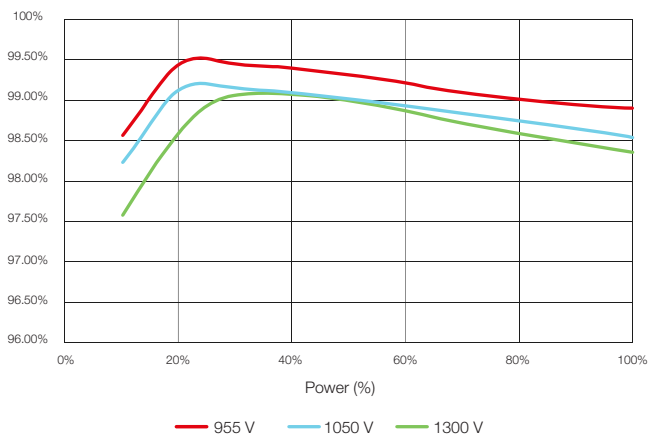
CoolBrid: Smart hybrid
cooling system that allows
critical components to work
far below the temperature
limit

Lowest THDi in the market
helps to extend power
transformers lifespan

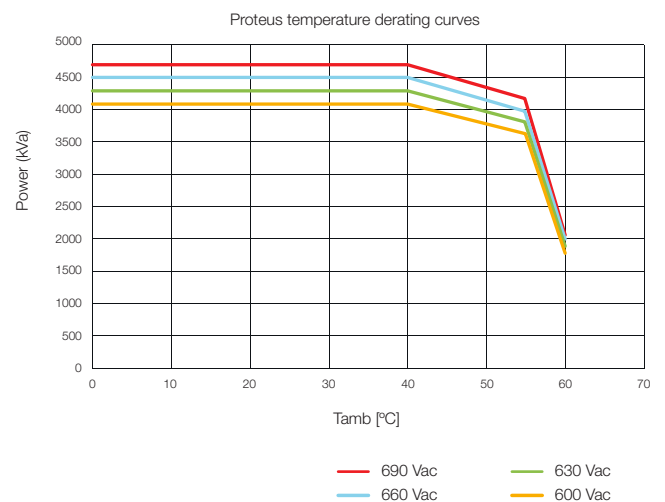
Different product configurations available to optimize performance in demanding environments as well as different voltage levels to fit customers' needs.



Efficiency



Configurations



The Gamesa Electric Proteus PV Inverters combine high power with maximum versatility for PV plants LCoE reduction.

	Gamesa Electric Proteus PV 4100	Gamesa Electric Proteus PV 4300	Gamesa Electric Proteus PV 4500	Gamesa Electric Proteus PV 4700
DC Input				
DC Voltage Range ⁽¹⁾	835 - 1500 V	875 - 1500 V	915 - 1500 V	955 - 1500 V
DC Voltage Range MPPT ⁽¹⁾	835 - 1300 V	875 - 1300 V	915 - 1300 V	955 - 1300 V
Number of Power Modules	2, not galvanically isolated, 1 MPPT			
Max. DC Current @40°C [104°F]	2 x 2500 A			
Max. DC Current @50°C [122°F]	2 x 2313 A			
Max. DC Current @55°C [131°F]	2 x 2220 A			
Max. DC Current @60°C [140°F]	2 x 1110 A			
Maximum Short-circuit Current, I _{sc} PV	Up to 9000 A			
Nr of DC Ports ⁽¹⁾	Max 24 fuse +/- monitored			
Fuse Dimensions	125 A to 630 A			
Max. Wire Cross Section per DC Input	2 x 400 mm² - 800 AWG			
Energy Production from	0.35% Pn approx.			
AC Output				
Number of phases	Three-phase			
Nominal AC Power Total @40°C [104°F]	4095 kVA	4299 kVA	4504 kVA	4709 kVA
Nominal AC Power Total @50°C [122°F]	3790 kVA	3979 kVA	4169 kVA	4358 kVA
Nominal AC Power Total @55°C [131°F]	3637 kVA	3819 kVA	4001 kVA	4183 kVA
Nominal AC Power Total @60°C [140°F]	1819 kVA	1910 kVA	2001 kVA	2091 kVA
Maximum AC Current @40°C [104°F]	3940 Arms			
Nominal AC Voltage ⁽¹⁾	600 Vrms	630 Vrms	660 Vrms	690 Vrms
Nominal Voltage Allowance Range ⁽¹⁾	+/- 15%			
Frequency Range ⁽¹⁾	50/60 Hz (+ 6% / - 7%)			
THD of AC Current	< 1% @Sn			
Power Factor Range ⁽³⁾	0 (lagging) - 1 - 0 (leading)			
Max. Wire Cross Section per AC Output	6 x 400 mm² - 800 AWG			
Performance				
Max. Efficiency	99.45%			
Euro Efficiency	99.24%			
CEC Efficiency	99.02%	99.07%	99.11%	99.14%
Stand-by Power Consumption	< 200 W			
General Data				
Temperature Range - Operation ⁽²⁾	-20°C / +60°C [-4°F / +140°F]			
Maximum Altitude ⁽³⁾	< 2,000 m [6,561 ft] (w/o derating)			
Cooling System	Liquid & forced air			
Relative Humidity	4% – 100% (w/o condensation)			
Protection Class	IP55 class 1, NEMA3R			
Dimensions (W/H/D)	4,325 x 2,250 x 1,022 mm [170.3" x 88.5" x 40.2"]			
Weight	4,535 kg [10,000 lb]			
AC Protections		Other Protections		
AC Side Disconnection & Short-circuit Current Protection	Two motorized AC circuit breakers - one per each power module	Over-temperature Protection		
AC Overvoltage Protection	Type 1 + 2 SPD	Emergency Push Button		
Anti-islanding	Included (SW)			
Grid Voltage Fluctuations (LVRT, HVRT) ⁽¹⁾	Included (SW)			
Frequency Failure	Included (SW)			
DC Protections		Optional		
DC Disconnection	Two motorized DC switches (on-load) - one per each power module	Low Temperature Kit up to -30°C [-22°F]		
DC Short-circuit Protection	DC fuses	Enhanced corrosion protection		
DC Over-voltage Protection	Type 1 + 2 SPD			
Reverse Polarity Detection	Included			
DC Ground Fault and Insulation Detection	Included			
Communications				
Control ⁽¹⁾	Modbus TCP/IP	⁽¹⁾ Consult Gamesa Electric for a specific configuration		
Monitoring ⁽¹⁾	Modbus TCP/IP	⁽²⁾ With derating from 40°C [104°F]		
Webserver	Included	⁽³⁾ Up to 4,000m [13,123 ft] with derating as optional		
		⁽⁴⁾ Consult Gamesa Electric for other Standards/Directives		
Standards/Directives ⁽⁴⁾				
IEC 62109-1	CEA 2019	NEMA 250-2014	CEI 016	CEC 2015
IEC 62109-2	Arrêté du 9 juin 2020	UTE C 15-400	EirGrid V10:2020	VDE-AR-N 4110 4120 4130 2018
IEC 61000-6-2	EN 55011/CISPR11:2019	IEC 61683	NTS 631 v1.1 SENP, v2.1 SEPE	IEC 62477-1:2022
IEEE 1547	IEC 62116	IEC 60529	UL 1741-SB	Portaria nº73/2020
Allegato A.68	ENA G99	UNE-EN 5054 9	CSA C22.2	PTPIREE.28.04.2021

⁽¹⁾ Consult Gamesa Electric for a specific configuration

⁽²⁾ With derating from 40°C [104°F]

⁽³⁾ Up to 4,000m [13,123 ft] with derating as optional

⁽⁴⁾ Consult Gamesa Electric for other Standards/Directives



Gamesa Electric

Medium Voltage Solutions

Fully integrated MV solutions
for large scale projects

Gamesa Electric provides MV solutions encompassing its inverters, LV/MV transformers (both dry and oil filled), switchgears and accessories.

These power stations are adapted to each country to ensure compliance to specific local regulations and/or customer specifications. Installations are made easy with a true “plug & play” finished product (IEC version).

As built, a customer needs only to connect the DC input cables to the inverter DC panel and the AC output cables to the switchgear and finally commission to be online.

Best of all, the company MV solutions include the same comprehensive Operations & Maintenance support all backed by Gamesa Electric's warranty.

Gamesa Electric Medium Voltage solutions are the ultimate option for large photovoltaic arrays.

Designed for customers who wish to have a guaranteed comprehensive solution, these photovoltaic power stations are fully integrated in ready-to-use buildings.

A complete MV solution which includes the photovoltaic inverters, transformer, switchgear and monitoring hardware. Furthermore, Gamesa Electric can provide customers with tailor made configurations upon request.



Gamesa Electric Proteus PV Stations

Larger MV solution for
LCoE reduction



FULL DATASHEET
[CLICK HERE](#)

Compact
and modular
design

THDi <1%

One-way
efficiency
99.9%

Outdoor
solution

2 x Gamesa Electric Proteus PV

Transformer

Auxiliary services
cabinet

MV switchgear



Better LCoE

Largest single inverter
power block in the market
with 4,700 KVA

Fewer inverters per project
thus lower Capex and Opex

DC/AC ratio of up to 200%



Higher yield

Market-leading efficiency
with 99.45%

THDi < 1% which reduces
losses

Enhanced temperature
derating: keeping full power
up to 40°C [104°F]



Built to last

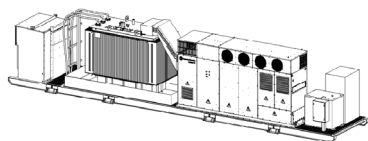
Designed and manufactured
for a 30 year life span

CoolBrid: Smart hybrid
cooling system that allows
critical components to work
far below the temperature
limit

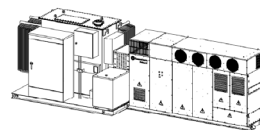
Lowest THDi in the market
helps to extend power
transformers lifespan

1 x Gamesa Electric Proteus PV Inverter Configurations

Gamesa Electric Proteus PV Station				
Number of Gamesa Electric Proteus PV Inverters	1 x Proteus PV 4100	1 x Proteus PV 4300	1 x Proteus PV 4500	1 x Proteus PV 4700
DC Connection				
DC Voltage Range	835 - 1500 V	875 - 1500 V	915 - 1500 V	955 - 1500 V
DC Voltage Range MPPT	835 - 1300 V	875 - 1300 V	915 - 1300 V	955 - 1300 V
Number of Power Modules	1 independent MPPT			
Max. DC Current @40°C [104°F]	2 x 2500 A			
Max. DC Current @50°C [122°F]	2 x 2313 A			
Max. DC Current @55°C [131°F]	2 x 2220 A			
Max. DC Current @60°C [140°F]	2 x 1110 A			
Number of Fused DC Inputs ⁽²⁾	Up to 24 fuse +/- monitored			
Energy Production from	0.35% Pn approx.			
AC Connection				
Number of Phases	Three-phase			
Nominal AC Power Total @40°C [104°F]	4095 kVA	4299 kVA	4504 kVA	4709 kVA
Nominal AC Power Total @50°C [122°F]	3790 kVA	3979 kVA	4169 kVA	4358 kVA
Nominal AC Power Total @55°C [131°F]	3637 kVA	3819 kVA	4001 kVA	4183 kVA
Nominal AC Power Total @60°C [140°F]	1819 kVA	1910 kVA	2001 kVA	2091 kVA
Maximum AC Current @40°C [104°F]	3940 Arms			
Nominal AC Voltage, LV side	600 Vrms	630 Vrms	660 Vrms	690 Vrms
Nominal AC Voltage, MV side	Up to 34.5 kV			
Nominal Voltage Allowance Range	+/-10%			
Frequency Range	47.5 - 52.5/57 - 63.5 Hz			
THD of AC Current	< 1% @Sn			
Power Factor Range	0 (lagging) - 1 - 0 (leading)			
Protection devices				
DC Connection	Motorized DC switches (on-load), Overvoltage protection (Type 1 + 2 SPD), Reverse polarity detection, DC ground fault and insulation detection			
AC MV Connection	Protection switchgear			
Over-temperature Protection	Included			
Emergency Push Button	Included			
Components Proteus PV Station				
Inverters	1 x Proteus PVS 4100	1 x Proteus PVS 4300	1 x Proteus PVS 4500	1 x Proteus PVS 4700
Transformer ⁽¹⁾⁽⁶⁾	Dy11y11 KNAN			
Switchgear ⁽¹⁾⁽⁶⁾	0L1V / 1L1V / 2L1V up to 38 kV			
Custom Auxiliary Transformer ⁽¹⁾	Optional			
Others ⁽¹⁾	Auxilliary cabinet			
Communications				
Control	Modbus TCP / IP			
Monitoring	Modbus TCP / IP			
Webserver	Included			



IEC version
1 x PV



UL version
1 x PV

Other Features				Optional ⁽¹⁾
Temperature Range - Operation ^{(1) (2)}		-20°C / +60°C [-4°F/+140°F]		Low Temperature Kit up to -30 °C [-22°F]
Relative Humidity		4% - 100% (without condensation)		Different rating fuses
Maximum Altitude (without derating) ⁽³⁾		2,000 m [6,561 ft]		Enhanced corrosion protection
Dimensions W x H x D (IEC / UL version) ⁽⁴⁾		11,800 x 2,600 x 2,100 mm / 30 x 8.5 x 8.6 ft		Motorized MV Switchgear
Protection ⁽⁵⁾		IP54		UPS
Cooling System		Liquid & forced air		Custom Auxiliary Transformer
				Seismic Reinforcement
Standards/Directives ⁽⁶⁾				
IEC 62109-1	IEC 62116	IEC 62477-1:2022		⁽¹⁾ Consult Gamesa Electric for specific configurations
IEC 62109-2	UL 1741-SB	IEEE C57		⁽²⁾ With derating from 40°C [104°F]
IEC 61000-6-2	CSA 22.2.No 107.1	IEC 60076		⁽³⁾ Up to 4,000m [13,123 ft] with derating
IEEE 1547	NFPA 70:2020			⁽⁴⁾ UL variant only available for 1-PV Inverter based configuration
EN 55011/CISPR11:2019	IEC 62271-202			⁽⁵⁾ Consult Gamesa Electric for more details
				⁽⁶⁾ UL version: Padmounted Dyn (without external switchgear)

⁽¹⁾ Consult Gamesa Electric for specific configurations

⁽²⁾ With derating from 40°C [104°F]

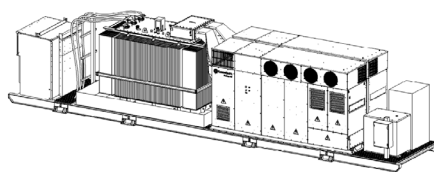
⁽³⁾ Up to 4,000m [13,123 ft] with derating

⁽⁴⁾ UL variant only available for 1-PV Inverter based configuration

⁽⁵⁾ Consult Gamesa Electric for more details

⁽⁶⁾ UL version: Padmounted Dyn (without external switchgear)

		Gamesa Electric Proteus PV Station			
		Proteus PVS 8200	Proteus PVS 8600	Proteus PVS 9000	Proteus PVS 9400
Number of Gamesa Electric Proteus PV Inverters		2 x Proteus PV 4100	2 x Proteus PV 4300	2 x Proteus PV 4500	2 x Proteus PV 4700
DC Connection					
DC Voltage Range		835 - 1500 V	875 - 1500 V	915 - 1500 V	955 - 1500 V
DC Voltage Range MPPT		835 - 1300 V	875 - 1300 V	915 - 1300 V	955 - 1300 V
Number of Power Modules		2 independent MPPT			
Max. DC Current @40°C [104°F]		4 x 2500 A			
Max. DC Current @50°C [122°F]		4 x 2313 A			
Max. DC Current @55°C [131°F]		4 x 2220 A			
Max. DC Current @60°C [140°F]		4 x 1110 A			
Number of Fused DC Inputs ⁽²⁾		Up to 48 fuse +/- monitored			
Energy Production from		0.35% Pn approx.			
AC Connection					
Number of Phases		Three-phase			
Nominal AC Power Total @40°C [104°F]		8190 kVA	8598 kVA	9008 kVA	9418 kVA
Nominal AC Power Total @50°C [122°F]		7580 kVA	7958 kVA	8338 kVA	8716 kVA
Nominal AC Power Total @55°C [131°F]		7274 kVA	7638 kVA	8002 kVA	8366 kVA
Nominal AC Power Total @60°C [140°F]		3638 kVA	3820 kVA	4002 kVA	4182 kVA
Maximum AC Current @40°C [104°F]		2 x 3940 Arms			
Nominal AC Voltage, LV side		2 x 600 Vrms	2 x 630 Vrms	2 x 660 Vrms	2 x 690 Vrms
Nominal AC Voltage, MV side		< 34.5 kV			
Nominal Voltage Allowance Range		+/-10%			
Frequency Range		47.5 - 52.5 / 57 - 63.5 Hz			
THD of AC Current		< 1% @Sn			
Power Factor Range		0 (lagging) - 1 - 0 (leading)			
Protection devices					
DC Connection		Motorized DC switches (on-load), Overvoltage protection (Type 1 + 2 SPD), reverse polarity detection, DC ground fault and insulation detection			
AC MV Connection		Protection switchgear			
Over-temperature Protection		Included			
Emergency Push Button		Included			
Components Proteus PV Station					
Inverters		2 x Proteus PVS 4100	2 x Proteus PVS 4300	2 x Proteus PVS 4500	2 x Proteus PVS 4700
Transformer ⁽¹⁾		Dy11y11 KNAN			
Switchgear ⁽¹⁾		0L1V / 1L1V / 2L1V up to 38 kV			
Custom Auxiliary Transformer ⁽¹⁾		Optional			
Others ⁽¹⁾		Auxiliary cabinet			
Communications					
Control		Modbus TCP / IP			
Monitoring		Modbus TCP / IP			
Webserver		Included			



IEC version
2 x PV

Other Features		Optional ⁽¹⁾		
Temperature Range - Operation ^{(1) (2)}	-20°C / +60°C[-4°F/+140°F], Option -30°C[-22°F]	Low Temperature Kit up to -30 °C [-22°F]		
Relative Humidity	4% - 100% (without condensation)	Different rating fuses		
Maximum Altitude (without derating) ⁽³⁾	2,000 m[6561 ft]	Enhanced corrosion protection		
Dimensions W x H x D (IEC / UL version) ⁽⁴⁾	11,800 x 2,600 x 2,100 mm / 30 x 8.5 x 8.6 ft	Motorized MV Switchgear		
Protection ⁽⁵⁾	IP54	UPS		
Cooling System	Liquid & forced air	Custom Auxiliary Transformer		
		Seismic Reinforcement		

Standards/Directives ⁽⁶⁾				
IEC 62109-1	IEC 62116	IEC 62477-1:2022		
IEC 62109-2	UL 1741-SB	IEEE C57		
IEC 61000-6-2	CSA 22.2.No 107.1	IEC 60076		
IEEE 1547	NFPA 70:2020			
EN 55011/CISPR11:2019	IEC 62271-202			

⁽¹⁾ Consult Gamesa Electric for specific configurations

⁽²⁾ With derating from 40°C [104°F]

⁽³⁾ Up to 4,000m [13,123 ft] with derating

⁽⁴⁾ UL variant only available for 1-PV Inverter based configuration

⁽⁵⁾ Consult Gamesa Electric for more details



Gamesa Electric

Energy Storage Solutions

Battery Inverters

Advanced energy markets face challenging problems that demand flexible, robust and innovative solutions. Gamesa Electric Proteus PCS-E is designed with these challenges in mind to support a wide range of DC voltage levels and accommodates all of the main battery technologies, including Li-Ion, Lead-acid, Zinc-Air, Ni-Cd, flow batteries, and supercapacitors. Leveraging Gamesa Electric's expertise in power electronics and controls across diverse applications—such as wind, solar, power quality, marine propulsion, and industrial drives—PCS-E ensures optimal performance for any storage system with a minimum failure rate.

The Gamesa Electric Proteus PCS-E control optimizes communication between the battery management system (BMS) and the power plant controller, SCADA, or EMS (Energy Management System). With dynamic regulation loops, Gamesa Electric Proteus PCS-E ensures quick response to commands and achieves the desired outcomes, highlighting the following:

- › Ultra-low THDi to avoid the risks of resonances and disturbances with the electrical grid, as well as to reduce losses.
- › Fast response to changes in operating conditions, both environmental and grid-related, as well as to changes in set points and operating modes.
- › Capability to meet the most demanding grid codes, being a key component for the ancillary services and capacity markets.

- › Capacity to manage multiple BMS and accept up to two independent setpoints for active and reactive powers, thanks to the PCS-E architecture based on two power blocks.

Advanced Functionalities:

The Gamesa Electric Proteus PCS-E has been designed to support advanced functionalities to contribute to higher stability and robustness of the electrical grid, such as:

- › Grid-forming capability both on-grid and off-grid (island)
- › Black start capability
- › Fast switching from grid-forming to grid-following mode and vice versa

Also, it should be noted that Gamesa Electric engineers will provide support during grid connection studies to ensure rapid BESS deployment and compliance with the main standards and requirements applicable to the connection point.



Gamesa Electric Proteus PCS-E Inverters

1500V Battery Inverters



[FULL DATASHEET
CLICK HERE](#)

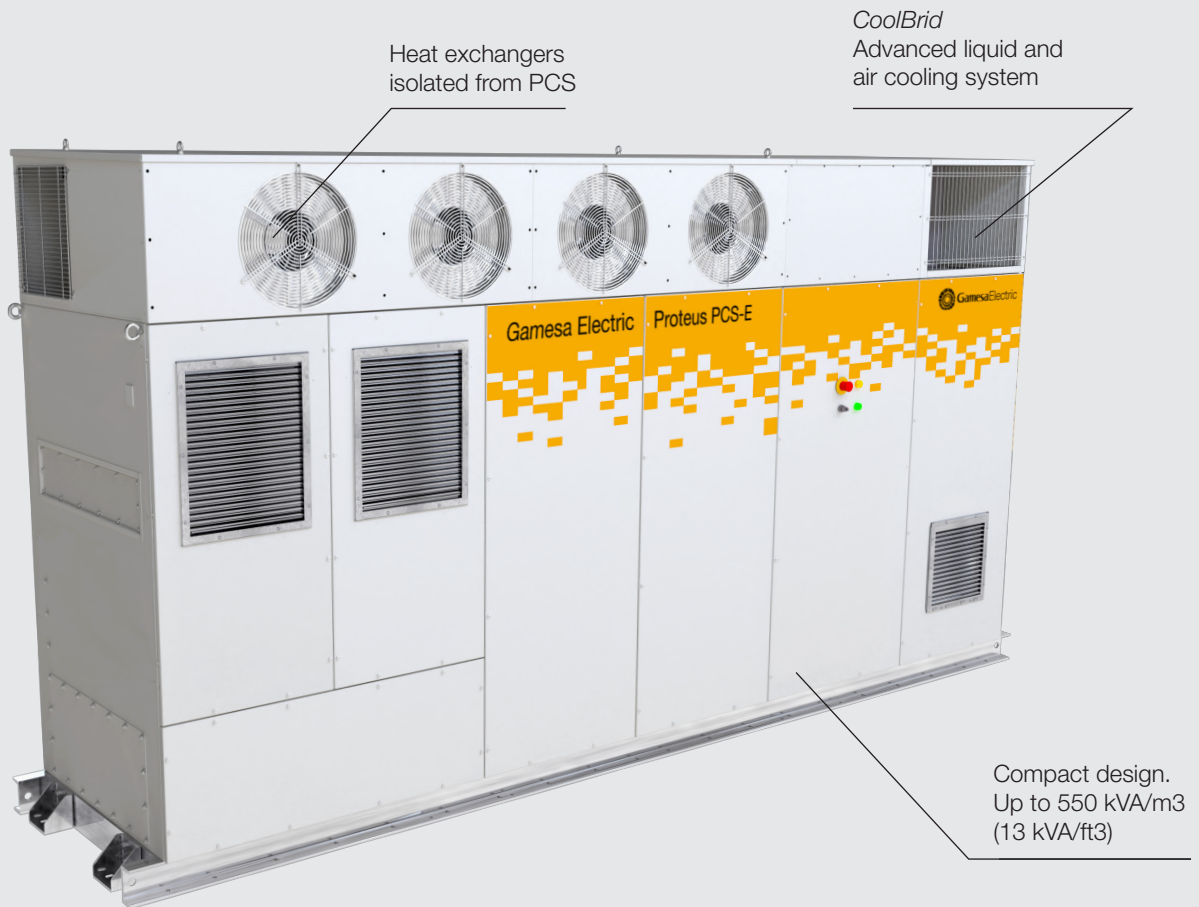
High DC
short-circuit
capacity

High power
capability up
to 1500Vdc

THDi <1.0%

High
efficiency

Outdoor
solution



High Round Trip Efficiency (RTE)

High efficiency that allows to improve the overall system RTE and LCoS.



Grid connection

Four quadrant operation for full active and reactive power support to comply with the most demanding grid codes



Battery oriented

Safety centered design with high speed control and monitoring.

Smart liquid/air cooling system that allows critical components to work at temperature level far below their limits, guaranteeing longer product lifespan and lower thermal losses

Weak grid and micro-grid configuration with a seamless transition and black start capability

Double power module topology for two independent battery connections allowing for much higher DC short-circuit currents and increased system availability

Low power derating

High power capacity at 1500Vdc

Wide operating temperature range

Fast frequency response

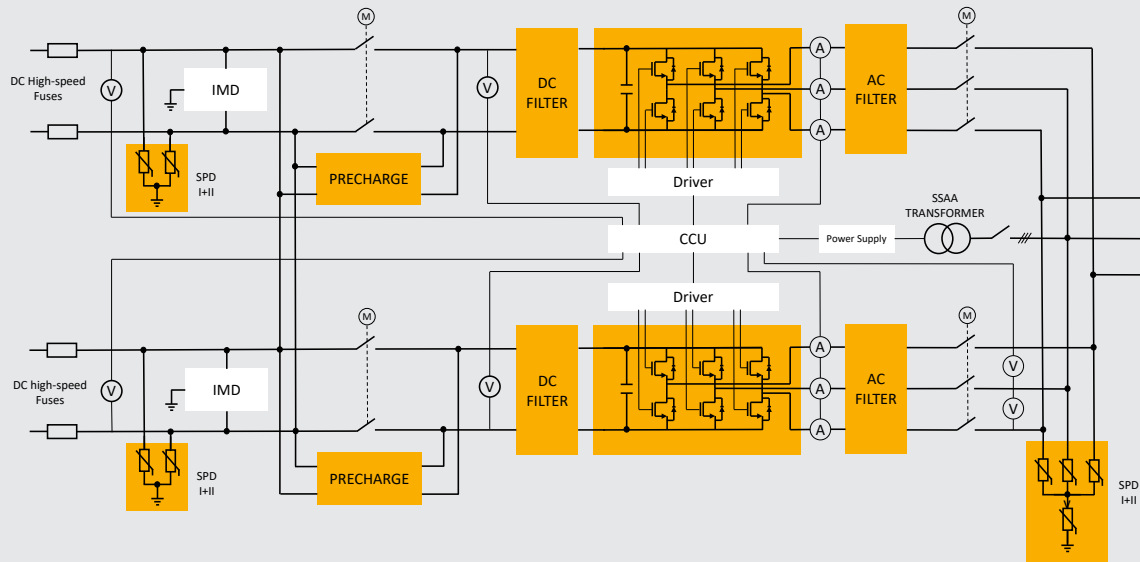
Synthetic inertia

Grid forming in parallel operation with the grid

Battery agnostic design to accommodate different battery technologies up to 1500Vdc, including: li-ion, lead-acid, flow and others

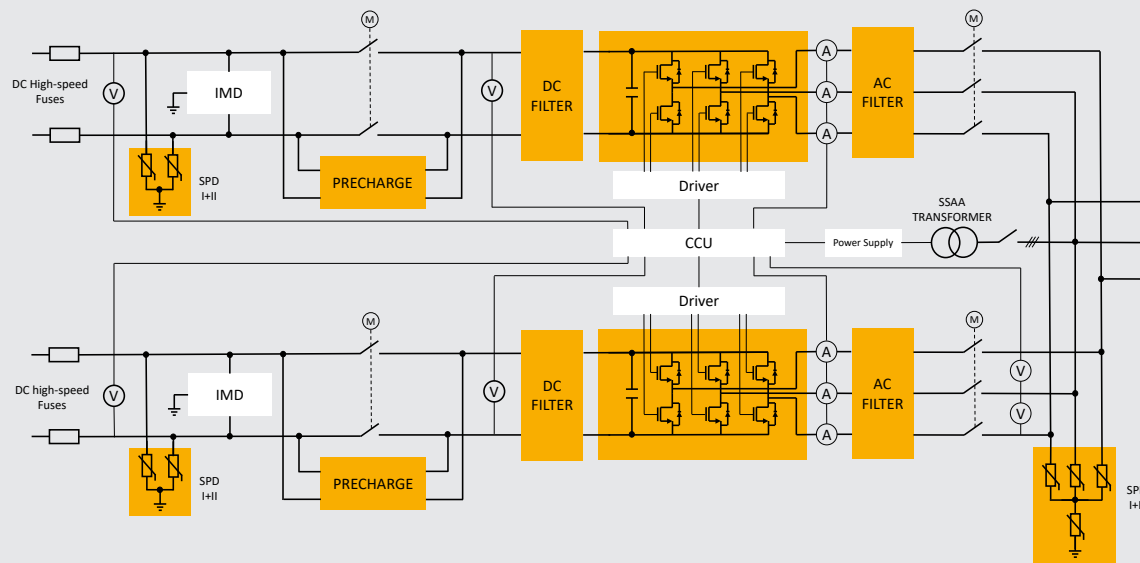
Different product configurations available to optimize performance in demanding environments as well as different voltage levels to fit customers' needs.

SINGLE BUS CONFIGURATION



DOUBLE BUS CONFIGURATION

Capacity to manage two independent batteries



Proteus PCS-E Battery Inverters					
	Gamesa Electric Proteus PCS 4180E	Gamesa Electric Proteus PCS 4360E	Gamesa Electric Proteus PCS 4600E	Gamesa Electric Proteus PCS 4910E	Gamesa Electric Proteus PCS 5150E
DC Input					
DC Minimum Voltage for grid tied mode ⁽¹⁾	976 V	1018 V	1075 V	1146 V	1202 V
DC Maximum Voltage	1500 V				
Number of Independent Power Modules per PCS	2, not galvanically isolated				
Max. DC Current	2 x 2227 A				
Number of Fused DC Inputs per Power Module/Total ⁽²⁾	Up to 3+ & 3- / 6+ & 6-				
Max. DC short-circuit withstanding capability	2 x 250kA, 3ms Double DC bus configuration 1 x 250kA, 3ms Single DC bus configuration				
AC Output					
Number of Phases	Three-phase w/o neutral point				
Nominal AC Power Total @25°C [77°F], 1500VDC	4446 kVA	4639 kVA	4897 kVA	5219 kVA	5477 kVA
Nominal AC Power Total @40°C [104°F], 1500VDC	4183 kVA	4365 kVA	4607 kVA	4910 kVA	5153 kVA
Nominal AC Power Total @40°C [104°F], 1300VDC	4494 kVA	4689 kVA	4950 kVA	5275 kVA	5535 kVA
Nominal AC Voltage ⁽²⁾	690 Vrms	720 Vrms	760 Vrms	810 Vrms	850 Vrms
Nominal Voltage Allowance Range ⁽²⁾	+/-15%				
Frequency Range ⁽²⁾	46.5-53 Hz // 56-63.5 Hz				
THD of AC Current	<1.0% @Sn				
Power Factor Range ⁽³⁾	0 (lagging) - 1- 0 (leading)				
Performance					
Max. Efficiency	98.57%				
Stand-by Power Consumption	< 200 W				
General Data					
Temperature Range - Operation	-20°C / +60°C [-4°F / +140°F]				
Maximum Altitude	< 2,000 m [6,561 ft] (w/o derating)				
Cooling System	Liquid & forced air				
Relative Humidity	4% – 100% (w/o condensation)				
Protection Class	IP55 class 1, NEMA3R				
Dimensions (W/H/D)	4,325 x 2,255 x 1,022 mm [170.3" x 88.5" x 40.2"]				
Weight	4,535 kg [10,000 lb]				
AC Protections					
AC Side Disconnection & Short-circuit Current Protection	Two motorized AC circuit breakers - one per each power module				
AC Overvoltage Protection	Type 1 + 2 SPD				
Anti-islanding	Included (SW)				
Grid Voltage Fluctuations (LVRT, HVRT) ⁽²⁾	Included (SW)				
Frequency Failure	Included (SW)				
DC Protections					
DC Disconnections	Two motorized DC switches (on-load) - one per each power module				
DC Short-circuit Protection	DC fast fuses (optional)				
DC Over-voltage Protection	Type 1 + 2 SPD				
Reverse Polarity Detection	Included				
DC Ground Fault and Insulation Detection	Included				
Other Protections					
Over-temperature Protection	Included				
Emergency Push Button	Included				
Communications					
Control ⁽²⁾	Modbus TCP/IP				
Monitoring ⁽²⁾	Modbus TCP/IP				
Webserver	Included				
Optional					
Low Temperature Kit to up to -30°C [-22°F]	(1) At nominal AC voltage. Consult Gamesa Electric for other options				
Factory-fitted DC fuses	(2) Consult Gamesa Electric for a specific configuration				
Factory-fitted joint DC inputs	(3) Consult P-Q chart				
Enhanced corrosion protection	(4) Consult Gamesa Electric for more details				

Proteus PCS-E Battery Inverters						
	Gamesa Electric	Gamesa Electric	Gamesa Electric	Gamesa Electric	Gamesa Electric	Gamesa Electric
	Proteus PCS 2420E	Proteus PCS 2910E	Proteus PCS 3150E	Proteus PCS 3630E	Proteus PCS 3810E	Proteus PCS 4000E
DC Input						
DC Minimum Voltage for grid tied mode ⁽¹⁾	566 V	679 V	736 V	849 V	891 V	934 V
DC Maximum Voltage	1238 V	1310 V	1347 V	1418 V	1445 V	1473 V
Number of Independent Power Modules per PCS	2, not galvanically isolated					
Max. DC Current	2 x 2227 A					
Number of Fused DC Inputs per Power Module/Total ⁽²⁾	Up to 3+ & 3- / 6+ & 6-					
Max. DC short-circuit withstanding capability	2 x 250kA, 3ms Double DC bus configuration 1 x 250kA, 3ms Single DC bus configuration					
AC Output						
Number of Phases	Three-phase w/o neutral point					
Nominal AC Power Total @25°C [77°F], Max. Vdc	2577 kVA	3093 kVA	3351 kVA	3866 kVA	4059 kVA	4250 kVA
Nominal AC Power Total @40°C [104°F], Max. Vdc	2425 kVA	2910 kVA	3152 kVA	3637 kVA	3819 kVA	4000 kVA
Nominal AC Power Total @40°C [104°F], 1300VDC	N/A	3126 kVA	3387 kVA	3908 kVA	4103 kVA	4298 kVA
Nominal AC Voltage ⁽²⁾	400 Vrms	480 Vrms	520 Vrms	600 Vrms	630 Vrms	660 Vrms
Nominal Voltage Allowance Range ⁽²⁾	+/-15%					
Frequency Range ⁽²⁾	46.5-53 Hz / 56-63.5 Hz					
THD of AC Current	<1.0% @Sn					
Power Factor Range ⁽³⁾	0 (lagging) - 1- 0 (leading)					
Performance						
Max. Efficiency	98.57%					
Stand-by Power Consumption	< 200 W					
General Data						
Temperature Range - Operation	-20°C / +60°C [-4°F / +140°F]					
Maximum Altitude	< 2,000 m [6,561 ft] (w/o derating)					
Cooling System	Liquid & forced air					
Relative Humidity	4% – 100% (w/o condensation)					
Protection Class	IP55 class 1, NEMA3R					
Dimensions (W/H/D)	4,325 x 2,255 x 1,022 mm [170.3" x 88.5" x 40.2"]					
Weight	4,535 kg [10,000 lb]					
AC Protections						
AC Side Disconnection & Short-circuit Current Protection	Two motorized AC circuit breakers - one per each power module					
AC Overvoltage Protection	Type 1 + 2 SPD					
Anti-islanding	Included (SW)					
Grid Voltage Fluctuations (LVRT, HVRT) ⁽²⁾	Included (SW)					
Frequency Failure	Included (SW)					
DC Protections						
DC Disconnections	Two motorized DC switches (on-load) - one per each power module					
DC Short-circuit Protection	DC fast fuses (optional)					
DC Over-voltage Protection	Type 1 + 2 SPD					
Reverse Polarity Detection	Included					
DC Ground Fault and Insulation Detection	Included					
Other Protections						
Over-temperature Protection	Included					
Emergency Push Button	Included					
Communications						
Control ⁽²⁾	Modbus TCP/IP					
Monitoring ⁽²⁾	Modbus TCP/IP					
Webserver	Included					
Optional						
Low Temperature Kit to up to -30°C [-22°F]	(1) At nominal AC voltage. Consult Gamesa Electric for other options					
Factory-fitted DC fuses	(2) Consult Gamesa Electric for a specific configuration					
Factory-fitted joint DC inputs	(3) Consult P-Q chart					
Enhanced corrosion protection	(4) Consult Gamesa Electric for more details					

Standards/Directives ⁽⁴⁾					
IEC 62109-1	IEC 62116	CSA C22.2 No 107.1	Ambiente e ação climática 73/2020	NEMA 250-2014	UTE C15-400
IEC 62109-2	IEC 61683	CEI 0-16; V2 2021-06	CEA 2019	NFPA 70:2020	EirGrid V10:2020
IEC 61000-6-2	IEC 60529	Allegato A.79	Rule 14, Rule 21	IEC 62477-1:2022	
IEEE 1547	NTS 631 v1.1 SENP, v2.1 SEPE	ENA G99	PRC 024-2	VDE-AR-N 4110 4120 4130 2018	
EN 55011 / CISPR11:2019	UL 1741-SB	UNE-EN 50541- 2:2014	CEC 2015	Arrêté du 9 juin 2020	

Proteus PCS-E Inverters combine reliability
and robustness, efficiency, compactness and
high power capability at 1500Vdc,
all for a minimum LCoS





Gamesa Electric

Energy Storage MV Solutions

Medium Voltage solutions for large-MW
battery energy storage systems

Gamesa Electric Storage “plug and play” solutions are customizable to the needs of each client (number of Gamesa Electric PCS battery inverters, step-up transformers, MV protection switchgear, etc.), minimizing logistic costs and on site installation activities.



Gamesa Electric Proteus PCS-E Stations

Maximum efficiency and compactness
for utility-scale energy storage projects



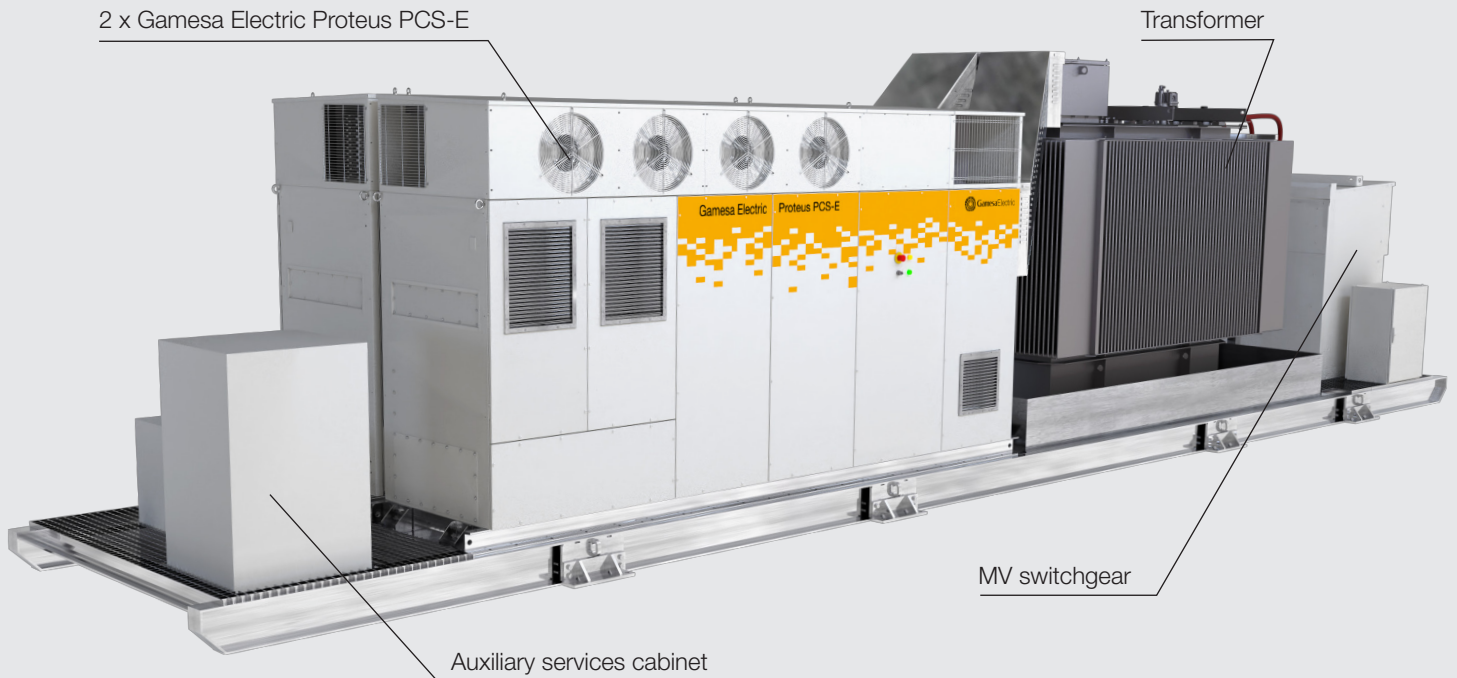
FULL DATASHEET
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High DC
short-circuit
capacity

THDi <1%

High
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Outdoor
solution



High Round Trip Efficiency (RTE)

High efficiency that allows to improve the overall system RTE and LCoS.

Smart liquid/air cooling system that allows critical components to work at temperature level far below their limits, guaranteeing longer product lifespan and lower thermal losses

Low power derating

High power capacity at 1500Vdc



Grid connection

Four quadrant operation for full active and reactive power support to comply with the most demanding grid codes

Weak grid and micro-grid configuration with a seamless transition and black start capability

Wide operating temperature range

Fast frequency response

Synthetic inertia

Grid forming in parallel operation with the grid



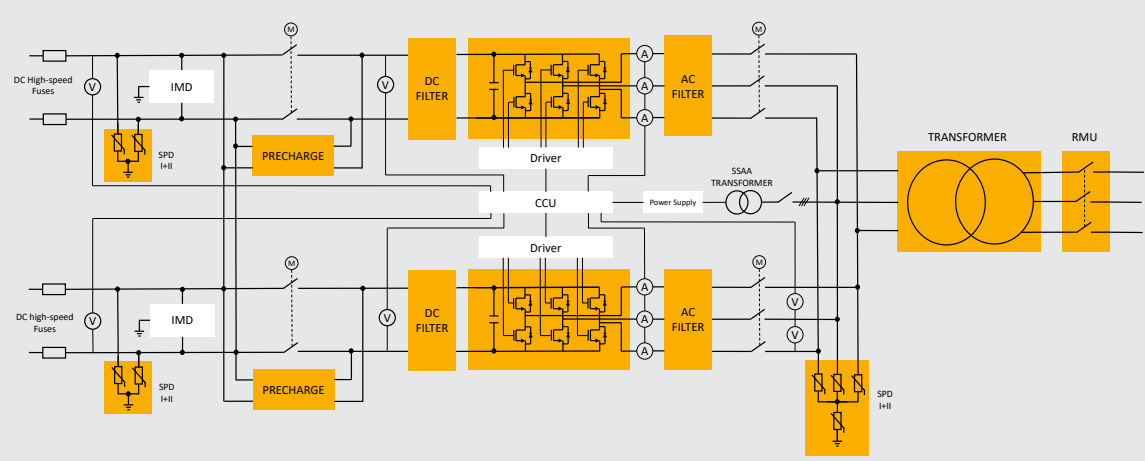
Battery oriented

Safety centered design with high speed control and monitoring.

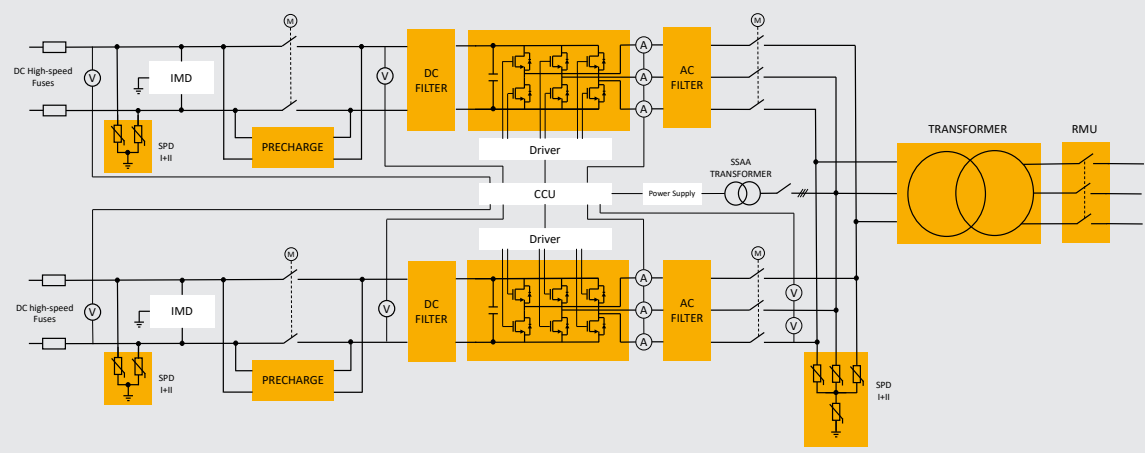
Double power module topology for two independent battery connections allowing for much higher DC short-circuit currents and increased system availability

Battery agnostic design to accommodate different battery technologies up to 1500Vdc, including: li-ion, lead-acid, flow and others

Single station (1 x PCS-E), Single DC bus configuration (Capacity to manage 1 battery)

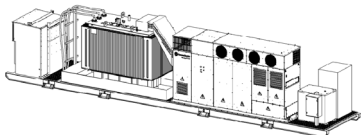


Single station (1 x PCS-E), Double DC bus configuration (Capacity to manage up to 2 independent batteries)

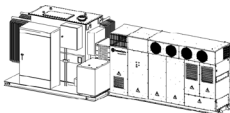


1 x Gamesa Electric Proteus PCS-E Configurations

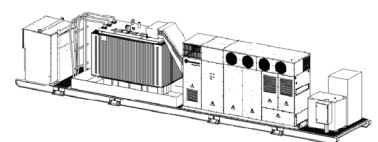
Gamesa Electric Proteus PCS-E Stations						
Number of PCS-Es	1 x Proteus PCS 4000E	1 x Proteus PCS 4180E	1 x Proteus PCS 4360E	1 x Proteus PCS 4600E	1 x Proteus PCS 4910E	1 x Proteus PCS 5150E
DC Connection						
DC Minimum Voltage ⁽¹⁾	934 V	976 V	1018 V	1075 V	1146 V	1202V
DC Maximum Voltage	1473 V	1500 V	1500 V	1500 V	1500 V	1500 V
Number of Independent Power Modules	2, not galvanically isolated					
Max. DC Current @40°C [104°F]	2 x 2227 A					
Number of Fused DC Inputs ⁽²⁾	Up to 6+ & 6-					
Max. DC short-circuit withstanding capability	2 x 250kA, 3ms Double DC bus configuration 1 x 250kA, 3ms Single DC bus configuration					
AC Connection						
Number of Phases	Three-phase					
Nominal AC Power Total @25°C [77°F], Max. Vdc	4250 kVA	4446 kVA	4639 kVA	4897 kVA	5219 kVA	5477 kVA
Nominal AC Power Total @40°C [104°F], Max. Vdc	4000 kVA	4183 kVA	4365 kVA	4607 kVA	4910 kVA	5153 kVA
Nominal AC Power Total @40°C [104°F], 1300VDC	4298 kVA	4494 kVA	4689 kVA	4950 kVA	5275 kVA	5535 kVA
Nominal AC Voltage, LV side ⁽²⁾	660 Vrms	690 Vrms	720 Vrms	760 Vrms	810 Vrms	850 Vrms
Nominal AC Voltage, MV side ⁽²⁾	Up to 34.5kV					
Nominal Voltage Allowance Range ⁽²⁾	+/-10%					
Frequency Range ⁽²⁾	47.5 - 52.5/57 - 63.5 Hz					
THD of AC Current	< 1% @Sn					
Power Factor Range ⁽³⁾	0 (lagging) - 1 - 0 (leading)					
Protection devices						
DC Connection	Motorized DC switches (on-load), Overvoltage protection (Type 1 + 2 SPD), Reverse polarity detection, DC ground fault and insulation detection, fast fuses (optional)					
AC MV Connection	Protection switchgear					
Over-temperature Protection	Included					
Emergency Push Button	Included					
Components Proteus PCS-E Stations						
PCS-E	1 x Proteus PCS 4000E	1 x Proteus PCS 4180E	1 x Proteus PCS 4360E	1 x Proteus PCS 4600E	1 x Proteus PCS 4910E	1 x Proteus PCS 5150E
Transformer ⁽²⁾⁽⁴⁾	Dy11y11 KNaN					
Switchgear ⁽²⁾⁽⁶⁾	0L1V / 1L1V / 2L1V up to 38 kV					
Custom Auxiliary Transformer ⁽²⁾	Optional					
Others ⁽²⁾	Auxilliary cabinet					
Communications						
Control ⁽²⁾	Modbus TCP / IP					
Monitoring ⁽²⁾	Modbus TCP / IP					
Webserver	Included					
Other Features						
Temperature Range - Operation	-20°C / +60°C[-4°F/+140°F]					
Relative Humidity	4% - 100% (without condensation)					
Maximum Altitude (without derating)	2,000 m [6,561 ft]					
Dimensions W x H x D (IEC / UL version) ⁽⁴⁾	11,800 x 2,600 x 2,100 mm / 30 x 8.5 x 8.6 ft					
Protection ⁽⁵⁾	IP54					
Cooling System	Liquid & forced air					
Optional ⁽²⁾						
Low Temperature Kit to up to -30°C [-22°F]						
Factory-fitted DC fuses						
Factory-fitted joint DC inputs						
Enhanced corrosion protection						
Motorized MV Switchgear						
UPS						
Custom Auxiliary Transformer						
Seismic Reinforcement						
Standards/Directives ⁽⁵⁾						
IEC 62109-1	IEC 62116	IEEE C57				
IEC 62109-2	UL 1741-SB	IEC 60076				
IEC 61000-6-2	CSA C22.2 No 107.1	IEC62271-202				
IEEE 1547	NFPA 70:2020					
EN 55011 / CISPR11:2019	IEC 62477-1:2022					



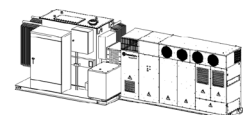
IEC version
1 x PCS-E



UL version
1 x PCS-E



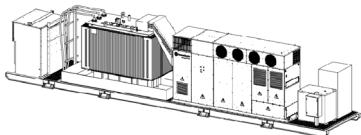
IEC version
1 x PCS-E



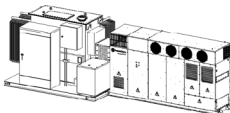
UL version
1 x PCS-E

1 x Gamesa Electric Proteus PCS-E Configurations

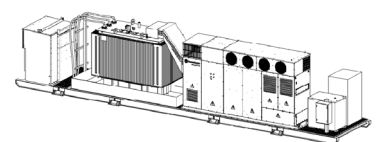
Gamesa Electric Proteus PCS-E Stations						
Number of PCS-Es	1 x Proteus PCS 2420E	1 x Proteus PCS 2910E	1 x Proteus PCS 3150E	1 x Proteus PCS 3630E	1 x Proteus PCS 3810E	
DC Connection						
DC Minimum Voltage ⁽¹⁾	566 V	679 V	736 V	849 V	891 V	
DC Maximum Voltage	1238 V	1310 V	1347 V	1418 V	1445 V	
Number of Independent Power Modules	2, not galvanically isolated					
Max. DC Current @40°C [104°F]	2 x 2227 A					
Number of Fused DC Inputs ⁽²⁾	Up to 6+ & 6-					
Max. DC short-circuit withstanding capability	2 x 250kA, 3ms Double DC bus configuration 1 x 250kA, 3ms Single DC bus configuration					
AC Connection						
Number of Phases	Three-phase					
Nominal AC Power Total @25°C [77°F], Max. Vdc	2577 kVA	3093 kVA	3351 kVA	3866 kVA	4059 kVA	
Nominal AC Power Total @40°C [104°F], Max. Vdc	2425 kVA	2910 kVA	3152 kVA	3637 kVA	3819 kVA	
Nominal AC Power Total @40°C [104°F], 1300VDC	N/A	3127 kVA	3387 kVA	3908 kVA	4103 kVA	
Nominal AC Voltage, LV side ⁽²⁾	400 Vrms	480 Vrms	520 Vrms	600 Vrms	630 Vrms	
Nominal AC Voltage, MV side ⁽²⁾	Up to 34.5kV					
Nominal Voltage Allowance Range ⁽²⁾	+/-10%					
Frequency Range ⁽²⁾	47.5 - 52.5/57 - 63.5 Hz					
THD of AC Current	< 1% @Sn					
Power Factor Range ⁽³⁾	0 (lagging) - 1 - 0 (leading)					
Protection devices						
DC Connection	Motorized DC switches (on-load), Overvoltage protection (Type 1 + 2 SPD), Reverse polarity detection, DC ground fault and insulation detection, fast fuses (optional)					
AC MV Connection	Protection switchgear					
Over-temperature Protection	Included					
Emergency Push Button	Included					
Components Proteus PCS-E Stations						
PCS-E	1 x Proteus PCS 2420E	1 x Proteus PCS 2910E	1 x Proteus PCS 3150E	1 x Proteus PCS 3630E	1 x Proteus PCS 3810E	
Transformer ⁽²⁾⁽⁶⁾	Dy11y11 KNaN					
Switchgear ⁽²⁾⁽⁶⁾	0L1V / 1L1V / 2L1V up to 38 kV					
Custom Auxiliary Transformer ⁽²⁾	Optional					
Others ⁽²⁾	Auxilliary cabinet					
Communications						
Control ⁽²⁾	Modbus TCP / IP					
Monitoring ⁽²⁾	Modbus TCP / IP					
Webserver	Included					
Other Features						
Temperature Range - Operation	-20°C / +60°C[-4°F/+140°F]					
Relative Humidity	4% - 100% (without condensation)					
Maximum Altitude (without derating)	2,000 m [6,561 ft]					
Dimensions W x H x D (IEC / UL version) ⁽⁴⁾	11,800 x 2,600 x 2,100 mm / 30 x 8.5 x 8.6 ft					
Protection ⁽⁵⁾	IP54					
Cooling System	Liquid & forced air					
Optional ⁽²⁾	⁽¹⁾ At nominal AC voltage. Consult Gamesa Electric for other options					
Low Temperature Kit to up to -30°C [-22°F]	⁽²⁾ Consult Gamesa Electric for a specific configuration					
Factory-fitted DC fuses	⁽³⁾ Consult P-Q chart					
Factory-fitted joint DC inputs	⁽⁴⁾ UL variant only available for 1-PCS-E based configuration					
Enhanced corrosion protection	⁽⁵⁾ Consult Gamesa Electric for more details					
Motorized MV Switchgear	⁽⁶⁾ UL version: Padmounted Dyn (without external switchgear)					
UPS						
Custom Auxiliary Transformer						
Seismic Reinforcement						
Standards/Directives ⁽⁶⁾						
IEC 62109-1	IEC 62116	IEEE C57				
IEC 62109-2	UL 1741-SB	IEC 60076				
IEC 61000-6-2	CSA C22.2 No 107.1	IEC62271-202				
IEEE 1547	NFPA 70:2020					
EN 55011 / CISPR11:2019	IEC 62477-1:2022					



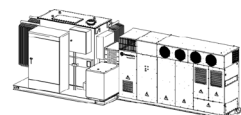
IEC version
1 x PCS-E



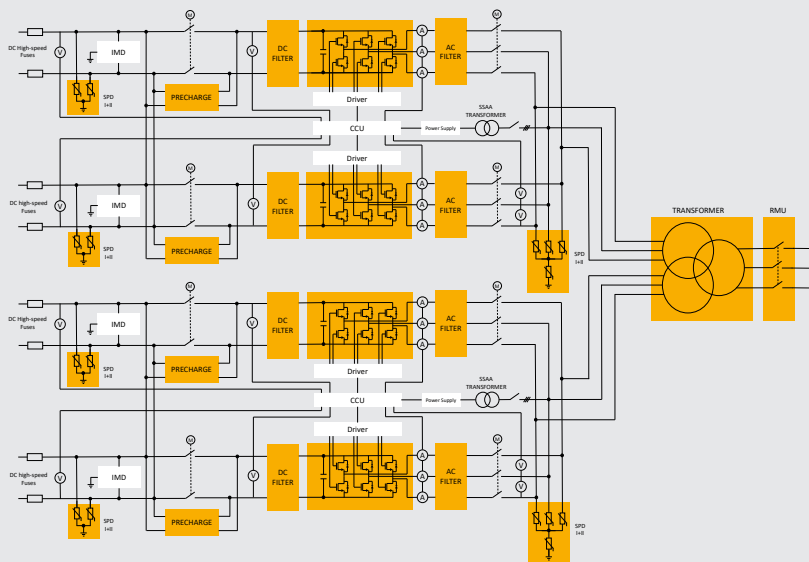
UL version
1 x PCS-E



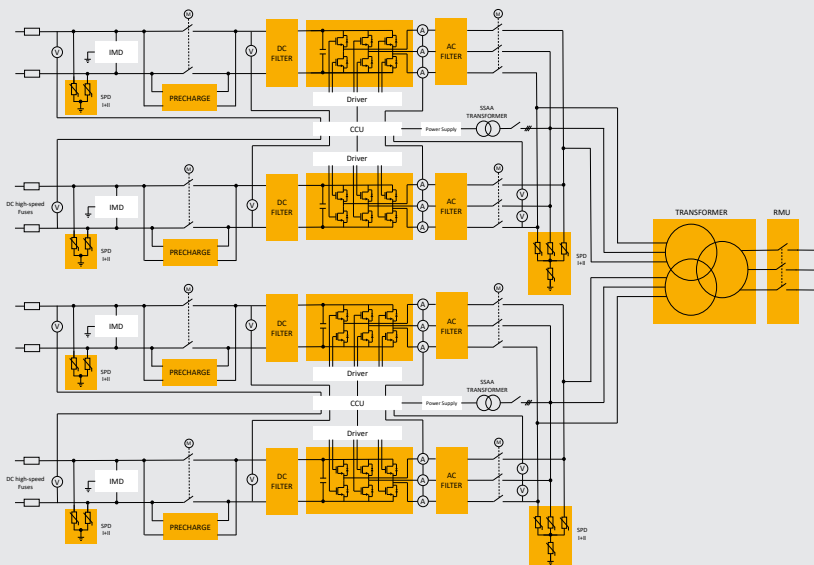
IEC version
1 x PCS-E



UL version
1 x PCS-E



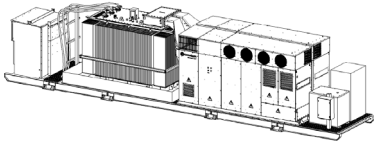
Double station (2 x PCS-E)
Double DC bus configuration
(Capacity to manage up to
4 independent batteries)



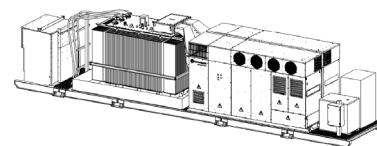
Double station (2 x PCS-E),
Double DC bus configuration
(Capacity to manage up to
2 independent batteries)



	Gamesa Electric Proteus PCS-E Stations					
	Proteus PCSS 8000E	Proteus PCSS 8360E	Proteus PCSS 8720E	Proteus PCSS 9200E	Proteus PCSS 9820E	Proteus PCSS 10,300E
Number of PCS-Es	2x Proteus PCS 4000E	2x Proteus PCS 4180E	2x Proteus PCS 4360E	2x Proteus PCS 4600E	2x Proteus PCS 4910E	2x Proteus PCS 5150E
DC Connection						
DC Minimum Voltage ⁽¹⁾	934 V	976 V	1018 V	1075 V	1146 V	1202V
DC Maximum Voltage	1473 V	1500 V	1500 V	1500 V	1500 V	1500 V
Number of Independent Power Modules per PCS-E / Total	2 / 4					
Max. DC Current @40°C [104°F]	4 x 2500 A					
Number of Fused DC Inputs per PCS-E / Total ⁽²⁾	Up to 12+ & 12-					
Max. DC short-circuit withstanding capability	4 x 250kA, 3ms Double bus configuration 2 x 250kA, 3ms Single bus configuration					
AC Connection						
Number of Phases	Three-phase					
Nominal AC Power Total @25°C [77°F], Max. Vdc	8500 kVA	8892 kVA	9278 kVA	9794 kVA	10438 kVA	10954 kVA
Nominal AC Power Total @40°C [104°F], Max. Vdc	8000 kVA	8366 kVA	8730 kVA	9214 kVA	9820 kVA	10306 kVA
Nominal AC Power Total @40°C [104°F], 1300VDC	8596 kVA	8988 kVA	9378 kVA	9900 kVA	10550 kVA	11070 kVA
Nominal AC Voltage, LV side ⁽²⁾	2 x 660 Vrms	2 x 690 Vrms	2 x 720 Vrms	2 x 760 Vrms	2 x 810 Vrms	2 x 850 Vrms
Nominal AC Voltage, MV side ⁽²⁾	Up to 34.5kV					
Nominal Voltage Allowance Range ⁽²⁾	+/-10%					
Frequency Range ⁽²⁾	47.5 - 52.5/57 - 63.5 Hz					
THD of AC Current	< 1% @Sn					
Power Factor Range ⁽³⁾	0 (lagging) - 1 - 0 (leading)					
Protection devices						
DC Connection	Motorized DC switches (on-load), Overvoltage protection (Type 1 + 2 SPD), Reverse polarity detection, DC ground fault and insulation detection, fast fuses (optional)					
AC MV Connection	Protection switchgear					
Over-temperature Protection	Included					
Emergency Push Button	Included					
Components Proteus PCS-E Stations						
PCS-E	2 x Proteus PCS 4000E	2 x Proteus PCS 4180E	2 x Proteus PCS 4360E	2 x Proteus PCS 4600E	2 x Proteus PCS 4910E	2 x Proteus PCS 5150E
Transformer ⁽²⁾	Dy11y11 KNaN					
Switchgear ⁽²⁾	0L1V / 1L1V / 2L1V up to 38 kV					
Custom Auxiliary Transformer ⁽²⁾	Optional					
Others ⁽²⁾	Auxilliary cabinet					
Communications						
Control ⁽²⁾	Modbus TCP / IP					
Monitoring ⁽²⁾	Modbus TCP / IP					
Webserver	Included					
Other Features						
Temperature Range - Operation	-20°C / +60°C [-4°F/+140°F]					
Relative Humidity	4% - 100% (without condensation)					
Maximum Altitude (without derating)	2,000 m [6,561 ft]					
Dimensions W x H x D (IEC / UL version) ⁽⁴⁾	11,800 x 2,600 x 2,100 mm / 30 x 8.5 x 8.6 ft					
Protection ⁽⁵⁾	IP54					
Cooling System	Liquid & forced air					
Optional ⁽²⁾						
Low Temperature Kit to up to -30°C [-22°F]	⁽¹⁾ At nominal AC voltage. Consult Gamesa Electric for other options					
Factory-fitted DC fuses	⁽²⁾ Consult Gamesa Electric for a specific configuration					
Factory-fitted joint DC inputs	⁽³⁾ Consult P-Q chart					
Enhanced corrosion protection	⁽⁴⁾ UL variant only available for 1-PCS-E based configuration					
Motorized MV Switchgear	⁽⁵⁾ Consult Gamesa Electric for more details					
UPS						
Custom Auxiliary Transformer						
Seismic Reinforcement						
Standards/Directives ⁽⁵⁾						
IEC 62109-1	IEC 62116	IEEE C57				
IEC 62109-2	UL 1741-SB	IEC 60076				
IEC 61000-6-2	CSA C22.2 No 107.1	IEC62271-202				
IEEE 1547	NFPA 70:2020					
EN 55011 / CISPR11:2019	IEC 62477-1:2022					

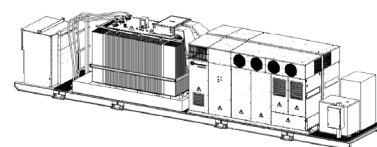


IEC version
2 x PCS-E



IEC version
2 x PCS-E

		Gamesa Electric Proteus PCS-E Stations				
		Proteus PCSS 4840E	Proteus PCSS 5820E	Proteus PCSS 6300E	Proteus PCSS 7260E	Proteus PCSS 7620E
Number of PCS-Es		2x Proteus PCS 2420E	2x Proteus PCS 2910E	2x Proteus PCS 3150E	2x Proteus PCS 3630E	2x Proteus PCS 3810E
DC Connection						
DC Minimum Voltage ⁽¹⁾		566 V	679 V	736 V	849 V	891V
DC Maximum Voltage		1238 V	1310V	1347 V	1418 V	1445 V
Number of Independent Power Modules per PCS-E / Total		2 / 4				
Max. DC Current @40°C [104°F]		4 x 2500 A				
Number of Fused DC Inputs per PCS-E / Total ⁽²⁾		Up to 12+ & 12-				
Max. DC short-circuit withstanding capability		4 x 250kA, 3ms Double bus configuration 2 x 250kA, 3ms Single bus configuration				
AC Connection						
Number of Phases		Three-phase				
Nominal AC Power Total @25°C [77°F], Max. Vdc		5154 kVA	6186 kVA	6702 kVA	7732 kVA	8118 kVA
Nominal AC Power Total @40°C [104°F], Max. Vdc		4850 kVA	5820 kVA	6304 kVA	7274 kVA	7638 kVA
Nominal AC Power Total @40°C [104°F], 1300VDC		N/A	6252 kVA	6774 kVA	7816 kVA	8206 kVA
Nominal AC Voltage, LV side ⁽²⁾		2 x 400 Vrms	2 x 480 Vrms	2 x 520 Vrms	2 x 600 Vrms	2 x 630 Vrms
Nominal AC Voltage, MV side ⁽²⁾		Up to 34.5kV				
Nominal Voltage Allowance Range ⁽²⁾		+/-10%				
Frequency Range ⁽²⁾		47.5 - 52.5/57 - 63.5 Hz				
THD of AC Current		< 1% @Sn				
Power Factor Range ⁽³⁾		0 (lagging) - 1 - 0 (leading)				
Protection devices						
DC Connection		Motorized DC switches (on-load), Overvoltage protection (Type 1 + 2 SPD), Reverse polarity detection, DC ground fault and insulation detection, fast fuses (optional)				
AC MV Connection		Protection switchgear				
Over-temperature Protection		Included				
Emergency Push Button		Included				
Components Proteus PCS-E Stations						
PCS-E		2 x Proteus PCS 2420E	2 x Proteus PCS 2910E	2 x Proteus PCS 3150E	2 x Proteus PCS 3630E	2 x Proteus PCS 3810E
Transformer ⁽²⁾		Dy11y11 KNaN				
Switchgear ⁽²⁾		0L1V / 1L1V / 2L1V up to 38 kV				
Custom Auxiliary Transformer ⁽²⁾		Optional				
Others ⁽²⁾		Auxiliary cabinet				
Communications						
Control ⁽²⁾		Modbus TCP / IP				
Monitoring ⁽²⁾		Modbus TCP / IP				
Webserver		Included				
Other Features						
Temperature Range - Operation		-20°C / +60°C[-4°F/+140°F]				
Relative Humidity		4% - 100% (without condensation)				
Maximum Altitude (without derating)		2,000 m [6,561 ft]				
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Protection ⁽⁵⁾		IP54				
Cooling System		Liquid & forced air				
Optional ⁽²⁾						
Low Temperature Kit to up to -30°C [-22°F]						
Factory-fitted DC fuses						
Factory-fitted joint DC inputs						
Enhanced corrosion protection						
Motorized MV Switchgear						
UPS						
Custom Auxiliary Transformer						
Seismic Reinforcement						
Standards/Directives ⁽⁵⁾						
IEC 62109-1		IEC 62116		IEEE C57		
IEC 62109-2		UL 1741-SB		IEC 60076		
IEC 61000-6-2		CSA C22.2 No 107.1		IEC62271-202		
IEEE 1547		NFPA 70:2020				
EN 55011 / CISPR11:2019		IEC 62477-1:2022				



IEC version
2 x PCS-E



Gamesa Electric

Power Plant Controller

Smart technology for renewable energy grid integration

Gamesa Electric Proteus PV and PCS inverters have highly flexible and dynamic hardware and software to meet the most demanding requirements regarding grid connection. However, in most cases, these requirements are necessary at the Point of Common Coupling (POC) level rather than at the inverter level. The equipment required to implement these characteristics at the POC is known as Gamesa Electric Orchestra.

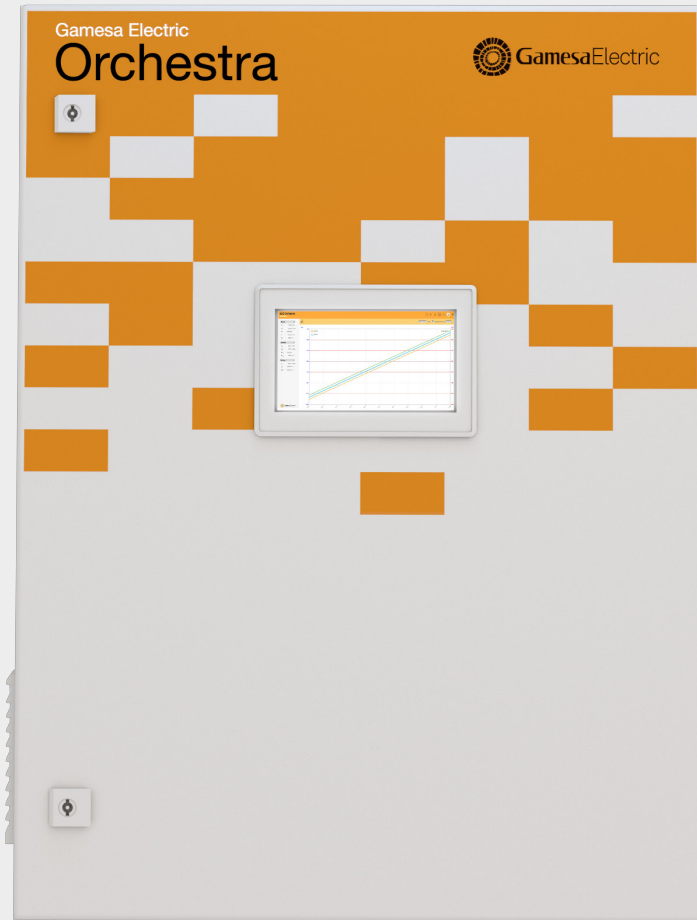
Gamesa Electric Orchestra is a flexible plant controller that accepts multiple configurations, such as only PV inverters, BESS standalone, or hybrid technologies like PV + BESS, achieving an ultra-fast and accurate response with minimal overshoot.

Grid operators are increasingly demanding higher technical capabilities for new energy plants to improve grid quality, which include:

- › On-demand active and reactive power generation capability to match grid power generation and consumption.
- › Power factor regulation capability.

- › Voltage regulation capability.
- › Control of active power for frequency regulation and ramp-up/down.
- › Grid-forming management for on-grid and off-grid applications (island).
- › Black start management with multiple PCS-E in parallel.
- › Synchronization of internal/external grids to connect a microgrid to the main grid.
- › Power oscillation dumping (POD)

Gamesa Electric Orchestra also can accept external set-points from the grid operator, EMS, or a high-level controller to participate successfully in ancillary services, capacity markets, trading, or energy shifting among other applications.

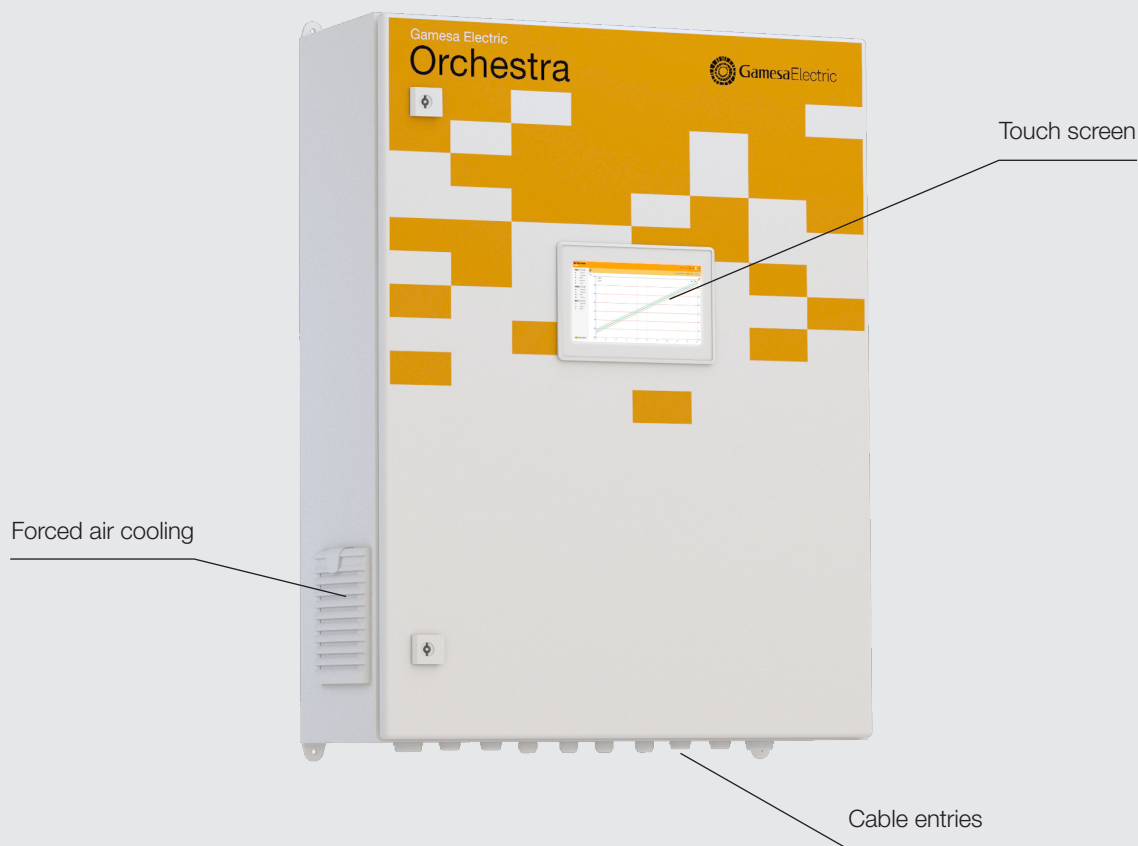


Gamesa Electric Orchestra

Power Plant Controller for
PV and Storage



FULL DATASHEET
CLICK HERE



Broad & flexible functionality

Flexible plant configuration:

- Photovoltaic generation
- BESS stand alone
- Hybrid solar + storage

Multiple applications:

Fast frequency response (FFR), voltage regulation, active/reactive power control, ramp-rate, power oscillation damping (POD)...

Local and remote control and monitoring compatible with different users: plant operator, grid operator, plant owner, service team



Grid connection robustness

Extensive grid code knowledge based on wind, solar and BESS experience in more than 54 countries.

Grid code compliance proven in the most demanding markets including Europe, Australia, Mexico, USA and others

Advance functionalities as optional: Grid forming based on VSM algorithms (on-grid and off-grid modes), black start, synchronization of grids, support of external grid outage



Scalability and connectivity

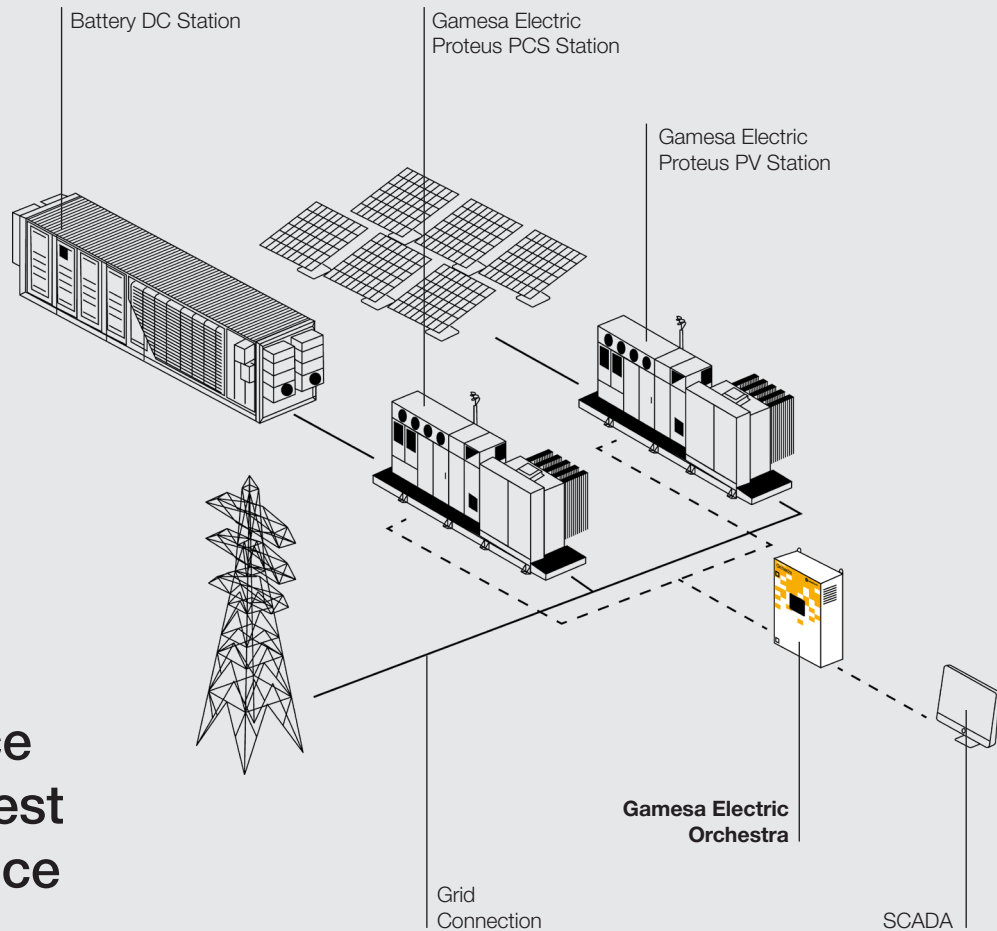
Scalability from small to large utility scale projects

Multi-PCS and multi-PV inverter coordination for maximum performance. Optimized state of charge (SOC) recovery algorithms

High communication speed and connectivity capacity, fast plant response.

Full grid compliance with the best performance

Power Plant Controller
for PV & BESS



Gamesa Electric Orchestra brings intelligence to the PV and storage system optimising resources and maximising performance.

General Data

Plant Configuration ⁽¹⁾	Photovoltaic / BESS Standalone / Hybrid PV + BESS
Inverter Compatibility	Gamesa Electric Proteus Series

Main characteristics

Dimensions (H / W / D)	800 x 600 x 300 mm [31.5 x 23.6 x 11.8 inch]
Weight	45 kg [99.2 lb]
Standard Protection Class ⁽¹⁾	IP20
Power Supply ⁽¹⁾	250W, 1ph, 230Vac 50/60Hz
Cooling	Forced air
Mounting System ⁽¹⁾	Wall / Support structure mounted
Certification ⁽²⁾	CE Marking

Environmental Conditions

Temperature Range – Operation ⁽¹⁾	0°C / +60°C [32°F / 140°F]
Relative Humidity	5 – 95% (non-condensing)
Maximum Altitude ⁽¹⁾	2000 m
Corrosion Protection ⁽¹⁾	C4

Grid Metering

Integrated Direct Analog Readings ⁽³⁾	3 x CTs and 3 x VTs
Grid Analyzer	Optional

Communications	
Power Converters	Modbus TCP/IP
SCADA ⁽¹⁾	Modbus TCP/IP
Grid Operator ⁽¹⁾	Modbus TCP/IP
Webserver	Included

Optionals

Grid Analyzer	
Touch screen	
Auxiliary power supply at +24V	
Low Temperature Kit up to -20 °C [-4 °F]	
High Altitude Kit up to 4,000 [13,123 ft]	
Protection Against High Corrosion C5	
Power Supply Kit 250W, 120Vac, 1ph, 50/60Hz	
Cold Swap Redundancy	

⁽¹⁾ Consult Gamesa Electric for a specific configuration

⁽²⁾ Consult Gamesa Electric for different Standards/Directives

⁽³⁾ Optimum for solutions where Orchestra is located in a near proximity of the POI measurement (<10 m [32.8 ft])

Always at your service

Gamesa Electric has a leading service of technical assistance.

A team of professionals with extensive experience in the sector, capable of carrying out analysis and plant repairs with a capacity of response that allows reaching the client's facilities.



GamesaElectric

Shaping New Energy



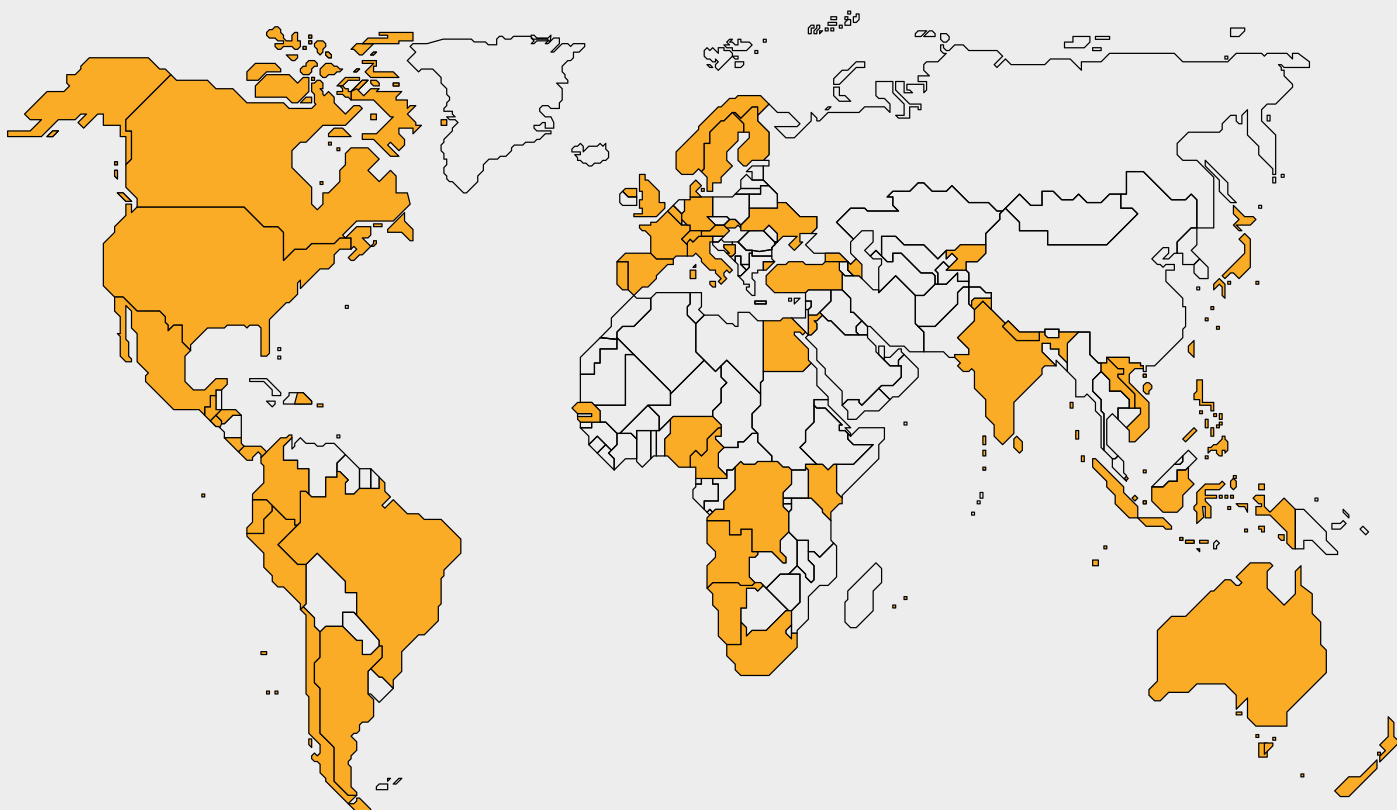
+8.5 GW SOLAR &
STORAGE ENERGY



+62 GW
WIND POWER



+60
COUNTRIES



Worldwide presence

Albania
Angola
Argentina
Australia
Austria
Azerbaijan
Belgium
Bosnia and
Herzegovina

Brazil
Bulgaria
Cameroun
Canada
Chile
Colombia
Costa Rica
D.R. Congo
Denmark

Denmark (Faroe
Islands)
Dominican Rep.
Ecuador
Egypt
El Salvador
Finland
France
Georgia

Germany
Guatemala
Honduras
India
Indonesia
Italy
Japan
Jordan
Kenya

Kyrgyzstan
Laos
Mexico
Namibia
Nepal
New Zealand
Nigeria
Norway
Panama

Peru
Philippines
Portugal
Rwanda
Senegal
Slovakia
South Africa
Spain
Sri Lanka

Sweden
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Ukraine
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Vietnam



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January 2025