



# Gamesa Electric

## Proteus PCS-E

### 1500V Battery Inverters



High DC  
short-circuit  
capacity

High  
power  
capability up  
to 1500Vdc

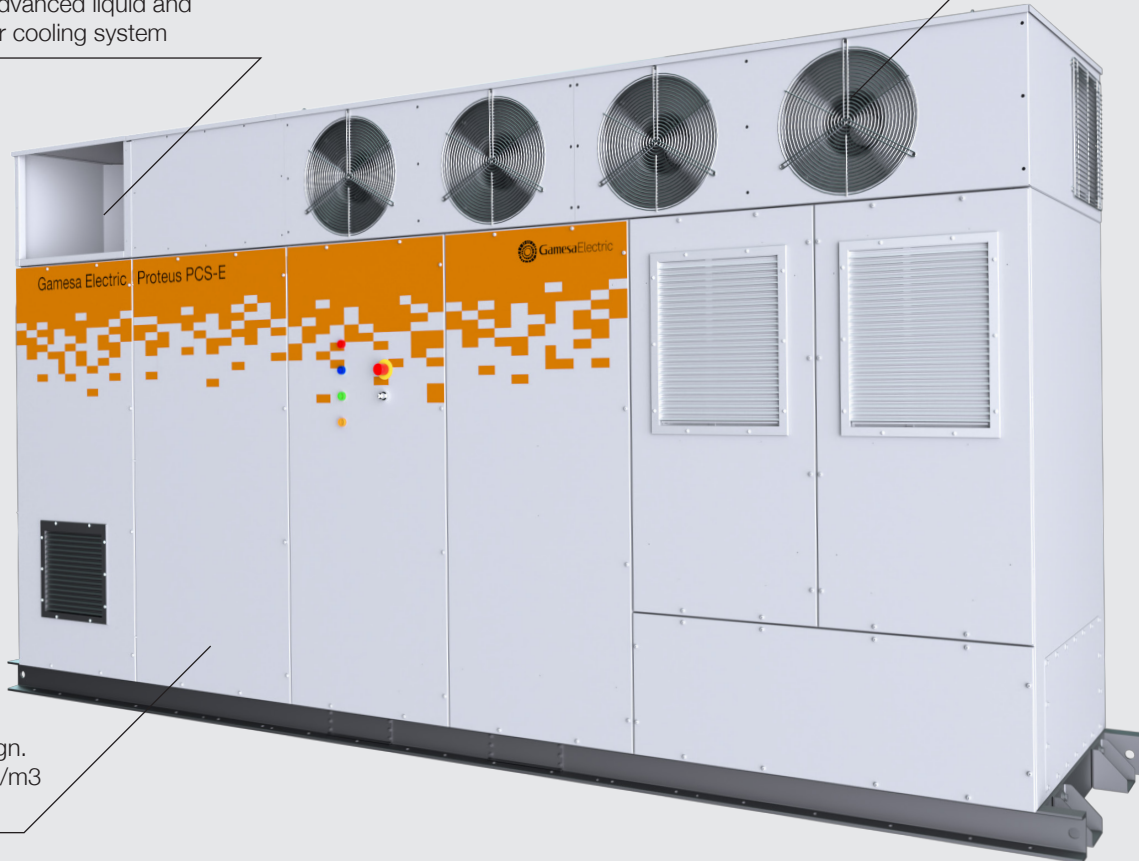
THDI <1.0%

High  
efficiency

Outdoor  
solution

CoolBrid  
Advanced liquid and  
air cooling system

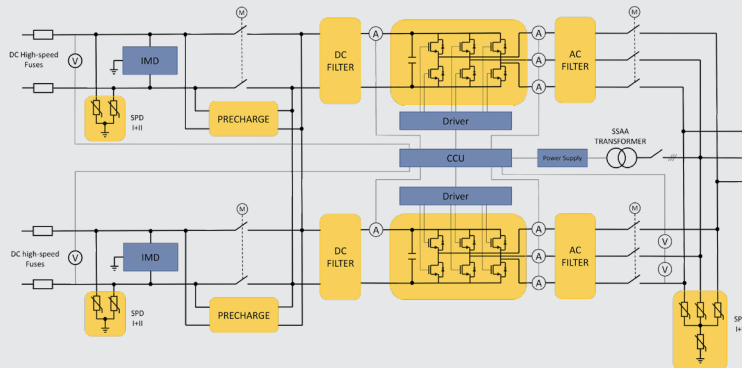
Heat exchangers  
isolated from PCS



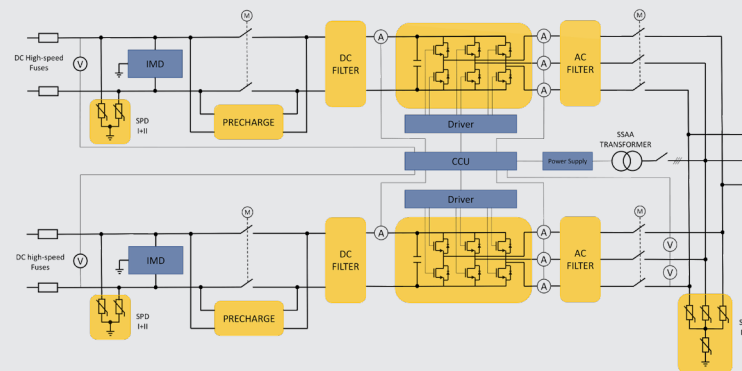
Compact design.  
Up to 550 kVA/m<sup>3</sup>  
(13 kVA/ft<sup>3</sup>)

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

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

## Gamesa Electric Proteus PCS-E 1500V Battery Inverters

 <p><b>High Round Trip Efficiency (RTE)</b></p>	<p>High efficiency that allows to improve the overall system RTE and LCoS.</p>	<p>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</p>	<p>Low power derating High power capacity at 1500Vdc Wide operating temperature range</p>
 <p><b>Grid connection</b></p>	<p>Four quadrant operation for full active and reactive power support to comply with the most demanding grid codes</p>	<p>Weak grid and micro-grid configuration with a seamless transition and black start capability</p>	<p>Fast frequency response Synthetic inertia Grid forming in parallel operation with the grid</p>
 <p><b>Battery oriented</b></p>	<p>Safety centered design with high speed control and monitoring.</p>	<p>Double power module topology for two independent battery connections allowing for much higher DC short-circuit currents and increased system availability</p>	<p>Battery agnostic design to accommodate different battery technologies up to 1500Vdc, including: li-ion, lead-acid, flow and others</p>

	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
<b>DC Input</b>					
DC Minimum Voltage for grid tied mode <sup>(1)</sup>	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 <sup>(2)</sup>	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				
<b>AC Output</b>					
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	4541 kVA	4739 kVA	5002 kVA	5331 kVA	5595 kVA
Nominal AC Voltage <sup>(2)</sup>	690 Vrms	720 Vrms	760 Vrms	810 Vrms	850 Vrms
Nominal Voltage Allowance Range <sup>(2)</sup>	+/-10%				
Frequency Range <sup>(2)</sup>	47.5-53 Hz // 57-63 Hz				
THD of AC Current	<1% @Sn				
Power Factor Range <sup>(3)</sup>	0 (inductive)-1-0 (capacitive)				
<b>Performance</b>					
Efficiency	99,00%				
Stand-by Power Consumption	< 200 W				
<b>General Data</b>					
Temperature Range - Operation	-20°C / +60°C [-4°F / +140°F]				
Maximum Altitude <sup>(4)</sup>	< 2,000 m [6,561 ft] (w/o derating)				
Cooling System	Liquid & forced air				
Relative Humidity	4% – 100% (w/o condensation)				
Seismic <sup>(2)</sup>	Zone 4 IBC 2012				
Max. wind speed <sup>(2)</sup>	288 km/h (179 mph)				
Snow load <sup>(2)</sup>	2,5 kN/m <sup>2</sup>				
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]				
<b>AC Protections</b>					
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) <sup>(2)</sup>	Included (SW)				
Frequency Failure	Included (SW)				
<b>DC Protections</b>					
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				
<b>Other Protections</b>					
Over-temperature Protection	Included				
Emergency Push Button	Included				
<b>Communications</b>					
Control <sup>(2)</sup>	Modbus TCP/IP				
Monitoring <sup>(2)</sup>	Modbus TCP/IP				
Websserver	Included				
<b>Optionals</b>					
Low Temperature Kit to up to -30°C [-22°F]					
Factory-fitted DC fuses					
Factory-fitted joint DC inputs					
Enhanced corrosion protection					
<b>Standards/Directives<sup>(5)</sup></b>					
IEC 62109-1	IEC 62920	IEC 60529	NEC 2020		
IEC 62109-2	UL 62109-1	IEC 61727	CEA 2007		
IEC 61000-6-2/4	IEC 62116	NTS 631 v1.1 SENP, v2.1 SEPE	Rule 14, Rule 21		
IEEE 1547	IEC 61683	UL 1741-SA	PRC 024		
EN 55011	IEEE 519	CSA C22.2			

<sup>(1)</sup> At nominal AC voltage. Consult Gamesa Electric for other options

<sup>(2)</sup> Consult Gamesa Electric for a specific configuration

<sup>(3)</sup> Consult P-Q chart

<sup>(4)</sup> Up to 4,000m [13,123 ft] with derating as optional

<sup>(5)</sup> Certification in process. Consult Gamesa Electric for other Standards/Directives



GamesaElectric

Shaping New Energy



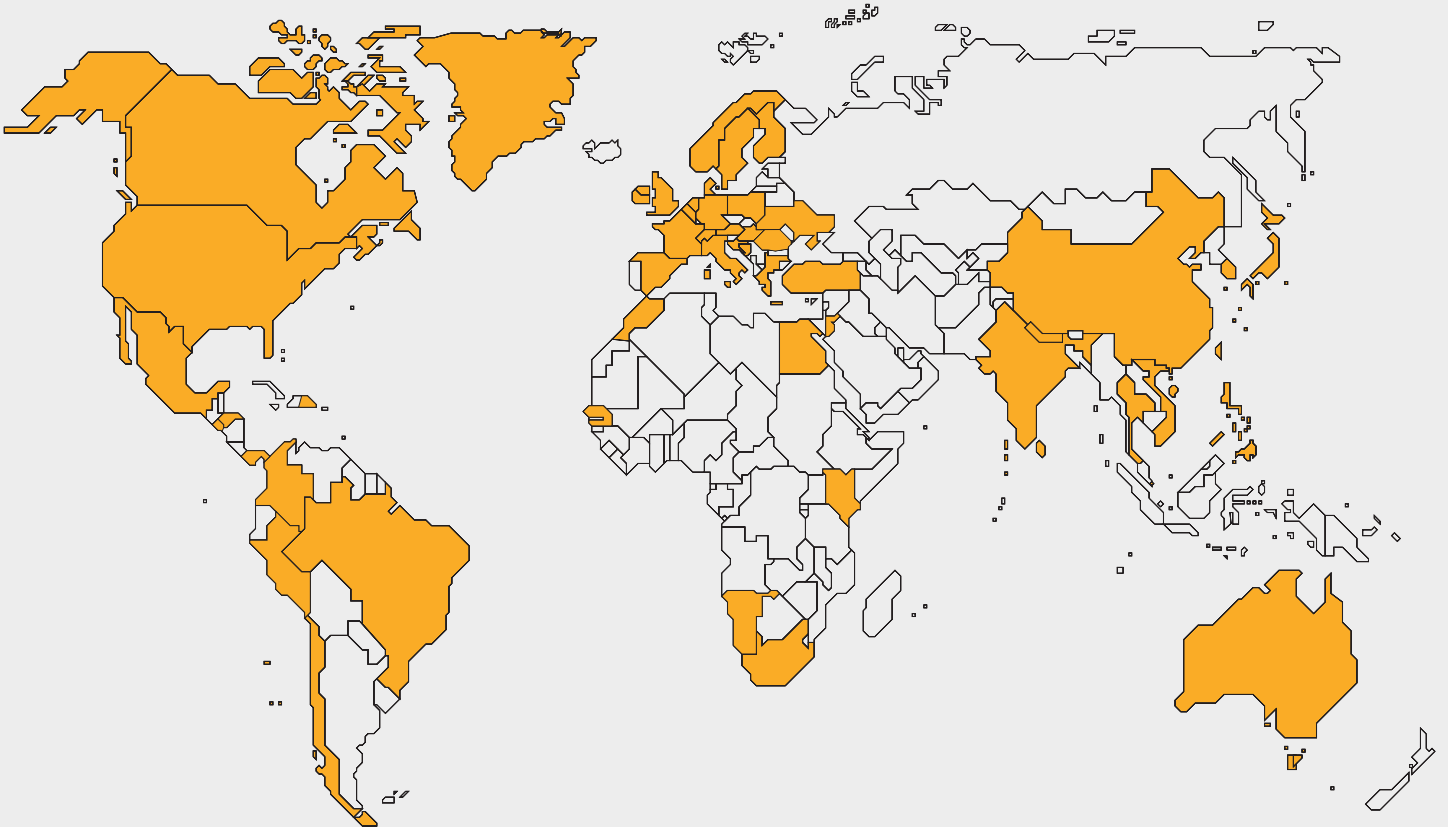
**+5 GW**  
SOLAR ENERGY



**+127 GW**  
WIND POWER



**+90**  
COUNTRIES



**Worldwide presence**

Australia	Chile	Finland	Ireland	Namibia	Singapore	Ukraine
Austria	China	France	Italy	Netherlands	South Africa	UK
Belgium	Colombia	Germany	Japan	Norway	Spain	USA
Bosnia and Herzegovina	Croatia	Greece	Jordan	Panama	Sri Lanka	
Brazil	Denmark	Honduras	Kenya	Peru	Sweden	
Bulgaria	Dominican Rep.	Hong Kong	Korea	Philippines	Switzerland	
Canada	Egypt	Hungary	Mexico	Poland	Thailand	
	El Salvador	India	Morocco	Senegal	Turkey	



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