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LARGE SCALE STORAGE SYSTEMS



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zeroCO₂ extra large range

zeroCO₂ extra large

What is zeroCO₂ extra large:

ZeroCO₂ extra large is a large storage solution connected in alternating current for new and retrofit plants, from 60 kWh up to multiple MWh applications in dedicated containers.

Who is it for:

The zeroCO₂ extra large is designed for those who want to add a large ESS to their photovoltaic system, whether new or existing, of commercial, industrial or utility scale, in order to increase self-consumption, improve peak shaving or to feed energy into the grid in a controlled manner. ZeroCO₂ extra large can also be the heart of an energy community and also represents an element of enhancement of your plant by reducing the investment payback times. The zeroCO₂ extra large, thanks to the EMS control, is compatible with many forms of incentives including industry 4.0.

How zeroCO₂ extra large is made:

The zeroCO₂ extra large is composed of modular conversion elements of 60 kW housed in their own dedicated cabinet together with the EMS (Energy Management System) and by one or more rack cabinets that contain the battery modules in a variable number according to the capacity of storage desired. Along with the batteries in the same cabinet is the BMS. Depending on the size requested, there are solutions for technical compartments or in dedicated containers.

Advantages of the zeroCO₂ extra large system:

The zeroCO₂ extra large system is compatible with any photovoltaic, wind or renewable energy system, either existing or under construction. Furthermore the modularity of the technology allows the system to be customized to a wide range of charge/discharge powers as well as storage capacities. What makes the zeroCO₂ extra large system unique is the EMS, designed and built by Energy S.p.A., it is the real brain of the storage system. Energy's EMS is the result of efficient integration between power converters and batteries and is what makes the entire solution a product of the highest quality.

Reliability of the zeroCO₂ extra large system:

The PCS (Power Conversion Systems) of zeroCO₂ extra large are guaranteed for 2 years against any malfunction with the possibility of extending the guarantee up to 5 years. The Pylontech batteries used, have a 7-year warranty and were found in a recent report by the independent Australian ITP, to be the most reliable in duration, not reporting any interruptions in the current test in progress from 2017 to today.

Italian assistance and expertise

Energy S.p.A., which takes care of the design and production of the zeroCO₂ extra large EMS, takes care of the pre-sale and after-sale assistance of the entire system from its operational headquarters in Sant'Angelo di Piove di Sacco (PD). Along with the supply of products, it is also possible to have a system start-up service by Energy S.p.A. specialized personnel.





Loc. Mortilla - Comiso - Sicily - Italy

600 kW power
600 kW storage

Zero CO₂ extra large is a modular storage system ranging in size from commercial to utility scale. The system consists of one or more **XL System** connected to one or more **XL Rack 125 kWh** rated capacity.

XL System

The **XL System** is equipped with one or more 60 kW **PCS** (Power Conversion System) and the **EMS** (Energy Management System) that allows you to monitor the system in real time through a high-speed internet connection. Through the EMS it is possible to program and monitor the charge and discharge of batteries according to the needs of the user by setting various scenarios: from maximum self-consumption to peak shaving up to a schedule on time bands to maximize the return on investment.

The XL System can be connected in AC to any renewable (wind/photovoltaic) or traditional generator or can be used as an energy reserve even in the absence of an alternative source to the electricity grid.



zeroCO₂ - XL System 240K -
DC Bus 680-1000V

DIMENSIONS (WxHxD) (mm):
700 x 1683 x 776

XL Rack

The **XL Racks**, also designed with a modular logic, are equipped with up to 26 Pylontech batteries with a capacity of 4.74 kW, with the latest Lithium Iron Phosphate LiFePO₄ technology.

One slot is dedicated to the BMS that keeps the individual batteries equalized for optimal operation.

Batteries can be charged and discharged typically at 0.5 C but can also work at 1 C in temperature-controlled environments (25 °C).



zeroCO₂ - XL Rack 125 kWh -
DIMENSIONS (WxHxD) (mm):
1200 x 1683 x 776



zeroCO₂ - XL Rack 125 kWh

Consisting of n°26 H32148 batteries
1 BMS SC1000-200J



Some typical examples of combinations between charge and discharge power and storage capacity are shown in the following table (Tab. 1), however intermediate sizes are also possible thanks to the modularity of the system:

Industrial and Utility Size Plants													
POWER kW	Storage Capacity [kWh]												
		125	250	375	500	625	1125	1750	2125	2500	3125	4125	5125
	60	+	+	+	+	+	-	-	-	-	-	-	-
	120	+	+	+	+	+	+	-	-	-	-	-	-
	180	-	+	+	+	+	+	+	+	-	-	-	-
	240	-	+	+	+	+	+	+	+	+	+	-	-
	300	-	-	-	+	+	+	+	+	+	+	-	-
	360	-	-	-	+	+	+	+	+	+	+	+	-
	420	-	-	-	+	+	+	+	+	+	+	+	-
	480	-	-	-	+	+	+	+	+	+	+	+	-
	540	-	-	-	-	+	+	+	+	+	+	+	+
	600	-	-	-	-	+	+	+	+	+	+	+	+
	1200	-	-	-	-	-	-	+	+	+	+	+	+
	1800	-	-	-	-	-	-	-	+	+	+	+	+
	2400	-	-	-	-	-	-	-	-	+	+	+	+
	3000	-	-	-	-	-	-	-	-	-	+	+	+

Tab.1

EMS (Energy Management System)

The **EMS** allows you to keep the entire system under control in real time and to interact remotely at any time. The uniqueness of the zeroCO₂ extra large solution is the high integration between conversion electronics and Pylontech batteries, of which Energy S.p.A. has been a technical partner for many years. In fact, the EMS is not limited to managing the conversion part but communicates directly with the electronics of the batteries, investigating and monitoring their performance down to the smallest detail of each cell. The consistent battery life over time is the result of this pushed integration between the two technologies and differentiates it from other offers on the market in which the solution appears only as a commercial sum of two independent products.



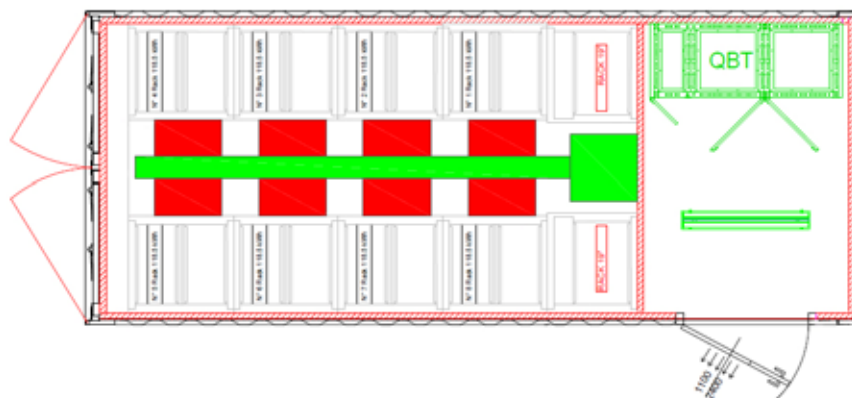
Real time monitoring screen



Details with battery cell monitoring



zeroCO₂ XL available on project with container solution



Container zeroCO₂ extra large

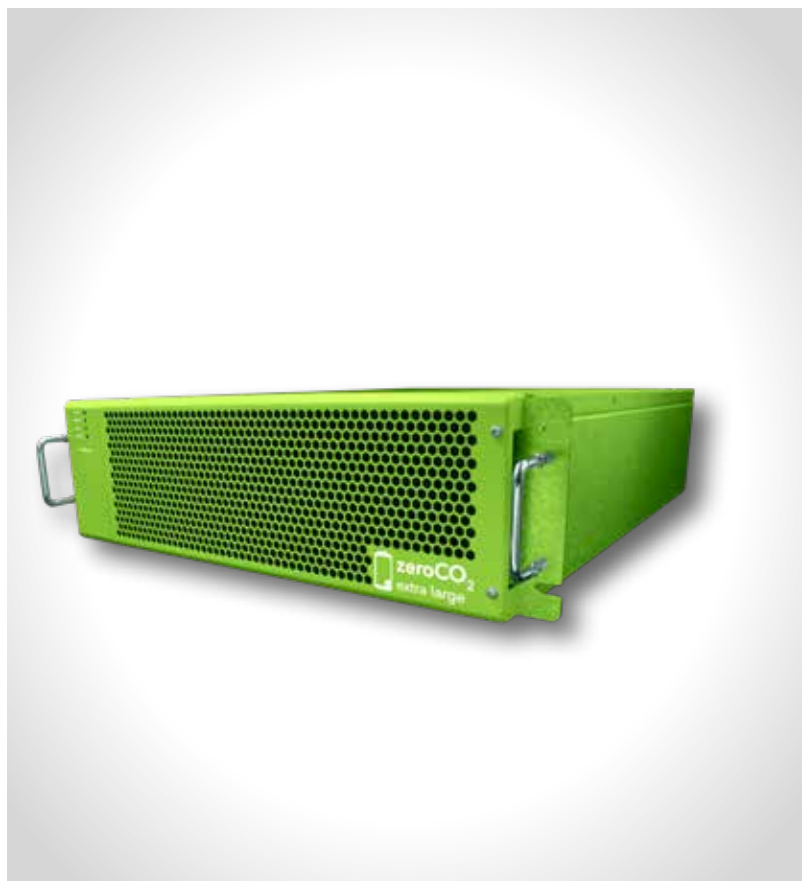
Solution consisting of a 20ft high cube container for a total of 1MWh (948kWh - 480kW)

60 kW

Power Conversion System

Features:

- With the “smart” fan regulation function, energy consumption and noise are reduced;
- Resilient construction, resistant to high temperatures, humidity, saline environments and other harsh conditions;
- Adopts particular solutions to reduce the ripple current of the capacitor and increase the life of the module;
- Modular design (expandable up to 10) and easy to use;
- Operating temperature range: full load operation from -30 °C to + 45 °C;
- The power factor on the AC side is ± 1 , improving the load capacity;
- It can work in on-grid and off-grid mode with an external accessory;
- It can have different types of batteries connected at the same time;
- The change time between charge and discharge is 10 ms.



DIMENSIONS:

Height: 130 mm
Width: 430 mm
Depth: 500 mm
Weight: 28kg



Model	P 60K A
AC PARAMETER	
Maximum power [kW]	60
Max. apparent power [kVA]	60
Input type	Three-phase five-conductor system
Voltage range [Vac]	400Vac ±15%
Current range [A]	±90
Rated voltage and frequency [V-Hz]	380/400V - 50/60Hz
Power factor adjustment range	>0.99 0.8 leading ...0.8 lagging
Componente DC corrente [%]	≤ 0.5%
Harmonic content THDi [%]	≤ 3%
AC and DC start function	Yes
Positive direction switching time [ms]	≤ 10ms
Conversion efficiency [%]	≥ 98.5%
Standby loss [W]	< 25
DC PARAMETER	
Voltage range [Vdc]	680-1000
Current range [A]	±100A
Voltage error	±1%
Steady voltage accuracy	±1%
Current error	±1%
Steady current accuracy	±1%
Voltage limiting characteristic	Yes
Current limiting characteristic	Yes
EQUIPMENT USE ENVIRONMENT	
Range of working temperature [°C]	-30 ~ +60 (>45°C derating)
Operating humidity range [%RH]	<+95% Relative humidity, non condensing
Storage temperature [°C]	-40 ~ +70
Storage humidity [%RH]	0 ~ +95% Relative humidity, non condensing
Cooling method	Forced air
Altitude [m]	3000
Protection level	IP20
Noise emission	<70dB
Dimension [WxHxD] [mm]	430x130x500
Weight [kg]	28
COMMUNICATION FUNCTION	
Communication method	CAN, RS485, Ethernet, dry contact
Reporting signal	Various protection signals, voltage and current signals
Receive signal	Power on and off signal
SECURITY GRADE	
Safety specification	reference 18487.1
Withstand voltage: input & output - PE	3535Vdc
Withstand voltage: input & output - CAN	2828Vdc
Surge: Input & Output - PE [kV]	6
EMC characteristics	reference 33008.1
Radiation	CLASS A
ESD	3
EFT	3
Radio frequency immunity	3
MTBF [hrs]	100000
Certification	CEI 0-21, CEI 0-16, VDE ARN 4105
Warranty	2 years

EMS

Energy Management System

The **EMS** allows you to keep the entire system under control in real time and to interact remotely at any time.

The EMS is not limited to managing the conversion part but communicates directly with the battery electronics by investigating and monitoring the performance down to the smallest detail of each cell.

Features:

- Power supply 150 W;
- Operating temperature from 0°C to 50 °C;
- Protection level IP20;
- 2 year warranty;
- Assistance by Energy S.p.A.



DIMENSIONS:

Height: 89 mm
Width: 440 mm
Depth: 300 mm
Weight: 6 kg



Model	EMS
Power supply [W]	150
Type of power supply [V-Hz]	230V/50Hz
Standby power consumption [W]	<5
EQUIPMENT USE ENVIRONMENT	
Range of working temperature [°C]	0 ~ +50
Operating humidity range [%RH]	<+95% Relative humidity, non condensing
Storage temperature [°C]	-20 ~ +60
Storage humidity [%RH]	0 ~ +95% Relative humidity, non condensing
Cooling method	Natural cooling
Altitude [m]	3000
Protection level	IP20
Noise emission	<40dB
DIMENSIONS AND WEIGHT	
Dimension [WxHxD] [mm]	440x89x300
Weight [kg]	6
COMMUNICATION FUNCTION	
Communication method	1 Porta WAN - 1 porta LAN - 1 porta RS485 - 1 porta RS232
Warranty	2 years

PRODUCT CODES

zeroCO ₂ XL SYSTEM	CODE	DESCRIPTION
	90110005	ZeroCO2 - XL System 60K - DC Bus 680-1000V
	90110010	ZeroCO2 - XL System 120K - DC Bus 680-1000V
	90110015	ZeroCO2 - XL System 180K - DC Bus 680-1000V
	90110020	ZeroCO2 - XL System 240K - DC Bus 680-1000V
	90110026	ZeroCO2 BESS 125K

ACCESSORIES AND SPARE PARTS CODES

CODE	DESCRIPTION
90100004	PC board IEI WAFER-AL- N1-R10
90100020	Power supply ATX 1U ACE-A615C-RS-R11 150 W
90900219	Connection Cable kit BESS 125K - 26 modules
90900315	Eastron three-phase meter kit with external CT (SDM630MCT + 3x ESCT-T24-5)
90040202	Pylontech H32148 Lithium battery module 148 A/32V - 4.74 kWh - DOD 90% - DANGEROUS GOODS: UN3480 Lithium-ion battery, class 9
90040212	Pylontech MBMS1000 Parallel MBMS module for high voltage batteries
90040213	Pylontech BMS SC-1000a- 200J - with internal power supply
90100075	8 Gigabit ports LAN Switch
90101000	EMS - Energy Management System with LAN communication
90110100	Zero CO2 - XL Cloud Monitoring System annual license fee
90090015	P 60K A - PCS 60 kW 400V/50Hz - DCBHV - Trasformerless
90101005	Router Dual Sim 4G LTE per EMS Zero CO2
90100080	UPS module 3 kVA 2U -19"
90920656	1000 V -160 A fuses
90920695	Kit DC Bracker 1000 V - 160 A





Request the product catalog from distributors of photovoltaic material.

Energy S.p.A.

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