BENNING SOLAR

safe • powerful • efficient • made in Germany

LIONIC solar®
Energy Storage System (ESS)

Data logger and web server as standard

LOGIN

Emergency power supply

POWER



BENNING Li-energy storage system

LIONIC solar®

ESS system benefits

- emergency power supply
- on and off-grid application
- flexible application due to AC and DC coupling
- high efficiency
- safety due to one complete system from a single provider
- efficient storage by means of state-of-the-art Li-ion technology

Energy storage technology – future-proof and scalable!

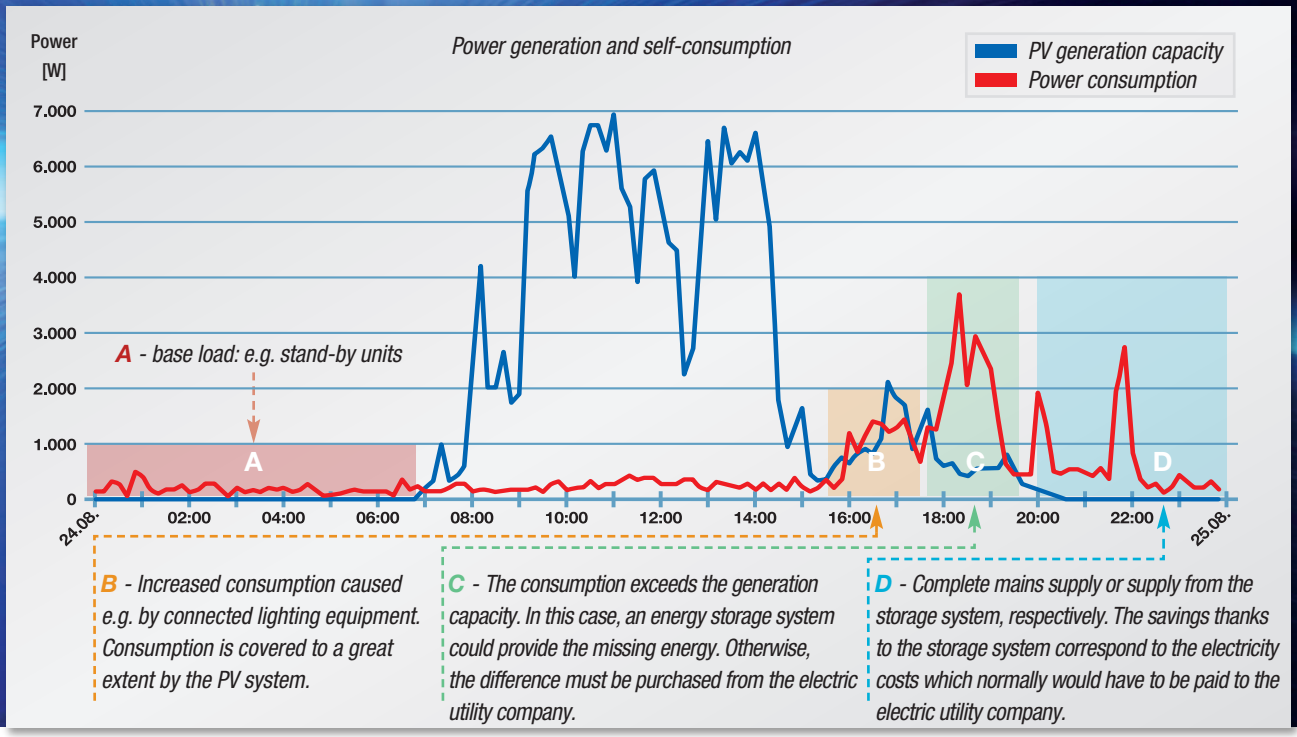


Fig. 1: The diagram illustrates a rather sunny day with changeable weather conditions. It is obvious that electricity can be taken from the storage system in the early evening hours already.

Benefits of the modular REM4 batteries

- modularly scalable
- flexibly adaptable to various requirements
- efficient, low weight and compact
- saves energy and reduces CO_2 emissions
- allows quick charging and intermediate charging
- long cycle life
- free of maintenance and zero emissions
- low self-discharge
- integrated battery management system (BMS)
- high intrinsic safety and stability
- industry standard (CE, EMC, UN38.3)



Modular Lithium-Ion battery REM4

Technical data for the REM4 batteries

Watt-hour rating (nominal energy)	4.0 kWh
Nominal voltage	96 V
Nominal capacity	40 Ah
Operating temperature	0 – 40 °C
Storage	0 – 40 °C (6 months)
Self-discharge	< 3 % / month
Interconnection	1 piece - 19" module
Contacting	plug & play
Standards	IP 20, UN38.3, CE
Dimensions per battery block	(H x W x D) 133 x 536 x 508 mm
Weight per battery block	approx. 40 kg

Subject to technical changes.

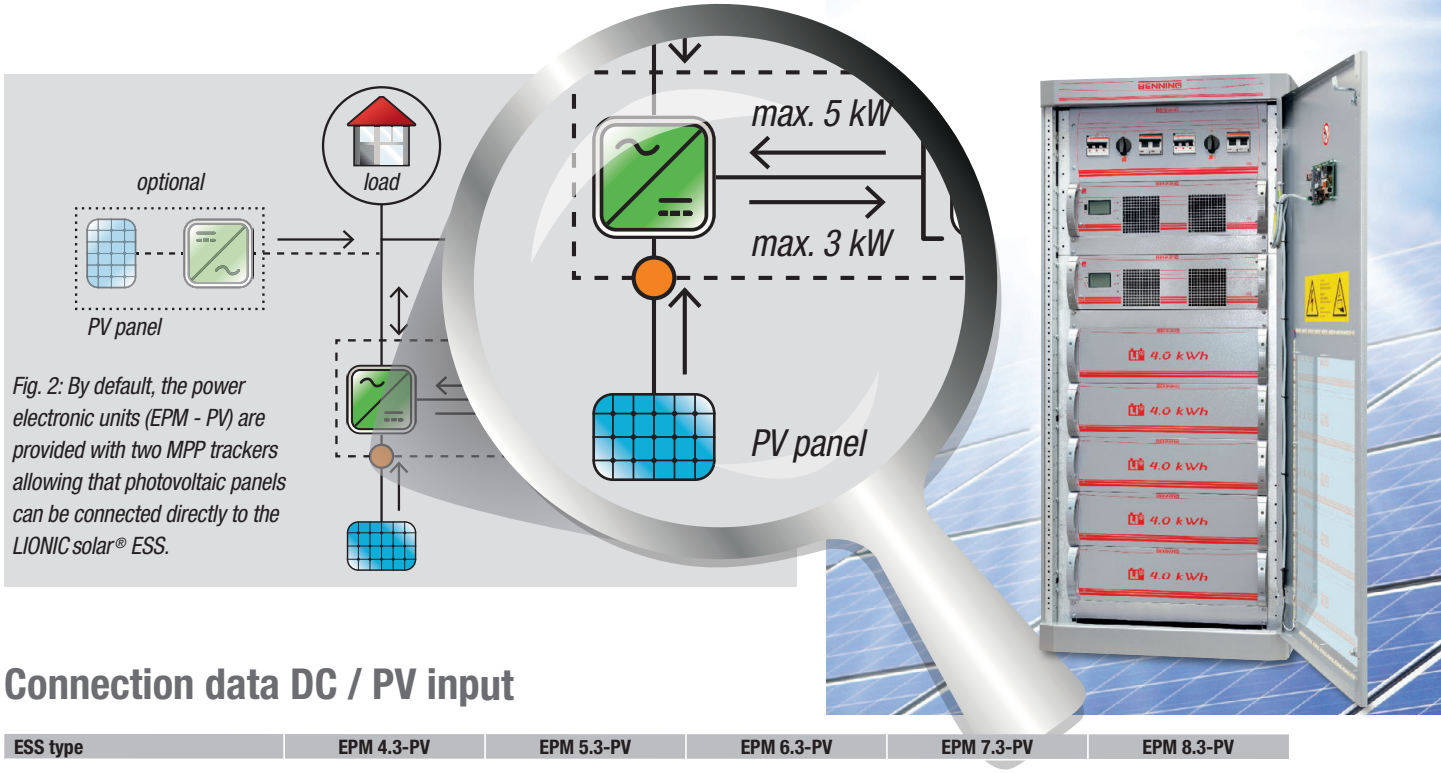


Fig. 2: By default, the power electronic units (EPM - PV) are provided with two MPP trackers allowing that photovoltaic panels can be connected directly to the LIONIC solar® ESS.

Connection data DC / PV input

ESS type	EPM 4.3-PV	EPM 5.3-PV	EPM 6.3-PV	EPM 7.3-PV	EPM 8.3-PV
DC / PV connection data					
Maximum recommended DC power (PV)	4700 W	5800 W	7000 W	8700 W	9500 W
Maximum DC input voltage	900 V				
Minimum DC voltage / starting voltage	Input A: 175 V to 200 V				
Minimum DC voltage*1	Input B: 120 V				
MPP voltage range	190 to 680 V	240 to 680 V	280 to 680 V	260 to 680 V	290 to 680 V
Maximum DC current / input (A/B)*2	10/10 A	10/10 A	10/10 A	18/10 A	18/10 A
Max. short-circuit current / input (A/B)	12/12 A	12/12 A	12/12 A	20/12 A	20/12 A
Feed-in from	20 W				
No. of MPP trackers	2				
DC overvoltage category	III				

*1 This value shall apply, if an input has exceeded the starting voltage.
*2 An exceedance of this value is admissible provided that the admissible short-circuit current stated is not exceeded.

Subject to technical changes



ESS cabinet system with EPM 7.3-PV

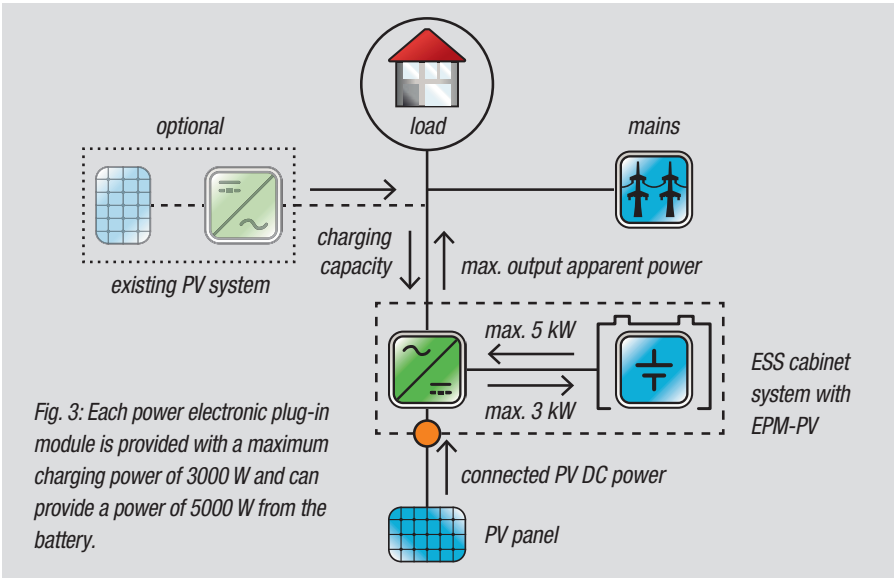


Fig. 3: Each power electronic plug-in module is provided with a maximum charging power of 3000 W and can provide a power of 5000 W from the battery.

AC connection data

ESS type	EPM 4.3-AC	EPM 5.3-AC	EPM 4.3-PV	EPM 5.3-PV	EPM 6.3-PV	EPM 7.3-PV	EPM 8.3-PV
AC connection data							
Max. output apparent power	4000 V A	5000 V A	4000 V A	5000 V A	6000 V A	7000 V A	8000 V A
PV connection available*1	○	○	●	●	●	●	●
AC mains connection	3 / N / PE						
AC nominal voltage range	3 x 400 V / 3 x 230 V +/- 20% (50Hz)						
Displacement power factor cos (φ)	0.9 ind. … 1 … 0.9 cap.						
Network types (earthing system)	TN-C, TN-S, TN-C-S, TT						
Max. short-circuit current	3 x 8 A	3 x 8 A	3 x 8 A	3 x 8 A	3 x 10 A	3 x 12 A	3 x 12 A
Self-consumption (at night)	< 2 W						
AC overvoltage category	III						

*1 ● available / ○ not available

Subject to technical changes.

ESS cabinet system



Equipment	ESS 4.0	ESS 8.0	ESS 12.0	ESS Plus
Dimensions and weight				
Dimensions in mm (W x D x H):	600 x 600 x 900			600 x 600 x 1400
System weight, approx.	130 kg	170 kg	210 kg	from 135 kg
No. of equipment carriers	1	1	1	2
State-of-charge indication	LED bargraph indication at the front door			
Charging time / charging power	< 1.5 h / 3000 W	< 2.5 h / 3000 W	< 3.5 h / 3000 W	< 2.5 h / 6000 W
Accumulators	**1x REM4**	**2x REM4**	**3x REM4**	**1x – 5x REM4**
Battery capacity	4.0 kWh	8.0 kWh	12.0 kWh	up to 20 kWh
Depth of discharge	DoD 80 %			
Cycles	approx. 5000			
Battery voltage	96 V			

Subject to technical changes.

Efficiency, safety, approvals & general information

ESS type	EPM 4.3-AC	EPM 5.3-AC	EPM 4.3-PV	EPM 5.3-PV	EPM 6.3-PV	EPM 7.3-PV	EPM 8.3-PV
Efficiency							
Max. / European efficiency	97.5 % / 97 %						
Charge controller: Charge / discharge level	96.9 % / 98 %						
Safety, protection equipment							
PV device concept	–	–	without transformer				
Battery concept	galvanically isolated						
Earth fault monitoring	–	–	integrated				
DC load disconnecting switch	–	–	integrated				
Protection class / - category	I / IP21						
Fault current monitoring	integrated, universal current-sensitive						
Overload / excess temperature behaviour	operating point shift						
Overvoltage protection input / output	integrated, type 3 acc. to EN61643-11						
Automatic disconnection device	acc. to VDE 0126 - 1 - 1						
Ambient temperature range	0°C to 40°C						
Relative air humidity	0 to 80 %						
Max. installation altitude	2000 m above sea level						
Noise level	≤ 50 dB(A)						
Minimum distances	5 cm to the rear panel / 30 cm at the left/right / 60 cm to the front						
Standards							
EMC approvals	EN 61000-6-3: 2011-9 / EN 61000-6-2: 2006-3						
Equipment safety / approvals / certificates	EN 62109-1, -2 / VDE-AR-N 4105						
Batteries	UN 38.3						
Dimensions and weight							
Dimensions in mm (W x D x H):	482 x 133 x 470						
Weight, approx.	18 kg	18 kg	19 kg	19 kg	20 kg	20 kg	20 kg
Device equipment							
Display (EPM)	graphic (128 x 64 pixels)						
Communication interfaces (internal)	RS 485, USB, Ethernet, S0 acc. to DIN EN 62053-31 class B, CAN						
Measured value recording	24 hours: 5-min values / 30 days: hourly values / 20 years: daily values						
	internal data logger for up to 20 years						

The illustrations used may differ from the actual scope of delivery.

Subject to technical changes.

Your specialty retailer:

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