



Most Reliable Quality

- Reliable and robust BMS guarantees long battery lifespan
- State-of-the-art fire safety system (Stat-X 60 E)
- Compliance with all required grid codes
- Converters are designed for a lifetime of > 20 years

Outstanding Flexibility

- Flexible energy storage solution with high-quality LiFePO4 batteries
- Plug & play design with MSC Hybrid Converter 250 kW to 2 MW, scalable to > 100 MW
- Subsequent integration of energy sources / consumers requires little effort

Modular System

- Hybrid-Converter-Concept enables integration of additional energy sources / consumers such as PV, wind or hydrogen
- Compact, modular solution in an ISO container (optionally available as in-house solution)

FREQCON Converter System with reliable Battery Storage

A compact, modular container solution for different applications

We have developed the FREQCON BESS FQ as a compact, modular container solution. It combines proven power converter technology, designed for a lifespan of 20 years, with battery storage, a robust Battery Management System (BMS) and project-specifically customisable Energy Management System (EMS).

What makes our system so ingenious is not only its quality, but also a flexible and easy customization for a wide range of applications in the Low and Medium Voltage.

Our modular system is available in multiple container sizes (20 ft., 30 ft. or 40 ft.)

The information in our brochure is related to operation up to 1C.

APPLICATIONS

Our Grid & Storage Solutions allow efficient and reliable use for all Class B and Class C applications, including:

- Peak shaving
- Peak shifting
- Uninterruptible power supply (UPS)
- Active harmonic filter
- Hybrid applications
- Energy arbitrage / Daytrading
- Grid services
- Black start capability
- Island grid operation
- Dynamic voltage control
- Reactive power compensation
- Voltage dip mitigation
- Primary control reserve (PCR) / Frequency containment reserve (FCR)
- Frequency control
- Grid forming
- Synthetic inertia

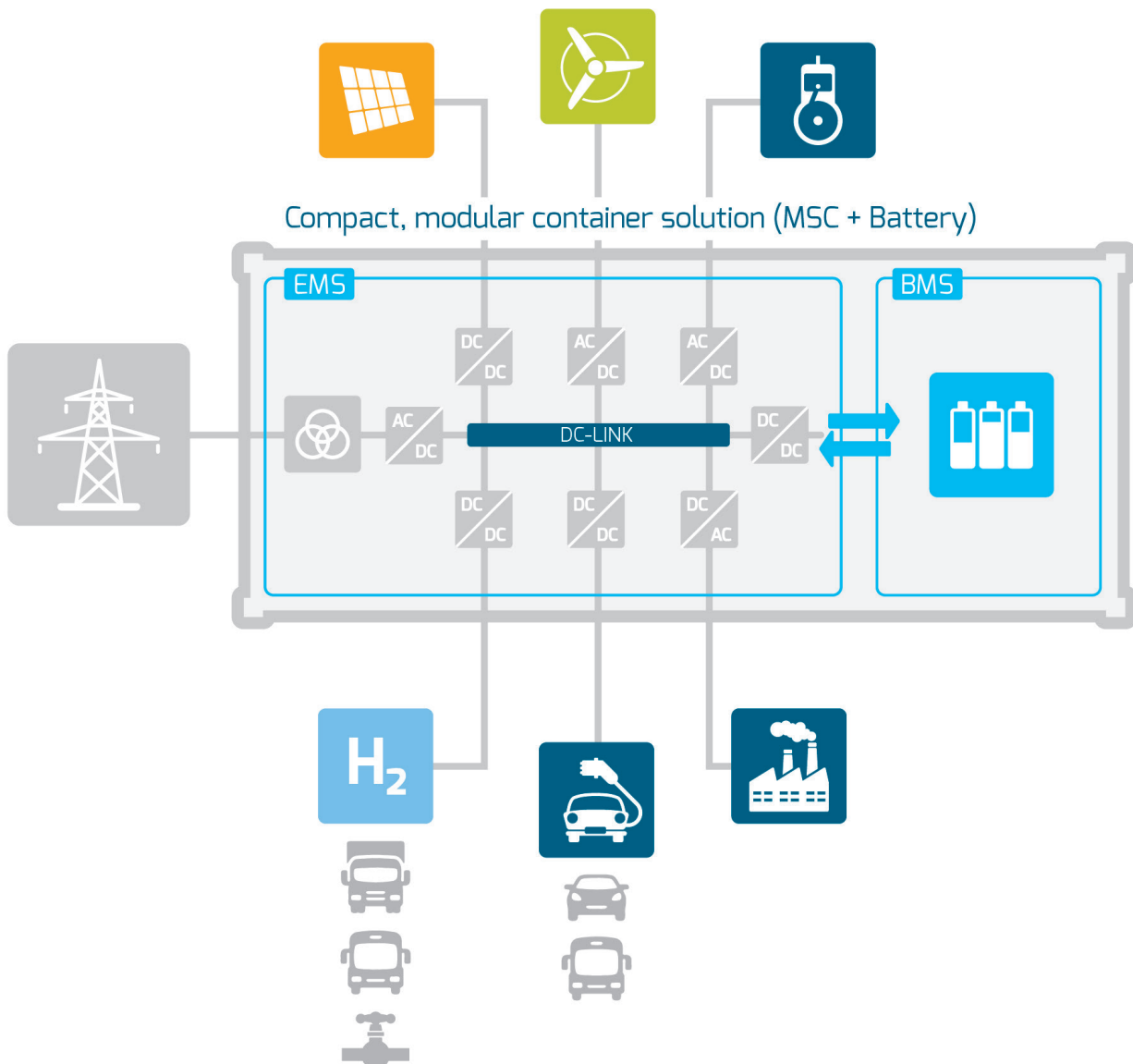
CONTAINER SIZES

Overview

Maximum Sizes BESS FQ (Converter and Storage)			
Housing	20 ft. HC	30 ft. HC	40 ft. HC
Maximum rating (LV)	1 MW / 1 MWh	1 MW / 2 MWh	1 MW / 3.5 MWh
Maximum rating (MV)	0.75 MW / 0.75 MWh	1 MW / 1MWh	2 MW / 2MWh

Battery Storage Sizes			
Container size	20 ft. HC	30 ft. HC	40 ft. HC
Installed / usable capacity	up to 2257 / 2052 kWh	up to 3763 / 3421 kWh	up to 5268 / 4789 kWh

SYSTEM DIAGRAM



Technical Data	BESS 2052	BESS 3421	BESS 4789
Usable capacity	2052 kWh	3421 kWh	4789 kWh
Installed capacity	2257 kWh	3763 kWh	5268 kWh
Corresponding Converter Model (1C)	MSC 2000	MSC 3500	MSC 5000
Corresponding Converter Model (0.5C)	MSC 1000	MSC 2000	MSC 2500
Housing container size	1 x 20 ft. HC	1 x 30 ft. HC	1 x 40 ft. HC
Battery type	Lithium-Iron-Phosphate		
Cell-Balancing	FREQCON Battery Management System (BMS)		
Voltage range	700 to 1022 VDC		
Battery discharge efficiency	97.8 % @ 1C / 1C / @ 25 °C		
Capacity guaranteed	10 years		
Depth of discharge (DoD)	100 % DoD		
Lifetime-cycles (expected)	5000 @ 1C / 1C / @ 25 °C / 100 % DoD / 80 % EoL		
Lifetime-cycles (guaranteed)	3750 @ 1C / 1C / @ 25 °C / 100 % DoD / 80 % EoL		
Mixed sound source level	60 dB		
Temperature range (transport and storage)	0 °C to +35 °C		
Temperature range (operation)	-20 °C to +40 °C		
Environmental classifications (ISO 9223)	C3, C4 and C5 upon request		
Cooling	Integrated air-conditioning system		
Battery Racks			
Number of battery racks	9	15	21
Nominal storage capacity per battery rack	250.88 kWh		
Number of battery modules per battery rack	28		
Number of cells per battery rack	280		
Battery rack dimensions (wxdxh)	1000 x 1000 x 2200 mm		
Battery rack cooling method	Air cooled		
Battery rack BMS	FREQCON Battery Management System (BMS)		
Battery Cells			
Cell type	LiFePO4		
Model	EVE LF280		
Nominal voltage	3.2 V		
Nominal capacity	280 Ah		
Energy	896 Wh		
Standard charge/ discharge	Current	1C / 1C	
	Cut-off voltage	3.65 V / 2.5 V	
Max. current of charge/ discharge	Continuous charge/ discharge	1C / 1C	
Data transmission and Remote control			
Supported communication protocols	MODBUS TCP, Ethernet IP (others available upon request)		
Remote access	Supports all Ethernet based protocols available		
Main Controller			
Main controller	Siemens Simotion P320-4		
Control software	FREQCON Framework		
Internal communication bus	Profinet		
External communication interface	MODBUS TCP, Ethernet IP (others available upon request)		
Control method	External control via MODBUS TCP or Ethernet IP with higher-level controller		
Protection Devices			
Fire detection method	CO sensor and temperature sensor combination		
Fire Extinguishing System	Stat-X		
Fire alarm	Yes		
Emergency stop button outside	Yes		
Standards and Certifications cells	Safety: IEC 62619		
Standards and Certifications Battery System	Safety: IEC 62619, 62620, 63056, 62485-1, 62485-5, 62281, 61140, Batt 2006/66/EG and EMC: IEC 55011, 61000-2, 61000-4		