FREQCON BESS FQ
FLEXIBLE ENERGY STORAGE SYSTEM

FREQCON

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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

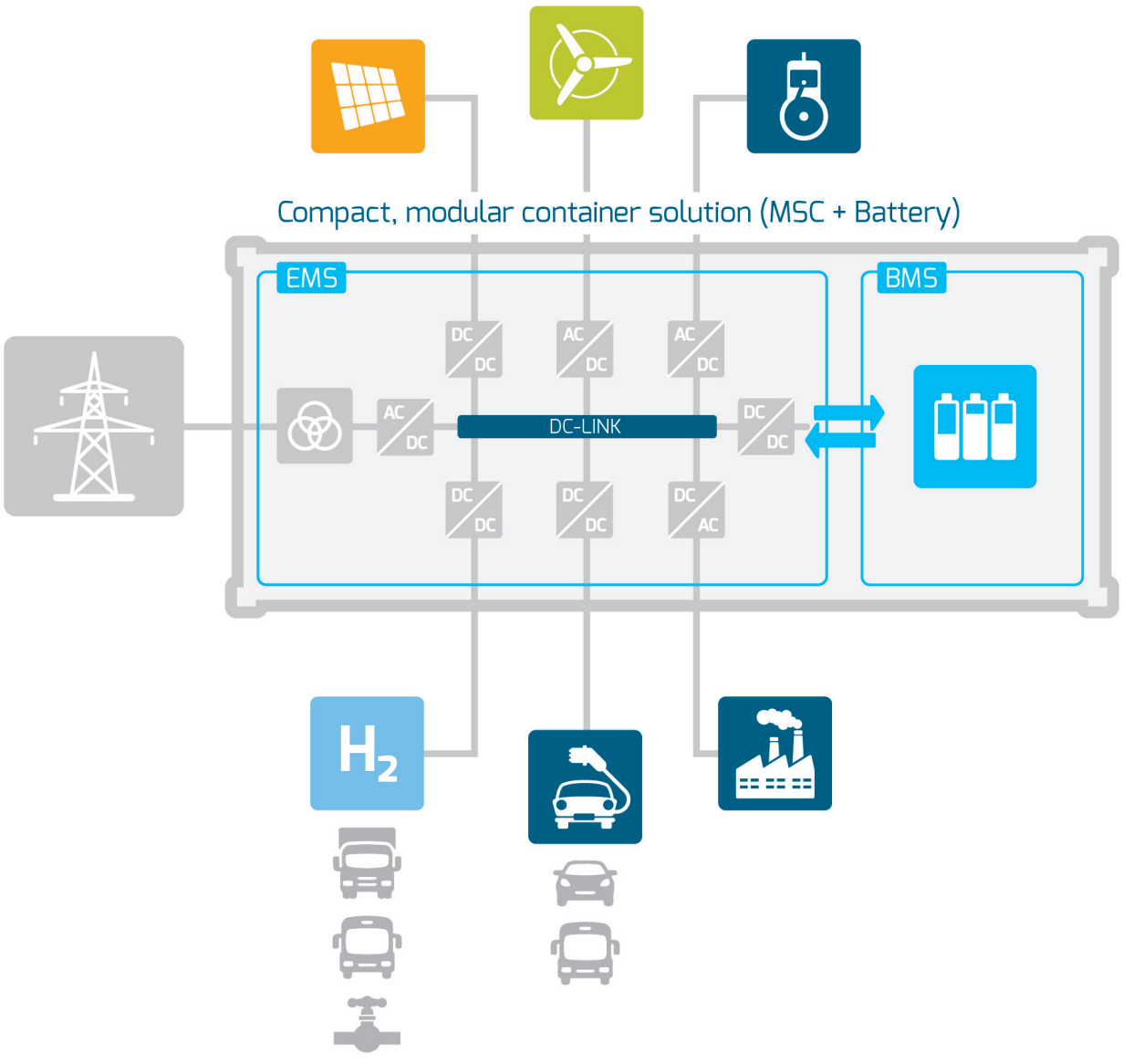
CONTAINER SIZES

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



System diagram for FREQCON BESS FQ

FREQCON BESS FQ
Standard Sizes

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		
Capacyity 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		

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