FREQCON

FREQCON U-UPS

Innovative solution for short-term factory and grid support

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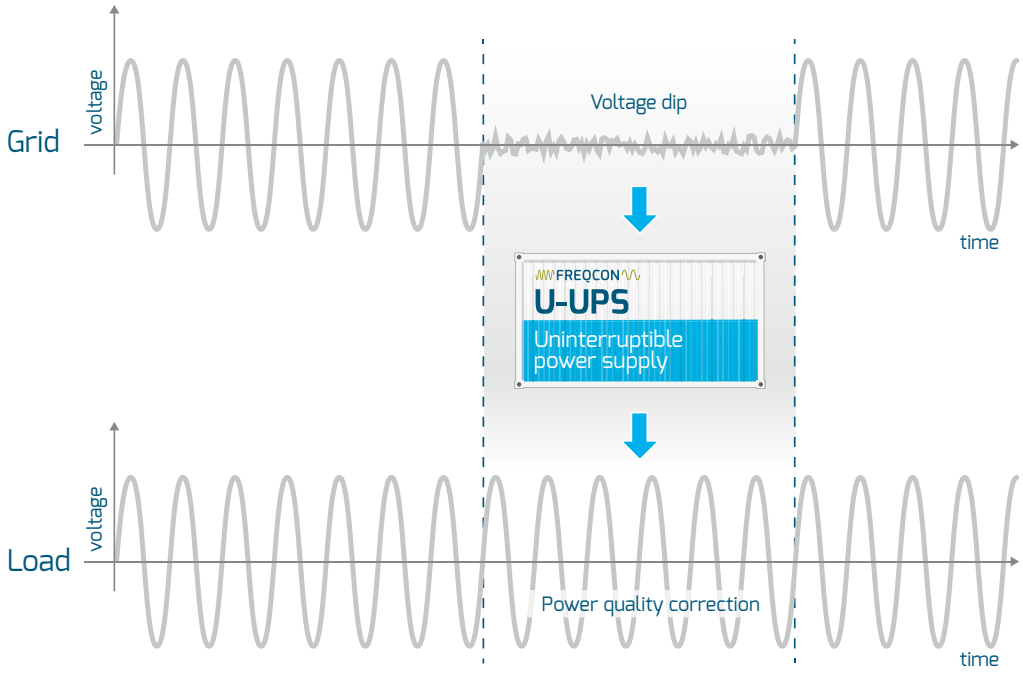
Application

The FREQCON Ultracapacitor Uninterruptible Power Supply (U-UPS) is designed to provide an island grid for a short period of time in case of voltage dips and micro interruptions in the public grid. The system automatically reacts to a ”grid event“ and takes over the load supply using the integrated energy storage. It disconnects from the public grid and establishes its own iso-lated network. Our U-UPS solution is designed to play a vital role in the industry to ensure system stability and to protect automated production processes.



Key benefits

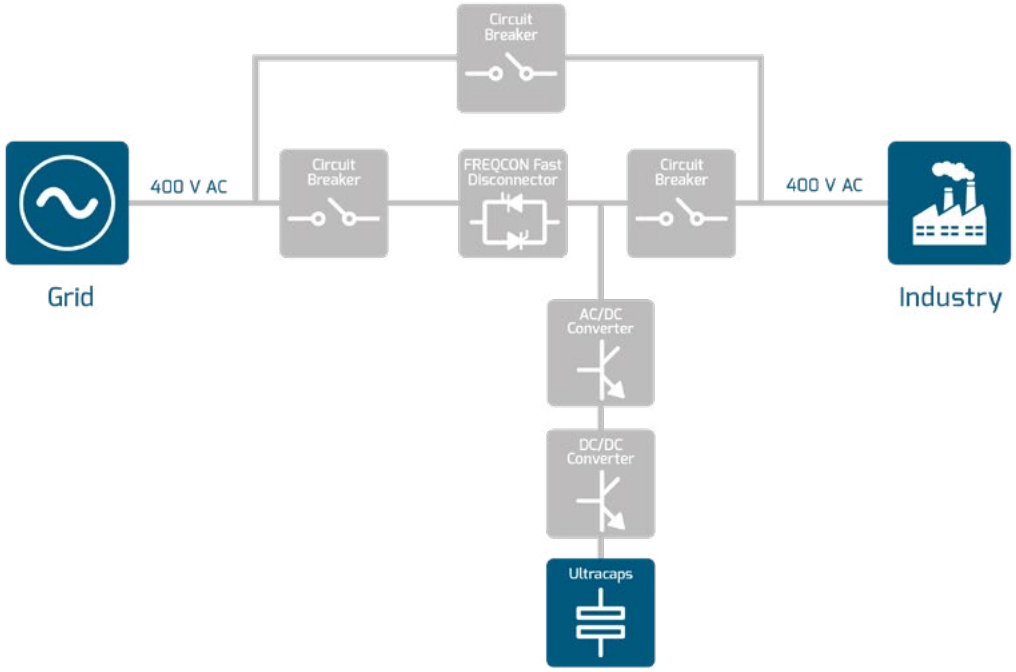
- **Maximum production uptime** – by eliminating 100% production downtimes due to micro interruptions and voltage dips etc.; maintenance-free energy storage; economic solution especially for applications from 1 – 10 sec for power supply
- **High flexibility** – offers scalable high quality power from 175 kVA up to 3 MVA; optional integration of additional battery storage system in the future
- **Cost saving solution compared to Online-UPS-systems** – minimal efficiency losses in standby mode; minimal auxiliary loads due to highly-efficient liquid cooling; cost-efficient operation, service and maintenance
- **Ensured security of high quality and reliable power supply**
- **Ultra-fast response time** – detects grid events and takes over within 10 ms
- **High power density** – offers rapid charge and discharge times (high c-rates); ultracaps provide high power density and long lifecycles up to 1 million duty cycles
- **Space-saving** – as a turnkey container solution
- **Application in all industrial branches**

Container size configuration

U-UPS 400 V AC	Container size
175 kVA, 500 kVA, 1 MVA	20 ft
2 MVA	20 ft
3 MVA	30 ft

Other sizes upon request

U-UPS solution: schematic für low-voltage applications



System components

- **FREQCON Fast Disconnector** – for separating the protected grid from the public grid
- **AC/DC Converter** – provides power in order to establish an island grid in case of voltage dips or micro interruptions in the public grid and to charge the Ultracapacitors in normal grid condition
- **DC/DC Converter** – adopts the DC-link´s constant voltage to the variable Ultracapacitor voltage
- **Ultracapacitors** – store the required energy
- **Bypass switch** – used in case of inspection and maintenance

FREQCON U-UPS
Technical data

Technical Data	Standard sizes for U-UPS								
	175 kVA/ 5 sec	500 kVA/ 1sec	500 kVA/ 2 sec	1000 kVA/ 1 sec	1000 kVA/ 2 sec	2000 kVA/ 1 sec	2000 kVA/ 2 sec	3000 kVA/ 1 sec	3000 kVA/ 2 sec
Converter	MSC 175	MSC 500		MSC 1000		MSC 2000		MSC 3000	
Nominal AC voltage	400 V								
Nominal apparent power*	175 kVA	500 kVA		1000 kVA		2000 kVA		3000 kVA	
Power bridging	5 sec	1 sec	2 sec	1 sec	2 sec	1 sec	2 sec	1 sec	2 sec
Nominal AC current (I)	253 A	722 A		1444 A		2888 A		4332 A	
Maximum short-circuit current breaking capacity (Icu)	40 kA								
Power factor at rated power / adjustable	1 / 0.03 capacitive to 0.0 inductive								
AC power frequency (range)	50 Hz (47 to 53 Hz)								
IGTB switching frequency	2 to 4 kHz								
Number of DC outputs	1	1		1		2		3	
DC voltage range	400 V_{DC} to 1100 V_{DC}								
DC current per output/ DC current combined	1100 A_{DC} / 1100 A_{DC}	1600 A_{DC} / 1600 A_{DC}		1600 A_{DC} / 1600 A_{DC}		1600 A_{DC} / 3200 A_{DC}		1600 A_{DC} / 4800 A_{DC}	
Energy Storage Medium	Ultracapacitors								
Cycle Life	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Fast Disconnector (UPS Functionality)	FREQCON Fast Disconnector (FFD)								
Transfer time (with FFD)	≤ 10 ms								
Main controller	Siemens Simotion P320-4								
Control software	FREQCON Framework								
Internal communications	Profinet IRT								
External communications interfaces	MODBUS TCP, Ethernet IP (others available on request)								
Protection level	IP31 / IP54								
Noise level cabinets	~70 dB(A) at 2m distance								
Max. total harmonic distortion	< 3 % at nominal power								
Max. efficiency (AC to DC)/ Standby mode (Full load)/ Harmonics filtering mode	98.3 % / 99.5 % / 99.2 %								
Max. efficiency (DC to DC)	99.4 %								
Performance	IEC 62040-3, ITI (CBEMA)								
Operating temperature	ambient: -20°C to 40 °C								
Protectice Devices									
Ultracapacitors (DC)	Fuse and DC load break switch								
AC side disconnection point	Circuit breaker								
DC overvoltage protection	Surge arrester, Type II (I)								
AC overvoltage protection	Surge arrester, Type II (I)								
Ground fault monitoring	YES								
Fire protection	Smoke and Arc detection								
Cooling principle	Liquid cooled								
Life (rated condition)	20 years								

* other sizes available on request

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