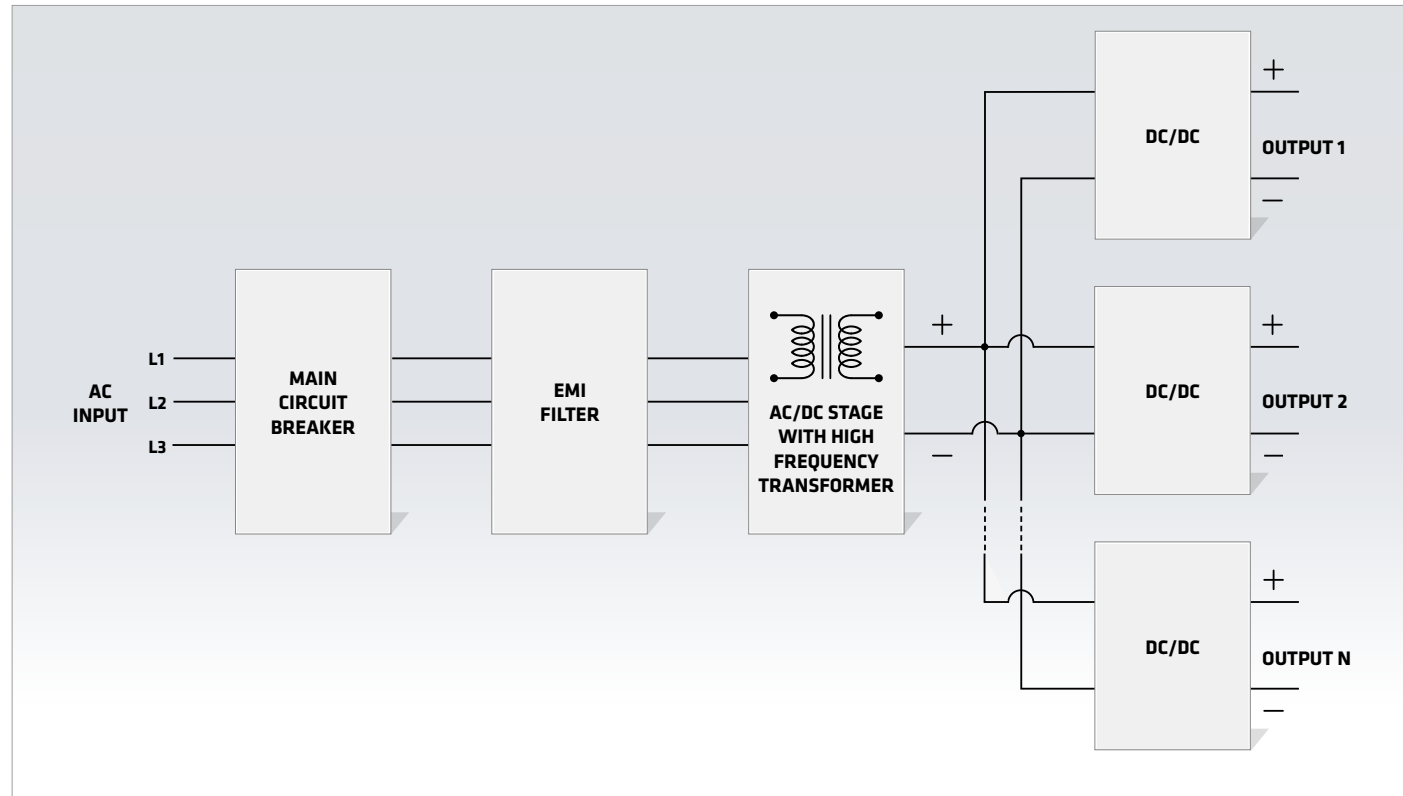


SMF CHARGERS

Regenerative High Switching Frequency Formation Technology for Lithium-Ion Cells



This multi-line modular converter is designed for lithium-ion cell formation and is built with high frequency switching technology. Each line works with a specific formation control program, up to 50A and 6V. The unit manages up to 256 formation lines.



SYSTEM COMPONENTS

The equipment is comprised of three major subsystems:

1. A high frequency bidirectional AC/DC stage with galvanic insulation;
2. High frequency bidirectional DC/DC circuits;
3. A control unit for the converter and the formation lines through a proprietary software suite.

The SMF Charger works with a companion formation chamber which provides automatic electrical contact with the lithium-ion cells to form.

EQUIPMENT PERFORMANCE

Input AC/DC IGBT inverter stage:

power factor > 0.99
current distortion < 5%

This guarantees high compatibility with the electrical grid.

High efficiency output DC/DC stage > 90%



charger's AC/DC and DC/DC stages

formation chamber docks

TURNKEY SYSTEM FOR CELL FORMATION

The SMF charger is designed to be easily integrated with Solith Modular Formation Chamber (MFC) which provides the automatic electrical contact of Li-ion cells. The system is supplied as one ready-to-use piece of equipment.

GENERAL SMF CHARGER FEATURES

- Current Accuracy: $\pm 0.1\%$ FS
- Voltage Accuracy: $\pm 0.1\%$ FS
- Output DC/DC Stage Efficiency: $\geq 90\%$
- Input Power Factor: >0.99
- Input Current Total Harmonic Distortion (THD): $\leq 5\%$
- Regenerative Function for Excess Energy During Discharge
- Overvoltage and Overcurrent Hardware Control for Enhanced Reliability
- Single Circuit Independent Operation
- Two Independent Control Loops for Current and Voltage



30A 4-line circuit



5A 8-line circuit



5A 16-line circuit



- ▶ PF \geq 0,99 during charge & discharge:
NO NEED FOR EXTERNAL POWER FACTOR CORRECTION SYSTEM
- ▶ THD \leq 5%:
NO NEED FOR EXTERNAL HARMONIC DISTORTION CORRECTION SYSTEM
NO HARMONIC RESONANCE IN THE POWER GRID
- ▶ Galvanic insulation with respect to the AC grid:
HIGHER SAFETY STANDARDS
- ▶ Modular concept design:
FAST DC/DC MODULE REPLACEMENT (LOWER DOWNTIME)
SINGLE CIRCUIT DSP CONTROL BOARD
- ▶ Fast Service System/Autodiagnostic with integrated DSP sensors:
FASTER RESPONSE & INTERVENTION TIME
- ▶ Switching technology:
HIGHER ENERGY EFFICIENCY COMPARED TO LINEAR TECHNOLOGY
- ▶ Regenerative switching mode topology:
ENERGY SAVINGS IN EXCESS OF 60% COMPARED TO TRADITIONAL SYSTEMS
- ▶ Compact footprint:
HIGH CIRCUIT DENSITY (UP TO 256 PER CABINET)
SMALL DIMENSIONS
- ▶ Proven experience in switching technology equipment:
MORE THAN 600 UNITS INSTALLED WORLDWIDE

TECHNICAL DATA

Model	Type	Current (A)	Voltage (V)	Number of circuits per cabinet
SMF-168-5A-5V	ONLY CHARGE	0-5	0-5 charge	168
SMF-256-5A-5V	CHARGE/DISCHARGE	0-5	0-5 charge, 1.5 -5 discharge	
SMF-96-10A-6V	CHARGE/DISCHARGE	0-10	0-6 charge, 1.8-6 discharge	96
SMF-96-25A-6V	CHARGE/DISCHARGE	0-25	0-6 charge, 1.8-6 discharge	96
SMF-168-30A-5V	CHARGE/DISCHARGE	0-30	0-6 charge, 1.8-6 discharge	168
SMF-96-50A-6V	CHARGE/DISCHARGE	0-50	0-6 charge, 1.8-6 discharge	96
SMF-48-100A-6V	CHARGE/DISCHARGE	0-100	0-6 charge, 1.5-6 discharge	

Other versions are available upon Customer's request.

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