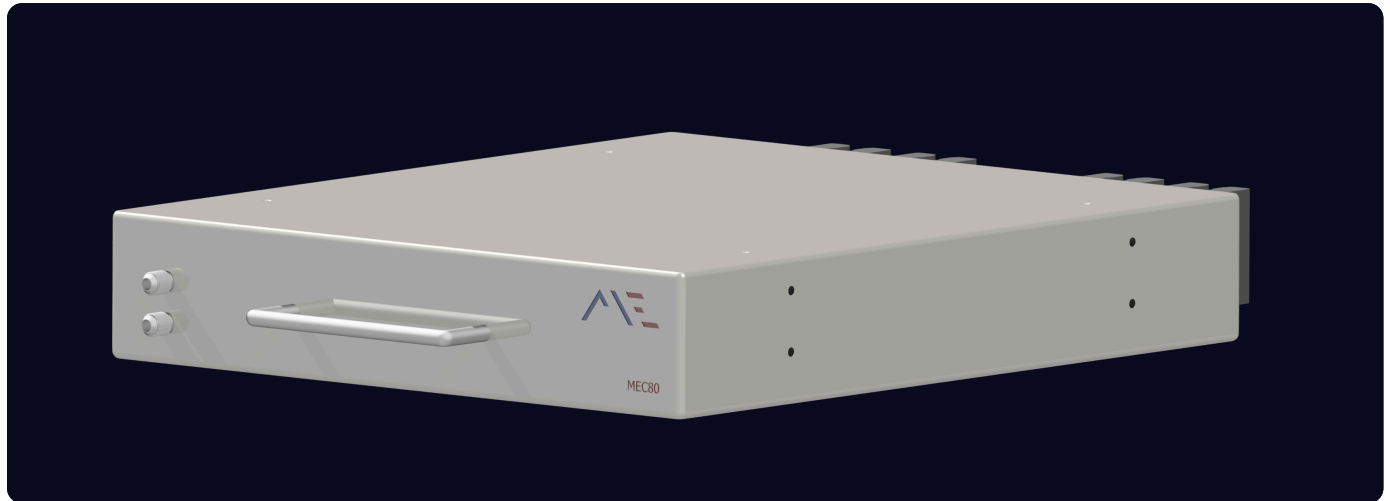


MEC80

80 kVA isolated bidirectional GaN converter module



80 kVA

RATED POWER

98.7 %

PEAK EFFICIENCY†

1500 V DC

1000 V AC PORTS

3.6 kVA/L

POWER DENSITY

2U • 12 kg

19" RACK MODULE

/ DESCRIPTION

The MEC80 is a galvanically isolated, bidirectional 80 kVA power converter module built on gallium nitride (GaN) switching at up to 1 MHz. A single module converts between a 0 to 1500 V DC port and a 0 to 1000 V AC or DC port through a high-frequency isolation stage, replacing the line-frequency transformer and its size, weight and losses.

Modules are designed for series stacking: with fiber-isolated EtherCAT control and full galvanic isolation, stacks reach system voltages of tens of kV for solid-state transformer (SST) applications, while single modules serve as compact building blocks for battery storage, electrolysis, fuel cells and solar conversion.

The sealed, fanless enclosure is liquid cooled through two coolant fittings and fits a standard 19" rack at 2U height. There are no filters, fans or scheduled service items.

/ APPLICATIONS

- Battery energy storage and battery-buffered EV charging
- Electrolysis and fuel cell power conversion
- Solid-state transformers, stackable to tens of kV
- Solar string inverters and DC collection grids
- Data center power distribution

/ FEATURES

- 80 kVA bidirectional, four-quadrant operation, power factor 0 to 1
- Galvanic isolation via high-frequency transformer stage
- GaN power stage, switching up to 1 MHz
- 98.7 % peak efficiency†, <1 % current THD
- Full LVRT and frequency response for grid-connected use
- EtherCAT control with fiber optic isolation, multi-module synchronization
- Liquid cooled, fanless, zero scheduled maintenance
- 19" rack form factor, 89 × 480 × 520 mm, 12 kg
- Rear plug-in power connections for fast module exchange
- Designed for CE compliance†

† Advance information. All parameters in this document are design targets derived from detailed simulation and ongoing prototype characterization, not measurements of a released product. Values are subject to change without notice and do not constitute a warranty of performance. Certification targets are listed on page 2.

/ DC PORT

Voltage range	0 to 1500 V DC
Maximum current	85 A
Maximum power	80 kW, bidirectional

/ AC PORT

Voltage range	0 to 1000 V AC
Maximum current	63 A RMS
Power factor	0 to 1, four-quadrant
Current THD	< 1 %
Grid support	Full LVRT and frequency response

/ CONVERSION STAGE

Topology	Isolated GaN power stage, high-frequency transformer
Switching frequency	Up to 1 MHz
Peak efficiency	98.7 % (target)
Maximum dissipation	≈ 1200 W at full load

/ ISOLATION & STACKING

Isolation	Galvanic, HF transformer stage
Series stacking	Multi-module stacks to tens of kV system voltage
Isolation test voltage	To be confirmed

/ CONTROL & COMMUNICATION

Fieldbus	EtherCAT
Physical interface	Fiber optic, galvanically isolated
Stack operation	Synchronized multi-module control
Protection	Overcurrent, overvoltage, overtemperature

/ MECHANICAL & COOLING

Dimensions (H × W × D)	89 × 480 × 520 mm (2U, 19" rack)
Weight	12 kg
Cooling	Liquid, fanless, sealed enclosure
Coolant connections	2× front-panel fittings
Power connections	Rear plug-in connectors
Maintenance	None scheduled

/ ENVIRONMENT

Operating temperature	−20 to +55 °C
Humidity, altitude	To be confirmed

/ COMPLIANCE (DESIGN TARGETS)

Marking	CE
Safety	EN IEC 62477-1
EMC	EN IEC 61000-6-2, EN IEC 61000-6-4
Grid connection	EN 50549-1 / -2

/ AVAILABILITY

Status	In development, advance information
Evaluation units	By arrangement, contact Maskinel
Contact	ruben@maskinel.dk

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