



PRODUCT SPECIFICATIONS

GRID-FLEX

800VDC Bi-Directional Inverter

[GATEWAY](#) · [INVERTER](#) · [LINK](#)

Factory-built power conversion for AI compute, energy storage and microgrid infrastructure. 800 kW to 3.2 MW per block, delivered as 800–950 VDC.

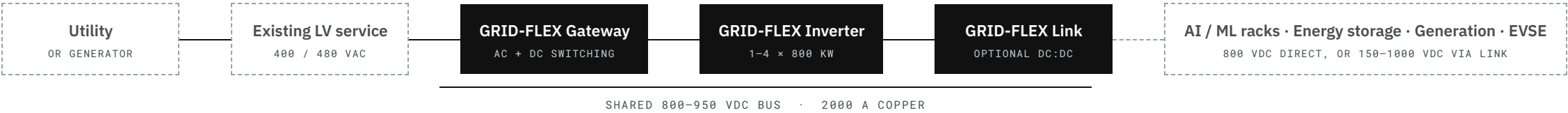
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1.6 MW BLOCK – TWO INVERTER CABINETS AND ONE GATEWAY ON A SHARED CABLE-ENTRY PLINTH

System Overview

GRID-FLEX is built from modular cabinets that share a common DC bus and a single liquid-cooling architecture. Up to two Inverters share one 2000 A DC bus; a 3.2 MW block is two such strings either side of the Gateway. The Gateway defines how power leaves the block. The Link converts the bus again where isolation or a different voltage is needed.



PRODUCT 01 GRID-FLEX Gateway Combined AC and DC switching cabinet. Terminates the incoming feed, carries protection, isolation and monitoring for both sides, and presents the DC bus to whatever the site needs — busway, combiner boxes or a DC distribution board. 2000 A AC BUS · 2000 A DC BUS	PRODUCT 02 GRID-FLEX Inverter Bi-directional AC:DC power cabinet. Sixteen liquid-cooled 50 kW silicon-carbide active-front-end modules on two independent banks deliver 800 kW per cabinet at 98.5% efficiency, with four-quadrant grid support. 800 KW · 800-950 VDC	PRODUCT 03 GRID-FLEX Link Isolated DC:DC power cabinet on the same bus. Adds galvanic isolation and independent voltage regulation for DC-coupled storage, generation, or loads that need something other than 800 V. UP TO 816 KW · 150-1000 VDC
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3.2 MW PER BLOCK 4 INVERTERS, 2 BUS STRINGS	98.5% CONVERSION EFFICIENCY AT FULL POWER	2000 A SHARED DC BUS 800-950 VDC	IP65 SEALED ENCLOSURE NEMA TYPE 3R	-35 to +55 °C OPERATING TEMPERATURE RANGE
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GRID-FLEX Inverter

The Inverter is the rectification and power-delivery core of the platform. Sixteen 50 kW liquid-cooled silicon-carbide active-front-end modules sit on two independent banks, each with its own current-limiting input fuses, precharge interface board, capacitor bank, output fuse, contactor and isolator — so a bank can be isolated with the rest of the cabinet running.

400 kW to 3.2 MW of distributed DC power delivery

50 kW liquid-cooled silicon-carbide modules — 800–950 VDC output, 10-year warranty

Bi-directional four-quadrant operation, import and export

Dynamic power factor from 0.0 lagging to 0.0 leading

Input current THDi $\leq 1.5\%$ from 20% to 100% of rated load

Fault ride-through with reactive injection during voltage dips

IP65 sealed enclosure for harsh and outdoor environments

N+2 redundancy at full rating — modules are rated 50 kW and capable of 60 kW, so any fourteen of sixteen carry the full 800 kW



FRONT — OUTER DOORS OPEN
AC:DC POWER MODULES, COOLANT
MANIFOLDS



REAR — INNER DOORS OPEN
ISOLATORS, FUSING, CONTACTORS, DC
BUSBAR

Inverter Specifications

System Characteristics

Grid voltage: 400 VAC 3ph +10% / –15% | 480 VAC 3ph +10% / –15%

Grid frequency: 50 Hz ±10% | 60 Hz ±10%

Efficiency: 98.5% at full power

Power factor: Dynamic correction, 0.0 lagging to 0.0 leading

Input current THDi: ≤ 3% from 10–100% rated load; ≤ 1.5% from 20–100% rated load

Earthing systems: TT, TN-C-S, TN-S, TN-C, IT

Network connection: Ethernet | cellular 4G / LTE (optional)

Local management: MODBUS TCP

Remote management: Secure customer web portal – configuration, diagnostics, software update

Cooling: Liquid-cooled power electronics; 60/40 ethylene glycol and demineralised water

Heat rejection: Converter losses taken to air by the coolant distribution unit mounted on top of the cabinet

Dynamic Performance

Instantaneous load rejection: Holds 850–1000 VDC from an initial 900 VDC through a 400 kW rejection at full load

Load addition: Holds the same band from zero to full load at 200 kW per second

Static droop: No-load to full-load decrease limited to 25 V

Ride-through: Fault ride-through with reactive injection during voltage dips

Precharge: Interface board energises the DC bus into a capacitive load without inrush, with any combination of modules enabled

Electrical Safety

Surge protection: Type 1+2 SPD

Short circuit current rating: 65 kA

Insulation coordination: Input overvoltage category III, 4 kV impulse withstand, pollution degree 2, per IEC 60664-1

Electrical protections: Over current, over voltage, under voltage, short circuit, over temperature

Under-voltage relay or shunt trip: Optional

Environmental

Operating temperature: –35 °C to +55 °C (–31 °F to +131 °F)

Storage temperature: –40 °C to +60 °C (–40 °F to +140 °F)

Humidity: 95% RH non-condensing

Maximum operating altitude: 3000 m (9840 ft)

Ingress protection: IP65 | NEMA Type 3R; sealed rather than ventilated

Impact protection: IK10

Noise emissions: ≤ 65 dB(A) at 1 m, full power, 25 °C (77 °F)

Structural

Seismic: IEEE 693 High Qualification Level, IBC Risk Category II

Wind: 150 mph at Exposure Category C

Design life: Ten years at 100% rated capacity, twelve hours a day

Dimensions

DIMENSION	INVERTER	GATEWAY
Width	663 mm (26.1")	500 mm (19.7")
Height	2250 mm (88.6")	2250 mm (88.6")
Height with plinth	2450 mm (96.5")	2450 mm (96.5")
Depth	1225 mm (48.2")	1225 mm (48.2")
Weight	880 kg (1940 lb)	—

Isolation & Interlocks

Bank isolation: Output fuse, contactor and two-pole isolator per bank

Loss of supply: Defaults to a de-energised state

Field verified. In July 2026 a test programme commissioned by a hyperscale customer and executed by an independent engineering firm ran fifteen scenarios on a nominally 1600 kW installation connected to an ungrounded AC supply, loaded to 1000 kW. DC bus voltage was stable through loaded operation and transient load rejections, and earth-fault detection and protection functioned as expected – exercised both loaded and unloaded.

GRID-FLEX Gateway

The Gateway is the configurable element of the platform. It closes one end of a cabinet row, provides switching, protection and monitoring for both the incoming AC feed and the internal DC bus, and is built to match the distribution scheme the site requires.

Gateway Functions

Access to the 1.6 MW DC bus for distribution downstream

Ties or separates two bus strings. A 3.2 MW block is two rectifier strings either side of the Gateway, which joins the two 2000 A buses or keeps them separate and distributes independently

Utility / generator transfer — two interlocked 2000 A incoming breakers, trapped-key and electrically interlocked so the sources cannot be paralleled, with remote operator stations

Arc-energy reduction (ERMS) per NEC 240.87

120 VAC 20 A auxiliary circuit for customer use, with automatic source transfer

AC Section

Main AC busbar to 2000 A at 480 V, 3-phase 3-wire, 65 kA available

Load-break isolators with lock-off; I> and I>> protection

Class I+II surge protection — 20 kA (10/350 µs), 200 kA SCCR, suitable for ungrounded systems

Type B residual current monitoring

Insulation monitoring device (IMD) on the AC bus — ungrounded systems

Main earth busbar and local earth-stake termination

3 kVA auxiliary transformer; 24 VDC control supplies

DC Section

DC pass-through busbars — 2000 A copper, two per cabinet

DC main fuses, output contactor and output isolator

DC surge protection with dedicated SPD fusing

DC residual current monitoring — grounded systems

DC cable terminations to combiner boxes, busway or distribution board

Thermal

Heat exchanger with four fans; dedicated fuse cooling fans

Four temperature monitoring points

Control & Monitoring

Bay Controller Unit and Communications Unit

MODBUS TCP endpoint and industrial network switch

Local / remote keyswitch and status indicators

GRID-FLEX Link

The Link is a DC power cabinet that connects to the same 800–950 VDC bus as the Inverters. It converts that bus to an independently regulated 150–1000 VDC output with galvanic isolation, in bi-directional 25.5 kW increments — and it is the element that carries the source-side isolation barrier the 800 VDC specifications require.

99% PEAK MODULE EFFICIENCY	816 kW PER CABINET AT ≥408 V 32 × 25.5 kW	150–1000 REGULATED DC OUTPUT VDC, ISOLATED
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Link Functions

- 816 kW per cabinet** — thirty-two 25.5 kW modules in two columns, matched to one Inverter
- Up to two Link cabinets** on the same 2000 A bus
- Two-wire 800 V or three-wire ±400 V** from the same cabinet — parallel all thirty-two modules, or two series banks of sixteen with the junction brought out as the midpoint, 400 kW per rail and 800 kW total
- Galvanically isolated** dual-active-bridge topology — the source-side barrier
- Bi-directional** — the DC storage port, with no second converter
- Independent regulation per branch**, for per-rack or per-row control and containment
- Same enclosure and cooling architecture** as the Inverter

Output Characteristics

- Bus input voltage:** 800 VDC ±2% to 970 VDC ±2%
- Output voltage:** 150 VDC to 1000 VDC
- Output power:** 25.5 kW continuous per module; 816 kW per cabinet at 32 modules
- Power available against output voltage:** Full rated power available at outputs ≥ 408 V; current-limited to 62.5 A per module below that
- Output current:** 62.5 A continuous per module
- Constant-voltage accuracy:** ±5 V (150–500 V) | ±1% (>500 V)
- Constant-current accuracy:** ±150 mA (<5 A) | ±1.5 A (5–50 A) | ±3% (>50 A)
- Efficiency:** 99% peak | 98.5% at full power

Cabinet

- Width:** 663 mm (26.1")
- Height:** 2250 mm (88.6") | 2450 mm (96.5") with plinth
- Depth:** 1225 mm (48.2")
- Insulation coordination:** Input overvoltage category III; output category II
- Protection:** Over / under-voltage shutdown, over temperature, internal fault; DC input and output fusing
- Standards:** UL 1741:2024, IEC 61851-23:2023, IEC 62477-1:2022, EU 2024/573

Why the Barrier Sits Here

- Two barriers, two jobs:** The converter in the compute tray creates the SELV domain the server electronics live in. The source-side barrier decides the character of the distribution network between the cabinet and the tray.
- First fault is an alarm, not an outage:** With an isolated source the network is a floating IT system. Insulation resistance is measured continuously; a first earth fault raises an alarm and is located while the load keeps running.
- The earthing scheme becomes a choice:** Isolation from the AC input is what lets the DC side be earthed to suit the application — high-resistance midpoint grounding to alarm on the first fault, or solid midpoint grounding for conventional overcurrent clearing. Without it you inherit whatever the AC system does.

Power Modules

Every GRID-FLEX cabinet is populated from the same family of liquid-cooled power modules on a common 200 mm-wide rack pitch and a common coolant circuit. Modules connect on quick-release, no-drip coolant connectors.



RECTIFICATION
50 kW AC:DC — SiC Active Front End
Sixteen per Inverter cabinet, eight per bank



ISOLATED CONVERSION
25.5 kW DC:DC — Dual Active Bridge
Thirty-two per Link cabinet, in two columns

	50 KW AC:DC MODULE	25.5 KW DC:DC MODULE
Topology	Silicon-carbide active front end, non-isolated	Dual active bridge, galvanically isolated
Rated power	50 kW rated, capable of 60 kW	25.5 kW continuous
Input	340–530 Vrms L-L typical, 600 Vrms maximum; ±500 Vpk L-PE; 10% phase imbalance; 80 Arms maximum; 50 / 60 Hz ±10%	800 VDC ±2% to 970 VDC ±2%; 35 A maximum, 0.01 A typical standby
Output voltage	1000 VDC maximum (800–950 VDC in service)	150 VDC to 1000 VDC, regulated
Output current	67 A maximum	0.1 A to 62.5 A
Efficiency	98.5% peak	99% peak 98.5% at full power
Power flow	Bi-directional; dynamic power factor and fault ride-through	Bi-directional; constant-voltage and constant-current modes
Harmonic distortion	Input current THDi ≤ 3% from 10–100% rated load; ≤ 1.5% from 20–100%	—
Coolant	60% ethylene glycol / 40% demineralised water; 2.0 L/min minimum, 5.0 L/min maximum	OECD 301 B, 60/40 ethylene glycol and demineralised water; 2 bar (29 psi); 2.0 L/min minimum
Full-power temperature	Air –35 °C to +70 °C coolant –35 °C to +60 °C	Air –35 °C to +60 °C coolant –35 °C to +50 °C
Dimensions	200 mm W × 132 mm H × 526.5 mm D (584.5 mm at mounting points)	200 mm W × 79 mm H × 615 mm D; 7.5 kg (16.5 lb)
Certification	CB Scheme to IEC 62477-1; NRTL to UL 2202 and CSA 22.2; EMC to CISPR 11 Class B with margin	UL 1741:2024; IEC 61851-23:2023, IEC 62477-1:2022; complies with regulation (EU) 2024/573

Scaling a Block

Up to two Inverter cabinets share a single 2000 A DC bus. Above 1.6 MW the block is two such strings with the Gateway between them, joining the buses or keeping them separate and distributing independently. Up to two Link cabinets can be added to each bus.

	1 INVERTER – 800 KW	2 INVERTERS – 1600 KW	3 INVERTERS – 2400 KW	4 INVERTERS – 3200 KW
				
AC INPUT				
Nominal input current	400 V: 1234 A 480 V: 1028 A	400 V: 2467 A 480 V: 2056 A	400 V: 3701 A 480 V: 3084 A	400 V: 4935 A 480 V: 4112 A
Maximum input current low-line condition	400 V: 1259 A 480 V: 1082 A	400 V: 2518 A 480 V: 2164 A	400 V: 3776 A 480 V: 3246 A	400 V: 5036 A 480 V: 4329 A
DC OUTPUT				
DC voltage	800–950 VDC			
Bus strings	1	1	2	2
DC current per bus, maximum	1000 A	2000 A	2000 A + 1000 A	2000 A + 2000 A
DC output power	835 kW max ($V_{out} > 835$ VDC) 800 kW at $V_{out} = 800$ VDC	1670 kW max 1600 kW at $V_{out} = 800$ VDC	2505 kW max 2400 kW at $V_{out} = 800$ VDC	3340 kW max 3200 kW at $V_{out} = 800$ VDC
COMPOSITION, DIMENSIONS AND WEIGHTS				
Gateway sections	1	1	2	2
Link cabinets supported	Up to 2 per bus string			
Width, overall	1163 mm (45.8")	1826 mm (71.9")	2989 mm (117.7")	3652 mm (143.8")
Height / with plinth	2250 mm (88.6") / 2450 mm (96.5")			
Depth	1225 mm (48.2")			
Weight, Inverters	880 kg (1940 lb)	1760 kg (3880 lb)	2640 kg (5820 lb)	3520 kg (7760 lb)

Inverter weights exclude Gateway and Link cabinets. Overall width is the sum of Inverter cabinets at 663 mm and Gateway sections at 500 mm, and excludes Link cabinets, which add 663 mm each. Blocks are paralleled to reach tens of megawatts.

System Topologies

Four ways to combine the three cabinets.

CONFIGURATION A

Rectify

GATEWAY + 1–4 INVERTERS

Direct AC to 800 VDC. The Gateway presents the 2000 A bus to a DC busway, combiner boxes or a distribution board.

TYPICAL USE

800 VDC to AI/ML racks. Highest efficiency, fewest conversions.

CONFIGURATION B

Rectify + Isolate

GATEWAY + INVERTERS + LINK

Link cabinets share the same DC bus and add galvanic isolation with an independently regulated 150–1000 VDC output.

TYPICAL USE

DC-coupled battery storage, mixed-voltage loads, EVSE dispensers.

CONFIGURATION C

Export

BI-DIRECTIONAL OPERATION

Active front-end modules run in all four quadrants, injecting or absorbing reactive power on a remote setpoint.

TYPICAL USE

Grid support, peak shaving, VDE-AR-N 4110 compliance.

CONFIGURATION D

Multi-Block

3.2 MW BLOCKS IN PARALLEL

Blocks are independent and repeatable. Each has its own feeders, its own cooling and its own protection.

TYPICAL USE

9.6 MW and above. Capacity added without re-engineering the site.

DEPLOYMENT & COOLING	OUTDOOR	INDOOR
Thermal unit	Coolant Distribution Unit (CDU) — reservoir, twin radiator heat exchangers, pump and fan, mounted on the cabinet	Centralised Coolant Interface Unit (CCIU) — plate heat exchanger, reservoir, pump and service shut-off valves
Heat path	Converter losses rejected directly to ambient air	Converter losses rejected to the facility coolant loop
Redundancy	Adjacent CDUs cross-link through a linking valve	Adjacent CCIUs cross-link through a linking valve
Footprint	Identical — the cabinet does not change	



3.2 MW BLOCK – FOUR INVERTERS, TWO GATEWAYS

Data Centre Interface

The 800 VDC source sits outside the rack in every architecture now being deployed. The specifications the industry is converging on ask the same thing of it: a high-voltage DC output galvanically isolated from the AC input and from protective earth, presented as a floating system, with continuous insulation monitoring and a defined earth-fault response.

OCP DIABLO 400	NVIDIA 800 VDC
±400 VDC	800 VDC
Three-wire floating set — positive, midpoint return, negative.	Two-wire feed, isolated from PE ground.

Both come from the same cabinet as a configuration rather than a variant, because each Link module output is galvanically isolated on its own: parallel all thirty-two for two-wire 800 V, or series-connect two banks of sixteen and bring the junction out as the midpoint. A non-isolated source cannot stack outputs that share a common reference.

REQUIREMENT	WHAT THE SPECIFICATION ASKS	GRID-FLEX TODAY
SAFETY AND ELECTRICAL		
Isolated DC output	Galvanic isolation of the source output from the AC input and from PE; 800 VDC and its return safety isolated from PE ground	Link modules are galvanically isolated and certified to IEC 61851-23:2023 and UL 1741:2024
Continuous insulation monitoring	Floating operation depends on detecting the first earth fault before a second occurs	IMD in the Gateway, measuring on the AC bus in idle, running and faulted states
Earth-fault response	Trip and indicate on detection; remain faulted until a manual reset is issued	Implemented, and exercised loaded and unloaded during July 2026 field testing
Grounded and ungrounded supplies	Site earthing arrangements vary and are not the supplier's choice	TT, TN-C, TN-S, TN-C-S and IT supported; selection is a configuration option
DC voltage class	800 VDC nominal two-wire, or ±400 VDC three-wire	Inverter 800–950 VDC; Link regulated 150–1000 VDC, ±1% above 500 V
Large instantaneous load rejection	Bounded overshoot when a load is removed	Holds 850–1000 VDC through a 400 kW instantaneous rejection from full load
Fast load addition	Compute ramping from idle to full	Holds the same band through zero to full load at 200 kW per second
Power quality	Harmonic limits at the point of common coupling	Input current THDi ≤ 3% from 10–100% load and ≤ 1.5% from 20–100%; power factor dynamic from 0.0 lagging to 0.0 leading
ENVIRONMENTAL AND OPERATIONAL		
Ingress and impact	Outdoor or grid-edge deployment without a building	IP65 and NEMA Type 3R; IK10 impact rating; sealed rather than ventilated
Seismic and wind	Qualification to a defined seismic level and wind speed	IEEE 693 High Qualification Level, IBC Risk Category II; 150 mph at Exposure Category C
Electromagnetic compatibility	Class A emissions limits in an industrial environment	Module tested to CISPR 11 Class B with margin — tighter than the Class A limit asked for
Telemetry and control	Per-module measurement and status into a site supervisory layer over an open protocol	MODBUS TCP over Ethernet with per-module measurement, state, fault and alarm points

Compliance, Protection & Service

Certified, monitored, serviceable. Every block arrives factory assembled and factory tested.

Certification

- System — North America:** UL 1741; 47 CFR § 1.130; FCC 47 CFR Part 15 B; FCC-certified cellular module. Canada: CSA 22.2 107.1, RSS-210 and SPR-002, ICES-003
- System — Europe:** IEC 62477-1, IEC 62311, IEC 61000-3-4, ETSI EN 303 446-1, ETSI EN 301 489-1, -3 and -52, VDE-AR-N 4110 at 50 and 60 Hz
- Common:** IEEE 1547 and IEEE 519 at 50 and 60 Hz
- AC:DC module:** CB Scheme to IEC 62477-1; NRTL to UL 2202 and CSA 22.2; EMC to CISPR 11 Class B with margin; materials V-0 for live parts, V-2 for insulated parts
- DC:DC module:** IEC 61851-23:2023; IEC 62477-1:2022; UL 1741:2024; complies with regulation (EU) 2024/573
- Enclosure:** IP65 and NEMA Type 3R to IEC 60529 and NEMA 250; IK10 impact
- Site installation:** Field certification available through a Nationally Recognised Testing Laboratory

Protection & Monitoring

- AC incoming:** Two interlocked 2000 A breakers, trapped-key and electrical; ERMS arc-energy reduction per NEC 240.87 with local status indication on both; remote operator stations
- AC surge:** Class I+II, 480 V, 20 kA at 10/350 µs, 200 kA SCCR, selected as suitable for ungrounded systems
- DC surge:** Class I+II rated for 1000 VDC, 20 kA
- Insulation monitoring:** IMD measuring insulation resistance on the AC bus in all operating modes, including idle and faulted; fitted on ungrounded systems
- Residual current:** Type B monitor — alternating, pulsating direct and smooth direct residual currents
- Branch protection:** Fuses in both the positive and negative rail of every outgoing circuit, with per-branch isolation and mechanical lock-off
- Module protections:** DC voltage high, AC out of range, loss of AC synchronisation, over temperature, communication timeout, internal fault

Service & Support

- Module warranty:** Ten years on power modules; ten-year design life at 100% rated capacity, twelve hours a day
- Fault containment:** Each module isolates its own AC input and DC output, so a module failure leaves the cabinet running with degraded capacity rather than tripping the bus
- Field-replaceable:** Fuses, breakers and modules, on quick-release, no-drip coolant connectors
- Telemetry:** MODBUS TCP over Ethernet with per-module measurement, state, fault and alarm points; remote management through the customer portal
- Manufacture and service:** Built in the U.S.A. Field service scaled up across the US, Europe, and Australia
- Specifications are for the 400 / 480 VAC product configuration and are subject to change. Site-specific variants — including alternative Gateway distribution schemes and output presentations — are available. Confirm the configuration for your site before design freeze.



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