OUTDOOR COMMERCIAL & INDUSTRIAL
HYBRID ENERGY STORAGE SYSTEM · 50 KW

PV | BATTERY | GENSET | GRID | EV

WattCision.

A 50 kW true hybrid for outdoor C&I.

One all-SiC core. Five paths. PV, battery, genset, grid, backup — plus an optional DC fast charger. Five hybrid SKUs (29.9 – 50 kW) share an 80 kg, IP66 chassis. 221 kWh battery cabinets stack to 1.1 MWh per cluster. The 120 kW charger ships as a modular add-on — 30 kW slices, retrofittable to live sites.

29.9 KW	36 KW	40 KW	46 KW	50 KW
29.9 kW	36 kW	40 kW	46 kW	50 kW
CISION-29.9K-3PH	CISION-36K-3PH	CISION-40K-3PH	CISION-46K-3PH	CISION-50K-3PH
33 kVA	39.6 kVA	44 kVA	50.6 kVA	55 kVA

CISION-50K-3PH · 50 KW · 80 KG · IP66

PEAK EFFICIENCY	MASS	BATTERY	FAST CHARGE	HANDOVER
98.20 %	80 kg	221 kWh	120 kW	<20 ms
All-SiC · transformerless	50 kW · IP66	LFP · modular to 1.1 MWh	Modular add-on · Dual CCS2	UPS-class · IEC 62040-3

§ 02 / THE PLATFORM

One inverter. Five paths.

PV · Battery · Genset · Grid · Backup.

PV, battery and three independent AC ports — Grid, Genset, Backup — converge on one all-SiC power stage. No isolation transformer. No third-party ATS. The DC-coupled charge tap bypasses AC conversion entirely. Five SKUs (29.9 – 50 kW) share one enclosure, one firmware, one wiring spec.

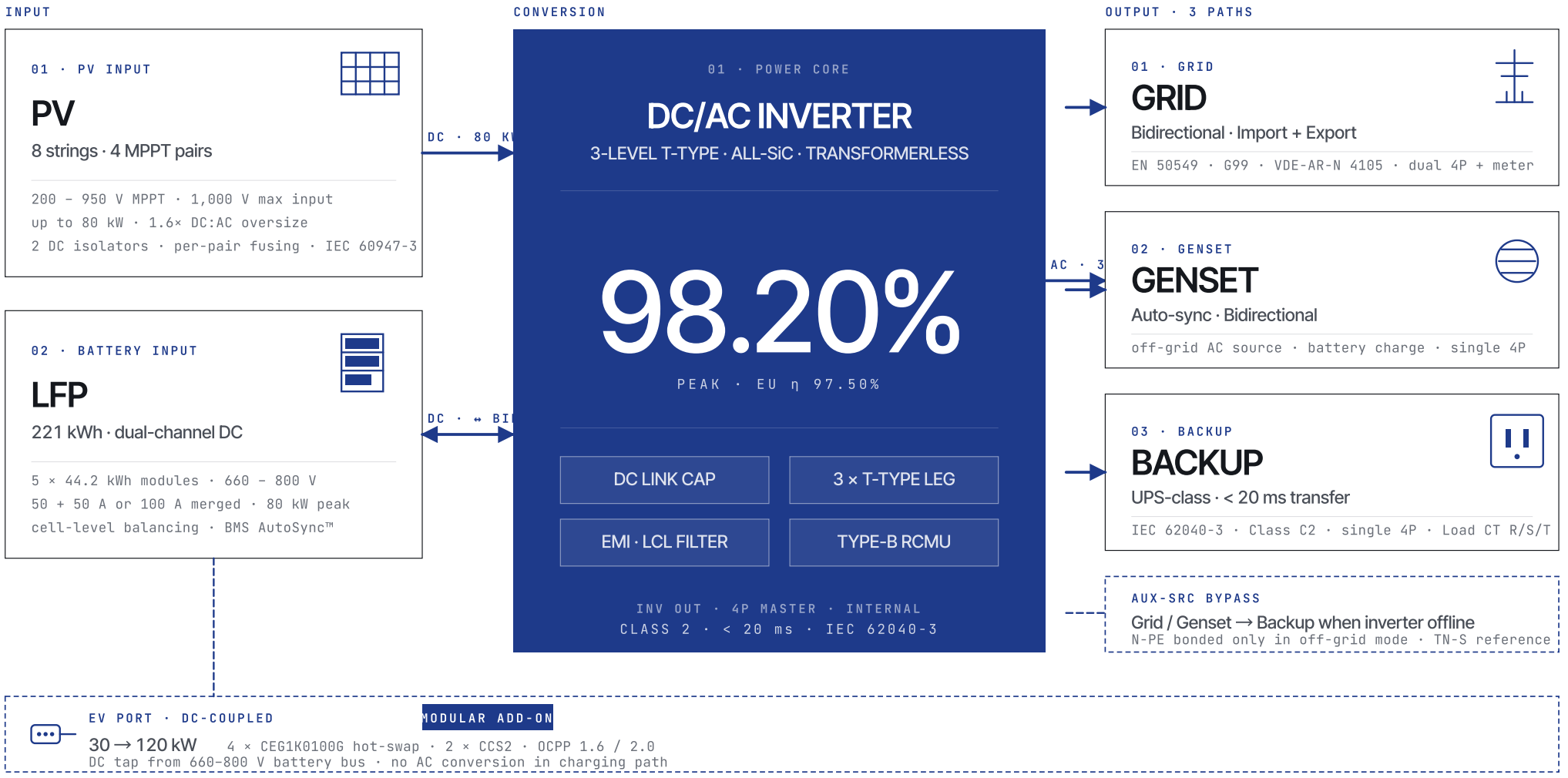
PEAK EFFICIENCY	POWER DENSITY	OPERATING RANGE	AC PORTS
98.20 %	625 W/KG	−30 / +60 °C	3 NATIVE
All-SiC · transformerless	50 kW · 80 kg	IP66 outdoor	Grid · Genset · Backup

Hybrid topology

ONE CORE · FIVE PATHS

§ 02 / TOPOLOGY · INPUT → CONVERSION → OUTPUT

5-IN-1 PLATFORM



8 STRINGS · DUAL-CH BATTERY · ALL-SIC T-TYPE 3-LEVEL · 3 INDEPENDENT AC PORTS · MODULAR DC FAST-CHARGE

PV and a dual-channel LFP cabinet feed one all-SiC core. The core feeds three independent AC ports — Grid, Genset, Backup — and an optional DC-coupled fast charger. No external transfer switch.

01 / HYBRID

One core, three jobs

Solar, battery and grid share a single all-SiC stage. No internal AC-DC double conversion.

02 / GENSET

Native generator port

Auto-sync, soft-load, load-shed. The genset stays off-line until called.

03 / NO ATS

Backup, isolated by hardware

Backup and grid terminals are **physically separate** on the chassis — no third-party transfer switch in the loop.

04 / EV-READY

DC-coupled, retrofittable

A 660–800 V battery tap accepts a modular fast charger later — **30 → 120 kW in 30 kW slices**, hot-swap.

§ 03 / BATTERY CABINET

221 kWh per cabinet.

5 modules · one liquid loop.

Vehicle-grade BMS · AEC-Q100. Liquid-cooled LFP. Per-cell active balancing to ±20 mV. IP55 · C3 anti-corrosion (C5 option · ISO 12944-2). Halocarbon-free aerosol at cell, pack and cabinet level. **Stack one to five cabinets per cluster.**

01 / CABINET

221 kWh per cabinet. Five 44.2 kWh modules, one liquid loop.

LFP chemistry, 314 Ah cells, cell-level thermal control. Battery operates at full power across **–30 to +55 °C**; inverter derates above +45 °C per IEC 62109.

02 / CLUSTER SCALING · 1 TO 5 CABINETS — 8,000 CYC · 10-YR WARRANTY

CLUSTER	CABINETS	CAPACITY	FOOTPRINT WIDTH	MASS	CHANNEL MODE
C1	1	221 kWh	1,100 mm	2,700 kg	50+50 A or 100 A
C2	2	442 kWh	2,200 mm	5,400 kg	dual-channel DC
C3	3	663 kWh	3,300 mm	8,100 kg	dual-channel DC
C4	4	884 kWh	4,400 mm	10,800 kg	dual-channel DC
C5	5	1,105 kWh	5,500 mm	13,500 kg	dual-channel DC

Each cabinet · 5 × 44.2 kWh modules · 314 Ah LFP cells · 704 V nominal · IP55 · C3 · 1,100 × 2,240 × 1,400 mm.
Mixed-vintage clusters: old and new cabinets ride isolated channels, with independent SOC, SOH and dispatch.

03 / BMS AUTOSYNC — CELL-LEVEL · DUAL-CHANNEL

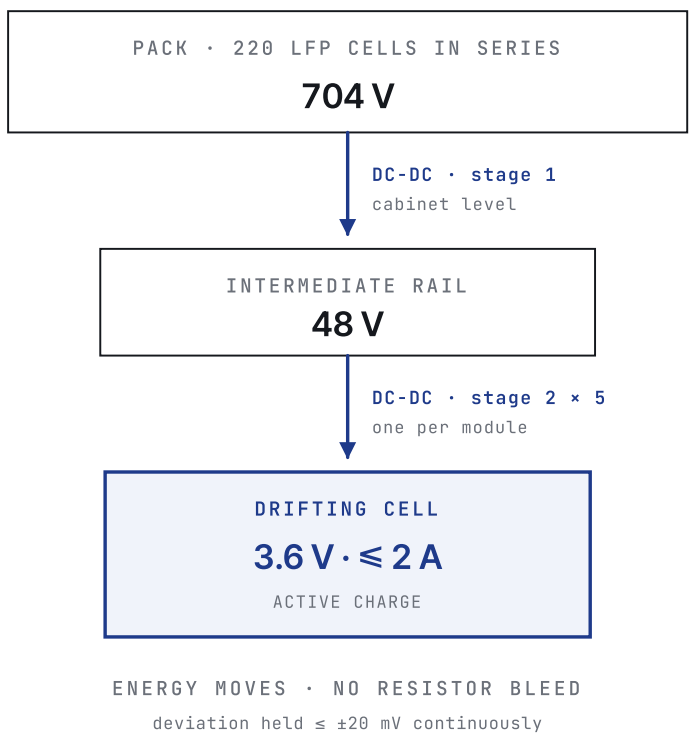
Active redistributive balancing. Two-stage DC-DC.

220 LFP cells sit on a single 704 V series string. A two-stage DC-DC ladder — **704 V → 48 V → 3.6 V** — channels energy from the whole pack into any drifting cell at **up to 2 A**. Energy moves; nothing burns off as heat. Deviation holds **≤ ±20 mV** continuously.

On the cluster side, two DC channels at 50 A each (or 100 A merged) keep new and old cabinets on **isolated current paths** — older-cabinet capacity is preserved, not dragged down.

2-stage	704 V → 48 V → 3.6 V
≤ 2 A	PER-CELL ACTIVE CHARGE
≤ ±20 mV	CELL DEVIATION
8,000 cyc	@ 90 % DOD · IEC 62619

04 / THE ACTIVE PATH — 704 V → 48 V → 3.6 V



ENERGY FROM THE WHOLE PACK, INTO THE WEAKEST CELL

§ 04 / RESILIENCE

Built to last.
Built to scale.

Four-layer fire safety · dual-inverter redundancy.

Two stories on one platform. Layered protection — arc detection through cluster cut-off — keeps the system whole when something goes wrong. Active-active redundancy — two inverters in one enclosure — keeps power flowing when one stops.

LAYER 01 / PREVENTION

AFCI arc detection

Up to 8 DC arc-fault channels (factory-fit). Type A/B per EN IEC 63027:2023.

LAYER 02 / DETECTION

Cell-level active BMS

Per-cell V/T to a vehicle-grade BMS (AEC-Q100). SOH drift detected at cell resolution.

LAYER 03 / SUPPRESSION

Halocarbon-free aerosol

Three depths — cell · pack · cabinet. Zero GWP. Future-proof under EU 2024/573.

LAYER 04 / ISOLATION

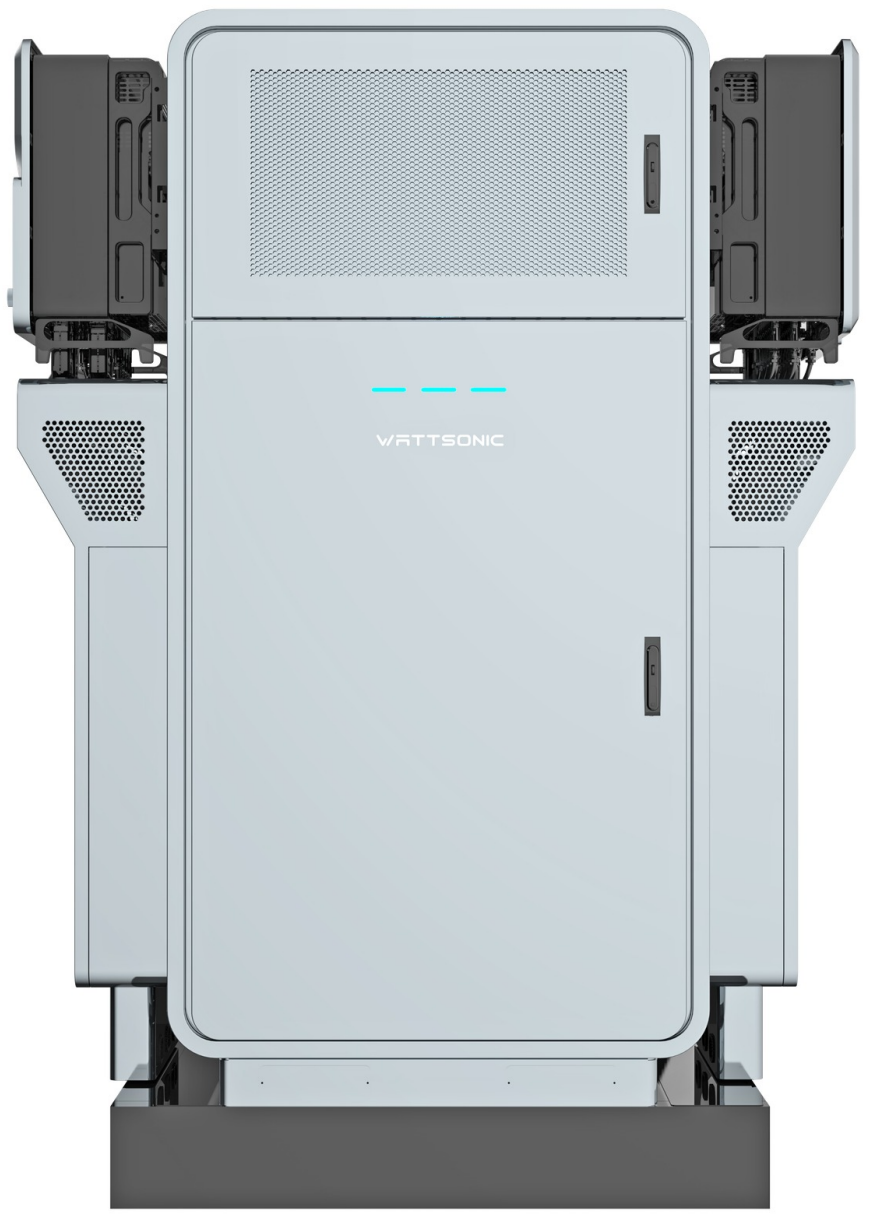
Cluster + system cut-off

Cluster electrical cut-off. System hardline E-stop. Backup and grid terminals **physically isolated**.

DUAL-INVERTER PARALLEL — MODULAR ADD-ON

The power of two, the footprint of one.

Start with one inverter. Add the second when load grows. Two CISION units share the same enclosure and AC bus, synchronizing in real time — no re-cabling, no re-commissioning of upstream equipment. One unit faults; the other holds full-rated load. Floor-plan unchanged.



50 → 100 kW	200 A	2 ×
FIELD-UPGRADABLE	CONTINUOUS CURRENT	ACTIVE REDUNDANCY

§ 05 / SMART ENERGY

Local-first control. Cloud-optional.

At every layer.

Edge nodes per cabinet. Price-aware dispatch on top. **One auditable cloud egress.** Three AC ports — Grid · Genset · Backup — choreographed by one EMS. No third-party ATS.

01 / DISTRIBUTED EDGE MESH — LOCAL-FIRST

Cloud-optional dispatch. Five protocol layers, one bus.

Each cabinet runs an edge controller. A 1 MW site carries **24 of them**, with master + hot-standby failover in **< 10 s**. **Cloud link drops? Dispatch continues from the local mesh.**

24 nodes	IN 1 MW SYSTEM
<10 s	MASTER FAILOVER
5 layers	CAN → MODBUS → SERIAL → ETH → CLOUD

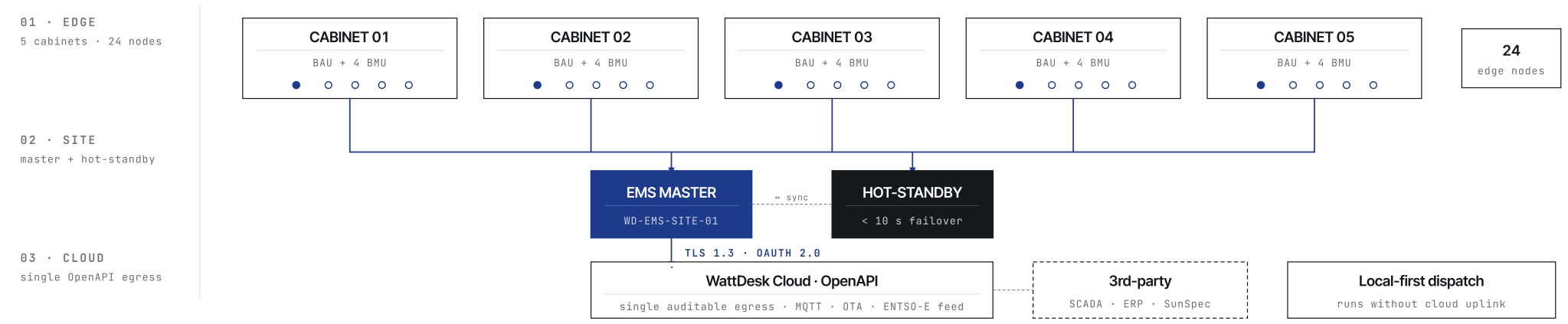
02 / DAY-AHEAD PRICE-AWARE DISPATCH — ENTSO-E

27 European bidding zones, one MILP optimiser.

A 24-hour MILP optimiser ingests **ENTSO-E day-ahead prices** across 27 European bidding zones. Output: a charge/discharge schedule, traceable per event via OpenAPI / JSON.

27 zones	ENTSO-E COVERAGE
MILP	24-HOUR HORIZON
OpenAPI	SINGLE CLOUD EGRESS

04 / EDGE-MESH TOPOLOGY · 1 MW REFERENCE SITE — CABINET EDGE → MASTER + STANDBY → CLOUD



§ FROM EDGE TO ASPHALT

One cloud egress. One depot or one thousand.

A live WattCision depot under WattDesk orchestration: **price-aware** charging windows, **predictive** alerts on impedance and junction temperature, **zero truck rolls**. The cloud sees every cabinet through the same OpenAPI surface.

0	365 d	< 10 s
TRUCK ROLLS PER OTA	EVENT LOG RETENTION	MASTER FAILOVER

PROTOCOL STACK — ENTSO-E · MODBUS TCP · EEBUS · CAN 2.0 · OPENAPI · OCPP-READY · SUNSPEC · TLS 1.3 · OAUTH 2.0

03 / WATTDESK CLOUD PLATFORM — ZERO SITE VISITS

01 / OTA

Remote firmware updates

Inverter and BMS OTA across the full fleet from one console. **Staged rollouts · signed images · automatic rollback** on integrity-check failure.

02 / TELEMETRY

Online diagnostics & configuration

Per-cabinet telemetry. Grid-code parameter sets and protection thresholds pushed without truck roll. Full event log retained 365 days.

03 / PREDICTIVE

Lower service costs

Predictive alerts via cloud anomaly detection on impedance drift, fan current, junction temperature and cell ΔV trends.

04 / ANALYTICS

Big-data forecasting

Day-ahead forecasting and ENTSO-E price-aware strategies via the WattDesk OpenAPI. CSV / JSON export · TLS 1.3 · OAuth 2.0.

§ 06 / PV + ESS + EV

One platform. One supplier.

PV · Battery · EV charger.

Solar, battery and diesel-generator feed the AC busbar (grid + backup). A parallel DC tap from the 660–800 V battery bus drives the 120 kW fast charger directly. **Inverter, battery, EMS, dual-CCS2 charger — all from Wattsonic.**

01 / DC FAST CHARGING · MODULAR ADD-ON — 30 → 120 KW · FIELD-RETROFITTABLE

Modular DC fast charging. Add slices when load grows.

Start the site without a charger. Add one later when fleet rotation justifies it. **30 kW CEG1K0100G slices** hot-plug into the dispenser — 1 to 4 modules per install — fed straight from the 660–800 V battery bus. **No AC conversion in the charging path.** Dual CCS2 · JC-6512 master · JC-1312 insulation · JC-6620 OCPP gateway.

30 → 120 kW	1-4 HOT-SWAP SLICES
Add-on	RETROFITTABLE POST-DEPLOYMENT
2× CCS2	EU DUAL GUN · 150-1000 V
OCPP 1.6/2.0	JC-6620 PROTOCOL BRIDGE

02 / SYSTEM-LEVEL INTEGRATION — ONE SUPPLIER

Inverter, battery, EMS, charger. One contract.

CISION inverter (29.9 – 50 kW), 221 kWh modular battery cabinet, WattDesk EMS, and 120 kW DC charger — all designed and warranted by Wattsonic. **One contract. One OpenAPI. One OTA channel.**

1 vendor	INVERTER + BATTERY + EMS + CHARGER
1 warranty	10-YEAR, FULL STACK
1 firmware	OTA ACROSS FULL STACK

A / FLEET & DEPOT

PV self-consumption + arbitraged charging

PV self-consumption + grid-arbitraged charging windows. Up to 8 vehicles in rotation per 120 kW unit.

B / COMMERCIAL

Demand-charge management + tenant DC

Demand-charge management on AC. Tenant DC charging on DC. Single AC busbar.

C / LOGISTICS

Backup-grade ESS + on-site charging

Backup-grade ESS plus on-site charging. Black-start capable. UPS-class transfer < 20 ms.

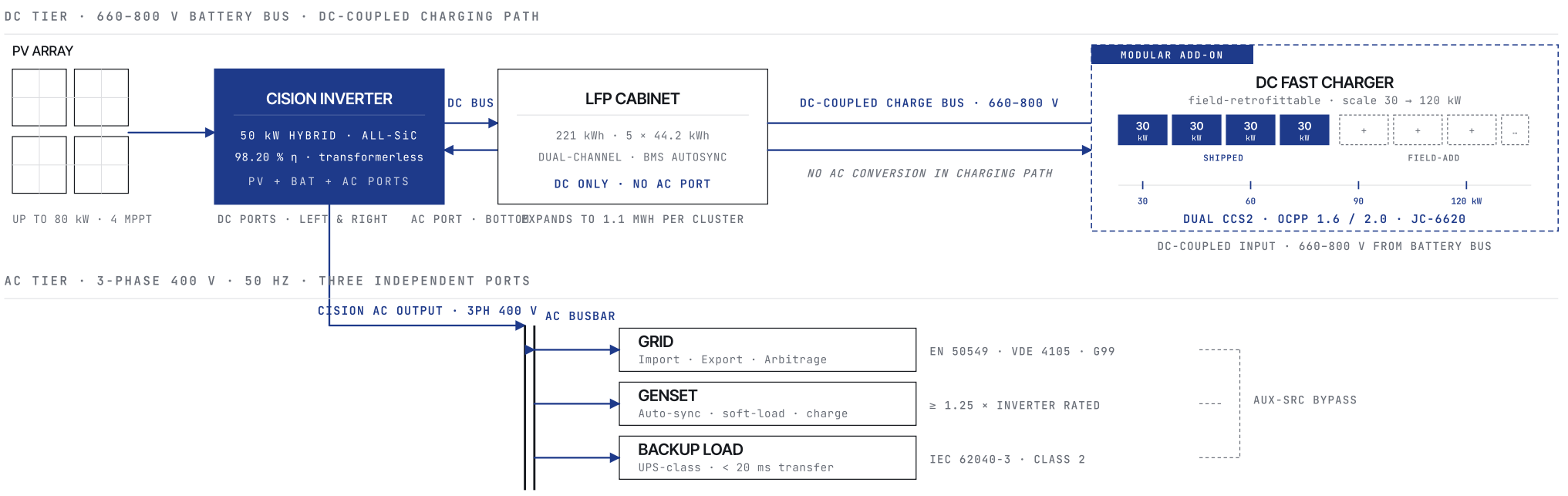
D / RENEWABLE

Solar-first dispatch + day-ahead arbitrage

Solar-first dispatch with day-ahead arbitrage residual. ENTSO-E price-aware schedule.

Triple-play architecture · PV → ESS → EV

DC TIER · 660-800 V BATTERY BUS
AC TIER · 3-PHASE 400 V · 50 HZ



DC and AC tiers are decoupled at the inverter. **LFP cabinet has no AC port**; the fast charger taps the battery bus directly. Backup and grid terminals are **physically separate.**

§ 07 / PERFORMANCE

98.20 % peak. 97.5 % EU.

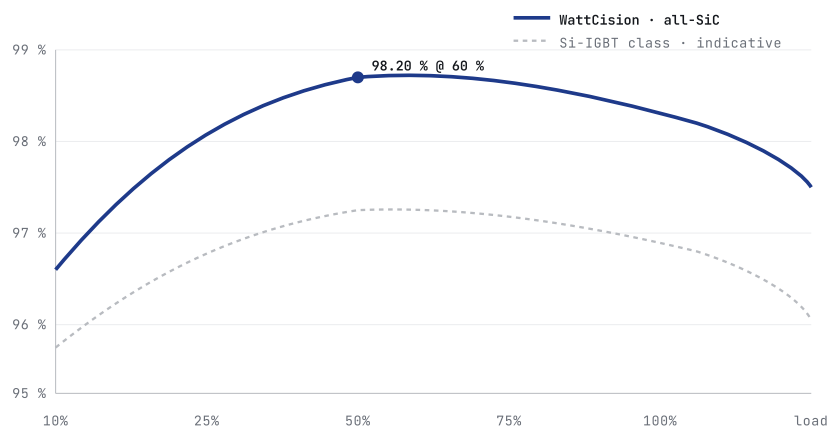
Across the full 50 kW envelope.

Efficiency curves measured per **EN 50530**. Thermal derating per **IEC 62109-1**. The 1 MW reference: 20 inverters + 5 cabinets + 1 EMS · 12 m × 7 m footprint · 24 edge nodes · single OpenAPI surface.

Inverter efficiency vs. load

FIG. 7.1 · EN 50530

EN 50530 method · 600 V DC · 25 °C · 0.95 PF. Peak **98.20 %** at 60 % load. EU-weighted **97.5 %**. Curve stays flat above 30 % load — partial-load efficiency is what dominates a battery-paired site.



98.20 % peak efficiency

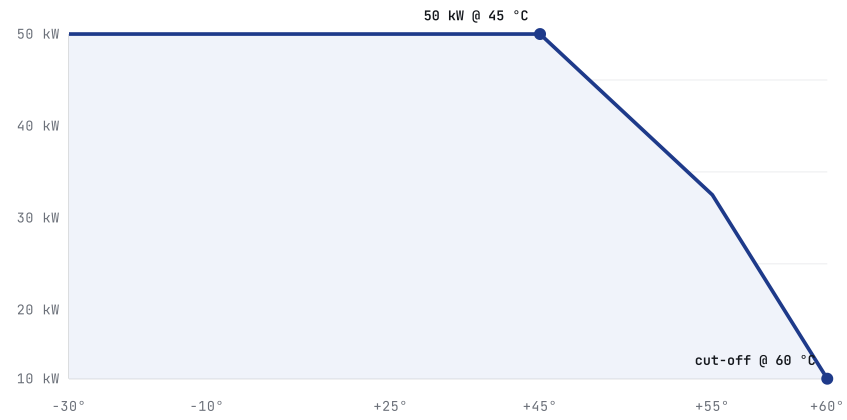
97.5 % EU-weighted

flat > 30 % partial-load envelope

Power vs. ambient temperature

FIG. 7.2 · IEC 62109-1

Inverter delivers full **50 kW** from −30 to +45 °C. Linear derate above +45 °C, full shutoff at +60 °C.



−30 to +45 °C full 50 kW

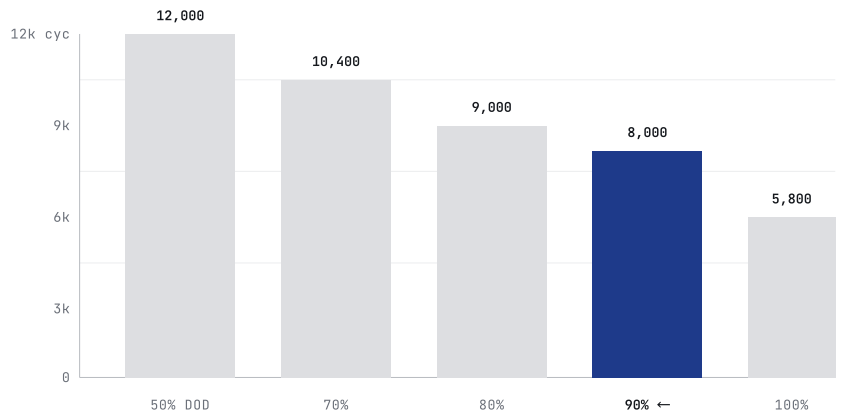
+60 °C protective shutoff

IEC 62109-1 derate compliance

Battery cycle life vs. DOD

FIG. 7.3 · IEC 62619

LFP 314 Ah cell · 0.5C / 0.5C · 25 °C · BoL. **8,000 cycles at 90 % DOD** with SoH ≥ 70 % at end of life — basis of the 10-yr / 28 MWh-per-kWh warranty.



8,000 cyc at 90 % DOD (rated)

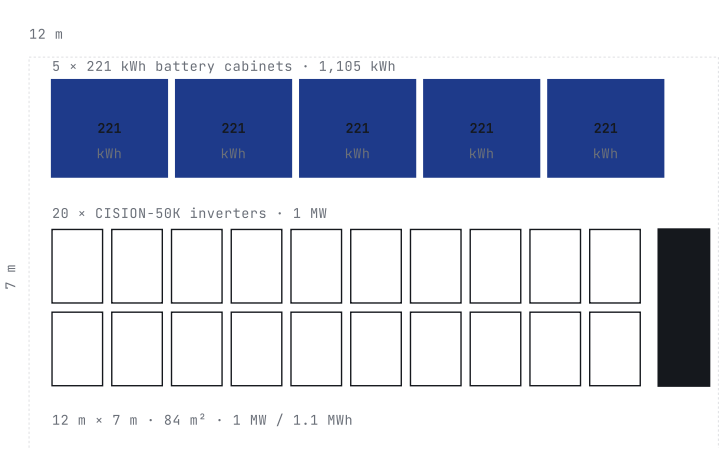
≥ 70 % SoH at end of warranty

10 yr warranty term

1 MW reference site

FIG. 7.4 · FOOTPRINT

20 inverters · 5 battery cabinets · 1 EMS rack · 24 edge nodes. **12 m × 7 m** total footprint, single OpenAPI surface.



1 MW 20 × CISION-50K

1.1 MWh 5 × 221 kWh

84 m² 12 m × 7 m

REFERENCE POWER

1 MW

20 × CISION-50K · all-SiC

REFERENCE CAPACITY

1.1 MWH

5 × 221 kWh cabinets

FOOTPRINT

84 M²

12 m × 7 m

EDGE NODES

24

master + hot-standby

CLOUD EGRESS

OpenAPI

single auditable path

§ 08 / INVERTER SPEC

Five SKUs. One enclosure.

29.9 → 50 kW.

All five CISION inverters share the same **80 kg, IP66, all-SiC enclosure**. The differences are firmware-defined output limits, certified per local grid code. PV input range, AC port arrangement and protection class are identical across the line.

PARAMETER	CISION-29.9K	CISION-36K	CISION-40K	CISION-46K	CISION-50K
01 DC INPUT · PV SIDE					
Max recommended PV power	45 kWp	54 kWp	60 kWp	69 kWp	75 kWp
Max input voltage	1,000 V DC				
MPPT voltage range	200 – 950 V DC				
Number of MPP trackers	4 (2 strings per MPPT)				
Max input current per MPPT	32 A				
Short-circuit current per MPPT	40 A				
02 DC BUS · BATTERY SIDE					
Battery voltage range	200 – 800 V DC				
Nominal battery voltage	704 V DC				
Max charge / discharge current	2 × 50 A or 1 × 100 A · sw-selectable				
Battery channels	2 (dual-channel DC architecture)				
Compatible chemistry	LFP only · WattCision LFP cabinet				
03 AC OUTPUT · GRID SIDE					
Rated active power	29.9 kW	36 kW	40 kW	46 kW	50 kW
Max apparent power	33 kVA	39.6 kVA	44 kVA	50.6 kVA	55 kVA
Nominal voltage / range	3-phase 400 V (3W+N+PE) · ±20 %				
Frequency / range	50 / 60 Hz · ±5 Hz				
THDi at rated power	< 3 %				
Power factor	0.8 leading … 0.8 lagging				
04 AC BACKUP · UPS-CLASS					
Backup port arrangement	3-phase 400 V · physically separate from grid port				
Backup rated power	29.9 kW	36 kW	40 kW	46 kW	50 kW
Off-grid handover time	< 20 ms · IEC 62040-3				
Black-start capable	yes				
05 GENSET PORT					
Genset port arrangement	3-phase 400 V · auto-sync · soft-load · load-shed				
Genset compatibility	≥ 1.25 × inverter rated power · 50/60 Hz				
06 EFFICIENCY					
Max efficiency (η_{max})	98.20 % · all-SiC · transformerless · EN 50530				
EU-weighted efficiency	97.5 %				
MPPT efficiency	> 99.5 %				
07 MECHANICAL & ENVIRONMENT					
Dimensions (H × W × D)	810 × 590 × 285 mm				
Mass	80 kg				
Mounting	wall · pole · cabinet rail				
Ingress protection	IP66				
Operating temperature	-30 to +60 °C · derate > +45 °C per IEC 62109-1				
Cooling	smart forced air · variable-speed fan				
Audible noise	< 65 dB(A) at 1 m				
Anti-corrosion class	C3 standard · C5 option · ISO 12944-2				
08 PROTECTION & CERTIFICATION					
DC insulation monitoring	integrated · IEC 62109-2				
AFCI (arc-fault detection)	8 channels · optional · EN IEC 63027:2023				

§ 09 / BATTERY SPEC

One cabinet. Five clusters.

221 kWh → 1.1 MWh.

LFP · 314 Ah cells · 704 V nominal · liquid-cooled · IP55. Same cabinet, parallelled one to five times per cluster — with **independent SOC and SOH per cabinet** on the dual-channel DC architecture. Mixed-vintage clusters supported by design.

PARAMETER	CELL	MODULE	CABINET	CLUSTER (MAX)	1 MW SYSTEM
01 ORDER CODES & PART NUMBERS					
Battery cabinet			WC-BAT-221K-LFP · 5 modules · IP55 · C3		
Battery module			WC-MOD-44K-LFP · 314 Ah · 140.8 V		
EMS controller			WD-EMS-EDGE-01 · cabinet edge node		
EMS site master			WD-EMS-SITE-01 · master + hot-standby pair		
DC fast charger (add-on)			WC-DCFC-30…120-2G · modular 30 → 120 kW · dual CCS2 · field-retrofittable		
DCDC charger slice			CEG1K0100G · 30 kW hot-swap module (1 to 4 per charger; expandable post-deployment)		
Charger master controller			JC-6512		
Charger insulation monitor			JC-1312		
OCPP gateway			JC-6620 · OCPP 1.6 / 2.0		
02 CAPACITY & VOLTAGE					
Energy	1.0 kWh	44.2 kWh	221 kWh	1,105 kWh	1,105 kWh
Nominal voltage	3.2 V	140.8 V	704 V	704 V	704 V
Voltage range	2.5 – 3.65 V	110 – 160 V	660 – 800 V	660 – 800 V	660 – 800 V
Nominal current	314 Ah	314 Ah	50 + 50 A · 100 A	50 + 50 A · 100 A	5 × 100 A
02 CHEMISTRY & CYCLE LIFE					
Cell chemistry			LFP · $LiFePO_4$		
Cycle life @ 90 % DOD			8,000 cycles · 0.5C / 0.5C · 25 °C · BoL · IEC 62619		
Cycle life @ 70 % DOD			10,400 cycles · same conditions		
Battery RTE (DC-DC)			≥ 96 % · 0.5C · 25 °C · BoL		
System RTE (AC-AC)			≥ 89 % · rated discharge · 25 °C · inverter + battery		
Throughput warranty			28 MWh / kWh installed (whichever first vs. 10 yr)		
SoH at end of warranty			≥ 70 %		
03 BMS · BMS AUTOSYNC™					
Hierarchy			3-tier · BMU (cell) → BCU (pack) → BAU (cabinet)		
Component grade			AEC-Q100 (vehicle-grade)		
Cell measurement			voltage ±2 mV · temperature ±0.5 °C		
Active balancing			per-cell · continuous · target ≤ ±20 mV		
Architecture			dual-channel DC · independent SOC / SOH per cabinet		
04 MECHANICAL & ENVIRONMENT					
Module mass	—	540 kg	2,700 kg	13,500 kg	13,500 kg
Cabinet dimensions (W × H × D)			1,100 × 2,240 × 1,400 mm		
Cluster footprint width	—	—	1,100 mm	5,500 mm	5,500 mm
Operating temperature			-30 to +55 °C · cell-level liquid cooling		
Storage temperature			-40 to +60 °C		
Relative humidity			5 – 95 % non-condensing		
Altitude			0 – 4,000 m (derate > 2,000 m)		
Ingress protection			IP55 · C3 anti-corrosion (C5 option · ISO 12944-2)		
Cooling system			closed-loop liquid · cell-level distribution		
05 FIRE SAFETY · HALOCARBON-FREE					
Suppression chemistry			solid-aerosol · halocarbon-free · 0 GWP		
Suppression depth			cell + pack + cabinet (3 levels)		
Detection			cell-level V / T / SOH drift via active BMS		
Isolation			cluster-level cut-off + system hardline E-stop		

§ 10 / MECHANICAL & CERTIFICATION

Built outdoors. Certified everywhere.

IP66 inverter · IP55 battery · 12 grid codes.

Outdoor from the inverter's IP66 enclosure to the battery cabinet's IP55 housing with C3 anti-corrosion (C5 optional). Twelve grid-code certifications across Europe, UK, South Africa, Italy, Spain, Australia. **One warranty. Full stack.**

01 / INVERTER — MECHANICAL — CISION-50K

810 × 590 × 285 mm. 80 kg.

Single-person hoist class. Wall, pole or cabinet-rail mount. Variable-speed forced-air cooling · < 65 dB(A) at 1 m. **IP66**, C3 anti-corrosion standard (C5 per ISO 12944-2).

810 × 590 × 285	MM · H × W × D
80 kg	50 KW · 625 W/KG
IP66	-30 TO +60 °C AMBIENT
< 65 dB(A)	AT 1 M · VARIABLE-SPEED FAN

02 / BATTERY CABINET — MECHANICAL — 221 KWH

1,100 × 2,240 × 1,400 mm. 2,700 kg.

Five 44.2 kWh modules per cabinet · closed-loop liquid cooling to cell level. **IP55**, C3 anti-corrosion (C5 option). Cluster footprint widens linearly — one cabinet 1.1 m, five cabinets 5.5 m.

1,100 × 2,240 × 1,400	MM · W × H × D
2,700 kg	PER CABINET
IP55	-30 TO +55 °C OPERATING
Liquid · cell-level	CLOSED-LOOP COOLANT DISTRIBUTION

03 / CERTIFICATION MATRIX — 12 GRID CODES · 6 SAFETY · 4 EMC

DOMAIN	STANDARD	SCOPE	REGION	STATUS
Safety	IEC 62109-1 / -2	Inverter safety, PV converter	Global	CERTIFIED
Safety	IEC 62619	Industrial battery safety	Global	CERTIFIED
Safety	UN 38.3	Lithium battery transport	Global	CERTIFIED
Safety	IEC 62133-2	Cell & pack safety	Global	CERTIFIED
Safety	EN IEC 63027:2023	AFCI · arc-fault detection	EU	CERTIFIED
Safety	IEC 62040-3	UPS-class transfer	Global	CERTIFIED
EMC	EN 61000-6-1/2/3/4	Generic EMC immunity & emissions	EU	CERTIFIED
Grid code	EN 50549-1	LV grid connection	EU	CERTIFIED
Grid code	VDE-AR-N 4105	LV connection	Germany	CERTIFIED
Grid code	G99	LV / MV connection	UK	CERTIFIED
Grid code	CEI 0-21	LV connection	Italy	CERTIFIED
Grid code	UNE 217002	LV connection	Spain	CERTIFIED
Grid code	NRS 097-2-1	LV embedded generation	South Africa	CERTIFIED
Grid code	AS/NZS 4777.2	Inverter requirements	Australia / NZ	IN PROGRESS
Marking	CE · UKCA	Conformity marking	EU / UK	MARKED
Environmental	EU 2024/573	F-gas / PFAS roadmap	EU	COMPLIANT

Status as of release. Localised type tests update on the WattDesk Compliance Portal.