

INDOOR · IP21

H500-I and H250-I in a plant room


OUTDOOR · IP55

H500-O beside the array


DC-COUPLED SOLAR CONVERTER

HELIOS

H250 · H500

250–500 kW · PV TO BATTERY
INDOOR IP21 · OUTDOOR IP55

250–500 kW

DC BUS POWER
two cabinet sizes

5–10 MPPT

PV CHANNELS
160 A per channel

600–950 V

BATTERY PORT
A1000 · A2000 string

1 stage

PV TO BATTERY
DC/DC, no AC leg

IP55

OUTDOOR
IP21 indoor
version

WHY IT HOLDS UP
FIVE DESIGN DECISIONS
01
Solar straight to storage

One DC/DC stage from the PV string to the battery bus. No PV inverter in between.

02
Behind any export cap

PV charges the battery on the DC side, so a tight export limit does not curtail the array.

03
Its own MPPT per channel

Five or ten 160 A channels. Roofs facing different ways each track their own peak.

04
Indoor or outdoor

IP21 for a plant room, IP55 for the yard. Same converter, same rating.

05
Sold as a system

Supplied only with an AMPROTEQ battery and Solaris™ EMS, commissioned as one.

SUPPLIED ONLY AS PART OF AN AMPROTEQ SYSTEM


AMPROTEQ BATTERY

APEX A1000 · A2000 · 832 V



CONTROL

Solaris™ EMS



DC/DC MODULE TESTED TO

EN 62109 · IEC 61000

02 · INDOOR OR OUTDOOR

One converter, two enclosures.

02

Each rating comes as an indoor cabinet for a plant room and an outdoor cabinet for the yard. The DC/DC channels, breakers and control inside are the same.


INDOOR

IP21 · plant room, switch room or container


OUTDOOR

IP55 · yard, roof or plinth beside the array

1

Local control panel

Touch LCD · monitor · upgrade

2

Perforated doors

Indoor air path · IP21

3

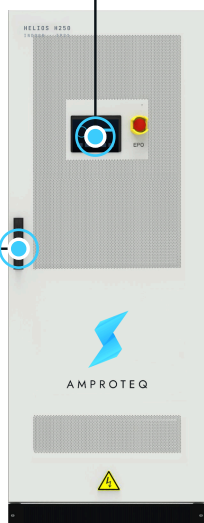
Lifting eyes

Four points · crane set-down

4

EPO & status lamps

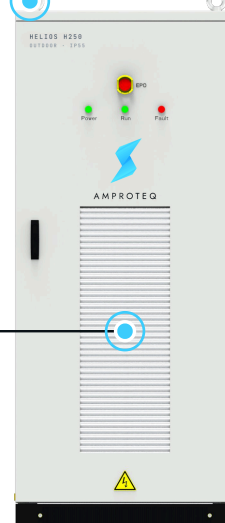
Power · Run · Fault



800

H250-I
250 kW · IP21
≈ 450 kg


1 200

H500-I
500 kW · IP21
≈ 750 kg


900

H250-O
250 kW · IP55
≈ 660 kg


1 350

H500-O
500 kW · IP55
≈ 900 kg

5

Front-access doors

Lockable · rack modules

6

Air cooling

Intelligent, fan-controlled

7

Louvred intake

Rain-shielded · IP55

8

Two-door front

Full-width module access

SIDE BY SIDE

● **INDOOR · H250-I · H500-I**

● **OUTDOOR · H250-O · H500-O**

Protection	IP21	IP55
Where it stands	Plant room, switch room or container	Yard, roof or plinth beside the array
On the door	Touch LCD panel and EPO	EPO with Power · Run · Fault lamps
Air path	Perforated doors, lower exhaust grilles	Louvred, rain-shielded intakes
Footprint, W × D	800 × 800 · H250 1 200 × 1 000 · H500	900 × 1 000 · H250 1 350 × 1 000 · H500
Weight, approx.	450 kg · H250 750 kg · H500	660 kg · H250 900 kg · H500
Common to both	2 100 mm high · -25 ... +60 °C · 0-95 % RH · 3 000 m · < 78 dB · intelligent air cooling · front maintenance	

Renderings show typical configurations, drawn to scale. Electrical ratings are identical indoors and outdoors.

03 · HOW IT WORKS

Solar into the battery, not through the grid.

03

AC-coupled solar is inverted to AC and back to DC before it is stored. HELIOS stores it in one DC/DC step. The battery's PCS delivers it when the site needs it.



FIG 03-1 · TWO WAYS TO STORE SOLAR

CONVERSION STAGES FROM PV TO BATTERY

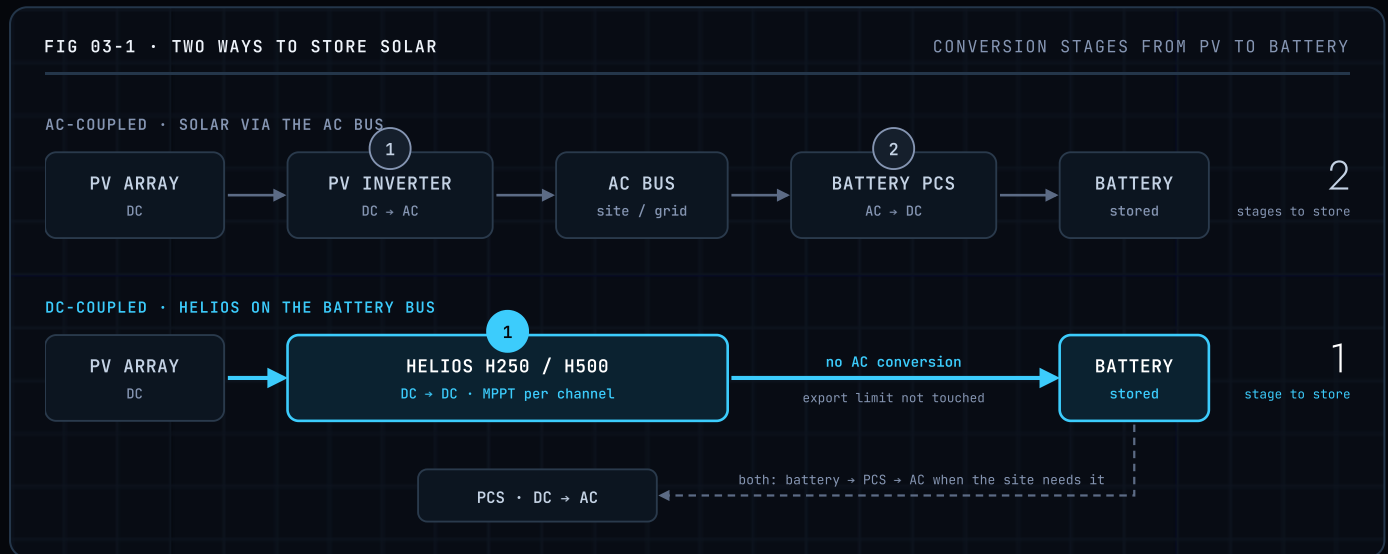
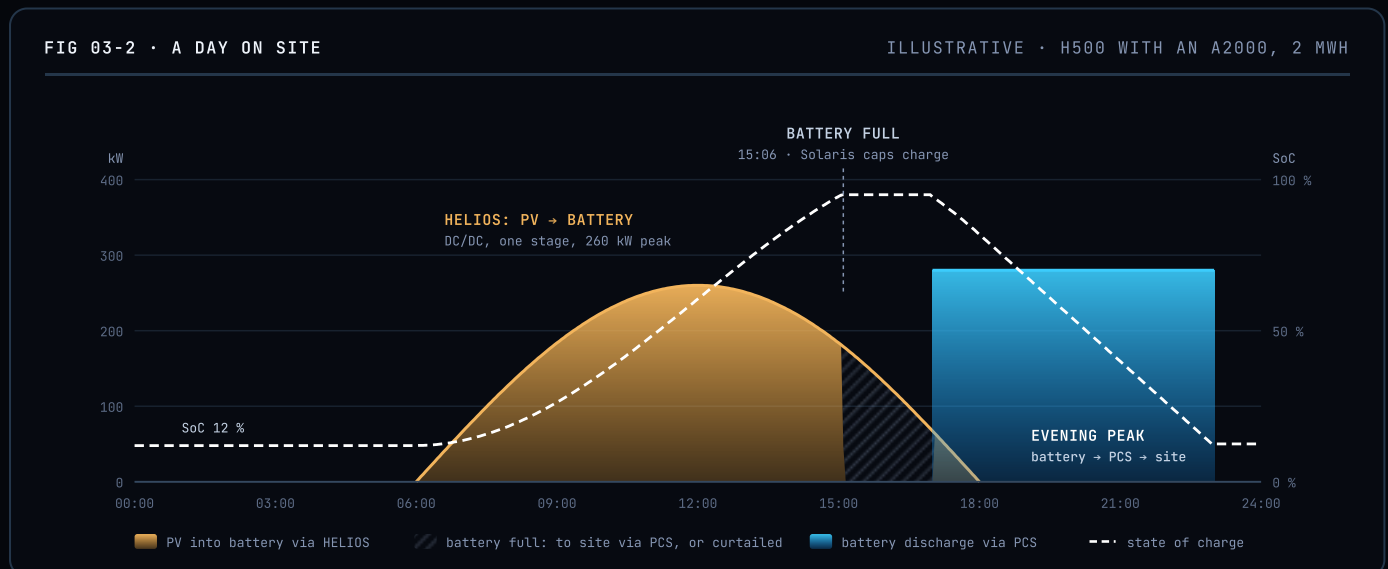


FIG 03-2 · A DAY ON SITE

ILLUSTRATIVE · H500 WITH AN A2000, 2 MWH



01

Export-capped sites

Solar the connection cannot take goes into the battery instead of being curtailed.

02

Solar onto storage

Add an array to an AMPROTEQ battery without a second AC connection.

03

Islanded running

The converter works on the DC bus, so PV keeps charging while the site runs off-grid.

04 · SPECIFICATION

HELIOS · H250 and H500

04

Typical configuration. Final values are fixed in the project technical agreement.

250 / 500 kW
DC BUS POWER

5 / 10 MPPT
160 A PER CHANNEL

600–950 V
BATTERY PORT

IP21 / IP55
INDOOR / OUTDOOR

01 PV PORT	H250	H500
PV voltage range	250 V ... battery minimum – 20 V Open-circuit voltage stays below the battery	
Max. PV input current	5 × 160 A	10 × 160 A
MPPT channels	5	10
Power per channel	≈ 50 kW · full power from ≈ 313 V Calculated: bus power ÷ channels, ÷ 160 A	
Channel protection	QF2 – QF6	QF2 – QF11
Surge protection	SPD on the PV side and the battery side	
02 BATTERY PORT		
Battery voltage range	600 – 950 V · A1000 / A2000: 728 – 936 V	
DC bus power	250 kW	500 kW
DC inputs	1	1
Battery current, max.	≈ 417 A	≈ 833 A
Battery protection	QF1 DC breaker · SPD1 Current calculated at 600 V	
03 CONTROL & SYSTEM		
Supplied with	AMPROTEQ APEX A1000 / A2000 + Solaris™ EMS Not sold as a stand-alone converter	
Local panel	LCD · monitoring, strategy set-up, remote upgrade	
BMS communication	CAN	
EMS communication	RS-485 / CAN / Ethernet	
MPPT controller	Configured per project	

04 ENCLOSURE	H250	H500
Protection	IP21 indoor (-I) · IP55 outdoor (-O)	
Protective class	I	
Indoor, W × D	800 × 800 mm	1200 × 1000 mm
Outdoor, W × D	900 × 1000 mm	1350 × 1000 mm
Height	2100 mm · all cabinets	
Weight, indoor	≈ 450 kg	≈ 750 kg
Weight, outdoor	≈ 660 kg	≈ 900 kg
Construction	Modular rack, front maintenance Single-row or double-row layouts	
05 ENVIRONMENT		
Ambient temperature	–25 ... +60 °C · derating above 45 °C	
Relative humidity	0 – 95 %, non-condensing	
Altitude	3000 m · derating above 3000 m	
Cooling	Intelligent forced air	
Noise	< 78 dB	

06 DC/DC MODULE · TESTED TO	
EN 62109	EN IEC 61000
Safety of power converters in PV systems · electromagnetic compatibility. Certificates held for the DC/DC module.	

MODEL CODE

H 500 – 0 / I

0 outdoor · I indoor

kW · 250 or 500

HELIOS series

SCOPE OF SUPPLY

DC/DC modules on a rack, PV channel breakers, battery breaker, surge protection, the local control panel and the EMS interface, factory-integrated and tested before dispatch. Supplied only within an AMPROTEQ system with an APEX A1000 or A2000 battery and Solaris™ EMS. PV array and DC cabling are scoped per project.

Size your array.

Send the PV layout and the module datasheet. We return the string plan, the HELIOS and battery sizing and the single-line diagram.

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05 · SINGLE-LINE

Every string its own channel, one breaker to the battery.

Each PV input has its own breaker and DC/DC channel. The channels share one DC bus, which reaches the battery through QF1. The battery's PCS stays the only link to AC.

FIG 05-1 · SYSTEM SINGLE-LINE

PV → HELIOS H250 → AMPROTEQ BATTERY → PCS · SIMPLIFIED

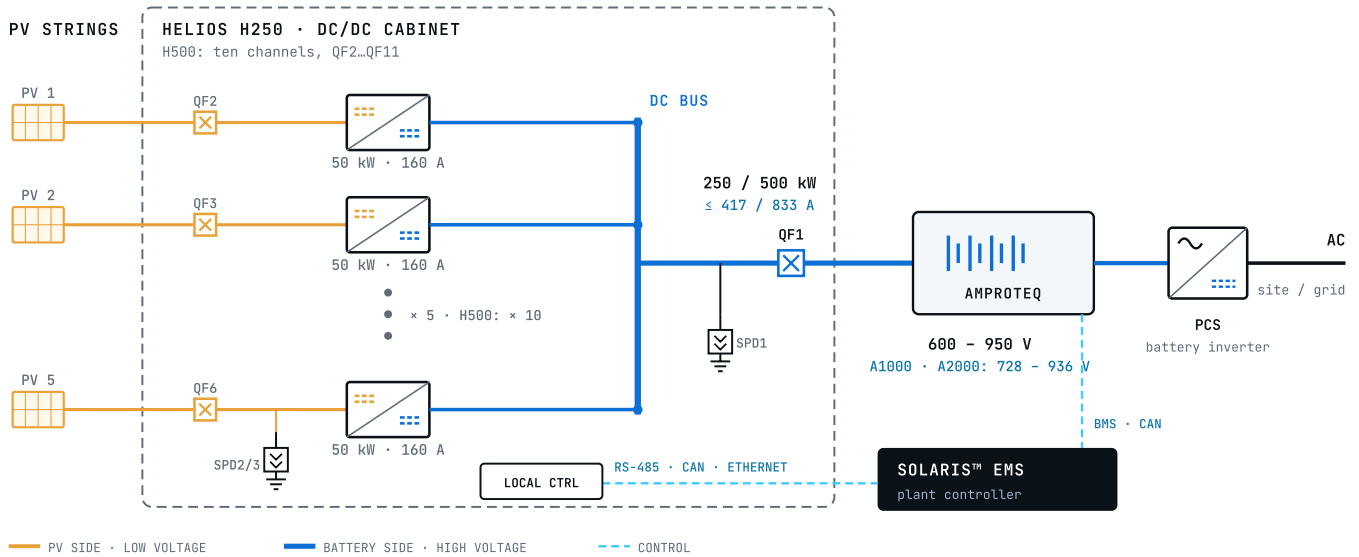
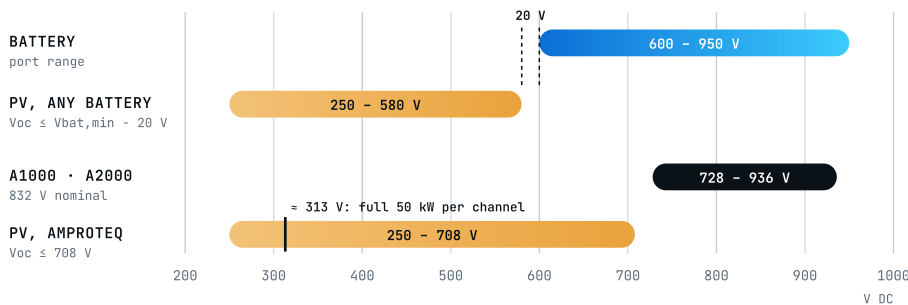


FIG 05-2 · VOLTAGE WINDOWS

PV STAYS UNDER THE BATTERY

PER CABINET

H250 · H500



Bus power	250 · 500 kW
PV channels	5 · 10
Per channel	≈ 50 kW · 160 A
PV breakers	QF2-QF6 · QF2-QF11
Battery breaker	QF1
Battery window	600 - 950 V
Current at 600 V	≈ 417 · 833 A
Current at 950 V	≈ 263 · 526 A
Surge	SPD1 · SPD2/3

BATTERY-SIDE CURRENT A, AT RATED POWER

H250 · 950 V	263 A
H250 · 600 V	417 A
H500 · 950 V	526 A
H500 · 600 V	833 A

ISOLATION

TWO LEVELS

Per channel: a breaker on each PV input takes one string and its channel out while the others keep charging.

Per cabinet: QF1 on the battery side separates the whole cabinet from the DC bus.

READING THE FIGURES

Currents are calculated at rated power. A1000 and A2000 values use their 728-936 V string window and 832 V nominal.

The PV string's cold open-circuit voltage must stay 20 V under the battery's lowest voltage. The project SLD fixes ratings and settings.

06 • THE SYSTEM

Sold as a system,
never on its own.

06

HELIOS, the battery and the controller are sized, delivered and commissioned together, so the voltages, limits and dispatch are matched from day one.



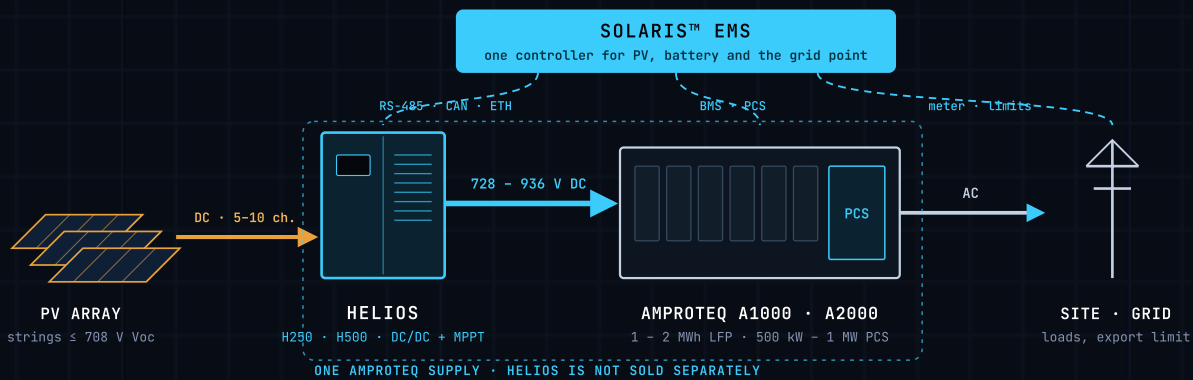
HELIOS is not sold as a stand-alone converter.

It is supplied only as part of an AMPROTEQ system: an APEX A1000 or A2000 battery, controlled by Solaris™ EMS.

BATTERY • APEX A1000 / A2000
CONTROL • SOLARIS™ EMS
CONVERTER • HELIOS H250 / H500

FIG 06-1 • ONE AMPROTEQ SYSTEM

WHAT EACH PART DOES



PAIRINGS

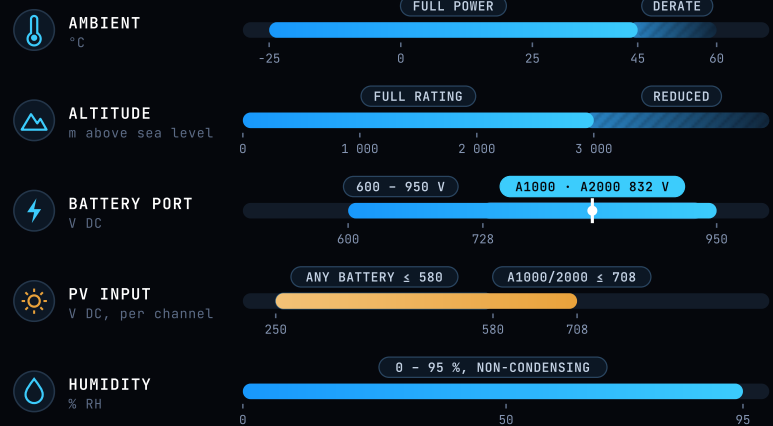
AT 832 V NOMINAL

BATTERY	HELIOS	PV	CURRENT	RATE
A1000	1 × H250	250 kW	300 A	0.25 C
A1000	1 × H500	500 kW	601 A	0.50 C
A2000	1 × H500	500 kW	601 A	0.25 C
A2000	2 × H500	1 000 kW	1 202 A	0.50 C

Calculated at rated power. A1000: 1 MWh, 500 kW PCS. A2000: 2 MWh, 500 kW or 1 MW PCS. The battery's BMS limit sets the final charge current.

FIG 06-2 • OPERATING ENVELOPE

FULL • DERATED • WINDOW



01

Matched voltage

The A1000 and A2000 string sits inside the HELIOS battery window, so strings are planned once.

02

Battery limits held

HELIOS reads the BMS over CAN and never charges past the battery's own limits.

03

One controller

Solaris™ EMS dispatches PV, battery and the grid point against tariff and export limit.

04

One commissioning

Converter, battery and controller are tested and handed over together.

07 · NEXT STEPS

From roof plan to charging.

07

Four steps from your array to solar on the DC bus. We size HELIOS, the battery and Solaris™ EMS together, around your connection.

01

Array & site

PV layout, module datasheet, export limit and twelve months of interval data.

02

System design

String plan per channel, HELIOS and battery sizing, single-line diagram and the yield case.

03

Delivery

Factory-integrated HELIOS and battery, tested before dispatch, indoors or on prepared plinths.

04

Energise

String and battery terminations, commissioning, then Solaris™ EMS takes over.

WHAT TO SEND

01

- ✓ PV layout and module datasheet
- ✓ Export limit or grid agreement
- ✓ 12 months of 30-minute interval data
- ✓ Indoor plant room or outdoor yard
- ✓ The dispatch you need: hours, peaks, backup

WHAT YOU RECEIVE

02

- ✓ String plan inside the PV window
- ✓ HELIOS, battery and PCS sizing
- ✓ Single-line diagram and general arrangement
- ✓ Yield and dispatch model on your load data
- ✓ Offer with warranty terms

THE RANGE

ONE FAMILY

APEX A1000 – A6250

Battery storage · A1000, A2000 pair with HELIOS

HELIOS H250 · H500

DC-coupled solar converter

NEXUS N2500

2.5 MW medium-voltage skid

Solaris™ EMS

Plant controller and dispatch

TALK TO US

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AMP-DS-HELIOS · REV 1.0 · 10/2026 · SUBJECT TO CHANGE

