CRITICAL POWER · USA 2026

UPS

Catalog 2026



Since 1968
Continuity and reliability in critical power

TWSE:1514
Listed on the Taiwan Stock Exchange since 1994

80+
Countries reached by the AEC network

3 years
Warranty on the UPS; 5 years on LUMINA, ETHERNO and lithium



THE COMPANY

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Each product section opens with its key numbers and includes technical data and ordering codes.

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AEC

ALLIS ELECTRIC GROUP · SINCE 1968

Company Overview
Allis Electric Group

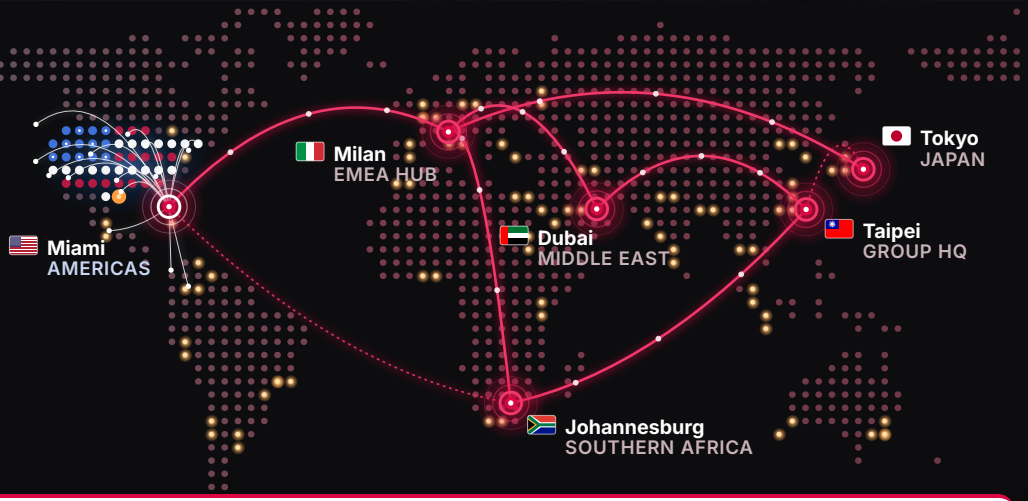
AEC INTERNATIONAL (MILAN)

A GLOBAL GROUP

Group Sites
Four Continents

AEC is the UPS brand of Allis Electric Co., Ltd., listed on the Taiwan Stock Exchange (TWSE:1514), with factories in Taiwan and sites in Italy, the USA, the UAE, Japan and South Africa.

- The group network
- Miami across the Americas
- The six group sites



80+ Countries reached by the AEC network

844 Employees in the group

6 Group sites on four continents

58 Years of activity, since 1968

AEC IN THE USA

AEC in the USA
Miami, Florida

Sales, stock and service for the United States from Miami: 60 Hz online UPS from 1 kVA to 1.6 MVA.

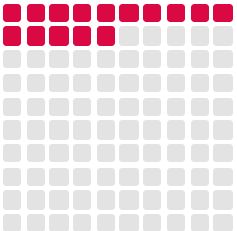


2022 Miami, Florida
AEC UPS USA LLC opens: headquarters, stock and training center

24/7 sales and service
Technicians across the United States; phone and WhatsApp +1 786 553 2100

People and know-how

130
electronics engineers
out of 844 employees



15 % in design and R&D · 1 square = 1 %

Founded 1968, listed 1994

1968
Listed on the Taiwan Stock Exchange since 1994 (TWSE:1514).

1994	1998	2022
Listed, Taipei	UPS, Milan	USA, Miami

Warranty

3 years on the UPS

5 years on LUMINA, ETHERNO and lithium

OUR HISTORY

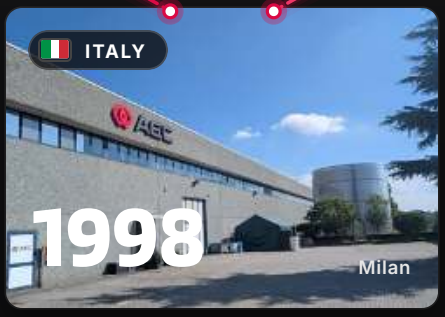
Company History 1968–2026

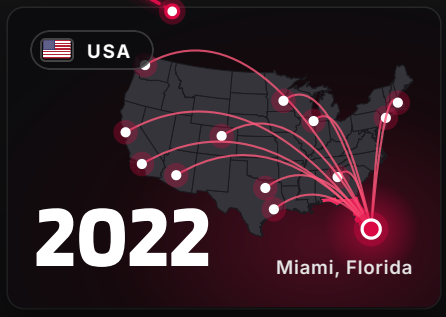
Allis Electric Co., Ltd. was founded on September 25, 1968, in Taipei, Taiwan. Its UPS engineering grew in Milan, Italy, from 1998; AEC UPS USA opened in Miami, Florida, in 2022.

THE JOURNEY · 1968 – 2022

TAIPEI · MILAN · MIAMI







Taiwan WHERE IT BEGAN
Allis Electric founded: switchboards, then transformers, switchgear and power electronics.

Italy UPS ENGINEERING
AEC International (Milan): UPS design and test center, today the hub for Europe, the Middle East and Africa.

USA AEC UPS USA
Stock, training and service for the US, Canada and Latin America, with technicians across the United States.

58
years of activity, since 1968

1994
listed on the Taiwan Stock Exchange, TWSE:1514

6
group sites on four continents

~$894M
market capitalization, October 2026

1968
Allis Electric founded
Taipei, Taiwan: low-voltage switchboards, motor control centers, industrial controls.

1994
Listed in Taiwan
TWSE:1514. Market cap above $100 million, 500 employees.

1998
AEC International (Milan)
The group's UPS design and test center, for Europe, the Middle East and Africa.

2002
AEC South Africa
AEC PHD Powerhouse, Johannesburg, for the Republic of South Africa.

2015
AEC Nippon
A joint venture in Tokyo for transformers and equipment.

2022
AEC UPS USA
Miami, Florida, for the US, Canada and Latin America. AEC Power opens in Dubai.

2024
New AEC identity
The new logo and the tagline: Technology Behind Power.

2026
A US range, 120–480 V
One catalog for 60 Hz sites, 1 kVA to 1.6 MVA, in every US voltage class.

AEC LOGO EVOLUTION

Logo History 1968 and 2024

The diamond of the first sign became the AEC mark of today.



56 YEARS

AEC
2024–TODAY

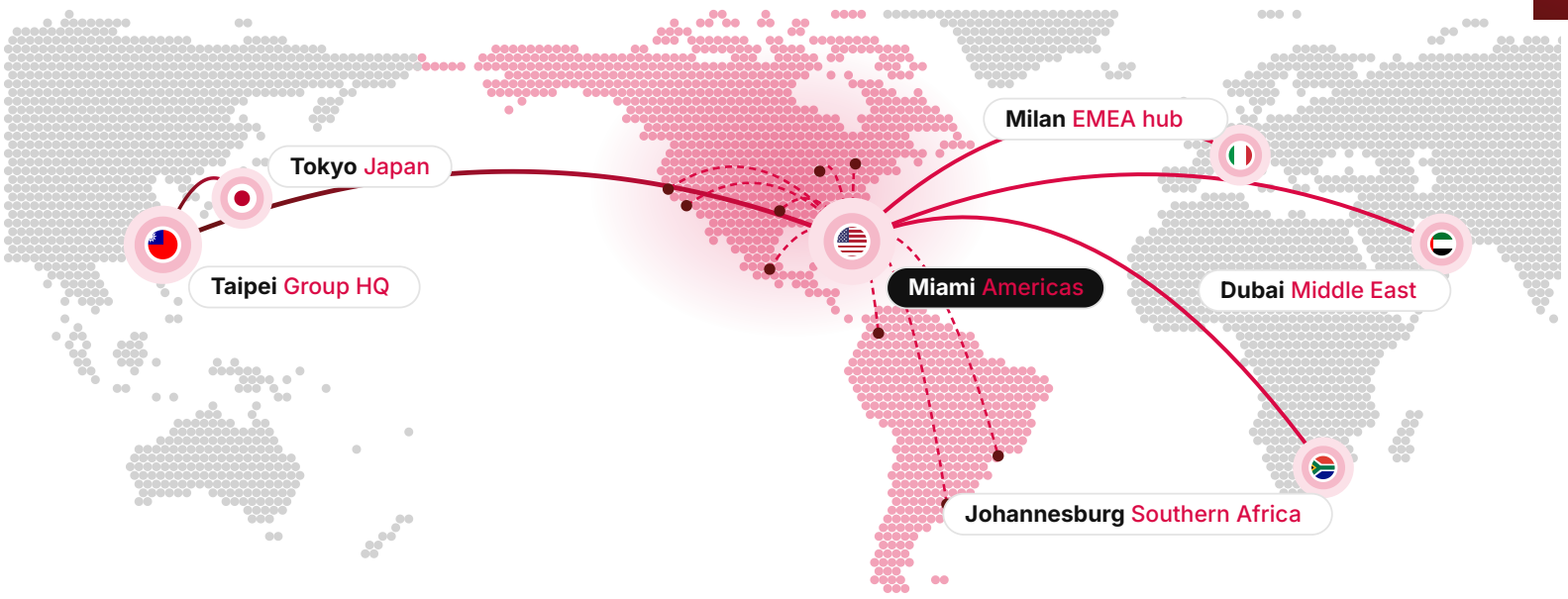
TECHNOLOGY BEHIND POWER

The tagline of the AEC brand, from 2024.

GLOBAL PRESENCE

Global Presence Six Group Sites

AEC works through subsidiaries, branch offices and certified partners, with local stock and field engineers where customers operate. The United States, Canada and Latin America are served from Miami, Florida.



The Americas, served from Miami — Group network: Miami, Taipei and the hubs — Support from Miami to the Americas

AEC UPS USA LLC
Miami, Florida
US, Canada and Latin America

Allis Electric Co., Ltd.
Taipei
Group headquarters

AEC International (Milan)
Milan
Europe, Middle East and Africa

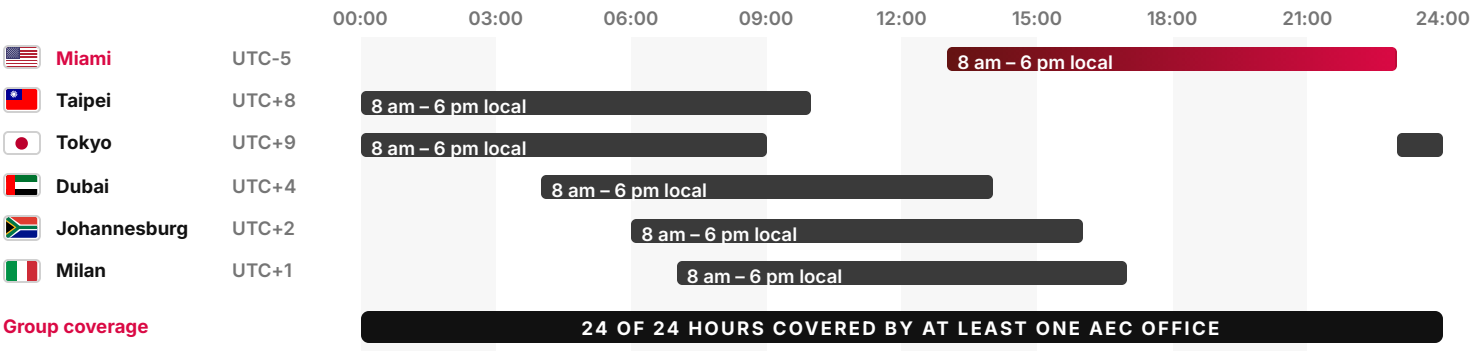
AEC PHD Powerhouse Ltd
Johannesburg
Republic of South Africa

AEC Nippon Co., Ltd.
Tokyo
Transformers and equipment

AEC Power LLC
Dubai
Middle East

OFFICE HOURS AROUND THE WORLD

8 am – 6 pm local, standard time, on the UTC clock





6
Group sites

24/7
Sales and service line, from Miami

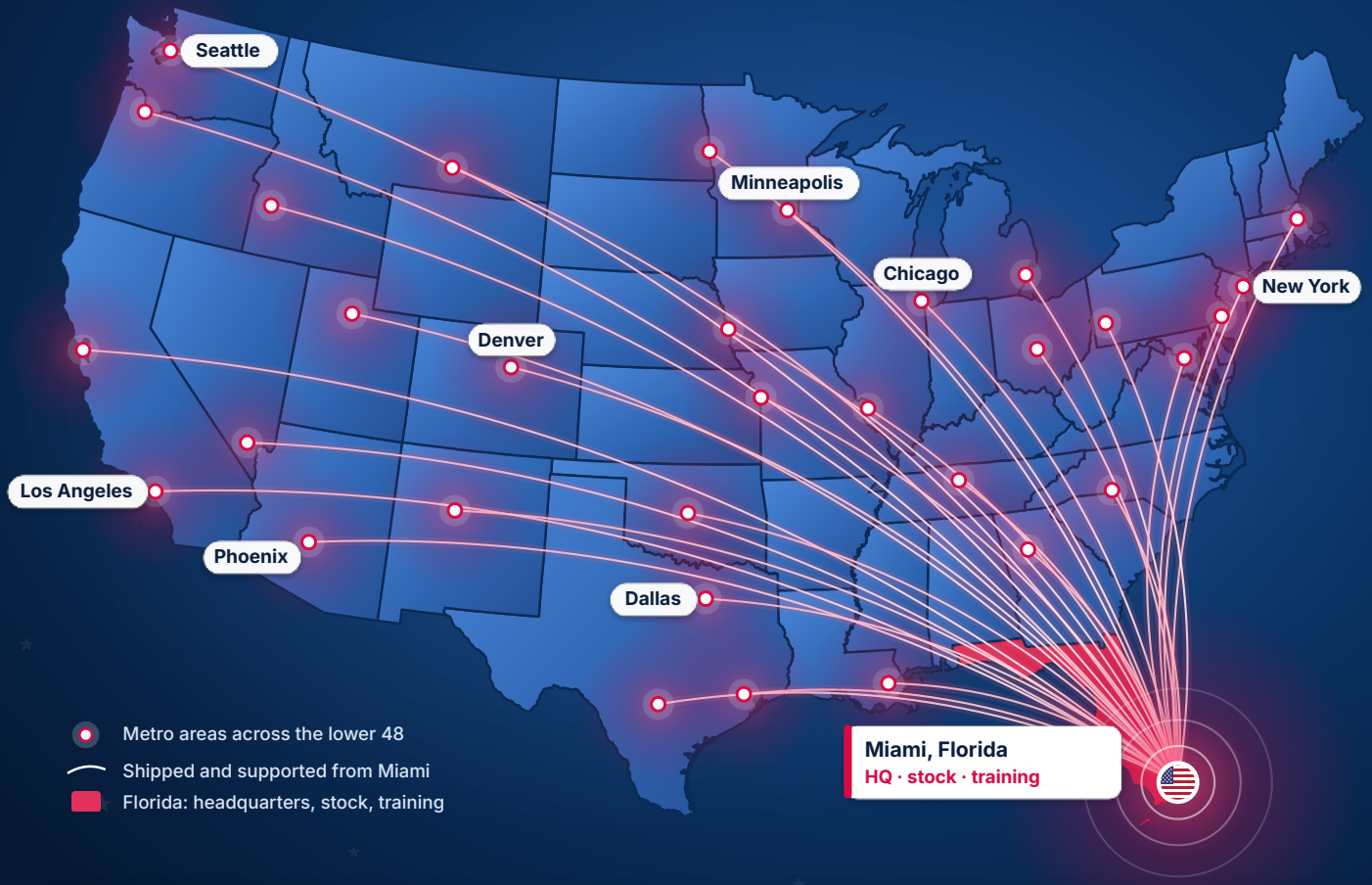
21+
Countries with spare parts in stock

80+
Countries reached by the AEC network

AEC UPS USA LLC · MIAMI, FLORIDA

AEC in the USA Nationwide from Miami

AEC UPS USA LLC opened in Miami, Florida, in 2022: headquarters, stock and training center. Sales, stock and service for the whole United States from Miami, with technicians across the country and a support line that never closes, in every US time zone.



2022 Miami
AEC UPS USA opens: headquarters, stock, training

24/7 service
phone and WhatsApp +1 786 553 2100

50 states
sales, stock and service for the whole United States

60 Hz 120–480 V
every US voltage class, 1 kVA to 1.6 MVA

3 yr · 5 yr
warranty: 3 years on the UPS, 5 on LUMINA, ETHERNO and lithium

THE RANGE BY US VOLTAGE CLASS · 60 HZ

1 kVA to 1.6 MVA · listings: see each data page

120 V
Single-phase
1–3 kVA
LUMINA · FERRUS · FERRUS RT

120/240 V
Split-phase
6–20 kVA
FERRUS SP · FERRUS SP RT

208 V
Three-phase
10–100 kVA
ETHERNO · AUREON · RADIANT · RADIANT-IB

480 V
Three-phase
30–1,600 kVA
CIRRO-IB · CIRRO · INFINITE

Lithium 50 Ah
UL 1973 listed
UL 9540A tested
UN38.3 · 5,000+ cycles

IN STOCK IN MIAMI

120 V and 208 V



LUMINA
1–3 kVA · 120 V · lithium



FERRUS
1–3 kVA · 120 V · tower



FERRUS RT
1–3 kVA · 120 V · rack/tower



ETHERNO
10–30 kVA · 208 V · lithium

YOUR CONTACT IN THE USA

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4872 SW 72nd Ave
Miami, FL 33155
sales@aecups.com
aecups.com

SALES · PROJECTS · SERVICE · 24/7
+1 786 553 2100 phone, WhatsApp

FINANCIALS

Financial Results 2020–2025

Allis Electric Co., Ltd., parent company of AEC, in US dollars: revenue more than doubled in five years, net profit tripled.

GROUP REVENUE 2025

$325 million

▲ +10.2 % on 2024 · ×2.3 since 2020

$39M Net profit 2025

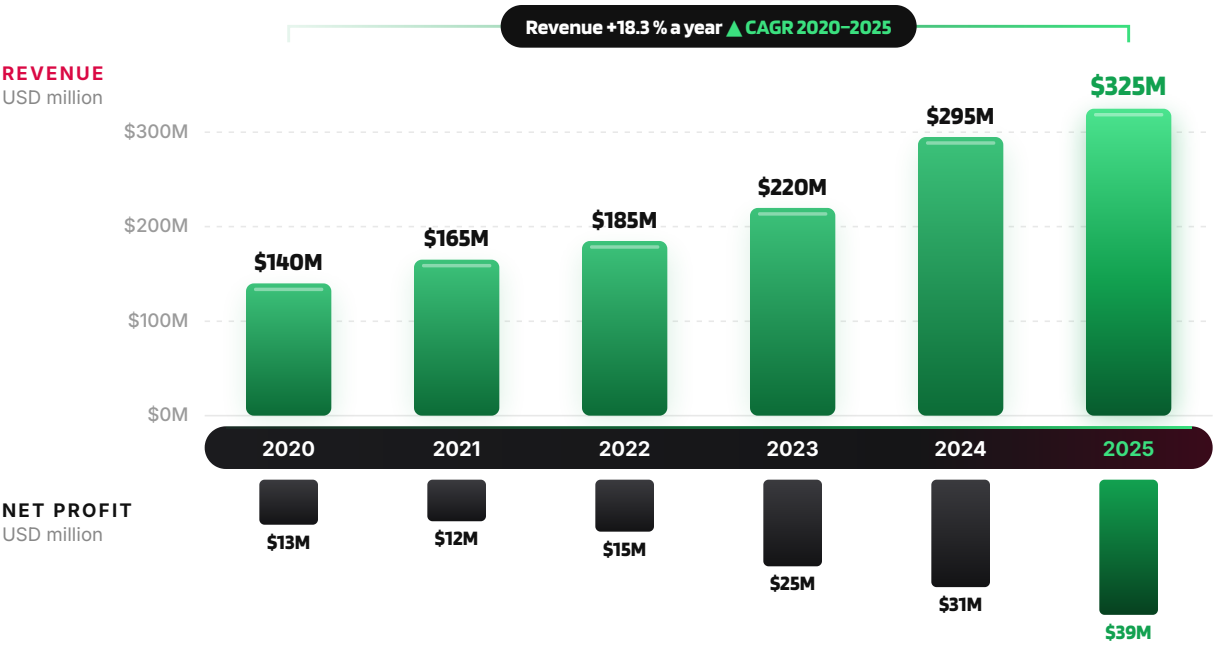
12.0 % Net margin 2025

~$894M Market cap, Oct 8, 2026

844 Employees in the group

Revenue, net profit and growth, 2020–2025

Growth on the year before · CAGR: compound annual growth rate



	2020	2021	2022	2023	2024	2025
Revenue growth on the year before	—	▲ +17.9 %	▲ +12.1 %	▲ +18.9 %	▲ +34.1 %	▲ +10.2 %
Net profit growth on the year before	—	▼ −7.7 %	▲ +25.0 %	▲ +66.7 %	▲ +24.0 %	▲ +25.8 %
Net margin net profit ÷ revenue	9.3 %	7.3 %	8.1 %	11.4 %	10.5 %	12.0 %

2020–2025

×2.3 revenue $140M → $325M

+132 % revenue in 5 years

×3.0 net profit $13M → $39M

+18.3 % a year

+24.6 % a year

+2.7 pts margin 9.3 → 12.0

REINVESTED IN ENGINEERING

≈$19.5M R&D investment, 2025 — 6 % of 2025 revenue

130 Electronics engineers — out of 844 employees

15 % Of the workforce — in design and R&D

≈$385k Revenue per employee — $325M ÷ 844 employees

REVENUE BY DIVISION, 2025 · $325M

Allis Electric group, the four businesses



$101M 31 % Critical power

$88M 27 % Transformers

$71M 22 % Switchgear

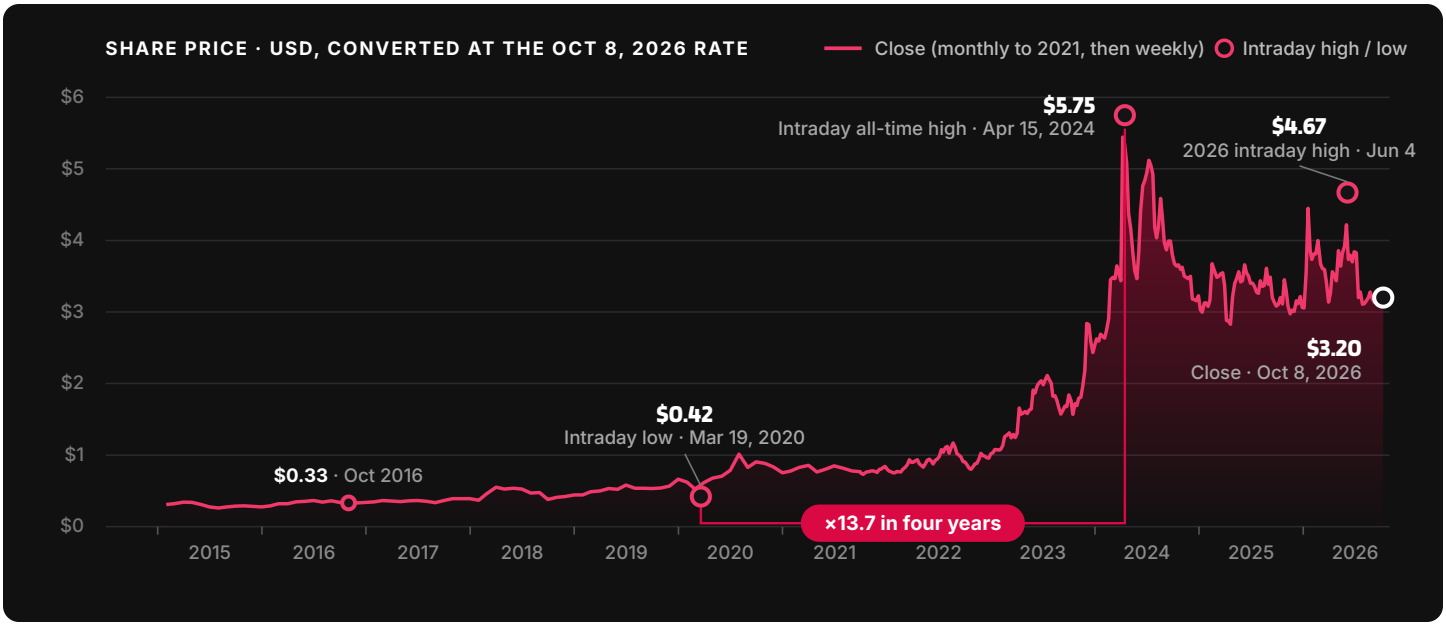
$65M 20 % Engineering projects

Group figures in US dollars; growth, CAGR (2020–2025, 5 years) and ratios calculated from them. Market cap at Oct 8, 2026. Past results do not predict future results.

ON THE STOCK EXCHANGE

Stock Information TWSE:1514

Allis Electric, the parent company of AEC, has been listed on the Taiwan Stock Exchange since March 1994. Grid investment, semiconductor fabs and AI data centers have taken the share price, the dividend and the order book to records.



×13.7
From the 2020 low to the 2024 high
$0.42 → $5.75

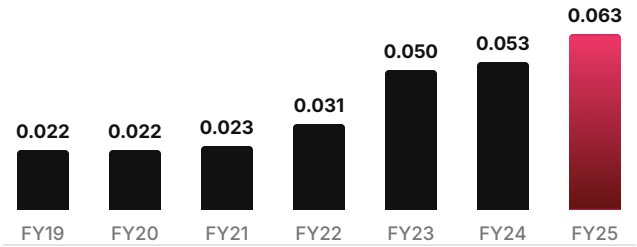
×9.7
Share price in ten years
$0.33 → $3.20, Oct 2016–2026

$894M
Market capitalization
Oct 8, 2026

×2.9
Cash dividend per share
$0.022 → $0.063, FY2019–2025

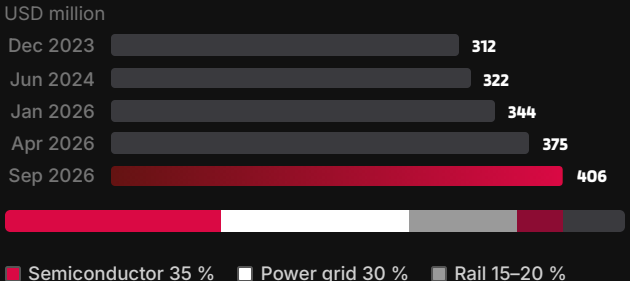
DIVIDEND EVERY YEAR

Cash dividend per share, USD, plus a stock dividend each year



RECORD ORDER BACKLOG

USD million



Power grid

Turnkey substations and smart-grid equipment for the national grid.

Semiconductor fabs

Supplier to fabs in Taiwan, the USA, Japan, Singapore and Germany.

AI data centers

Orders for AI data centers in Asia and Latin America.

Rail

Third-generation train control for rail.

Share prices and dividends in US dollars at the Oct 8, 2026 exchange rate (102.5 TWD = $3.20), not adjusted for stock dividends. Market data at Oct 8, 2026. Past performance is no guarantee of future results.

AEC PARTNERSHIP PROGRAM

Partner Program Tiers and Benefits

Join the AEC family through the PARTNERSHIP program, open to every customer in the group. Your deals stay yours, AEC engineers work under your logo and your customer is never left without power. **Three tiers, fifteen benefits:** the higher the tier, the more AEC puts in.

Gold
Installers and resellers

Distributor pricing · Engineering support · Datasheets, drawings · Training in Miami · Stock promotions

Platinum
Distributors with an annual plan

✓ **Everything in Gold, plus**

MDF 2 % · Growth rebate to 4 % · Certified technicians · Demo units · Deal registration · Co-branded catalog

Diamond
Strategic partners

✓ **Everything in Platinum, plus**

Top tier pricing · MDF 3 % · Growth rebate to 6 % · Project support · Customer seminars · Joint projects · Territory protection · Lead sharing · Diamond Summit

THE PROGRAM IN FOUR PARTS

Partner Benefits Four Groups

What a partner needs, not a volume table: your projects protected, engineering under your brand, a loaner when a customer's unit is down and the installed base working for you.

01 · 3 BENEFITS — Deal Protection

180 DAYS — **Project Lock**
Register a project: it is yours for 180 days, renewable while the bid is alive, price locked. AEC never quotes it to another partner or direct.

1 BUSINESS DAY — **Zero channel conflict**
Leads from aecups.com, campaigns and shows go to the partner of the area within 1 business day.

60 DAYS OF STOCK — **Price protection**
If the list price drops, the stock you bought in the last 60 days is credited the difference.

02 · 3 BENEFITS — Sales and Engineering Support

48 h TO SUBMITTAL — **Spec-to-Win desk**
Sizing, runtime, one-line drawing and the submittal package (datasheets, UL listings, drawings) with your logo, within 48 hours.

Your logo on this catalog
A co-branded edition of this catalog and the datasheets, for Platinum and Diamond.

UP TO 20 % — **Lithium Trade-Up**
Credit on an AEC lithium UPS for any old UPS, any brand; AEC recycles it.

03 · 4 BENEFITS — Rebates and Market Funds

UP TO 6 % EVERY QUARTER — **Growth rebate**
Paid quarterly on growth over the same quarter of last year: up to 4 % Platinum, 6 % Diamond.

+1 % ON LITHIUM — **Lithium bonus**
Extra rebate on every lithium UPS and battery system.

UP TO 3 % OF PURCHASES — **Market development funds**
2 % (Platinum) and 3 % (Diamond) of purchases for shows, campaigns and demo days, claimed against the activity.

Rep rewards
A rewards card for your sales reps, on every registered AEC sale.

04 · 5 BENEFITS — Service and Loaner Units

24/7 BACK-UP — **Service you can sell**
Technicians certified free in Miami; AEC pays partners to start up and maintain units.

48 h FROM MIAMI — **Never-down loaner**
A loaner ships in 48 hours while a customer's unit is repaired.

Lifecycle alerts
Battery and service reminders for your installed base.

Demo fleet
Demo units at a partner price, renewed yearly.

Diamond Summit
Once a year, a visit to the factories in Taiwan and the UPS design center in Italy.

LISTINGS AND STANDARDS

UL 1778	UL 1973 · 9540A	UN38.3	FCC	IEC 62040
UPS, per series	listed · tested	module, LUMINA	Part 15, Class A	-1 · -2 · -3

Program terms and eligibility by tier in the AEC partner agreement.

Become an AEC partner
Ask for the partner agreement →

PHONE AND WHATSAPP
+1 786 553 2100
Sales and service, 24/7

E-MAIL
sales@aecups.com
Partner inquiries

AEC UPS USA LLC
4872 SW 72nd Ave
Miami, FL 33155

TECHNOLOGY MAP

Technology Map All Series

Every AEC UPS is online double conversion: the inverter rebuilds the output from scratch, so a mains failure changes nothing at the load. Around that core each series adds its own technologies; the map shows where to find them.

3-level IGBT
Three-level inverters with full digital control in the online ranges: cleaner waves, lower losses.

LiFePO4
Lithium iron phosphate in LUMINA, ETHERNO and the L6 cabinets for INFINITE: longer life, less weight.

Modular N+X
Hot-swappable power modules from 15 to 100 kVA: grow with the load, service without a shutdown.

Silicon carbide
INFINITE switches its power on SiC semiconductors, for a peak efficiency of 97.3 %.

THE TECHNOLOGY MAP

On the right, the first page of each series.

	LiFePO4	VRLA	Unity PF	Hot-swap modules	Hot-swap batteries	Isolation trans-former	Touch screen	19-inch rack	SiC	Network card	Page
SINGLE-PHASE · 120 V											
 **LUMINA** 1–3 kVA · 1Ph 120 V	●	—	—	—	—	—	—	●	—	SNMP-L	11
 **FERRUS** 1–3 kVA · 1Ph 120 V	—	●	●	—	—	—	—	—	—	SNMP-M	20
 **FERRUS RT** 1–3 kVA · 1Ph 120 V	—	●	●	—	—	—	—	●	—	SNMP-M	28
SPLIT-PHASE · 120/240 V											
 **FERRUS SP** 6–20 kVA · 2Ph 120/240 V	—	●	●	—	—	●	●	—	—	SNMP-M	36
 **FERRUS SP RT** 6–10 kVA · 2Ph 120/240 V	—	●	●	—	—	●	●	●	—	SNMP-M	47
THREE-PHASE · 208 V											
 **ETHERNO** 10–30 kVA · 3Ph 208 V	●	—	●	—	●	—	●	—	—	SNMP-L	58
 **AUREON** 10–30 kVA · 3Ph 208 V	—	●	●	—	●	—	●	—	—	SNMP-L	71
 **RADIANT** 15–90 kVA · 3Ph 208 V	—	●	●	●	—	—	●	—	—	SNMP-M	83
 **RADIANT-IB** 20–100 kVA · 3Ph 208 V	—	●	●	●	●	—	●	—	—	SNMP-M	92
THREE-PHASE · 480 V											
 **CIRRO-IB** 30–150 kVA · 4W 480 V	—	●	●	●	●	—	●	—	—	SNMP-M	102
 **CIRRO** 60–1,600 kVA · 4W 480 V	—	●	●	●	—	—	●	—	—	SNMP-M	112
 **INFINITE** 100–1,200 kVA · 3W 480 V	●	●	●	●	—	—	●	—	●	SNMP-L	123

● the series has it — it does not

SNMP-L network card: LUMINA, ETHERNO, AUREON and INFINITE. Web pages, SNMP v1/v2c/v3 and Modbus TCP/IP; e-mail alarms. p. 158

SNMP-M network card: FERRUS, FERRUS RT, FERRUS SP, FERRUS SP RT, RADIANT, RADIANT-IB, CIRRO-IB and CIRRO. Web pages, SNMP v1/v2c/v3, Modbus TCP/IP and MQTT. p. 158

AEC

ONLINE UPS · LITHIUM · RACK / TOWER

LUMINA

1–3 kVA

Single-phase online double-conversion UPS with a built-in **LiFePO4 lithium** battery. Two rack units for a 19-inch cabinet, or standing as a tower.

LiFePO4 LITHIUM INSIDE



LUMINA · TOWER ON TOP, RACK BELOW · 2U

LiFePO4
Lithium battery built into the UPS

5 years
Warranty on the whole unit: UPS and lithium battery

92.6%
AC/AC efficiency, highest on the 2.2 kVA model

3×
Runtime vs a VRLA UPS in the same 2U

Product Overview
LUMINA 1–3 kVA

Single-phase online double-conversion UPS for 120 V loads with its **lithium** iron phosphate battery inside, 1 to 3 kVA, in one 2U chassis for the 19-inch rack or standing as a tower.

THE RANGE · power, backup with the built-in battery, weight and depth

1 kVA	1.5 kVA	2 kVA	2.2 kVA	3 kVA
900 W	1,350 W	1,800 W	1,980 W	2,700 W
11 min at full load	11 min at full load	11 min at full load	23 min at full load	11 min at full load
19.6 lb · 16.5 in deep	29.5 lb · 22.4 in deep	30 lb · 22.4 in deep	42.1 lb · 24.2 in deep	37.7 lb · 22.4 in deep

Main Features

LiFePO4
lithium battery inside: 12–15 years, 3,000 cycles

5 years
warranty on the whole unit, UPS and battery

≤ 5 h
back to full charge after an outage

2U
every rating, rack or tower; rail kit included

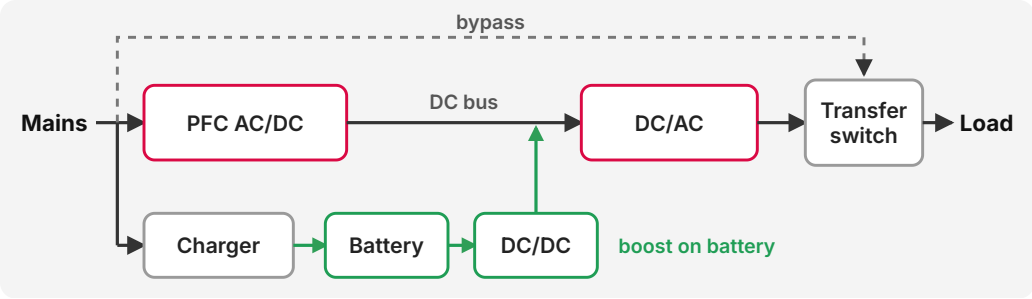
0 ms
online double conversion: no transfer time

92.6 %
highest AC/AC efficiency of the range

140 °F
highest operating temperature; full power to 104 °F

UL 1778
ETL listed; CSA; battery UN38.3 tested

How It Works



On mains
The PFC rectifier makes a steady DC bus; the inverter rebuilds 110 / 120 V and the charger keeps the battery full.

On battery
The DC/DC boosts the battery onto the same bus: the inverter never stops, 0 ms.

On bypass
Overload or inverter fault: the transfer switch puts the load on the mains.

Key Data

Input	88–148 V AC at full load; 50 / 60 Hz ±10 %
Output	110 / 120 V ±1 %, sine wave, THD < 3 %, PF 0.9
Battery	LiFePO4 lithium inside, 12–15 years
Recharge	≤ 5 h; no battery pack to add

Size, W × H	17.2 × 3.4 in (2U), 16.5–24.2 in deep
Communication	USB; slot for SNMP-L or RS485 + dry contacts; EPO
Standards	ETL listed UL 1778, CSA, UN38.3
Warranty	5 years, UPS and battery

LUMINA · FRONT VIEW

Front View
LUMINA 1–3 kVA

The 2U front of every LUMINA rating: the LCD, three keys and the rack ears. The same chassis stands as a tower on two stands.



1 LCD
blue LCD: output, input, battery, load, mode, fault code; rack or tower reading

2 ON key
1 s: on. On mains, 3 s: battery test. On battery, 3 s: buzzer off

3 OFF key
1 s: the UPS turns off

4 SELECT key
scrolls the readings; held 5 s it opens the settings

5 Rack ears and handles
19-inch rack, 2- or 4-post; rail kit included

6 Front grille
cooling air in at the front, out at the back



Rack or Tower

R In the rack
2U, 19-inch, ears and handles on the front; the telescopic rail kit for 2- or 4-post racks (up to 100 lb) is included.

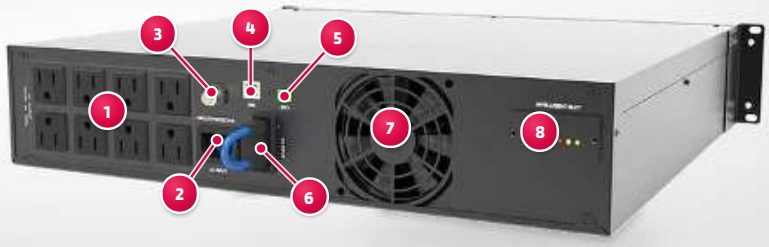
T As a tower
the same unit upright on its two stands; the LCD switches to the tower reading (TWR) from the settings.

S Space and room
11.8–19.7 in (300–500 mm) around the UPS, 19.7 in (500 mm) above it; 32–104 °F (0–40 °C) at full power, 0–95 % RH.

Rear View
LUMINA 1–3 kVA

1 kVA

OUTLETS	8 × NEMA 5-15R
INPUT	IEC C14 inlet
COOLING	one fan
CURRENT	9 A total



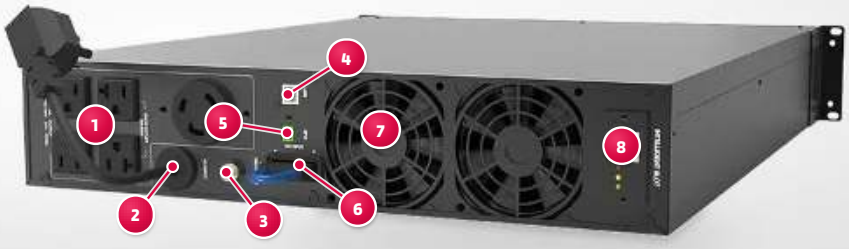
1.5 · 2 · 2.2 kVA

OUTLETS	6 × NEMA 5-20R
INPUT	IEC C20 inlet
COOLING	two fans
CURRENT	18 A (1.5 · 2 kVA) · 20 A (2.2 kVA)



3 kVA

OUTLETS	4 × NEMA 5-20R + 1 × L5-30R
INPUT	attached cord, twist-lock plug
COOLING	two fans
CURRENT	27 A total



1 Output sockets
NEMA receptacles for the loads; each 5-15R up to 15 A, each 5-20R up to 20 A, the L5-30R up to 30 A.

2 Input
IEC inlet with its cord, or the attached cord and plug of the 3 kVA, to a mains socket near the UPS.

3 Over-current protector
resettable protector on the input, part of the over-current protection of the UPS.

4 USB port
standard: status and readings on the computer, remote on and off with the UPS software.

5 EPO connector
its two pins joined: the UPS closes its output. Opened again and the UPS restarted: output back.

6 Battery connector
shipped unplugged for the journey; plugged into the battery port once the UPS is installed.

7 Cooling fans
one on the 1 kVA, two on the others; air out at the back, so keep the rear clear.

8 Intelligent slot
SNMP card: input, output and load over the network, remote on and off; or RS485 + dry contacts.

Display and Controls
LUMINA 1–3 kVA

The blue LCD of LUMINA and the three keys that run the UPS and its settings.



1. **Reading**
   TEMP, INPUT or OUTPUT: what the digits show
2. **Digits**
   voltage, frequency, battery voltage, load %, temperature or fault code
3. **Units**
   Vac, Hz, V DC, °C, %
4. **FAULT · SET**
   a fault code is shown; the settings page is open
5. **Mode icons**
   ECO, mains (lit in normal operation), bypass, battery
6. **Load ring**
   the load, in eight steps
7. **Mute · failure**
   buzzer silenced; UPS failure
8. **Battery ring**
   the battery level, in eight steps

Keys

Key	Function
ON	1 s: on · 3 s on mains: battery test · 3 s on battery: buzzer off, again 3 s to cancel
OFF	1 s: off
SELECT	press: next reading · 5 s: settings, scrolled with SELECT, confirmed with ON

Readings, Scrolled with SELECT

- Output voltage
- Output frequency
- Input voltage
- Input frequency
- Battery voltage
- Inner temperature
- Load %
- Fault information

Settings, SELECT Held 5 s

ECO · INV	operating mode
RCK · TWR	rack (default) or tower reading
110 · 120 V	output voltage

Fault Codes on the LCD

EPO
emergency power off: both outputs closed

BUS
DC bus voltage fault

TMP
over-temperature: check fans and vents

OUT
output short circuit or load too large

MIF
five inverter faults in five minutes

BAT
battery voltage too low or too high

FAN
fan fault: rapid beep, output about to stop

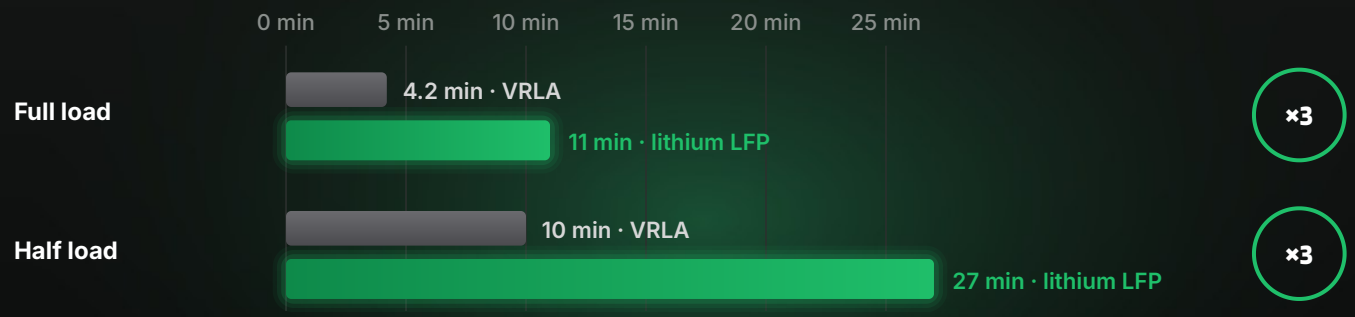
Load ring flashing
overload: rapid beep, reduce the load

Lithium Battery Technology
LUMINA 1–3 kVA

LUMINA with its built-in **lithium** iron phosphate battery against FERRUS RT, the online rack UPS of the same ratings with lead-acid batteries, and which one to choose.

BACKUP TIME, BUILT-IN BATTERY · 1, 2 AND 3 kVA

LUMINA lithium LFP vs FERRUS RT VRLA



Typical values at 77 °F (25 °C) with new batteries. Same values for LUMINA 1, 1.5, 2 and 3 kVA and FERRUS RT 1, 2 and 3 kVA; LUMINA 2.2 kVA: 23 and 46 min, FERRUS RT 1.5 kVA: 6 and 14.3 min. Full load is 900 W for LUMINA 1 kVA (PF 0.9), 1,000 W for FERRUS RT 1 kVA (PF 1).

LUMINA alone vs FERRUS RT with battery pack: 2U vs 4U

For about 25 minutes at half load, FERRUS RT 1 kVA needs its 2U battery pack (23.7 min). LUMINA 1 kVA does it alone (27 min).

LEAD-ACID · UPS + BATTERY PACK — 4U



4U	77.2 lb	23.7 min
rack space	1 kVA + pack	half load

Choose FERRUS or FERRUS RT

- Unity power factor: 1, 2 or 3 kW on the label.
- Runtime per site: one to four cabinets or packs.
- Lead-acid blocks any service team knows.

LITHIUM LFP · LUMINA ALONE — 2U



−50 %	−75 %	27 min
rack space	weight, 19.6 lb	half load

Choose LUMINA

- ×3 the full-load backup, with no battery pack.
- A battery that lasts as long as the UPS.
- Back to full in 5 hours or less.

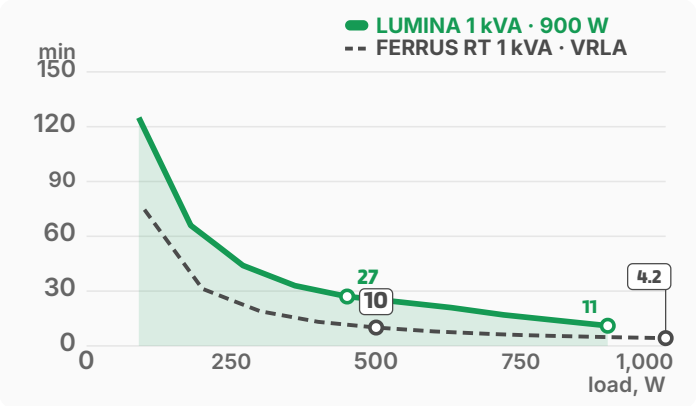
	LUMINA · lithium LFP	FERRUS RT · lead-acid rack UPS
Battery chemistry	**LiFePO4: stable, cobalt-free cells**	Lead-acid VRLA, 12 V 9 Ah blocks
Battery life · sets in 10 years	**12–15 years, 3,000 cycles · 1 set**	3–5 years · 2 to 4 sets, changed by qualified personnel
Recharge · first charge	**5 h or less · 10 h before first use**	12 h or more · at least 12 h
Operating temperature	**32–140 °F (0–60 °C), full power to 104 °F**	32–104 °F (0–40 °C); battery best at 68–77 °F, 57–77 °F allowed
Weight, 1 kVA · 3 kVA	**19.6 lb · 37.7 lb**	41.8 lb · 61.7 lb
Warranty	**5 years, UPS and battery**	3 years UPS · 2 years batteries
Standards	**ETL listed UL 1778 · CSA · UN38.3 tested**	UL 1778 standard

Battery and Runtime
LUMINA 1–3 kVA

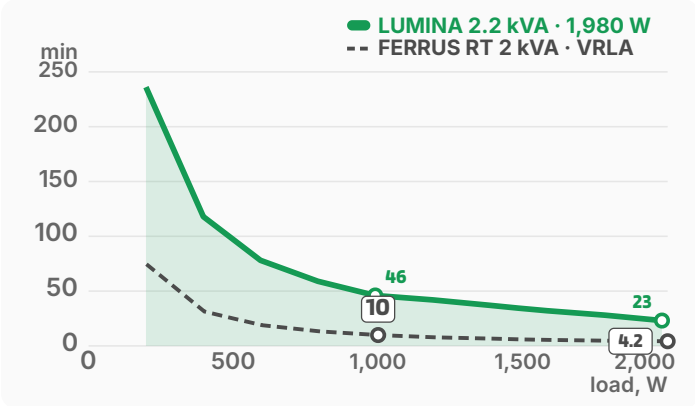
Each bubble is the backup of one model at one load, in minutes: larger bubble, longer backup. No battery pack to add.

	100 % load	75 % load	50 % load	25 % load	10 % load
LUMINA 1 kVA 900 W · 24 V DC	11	19	27	55	2 h 05
LUMINA 1.5 kVA 1,350 W · 48 V DC	11	19	27	55	2 h 05
LUMINA 2 kVA 1,800 W · 48 V DC	11	19	27	55	2 h 05
LUMINA 2.2 kVA 1,980 W · 72 V DC	23	34.5	46	98	3 h 56
LUMINA 3 kVA 2,700 W · 72 V DC	11	19	27	55	2 h 05

1 · 1.5 · 2 · 3 kVA



2.2 kVA, the long-backup model



Battery care, built into the UPS

Battery kept full
On the mains down to 88 V at full load, 77 V to 75 % and 60 V to 50 %: a weak grid does not cycle the battery.

From the panel
On mains, ON held 3 s tests the battery; a failed test, or a voltage out of range, shows the code BAT.

Under- and over-voltage
A discharge ends before the battery is harmed; over-voltage protection reacts to a charger fault.

Low-battery warning
The battery ring on the LCD; when it is empty and flashes, a rapid beep: time to save data.

In service and stored
Discharge and recharge every 4–6 months (2 in hot areas); stored at 32–104 °F; in storage longer than six months, recharge every 3 months.

Technical Specifications
LUMINA 1–3 kVA

Model	1 kVA	1.5 kVA	2 kVA	2.2 kVA	3 kVA
Power (VA / W)	1,000 / 900	1,500 / 1,350	2,000 / 1,800	2,200 / 1,980	3,000 / 2,700
INPUT					
Voltage range	88–148 V AC above 75 % load · 77–88 V AC 50–75 % · 60–77 V AC below 50 %				
Frequency · connection	50 / 60 Hz ±10 %, self-adapting · single-phase, three-wire				
Input	IEC C14 inlet	IEC C20 inlet			cord, twist-lock plug
OUTPUT					
Voltage · frequency	110 / 120 V ±1 %, set from the panel · 50 / 60 Hz ±0.2 % on battery				
Waveform · distortion · PF	sine wave · THD < 3 % (linear load) · 0.9				
Transfer time	0 ms, mains to battery				
Overload	100–130 % 1 min · 130–150 % 1 s · above 150 % 200 ms				
AC/AC efficiency, up to	91.7 %	92.5 %		92.6 %	92.5 %
Outlets	8× 5-15R	6× 5-20R			4× 5-20R + 1× L5-30R
BATTERY					
Type	LiFePO4 lithium, internal · 12–15 year life (3,000 cycles)				
DC voltage	24 V DC	48 V DC		72 V DC	
Backup at 50 % · 100 % load	27 min · 11 min			46 min · 23 min	27 min · 11 min
Recharge time	≤ 5 h				
GENERAL					
Communication	USB standard · intelligent slot: SNMP card or RS485 + dry-contact card (optional) · EPO				
Display	LCD, rack (RCK) or tower (TWR) reading				
Protection	battery under-voltage, overload, short circuit, over-temperature, input over-voltage				
Noise · environment	< 55 dB · 32–140 °F (0–60 °C), full power to 104 °F (40 °C) · 0–95 % RH non-condensing				
W × D × H in	17.2 × 16.5 × 3.4	17.2 × 22.4 × 3.4		17.2 × 24.2 × 3.4	17.2 × 22.4 × 3.4
W × D × H mm	438 × 420 × 87	438 × 570 × 87		438 × 615 × 87	438 × 570 × 87
Weight	19.6 lb (8.9 kg)	29.5 lb (13.4 kg)	30 lb (13.6 kg)	42.1 lb (19.1 kg)	37.7 lb (17.1 kg)
Standards	ETL listed UL 1778, CSA, UN38.3				
Warranty	5 years on the whole unit, UPS and lithium battery				

Runtimes with new batteries. Specifications are subject to change without notice.



SIZES

LUMINA 1–3 kVA

1 kVA	17.2 × 16.5 × 3.4 in 438 × 420 × 87 mm	19.6 lb
1.5 · 2 · 3 kVA	17.2 × 22.4 × 3.4 in 438 × 570 × 87 mm	29.5–37.7 lb
2.2 kVA	17.2 × 24.2 × 3.4 in 438 × 615 × 87 mm	42.1 lb

One 2U chassis, 17.2 in wide, 3.4 in high; four depths. W × D × H.

Ordering Information
LUMINA 1–3 kVA

LUM 1000 RT -2U -LI -NC

LUM	1000	RT	-2U	-LI	-NC
series: LUMINA	rating in VA	rack / tower	2U chassis	lithium battery inside	SNMP card fitted

EXAMPLES

LUM1000RT-2U-LI
LUMINA 1 kVA

LUM3000RT-2U-LI-NC
LUMINA 3 kVA with the SNMP card fitted

Code	Description
LUM1000RT-2U-LI	LUMINA 1 kVA online UPS, 2U rack / tower, built-in LiFePO4 battery; rail kit included **LUM1000RT-2U-LI-NC**: the same with the SNMP card fitted
LUM1500RT-2U-LI	LUMINA 1.5 kVA online UPS, 2U rack / tower, built-in LiFePO4 battery; rail kit included **LUM1500RT-2U-LI-NC**: the same with the SNMP card fitted
LUM2000RT-2U-LI	LUMINA 2 kVA online UPS, 2U rack / tower, built-in LiFePO4 battery; rail kit included **LUM2000RT-2U-LI-NC**: the same with the SNMP card fitted
LUM2200RT-2U-LI	LUMINA 2.2 kVA online UPS, 2U rack / tower, built-in LiFePO4 battery; extended runtime; rail kit included **LUM2200RT-2U-LI-NC**: the same with the SNMP card fitted
LUM3000RT-2U-LI	LUMINA 3 kVA online UPS, 2U rack / tower, built-in LiFePO4 battery; rail kit included **LUM3000RT-2U-LI-NC**: the same with the SNMP card fitted
SNMP-L	SNMP-L network card: web pages, SNMP v1/v2c/v3 and Modbus TCP/IP; e-mail alarms; for LUMINA, ETHERNO, AUREON and INFINITE
DRYCNT	Dry-contact relay card: mains failure, battery low, UPS fault, bypass; all AEC UPS series

Included with Every LUMINA

Rail kit: telescopic rails for 2- or 4-post 19-inch racks, up to 100 lb, in the box with every code. **Built-in battery:** nothing else to order for the standard backup.

Options

SNMP-L

Network card
SNMP-L in the intelligent slot: web pages, SNMP v1/v2c/v3 and Modbus TCP/IP; e-mail alarms.

DRYCNT

Dry-contact card
Relay outputs: mains failure, battery low, UPS fault, bypass; plug-in, intelligent slot.



LUMINA: rack or tower, every code

ONLINE UPS · DOUBLE CONVERSION · TOWER

FERRUS

1–3 kVA

Single-phase online UPS for 120 V servers, networks and offices: a compact tower with internal batteries, and matching battery cabinets for longer runtimes.



FERRUS 2 · 3 kVA TOWER

kVA = kW
1,000 W in every kVA

93 %
maximum efficiency

50–150 V
input range, 60 Hz

3 years
warranty on the UPS

Product Overview
FERRUS 1–3 kVA

Single-phase online double-conversion UPS for 120 V loads: three towers, 1 to 3 kVA, with BAT battery cabinets of the same size.

THE RANGE · power, backup with the internal batteries, weight and height

1 kVA	2 kVA	3 kVA
1,000 W	2,000 W	3,000 W
4.2 min at full load	4.2 min at full load	4.2 min at full load
16.5 lb · 13.9 in high	36.3 lb · 15.8 in high	45.2 lb · 15.8 in high
2 × 12 V 9 Ah · 24 V DC	4 × 12 V 9 Ah · 48 V DC	6 × 12 V 9 Ah · 72 V DC

BAT battery cabinets, the size of their UPS: one to four per UPS, up to 56.4 min at full load.



BAT0424 · BAT0848 · BAT1272

Main Features

Online
double conversion: the inverter feeds the load, 0 ms transfer

kVA = kW
output power factor 1: every VA a usable watt

50–150 V
input window: brownouts stay on the mains

Online + ECO
online or ECO mode, set from the panel

1–4
battery cabinets of the UPS's DC voltage per UPS

56.4 min
longest backup at full load

1–8 A
charger set to the cabinets, 9–200 Ah

Tower
for the desk, the office or the shop

Key Data

Ratings	1, 2, 3 kVA
Output power	1,000 W–3,000 W (PF 1)
Input	50–150 V AC, 60 Hz ±5 Hz
Output	100 / 110 / 115 / 120 V AC, sine wave
Efficiency	up to 93 %
Battery	12 V 9 Ah VRLA inside: 2, 4, 6 blocks

Backup, full load	4.2 min inside; up to 56.4 min with cabinets
Size, W × D × H	5.6 × 8.6 × 13.9 in–7.5 × 12.6 × 15.8 in
Weight	16.5–45.2 lb
Communication	RS232, slot for SNMP-M or dry contacts, EPO, USB optional
Standards · warranty	UL 1778 standard · 3 years UPS, 2 years VRLA batteries

FERRUS · FRONT VIEW

Front View
FERRUS 1–3 kVA

The front of the FERRUS tower: the LCD, the status LEDs and two keys over the front grille.



1 LCD
input and output voltage, frequency and current; battery voltage, current and %; load in kW, kVA or %; warning code. FUNC turns the four pages.

2 Status LEDs
on the power-flow mimic: REC and INV green in normal operation, BYP yellow on bypass, BAT yellow on battery.

3 ON/OFF key
starts the inverter; held 2.5 s: load to bypass, or on battery the UPS shuts down; confirms a setting.

4 FUNC key
next LCD page; held 1.5 s: mute (page 1) or clear a fault (page 4); with ON/OFF, 2.5 s: the settings.

5 Front grille
cooling air in at the front, out at the back; keep both clear.

6 Feet
the tower stands on the floor or a desk; the BAT cabinets of the same size beside it.

Three Ratings, One Design

	W × D × H, in	Weight
1 kVA	5.6 × 8.6 × 13.9	16.5 lb
2 kVA	7.5 × 12.6 × 15.8	36.3 lb
3 kVA	7.5 × 12.6 × 15.8	45.2 lb

Start and Stop from the Front

01
Start on mains
Mains on: the fans run, REC flashes green and the UPS starts on bypass (BYP yellow); then INV flashes and, in a few seconds, the inverter feeds the load.

02
Cold start
Without mains: ON/OFF once to light the LCD, then held 5 s; the UPS starts on battery.

03
Stop on mains
ON/OFF held 2.5 s: the load goes to bypass; with the mains off the UPS shuts down after a few seconds.

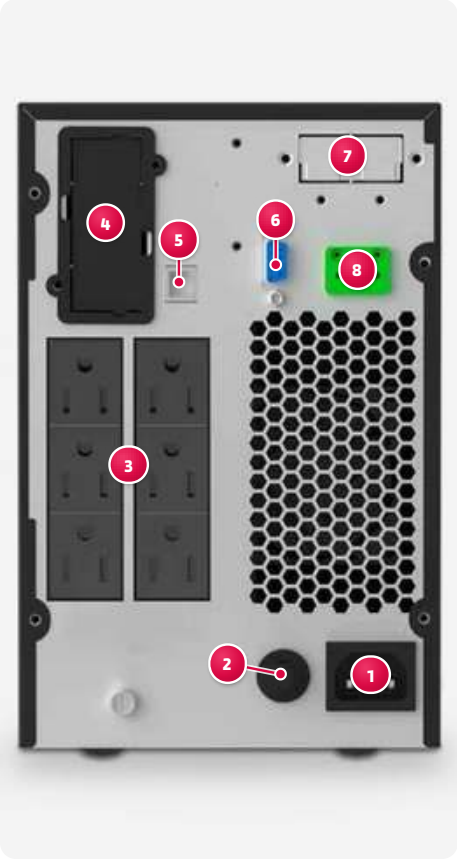
04
Stop on battery
ON/OFF held more than 2.5 s: no output, then the UPS shuts down completely.

FERRUS · REAR VIEW

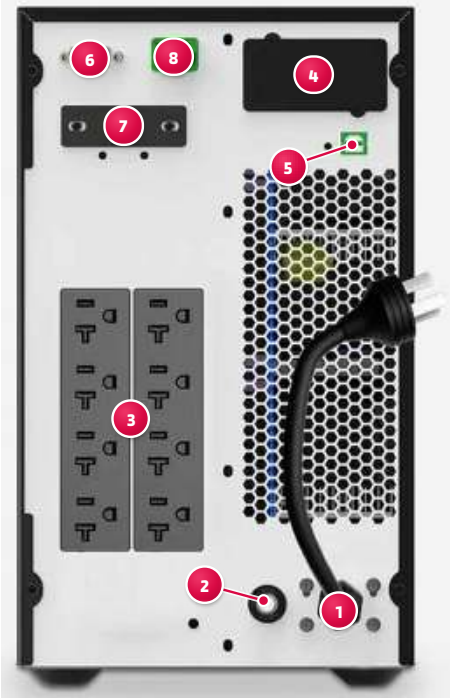
Rear View
FERRUS 1–3 kVA

The back of each rating: input, outlets, external battery terminal and communication.

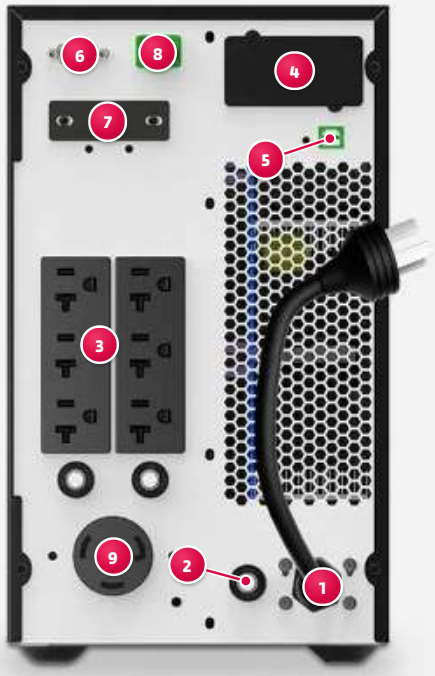
FERRUS 1 kVA



FERRUS 2 kVA



FERRUS 3 kVA



1 Input
Input socket or power cord.

2 Input surge protection
Resettable protector of the input.

3 Output sockets
NEMA outlets in two groups.

4 Intelligent slot
Dry-contact card or SNMP card.

5 USB
Optional.

6 RS232
DB9 port for monitoring software.

7 External battery terminal
For the battery cabinets (long backup).

8 EPO
Normally closed: opening it turns the UPS off.

9 NEMA L5-30R
30 A twist-lock output, 3 kVA.

SAFETY

EPO, normally closed

The EPO terminals are shorted in normal use; opening them stops the rectifier and inverter output at once. A remote switch can be wired to them.

INSTALLATION

Input cord and outlets

The input plugs into a wall receptacle: a cord in the IEC C14 inlet of the 1 kVA, an attached cord on the 2 and 3 kVA. The loads plug into the UPS.

OPTIONS

Intelligent slot

A dry-contact card (DB9 or terminal block) or the SNMP-M network card.

Display and Controls
FERRUS 1–3 kVA

The black LCD of FERRUS, its status LEDs and its two keys.



Shown in normal online operation: 120 V in and out, battery 100 %, load 45 %.

1. **Input** — voltage (VAC), frequency (Hz) or current (A), page by page
2. **Output** — the same readings for the output
3. **Power flow** — AC/DC/AC lit in online operation; BYP on bypass
4. **Battery** — voltage, current, capacity %, LOW; the arrow shows charge or discharge
5. **Load · version · code** — load in kW, kVA or %; firmware; model; a warning code with the triangle
6. **Alarm and settings** — buzzer, mute, OV LOAD, SHORT, ECO and the setting gear

Status LEDs

LED	Steady	Flashing	Off
REC	green: rectifier normal	green: rectifier starting	rectifier not working
INV	green: inverter normal	green: starting or tracking the bypass (ECO)	inverter not working
BYP	yellow: on bypass	yellow: bypass alarm	normal mode, bypass good
BAT	yellow: battery discharging	yellow: no battery or battery alarm	battery connected

Keys

Key	Function
ON/OFF	starts the inverter; held 2.5 s: load to bypass, or on battery the UPS shuts down; held 5 s without mains: cold start
FUNC	next page; held 1.5 s: mute (page 1) or clear a fault (page 4)
FUNC + ON/OFF	held 2.5 s together: the settings, applied after a restart

Online + ECO — online or ECO mode

100–120 V — output voltage

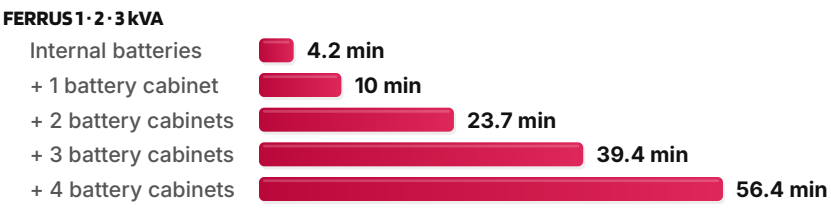
9–200 Ah — battery capacity

1–8 A — charger, long backup

Battery and Runtime
FERRUS 1–3 kVA

Every FERRUS has its batteries inside; one to four battery cabinets of the same voltage add runtime. Times at full load, new batteries.

Backup time at full load



Runtime at 100 % load; at lighter loads it is longer.

The battery cabinets

Code	Blocks · DC	W × D × H, in	For	Weight
BAT0424	4 × 12 V 9 Ah · 24 V DC	5.6 × 8.6 × 13.9	1 kVA	31.4 lb
BAT0848	8 × 12 V 9 Ah · 48 V DC	7.5 × 12.6 × 15.8	2 kVA	58.8 lb
BAT1272	12 × 12 V 9 Ah · 72 V DC	7.5 × 12.6 × 15.8	3 kVA	86.2 lb

Cabinets of the UPS's DC voltage and of its size; one to four per UPS.



Battery cabinets of the size of the UPS: BAT0424 as the 1 kVA; BAT0848 (48 V DC) and BAT1272 (72 V DC) as the 2 and 3 kVA.

Backup time by load

Set-up	100 %	75 %	50 %	25 %
1 · 2 · 3 kVA, internal batteries	4.2	6	10	25.1
1 · 2 · 3 kVA, + 1 battery cabinet	10	14.4	23.7	59.8
1 · 2 · 3 kVA, + 2 battery cabinets	23.7	34.1	56.4	2 h 22
1 · 2 · 3 kVA, + 3 battery cabinets	39.4	56.8	93.6	3 h 56
1 · 2 · 3 kVA, + 4 battery cabinets	56.4	81.3	2 h 14	5 h 38

Battery care

- Charge at least 12 hours before first use.
- Best at 68–77 °F (20–25 °C); 57–77 °F (14–25 °C) allowed.
- Battery life 3 to 5 years; replace as a full set.
- In storage, recharge every 4 to 6 months.

Adding battery cabinets: three steps

01

Same DC voltage as the UPS

BAT0424 (24 V DC) for the 1 kVA, BAT0848 (48 V DC) for the 2 kVA, BAT1272 (72 V DC) for the 3 kVA; one to four per UPS.

02

Wired to the external battery terminal

On the back of the tower: the external battery terminal, number 7 on the rear panel.

03

Capacity and charger set from the panel

The battery capacity, 9 to 200 Ah, is entered on the LCD; the charger is set from 1 to 8 A.

24 · 48 · 72 V
battery DC voltage

12 V 9 Ah
VRLA blocks, sealed

1–8 A
charger, long-backup set-ups

≧ 12 h
first charge

Technical Specifications
FERRUS 1–3 kVA

Model	1 kVA	2 kVA	3 kVA
Power (VA / W)	1,000 / 1,000	2,000 / 2,000	3,000 / 3,000
INPUT			
Voltage · frequency	50–150 V AC · 60 Hz ±5 Hz, single-phase		
Power factor	> 0.99 at full load		
Current, max.	10 A	20 A	30 A
Connection	IEC C14 inlet	attached cord, straight-blade plug	attached cord
OUTPUT			
Voltage	100 / 110 / 115 / 120 V AC, set from the panel		
Frequency · waveform	60 Hz (50 / 60 Hz settable) · sine wave		
Current	8.3 A	16.6 A	25 A
Outlets	6 × 5-15R	8 × 5-20R	6 × 5-20R + 1 × L5-30R
Efficiency, up to	93 %		
Modes	online (S) · ECO (E) · bypass · cold start from battery		
BATTERY			
Internal	2 × 12 V 9 Ah	4 × 12 V 9 Ah	6 × 12 V 9 Ah
DC voltage	24 V DC	48 V DC	72 V DC
Charger	1 A standard · 1–8 A with battery cabinets		
Backup at 50 % · 100 %	10 min · 4.2 min		
Recharge	at least 12 h for a full charge		
GENERAL			
Communication	RS232 · intelligent slot (dry contacts or SNMP-M) · EPO · USB optional		
Display	LCD, 4 LEDs, 2 buttons		
Environment	32–104 °F (0–40 °C) · RH < 95 % · 3,300 ft (1,000 m) at full power		
W × D × H in	5.6 × 8.6 × 13.9	7.5 × 12.6 × 15.8	
W × D × H mm	142 × 218 × 353	190 × 319 × 400	
Weight	16.5 lb (7.5 kg)	36.3 lb (16.5 kg)	45.2 lb (20.5 kg)
Standards	UL 1778 standard		
Warranty	3 years on the UPS · 2 years on VRLA batteries		

Specifications are subject to change without notice.



SIZES

FERRUS 1–3 kVA

1 kVA	5.6 × 8.6 × 13.9 in 142 × 218 × 353 mm	16.5 lb
2 · 3 kVA	7.5 × 12.6 × 15.8 in 190 × 319 × 400 mm	36.3–45.2 lb

Shown: the 2 and 3 kVA; the 1 kVA is the same design, smaller. W × D × H.

Ordering Information
FERRUS 1–3 kVA

FER | **3000** | **-6X9** | **+BAT1272** | **x2**

- FER — series: FERRUS
- 3000 — rating in VA
- -6X9 — internal batteries: 6 × 12 V 9 Ah
- +BAT1272 — battery cabinet of the same voltage
- x2 — how many

EXAMPLES

FER1000-2X9
FERRUS 1 kVA, internal batteries

FER3000-6X9+BAT1272x2
FERRUS 3 kVA with two battery cabinets

Code	Description
FER1000-2X9	FERRUS 1 kVA online UPS, tower, internal batteries
FER1000-2X9+BAT0424	FERRUS 1 kVA with 1 × BAT0424 battery cabinet
FER1000-2X9+BAT0424x2	FERRUS 1 kVA with 2 × BAT0424 battery cabinets
FER1000-2X9+BAT0424x3	FERRUS 1 kVA with 3 × BAT0424 battery cabinets
FER1000-2X9+BAT0424x4	FERRUS 1 kVA with 4 × BAT0424 battery cabinets
FER2000-4X9	FERRUS 2 kVA online UPS, tower, internal batteries
FER2000-4X9+BAT0848	FERRUS 2 kVA with 1 × BAT0848 battery cabinet
FER2000-4X9+BAT0848x2	FERRUS 2 kVA with 2 × BAT0848 battery cabinets
FER2000-4X9+BAT0848x3	FERRUS 2 kVA with 3 × BAT0848 battery cabinets
FER2000-4X9+BAT0848x4	FERRUS 2 kVA with 4 × BAT0848 battery cabinets
FER3000-6X9	FERRUS 3 kVA online UPS, tower, internal batteries
FER3000-6X9+BAT1272	FERRUS 3 kVA with 1 × BAT1272 battery cabinet
FER3000-6X9+BAT1272x2	FERRUS 3 kVA with 2 × BAT1272 battery cabinets
FER3000-6X9+BAT1272x3	FERRUS 3 kVA with 3 × BAT1272 battery cabinets
FER3000-6X9+BAT1272x4	FERRUS 3 kVA with 4 × BAT1272 battery cabinets
BAT0424	Battery cabinet, tower, 24 V DC, 4 × 12 V 9 Ah, for FERRUS 1 kVA
BAT0848	Battery cabinet, tower, 48 V DC, 8 × 12 V 9 Ah, for FERRUS 2 kVA
BAT1272	Battery cabinet, tower, 72 V DC, 12 × 12 V 9 Ah, for FERRUS 3 kVA
SNMP-M	SNMP-M network card: web pages, SNMP v1/v2c/v3, Modbus TCP/IP and MQTT; for FERRUS, FERRUS RT, FERRUS SP, FERRUS SP RT, RADIANT, RADIANT-IB, CIRRO-IB and CIRRO
DRYCNT	Dry-contact relay card: mains failure, battery low, UPS fault, bypass; all AEC UPS series



FERRUS 1 kVA, rear: the external battery terminal

+



BAT battery cabinet, the size of its UPS

× 1–4

Cabinets per UPS

Of the UPS's DC voltage: BAT0424 for 1 kVA, BAT0848 for 2 kVA, BAT1272 for 3 kVA. Pictures not to scale.

AEC

ONLINE UPS · DOUBLE CONVERSION · RACK / TOWER

FERRUS RT

1–3 kVA

Single-phase online UPS for 120 V loads in a 2U chassis: in a 19-inch rack or standing as a tower, with internal batteries and 19-inch battery packs for longer runtimes.



FERRUS RT · RACK BELOW, TOWER ON ITS STANDS

kVA = kW
1,000 W in every kVA

93 %
maximum efficiency

50–150 V
input range, 60 Hz

3 years
warranty on the UPS

Product Overview
FERRUS RT 1–3 kVA

Single-phase online double-conversion UPS for 120 V loads, 1 to 3 kVA, in one 19-inch, 2U chassis: in a rack or upright on two stands.

Main Features

Online
double conversion: the inverter feeds the load, 0 ms transfer

kVA = kW
output power factor 1: every VA a usable watt

50–150 V
input window: brownouts stay on the mains

Online + ECO
online or ECO mode, set from the panel

1–4
battery packs of the UPS's DC voltage per UPS

80.8 min
longest backup at full load

1–8 A
charger set to the packs, 9–200 Ah

2U
19-inch rack or tower on two stands

Key Data

Ratings	1, 1.5, 2, 3 kVA
Output power	1,000 W–3,000 W (PF 1)
Input	50–150 V AC, 60 Hz ±5 Hz
Output	100 / 110 / 115 / 120 V AC, sine wave
Efficiency	up to 93 %
Battery	12 V 9 Ah VRLA inside: 2, 4, 6 blocks

Backup, full load	4.2–6 min inside; up to 80.8 min with packs
Size, W × D × H	17.3 × 17.3–22.8 × 3.4 in (2U)
Weight	41.8–61.7 lb
Communication	RS232, slot for SNMP-M or dry contacts, EPO, USB optional
Standards · warranty	UL 1778 standard · 3 years UPS, 2 years VRLA batteries

Models

1 kVA
- 1,000 VA / 1,000 W
- 17.3 × 17.3 × 3.4 in
- 41.8 lb
- Battery 2 × 12 V 9 Ah
- 8 × 5-15R
- Backup 4.2 min full load

1.5 kVA
- 1,500 VA / 1,500 W
- 17.3 × 17.3 × 3.4 in
- 48.5 lb
- Battery 4 × 12 V 9 Ah
- 8 × 5-20R
- Backup 6 min full load

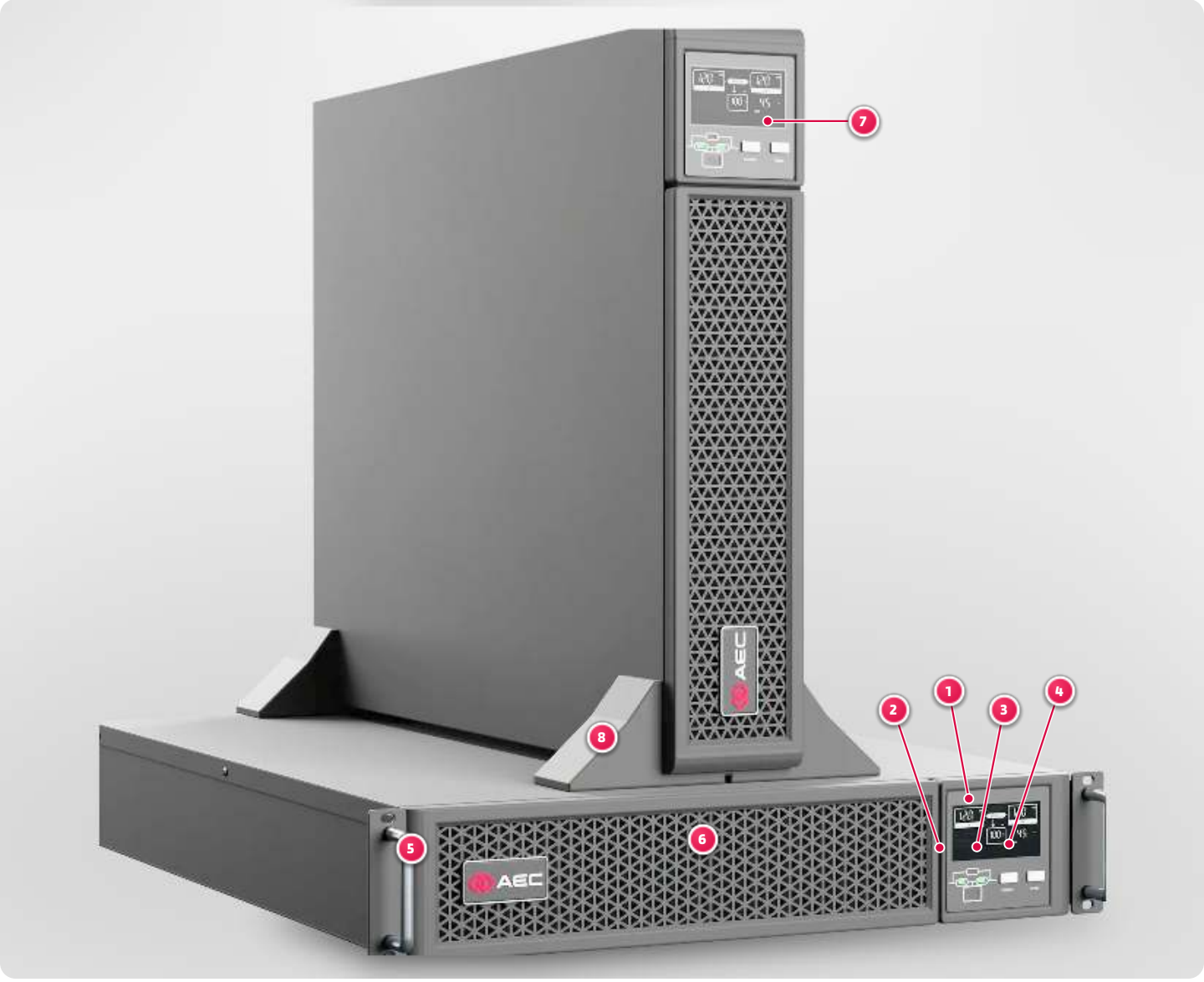
2 kVA
- 2,000 VA / 2,000 W
- 17.3 × 17.8 × 3.4 in
- 51.8 lb
- Battery 4 × 12 V 9 Ah
- 8 × 5-20R
- Backup 4.2 min full load

3 kVA
- 3,000 VA / 3,000 W
- 17.3 × 22.8 × 3.4 in
- 61.7 lb
- Battery 6 × 12 V 9 Ah
- 6 × 5-20R + 1 × L5-30R
- Backup 4.2 min full load

FERRUS RT · FRONT VIEW

Front View
FERRUS RT 1–3 kVA

One 2U front for every rating: the LCD, the status LEDs and two keys. In the rack on its ears, or upright on two stands.



1 LCD
readings and power flow, black screen

2 Status LEDs
REC, INV, BYP, BAT on the power-flow mimic

3 ON/OFF key
start, stop, transfer to bypass

4 FUNC key
pages, mute, settings

5 Rack ears and handles
19-inch rack, 2- or 4-post

6 Front grille
air in at the front

7 LCD, turned
as a tower the reading turns with the unit

8 Two stands
the same 2U chassis upright

Rear View
FERRUS RT 1–3 kVA

The back of every rating, 1, 1.5, 2 and 3 kVA, its parts numbered, and what each rating carries.

FERRUS RT 1 kVA



- **Output** 1,000 VA / 1,000 W
- **Size** 17.3 × 17.3 × 3.4 in, 2U
- **Weight** 41.8 lb
- **Input** IEC C14 inlet
- **Outlets, NEMA** 8 × 5-15R
- **Battery** 2 × 12 V 9 Ah, 24 V DC · packs BAT0424RT
- **Backup, full load** 4.2 min

FERRUS RT 1.5 and 2 kVA



- **Output** 1,500 VA / 1,500 W · 2,000 VA / 2,000 W
- **Size** 17.3 × 17.3 × 3.4 in · 17.3 × 17.8 × 3.4 in, 2U
- **Weight** 48.5 lb · 51.8 lb
- **Input** NEMA 5-20P cord
- **Outlets, NEMA** 8 × 5-20R
- **Battery** 4 × 12 V 9 Ah, 48 V DC · packs BAT0848RT
- **Backup, full load** 6 min · 4.2 min

FERRUS RT 3 kVA



- **Output** 3,000 VA / 3,000 W
- **Size** 17.3 × 22.8 × 3.4 in, 2U
- **Weight** 61.7 lb
- **Input** attached cord, straight-blade plug
- **Outlets, NEMA** 6 × 5-20R + 1 × L5-30R
- **Battery** 6 × 12 V 9 Ah, 72 V DC · packs BAT1272RT
- **Backup, full load** 4.2 min

1 Input
Input socket or power cord.

2 Input surge protection
Resettable protector of the input.

3 Output sockets
NEMA outlets in two groups.

4 Intelligent slot
Dry-contact card or SNMP card.

5 USB
Optional.

6 RS232
DB9 port for monitoring software.

7 External battery terminal
For the battery packs (long backup).

8 EPO
Normally closed: opening it turns the UPS off.

9 NEMA L5-30R
30 A twist-lock output, 3 kVA.

Display and Controls
FERRUS RT 1–3 kVA

The black LCD of FERRUS RT, its status LEDs and its two keys; the reading turns with the unit, rack or tower.



Shown in normal online operation: 120 V in and out, battery 100 %, load 45 %.

1. **Input**
   voltage (VAC), frequency (Hz) or current (A), page by page
2. **Output**
   the same readings for the output
3. **Power flow**
   AC/DC/AC lit in online operation; BYP on bypass
4. **Battery**
   voltage, current, capacity %, LOW; the arrow shows charge or discharge
5. **Load · version · code**
   load in kW, kVA or %; firmware; model; a warning code with the triangle
6. **Alarm and settings**
   buzzer, mute, OV LOAD, SHORT, ECO and the setting gear

Status LEDs

LED	Steady	Flashing	Off
REC	green: rectifier normal	green: rectifier starting	rectifier not working
INV	green: inverter normal	green: starting or tracking the bypass (ECO)	inverter not working
BYP	yellow: on bypass	yellow: bypass alarm	normal mode, bypass good
BAT	yellow: battery discharging	yellow: no battery or battery alarm	battery connected

Keys

Key	Function
ON/OFF	starts the inverter; held 2.5 s: load to bypass, or on battery the UPS shuts down; held 5 s without mains: cold start
FUNC	next page; held 1.5 s: mute (page 1) or clear a fault (page 4)
FUNC + ON/OFF	held 2.5 s together: the settings, applied after a restart

Online + ECO
online or ECO mode

100–120 V
output voltage

9–200 Ah
battery capacity

1–8 A
charger, long backup

Battery and Runtime
FERRUS RT 1–3 kVA

Every FERRUS RT has its batteries inside; one to four battery packs of the same voltage add runtime. Times at full load, new batteries.

Backup time at full load

FERRUS RT 1 · 2 · 3 kVA

Internal batteries	4.2 min
+ 1 battery pack	10 min
+ 2 battery packs	23.7 min
+ 3 battery packs	39.4 min
+ 4 battery packs	56.4 min

FERRUS RT 1.5 kVA

Internal batteries	6 min
+ 1 battery pack	14.3 min
+ 2 battery packs	34 min
+ 3 battery packs	56.4 min
+ 4 battery packs	80.8 min

Runtime at 100 % load; at lighter loads it is longer.



BAT...RT battery packs share the UPS's 19-inch chassis: 2U, 3U or 4U by rating.

The battery packs

Code	Blocks · DC	W × D × H, in	Height	Weight
BAT0424RT	4 × 12 V 9 Ah · 24 V DC	17.3 × 17.3 × 3.4	2U	35.4 lb
BAT0848RT	8 × 12 V 9 Ah · 48 V DC	17.3 × 17.3 × 5.2	3U	64.8 lb
BAT1272RT	12 × 12 V 9 Ah · 72 V DC	17.3 × 22.8 × 7	4U	94.2 lb

Packs of the UPS's DC voltage: BAT0424RT for 1 kVA, BAT0848RT for 1.5 and 2 kVA, BAT1272RT for 3 kVA; one to four per UPS.

Battery care

- Charge at least 12 hours before first use.
- Internal blocks and packs: replace as a full set, same type and capacity.
- Temperature, life and storage as FERRUS: p. 25.

Adding battery packs: three steps

01

Same DC voltage as the UPS
BAT0424RT (24 V DC) for the 1 kVA, BAT0848RT (48 V DC) for the 1.5 and 2 kVA, BAT1272RT (72 V DC) for the 3 kVA; one to four per UPS.

02

Under the UPS or beside it
The packs share the 17.3 in width of the 2U chassis: in the rack under the UPS, or standing beside it.

03

Wired and set
Each pack on the external battery terminal of the UPS; the capacity, 9 to 200 Ah, and the charger, 1 to 8 A, set from the panel.

24 · 48 · 72 V
battery DC voltage

12 V 9 Ah
VRLA blocks, sealed

1–8 A
charger, long-backup set-ups

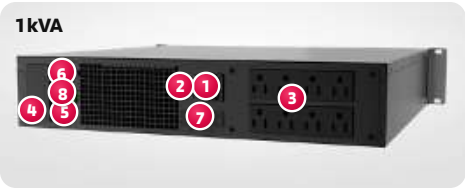
≧ 12 h
first charge

Technical Specifications
FERRUS RT 1–3 kVA

Model	1 kVA	1.5 kVA	2 kVA	3 kVA
Power (VA / W)	1,000 / 1,000	1,500 / 1,500	2,000 / 2,000	3,000 / 3,000
INPUT				
Voltage · frequency	50–150 V AC · 60 Hz ±5 Hz, single-phase			
Power factor	> 0.99 at full load			
Current, max.	10 A	20 A		30 A
Connection	IEC C14 inlet	NEMA 5-20P cord		attached cord, straight-blade plug
OUTPUT				
Voltage	100 / 110 / 115 / 120 V AC, set from the panel			
Frequency · waveform	60 Hz (50 / 60 Hz settable) · sine wave			
Current	8.3 A	—	16.6 A	25 A
Outlets	8 × 5-15R	8 × 5-20R		6 × 5-20R + 1 × L5-30R
Efficiency, up to	93 %			
Modes	online (S) · ECO (E) · bypass · cold start from battery			
BATTERY				
Internal	2 × 12 V 9 Ah	4 × 12 V 9 Ah		6 × 12 V 9 Ah
DC voltage	24 V DC	48 V DC		72 V DC
Charger	1 A standard · 1–8 A with battery packs			
Backup at 50 % · 100 %	10 min · 4.2 min	14 min · 6 min	10 min · 4.2 min	
Recharge	at least 12 h for a full charge			
GENERAL				
Communication	RS232 · intelligent slot (dry contacts or SNMP-M) · EPO · USB optional			
Display	LCD, 4 LEDs, 2 buttons			
Environment	32–104 °F (0–40 °C) · RH < 95 % · 3,300 ft (1,000 m) at full power			
W × D × H in	17.3 × 17.3 × 3.4		17.3 × 17.8 × 3.4	17.3 × 22.8 × 3.4
W × D × H mm	439 × 439 × 86		439 × 452 × 86	439 × 579 × 86
Weight	41.8 lb (19 kg)	48.5 lb (22 kg)	51.8 lb (23.5 kg)	61.7 lb (28 kg)
Standards	UL 1778 standard			
Warranty	3 years on the UPS · 2 years on VRLA batteries			

— The output current of the 1.5 kVA is not published. Runtimes with new batteries. Specifications are subject to change without notice.

REAR PANELS



OUTLETS 8 × NEMA 5-15R

1. **Input** · Input socket or power cord
4. **Intelligent slot** · Dry-contact card or SNMP card
7. **External battery terminal** · For the battery packs (long backup)



OUTLETS 8 × NEMA 5-20R

2. **Input surge protection** · Resettable protector of the input
5. **USB** · Optional
8. **EPO** · Normally closed: opening it turns the UPS off



OUTLETS 6 × NEMA 5-20R + 1 × L5-30R

3. **Output sockets** · NEMA outlets in two groups
6. **RS232** · DB9 port for monitoring software
9. **NEMA L5-30R** · 30 A twist-lock output, 3 kVA

Ordering Information
FERRUS RT 1–3 kVA

FER 3000RT -6X9 +BAT1272RT x2

series	VA, rack / tower	6 × 12 V 9 Ah	battery pack	1 to 4

EXAMPLES

FER1000RT-2X9
FERRUS RT 1 kVA, internal batteries

FER3000RT-6X9+BAT1272RTx2
FERRUS RT 3 kVA with two battery packs

Code	Description
FER1000RT-2X9	FERRUS RT 1 kVA online UPS, 2U rack / tower, internal batteries
FER1000RT-2X9+BAT0424RT	FERRUS RT 1 kVA with 1 × BAT0424RT battery pack
FER1000RT-2X9+BAT0424RTx2	FERRUS RT 1 kVA with 2 × BAT0424RT battery packs
FER1000RT-2X9+BAT0424RTx3	FERRUS RT 1 kVA with 3 × BAT0424RT battery packs
FER1000RT-2X9+BAT0424RTx4	FERRUS RT 1 kVA with 4 × BAT0424RT battery packs
FER1500RT-4X9	FERRUS RT 1.5 kVA online UPS, 2U rack / tower, internal batteries
FER1500RT-4X9+BAT0848RT	FERRUS RT 1.5 kVA with 1 × BAT0848RT battery pack
FER1500RT-4X9+BAT0848RTx2	FERRUS RT 1.5 kVA with 2 × BAT0848RT battery packs
FER1500RT-4X9+BAT0848RTx3	FERRUS RT 1.5 kVA with 3 × BAT0848RT battery packs
FER1500RT-4X9+BAT0848RTx4	FERRUS RT 1.5 kVA with 4 × BAT0848RT battery packs
FER2000RT-4X9	FERRUS RT 2 kVA online UPS, 2U rack / tower, internal batteries
FER2000RT-4X9+BAT0848RT	FERRUS RT 2 kVA with 1 × BAT0848RT battery pack
FER2000RT-4X9+BAT0848RTx2	FERRUS RT 2 kVA with 2 × BAT0848RT battery packs
FER2000RT-4X9+BAT0848RTx3	FERRUS RT 2 kVA with 3 × BAT0848RT battery packs
FER2000RT-4X9+BAT0848RTx4	FERRUS RT 2 kVA with 4 × BAT0848RT battery packs
FER3000RT-6X9	FERRUS RT 3 kVA online UPS, 2U rack / tower, internal batteries
FER3000RT-6X9+BAT1272RT	FERRUS RT 3 kVA with 1 × BAT1272RT battery pack
FER3000RT-6X9+BAT1272RTx2	FERRUS RT 3 kVA with 2 × BAT1272RT battery packs
FER3000RT-6X9+BAT1272RTx3	FERRUS RT 3 kVA with 3 × BAT1272RT battery packs
FER3000RT-6X9+BAT1272RTx4	FERRUS RT 3 kVA with 4 × BAT1272RT battery packs
BAT0424RT	Battery pack, 19-inch rack, 24 V DC, 4 × 12 V 9 Ah, for FERRUS RT 1 kVA
BAT0848RT	Battery pack, 19-inch rack, 48 V DC, 8 × 12 V 9 Ah, for FERRUS RT 1.5 and 2 kVA
BAT1272RT	Battery pack, 19-inch rack, 72 V DC, 12 × 12 V 9 Ah, for FERRUS RT 3 kVA
SNMP-M	SNMP-M network card: web pages, SNMP v1/v2c/v3, Modbus TCP/IP and MQTT; for FERRUS, FERRUS RT, FERRUS SP, FERRUS SP RT, RADIANT, RADIANT-IB, CIRRO-IB and CIRRO
DRYCNT	Dry-contact relay card: mains failure, battery low, UPS fault, bypass; all AEC UPS series

AEC

SPLIT-PHASE ONLINE UPS · ISOLATION TRANSFORMER

FERRUS SP

6–20 kVA

Online double conversion with an output isolation transformer, for 120/240 V split-phase loads: towers with internal batteries and matching battery cabinets.



FERRUS SP 6–10 AND 20 KVA TOWERS

120/240 V
split-phase output

kVA = kW
output power factor 1

93 %
efficiency, up to

Isolation
transformer integrated

Product Overview
FERRUS SP 6–20 kVA

ISOLATION

Isolation transformer

No wire runs from the supply to the loads: noise and faults on the mains stay on the mains side.

- isolated on the bypass too
- for mixed and motor loads

SPLIT-PHASE

120/240 V, four ways

Jumpers on the output terminals set the output for the site.

- two separate 120 V outputs
- one 240 V output, full rating

CLEAN POWER

Online double conversion

PFC input and IGBT inverter: sags and spikes never reach the load.

- input power factor > 0.99
- output THD < 2.5 %, up to 93 %

120/240 V split-phase

Two 120 V legs, 240 V across them.

Isolation transformer

The output isolated from the supply.

kVA = kW

Output power factor 1.

PFC input

Input power factor above 0.99.

Online, up to 93 %

Double conversion; ECO mode selectable.

Color touchscreen

Readings, settings, logs, two access levels.

Parallel ×3, N+1

Up to three units of one rating.

Maintenance bypass

Service with the load on the mains.

Key data

	6 kVA	10 kVA	20 kVA	20 kVA EMPTY
Power (W)	6,000	10,000	20,000	20,000
Battery inside	16 × 12 V 9 Ah inside	16 × 12 V 9 Ah inside	40 × 12 V 9 Ah inside	none: room for 40 × 12 V 9 Ah
DC bus	192 V DC	192 V DC	240 V DC	240 V DC
Backup 100 % · 50 %	6 min · 14 min	3.2 min · 7.5 min	4.2 min · 10 min	batteries not supplied
W × D × H	9.8 × 23.6 × 29.1 in	9.8 × 23.6 × 29.1 in	13.7 × 25 × 47.2 in	13.7 × 25 × 47.2 in
Weight	196.2 lb	235.9 lb	452 lb	218.3 lb

INPUT
176–275 V AC, 40–70 Hz, PF > 0.99

OUTPUT
120/240 V split-phase, 60 Hz, THD < 2.5 %

EFFICIENCY
up to 93 %

PARALLEL
up to 3 units, N+1

STANDARDS
UL 1778 standard

Front View
FERRUS SP 6–20 kVA



1 Color touchscreen
AEC interface: power flow, readings, settings, tests and logs.

2 Status LEDs
ALM, BYP, BAT, INV and buzzer mute, beside the screen.

3 Power button
On and off, as on the screen's Control page.

4 AEC badge
At the top corner of the front.

5 Front grille
Air in at the front, out through the transformer fan at the back.

6 Casters
The tower rolls into place; 9.8 in wide, 29.1 in high.

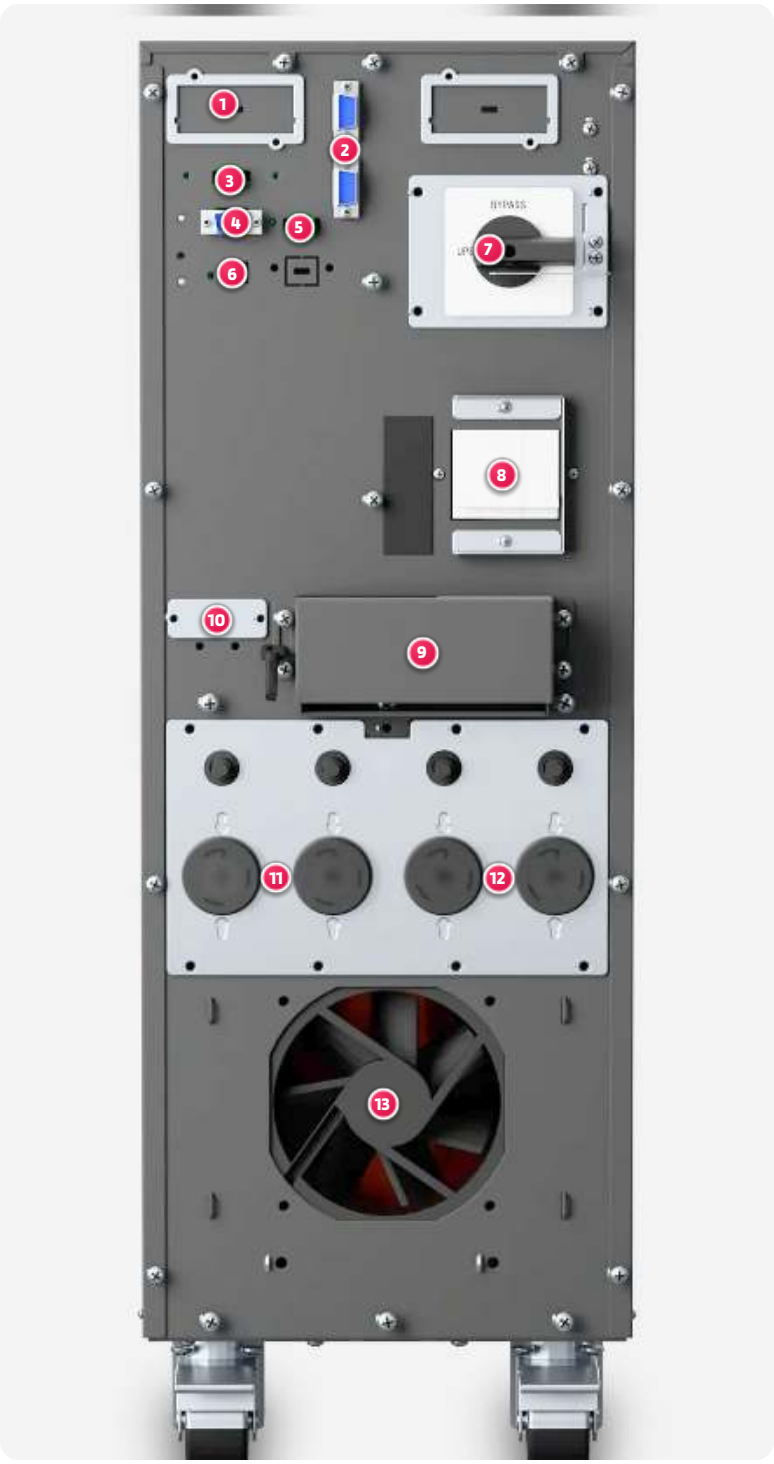
Status LEDs

○	**ALM**	Alarm: lit on a fault or a warning
○	**BYP**	Bypass: lit while the load is on the bypass
○	**BAT**	Battery: lit while the battery supplies the load
●	**INV**	Inverter: lit while the inverter supplies the load
○	**Mute**	The buzzer is muted

Normal operation: INV alone lit.

The 6, 10 and 20 kVA towers carry the same front panel; the 20 kVA-40X9, with 40 × 12 V 9 Ah inside, is wider and taller.

Rear View
FERRUS SP 6–10 kVA



FERRUS SP 6–10 kVA, rear

1. **Intelligent slots**
   Two: SNMP-M card and dry-contact card at once.

2. **Parallel ports**
   For the parallel cables, up to three units.

3. **RS485**
   Modbus link.

4. **RS232**
   DB9 for monitoring software.

5. **EPO**
   Normally closed loop.

6. **USB**
   Monitoring software.

7. **Maintenance bypass**
   UPS or BYPASS: the load stays on the mains for service.

8. **Mains and bypass breakers**
   Of the split-phase input and the bypass.

9. **Terminal strip**
   PE, input L1 and L2, output L1 N1 L2 N2: 120 V and 240 V.

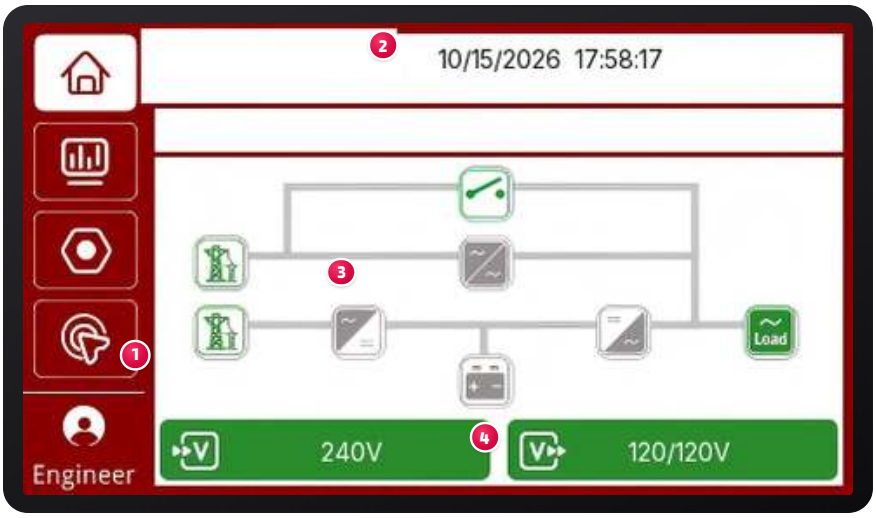
10. **Battery terminals**
    BAT+ and BAT– for battery cabinets.

11. **NEMA L5-30R**
    30 A outlets, 120 V, with output surge protection.

12. **NEMA L6-30R**
    30 A outlets, 240 V, with output surge protection.

13. **Transformer fan**
    Cooling of the output transformer.

Touchscreen Interface
FERRUS SP 6–20 kVA





Data menu
Bypass, Input, Output, Load, Battery and Information; page 1 of 2.

1 Side menu
Home and Data pages and two more; the user level logged in below (Engineer).

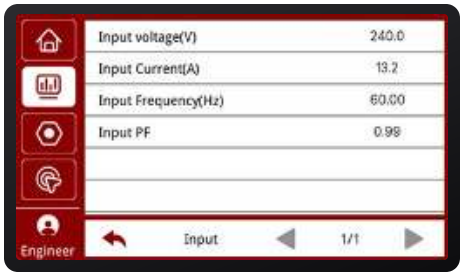
2 Status bar
The current message, buzzer mute, date and time.

3 Power flow
Mains, bypass switch, rectifier, inverter, battery and load, each shown green or grey.

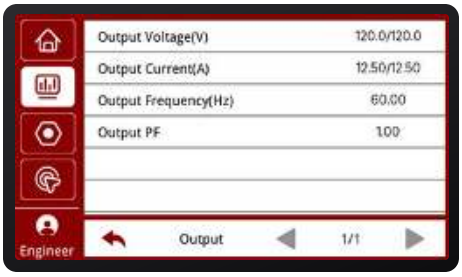
4 Input and output
Input voltage, and the output voltage of the two legs.



Data · Bypass
Bypass voltage, current, frequency and power factor.



Data · Input
Input voltage, current, frequency and power factor.



Data · Output
Voltage and current of the two legs, frequency and power factor.

Access and functions

Access levels
User: home, data, logs, mute. Engineer: settings and tests.

ECO mode
System mode E: the load on the bypass while the mains is good.

Battery self-test
A short discharge tests the batteries; a failure raises an alarm.

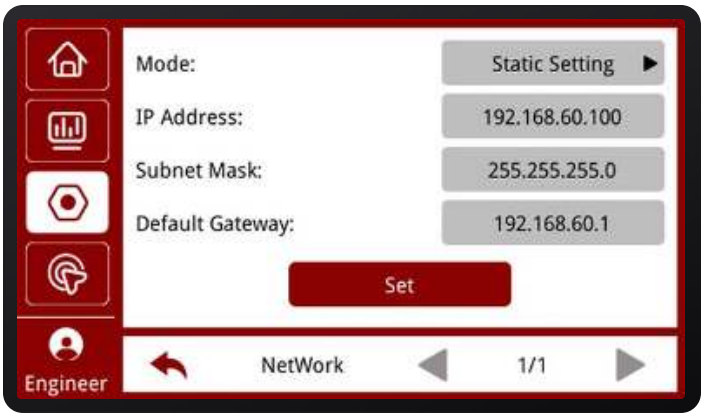
Cold start
No mains: COLD START, then ON/OFF: the UPS runs on battery.

The screens are the same on FERRUS SP and FERRUS SP RT.

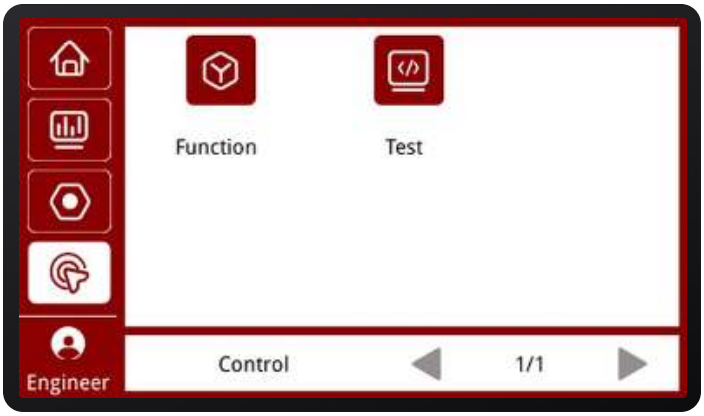
Touchscreen Menus
FERRUS SP 6–20 kVA



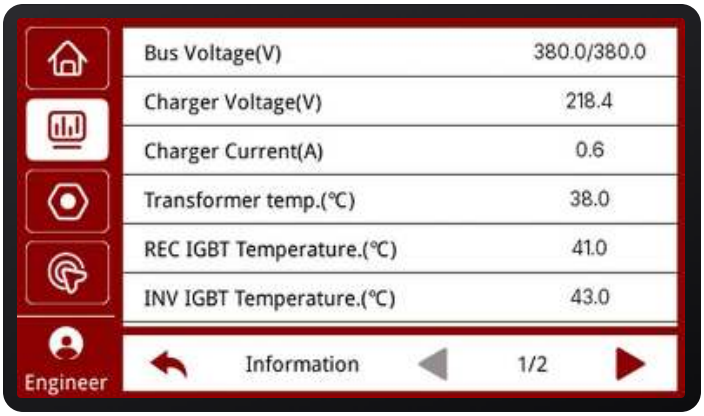
Set menu
Language, Sys Func, NetWork, Display Set, Comm Set and BATT Set; page 1 of 2.



Set · NetWork
Mode Static Setting; IP address, subnet mask and default gateway, applied with Set.



Control menu
Two pages: Function and Test.



Data · Information
Bus, charger voltage and current; transformer, rectifier and inverter IGBT temperatures; page 1 of 2.

What the settings set

Rated values
Input and output voltage and frequency, set for the site.

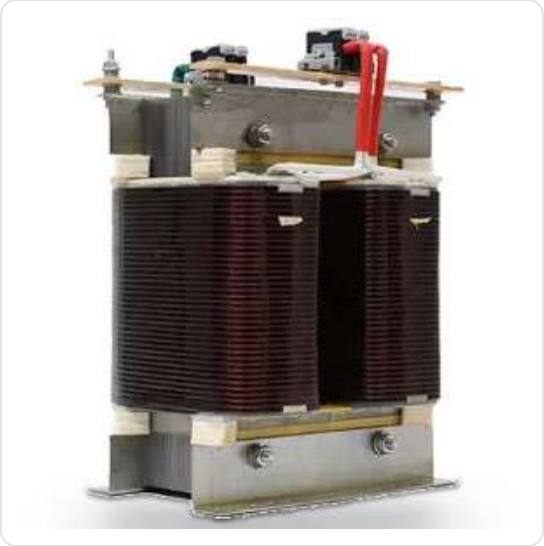
Battery
Number of 12 V blocks, 10 to 20 (120–240 V DC), capacity in Ah and charger current.

System mode
Single, parallel with a unit ID, ECO, or self-aging.

Communication
RS-232 and RS-485: baud rate, ID 1 to 32 and protocol (Modbus).

Settings at the engineer level; new settings take effect after a restart.

Isolation Transformer Technology
FERRUS SP 6–20 kVA



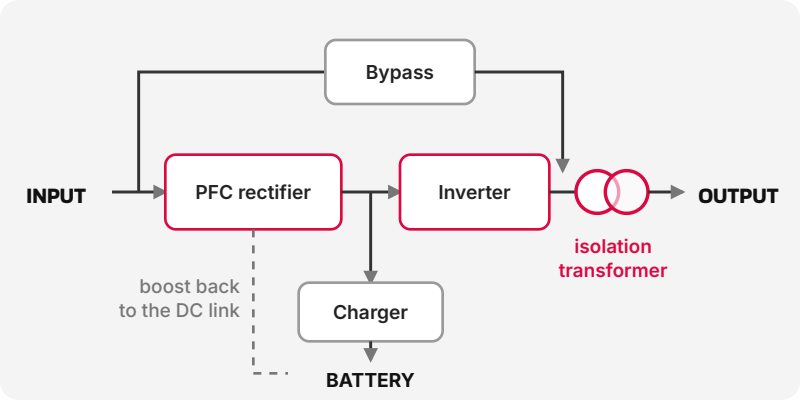
Galvanic isolation
No wire runs from the supply to the loads: the power crosses the transformer as a magnetic field, so noise and faults on the mains stay on the mains side.

120 V and 240 V from one UPS
Two secondary windings make the two 120 V legs; in series, 240 V. Jumpers on the output terminals choose the wiring.

Isolated on the bypass too
The bypass joins ahead of the transformer: the loads stay on its windings in bypass mode; mains disturbances are not filtered there.

For mixed and motor loads
120 V equipment and 240 V machines on the same UPS, as on a panel board.

Working principle



At the input, surge suppression (TVSS) and EMI/RFI filters; a 3-level IGBT inverter.

Operating modes

Line mode
PFC and inverter feed the load; the charger float-charges the battery.

Battery mode
Mains abnormal: the battery takes over without interrupting the output.

Bypass mode
Overload, over-temperature or a fault: the load moves to the bypass automatically.

ECO mode
System mode E: the load stays on the bypass while it is good.

Facts

180°
Between the two legs
L1–N1 and L2–N2 in opposition, as in a North American split-phase service.

110–127 V
Per leg
110, 115, 120 or 127 V on each leg; 220, 230 or 240 V from L1 to N2.

100 %
Of the rating on one output
One 120 V or one 240 V output carries the full rating; two separate 120 V outputs, 50 % each.

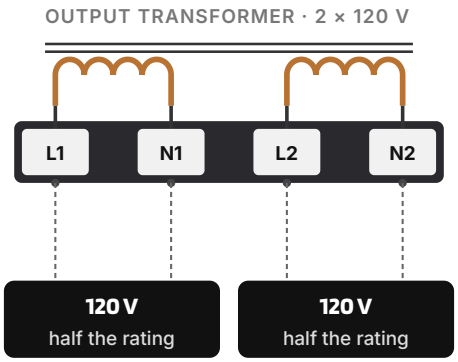
25 · 42 · 84 A
Per leg at 120 V
Output current of the 6, 10 and 20 kVA models on each 120 V leg.

Output Configurations
FERRUS SP 6–20 kVA

Two 120 V legs from the isolation transformer; jumpers on the output terminals set the output for the site. In a parallel system every unit uses the same configuration.

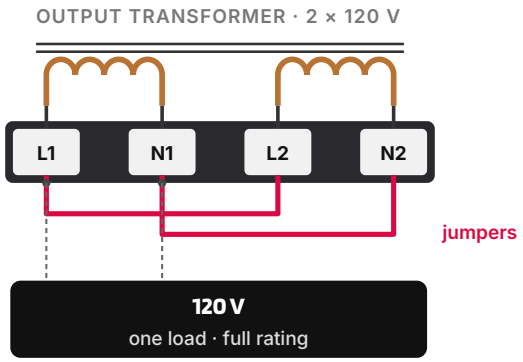
01 Two separate 120 V outputs

Load 1 on L1–N1, load 2 on L2–N2; half the rating each.



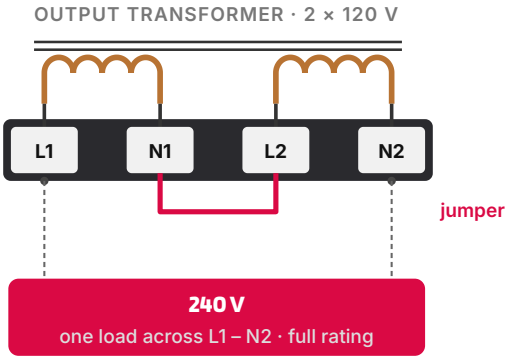
02 One 120 V output

L1 jumpered to L2 and N1 to N2: the full rating at 120 V.



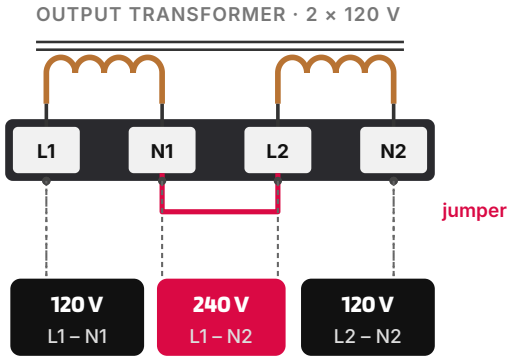
03 One 240 V output

N1 jumpered to L2: the full rating at 240 V, L1 to N2.



04 120 V and 240 V together

N1–L2 jumpered: 120 V on each leg, 240 V across.



Terminal strip

PE	protective earth
I/P L1 · L2	split-phase input
O/P L1 · N1	120 V output, leg 1
O/P L2 · N2	120 V output, leg 2
BAT+ · BAT–	external battery

Outlets · 6 and 10 kVA towers



2 × NEMA L5-30R
120 V, 30 A



2 × NEMA L6-30R
240 V, 30 A

Battery and Runtime
FERRUS SP 6–20 kVA

The 6 and 10 kVA towers carry 16 blocks inside, the 20 kVA 40; BB4US cabinets add 32, 64 or 80 blocks. Times at full load, new batteries.

Backup time at full load

FERRUS SP 6 kVA

Internal batteries	6 min
+ BB4US 32 × 9 Ah	24 min
+ BB4US 64 × 9 Ah	45 min
+ BB4US 80 × 9 Ah	57 min

FERRUS SP 10 kVA

Internal batteries	3.2 min
+ BB4US 32 × 9 Ah	13 min
+ BB4US 64 × 9 Ah	24 min
+ BB4US 80 × 9 Ah	30 min

FERRUS SP 20 kVA

Internal batteries	4.2 min

Runtime at 100 % load; at lighter loads it is longer.



BB4US battery cabinet: up to 80 blocks of 12 V 9 Ah inside, 9.8 in wide.

Backup time by load

Set-up	100 %	75 %	50 %	25 %
6 kVA + BB4US 32 × 9 Ah	24	31	56	107
6 kVA + BB4US 64 × 9 Ah	45	59	107	3 h 22
6 kVA + BB4US 80 × 9 Ah	57	74	2 h 15	4 h 14
10 kVA + BB4US 32 × 9 Ah	13	17	30	56
10 kVA + BB4US 64 × 9 Ah	24	32	57	107
10 kVA + BB4US 80 × 9 Ah	30	40	72	2 h 15

Battery care

- Operate at 59–77 °F (15–25 °C) for rated battery life.
- Long-backup set-ups: battery capacity above 24 Ah.
- Open the external battery breaker before opening any cover.
- Check the polarity of external batteries with a voltmeter before connecting.

Adding a battery cabinet

01 The same 192 V DC string as inside the UPS.

02 Wired to BAT+ and BAT−, the cabinet breaker open.

03 Battery set-up entered on the touchscreen.

192 · 240 V
battery DC bus

12 V 9 Ah
VRLA blocks, sealed

1–8 A
charger, long-backup set-ups

10–20
blocks per string, set on the panel

Technical Specifications
FERRUS SP 6–20 kVA

Model	6 kVA	10 kVA	20 kVA
Power (VA / W)	6,000 / 6,000	10,000 / 10,000	20,000 / 20,000
INPUT			
Voltage · frequency	176–275 V AC at full load · 40–70 Hz		
Power factor	> 0.99 at full load		
Current, max.	36 A	63 A	125 A
OUTPUT			
Voltage	120/240 V split-phase (110 / 115 / 120 / 127 V per leg) · 240 V single output		
Regulation · frequency	1 % · 60 Hz, 0.1 % of nominal		
THD · crest factor	< 2.5 % at full linear load · 3 : 1		
Overload	110 % 10 min · 130 % 1 min · 150 % 30 s, then bypass		
Efficiency, up to	93 %		
Outlets	terminal strip · 6 and 10 kVA: 2 × L5-30R, 2 × L6-30R		
BATTERY			
Configuration	16 × 12 V 9 Ah inside		40 × 12 V 9 Ah inside
DC voltage	192 V DC		240 V DC
Backup at 50 % · 100 %	14 min · 6 min	7.5 min · 3.2 min	10 min · 4.2 min
GENERAL			
Communication	RS232 · RS485 · USB · 2 intelligent slots (SNMP-M and dry contacts) · EPO · parallel ports		
Parallel	up to 3 units, N+1		
Environment · clearance	32–104 °F (0–40 °C) · RH < 95 % · 3,300 ft (1,000 m) at full power · 20 in (0.5 m) clear on each side, vents open		
W × D × H in	9.8 × 23.6 × 29.1		13.7 × 25 × 47.2
W × D × H mm	249 × 599 × 739		348 × 635 × 1,199
Weight	196.2 lb (89 kg)	235.9 lb (107 kg)	452 lb (205 kg)
Standards	UL 1778 standard		
Warranty	3 years on the UPS · 2 years on VRLA batteries		

Options

BB4US

Battery cabinet, 192 V DC

Up to 80 × 12 V 9 Ah blocks: empty, or with 32, 64 or 80 installed. 9.8 × 33.5 × 28.5 in, 110 lb empty.

SNMP-M

SNMP card

Web pages, SNMP v1/v2c/v3, Modbus TCP/IP and MQTT.

DRYCNT

Dry-contact card

Signals as voltage levels from the card's 12–24 V DC supply: UPS fault, warning, bypass, battery low, normal mode, utility fault; a remote shutdown input.

The 20 kVA also comes with its battery compartment supplied empty (FERSP20000-EMPTY), same electrical data. Subject to change without notice.

Ordering Information
FERRUS SP 6–20 kVA

FERSP 10000 -16X9 +BB4US-32X9

series	rating in VA	battery: 16 × 12 V 9 Ah, internal	battery cabinet and its blocks

RATING
6000, 10000 or 20000 VA

BATTERY INSIDE
-16X9 on the 6 and 10 kVA;
-40X9 or -EMPTY on the 20 kVA

CABINET
+BB4US-32X9, -64X9 or -80X9, on the 6 and 10 kVA

EXAMPLES

FERSP6000-16X9
FERRUS SP 6 kVA

FERSP10000-16X9+BB4US-64X9
10 kVA with a BB4US of 64 blocks

Code	Description
FERSP6000-16X9	FERRUS SP 6 kVA split-phase online UPS, tower, internal batteries
FERSP6000-16X9+BB4US-32X9	FERRUS SP 6 kVA with BB4US cabinet, 32 × 12 V 9 Ah
FERSP6000-16X9+BB4US-64X9	FERRUS SP 6 kVA with BB4US cabinet, 64 × 12 V 9 Ah
FERSP6000-16X9+BB4US-80X9	FERRUS SP 6 kVA with BB4US cabinet, 80 × 12 V 9 Ah
FERSP10000-16X9	FERRUS SP 10 kVA split-phase online UPS, tower, internal batteries
FERSP10000-16X9+BB4US-32X9	FERRUS SP 10 kVA with BB4US cabinet, 32 × 12 V 9 Ah
FERSP10000-16X9+BB4US-64X9	FERRUS SP 10 kVA with BB4US cabinet, 64 × 12 V 9 Ah
FERSP10000-16X9+BB4US-80X9	FERRUS SP 10 kVA with BB4US cabinet, 80 × 12 V 9 Ah
FERSP20000-40X9	FERRUS SP 20 kVA split-phase online UPS, tower, internal batteries
FERSP20000-EMPTY	FERRUS SP 20 kVA, battery compartment supplied empty
BB4US	Battery cabinet, tower, 192 V DC, empty
BB4US-32X9	Battery cabinet, tower, 192 V DC, 32 × 12 V 9 Ah
BB4US-64X9	Battery cabinet, tower, 192 V DC, 64 × 12 V 9 Ah
BB4US-80X9	Battery cabinet, tower, 192 V DC, 80 × 12 V 9 Ah
SNMP-M	SNMP-M network card: web pages, SNMP v1/v2c/v3, Modbus TCP/IP and MQTT; for FERRUS, FERRUS RT, FERRUS SP, FERRUS SP RT, RADIANT, RADIANT-IB, CIRRO-IB and CIRRO
DRYCNT	Dry-contact card: status signals and a remote shutdown input



FERRUS SP 6 · 10 kVA tower

+



BB4US battery cabinet

32 · 64 · 80

Blocks in the BB4US

12 V 9 Ah blocks: the cabinet is ordered empty or filled, BB4US-32X9 to -80X9. 9.8 × 33.5 × 28.5 in, 110 lb empty; 192 V DC, for the 6 and 10 kVA.

SPLIT-PHASE ONLINE UPS · ISOLATION TRANSFORMER

FERRUS SP RT

6–10 kVA

Online double conversion with an output isolation transformer, for 120/240 V split-phase loads: a rack unit with its battery packs, hardwired.



FERRUS SP RT 6 · 10 kVA, RACK OR TOWER

120/240 V
split-phase output

kVA = kW
output power factor 1

93 %
efficiency, up to

×3
units in parallel, N+1

Product Overview
FERRUS SP RT 6–10 kVA

ISOLATION

Isolation transformer

No wire runs from the supply to the loads: noise and faults on the mains stay on the mains side.

- isolated on the bypass too
- for mixed and motor loads

SPLIT-PHASE

120/240 V, four ways

Jumpers on the output terminals set the output for the site.

- two separate 120 V outputs
- one 240 V output, full rating

CLEAN POWER

Online double conversion

PFC input and IGBT inverter: sags and spikes never reach the load.

- input power factor > 0.99
- output THD < 2.5 %, up to 93 %

120/240 V split-phase

Two 120 V legs, 240 V across them.

Isolation transformer

The output isolated from the supply.

kVA = kW

Output power factor 1.

PFC input

Input power factor above 0.99.

Online, up to 93 %

Double conversion; ECO mode selectable.

Color touchscreen

Readings, settings, logs, two access levels.

Parallel ×3, N+1

Up to three units of one rating.

Rack or tower

19-inch, 4U and 5U, or standing upright.

Key data

	6 kVA	10 kVA
Power	6,000 VA / 6,000 W	10,000 VA / 10,000 W
Chassis	4U, 17.3 in wide	5U, 17.3 in wide
W × D × H	17.3 × 22.8 × 6.7 in	17.3 × 22.8 × 8.5 in
Weight	128 lb	143 lb
Battery	BAT16192RT packs, 1 to 4	BAT16192RT packs, 1 to 4
Backup, 1 pack, 100 % · 50 %	6 min · 14.3 min	3.2 min · 7.5 min
Backup, 4 packs, 100 %	34 min	17.9 min

INPUT
176–275 V AC, 40–70 Hz, PF > 0.99

OUTPUT
120/240 V split-phase, 60 Hz, THD < 2.5 %

EFFICIENCY
up to 93 %

PARALLEL
up to 3 units, N+1

STANDARDS
UL 1778 standard

FERRUS SP RT · FRONT VIEW

Front View
FERRUS SP RT 6–10 kVA



1 Color touchscreen
AEC interface: power flow, readings, settings, tests and logs.

2 Status LEDs
ALM, BYP, BAT, INV and buzzer mute.

3 Power button
On and off, as on the screen's Control page.

4 AEC badge
On the upper grille.

5 Front grilles
Air in at the front, out through the transformer fans at the back.

6 Handles
One on each side, for lifting into the rack.

7 Rack ears
19-inch mounting; 4U (6 kVA) or 5U (10 kVA).

Status LEDs

ALM	Alarm: lit on a fault or a warning	**BYP**	Bypass: lit while the load is on the bypass
BAT	Battery: lit while the battery supplies the load	**INV**	Inverter: lit while the inverter supplies the load
Mute	The buzzer is muted		

Normal operation: INV alone lit.

FERRUS SP RT · REAR VIEW

Rear View
FERRUS SP RT 6–10 kVA



1 Input breaker
Breaker of the split-phase input.

2 Cable entry
Input, output and battery cables, hardwired on the terminal strip: no wall plug, no outlets.

3 Parallel ports
Two ports for the parallel cables.

4 RS232
DB9 for monitoring software.

5 EPO
Normally closed loop: opening it stops the output.

6 RS485
Modbus link.

7 USB
Monitoring software.

8 Intelligent slot
SNMP-M card, or a dry-contact card on DB9 or terminal block.

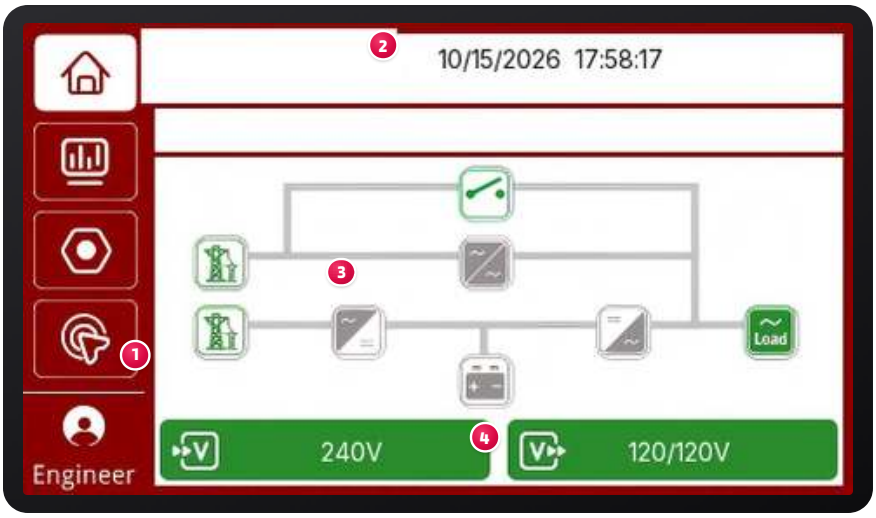
9 Transformer fans
Cooling of the output transformer.

SAFETY
EPO, normally closed
Opening the EPO loop stops the output; wire a remote switch to it.

INSTALLATION
Hardwired
Split-phase input and output on the terminal strip behind the cable entry.

OPTIONS
Intelligent slot
SNMP-M network card, or a dry-contact card on DB9 or terminal block.

Touchscreen Interface
FERRUS SP RT 6–10 kVA





Data menu
Bypass, Input, Output, Load, Battery and Information; page 1 of 2.

1 Side menu
Home and Data pages and two more; the user level logged in below (Engineer).

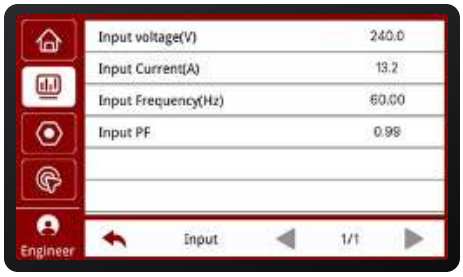
2 Status bar
The current message, buzzer mute, date and time.

3 Power flow
Mains, bypass switch, rectifier, inverter, battery and load, each shown green or grey.

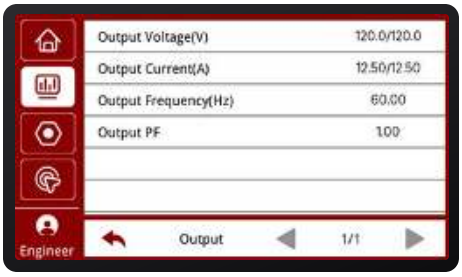
4 Input and output
Input voltage, and the output voltage of the two legs.



Data · Bypass
Bypass voltage, current, frequency and power factor.



Data · Input
Input voltage, current, frequency and power factor.



Data · Output
Voltage and current of the two legs, frequency and power factor.

Access and functions

Access levels
User: home, data, logs, mute. Engineer: settings and tests.

ECO mode
System mode E: the load on the bypass while the mains is good.

Battery self-test
A short discharge tests the batteries; a failure raises an alarm.

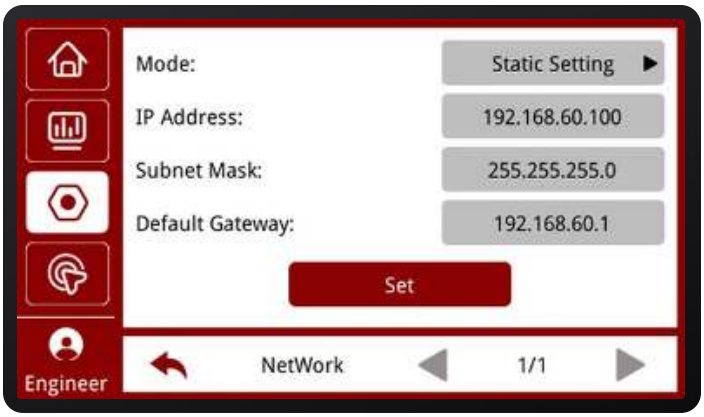
Cold start
No mains: COLD START, then ON/OFF: the UPS runs on battery.

The screens are the same on FERRUS SP and FERRUS SP RT.

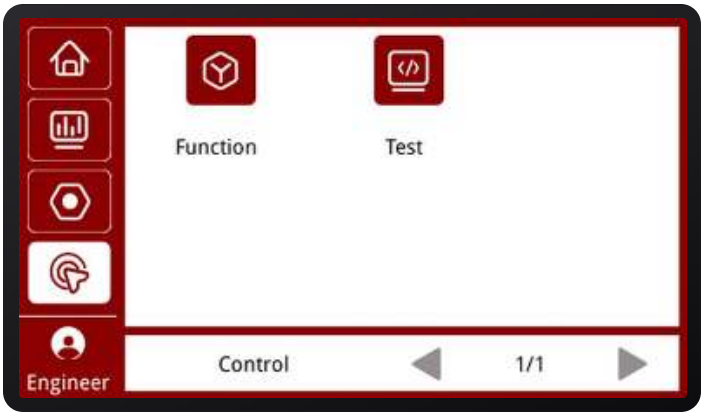
Touchscreen Menus
FERRUS SP RT 6–10 kVA



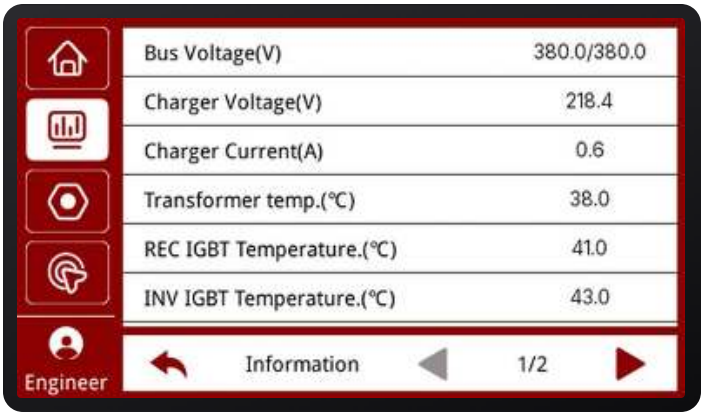
Set menu
Language, Sys Func, NetWork, Display Set, Comm Set and BATT Set; page 1 of 2.



Set · NetWork
Mode Static Setting; IP address, subnet mask and default gateway, applied with Set.



Control menu
Two pages: Function and Test.



Data · Information
Bus, charger voltage and current; transformer, rectifier and inverter IGBT temperatures; page 1 of 2.

What the settings set

Rated values
Input and output voltage and frequency, set for the site.

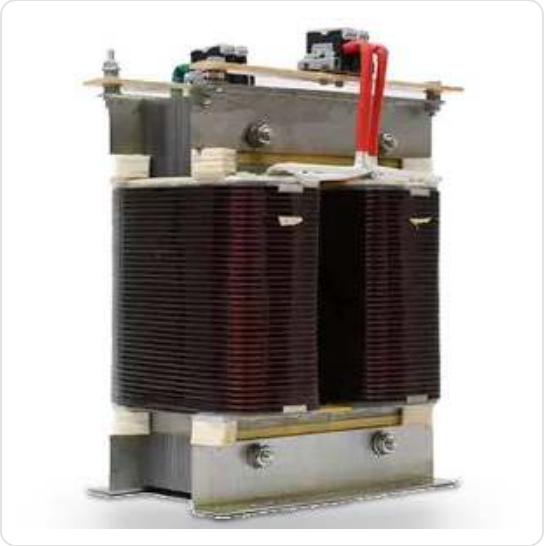
Battery
Number of 12 V blocks, 10 to 20 (120–240 V DC), capacity in Ah and charger current.

System mode
Single, parallel with a unit ID, ECO, or self-aging.

Communication
RS-232 and RS-485: baud rate, ID 1 to 32 and protocol (Modbus).

Settings at the engineer level; new settings take effect after a restart.

Isolation Transformer Technology
FERRUS SP RT 6–10 kVA



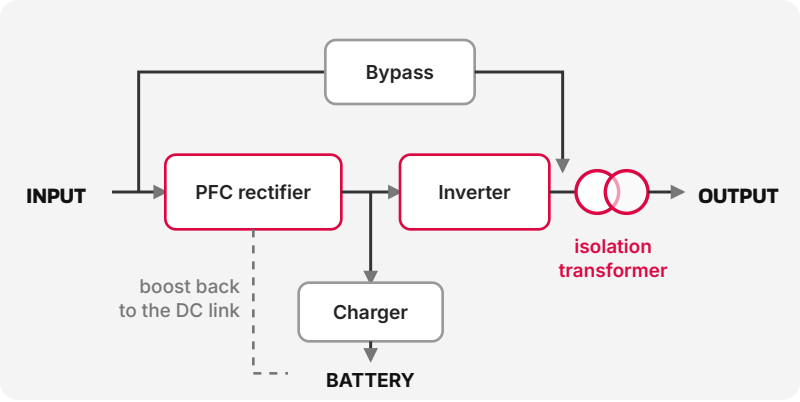
Galvanic isolation
No wire runs from the supply to the loads: the power crosses the transformer as a magnetic field, so noise and faults on the mains stay on the mains side.

120 V and 240 V from one UPS
Two secondary windings make the two 120 V legs; in series, 240 V. Jumpers on the output terminals choose the wiring.

Isolated on the bypass too
The bypass joins ahead of the transformer: the loads stay on its windings in bypass mode; mains disturbances are not filtered there.

For mixed and motor loads
120 V equipment and 240 V machines on the same UPS, as on a panel board.

Working principle



At the input, surge suppression (TVSS) and EMI/RFI filters; a 3-level IGBT inverter.

Operating modes

Line mode
PFC and inverter feed the load; the charger float-charges the battery.

Battery mode
Mains abnormal: the battery takes over without interrupting the output.

Bypass mode
Overload, over-temperature or a fault: the load moves to the bypass automatically.

ECO mode
System mode E: the load stays on the bypass while it is good.

Facts

180°
Between the two legs
L1–N1 and L2–N2 in opposition, as in a North American split-phase service.

110–127 V
Per leg
110, 115, 120 or 127 V on each leg; 220, 230 or 240 V from L1 to N2.

100 %
Of the rating on one output
One 120 V or one 240 V output carries the full rating; two separate 120 V outputs, 50 % each.

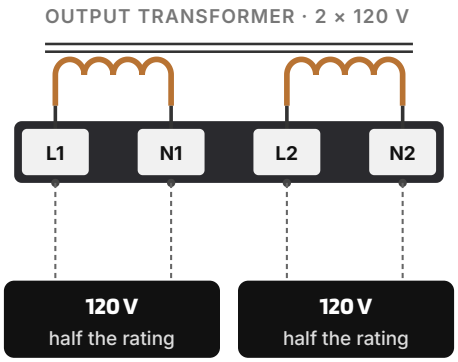
25 · 42 A
Per leg at 120 V
Output current of the 6 and 10 kVA models on each 120 V leg.

Output Configurations
FERRUS SP RT 6–10 kVA

Two 120 V legs from the isolation transformer; jumpers on the output terminals set the output for the site. In a parallel system every unit uses the same configuration.

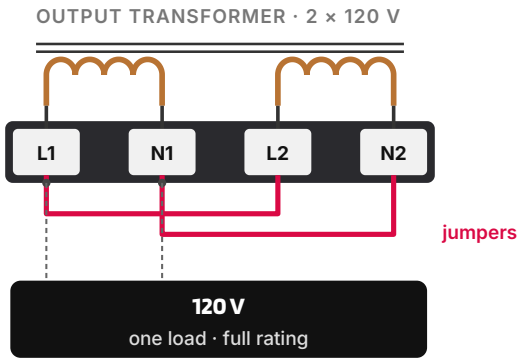
01 Two separate 120 V outputs

Load 1 on L1–N1, load 2 on L2–N2; half the rating each.



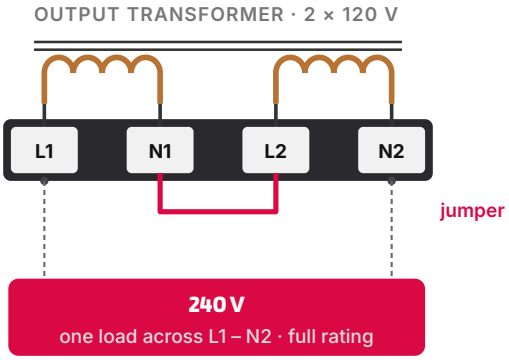
02 One 120 V output

L1 jumpered to L2 and N1 to N2: the full rating at 120 V.



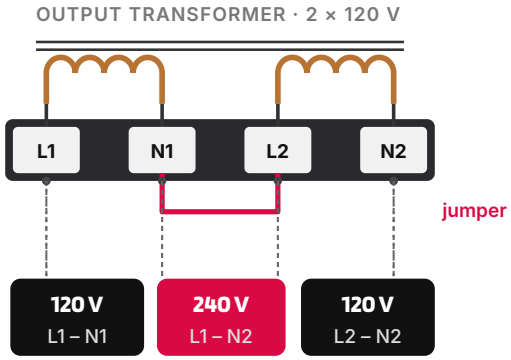
03 One 240 V output

N1 jumpered to L2: the full rating at 240 V, L1 to N2.



04 120 V and 240 V together

N1–L2 jumpered: 120 V on each leg, 240 V across.



Terminal strip

PE	protective earth
I/P L1 · L2	split-phase input
O/P L1 · N1	120 V output, leg 1
O/P L2 · N2	120 V output, leg 2
BAT+ · BAT–	external battery

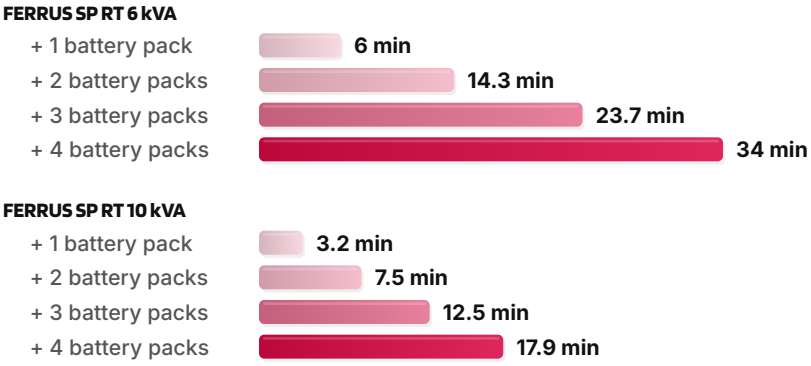
Hardwired

Input and output on the terminal strip behind the cable entry: no outlets on the rack unit.

Battery and Runtime
FERRUS SP RT 6–10 kVA

FERRUS SP RT draws its runtime from BAT16192RT packs, 16 × 12 V 9 Ah each at 192 V DC: one to four per UPS. Times at full load, new batteries.

Backup time at full load



Runtime at 100 % load; at lighter loads it is longer.

The pack

Blocks	16 × 12 V 9 Ah VRLA, sealed
DC bus	192 V DC
Size	3U · 17.3 × 25 × 5.2 in (439 × 635 × 132 mm)
Weight	123.6 lb (56.1 kg)
Per UPS	one to four packs
Charger	1–8 A, set on the panel

Pack care

- The packs share the UPS's rack: keep its front and rear vents open.
- The care of the 12 V 9 Ah blocks is that of FERRUS SP, p. 44.

Backup time by load

Set-up	100 %	75 %	50 %	25 %
6 kVA + 1 battery pack	6	8.7	14.3	36
6 kVA + 2 battery packs	14.3	20.6	34	85.5
6 kVA + 3 battery packs	23.7	34.1	56.4	2 h 22
6 kVA + 4 battery packs	34	49	80.8	3 h 24
10 kVA + 1 battery pack	3.2	4.6	7.5	19
10 kVA + 2 battery packs	7.5	10.9	17.9	45.2
10 kVA + 3 battery packs	12.5	18.1	29.8	75
10 kVA + 4 battery packs	17.9	25.9	42.7	107.5

Adding battery packs



BAT16192RT battery pack, 3U, 17.3 in wide like the UPS: one to four per UPS.

01 One to four packs, each its own 192 V DC string of 16 blocks, the UPS's bus.

02 Pack cables to the battery terminals behind the cable entry.

03 Battery set-up, with the number of packs, entered on the touchscreen.

192 V
battery DC bus

12 V 9 Ah
VRLA blocks, sealed

1–8 A
charger, long-backup set-ups

10–20
blocks per string, set on the panel

Technical Specifications
FERRUS SP RT 6–10 kVA

Model	6 kVA	10 kVA
Power (VA / W)	6,000 / 6,000	10,000 / 10,000
INPUT		
Voltage · frequency	176–275 V AC at full load · 40–70 Hz	
Power factor	> 0.99 at full load	
Current, max.	36 A	63 A
OUTPUT		
Voltage	120/240 V split-phase (110 / 115 / 120 / 127 V per leg) · 240 V single output	
Regulation · frequency	1 % · 60 Hz, 0.1 % of nominal	
THD · crest factor	< 2.5 % at full linear load · 3 : 1	
Overload	110 % 10 min · 130 % 1 min · 150 % 30 s, then bypass	
Efficiency, up to	93 %	
Outlets	terminal strip	
BATTERY		
Configuration	BAT16192RT battery packs, 16 × 12 V 9 Ah each, 1 to 4 per UPS	
DC voltage	192 V DC	
Backup at 50 % · 100 %	1 pack: 14.3 min · 6 min	1 pack: 7.5 min · 3.2 min
GENERAL		
Communication	RS232 · RS485 · USB · intelligent slot (SNMP-M or dry contacts) · EPO · parallel ports	
Parallel	up to 3 units, N+1	
Environment	32–104 °F (0–40 °C) · RH < 95 % · 3,300 ft (1,000 m) at full power	
W × D × H in	17.3 × 22.8 × 6.7	17.3 × 22.8 × 8.5
W × D × H mm	439 × 579 × 170	439 × 579 × 216
Weight	128 lb (58.1 kg)	143 lb (64.9 kg)
Standards	UL 1778 standard	
Warranty	3 years on the UPS · 2 years on VRLA batteries	

Options

BAT16192RT

Battery pack, 3U

16 × 12 V 9 Ah VRLA blocks at 192 V DC, one to four per UPS. 17.3 × 25 × 5.2 in, 123.6 lb.

SNMP-M

SNMP card

Web pages, SNMP v1/v2c/v3, Modbus TCP/IP and MQTT.

DRYCNT

Dry-contact card

Signals as voltage levels from the card's 12–24 V DC supply: UPS fault, warning, bypass, battery low, normal mode, utility fault; a remote shutdown input.

Subject to change without notice.

Ordering Information
FERRUS SP RT 6–10 kVA

FERSPRT | **10000** | **-16X9** | **+BAT16192RT** | **x2**

FERSPRT	10000	-16X9	+BAT16192RT	x2
series	rating in VA	the battery string the UPS is set for: 16 × 12 V 9 Ah	battery pack	how many

RATING
6000 or 10000 VA: the 4U or the 5U chassis

BATTERY STRING
-16X9 on both: 16 × 12 V 9 Ah, 192 V DC

PACKS
+BAT16192RT for one 3U pack; x2, x3 or x4 for two to four

EXAMPLES

FERSPRT6000-16X9
FERRUS SP RT 6 kVA

FERSPRT10000-16X9+BAT16192RTx2
10 kVA with two battery packs

Code	Description
FERSPRT6000-16X9	FERRUS SP RT 6 kVA, rack / tower; packs added with +BAT16192RT
FERSPRT6000-16X9+BAT16192RT	FERRUS SP RT 6 kVA with 1 × BAT16192RT battery pack
FERSPRT6000-16X9+BAT16192RTx2	FERRUS SP RT 6 kVA with 2 × BAT16192RT battery packs
FERSPRT6000-16X9+BAT16192RTx3	FERRUS SP RT 6 kVA with 3 × BAT16192RT battery packs
FERSPRT6000-16X9+BAT16192RTx4	FERRUS SP RT 6 kVA with 4 × BAT16192RT battery packs
FERSPRT10000-16X9	FERRUS SP RT 10 kVA, rack / tower; packs added with +BAT16192RT
FERSPRT10000-16X9+BAT16192RT	FERRUS SP RT 10 kVA with 1 × BAT16192RT battery pack
FERSPRT10000-16X9+BAT16192RTx2	FERRUS SP RT 10 kVA with 2 × BAT16192RT battery packs
FERSPRT10000-16X9+BAT16192RTx3	FERRUS SP RT 10 kVA with 3 × BAT16192RT battery packs
FERSPRT10000-16X9+BAT16192RTx4	FERRUS SP RT 10 kVA with 4 × BAT16192RT battery packs
BAT16192RT	Battery pack, 3U rack, 192 V DC, 16 × 12 V 9 Ah
SNMP-M	SNMP-M network card: web pages, SNMP v1/v2c/v3, Modbus TCP/IP and MQTT; for FERRUS, FERRUS RT, FERRUS SP, FERRUS SP RT, RADIANT, RADIANT-IB, CIRRO-IB and CIRRO
DRYCNT	Dry-contact card: status signals and a remote shutdown input

Choose the rack: FERRUS SP RT · 4U · 5U, 17.3 in wide

- In the 19-inch rack with the servers, or as a tower.
- 1–4 BAT16192RT packs of 3U; backup on p. 55.
- Rails: ask AEC for the kit matched to the unit.

Choose the tower: FERRUS SP · 6–20 kVA, p. 37

- 20 kVA in one unit, 40 blocks inside or supplied empty.
- 6 and 10 kVA: 16 blocks inside; BB4US cabinets, up to 80 blocks.
- No rack needed: it stands on the floor.



FERRUS SP RT, rack or tower

+



BAT16192RT battery pack, 3U

× 1–4

Packs per UPS

16 × 12 V 9 Ah per pack, the same 192 V DC string as the UPS bus. Each pack 3U, 17.3 × 25 × 5.2 in, 123.6 lb. Pictures not to scale.

AEC

THREE-PHASE ONLINE UPS · LITHIUM INSIDE

ETHERNO

10–30 kVA

Online double conversion for 208/120 V three-phase loads, with a three-level inverter and up to three 50 Ah **lithium** modules inside one 12.6-inch tower.

LiFePO4 LITHIUM INSIDE

3 × 50 Ah
hot-swappable LiFePO4 modules, the L6 module

41 min
at 10 kW with three modules

12–15 yr
module life



ETHERNO 10–30 KVA · DOOR OPEN, WITH ITS LITHIUM MODULES

208/120 V
three-phase, 4-wire + PE

LiFePO4
50 Ah modules inside, 1 to 3

94 %
efficiency online; 98 % in ECO

Touchscreen
4.3-inch color display: every setting on the screen

Product Overview
ETHERNO 10–30 kVA

An online double-conversion UPS for 208/120 V three-phase loads, 10 to 30 kVA, with one to three hot-swappable 50 Ah **lithium** modules inside the same tower.

LITHIUM INSIDE

UPS and battery in one

No battery cabinet: one to three hot-swappable 50 Ah LiFePO4 modules inside the 12.6 in tower.

- 2.9, 5.8 or 8.6 kWh, 240 V DC bus
- the L6 module: 5,000+ cycles
- UL 1973 listed, UL 9540A tested

REAL POWER

kVA = kW, up to 94 %

Output power factor 1 and a three-level inverter: the full rating is real power.

- 10, 20 and 30 kW
- up to 94 % online, up to 98 % in ECO
- transfer to bypass < 1 ms, synchronized

CLEAN POWER

Online double conversion

The inverter rebuilds the output: sags and spikes never reach the load.

- no break from mains to battery
- input power factor ≥ 0.99
- output distortion ≤ 1 %

208/120 V

Three-phase, 4-wire

3 + N + PE in and out; 120 V L-N, settable 110 to 127 V.

90–155 V

Wide input window

L-N at full load, 39.5–70.5 Hz: brownouts stay on the mains.

Touch

4.3-inch touchscreen

Power flow, settings, tests and records; three password levels.

×4 · N+1

Parallel

Up to four units, for more power or for redundancy.

10–100 %

Self-load test

The UPS tests itself at its rating, with no load bank.

10–200 ms

Short-circuit hold

The faulty branch trips; the other loads keep running.

10,000

Events and waveforms

A built-in scope; records exported to a USB drive.

2 slots

Communication

RS485, dry contacts and EPO; SNMP, relay or protocol card.

Key data

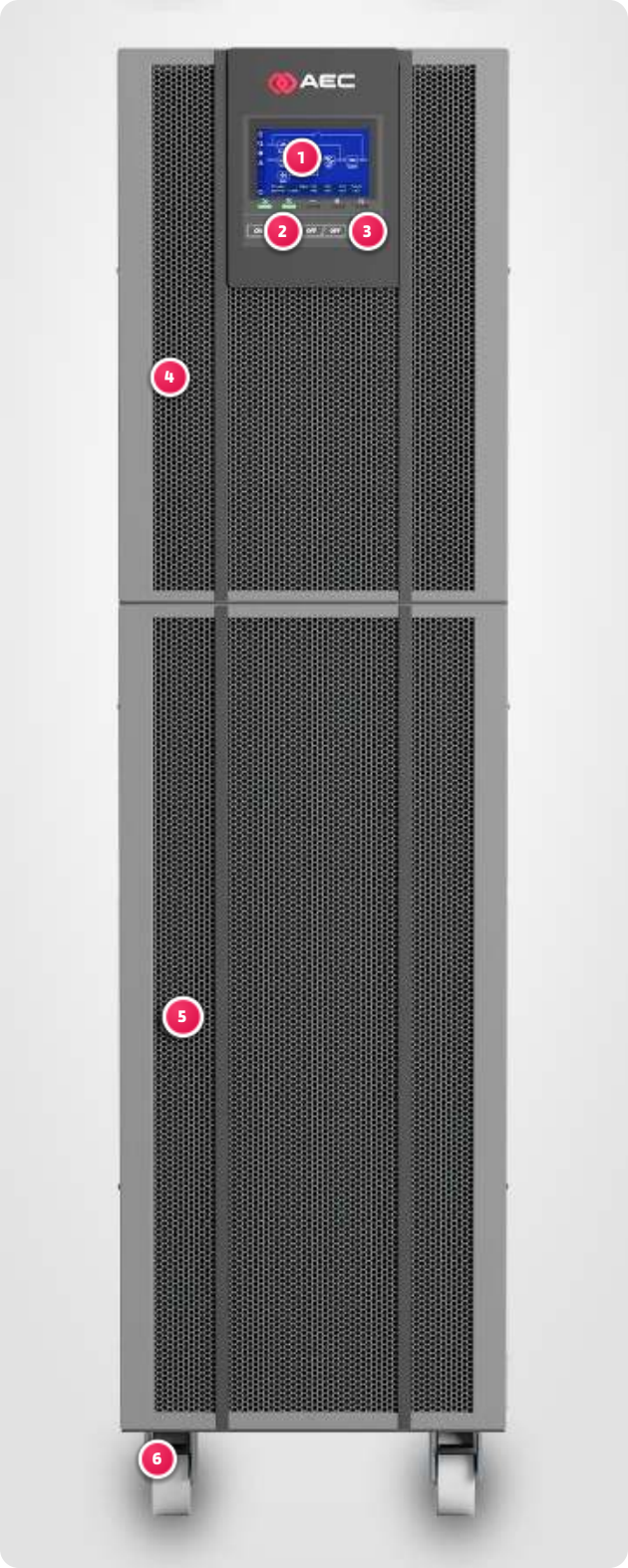
Ratings	10, 20, 30 kVA · kVA = kW
Input	3 + N + PE · 90–155 V L-N · 39.5–70.5 Hz
Output	120 V L-N, 208 V L-L · 60 Hz (or 50)
Efficiency	up to 94 % online · 98 % ECO
Charger	2–40 A settable, 20 A default

Battery	1–3 LiFePO4 modules, 50 Ah, inside
W × D × H	12.6 × 39.1 × 49.2 in, every rating
Weight	297.6–485 lb with the modules
Overload	105–110 % 60 min · 130–150 % 1 min
Standards	UL 1778 listed · warranty 5 years

10 kVA	20 kVA	30 kVA
10,000 W · 1–3 modules inside	20,000 W · 2–3 modules inside	30,000 W · 3 modules inside
up to 41 min at full load	up to 20 min at full load	up to 14 min at full load

ETHERNO · FRONT VIEW

Front View
ETHERNO 10–30 kVA



1 Color touchscreen
4.3-inch: live single-line diagram, readings, settings and records

2 Status lamps and keys
five lamps above the ON and OFF key pairs

3 EPO
emergency power off: the output is cut at once

4 Front grille
cooling air in at the front, out through the fans at the rear

5 Front door
lockable; behind it the battery plug-ins and the three slots of the 50 Ah lithium modules

6 Casters
moved upright, then anchored with four M8 bolts and leveled on four feet

12.6 × 39.1 × 49.2 in
W × D × H, every rating · 320 × 993 × 1,250 mm

ETHERNO · REAR VIEW

Rear View
ETHERNO 10–30 kVA



1. **RS485**
   Modbus link to a PC or BMS
2. **EPO + input dry contact**
   EPO loop (closed for normal operation) and input IN.1
3. **Output dry contacts**
   OUT.1 to OUT.5, NO / NC / COM
4. **BATT. Start**
   Starts the UPS from the battery when there is no mains
5. **Input breaker**
   Mains input
6. **Intelligent slot 1**
   SNMP card
7. **Intelligent slot 2**
   Dry-contact card, protocol-transfer card or SNMP card
8. **Parallel port**
   Two parallel cable sockets
9. **Bypass breaker**
   Bypass input
10. **Output breaker**
    UPS output
11. **Maintenance breaker**
    Behind an interlocked cover
12. **Wiring box**
    AC terminals and PE, cables from below
13. **Fans**
    Speed controlled by the load

ETHERNO · INTERNAL VIEW

Internal View
ETHERNO 10–30 kVA



1. **Color touchscreen**
   power flow, settings, records and the data of every module

2. **ON and OFF keys**
   both keys of a pair for 1 s; five status lamps above them

3. **EPO**
   emergency power off: the output is cut at once

4. **Battery plug-ins**
   one per module, unplugged before a module is pulled

5. **Lithium modules**
   three 50 Ah LiFePO4 slots, filled from the bottom up

6. **ON/OFF knob**
   locks the module in; turned on, it starts to deliver

7. **Module lamps**
   run green, alarm yellow, fault red

8. **Front door**
   lockable, opened with the key for module service

9. **Casters**
   four, with leveling feet and M8 anchor holes

Touchscreen Interface
ETHERNO 10–30 kVA



SCREEN

1 Color touchscreen
4.3-inch: the live single-line diagram (here normal mode, the load on the inverter), readings, settings and records. Its left bar carries the menus, the log-in and an ON/OFF icon.

Three password levels
user (reads), administrator (sets) and manufacturer: everything is accessible from the display, without a PC or external software.

STATUS LAMPS

2–6 AC/DC · DC/AC · BYP. · BATT. LOW · OVERLOAD
one lamp for each part of the UPS: green in normal operation, red when that part is abnormal.

KEYS

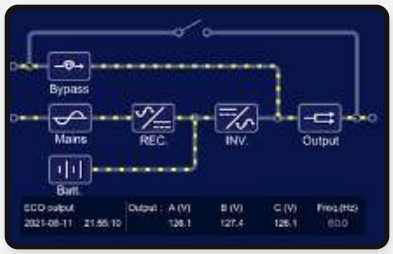
7 ON pair
both ON keys together for 1 s: the UPS powers on.

8 OFF pair
both OFF keys together for 1 s: the UPS powers off.

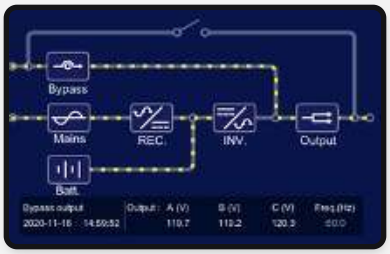
9 EPO
the output is cut at once, bypass and inverter both. The EPO loop on the rear panel does the same from afar.

Screens

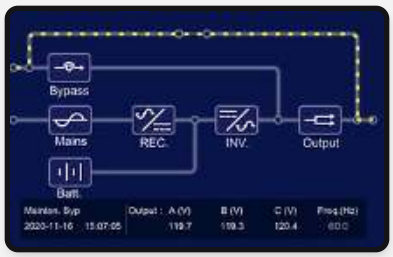
The home page draws the UPS at work, the yellow dots tracing the power, and reads the output phase by phase (L-N; the nameplate gives line voltage). A touch on a block opens its readings.



ECO mode
Single unit on a good grid: the load runs on the bypass at up to 98 % efficiency; the inverter waits, ready.



Bypass mode
UPS off, overload or over-temperature: the static switch puts the load on the bypass, traced in yellow.



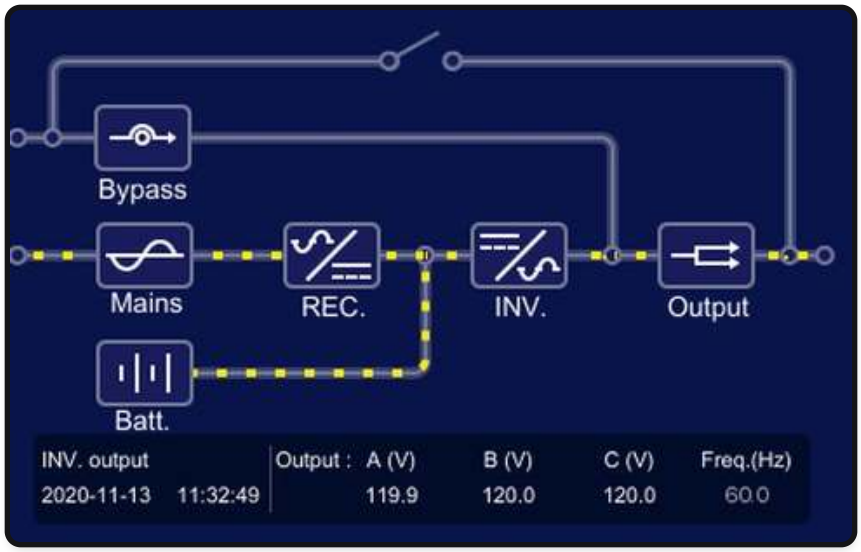
Maintenance bypass
Cover off, breaker on: the load runs on the maintenance bypass while the UPS is serviced.



Settings, behind the log-in
System, battery, tests, dry contacts, communication, screen, password, device, dedust and records.

4.3 in	5	3	5
color touchscreen	status lamps, green or red	password levels, no PC needed	working modes, each drawn live

Touchscreen Screens
ETHERNO 10–30 kVA



Live single-line diagram

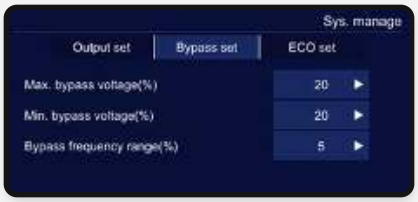
The home page draws the UPS as it runs: yellow dots trace the active power path (here mains, rectifier, inverter, output), a faulty block turns red, and the bottom line reads the output voltage of each phase and the frequency.

Touch any block (bypass, mains, battery, rectifier, inverter, output) to open its page; the bar at the left opens the menus, the log-in and the ON/OFF page.

Settings, behind the log-in



ECO setting
ECO on or off, with its voltage and frequency windows, in percent of nominal.



Bypass setting
The voltage and frequency window in which the static switch may transfer the load.



Output dry contacts
Five relays, each with its function: ECO output, battery abnormal, general alarm, bypass output, battery inverter output.



Battery test
Standard, deep or timed test, started from the screen; its status and its conditions shown.

Menus



Information menu
Run info, history record, user log, device information.



Settings menu
System, battery, battery test, dry contacts, communication, screen, password, device, dedust, records.

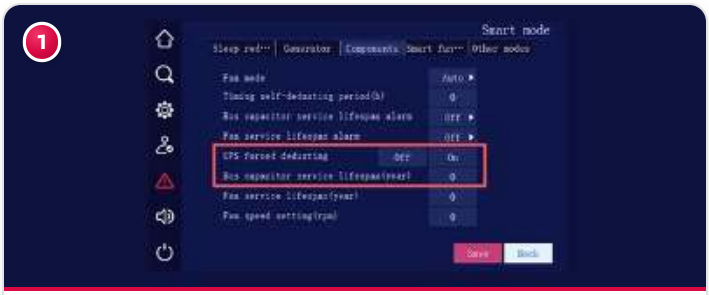


Screen setting
Date and time, backlight, language, brightness and the atmosphere light of the panel.

Smart Functions
ETHERNO 10–30 kVA

Functions built into every ETHERNO, each set and read on its touchscreen with three password levels: no PC, no external software.

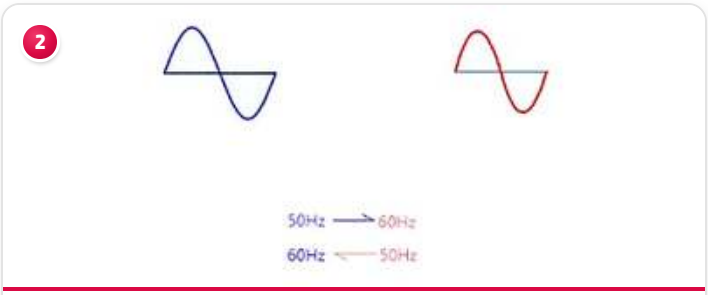
1



Fan self-cleaning — timed · forced

The fans run a dust-cleaning cycle on a timer or on demand (forced dedusting) to keep the air path and the electronics clean; fan and capacitor operating hours are counted on the screen.

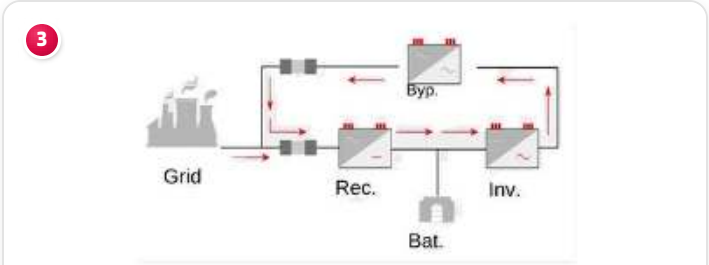
2



Frequency converter — 50 ↔ 60 Hz

Set on the device configuration page: the output runs at a fixed 50 or 60 Hz, whatever the input frequency, for loads built for another grid; the battery-not-connected warning can be disabled.

3



Self-load test — 10–100 %

The UPS tests itself at 10 to 100 % of its rating without a rented load bank: the power circulates through rectifier, inverter and bypass, drawing only about 2.7 % of the rated power.

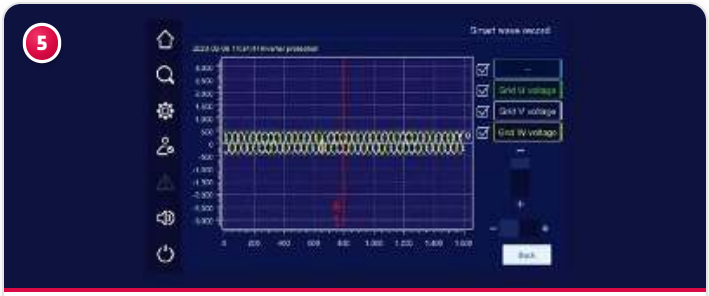
4



Short-circuit capability — 10–200 ms

On an output short circuit the inverter holds the fault for a settable time, so the faulty branch trips and the other loads keep running; the bypass can be set to stay off on a short circuit.

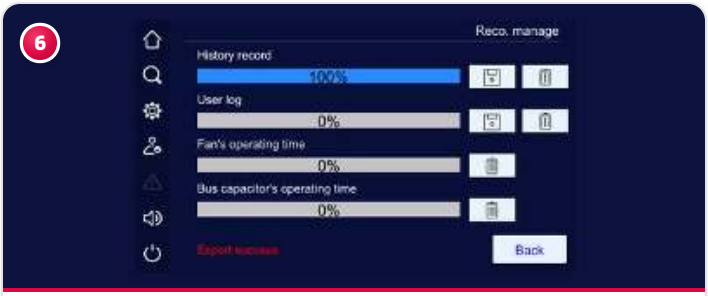
5



Waveform recording — built-in scope

An oscilloscope inside the UPS: the smart wave record captures the grid, rectifier and inverter waveforms around an event, shown on the screen phase by phase and kept for diagnosis.

6



USB port behind the display — all records

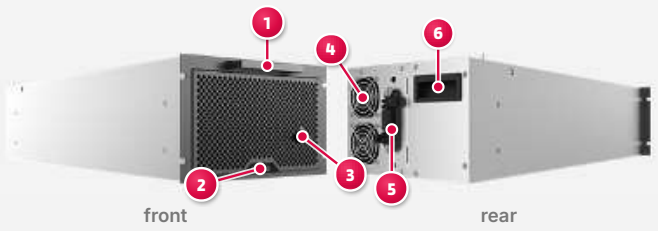
A USB flash drive in the port behind the display takes the memory of the UPS: history record (up to 10,000 events), user log and wave capture, with no PC and no software.

Lithium Battery Technology
ETHERNO 10–30 kVA

Every ETHERNO module is an L6 module: 18 **lithium** iron phosphate cells, its own battery management unit and its own DC/DC converter, in a drawer of 81.6 lb.

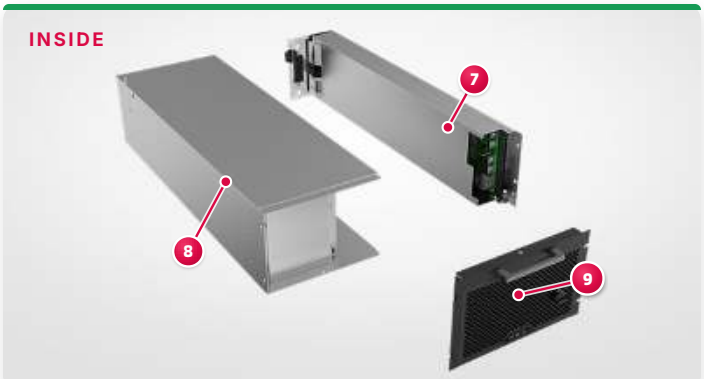
CELL 1	MODULE 2	TOWER 3	SCREEN 4
3.2 V · 50 Ah	**18 cells · 57.6 V**	**1 to 3 modules**	**every module**
LiFePO4, 4C discharge	2.88 kWh · BMS · DC/DC	on the 240 V DC bus	SOC · SOH · cells
2.4 lb	**81.6 lb**	**up to 8.6 kWh**	**4.3-inch touch**

OUTSIDE



1. **Front handle**
2. **Lamps** run, alarm, fault
3. **ON/OFF knob** locks the module in
4. **Fans**
5. **Output connector** to the DC bus
6. **Rear handle**

INSIDE



7. **DC/DC module** the isolated converter: 240 V DC out, 10 kW
8. **Battery cells** 18 LiFePO4 cells, 3.2 V 50 Ah, in the steel case
9. **Sealing plate** the front that closes the case: grille, handle, lamps, knob

The module

Code	ETH-50-LI, the L6-MOD-50LI module
Cells	18 × 3.2 V LiFePO4 · 57.6 V · 50 Ah
Energy	2.88 kWh · DC/DC output 10 kW
Size	8.8 in W × 26.2 in D × 6 in H (224 × 665 × 152 mm)
Weight	81.6 lb (37 kg)
Cycle life	5,000+ cycles
Standards	UL 1973 listed · UL 9540A tested · UN38.3 (T.1–T.8)

18 × Each cell 1.06 × 5.85 × 5.24 in (27 × 148.5 × 133 mm), 2.4 lb, **LiFePO4** 3.2 V 50 Ah: 4C discharge, 1C charge. The module is sealed: neither it nor its cells may be opened on site.

Three lamps

State	Run · green	Alarm · yellow	Fault · red
Charge	on		
Discharge	flashes		
Sleep	on	flashes	
Module alarm		on	
Communication lost		flashes	
Module protection			on
Battery abnormal			flashes

Module safety

Isolated DC/DC. A fault stays inside its module; low voltage inside the module, high voltage only at its output.

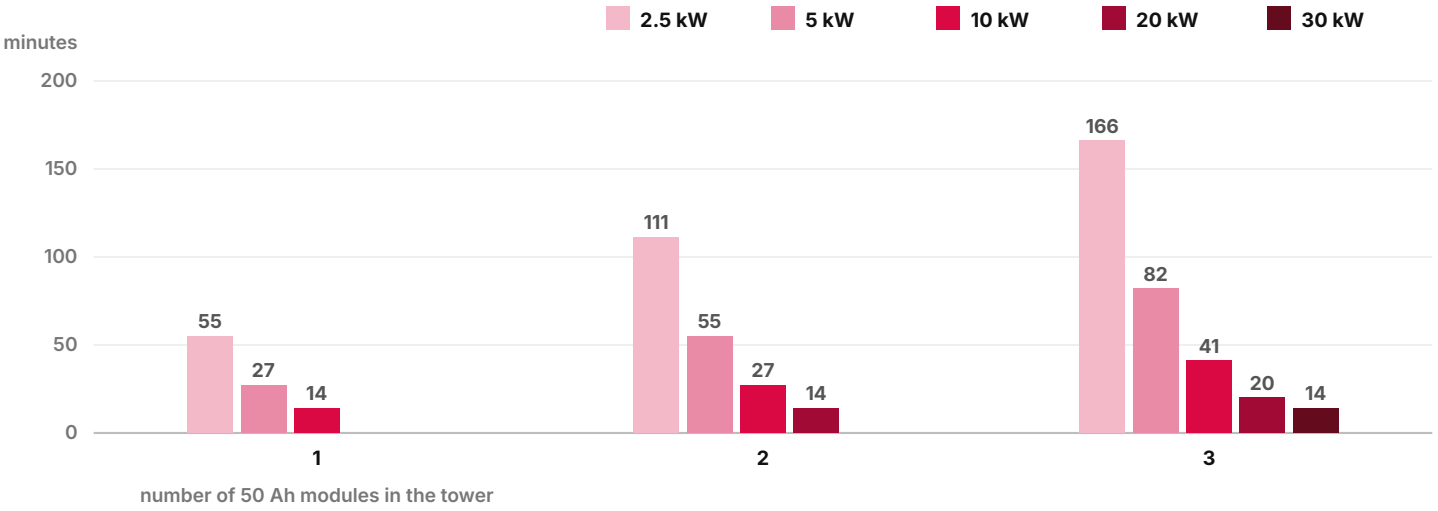
A faulty module drops out. It protects itself and leaves the system; the other modules carry on.

Insulation detection. Set on the battery page: the insulation of the modules is watched while the UPS runs.

Charge kept in hand. Charge current 2–40 A; forced charge on or off; SOC balance between modules.

Battery and Runtime
ETHERNO 10–30 kVA

Every rating, every load, every number of modules: minutes of backup. One to three 50 Ah **lithium** modules in the 10 kVA, two or three in the 20 kVA, three in the 30 kVA.



ETHERNO 10 kVA

1 to 3 modules · minutes

Load	1	2	3
1 kW · 10 %	133	265	398
2 kW · 20 %	66	133	199
2.5 kW · 25 %	55	111	166
3 kW · 30 %	44	89	133
4 kW · 40 %	33	66	100
5 kW · 50 %	27	55	82
6 kW · 60 %	23	46	68
7 kW · 70 %	18	36	55
7.5 kW · 75 %	17.5	35	53
8 kW · 80 %	17	34	51
9 kW · 90 %	15	30	46
10 kW · 100 %	14	27	41
kWh installed	2.9	5.8	8.6

ETHERNO 20 kVA

2 or 3 modules · minutes

Load	1	2	3
2 kW · 10 %	–	133	199
4 kW · 20 %	–	66	100
5 kW · 25 %	–	55	84
6 kW · 30 %	–	44	68
8 kW · 40 %	–	33	51
10 kW · 50 %	–	27	41
12 kW · 60 %	–	23	34
14 kW · 70 %	–	18	27
15 kW · 75 %	–	17.5	26.5
16 kW · 80 %	–	17	26
18 kW · 90 %	–	15	23
20 kW · 100 %	–	14	20
kWh installed	–	5.8	8.6

ETHERNO 30 kVA

3 modules · minutes

Load	1	2	3
3 kW · 10 %	–	–	133
6 kW · 20 %	–	–	66
7.5 kW · 25 %	–	–	55
9 kW · 30 %	–	–	44
12 kW · 40 %	–	–	33
15 kW · 50 %	–	–	27
18 kW · 60 %	–	–	23
21 kW · 70 %	–	–	18
22.5 kW · 75 %	–	–	17.5
24 kW · 80 %	–	–	17
27 kW · 90 %	–	–	15
30 kW · 100 %	–	–	14
kWh installed	–	–	8.6

Load in kW, with the share of the rating. Factory reference values at 77 °F (25 °C) with new modules; AEC sizes every system. –: not offered (the 20 kVA takes two or three modules, the 30 kVA three). Each table is its rating's own runtime table, so one load on the same modules can read a minute or two apart from one rating to the next. Bars: each load on the smallest rating that carries it, 10 kVA up to 10 kW.

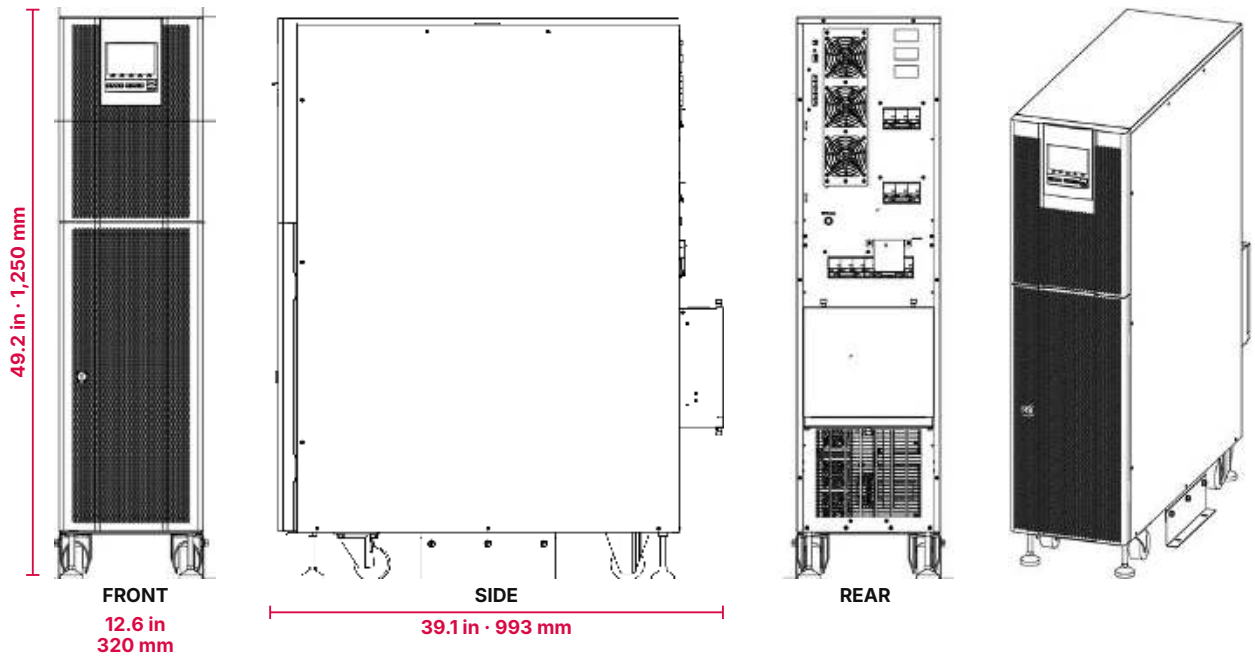
1 → 3
50 Ah modules, added on site one at a time

2.88 kWh
in every module: 18 LiFePO4 cells, 57.6 V

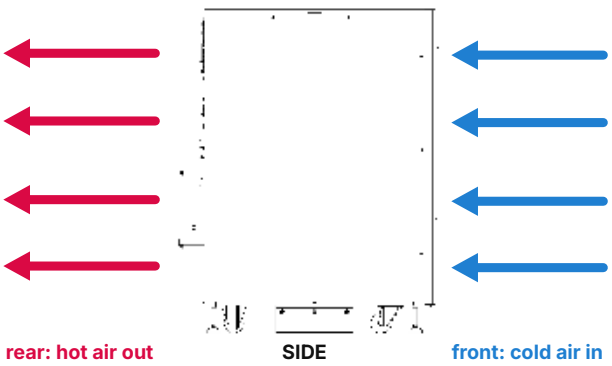
398 min
10 kVA with three modules, at 10 % load

14 min
at full load, every rating with one module per 10 kVA

Installation and Dimensions
ETHERNO 10–30 kVA



Air path



Space, floor and weights

Size, W × D × H	12.6 × 39.1 × 49.2 in · 320 × 993 × 1,250 mm
Weight, frame	10 kVA: 216 lb 20 kVA: 227 lb 30 kVA: 240.2 lb
Weight with batteries	10 kVA: 297.6 lb · 379.2 lb · 460.8 lb 20 kVA: 390.2 lb · 471.8 lb 30 kVA: 485 lb
Clearance	11.8 in (300 mm) behind and on both sides; the front clear for service
Floor	level, under 5° slope; four M8 expansion bolts on concrete, four leveling feet; moved upright by forklift
Environment	32–104 °F (0–40 °C) · 0–95 % RH · IP20 · below 6,562 ft (2,000 m)

12.6 in
wide, 320 mm

39.1 in
deep, 993 mm

49.2 in
high, 1,250 mm

11.8 in
free behind and on both sides

Technical Specifications
ETHERNO 10–30 kVA

Model	10 kVA	20 kVA	30 kVA
Power (VA / W)	10,000 / 10,000	20,000 / 20,000	30,000 / 30,000
INPUT			
Connection	3 phases + N + PE		
Voltage, L-N	90–155 V at full load; 70–90 V with the output derated linearly		
Frequency	39.5–70.5 Hz		
Bypass	window 10, 15 or 20 % (20 % default); synchronizing 50/60 Hz ± 10 %		
Power factor · current distortion	≥ 0.99 · ≤ 3 % resistive, ≤ 5 % non-linear		
Current, max., input · bypass	37.0 · 30.3 A	75.9 · 60.6 A	100.0 · 90.9 A
BATTERY			
Type	LiFePO4 lithium modules, 50 Ah, inside the tower		
DC bus	240 V DC		
Modules	1 · 2 · 3	2 · 3	3
Charge current	2–40 A settable, 20 A default		
Backup at 50 % · 100 %	27 · 14 / 55 · 27 / 82 · 41 min	27 · 14 / 41 · 20 min	27 · 14 min
OUTPUT			
Connection · voltage	3 phases + N + PE · 120 V L-N (110 / 115 / 127 settable), 208 V L-L (190 / 200 / 220)		
Frequency	follows the bypass; 60 ± 0.1 Hz (or 50) on battery		
Distortion · power factor	≤ 1 % resistive, ≤ 4 % non-linear · 1 or 0.9, 1 by default		
Transfer to bypass	< 1 ms synchronized, < 10 ms not		
Overload, inverter	< 105 % continuous · 105–110 % 60 min · 110–130 % 10 min · 130–150 % 1 min · 150–200 % 200 ms		
Overload, bypass	< 130 % continuous · 130–155 % 1 min · > 155 % 200 ms		
Current, max.	30.3 A	60.6 A	90.9 A
Efficiency	up to 94 % · up to 98 % in ECO		
SYSTEM			
Display · communication	touchscreen, 5 lamps · RS485, dry contacts (5 out, 1 in, EPO), 2 slots: SNMP, relay or protocol card		
Parallel	up to 4 units, redundant or expand		
Environment	32–104 °F (0–40 °C) · 0–95 % RH · IP20 · below 6,562 ft (2,000 m)		
Noise at 77 °F	< 63 dB		< 68 dB
W × D × H	12.6 × 39.1 × 49.2 in · 320 × 993 × 1,250 mm		
Weight, frame without batteries	216 lb	227 lb	240.2 lb
Weight with batteries	297.6 lb · 379.2 lb · 460.8 lb	390.2 lb · 471.8 lb	485 lb
Standards	UL 1778 listed · lithium modules UL 1973 listed, UL 9540A tested, UN38.3 tested · performance IEC 62040-3		
Warranty	5 years on the UPS and the lithium modules		

10–30 kVA
kVA = kW, output power factor 1

94 %
online efficiency; 98 % in ECO

UL 1778
listed UPS · modules UL 1973 listed

5 years
warranty: UPS and lithium modules

Ordering Information
ETHERNO 10–30 kVA

Every ETHERNO is ordered with one code: the rating, then the batteries inside. A frame without batteries takes **lithium** modules ordered separately.

ETH 20 -2X50A -LI

series	rating, kVA	lithium modules × Ah	lithium

EXAMPLES

ETH20
20 kVA frame, modules ordered as ETH-50-LI

ETH30-3X50A-LI
30 kVA with three 50 Ah modules

Code	Description
ETH10	ETHERNO 10 kVA frame, no batteries
ETH10-1X50A-LI	ETHERNO 10 kVA with 1 lithium module · 14 min at full load
ETH10-2X50A-LI	ETHERNO 10 kVA with 2 lithium modules · 27 min at full load
ETH10-3X50A-LI	ETHERNO 10 kVA with 3 lithium modules · 41 min at full load
ETH20	ETHERNO 20 kVA frame, no batteries
ETH20-2X50A-LI	ETHERNO 20 kVA with 2 lithium modules · 14 min at full load
ETH20-3X50A-LI	ETHERNO 20 kVA with 3 lithium modules · 20 min at full load
ETH30	ETHERNO 30 kVA frame, no batteries
ETH30-3X50A-LI	ETHERNO 30 kVA with 3 lithium modules · 14 min at full load
ETH-50-LI	Lithium module, LiFePO4 50 Ah, for ETHERNO
PAR-KIT-ETH	Parallel kit: cables and interface, up to four ETHERNO units
SNMP-L	SNMP-L network card: web pages, SNMP v1/v2c/v3 and Modbus TCP/IP; e-mail alarms; for LUMINA, ETHERNO, AUREON and INFINITE
DRYCNT	Dry-contact relay card: mains failure, battery low, UPS fault, bypass; all AEC UPS series



ETHERNO frame, 10–30 kVA

+



ETH-50-LI lithium module, 50 Ah

1–3

Modules per tower

Fitted at the factory or ordered as ETH-50-LI; they slide in from the front.

ORDER

Sizing by AEC

Tell us the load and the runtime: AEC chooses the code, the battery set-up and the cables.

STOCK

Miami

AEC UPS USA keeps units, modules and spare parts in Miami.

WARRANTY

5 years

5 years on the UPS and the lithium modules.

AEC

THREE-PHASE ONLINE UPS · BATTERIES INSIDE

AUREON

10–30 kVA

Online double conversion for 208/120 V three-phase loads, with a three-level inverter and up to 80 VRLA blocks in modules inside one tower, 14.9 in wide at the base.



AUREON 10–30 kVA · DOOR OPEN

208/120 V
three-phase, 4-wire + PE

PF 1
output power factor 1: kVA = kW

94 %
efficiency online; 98 % in ECO

Touchscreen
4.3-inch color display: every setting on the screen

Product Overview
AUREON 10–30 kVA

An online double-conversion UPS for 208/120 V three-phase loads, 10 to 30 kVA, with 40 to 80 VRLA blocks inside the same tower.

40–80
VRLA blocks inside
12 V 9 Ah blocks in 2 to 4 modules; external cabinets on BATT.+, N, BATT.–

kVA = kW
Output power factor 1
10, 20 and 30 kW of real power

94 %
Three-level inverter
online efficiency up to 94 %, 98 % in ECO on a single unit

208/120 V
Three-phase, 4-wire
3 + N + PE in and out; 120 V L-N, settable 110 to 127 V

Touch
Color touchscreen
power flow, settings, tests and records, three access levels

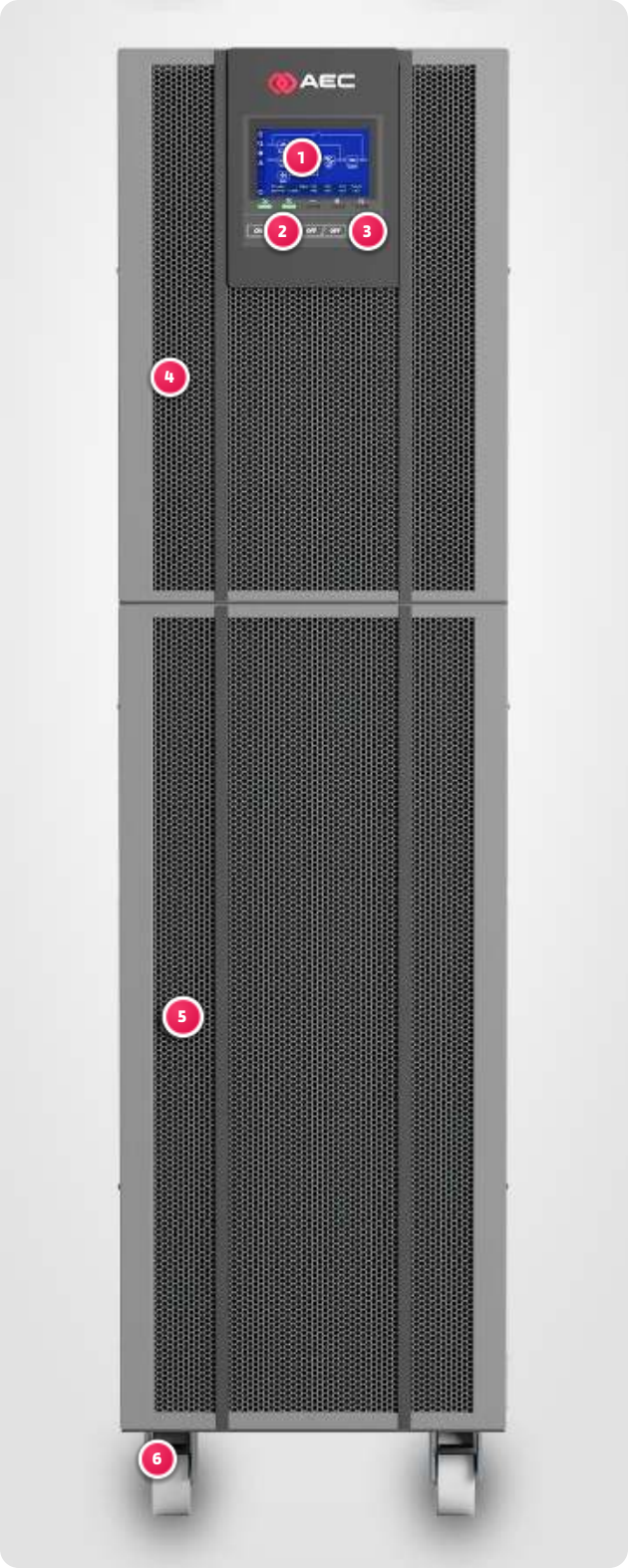
×4 · N+1
Parallel
up to four units for power or redundancy

Key data

Ratings	10, 20 and 30 kVA / kW
Input and output	208/120 V three-phase, 4-wire + PE; 60 Hz
Battery	VRLA, 12 V 9 Ah, 40 to 80 blocks inside; ±96 to ±120 V DC
Efficiency	up to 94 % online · up to 98 % in ECO
Size, W × D × H	14.9 × 39.1 × 49.2 in, width at the base · 378 × 993 × 1,250 mm
Operating temperature	23–104 °F (–5 to 40 °C)
Standards	UL 1778 listed · performance IEC 62040-3
Warranty	3 years on the UPS · 2 years on the VRLA batteries

10 kVA	20 kVA	30 kVA
10,000 W · 40 or 80 blocks inside	20,000 W · 60 or 80 blocks inside	30,000 W · 80 blocks inside
up to 20 min at full load	up to 10 min at full load	up to 4 min at full load

Front View
AUREON 10–30 kVA



1 Color touchscreen
4.3-inch: live single-line diagram, readings, settings and records

2 Status lamps and keys
five lamps above the ON and OFF key pairs

3 EPO
emergency power off: the output is cut at once

4 Front grille
cooling air in at the front, out through the fans at the rear

5 Front door
lockable; behind it 2 to 4 battery modules of 20 VRLA blocks, each with its breaker

6 Casters
moved upright, then anchored with four M8 bolts and leveled on four feet

14.9 × 39.1 × 49.2 in
W × D × H, every rating; width at the base · 378 × 993 × 1,250 mm

Rear View
AUREON 10–30 kVA



1. **RS485**
   Modbus link to a PC or BMS
2. **EPO + input dry contact**
   EPO loop (closed for normal operation) and input IN.1
3. **Output dry contacts**
   OUT.1 to OUT.5, NO / NC / COM
4. **BATT. Start**
   Starts the UPS from the battery when there is no mains
5. **Input breaker**
   Mains input
6. **Intelligent slot 1**
   SNMP card
7. **Intelligent slot 2**
   Dry-contact card, protocol-transfer card or SNMP card
8. **Parallel port**
   Two parallel cable sockets
9. **Bypass breaker**
   Bypass input
10. **Output breaker**
    UPS output
11. **Maintenance breaker**
    Behind an interlocked cover
12. **Wiring box**
    AC terminals and PE; BATT.+, N, BATT.– for external batteries, cables from below
13. **Fans**
    Speed controlled by the load

Internal View
AUREON 10–30 kVA



1. **Color touchscreen**
   the same panel and screen as ETHERNO

2. **Status lamps and keys**
   five lamps above the ON and OFF key pairs

3. **EPO**
   emergency power off: the output is cut at once

4. **Front grille**
   cooling air in at the front

5. **Module breaker**
   one on each battery module, opened before service

6. **Battery modules**
   2 to 4 modules of 20 × 12 V 9 Ah VRLA blocks, 99.2–132.3 lb each

7. **Front door**
   lockable, opened for battery service

8. **Casters**
   moved upright, then anchored and leveled on four feet

Touchscreen Interface
AUREON 10–30 kVA



SCREEN

1 Color touchscreen
4.3-inch: the live single-line diagram (here normal mode, the load on the inverter), readings, settings and records. Its left bar carries the menus, the log-in and an ON/OFF icon.

Three password levels
user (reads), administrator (sets) and manufacturer: everything is accessible from the display, without a PC or external software.

STATUS LAMPS

2–6 AC/DC · DC/AC · BYP. · BATT. LOW · OVERLOAD
one lamp for each part of the UPS: green in normal operation, red when that part is abnormal.

KEYS

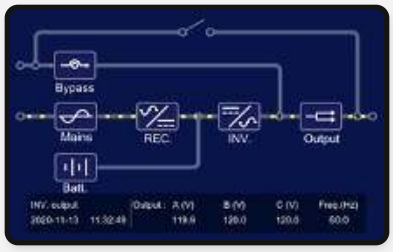
7 ON pair
both ON keys together for 1 s: the UPS powers on.

8 OFF pair
both OFF keys together for 1 s: the UPS powers off.

9 EPO
the output is cut at once, bypass and inverter both. The EPO loop on the rear panel does the same from afar.

Screens · the same panel as ETHERNO

The home page draws the UPS at work, the yellow dots tracing the power, and reads the output phase by phase (L-N; the nameplate gives line voltage). A touch on a block opens its readings.



Home page, normal mode
Mains, rectifier, inverter, load: the power traced in yellow; the output read phase by phase at 120 V.



Settings, behind the log-in
Ten setting pages: system, battery, tests, dry contacts, communication, screen, password, device, dedust, records.



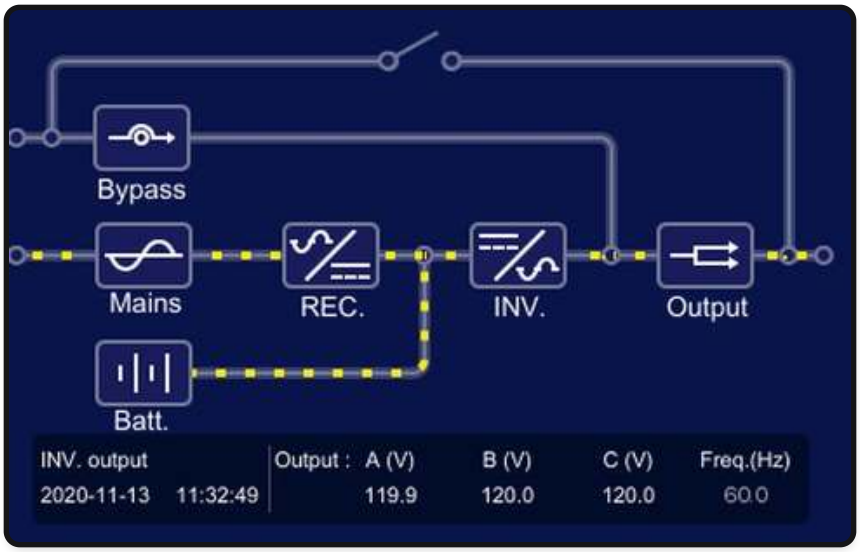
Output set
120 V per phase at 60 Hz, a fine adjustment of the voltage; saved with a green tick.



Input dry contact
Input 1 set to charge forbidden; each input takes one function from the list.

4.3 in	5	3	5
color touchscreen	status lamps, green or red	password levels, no PC needed	working modes, each drawn live

Touchscreen Screens
AUREON 10–30 kVA



Live single-line diagram

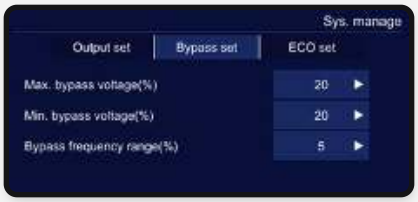
The home page draws the UPS as it runs: yellow dots trace the active power path (here mains, rectifier, inverter, output), a faulty block turns red, and the bottom line reads the output voltage of each phase and the frequency.

Touch any block (bypass, mains, battery, rectifier, inverter, output) to open its page; the bar at the left opens the menus, the log-in and the ON/OFF page.

Settings, behind the log-in



ECO setting
ECO on or off, with its voltage and frequency windows, in percent of nominal.



Bypass setting
The voltage and frequency window in which the static switch may transfer the load.



Output dry contacts
Five relays, each with its function: ECO output, battery abnormal, general alarm, bypass output, battery inverter output.



Battery test
Standard, deep or timed test, started from the screen; its status and its conditions shown.

Menus



Information menu
Run info, history record, user log, device information.



Settings menu
System, battery, battery test, dry contacts, communication, screen, password, device, dedust, records.

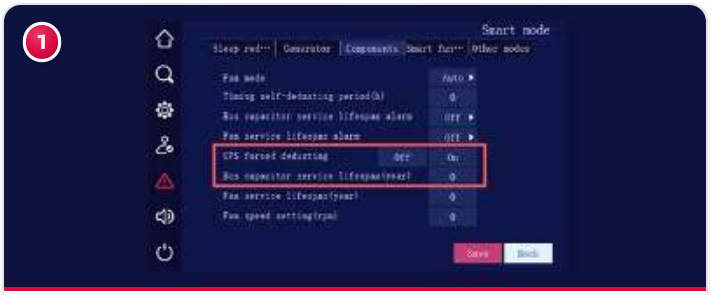


Screen setting
Date and time, backlight, language, brightness and the atmosphere light of the panel.

Smart Functions
AUREON 10–30 kVA

Functions built into every AUREON, each set and read on its touchscreen with three password levels: no PC, no external software.

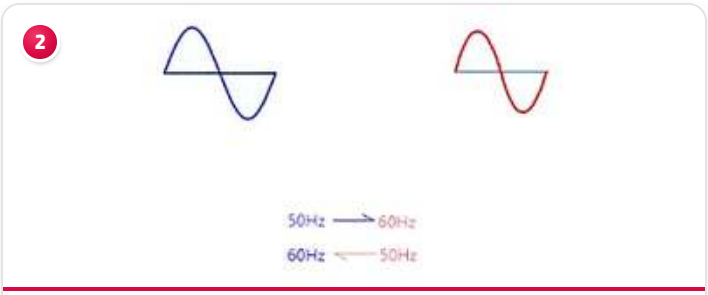
1



Fan self-cleaning — timed · forced

The fans run a dust-cleaning cycle on a timer or on demand (forced dedusting) to keep the air path and the electronics clean; fan and capacitor operating hours are counted on the screen.

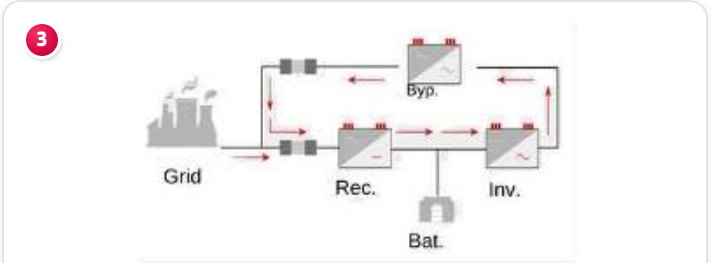
2



Frequency converter — 50 ↔ 60 Hz

Set on the device configuration page: the output runs at a fixed 50 or 60 Hz, whatever the input frequency, for loads built for another grid; the battery-not-connected warning can be disabled.

3



Self-load test — 10–100 %

The UPS tests itself at 10 to 100 % of its rating without a rented load bank: the power circulates through rectifier, inverter and bypass, drawing only about 2.7 % of the rated power.

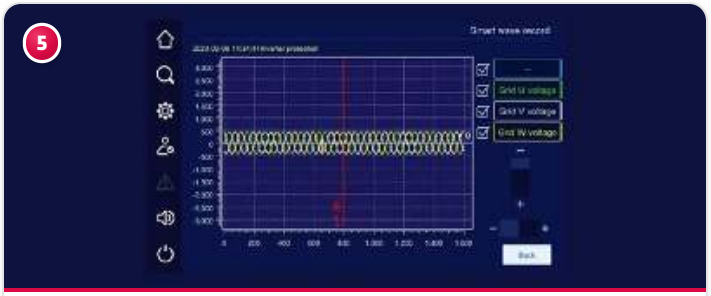
4



Short-circuit capability — 10–200 ms

On an output short circuit the inverter holds the fault for a settable time, so the faulty branch trips and the other loads keep running; the bypass can be set to stay off on a short circuit.

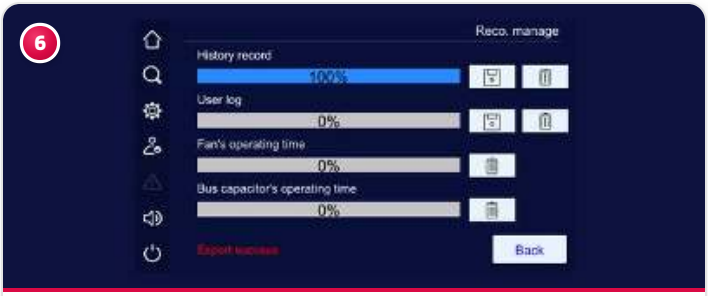
5



Waveform recording — built-in scope

An oscilloscope inside the UPS: the smart wave record captures the grid, rectifier and inverter waveforms around an event, shown on the screen phase by phase and kept for diagnosis.

6

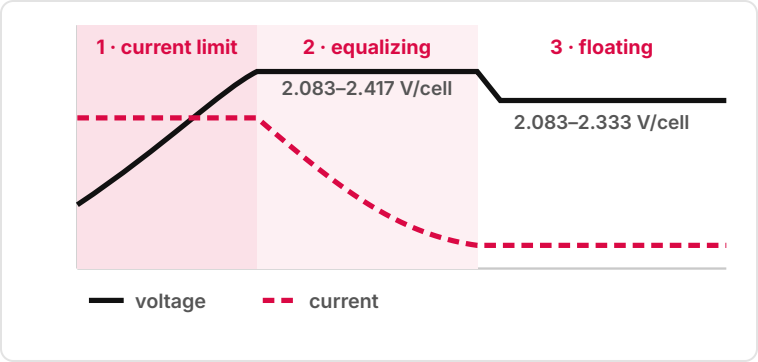


USB port behind the display — all records

A USB flash drive in the port behind the display takes the memory of the UPS: history record (up to 10,000 events), user log and wave capture, with no PC and no software.

Battery and Runtime
AUREON 10–30 kVA

Charging in stages



10 A

maximum charge current, AUREON 10 (1 A by default)

20 A

maximum, AUREON 20 and 30 (2 and 4 A by default)

- Equalizing charge 2.083–2.417 V/cell
- Floating charge 2.083–2.333 V/cell
- Capacity set from 1 to 2,000 Ah
- Static function: 1–30 days, delay 1–48 h

End of discharge

A low-voltage warning, then the protection level in V/cell:

2.083–2.333 floating charge

Warning battery low voltage

1.667–1.867 protection: output off

≈ 1 min the UPS switches off

Mains back: it restarts and recharges by itself.

Battery test

Started from the battery test page:

Standard | Deep | Timing

- Standard or deep test, or timed
- Ends at 1.667–1.867 V/cell, settable
- Shows status and battery current
- Consumed capacity and test time

Temperature

Charge voltage compensated for temperature:

0–2.8 mV/°F (0–5.0 mV/°C)

Compensation on or off, on the charge set page.

Heat shortens life

Long hours at high temperature and deep discharges age the blocks: where it is hot, a full discharge and recharge every 2 months instead of every 4 to 6.

Backup time by load

minutes · new batteries at 77 °F (25 °C) · blocks inside the tower

Load, % of rating	10 %	20 %	25 %	30 %	40 %	50 %	60 %	70 %	75 %	80 %	90 %	100 %
10 kVA · 40 blocks AUR10-40X9A	190	85	70	55	38	25	18	14	12.5	11	9	7
10 kVA · 80 blocks AUR10-80X9A	380	175	145	115	85	60	45	35	31.5	28	24	20
20 kVA · 60 blocks AUR20-60X9A	150	65	52.5	40	27	18	13	10	9	8	6	5
20 kVA · 80 blocks AUR20-80X9A	220	100	82.5	65	45	32	23	18	16	14	12	10
30 kVA · 80 blocks AUR30-80X9A	120	50	40	30	20	14	10	8	7	6	5	4

±96 to ±120 V

DC bus: 8 to 10 blocks on each side of the neutral, 10 + 10 by default; BATT.+, N and BATT. – for external cabinets

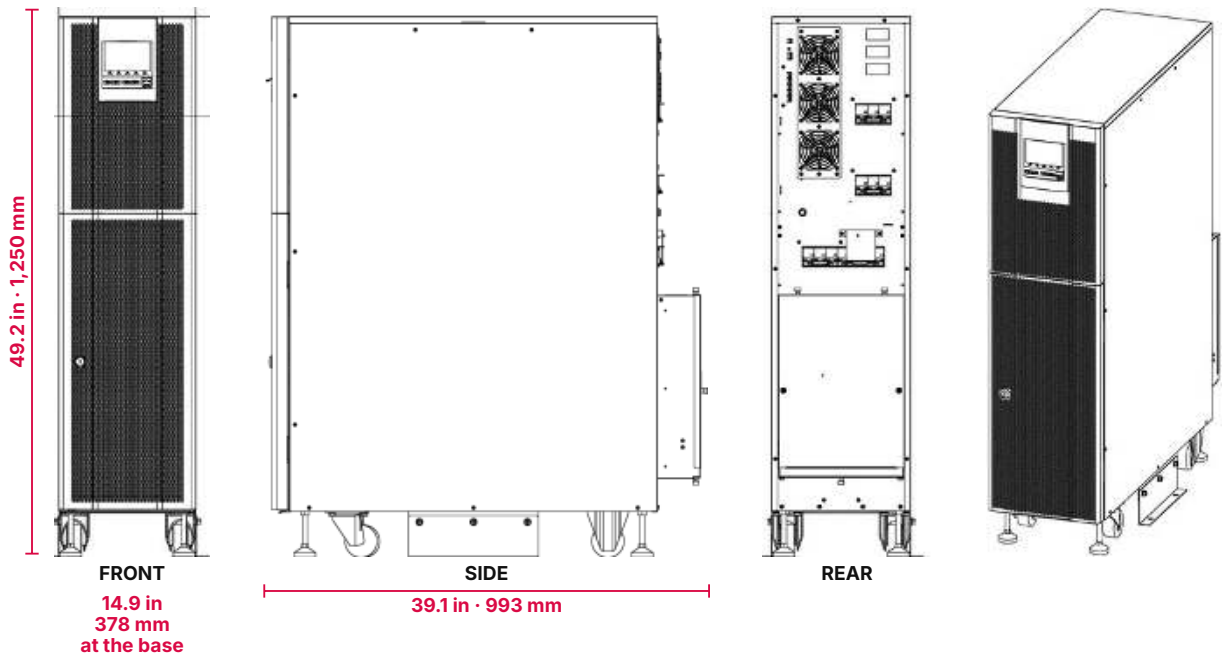
20 blocks

in each module, 99.2–132.3 lb, with its own breaker; 2 to 4 modules slide in from the front

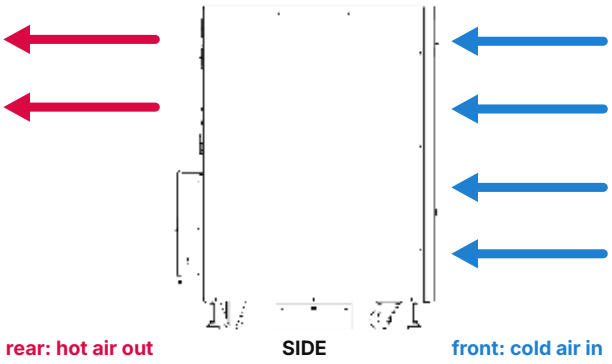
10 h

charge before first use; a battery left unused, 10 hours every 3 months

Installation and Dimensions
AUREON 10–30 kVA



Air path



Space, floor and weights

Size, W × D × H	14.9 × 39.1 × 49.2 in · 378 × 993 × 1,250 mm; width at the base
Weight, frame	10 kVA: 231 lb 20 kVA: 258 lb 30 kVA: 282 lb
Weight with batteries	10 kVA: 465 lb · 699 lb 20 kVA: 609 lb · 726 lb 30 kVA: 750 lb
Clearance	11.8 in (300 mm) behind and on both sides; the front clear for service
Floor	level, under 5° slope; four M8 expansion bolts on concrete, four leveling feet; moved upright by forklift
Environment	23–104 °F (–5 to 40 °C) · 0–95 % RH · IP20 · below 6,562 ft (2,000 m)

14.9 in
wide at the base, 378 mm

39.1 in
deep, 993 mm

49.2 in
high, 1,250 mm

11.8 in
free behind and on both sides

Technical Specifications
AUREON 10–30 kVA

Model	10 kVA	20 kVA	30 kVA
Power (VA / W)	10,000 / 10,000	20,000 / 20,000	30,000 / 30,000
INPUT			
Connection	3 phases + N + PE		
Voltage, L-N	90–155 V at full load; 70–90 V with the output derated linearly		
Frequency	39.5–70.5 Hz		
Bypass	window 10, 15 or 20 % (20 % default); synchronizing 50/60 Hz ± 10 %		
Power factor · current distortion	≥ 0.99 · ≤ 3 % resistive, ≤ 5 % non-linear		
Current, max., input · bypass	37.0 · 30.3 A	75.9 · 60.6 A	100.0 · 90.9 A
BATTERY			
Type	VRLA, 12 V 9 Ah blocks, in modules inside the tower; external cabinets		
DC bus	±96 to ±120 V DC (±48 to ±60 cells, ±60 default)		
Blocks inside	40 · 80	60 · 80	80
Charge current · DC current, max.	1–10 A, 1 A default · 45.3 A	1–20 A, 2 A default · 91.6 A	1–20 A, 4 A default · 137.4 A
Backup at 50 % · 100 %	25 · 7 / 60 · 20 min	18 · 5 / 32 · 10 min	14 · 4 min
OUTPUT			
Connection · voltage	3 phases + N + PE · 120 V L-N (110 / 115 / 127 settable), 208 V L-L (190 / 200 / 220)		
Frequency	follows the bypass; 60 ± 0.1 Hz (or 50) on battery		
Distortion · power factor	≤ 1 % resistive, ≤ 4 % non-linear · 1 or 0.9, 1 by default		
Transfer to bypass	< 1 ms synchronized, < 10 ms not		
Overload, inverter	< 105 % continuous · 105–110 % 60 min · 110–130 % 10 min · 130–150 % 1 min · 150–200 % 200 ms		
Overload, bypass	< 130 % continuous · 130–155 % 1 min · > 155 % 200 ms		
Current, max.	30.3 A	60.6 A	90.9 A
Efficiency	up to 94 % · up to 98 % in ECO		
SYSTEM			
Display · communication	touchscreen, 5 lamps · RS485, dry contacts (5 out, 1 in, EPO), 2 slots: SNMP, relay or protocol card		
Parallel	up to 4 units, redundant or expand		
Environment	23–104 °F (–5 to 40 °C) · 0–95 % RH · IP20 · below 6,562 ft (2,000 m)		
Noise at 77 °F	< 60 dB		< 65 dB
W × D × H	14.9 × 39.1 × 49.2 in · 378 × 993 × 1,250 mm, width at the base; body 12.6 in (320 mm)		
Weight, frame without batteries	231 lb	258 lb	282 lb
Weight with batteries	465 lb · 699 lb	609 lb · 726 lb	750 lb
Standards	UL 1778 listed · performance IEC 62040-3		
Warranty	3 years on the UPS · 2 years on the VRLA batteries		

10–30 kVA
kVA = kW, output power factor 1

94 %
online efficiency; 98 % in ECO

UL 1778
listed UPS

3 years
warranty on the UPS

Ordering Information
AUREON 10–30 kVA

Every AUREON is ordered with one code: the rating, then the batteries inside. A frame without batteries takes external batteries.

AUR 20 -60X9A

series | rating, kVA | VRLA blocks × Ah

EXAMPLES

AUR-20
20 kVA frame, no batteries

AUR10-80X9A
10 kVA with 80 blocks inside

Code	Description
AUR-10	AUREON 10 kVA frame, no batteries
AUR10-40X9A	AUREON 10 kVA with 40 × 12 V 9 Ah · 7 min at full load
AUR10-80X9A	AUREON 10 kVA with 80 × 12 V 9 Ah · 20 min at full load
AUR-20	AUREON 20 kVA frame, no batteries
AUR20-60X9A	AUREON 20 kVA with 60 × 12 V 9 Ah · 5 min at full load
AUR20-80X9A	AUREON 20 kVA with 80 × 12 V 9 Ah · 10 min at full load
AUR-30	AUREON 30 kVA frame, no batteries
AUR30-80X9A	AUREON 30 kVA with 80 × 12 V 9 Ah · 4 min at full load
PAR-KIT-AUR	Parallel kit: up to four AUREON units
SNMP-L	SNMP-L network card: web pages, SNMP v1/v2c/v3 and Modbus TCP/IP; e-mail alarms; for LUMINA, ETHERNO, AUREON and INFINITE
DRYCNT	Dry-contact relay card: mains failure, battery low, UPS fault, bypass; all AEC UPS series



Closed



Door open: battery modules



Rear: breakers, wiring box

40–80 Blocks inside

12 V 9 Ah VRLA blocks in modules of 20, two to four per tower; external cabinets on the battery terminals for more.

10 kVA	40 or 80 blocks
20 kVA	60 or 80 blocks
30 kVA	80 blocks

ORDER

Sizing by AEC

Tell us the load and the runtime: AEC chooses the code, the battery set-up and the cables.

STOCK

Miami

AEC UPS USA keeps units, modules and spare parts in Miami.

WARRANTY

3 + 2 years

3 years on the UPS · 2 years on the VRLA batteries.

MODULAR ONLINE UPS · 15 kVA MODULES

RADIANT

15–90 kVA

Online double conversion in 15 kVA hot-swappable power modules, up to six in one 17.4-inch frame with four breakers, for 208/120 V three-phase loads and an external VRLA battery bank.



RADIANT · THE 90 kVA FRAME, DOOR CLOSED

15 kVA
per hot-swappable module

Modular
technology: up to six modules per frame, N+X

95.5 %
efficiency online; 99 % in ECO

208/120 V
three-phase, 4-wire + PE

Product Overview
RADIANT 15–90 kVA

Key features of the RADIANT series.

15 kVA
Power modules, 1 to 6 per frame
One to six 15 kVA modules in a six-slot frame; each holds a rectifier, an inverter and a bidirectional DC/DC charger.

N+X
Redundant modules
A module can be set as redundant and withdrawn with the system running; the screen warns when the redundancy is lost.

95.5 %
Efficiency and input power factor
Up to 95.5 % in double conversion with 15 kVA modules, 99 % in ECO; input power factor 0.99, current THD below 2.2 %.

300 %
Overload and short-circuit current
Short-circuit current limited at 300 % for 200 ms; 170 % neutral current; 100 % non-linear load.

7"
Color touchscreen
Home, Cabinet, Module, Log, Set, Control and Scope; green, yellow and red indicators; EPO key.

4
Breakers in the frame
Input, bypass, output and maintenance bypass breakers in the US frame.

Key data

Power range	15–90 kVA: 1 to 6 × 15 kVA modules
Input · output	3 phases + N + PE · 208 or 220 V L-L
Power factor	1 (kVA = kW)
Efficiency	up to 95.5 % (15 kVA modules) · 99 % in ECO
Battery	external VRLA, 20–24 × 12 V, ±120 to ±144 V DC
Display	7-inch color touchscreen
Parallel	two frames, 1+1
W × D × H	17.4 × 33.1 × 59.4 in
Weight	244.5 lb (15 kVA) to 432 lb (90 kVA)
Standards · warranty	UL 1778 standard · 3 years on the UPS



0.99
input power factor

< 1 %
output THD, linear load

±1 %
output voltage, balanced load

0 ms
inverter ↔ bypass, synchronized

RADIANT · FRONT VIEW

Front View
RADIANT 15–90 kVA

The RADIANT frame from the front, closed and with the upper door open: the touchscreen and EPO on the door, the four breakers behind it, the modules behind the lower door.



DOOR CLOSED



DOOR OPEN

1 Touchscreen
7-inch color, on the upper door.

2 Status colors
Green, yellow and red indicators beside the screen.

3 EPO
Emergency power off, on the front.

4 Upper door
Lockable; behind it the four breakers.

5 Lower door
Perforated: air in, dust filter inside; behind it the bypass module and six module slots.

6 Casters
Four; lock them once in place.

7 Bypass breaker
Feeds the static bypass from the bypass input.

8 Maintenance bypass breaker
Feeds the load from the bypass input during service.

9 Input breaker
The mains to the rectifiers of the modules.

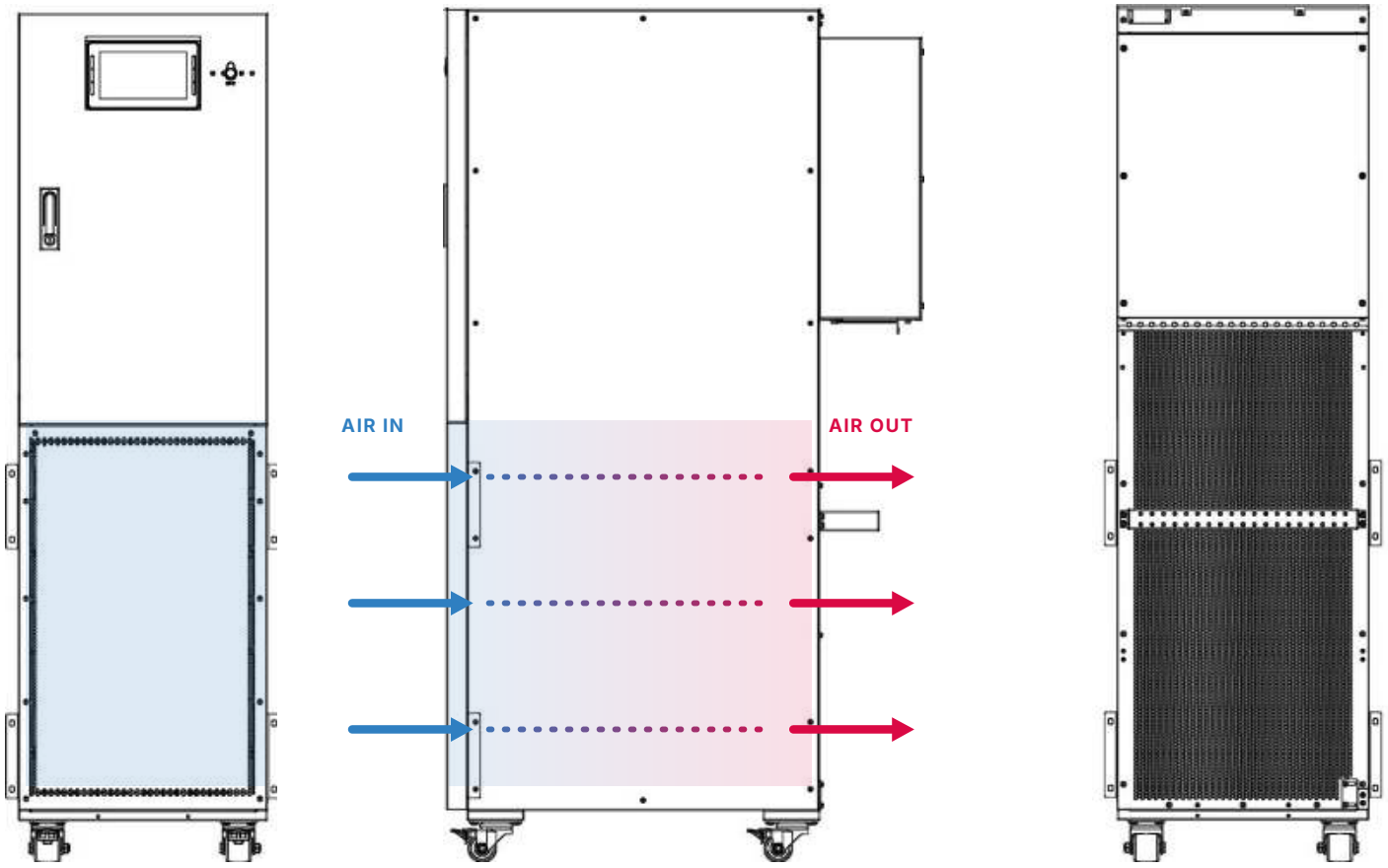
10 Output breaker
From the inverters and the bypass to the load.

11 Door, inside
The back of the display, with its cable.

RADIANT · REAR VIEW AND AIRFLOW

Rear View and Airflow
RADIANT 15–90 kVA

The RADIANT frame in three views at one scale. Cool air in at the front, warm air out at the back.



FRONT

RIGHT SIDE · FRONT AT LEFT

REAR

Cooling, front to back

- Forced convection by internal fans: the air enters at the front grilles, the perforated lower door, and leaves through the grilles at the rear.
- The grilles are on the lower half, in front of and behind the modules; the upper half carries the touchscreen and EPO in front, the terminals at the rear.
- Do not block the ventilation holes: keep the front door and the rear grille clear.
- A dust filter in the removable magnetic lower door, with a service period and a reset on the screen.

What each side carries

Front	touchscreen and EPO on the upper door; the perforated lower door, air in
Right side	26.0 in (661 mm) of cabinet; with the box at the rear, 33.1 in (840 mm)
Rear	the cover over the terminals at the top; the rear grille, air out
Base	four casters; lock them once in place

17.4 in
wide, 442 mm

33.1 in
deep, 840 mm

59.4 in
high, 1,510 mm

244.5–432 lb
lightest to heaviest model

Touchscreen Interface
RADIANT 15–90 kVA

The 7-inch color touchscreen of RADIANT: seven menus, the readings of the cabinet and of every module, the log, the settings behind a login, the commands and the waveforms.



ON THE DOOR

1 Color touchscreen
7-inch, on the upper door: power flow, readings, settings, log and scope.

2 Status colors
Green, yellow and red beside the screen: normal, warning, fault.

3 EPO
Emergency power off, beside the screen.

Login with user permissions for the settings.

Two short beeps and one long: a general alarm; continuous: a serious fault.

Seven menus

Home
power flow, load, battery, alarms

Cabinet
bypass, input, output, load, battery

Module
each module: input, output, DC bus, temperatures

Log
every event with date and time

Set
battery, system, contacts, network, language

Control
on/off, transfers, tests, resets

Scope
output and bypass waveforms

On the screen



1 Control · Function
On and off, manual transfer to inverter or bypass, fault clear and resets.



2 Set · System
Single or parallel mode, bypass window and the number of redundant modules.



3 Set · Network
IP address, subnet mask, gateway and DNS of the SNMP card.



4 Set · Communication
Modbus on RS232 and RS485/USB: protocol, baud rate and address.



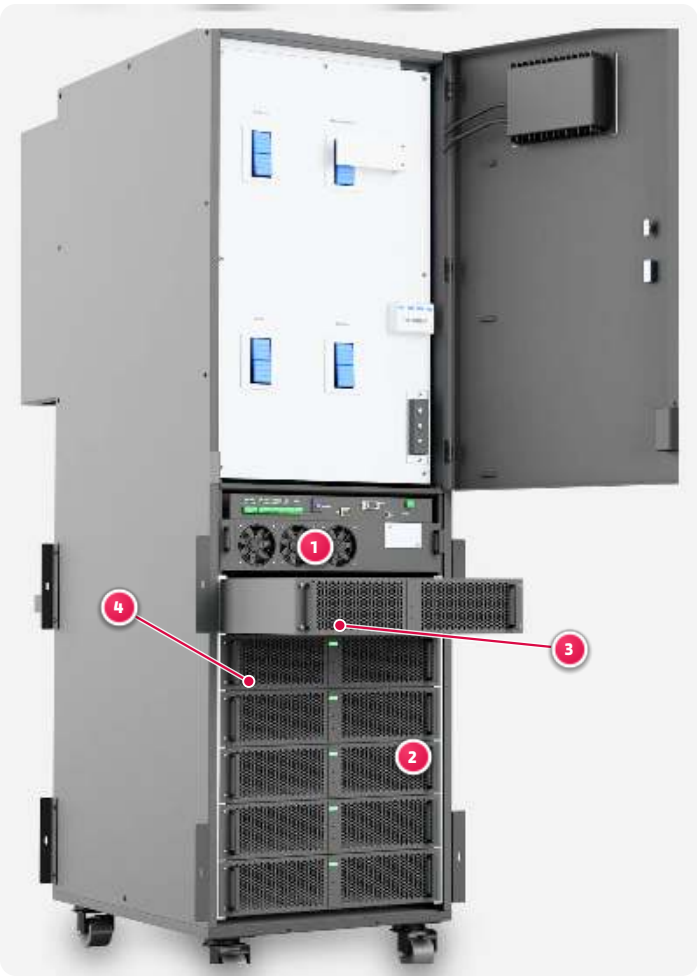
5 Set · Battery
Type, capacity, block count, float and boost charge, end of discharge.



6 Set · Language
Fourteen languages on the screen, Spanish and Portuguese included.

Modular Technology Architecture
RADIANT 15–90 kVA

Each power module is a complete double-conversion UPS of 15 kVA: rectifier, inverter and a bidirectional DC/DC that charges the battery. The modules slide in under the bypass module.



1. **Bypass module**
   One per frame: the static switch; ports and the cold-start button behind the touchscreen.
2. **Power modules**
   One to six 15 kVA modules, 2U each, from the bottom slot up.
3. **Status lamp**
   Green: the module runs.
4. **Handles and screws**
   Two handles to draw it out; the screws hold it in its slot.

The module

Rating	15 kVA
Size	15.7 × 19.5 × 3.4 in (400 × 495 × 86 mm), 2U
Weight	37 lb (16.8 kg)
Inside	rectifier, inverter, bidirectional DC/DC
Per frame	1 to 6
Front	status lamp, OFF key, cold-start button

Hot swap, with the load running

01 **Enable module OFF**
With a redundant module and the bypass normal, enable Module ON/OFF in the Control menu.

02 **Switch it off**
Press the module's OFF key: it leaves the system and the others carry the load.

03 **Pull it out**
Loosen the screws and pull the module out after 5 minutes; its DC bus must be below 60 V.

04 **Push the new one in**
Insert modules one at a time, at least 10 s apart: they join the system by themselves; tighten the screws.

N+X redundancy



With a module set as redundant (N+X), the others carry the load when one stops or is replaced; the screen shows 'Lost N+X Redundant' when the spare is missing. Example: a 75 kW load on six 15 kVA modules, N = 5, X = 1.

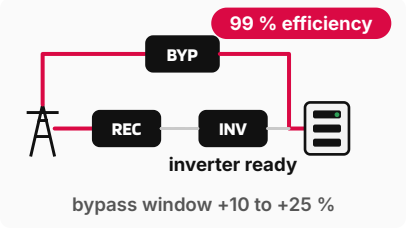
2U	37 lb	1–6	10 s
per 15 kVA module	module weight	modules per frame	at least, between insertions

Smart Functions
RADIANT 15–90 kVA

What each function does for the load and the batteries, and how it is set.

ENERGY

ECO mode, 99 %

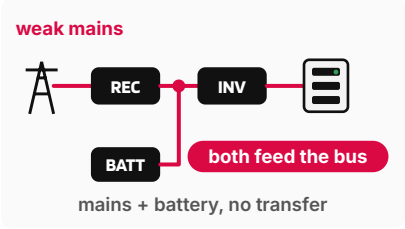


In ECO the load runs on the bypass while it stays in its window, with rectifier and inverter on standby; if the bypass fails the load moves to the battery and inverter in less than 10 ms. Single ECO or parallel ECO, chosen in the system mode.

System mode	**Single ECO · parallel ECO**
ECO → battery	**< 10 ms**

CONTINUITY

Source sharing



When the mains cannot give the rectifier all the power the load needs, each module draws from the mains and the battery at once: the load stays on the inverter without a transfer, and the battery gives only the difference.

Mode	**source-share, automatic**
Sources	**mains + battery together**

SITE

On a generator



Touchscreen · set, dry contact: genset input

A dry-contact input tells the UPS that the site has moved to its generator, and the event goes into the log with its time: the operator and the monitoring software see at once what is feeding the load.

Input	**IP3, generator connected**
Event	**Generator input, logged**

ENERGY

Module sleep at part load

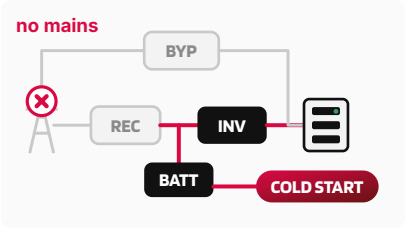


At part load the modules that are not needed go on standby, in turn, according to the load and the setting; the rest carry the load at a better point of their efficiency curve, and wake again as the load grows.

Modules	**stand by in turn**
Set by	**load percent and setting**

START-UP

Battery cold start



With no mains the UPS can be started from its batteries: the cold-start button on the bypass assembly, behind the touchscreen, then the cold-start button of each power module, one by one.

Button	**cold start, bypass assembly, behind the touchscreen**
Needs	**battery connected, breaker closed**

BATTERY

Battery test and maintenance



Touchscreen · control, test: battery test, battery maintain, stop test

A battery test moves the UPS to battery for 20 seconds; a maintenance discharge runs the string down to 1.1 times the end-of-discharge voltage. Self-tests repeat every 720 to 3,000 hours.

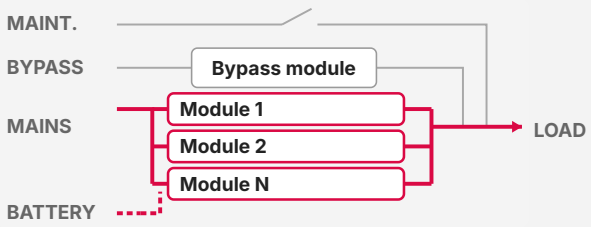
Test	**20 s on battery**
Maintenance	**down to 1.1 × EOD voltage**

Also: Frequency converter · 40–70 Hz in, 50 or 60 Hz out · Service life and wave capture · Automatic restart · after end of discharge · Temperature compensation · −1.7 mV/°F/cell (−3.0 mV/°C/cell) · Bypass window · +10 to +25, −10 to −40 %

Technical Specifications
RADIANT 15–90 kVA

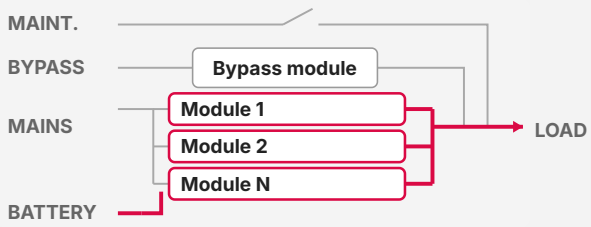
Model	Frame, all ratings
Ratings	15, 30, 45, 60, 75 and 90 kVA: 1 to 6 × 15 kVA modules
INPUT	
Connection · voltage	3 phases + N + PE · 208 or 220 V L-L
Voltage range	167–260 V L-L at full load; 125–167 V derated to 50 %
Frequency · power factor · THD	40–70 Hz · 0.99 · < 2.2 % (linear load)
Bypass	+10/+15/+20/+25 %, −10/−20/−30/−40 % (default +15/−20 %); ±1, 3 or 5 Hz
OUTPUT	
Voltage	208 or 220 V L-L; ±1 % balanced, ±1.5 % fully unbalanced; transient ±5 %
THD	< 1 % linear, < 5 % non-linear
Inverter overload	110 % 1 h · 125 % 10 min · 150 % 1 min · > 150 % 200 ms
Bypass overload	< 110 % long term · 125 % 10 min · 150 % 1 min · > 150 % 1 s
Fault current · neutral	300 % for 200 ms · 170 %
Efficiency	up to 95.5 % (15 kVA modules) · 99 % in ECO
Transfer	0 ms synchronized; < 10 ms from ECO
BATTERY	
Blocks · bus	external VRLA, 20–24 × 12 V · ±120 to ±144 V DC
Charge	float 2.25, boost 2.4 V/cell; charging power up to 50 % of the rating
SYSTEM	
Rated currents, 90 kVA	318 A mains · 252 A bypass and output · 403 A battery, maximum
Module	15 kVA, 2U, 15.7 × 19.5 × 3.4 in (400 × 495 × 86 mm), 37 lb
Display · communication	touchscreen, EPO, indicators · RS232, RS485, USB, dry contacts, SNMP slot
Parallel	two frames, 1+1
Environment	32–104 °F · 0–95 % RH · IP20 · full power to 9,800 ft · 64 dB
W × D × H	17.4 × 33.1 × 59.4 in · 442 × 840 × 1,510 mm
Weight	15 kVA 244.5 lb · 30 kVA 282 lb · 45 kVA 319.5 lb · 60 kVA 357 lb · 75 kVA 394.5 lb · 90 kVA 432 lb
Standards	UL 1778 standard
Warranty	3 years on the UPS

HOW IT WORKS · NORMAL MODE



The rectifier boosts the mains to the DC bus, the bidirectional DC/DC charges the battery, the inverters share the load.

BATTERY MODE



On a mains failure the inverters run from the battery and return to the mains by themselves; a cold start works with no mains.

Ordering Information
RADIANT 15–90 kVA

Every RADIANT is ordered with one code: the frame, then the number of 15 kVA modules. Frames and modules are also sold on their own; the battery bank is sized by AEC.

RAD90 -4X15

frame, 90 kVA — power modules × kVA

The frame first, then its 15 kVA modules: one for every 15 kVA of load and one more for N+1. The battery bank is external, sized by AEC.

EXAMPLES

RAD90-4X15
60 kVA: four 15 kVA modules

RAD90-6X15
90 kVA: six 15 kVA modules

Code	Description
RAD90-1X15	RADIANT 15 kVA: frame with 1 × 15 kVA module, external batteries
RAD90-2X15	RADIANT 30 kVA: frame with 2 × 15 kVA modules, external batteries
RAD90-3X15	RADIANT 45 kVA: frame with 3 × 15 kVA modules, external batteries
RAD90-4X15	RADIANT 60 kVA: frame with 4 × 15 kVA modules, external batteries
RAD90-5X15	RADIANT 75 kVA: frame with 5 × 15 kVA modules, external batteries
RAD90-6X15	RADIANT 90 kVA: frame with 6 × 15 kVA modules, external batteries
RAD90-FRAME	RADIANT frame: six slots, bypass module and four breakers, no modules
RAD-PWR-15	Power module 15 kVA
SNMP-M	SNMP network card
DRYCNT	Dry-contact card



RADIANT frame, 90 kVA, closed



The same frame open: four breakers

× 1–6

Modules per frame

15 kVA each, up to 90 kVA; one more than the load needs for N+1.

MODULAR ONLINE UPS · BATTERIES INSIDE

RADIANT-IB

20–100 kVA

Online double conversion in 20 kVA hot-swappable power modules, with 240 VRLA blocks in 24 trays inside the same 23.6-inch cabinet, for 208 V three-phase loads.



RADIANT-IB · THE CABINET, CLOSED

N+X
redundant power modules

240
12 V 9 Ah blocks inside

94 %
efficiency, double conversion

208 V
three-phase, 4-wire + PE

Product Overview
RADIANT-IB 20–100 kVA

Key features of the RADIANT-IB series.

20 kVA

Power modules, 1 to 5 per frame

One to five 20 kVA power modules in one frame. Each holds a rectifier, an inverter and a charger; the modules share the load.

N+X

Redundant modules

With one module more than the load needs, a module can stop or be pulled out while the others carry the load on the inverter.

240

Batteries inside

24 trays of ten 12 V VRLA blocks under the modules: strings of 20 blocks with the neutral at the midpoint, ±120 V DC.

94 %

Efficiency and input power factor

DSP full digital control; up to 94 % efficiency in double conversion, input power factor above 0.99.

7"

Color touchscreen

Power flow, cabinet and module readings, logs, settings, control and a scope of the output and bypass waveforms.

×3

Parallel cabinets

Up to three cabinets in parallel with ring cables, for more power or for redundancy.

Key data

Power range	20–100 kVA: 1 to 5 × 20 kVA modules
Input · output	3 phases + N + PE · 208 V L-L
Power factor	1 (kVA = kW)
Efficiency	94 % max, double conversion and battery mode
Battery	240 × 12 V 9 Ah VRLA inside, 24 trays, ±120 V DC

Display	7-inch color touchscreen
Parallel	up to 3 cabinets
W × D × H	23.6 × 39.4 × 78.7 in
Weight	2,191.8–2,399.8 lb with batteries
Standards · warranty	UL 1778 standard · 3 years on the UPS

> 0.99
input power factor

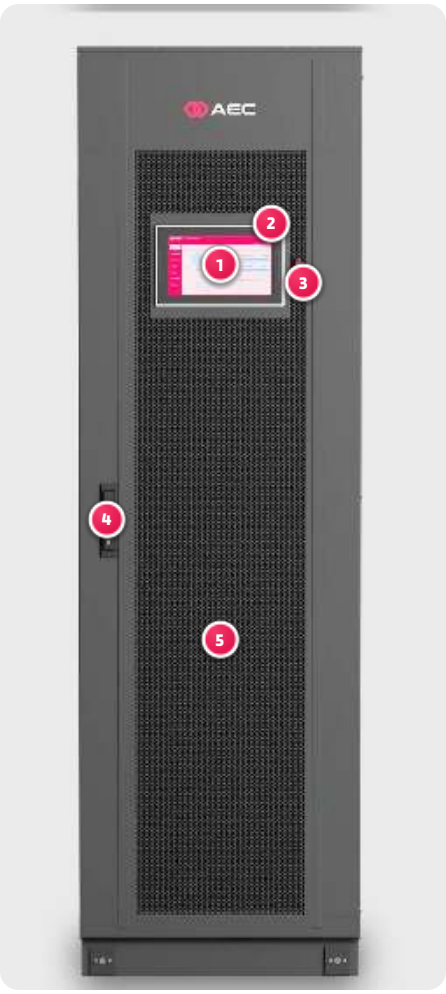
±0.1 %
output frequency

0 ms
inverter ↔ bypass, synchronized

40–70 Hz
input frequency

Front View
RADIANT-IB 20–100 kVA

The RADIANT-IB cabinet from the front, closed and open: the touchscreen and EPO on the door, the modules, the bypass & monitoring module and the 24 battery trays behind it.



DOOR CLOSED



DOOR OPEN

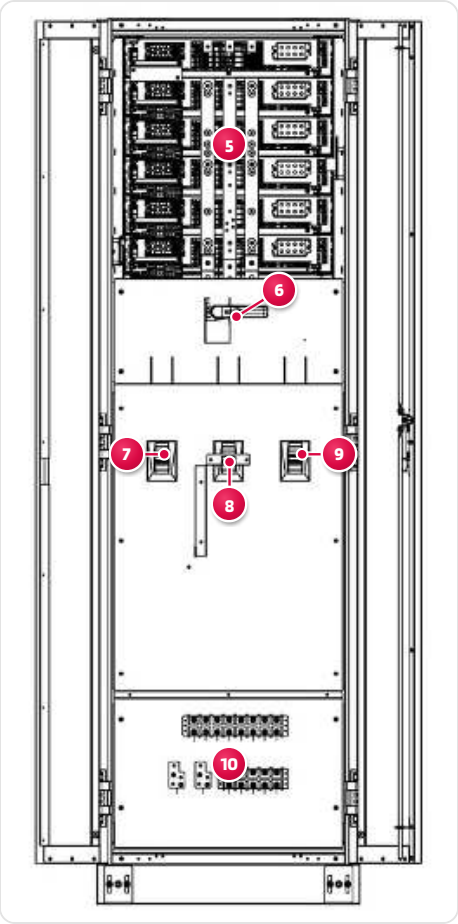
1. **Touchscreen**
   7-inch color, on the front door.
2. **Status indicator**
   Beside the screen.
3. **EPO**
   Covered emergency power off key.
4. **Door handle**
   Lockable front door.
5. **Perforated door**
   Air in at the front.
6. **Power modules**
   One to five 20 kVA modules, hot-swappable, at the top.
7. **Bypass & monitoring module**
   Static switch, controls, ports and the cold-start button.
8. **Battery trays**
   24 trays of ten 12 V blocks: 240 blocks.
9. **A tray drawn out**
   Each tray plugs into the battery bus with its own connector.
10. **Door, inside**
    The back of the touchscreen.

Rear View
RADIANT-IB 20–100 kVA

The rear of the RADIANT-IB cabinet, both doors open: the breakers and the power terminals.



REAR DOORS OPEN



REAR

1 Power modules, rear side
The 20 kVA modules; they are serviced from the front.

2 Battery breaker
Between the 240 blocks and the DC bus.

3 Breakers
Input, maintenance bypass and output; terminals below.

4 Rear doors
Two, with grilles at the top: air out.

5 Module backplane
The connectors the modules plug into.

6 Battery breaker, as drawn
Tripped by the UPS at end of discharge or on EPO.

7 Output breaker
To the load.

8 Maintenance bypass breaker
Feeds the load from the bypass during service.

9 Input breaker
The mains to the rectifiers.

10 Terminals
Mains, bypass, output, battery and PE; cables from the top or the bottom.

Touchscreen Interface
RADIANT-IB 20–100 kVA

The 7-inch color touchscreen of RADIANT-IB: seven menus, the readings of the cabinet and of every module, the log, the settings behind a login, the commands and the waveforms.



ON THE DOOR

1 Color touchscreen
7-inch, on the front door: power flow, readings, settings, log and scope.

2 Status indicator
Beside the screen: normal, warning, fault.

Login with user permissions for the settings.

A covered EPO key on the door; the log keeps every event with its date and time.

Seven menus

Home
power flow, load, battery, alarms

Cabinet
bypass, input, output, load, battery

Module
each module: input, output, DC bus, temperatures

Log
every event with date and time

Set
battery, system, contacts, network, language

Control
on/off, transfers, tests, resets

Scope
output and bypass waveforms

On the screen



1 Control · Test
Battery test, maintenance discharge, manual float and boost charge.



2 Set · Battery
Type, capacity, block count, float and boost charge, end of discharge.



3 Set · Dry contact
Generator input, battery breaker trip and the other relay functions.



4 Set · Alarm
The level of every event, set one by one.



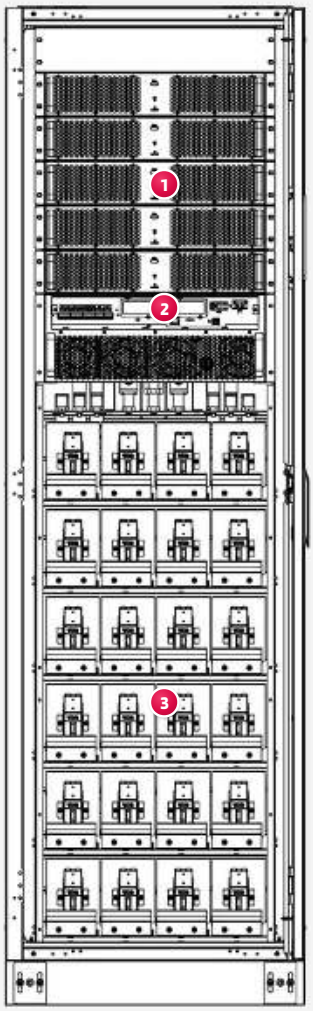
5 Set · System
Single or parallel mode, bypass window and the number of redundant modules.



6 Set · Language
Fourteen languages on the screen, Spanish and Portuguese included.

Modular Technology Architecture
RADIANT-IB 20–100 kVA

Each power module is a complete double-conversion UPS of 20 kVA: rectifier, inverter and charger. The modules sit at the top of the cabinet, above the bypass & monitoring module.

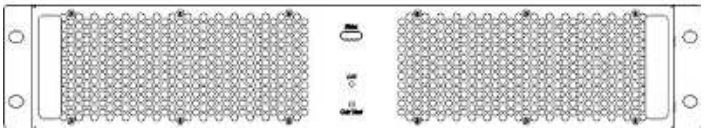


1. **Power modules**
   One to five 20 kVA modules, numbered from the bottom slot up.
2. **Bypass & monitoring module**
   Static switch, controls, interfaces and the cold-start button.
3. **Battery trays**
   24 trays of ten 12 V blocks under the modules.

The module

Rating	20 kVA = 20 kW
Size	17.3 × 26.7 × 3.3 in (440 × 678 × 85 mm), 2U
Weight	52 lb (23.6 kg)
Inside	rectifier, inverter, DC charger
Per cabinet	1 to 5
Front	status indicator, OFF key, cold-start button

The module, front



2U, 17.3 in wide: the OFF key, the status indicator and the cold-start button between two fan grilles.

Hot swap, with the load running

01 **Check the load**
The other modules must carry it; if not, transfer to bypass first.

02 **Switch the module off**
Module ON/OFF in the Control menu, then its OFF key for 3 s.

03 **Pull it out**
After 10 minutes remove the two screws; two people.

04 **Push the new one in**
Fix the screws: it starts and joins the system.

N+X redundancy



With one module more than the load needs (N+1), a module can stop or be replaced while the others carry the load; the screen warns when the redundant module is lost. Example: a 60 kW load on four 20 kVA modules, N = 3, X = 1.

2U
per 20 kVA module

52 lb
module weight

1–5
modules per cabinet

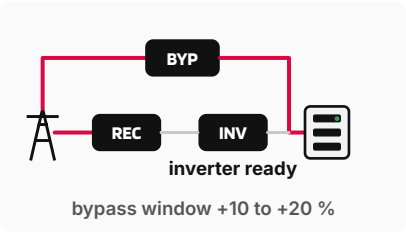
N+1
or N+N redundancy

Smart Functions
RADIANT-IB 20–100 kVA

What each function does for the load and the batteries, and how it is set.

ENERGY

ECO mode

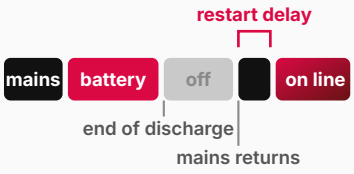


In ECO the load runs on the bypass while it stays in its window, with rectifier and inverter on standby; if the bypass fails the load moves to the battery and inverter in less than 10 ms. Single ECO or parallel ECO, chosen in the system mode.

System mode	**Single ECO · parallel ECO**
ECO → battery	**< 10 ms**

CONTINUITY

Auto-restart after an outage



If an outage outlasts the battery, the inverter stops at end of discharge; when the mains returns the UPS restarts by itself and goes back on line, after the delay set by the commissioning engineer.

After	**end of discharge (EOD)**
Restart delay	**set at commissioning**

SITE

On a generator



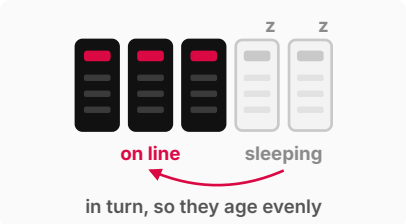
Touchscreen · set, dry contact: genset input

A dry-contact input tells the UPS that the site has moved to its generator, and the event goes into the log with its time: the operator and the monitoring software see at once what is feeding the load.

Input	**IP3, generator connected**
Event	**Generator input, logged**

ENERGY

Module sleep at part load

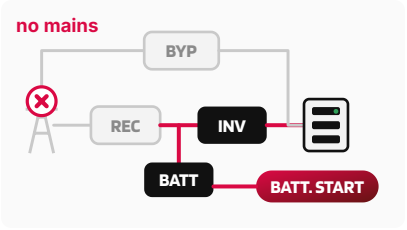


At part load the modules that are not needed go on standby, in turn, according to the load and the setting; the rest carry the load at a better point of their efficiency curve, and wake again as the load grows.

Modules	**stand by in turn**
Set by	**load percent and setting**

START-UP

Battery cold start



With no mains, press the red battery start button on the monitor module for 3 seconds, then the cold-start button of a power module: the UPS starts from its batteries and is put on line from the panel.

Buttons	**battery start, monitor module, 3 s · cold start, power module**
Needs	**battery connected, breaker closed**

BATTERY

Battery test and maintenance



Touchscreen · control, test: battery test, battery maintain, stop test

A battery test moves the UPS to battery for 20 seconds; a maintenance discharge runs the string down to 1.1 times the end-of-discharge voltage. An automatic maintenance discharge can repeat on a set period, with 20 to 100 % load.

Test	**20 s on battery**
Maintenance	**down to 1.1 × EOD voltage**

Also: Frequency converter · 40–70 Hz in, 50 or 60 Hz out · Service life and wave capture · Temperature compensation · −1.7 mV/°F/cell (−3.0 mV/°C/cell) · Bypass window · +10 to +20, −10 to −40 % · Scope · waveforms

Battery and Runtime
RADIANT-IB 20–100 kVA

The batteries ride in the UPS cabinet: 24 trays of ten 12 V blocks, in strings of 20 with the neutral at the midpoint, on a ±120 V DC bus.



The 24 trays behind the front door: ten 12 V blocks each.

The battery

Blocks	240 × 12 V 9 Ah VRLA
Trays	24 × 10 blocks; 63.5 lb each
Strings	20 blocks, neutral at the midpoint: ±120 V DC
Charge	float 2.25 V/cell, boost 2.3 V/cell; 0.1 C best, 0.2 C max
Compensation	−1.7 mV/°F/cell (−3.0 mV/°C/cell), settable 0 to −5.0, with the optional sensor
End of discharge	1.65 V/cell at 0.6 C, 1.75 V/cell at 0.15 C
Tests	battery test (20 s), maintenance discharge, boost, float
Cold start	from the batteries, about 60 s to output

Battery care

- Best at 68–77 °F (20–25 °C): life halves for every 18 °F (10 °C) above 68 °F.
- The block count set on the screen must equal the blocks installed.
- 'Battery Volt Low' is the pre-warning before the end of discharge.
- Maintenance discharge only with the bypass normal and 25 % capacity or more.

Backup time

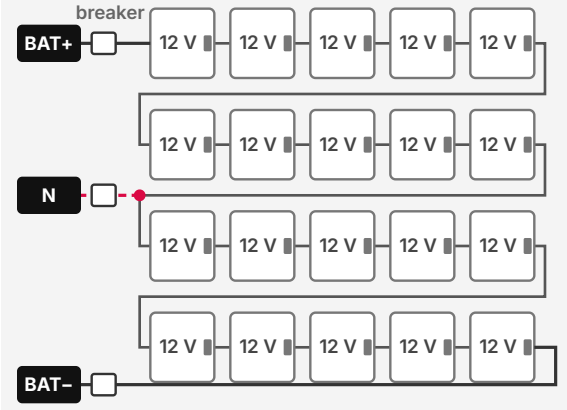
At 50 % load

20 kVA	85 min
40 kVA	32 min
60 kVA	22 min
80 kVA	14 min
100 kVA	12 min

At 100 % load

20 kVA	32 min
40 kVA	14 min
60 kVA	8 min
80 kVA	6 min
100 kVA	3 min

Minutes with the 240 internal blocks, new batteries.



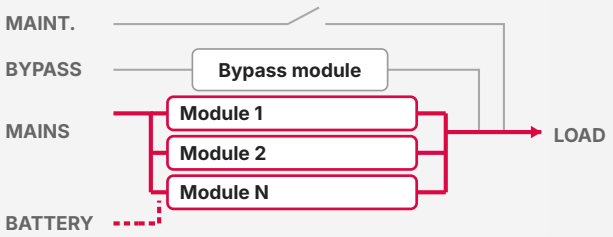
One string: 20 blocks of 12 V with the neutral at the midpoint, ±120 V DC, through the battery breaker; the 24 trays hold 240 blocks in such strings.

±120 V	240	2.25 V	68–77 °F
battery bus	blocks inside	float, per cell	best battery temperature

Technical Specifications
RADIANT-IB 20–100 kVA

Model	20 kVA	40 kVA	60 kVA	80 kVA	100 kVA
Power (kVA = kW)	20	40	60	80	100
Power modules	1 × 20 kVA	2 × 20 kVA	3 × 20 kVA	4 × 20 kVA	5 × 20 kVA
INPUT					
Connection · voltage	3 phases + N + PE · 208 V L-L (200 / 208 / 220 V rated)				
Voltage range	166–261 V L-L at full load; 125–166 V derated to 75 %				
Frequency · power factor	40–70 Hz · > 0.99				
Current THD	≤ 3 %				
Bypass	window +10/+15/+20 %, −10 to −40 % (default +15/−20 %); ±1, 3 or 5 Hz				
OUTPUT					
Voltage · frequency	208 V L-L · 50/60 Hz ± 0.1 %				
THD	≤ 1 % linear, ≤ 5 % non-linear				
Power factor	1 (kVA = kW)				
Inverter overload	110 % 1 h · 125 % 10 min · 150 % 1 min · > 150 % 200 ms				
Bypass overload	110 % long term · 125 % 5 min · 150 % 1 min · > 150 % 1 s				
Transfer	0 ms synchronized; < 10 ms from ECO				
Efficiency	94 % max, double conversion and battery mode				
BATTERY					
Blocks · bus	240 × 12 V 9 Ah VRLA in 24 trays · ±120 V DC, 20 blocks per string				
Charge	float 2.25 V/cell, boost 2.3 V/cell, −1.7 mV/°F/cell (−3.0 mV/°C/cell) compensation				
Backup at 50 · 100 %	85 min · 32 min	32 min · 14 min	22 min · 8 min	14 min · 6 min	12 min · 3 min
SYSTEM					
Rated currents, 100 kVA	348 A mains · 277 A bypass and output · 476 A battery				
Display · communication	7-inch color touchscreen · RS232, RS485, USB, dry contacts, EPO; SNMP and intelligent slots				
Parallel	up to 3 cabinets				
Environment	32–104 °F (0–40 °C) · 0–95 % RH · IP20 · full power to 3,300 ft (1,000 m), −1 % per 330 ft (100 m) above · < 65 dB				
W × D × H	23.6 × 39.4 × 78.7 in · 600 × 1,000 × 2,000 mm				
Weight with batteries	2,191.8 lb	2,243.8 lb	2,295.8 lb	2,347.8 lb	2,399.8 lb
Standards	UL 1778 standard				
Warranty	3 years on the UPS · 2 years on the VRLA batteries				

HOW IT WORKS · ONLINE DOUBLE CONVERSION



PROTECTIONS

- Output overload and short circuit
- Module and inlet over-temperature
- Battery low, end of discharge, reverse polarity
- Lost N+X redundancy
- Input neutral lost, bypass sequence error
- EPO, local and remote

Ordering Information
RADIANT-IB 20–100 kVA

Every RADIANT-IB is ordered with one code: the frame, then the number of 20 kVA modules. The 240 blocks come inside; frames, modules and trays are also sold on their own.

RADIB 100 -3X20

series | frame, kVA | power modules × kVA

The frame first, then its 20 kVA power modules: one for every 20 kVA of load and one more for N+1. Every frame comes with its 240 blocks in 24 trays.

EXAMPLES

RADIB100-3X20
60 kVA: three 20 kVA modules

RADIB100-5X20
100 kVA: five 20 kVA modules

Code	Description
RADIB100-1X20	RADIANT-IB 20 kVA: 1 × 20 kVA module, 240 × 12 V 9 Ah inside · 32 min at full load
RADIB100-2X20	RADIANT-IB 40 kVA: 2 × 20 kVA modules, 240 × 12 V 9 Ah inside · 14 min at full load
RADIB100-3X20	RADIANT-IB 60 kVA: 3 × 20 kVA modules, 240 × 12 V 9 Ah inside · 8 min at full load
RADIB100-4X20	RADIANT-IB 80 kVA: 4 × 20 kVA modules, 240 × 12 V 9 Ah inside · 6 min at full load
RADIB100-5X20	RADIANT-IB 100 kVA: 5 × 20 kVA modules, 240 × 12 V 9 Ah inside · 3 min at full load
RADIB-FRAME	RADIANT-IB 100 kVA frame with the bypass & monitoring module
RADIB-PWR-20	Power module 20 kVA
RADIB-BATTR-EMPTY	Battery tray, empty
RADIB-BATTR-10x9A	Battery tray with ten 12 V 9 Ah VRLA blocks
SNMP-M	SNMP network card
DRYCNT	Dry-contact card



RADIANT-IB 100 kVA cabinet, rear doors open



The same cabinet, front door open: modules, 24 trays

× 1–5

Modules per frame

20 kVA each, up to 100 kVA; one more than the load needs for N+1.

RADIB100-5X20 AS N+1

20 kVA	20 kVA	20 kVA	20 kVA	+1

Four modules carry up to 80 kVA of load; the fifth is the spare.

MODULAR ONLINE UPS · BATTERIES INSIDE

CIRRO-IB

30–150 kVA

Online double conversion in 30 kVA hot-swappable power modules, with 240 VRLA blocks in 24 trays inside the same 23.6-inch cabinet, for 480 V three-phase loads.



CIRRO-IB · THE CABINET, CLOSED

N+X	240	96 %	480 V
redundant power modules	12 V 9 Ah blocks inside	efficiency, double conversion	three-phase, 4-wire + PE

Product Overview
CIRRO-IB 30–150 kVA

Key features of the CIRRO-IB series.

30 kVA

Power modules, 1 to 5 per frame

One to five 30 kVA power modules in one frame. Each holds a rectifier, an inverter and a charger; the modules share the load.

N+X

Redundant modules

With one module more than the load needs, a module can stop or be pulled out while the others carry the load on the inverter.

240

Batteries inside

24 trays of ten 12 V VRLA blocks under the modules: strings of 40 blocks with the neutral at the midpoint, ±240 V DC.

96 %

Efficiency and input power factor

DSP full digital control; up to 96 % efficiency in double conversion, input power factor above 0.99.

7"

Color touchscreen

Power flow, cabinet and module readings, logs, settings, control and a scope of the output and bypass waveforms.

×3

Parallel cabinets

Up to three cabinets in parallel with ring cables, for more power or for redundancy.

Key data

Power range	30–150 kVA: 1 to 5 × 30 kVA modules
Input · output	3 phases + N + PE · 480 V L-L
Power factor	1 (kVA = kW)
Efficiency	96 % max, double conversion and battery mode
Battery	240 × 12 V 9 Ah VRLA inside, 24 trays, ±240 V DC

Display	7-inch color touchscreen
Parallel	up to 3 cabinets
W × D × H	23.6 × 39.4 × 78.7 in
Weight	2,191.8–2,399.8 lb with batteries
Standards · warranty	UL 1778 standard · 3 years on the UPS

> 0.99
input power factor

±0.1 %
output frequency

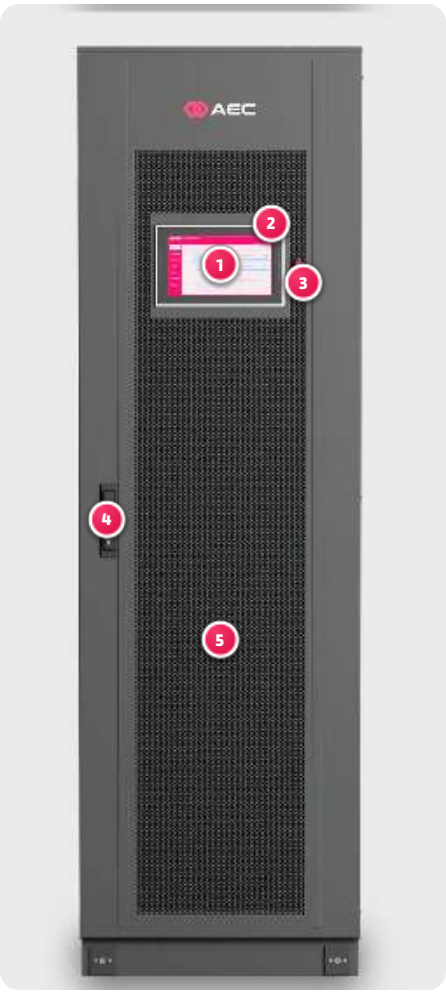
0 ms
inverter ↔ bypass, synchronized

40–70 Hz
input frequency

CIRRO-IB · FRONT VIEW

Front View
CIRRO-IB 30–150 kVA

The CIRRO-IB cabinet from the front, closed and open: the touchscreen and EPO on the door, the modules, the bypass & monitoring module and the 24 battery trays behind it.



DOOR CLOSED



DOOR OPEN

1 Touchscreen
7-inch color, on the front door.

2 Status indicator
Beside the screen.

3 EPO
Covered emergency power off key.

4 Door handle
Lockable front door.

5 Perforated door
Air in at the front.

6 Power modules
One to five 30 kVA modules, hot-swappable, at the top.

7 Bypass & monitoring module
Static switch, controls, ports and the cold-start button.

8 Battery trays
24 trays of ten 12 V blocks: 240 blocks.

9 A tray drawn out
Each tray plugs into the battery bus with its own connector.

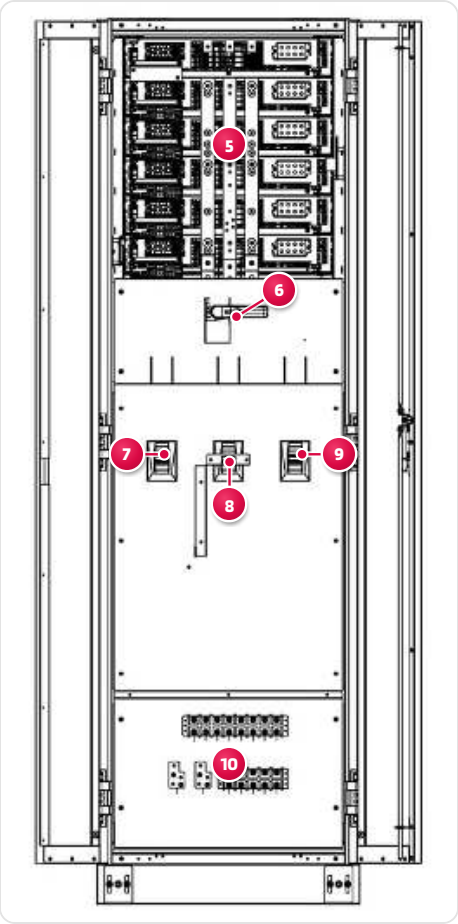
10 Door, inside
The back of the touchscreen.

Rear View
CIRRO-IB 30–150 kVA

The rear of the CIRRO-IB cabinet, both doors open: the breakers and the power terminals.



REAR DOORS OPEN



REAR

1 Power modules, rear side
The 30 kVA modules; they are serviced from the front.

2 Battery breaker
Between the 240 blocks and the DC bus.

3 Breakers
Input, maintenance bypass and output; terminals below.

4 Rear doors
Two, with grilles at the top: air out.

5 Module backplane
The connectors the modules plug into.

6 Battery breaker, as drawn
Tripped by the UPS at end of discharge or on EPO.

7 Output breaker
To the load.

8 Maintenance bypass breaker
Feeds the load from the bypass during service.

9 Input breaker
The mains to the rectifiers.

10 Terminals
Mains, bypass, output, battery and PE; cables from the top or the bottom.

Touchscreen Interface
CIRRO-IB 30–150 kVA

The 7-inch color touchscreen of CIRRO-IB: seven menus, the readings of the cabinet and of every module, the log, the settings behind a login, the commands and the waveforms.



ON THE DOOR

1 Color touchscreen
7-inch, on the front door: power flow, readings, settings, log and scope.

2 Status indicator
Beside the screen: normal, warning, fault.

Login with user permissions for the settings.

A covered EPO key on the door; the log keeps every event with its date and time.

Seven menus

Home
power flow, load, battery, alarms

Cabinet
bypass, input, output, load, battery

Module
each module: input, output, DC bus, temperatures

Log
every event with date and time

Set
battery, system, contacts, network, language

Control
on/off, transfers, tests, resets

Scope
output and bypass waveforms

On the screen



1 Set · System
Single or parallel mode, bypass window and the number of redundant modules.



2 Control · Test
Battery test, maintenance discharge, manual float and boost charge.



3 Set · Serial port
Baud rate and Modbus RTU address of the serial link.



4 Set · Alarm
The level of every event, set one by one.



5 Set · Battery
Type, capacity, block count, float and boost charge, end of discharge.

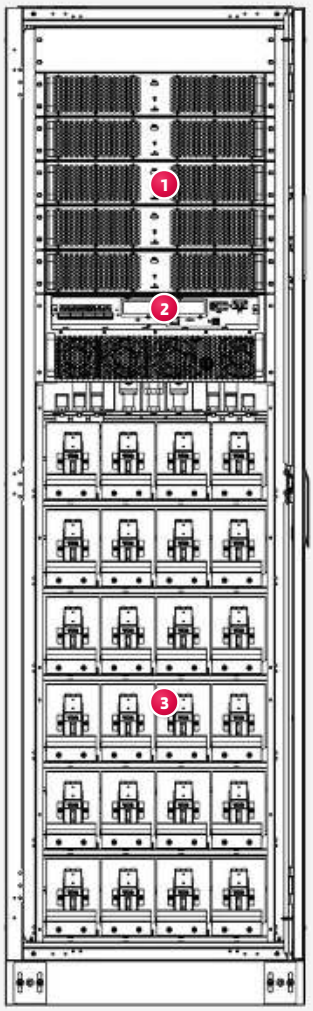


6 Set · Dry contact
Generator input, battery breaker trip and the other relay functions.

Modular Technology Architecture

CIRRO-IB 30–150 kVA

Each power module is a complete double-conversion UPS of 30 kVA: rectifier, inverter and charger. The modules sit at the top of the cabinet, above the bypass & monitoring module.

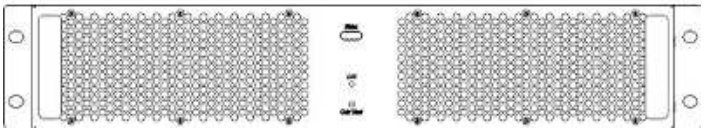


1. **Power modules**
   One to five 30 kVA modules, numbered from the bottom slot up.
2. **Bypass & monitoring module**
   Static switch, controls, interfaces and the cold-start button.
3. **Battery trays**
   24 trays of ten 12 V blocks under the modules.

The module

Rating	30 kVA = 30 kW
Size	17.3 × 26.7 × 3.3 in (440 × 678 × 85 mm), 2U
Weight	52 lb (23.6 kg)
Inside	rectifier, inverter, DC charger
Per cabinet	1 to 5
Front	status indicator, OFF key, cold-start button

The module, front



2U, 17.3 in wide: the OFF key, the status indicator and the cold-start button between two fan grilles.

Hot swap, with the load running

01 **Check the load**
The other modules must carry it; if not, transfer to bypass first.

02 **Switch the module off**
Module ON/OFF in the Control menu, then its OFF key for 3 s.

03 **Pull it out**
After 10 minutes remove the two screws; two people.

04 **Push the new one in**
Fix the screws: it starts and joins the system.

N+X redundancy



With one module more than the load needs (N+1), a module can stop or be replaced while the others carry the load; the screen warns when the redundant module is lost. Example: a 90 kW load on four 30 kVA modules, N = 3, X = 1.

2U
per 30 kVA module

52 lb
module weight

1–5
modules per cabinet

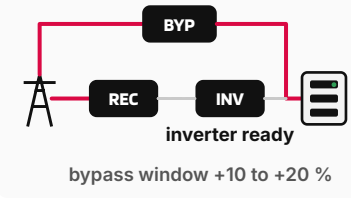
N+1
or N+N redundancy

Smart Functions
CIRRO-IB 30–150 kVA

What each function does for the load and the batteries, and how it is set.

ENERGY

ECO mode

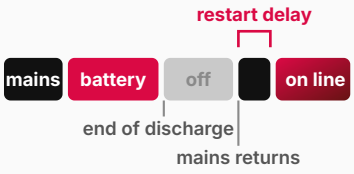


In ECO the load runs on the bypass while it stays in its window, with rectifier and inverter on standby; if the bypass fails the load moves to the battery and inverter in less than 10 ms. Single ECO or parallel ECO, chosen in the system mode.

System mode	**Single ECO · parallel ECO**
ECO → battery	**< 10 ms**

CONTINUITY

Auto-restart after an outage



If an outage outlasts the battery, the inverter stops at end of discharge; when the mains returns the UPS restarts by itself and goes back on line, after the delay set by the commissioning engineer.

After	**end of discharge (EOD)**
Restart delay	**set at commissioning**

SITE

On a generator



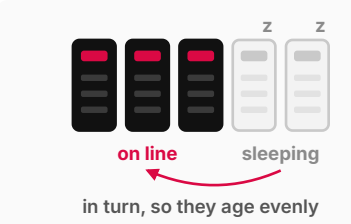
Touchscreen · set, dry contact: genset input

A dry-contact input tells the UPS that the site has moved to its generator, and the event goes into the log with its time: the operator and the monitoring software see at once what is feeding the load.

Input	**IP3, generator connected**
Event	**Generator input, logged**

ENERGY

Module sleep at part load

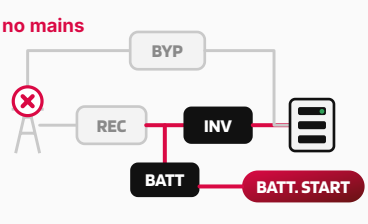


At part load the modules that are not needed go on standby, in turn, according to the load and the setting; the rest carry the load at a better point of their efficiency curve, and wake again as the load grows.

Modules	**stand by in turn**
Set by	**load percent and setting**

START-UP

Battery cold start



With no mains, press the red battery start button on the monitor module for 3 seconds, then the cold-start button of a power module: the UPS starts from its batteries and is put on line from the panel.

Buttons	**battery start, monitor module, 3 s · cold start, power module**
Needs	**battery connected, breaker closed**

BATTERY

Battery test and maintenance



Touchscreen · control, test: battery test, battery maintain, stop test

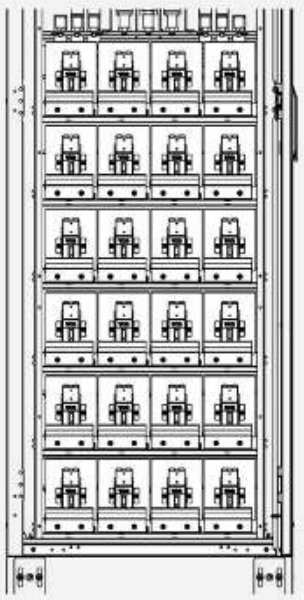
A battery test moves the UPS to battery for 20 seconds; a maintenance discharge runs the string down to 1.1 times the end-of-discharge voltage. An automatic maintenance discharge can repeat on a set period, with 20 to 100 % load.

Test	**20 s on battery**
Maintenance	**down to 1.1 × EOD voltage**

Also: Frequency converter · 40–70 Hz in, 50 or 60 Hz out · Service life and wave capture · Temperature compensation · −1.7 mV/°F/cell (−3.0 mV/°C/cell) · Bypass window · +10 to +20, −10 to −40 % · Scope · waveforms

Battery and Runtime
CIRRO-IB 30–150 kVA

The batteries ride in the UPS cabinet: 24 trays of ten 12 V blocks, in strings of 40 with the neutral at the midpoint, on a ±240 V DC bus.



The 24 trays behind the front door: ten 12 V blocks each.

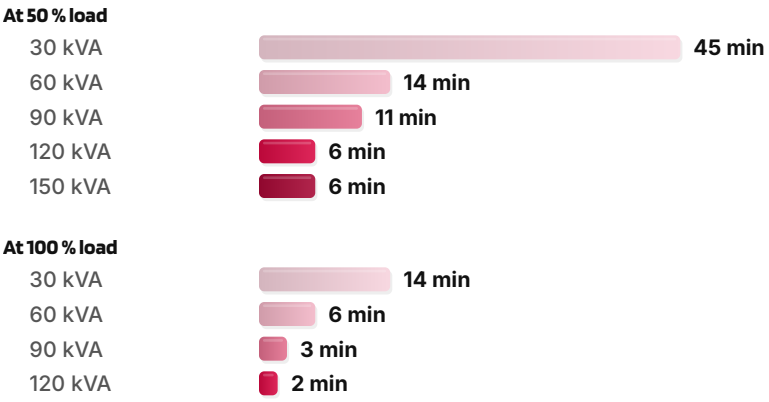
The battery

Blocks	240 × 12 V 9 Ah VRLA
Trays	24 × 10 blocks; 63.5 lb each
Strings	40 blocks, neutral at the midpoint: ±240 V DC
Charge	float 2.25 V/cell, boost 2.3 V/cell; 0.1 C best, 0.2 C max
Compensation	−1.7 mV/°F/cell (−3.0 mV/°C/cell), settable 0 to −5.0, with the optional sensor
End of discharge	1.65 V/cell at 0.6 C, 1.75 V/cell at 0.15 C
Tests	battery test (20 s), maintenance discharge, boost, float
Cold start	from the batteries, about 60 s to output

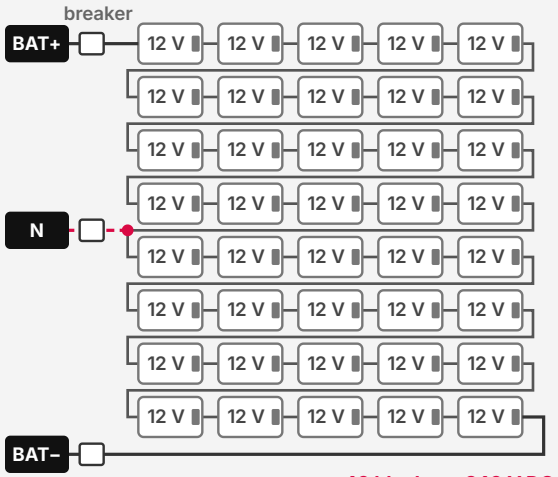
Battery care

- Best at 68–77 °F (20–25 °C): life halves for every 18 °F (10 °C) above 68 °F.
- The block count set on the screen must equal the blocks installed.
- 'Battery Volt Low' is the pre-warning before the end of discharge.
- Maintenance discharge only with the bypass normal and 25 % capacity or more.

Backup time



Minutes with the 240 internal blocks, new batteries.
150 kVA: no published runtime at full load with the internal blocks.



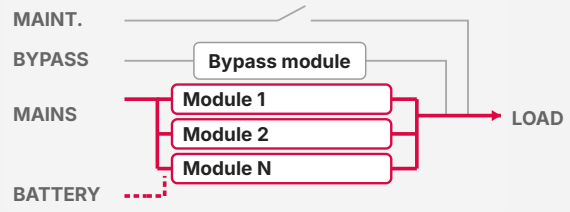
One string: 40 blocks of 12 V with the neutral at the midpoint, ±240 V DC, through the battery breaker; the 24 trays hold 240 blocks in such strings.

±240 V	240	2.25 V	68–77 °F
battery bus	blocks inside	float, per cell	best battery temperature

Technical Specifications
CIRRO-IB 30–150 kVA

Model	30 kVA	60 kVA	90 kVA	120 kVA	150 kVA
Power (kVA = kW)	30	60	90	120	150
Power modules	1 × 30 kVA	2 × 30 kVA	3 × 30 kVA	4 × 30 kVA	5 × 30 kVA
INPUT					
Connection · voltage	3 phases + N + PE · 480 V L-L				
Voltage range	384–528 V L-L at full load; 288–384 V derated to 75 %				
Frequency · power factor	40–70 Hz · > 0.99				
Current THD	≤ 3 %				
Bypass	window +10/+15/+20 %, −10 to −40 % (default +15/−20 %); ±1, 3 or 5 Hz				
OUTPUT					
Voltage · frequency	480 V L-L · 50/60 Hz ± 0.1 %				
THD	≤ 1 % linear, ≤ 5 % non-linear				
Power factor	1 (kVA = kW)				
Inverter overload	110 % 1 h · 125 % 10 min · 150 % 1 min · > 150 % 200 ms				
Bypass overload	110 % long term · 125 % 5 min · 150 % 1 min · > 150 % 1 s				
Transfer	0 ms synchronized; < 10 ms from ECO				
Efficiency	96 % max, double conversion and battery mode				
BATTERY					
Blocks · bus	240 × 12 V 9 Ah VRLA in 24 trays · ±240 V DC, 40 blocks per string				
Charge	float 2.25 V/cell, boost 2.3 V/cell, −1.7 mV/°F/cell (−3.0 mV/°C/cell) compensation				
Backup at 50 · 100 %	45 min · 14 min	14 min · 6 min	11 min · 3 min	6 min · 2 min	6 min · —
SYSTEM					
Rated currents, 150 kVA	225 A mains · 180 A bypass and output · 321 A battery				
Display · communication	7-inch color touchscreen · RS232, RS485, USB, dry contacts, EPO; SNMP and intelligent slots				
Parallel	up to 3 cabinets				
Environment	32–104 °F (0–40 °C) · 0–95 % RH · IP20 · full power to 4,900 ft (1,500 m), −1 % per 490 ft (150 m) above · < 65 dB				
W × D × H	23.6 × 39.4 × 78.7 in · 600 × 1,000 × 2,000 mm				
Weight with batteries	2,191.8 lb	2,243.8 lb	2,295.8 lb	2,347.8 lb	2,399.8 lb
Standards	UL 1778 standard				
Warranty	3 years on the UPS · 2 years on the VRLA batteries				

HOW IT WORKS · ONLINE DOUBLE CONVERSION



PROTECTIONS

- Output overload and short circuit
- Module and inlet over-temperature
- Battery low, end of discharge, reverse polarity
- Lost N+X redundancy
- Input neutral lost, bypass sequence error
- EPO, local and remote

Ordering Information
CIRRO-IB 30–150 kVA

Every CIRRO-IB is ordered with one code: the frame, then the number of 30 kVA modules. The 240 blocks come inside; frames, modules and trays are also sold on their own.

CIRIB 150 -3X30

series | frame, kVA | power modules × kVA

The frame first, then its 30 kVA power modules: one for every 30 kVA of load and one more for N+1. Every frame comes with its 240 blocks in 24 trays.

EXAMPLES

CIRIB150-3X30
90 kVA: three 30 kVA modules

CIRIB150-5X30
150 kVA: five 30 kVA modules

Code	Description
CIRIB150-1X30	CIRRO-IB 30 kVA: 1 × 30 kVA module, 240 × 12 V 9 Ah inside · 14 min at full load
CIRIB150-2X30	CIRRO-IB 60 kVA: 2 × 30 kVA modules, 240 × 12 V 9 Ah inside · 6 min at full load
CIRIB150-3X30	CIRRO-IB 90 kVA: 3 × 30 kVA modules, 240 × 12 V 9 Ah inside · 3 min at full load
CIRIB150-4X30	CIRRO-IB 120 kVA: 4 × 30 kVA modules, 240 × 12 V 9 Ah inside · 2 min at full load
CIRIB150-5X30	CIRRO-IB 150 kVA: 5 × 30 kVA modules, 240 × 12 V 9 Ah inside
CIRIB-FRAME	CIRRO-IB 150 kVA frame with the bypass & monitoring module
CIRIB-PWR-30	Power module 30 kVA
CIRIB-BATTR-EMPTY	Battery tray, empty
CIRIB-BATTR-10x9A	Battery tray with ten 12 V 9 Ah VRLA blocks
SNMP-M	SNMP network card
DRYCNT	Dry-contact card



CIRRO-IB 150 kVA cabinet, closed



The same cabinet open: modules, 24 trays

× 1–5

Modules per frame

30 kVA each, up to 150 kVA; one more than the load needs for N+1.

CIRIB150-5X30 AS N+1

30 kVA	30 kVA	30 kVA	30 kVA	+1

Four modules carry up to 120 kVA of load; the fifth is the spare.

AEC

MODULAR ONLINE UPS · 480 V

CIRRO

60–1,600 kVA

Online double conversion with a three-level IGBT inverter, in 60 kVA or 100 kVA hot-swappable modules: five frames from 360 to 1,600 kVA for 480 V three-phase loads, with an external battery bank.



CIRRO · THE TWO-DOOR FRAME, 1200 · 1600

1,600 kVA
in one frame, 16 × 100 kVA

97 %
efficiency, 600–1600 frames; 96 % on the 360

PF 1
output, kVA = kW

×8
frames in parallel

Product Overview
CIRRO 60–1,600 kVA

Key features of the CIRRO series.

100 kVA
Power modules, 60 or 100 kVA
60 kVA modules in the CIRRO 360 frame, 100 kVA modules in the 600, 800, 1200 and 1600 frames; added from the front.

N+X
Redundant modules
Keep one module spare for N+1: the load stays protected during a module fault or a hot swap. N+N for full redundancy.

3-level
IGBT inverter
Three output levels, +Vdc, 0 and –Vdc: lower THD, lower switching stress, lower EMI and higher efficiency.

97 %
Efficiency and output power factor
Up to 97 % AC/AC in the 600–1600 frames and 96 % in the CIRRO 360; output power factor 1.

10"
Color touchscreen
10-inch on the 600–1600 frames, 7-inch on the CIRRO 360; three access levels; 10,000 events, saved by USB.

×8
Parallel frames
Up to eight units in parallel with the parallel kit, for more power or redundancy.

Key data

Power range	60–1,600 kVA: 60 kVA modules (360), 100 kVA modules (600–1600)
Input · output	3 phases + N + PE · 480 V L-L
Power factor	1 (kVA = kW)
Efficiency	96 % (360) · up to 97 % (600–1600)
Battery	external VRLA, ±240 V DC, 40 blocks

Display	7-inch (360) · 10-inch (600–1600) color touchscreen
Parallel	up to 8 units, with the parallel kit
Frames, W × D × H	23.6 to 63 in wide, 39.3 to 43.3 in deep, 78.7 in high
Frame weight	559 lb (360) to 2,139 lb (1600)
Standards · warranty	UL 1778 standard · 3 years on the UPS

≧ 0.99
input power factor

≦ 1 %
output THD, linear load

40–70 Hz
input frequency

< 6 h
battery recharge

CIRRO · FRONT VIEW

Front View

CIRRO 360 · 60–360 kVA

The compact CIRRO frame, 60–360 kVA: one door 23.6 in wide, the 7-inch touchscreen at the top, the bypass module and six 60 kVA modules behind it, all reached from the front.



CIRRO 360

THE POWER OF THIS FRAME

60–360 kVA

1 to 6 modules of 60 kVA, N+X

1. **Touchscreen**
   7-inch color, at the top of the door.
2. **Bypass module**
   The static switch and the control logic, one per frame.
3. **Power modules**
   Six slots of 60 kVA (CIR-PWR-60), hot-swappable from the front.
4. **Door**
   Single door; the frame holds one breaker.

The frame

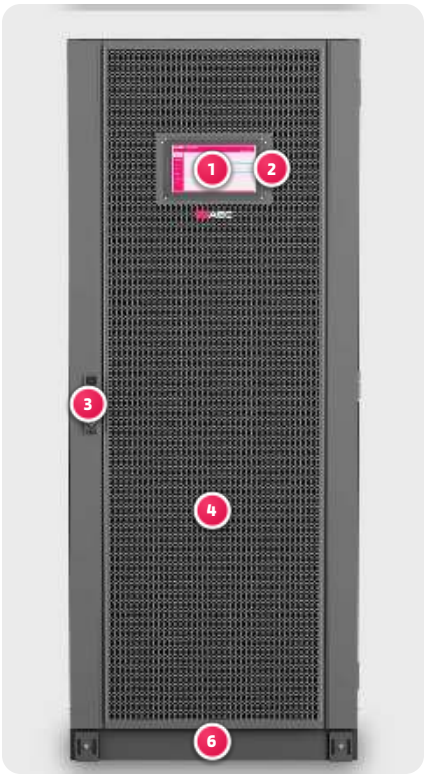
Ratings	60–360 kVA
Power modules	6 slots × 60 kVA, CIR-PWR-60
Breakers in the frame	1
Touchscreen	7-inch
W × D × H, in	23.6 × 39.3 × 78.7
Frame weight	559 lb
Doors	one
Inside, from the top	one breaker, the bypass module, six 60 kVA slots
Battery, external	30–44 blocks, ±180 to ±264 V DC
Charger	80 A, settable
Efficiency AC/AC	96 %
Ordering codes	6 (CIR360-1X60...6X60)

CIRRO · FRONT VIEW

Front View

CIRRO 600 · 800 · 100–800 kVA

The CIRRO 600 (100–600 kVA) and 800 (700–800 kVA) share one cabinet, 31.5 in wide: closed, an 800 with eight modules; open, a 600 with six; behind the door four breakers, the bypass module and the 100 kVA modules.



DOOR CLOSED
CIRRO 800 · 700–800 kVA



DOOR OPEN
CIRRO 600 · 100–600 kVA

1 Touchscreen
Color, on the door; seven menus.

2 EPO
Emergency power off.

3 Door handle
On the single front door.

4 Perforated door
Air in; an air filter is standard.

5 Power modules
100 kVA: eight in the 800, six in the 600.

6 Base
A plinth the full width.

7 Bypass input breaker
The bypass line to the static switch.

8 Maintenance bypass breaker
Feeds the load during service.

9 Main input breaker
The mains to the modules.

10 Output breaker
From the modules to the load.

11 Control strip
The EPO and the communication ports.

12 Bypass module
One per frame; its fans on the front.

	CIRRO 600 · 800
Ratings	100–600 kVA · 700–800 kVA
W × D × H, in	31.5 × 39.4 × 78.7
Frame weight	893 lb · 1,074 lb
Battery, external	30–50 blocks, ±180 to ±300 V DC
Charger	15 % of the output power
Efficiency AC/AC	up to 97 %
Ordering codes	5 (CIR600-1X100…6X100) · 2 (CIR800-7X100…8X100)

CIRRO · FRONT VIEW

Front View

CIRRO 1200 · 1600 · 900–1,600 kVA

The two-door CIRRO frames: the 1200 (900–1,200 kVA, 47.2 in wide) and the 1600 (1,300–1,600 kVA, 63 in wide), the 100 kVA modules in two bays, the breakers in the building's switchgear.



CIRRO 1200
900–1,200 kVA · 12 × 100 kVA



CIRRO 1600 · DOORS CLOSED
1,300–1,600 kVA · 16 × 100 kVA

1 Touchscreen
10-inch color, on the left door.

2 Bypass module
One per frame, with the control logic, above the left bay.

3 Left bay
100 kVA power modules, hot-swappable from the front.

4 Right bay
The same modules: 12 slots in the 1200, 16 in the 1600.

5 Two doors
Perforated: air in at the front; an air filter is standard.

6 No breakers in the frame
Input, bypass, output and maintenance bypass switching is in external switchgear.

	CIRRO 1200	CIRRO 1600
Ratings	900–1,200 kVA	1,300–1,600 kVA
Power modules	12 slots × 100 kVA, CIR-PWR-100	16 slots × 100 kVA, CIR-PWR-100
Breakers in the frame	none: switching in external switchgear	none: switching in external switchgear
Touchscreen	10-inch	10-inch
W × D × H, in	47.2 × 43.3 × 78.7	63 × 39.4 × 78.7
Frame weight	1,376 lb	2,139 lb
Battery, external	30–50 blocks, ±180 to ±300 V DC	30–50 blocks, ±180 to ±300 V DC
Charger	15 % of the output power	15 % of the output power
Efficiency AC/AC	up to 97 %	up to 97 %
Ordering codes	4 (CIR1200-9X100... 12X100)	4 (CIR1600-13X100... 16X100)

CIRRO · TOUCHSCREEN INTERFACE

Touchscreen Interface
CIRRO 60–1,600 kVA

The 7- or 10-inch color touchscreen of CIRRO: seven menus, the readings of the cabinet and of every module, the log, the settings behind a login, the commands and the waveforms.



ON THE DOOR

1 Color touchscreen
10-inch on the 600 to 1600 frames, 7-inch on the CIRRO 360.

2 Status lamps
Green in normal operation, beside the screen.

Three access levels: user, technician and manufacturer.

10,000 events in the log, downloaded through the USB port.

Seven menus

Home
power flow, load, battery, alarms

Cabinet
bypass, input, output, load, battery

Module
each module: input, output, DC bus, temperatures

Log
every event with date and time

Set
battery, system, contacts, network, language

Control
on/off, transfers, tests, resets

Scope
output and bypass waveforms

On the screen



1 Control · Function
On and off, manual transfer to inverter or bypass, fault clear and resets.



2 Set · Dry contact
Generator input, battery breaker trip and the other relay functions.



3 Set · Network
IP address, subnet mask, gateway and DNS of the SNMP card.



4 Set · Display
The protocol and the phase labels A/B/C on the screen.



5 Set · System
Single or parallel mode, bypass window and the number of redundant modules.



6 Set · Language
Fourteen languages on the screen, Spanish and Portuguese included.

Frame Sizes
CIRRO 60–1,600 kVA

Every CIRRO is a frame and its power modules. The 360 takes six 60 kVA modules; the 600 and 800 share one cabinet with four breakers inside; the 1200 and 1600 are two-door frames whose breakers sit in the switchgear outside.



CIRRO 360
one door · 6 × 60 kVA



CIRRO 600 · 800
one door · 6 or 8 × 100 kVA



CIRRO 1200
two doors · 12 × 100 kVA



CIRRO 1600
two doors · 16 × 100 kVA

Frame by frame

	CIRRO 360	CIRRO 600 · 800	CIRRO 1200	CIRRO 1600
Ratings	60–360 kVA	100–600 kVA · 700–800 kVA	900–1,200 kVA	1,300–1,600 kVA
Power modules	6 slots × 60 kVA, CIR-PWR-60	6 (600) or 8 (800) slots × 100 kVA	12 slots × 100 kVA, CIR-PWR-100	16 slots × 100 kVA, CIR-PWR-100
Breakers in the frame	1	4: main input, bypass input, output, maintenance bypass	none: switching in external switchgear	none: switching in external switchgear
Touchscreen	7-inch	10-inch	10-inch	10-inch
W × D × H, in	23.6 × 39.3 × 78.7	31.5 × 39.4 × 78.7	47.2 × 43.3 × 78.7	63 × 39.4 × 78.7
Frame weight	559 lb	893 lb · 1,074 lb	1,376 lb	2,139 lb
Doors	one	one	two	two
Inside, from the top	one breaker, the bypass module, six 60 kVA slots	four breakers, the bypass module, 6 or 8 slots	behind two doors: the bypass module and 12 slots	behind two doors: the bypass module and 16 slots
Bypass module	one, with the control logic	one, with the control logic	one, with the control logic	one, with the control logic
Battery, external	30–44 blocks, ±180 to ±264 V DC	30–50 blocks, ±180 to ±300 V DC	30–50 blocks, ±180 to ±300 V DC	30–50 blocks, ±180 to ±300 V DC
Charger	80 A, settable	15 % of the output power	15 % of the output power	15 % of the output power
Efficiency AC/AC	96 %	up to 97 %	up to 97 %	up to 97 %
Ordering codes	6 (CIR360-1X60…6X60)	5 (CIR600-1X100…6X100) · 2 (CIR800-7X100…8X100)	4 (CIR1200-9X100…12X100)	4 (CIR1600-13X100…16X100)

60 · 100 kVA
module sizes, one per frame type

6–16
slots per frame

78.7 in
every frame high, 2,000 mm

×8
units in parallel

Modular Technology Architecture
CIRRO 60–1,600 kVA

Each power module is a complete double-conversion UPS: rectifier, three-level IGBT inverter and charger. The frames are 78.7 in high with front access to every module.



1 Fans
Three, at the front of the module.

2 Cold start, status, OFF
The button, the lamp and the key, printed on the module's front.

3 Lock and handles
The module is unlocked and pulled out from the front.

The module

CIR-PWR-100	100 kVA = 100 kW · 18.7 × 27.8 × 5.5 in (475 × 705 × 140 mm) · 104 lb (47 kg)
CIR-PWR-60	60 kVA = 60 kW · 77 lb (35 kg), CIRRO 360 only
Inside	rectifier, three-level IGBT inverter, charger
Per frame	6, 8, 12 or 16 × 100 kVA; 6 × 60 kVA
Access	from the front
Hot swap	with the load running

Front access, hot swap

- Every module slides in from the front of the frame.
- Keep one module spare for N+1: the load stays protected during a module fault or a hot swap.
- N+N redundancy for the most critical loads.
- One bypass module with the control logic per frame.

Three-level IGBT inverter

+Vdc · 0 · −Vdc
three output levels instead of two

THD
smaller voltage steps, closer to the sine wave

Switching stress
lower switching stress and EMI

Switching losses
less loss in every switching

N+X redundancy

100 | 100 | 100 | 100 | 100 | 100 | 100 | +1

Each block a 100 kVA module; +1 the spare

With one module more than the load needs (N+1), a module fault or a hot swap leaves the load on the inverter. Example: a 700 kW load on a CIRRO 800 frame with eight 100 kVA modules, N = 7, X = 1.

104 lb
100 kVA module

77 lb
60 kVA module

16
modules, CIRRO 1600

N+1
or N+N redundancy

Functions, Parallel and Communication
CIRRO 60–1,600 kVA

Functions set on the touchscreen of every frame; up to eight frames in parallel with the parallel kit; serial ports, USB, dry contacts and EPO standard, SNMP as an option.

Event log
10,000 events
Every event is kept and downloaded through the built-in USB port.

Generator ready
advanced settings
Settings for stable operation and communication with diesel generators.

Custom alarms
dry contacts
The dry-contact alarms are set and managed from the touchscreen.

Self-cleaning
fan cycles
Automatic fan cycles remove the dust; an air filter is standard.

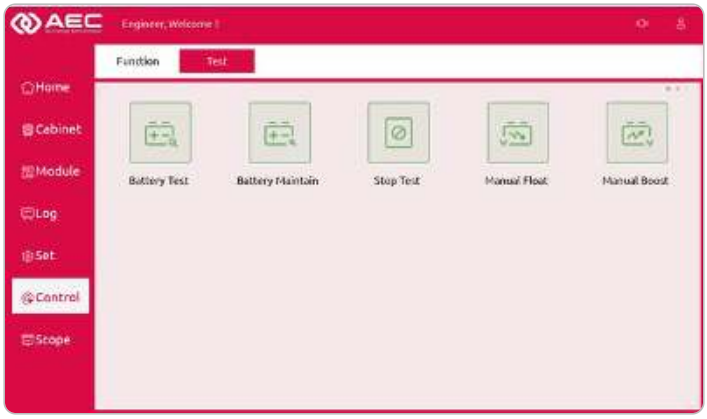
Waveform recording
diagnostics
Inverter, rectifier and control waveforms are recorded periodically.

Cold start
standard
The UPS starts from the battery with no mains.

Three access levels
user · technician · manufacturer
Each level sees and sets only its own pages.

Battery cell by cell
live
Battery status shown cell by cell on the touchscreen.

The touchscreen



Control · Test: battery test and maintenance, manual float and boost. 10-inch on the 600–1600 frames, 7-inch on the CIRRO 360; the same seven menus as RADIANT. The whole touchscreen: p. 117.

Parallel system

- Up to eight units in parallel, for more power or redundancy.
- PAR-KIT-CIR is required to run two or more frames in parallel.
- N+1 inside a frame and between frames.
- Parallel set-up and commissioning by AEC.

Communication

- USB, RS232 and RS485 standard, for monitoring software or a building system.
- Dry contacts and EPO standard; alarms set from the touchscreen.
- SNMP-M network card as an option: network monitoring and alarms.
- DRYCNT relay card for more alarm outputs.

×8	N+X	10,000
frames in parallel, with PAR-KIT-CIR	redundancy, set by the module count	events in the log

Standard on every frame: USB · RS232 · RS485 · Dry contacts · EPO · Cold start · Air filter

SNMP-M
SNMP network card
Web pages, SNMP v1/v2c/v3, Modbus TCP/IP and MQTT.

PAR-KIT-CIR
Parallel kit
Required for two or more frames, up to 8 units.

SPD-3PH-CIR
Surge protection
Protects the UPS input against transient overvoltage.

BATT-COMP-CIR
Battery compensation
Compensates the string voltage on long cable runs.

Technical Specifications
CIRRO 60–1,600 kVA

Model	CIRRO 360	CIRRO 600 · 800 · 1200 · 1600
Ratings	60–360 kVA	100–1,600 kVA
Power module	60 kVA (CIR-PWR-60), 77 lb	100 kVA (CIR-PWR-100), 104 lb, 18.7 × 27.8 × 5.5 in
Modules per frame	6	6 · 8 · 12 · 16
INPUT		
Connection · voltage	3 phases + N + PE · 480 V L-L	
Voltage range	384–528 V full load; 288–384 V derated to 75 %	384–528 V full load; 288–384 V derated to 50 %
Frequency · power factor	40–70 Hz · ≥ 0.99	
Current THD	≤ 3 %	≤ 2 % (100 % linear load)
OUTPUT		
Voltage · frequency	480 V L-L · 60 Hz ± 0.1 Hz · pure sine wave	
Power factor	1 (kVA = kW)	
THD	≤ 1 % linear, ≤ 5 % non-linear	≤ 1 % linear, ≤ 3 % non-linear
Overload	110 % 1 h · 125 % 10 min · 150 % 1 min · > 150 % 200 ms	
Efficiency AC/AC	96 %	up to 97 %
BATTERY		
Type · standard	external VRLA · ±240 V DC, 40 blocks	
Range	±180 to ±264 V DC, 30–44 blocks	±180 to ±300 V DC, 30–50 blocks
Charger · recharge	80 A settable · < 6 h	15 % of output power · < 6 h
SYSTEM		
Display	7" color touchscreen	10" color touchscreen
Communication	USB, RS232, RS485, dry contacts, EPO, cold start; SNMP optional	
Parallel	up to 8 units, with the parallel kit	
Breakers	1 in the frame	600 · 800: 4 in the frame · 1200 · 1600: external switchgear
Environment	32–104 °F · < 95 % RH · < 65 dB	32–104 °F · < 95 % RH · IP20 · 3,300 ft · 72 dB
W × D × H	23.6 × 39.3 × 78.7 in	600 · 800: 31.5 × 39.4 · 1200: 47.2 × 43.3 · 1600: 63 × 39.4 × 78.7 in
Standards	UL 1778 standard	
Warranty	3 years on the UPS	



TO SCALE

CIRRO 60–1,600 kVA

60–360 kVA 23.6 × 39.3 × 78.7 in	636.4–1,088.4 lb
100–800 kVA 31.5 × 39.4 × 78.7 in	996.5–1,902.4 lb
900–1,200 kVA 47.2 × 43.3 × 78.7 in	2,308.1–2,618.9 lb
1,300–1,600 kVA 63 × 39.4 × 78.7 in	3,485.3–3,796.1 lb

PROTECTIONS AND STANDARD FEATURES

- ✓ Overload: static bypass
- ✓ EPO on every frame
- ✓ Cold start on battery
- ✓ SPD surge protection, option
- ✓ Air filter, fan cleaning
- ✓ Three access levels

Ordering Information
CIRRO 60–1,600 kVA

Every CIRRO is ordered with one code: the frame, then the number and size of the modules. Frames, modules and options are also sold on their own; the battery bank is sized by AEC.

CIR600 -4X100

frame, kVA — power modules × kVA

The frame sets the slots: six 60 kVA modules in the 360, six or eight 100 kVA modules in the 600 and 800, twelve or sixteen in the 1200 and 1600. The battery bank is sized by AEC.

EXAMPLES

CIR360-3X60
180 kVA: three 60 kVA modules

CIR800-8X100
800 kVA: eight 100 kVA modules

Code	Description
CIR360-1X60	60 kVA · 1 × 60 kVA module · 636.4 lb
CIR600-1X100	100 kVA · 1 × 100 kVA module · 996.5 lb
CIR360-2X60	120 kVA · 2 × 60 kVA modules · 726.8 lb
CIR360-3X60	180 kVA · 3 × 60 kVA modules · 817.2 lb
CIR600-2X100	200 kVA · 2 × 100 kVA modules · 1,100.1 lb
CIR360-4X60	240 kVA · 4 × 60 kVA modules · 907.6 lb
CIR360-5X60	300 kVA · 5 × 60 kVA modules · 998 lb
CIR360-6X60	360 kVA · 6 × 60 kVA modules · 1,088.4 lb
CIR600-4X100	400 kVA · 4 × 100 kVA modules · 1,307.3 lb
CIR600-5X100	500 kVA · 5 × 100 kVA modules · 1,410.9 lb
CIR600-6X100	600 kVA · 6 × 100 kVA modules · 1,514.5 lb
CIR800-7X100	700 kVA · 7 × 100 kVA modules · 1,798.8 lb
CIR800-8X100	800 kVA · 8 × 100 kVA modules · 1,902.4 lb
CIR1200-9X100	900 kVA · 9 × 100 kVA modules · 2,308.1 lb
CIR1200-10X100	1,000 kVA · 10 × 100 kVA modules · 2,411.7 lb
CIR1200-11X100	1,100 kVA · 11 × 100 kVA modules · 2,515.3 lb
CIR1200-12X100	1,200 kVA · 12 × 100 kVA modules · 2,618.9 lb

Code	Description
CIR1600-13X100	1,300 kVA · 13 × 100 kVA modules · 3,485.3 lb
CIR1600-14X100	1,400 kVA · 14 × 100 kVA modules · 3,588.9 lb
CIR1600-15X100	1,500 kVA · 15 × 100 kVA modules · 3,692.5 lb
CIR1600-16X100	1,600 kVA · 16 × 100 kVA modules · 3,796.1 lb
CIR360-FRAME	Frame 360: 6 slots × 60 kVA, 1 breaker
CIR-PWR-60	Power module 60 kVA, CIRRO 360
CIR600-FRAME	Frame 600: 6 slots × 100 kVA, 4 breakers
CIR800-FRAME	Frame 800: 8 slots × 100 kVA, 4 breakers
CIR1200-FRAME	Frame 1200: 12 slots, external switchgear
CIR1600-FRAME	Frame 1600: 16 slots, external switchgear
CIR-PWR-100	Power module 100 kVA, 600–1600
PAR-KIT-CIR	Parallel kit, up to 8 units
BATT-COMP-CIR	Battery compensation kit
SPD-3PH-CIR	Three-phase surge protection
SNMP-M	SNMP network card
DRYCNT	Dry-contact card



CIRRO 600, door open: four breakers

+



CIR-PWR-100 module, 100 kVA

× 1–16 **Modules per frame**

60 kVA modules in the 360 frame (6 slots), 100 kVA in the 600 to 1600 frames (6 to 16 slots).

AEC

MODULAR ONLINE UPS · 480 V · LITHIUM-READY

INFINITE

100–1,200 kVA

Online double conversion in 100 kVA hot-swappable modules with two control cards: 100 and 200 kVA cabinets, and systems to 1,200 kVA in parallel, for 480 V three-wire loads on lead-acid or AEC L6 lithium batteries.



INFINITE · THE CABINET, 100 OR 200 kVA

100 kVA
per hot-swappable module

SiC
silicon carbide: 97.3 % peak online, 99 % in ECO

2 + 1
modules, and two control cards

UL 1778
listed · FCC Part 15 Class A

Product Overview
INFINITE 100–1,200 kVA

Key features of the INFINITE series.

100 kVA
Power modules, 1+1 or 2+1
100 kVA modules: 1+1 in the 100 kVA cabinet, 2+1 in the 200 kVA cabinet; a failed module isolates itself.

2×
Two control cards
Two identical system control cards back each other up; every card in the control box is hot-swappable.

SiC
Silicon carbide
SiC in the PFC stage of every module: 97.3 % published peak, ≥ 97.0 % at 50 % load guaranteed, up to 99 % in ECO.

Li
Lithium-ready
Lead-acid 360–600 V or lithium 384–640 V; the BMS card talks to the AEC L6 lithium cabinets.

7"
Color touchscreen
Power flow, records, smart wave capture, energy storage and every setting; status light and five indicators.

×8
Parallel and dual bus
Up to eight UPSs in parallel, current sharing within 3 %; BSC synchronizes up to three buses.

Key data

Power range	100–1,200 kVA: 100 and 200 kVA cabinets; 1,200 kVA as six 200 kVA in parallel
Input · output	3 phases + PE, no neutral · 480 V L-L
Power factor	1 (kVA = kW)
Efficiency	SiC: 97.3 % published peak online · up to 99 % in ECO
Battery	lead-acid 360–600 V or L6 lithium 512 V

Display	7-inch touchscreen, five LEDs, light bar
Parallel	up to 8 UPSs can be paralleled · BSC up to 3 buses
W × D × H	23.6 × 39.4 × 81.4 in
Weight	452–710 lb per cabinet
Standards · warranty	UL 1778 listed, FCC Part 15 Class A · 3 years UPS, 5 years L6

≥ 0.99
input power factor

≤ 1 %
output THD, resistive load

1 ms
bypass ↔ inverter, synchronized

≤ 3 %
current sharing between modules

INFINITE · FRONT VIEW

Front View
INFINITE 100–1,200 kVA

The INFINITE cabinet from the front, closed and with the door open: the touchscreen, LEDs and light bar on the door; switches, control box, bypass module and power modules behind it.



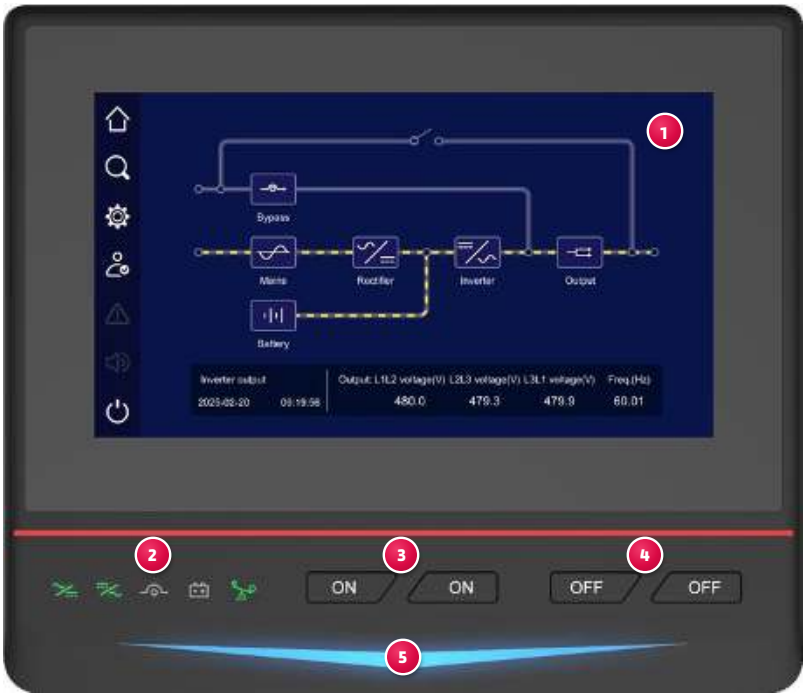
DOOR CLOSED



DOOR OPEN

1. **Touchscreen**
   7-inch, the single-line diagram live.
2. **LEDs, keys, light bar**
   Five status LEDs, ON and OFF keys, the light bar.
3. **Door handle**
   Lockable.
4. **Air inlet**
   In at the lower front, out at the top.
5. **Casters and feet**
   Moved on casters, fixed on feet.
6. **Switches**
   Bypass, output and input.
7. **SPD**
   Surge protection with its breaker, optional.
8. **EPO and cold start**
   EPO key switch, battery cold-start button.
9. **System control box**
   Two control cards, monitoring card, option slots; hot-swappable.
10. **Bypass module**
    Static switch and filter, 200 kVA.
11. **Power modules**
    100 kVA each: 2+1 here, 1+1 in the 100 kVA cabinet.

Display and Status Bar
INFINITE 100–1,200 kVA



1. **Color touchscreen**
   7 inches: live single-line diagram, measurements, settings and records.
2. **Five status LEDs**
   AC/DC, DC/AC, bypass, battery and load: green when working or normal, red when abnormal.
3. **ON keys**
   Press both together for 3 s to start the inverter.
4. **OFF keys**
   Press both together for 3 s to stop the inverter; with a good bypass the load passes to the bypass.
5. **Ambient light bar**
   The V-shaped light shows the state of the UPS in color, even with the screen backlight off.

Ambient light bar

Four states, each with its own light: the operator knows how the UPS is doing before reaching the screen.



Blue
Normal operation



Blue, flashing
Battery output



Yellow
Abnormal, the load still supplied



Red
Abnormal, the UPS not working

Status LEDs

LED	Green	Red
AC/DC	Rectifier normal	Rectifier abnormal
DC/AC	Inverter normal	Inverter abnormal
Bypass	Bypass output normal	Bypass abnormal
Battery	Battery output	Battery low voltage
Load	Output normal	Output overload

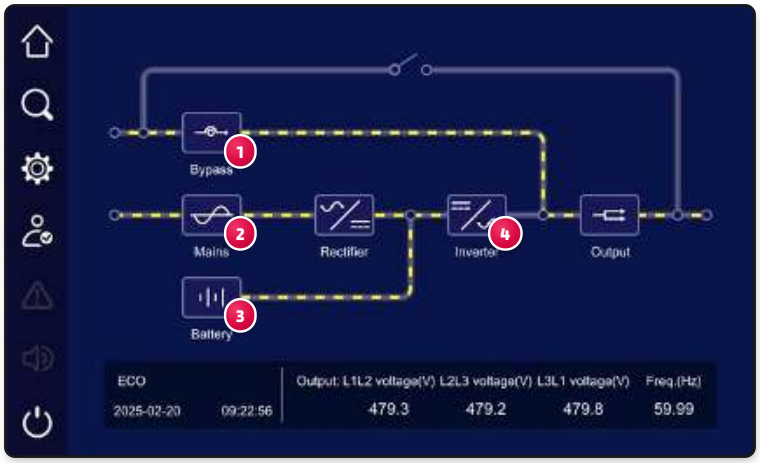
On the screen



Screen setting, basic functions

- Touch a block to read its measurements
- 10,000 records, exported to USB
- Backlight, language, time zone, NTP

Touchscreen Interface
INFINITE 100–1,200 kVA

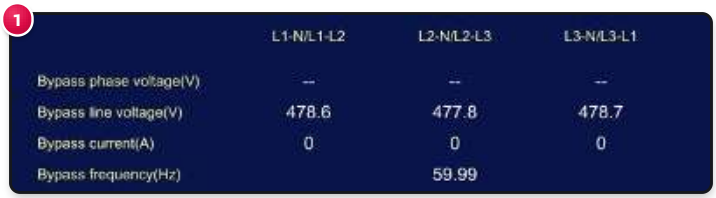


Live single-line diagram

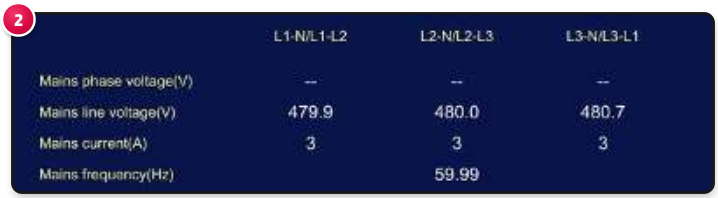
The home page draws the UPS at work: the yellow dots trace the path the power takes, a block flashes red when its part is abnormal, and the state bar shows the state, date and time, the output voltages and the frequency.

Touch a block to open its page: the four pages below are marked 1–4 on the diagram. The rectifier and inverter pages show every power module in turn.

Home page in ECO mode: the load on the bypass, rectifier and inverter on line. The four pages below are separate captures, taken in normal mode: the inverter carries the load, the bypass current reads 0.



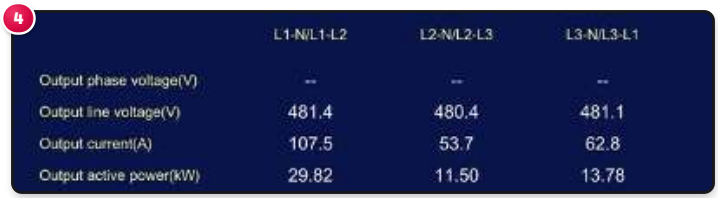
Bypass info · phase and line voltages, current, frequency



Mains info · phase and line voltages, current, frequency



Battery info · voltage, currents, remaining capacity and time



Inverter info · output voltages, current and active power

Menus



Information menu
Running info, history record, user log, smart record, device info, smart wave capture and running record



Settings menu
Cabinet, battery, battery test, output, smart mode, dry contacts, screen, password, communication, record manage and energy storage

7"
color touchscreen on the door

6
touch blocks: bypass, mains, rectifier, inverter, battery and output

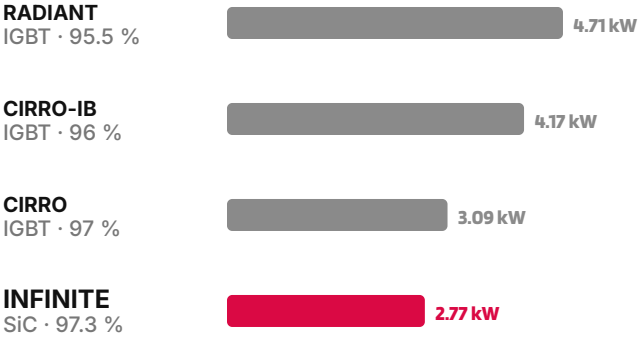
7 · 11
pages in the information and the settings menus

2–8
cabinets on one screen: the smart integrated display, over RS485

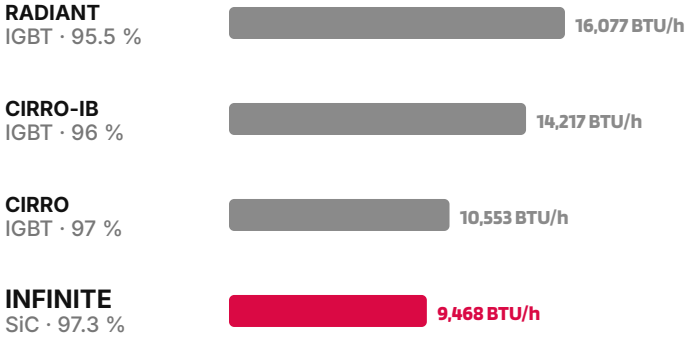
Silicon Carbide Technology
INFINITE 100–1,200 kVA

SiC semiconductors in the PFC stage of every 100 kVA module: 97.3 % published peak, at least 97.0 % at half load, 99 % in ECO. What that means against AEC's own IGBT ranges.

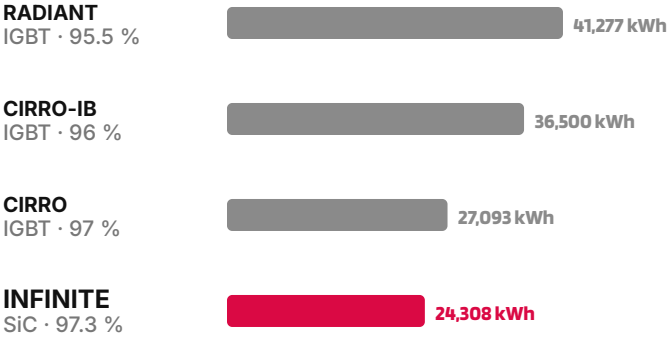
Losses per 100 kW of load



Heat to remove per 100 kW



Energy lost in a year, per 100 kW



Why silicon carbide

01 Silicon-carbide semiconductors switch faster and lose less energy at every switching than silicon, so the PFC stage of each module runs cooler.

02 Less heat in the module means less heat in the room: smaller cooling, smaller footprint for the same power.

03 Every 100 kVA module carries it, so a 1,200 kVA system saves as much per kW as a 100 kVA one.

−41 %
losses against the IGBT RADIANT, both at their published peak

16,969
kWh a year saved per 100 kW, at the published peaks

97.3 %
published peak online, with SiC

99 %
in ECO; Wise ECO also cleans the bypass current

Measured efficiency

Load, resistive	30 %	50 %	100 %
Online, mains	≥ 96.8 %	≥ 97.0 %	≥ 96.4 %
Battery mode	≥ 96.1 %	≥ 96.7 %	≥ 95.8 %
ECO	up to 99 %		

Resistive load. Heat: 18,425 BTU/h from a 200 kVA cabinet at full load, 6,824 BTU/h in ECO.

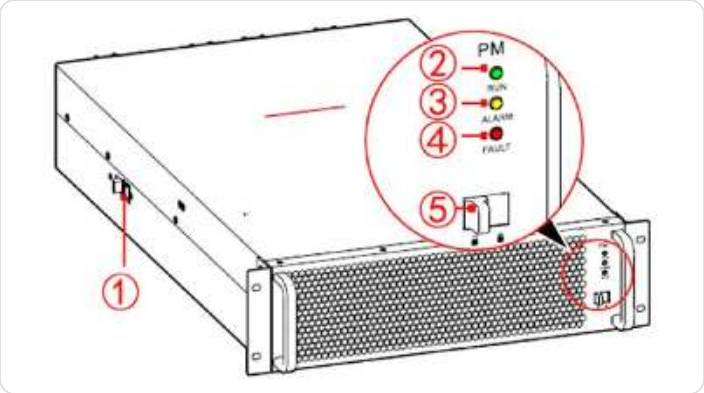
Low-load operation: sleep, fans, Wise ECO

- Sleep redundancy: spare modules rest in turn and wake when the load rises, so the others work nearer their best point.
- Fans follow the load; the air comes in at the front and leaves at the top.
- Wise ECO: the load on the bypass while the modules compensate its harmonics: higher power factor, lower THDi.

Power Module
INFINITE 100–1,200 kVA

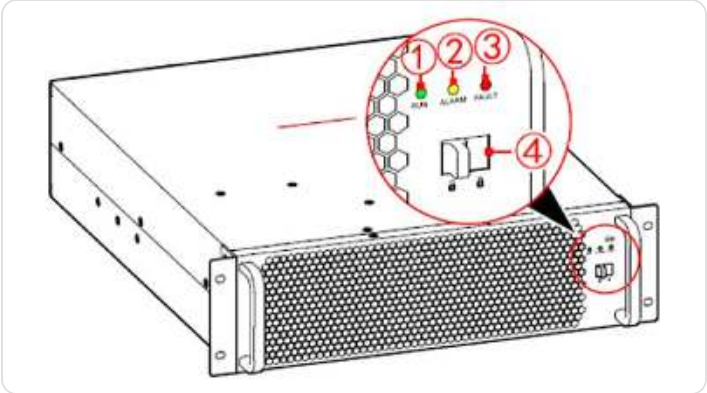
Each power module is a complete double-conversion UPS of 100 kVA: rectifier, inverter and DC/DC converter. A ready switch locks it in its slot; a failed module isolates itself and the others carry on.

100 kVA power module



1. **Positioning lock** · pressed to pull the module out
2. **RUN, green** · on: inverter; flashing: step-up or ready
3. **ALARM, yellow** · on: the module has an alarm
4. **FAULT, red** · on: the module is faulty
5. **Ready switch** · red: locked in service; green: free to remove

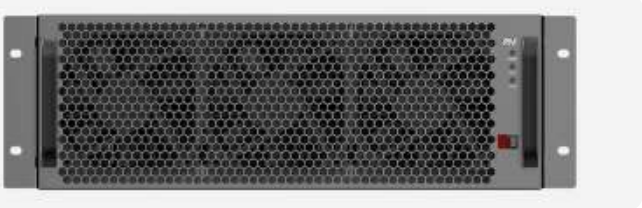
Bypass module, 100 or 200 kVA



1. **RUN, green** · on: bypass output; flashing: standby
2. **ALARM, yellow** · reserved
3. **FAULT, red** · on: the bypass module is faulty
4. **Ready switch** · red: locked in service; green: free to remove

The module

Rating	100 kVA = 100 kW
Size	17.3 × 29.5 × 5.1 in (440 × 750 × 130 mm), 3U
Weight	119 lb (54 kg)
Inside	rectifier, inverter, DC/DC converter
Per cabinet	1+1 (100 kVA), 2+1 (200 kVA)
Bypass module	17.3 × 22.6 × 5.1 in (440 × 575 × 130 mm), 34 lb (15.5 kg); static switch and filter



The module from the front: lamps and ready switch at the right.

Hot swap, with the load running

01 **Unlock**
Set the ready switch to unlocked (green): the module leaves the system, the others carry the load.

02 **Pull it out**
Press the positioning lock, remove the screws and pull it by the handles: 119 lb, three people or a lift truck; wait at least 20 minutes before opening it.

03 **Slide the new one in, lock**
Push it in until it meets the connector, fasten it and set the ready switch to locked (red).

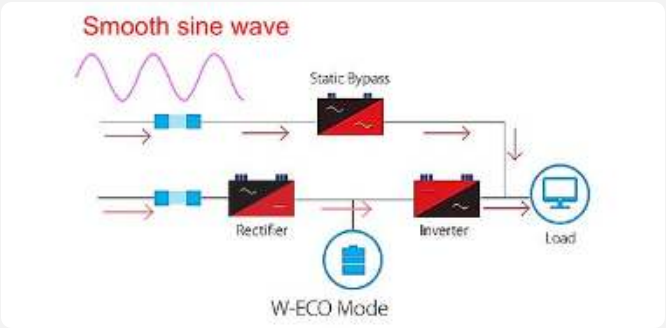
Also replaced with the load on: the bypass module, the two control cards (each backs up the other), the monitoring card and the SNMP, BMS and dry-contact cards.

Options in the control box

- **SNMP card**: network monitoring, BACnet
- **BMS card**: talks to the AEC L6 lithium cabinets
- **Dry-contact card**: more relay contacts for the building
- **Battery temperature kit**: the charge follows the battery temperature
- **SPD**, optional: surge protection with its own breaker

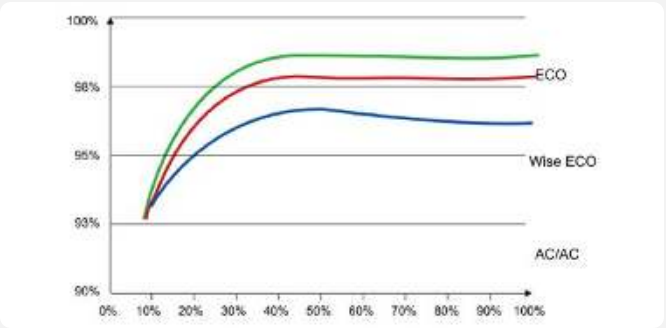
Smart Functions
INFINITE 100–1,200 kVA

Energy, battery and grid functions of every INFINITE.



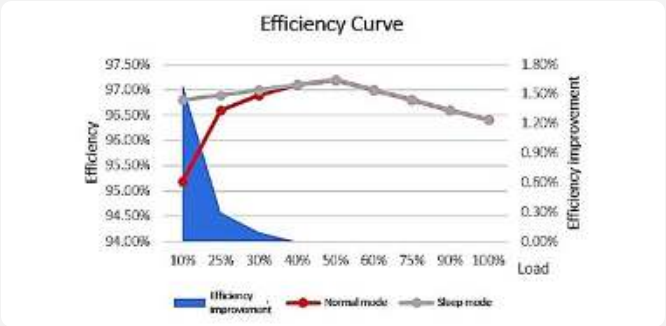
Wise ECO: ECO with a clean wave

The load runs on the static bypass while the inverter stays on line and compensates the harmonics of the bypass current: ECO efficiency, a higher power factor, a lower THDi.



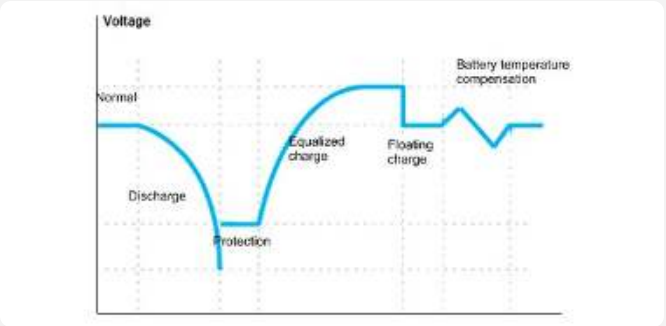
Efficiency in ECO, Wise ECO and online

Up to 99 % in ECO; 97.3 % published peak online with silicon carbide, at least 97.0 % at half load. The curves: ECO, Wise ECO and online (AC/AC) against the load.



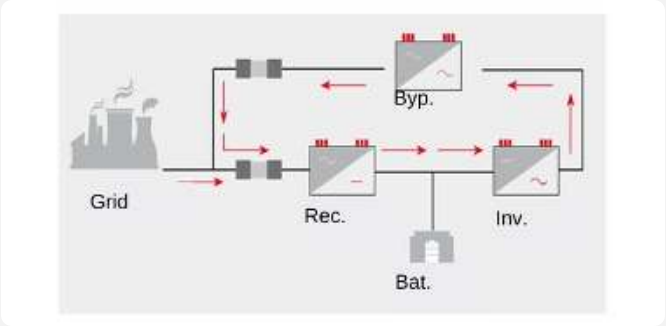
Intelligent sleep

At part load the spare modules sleep in turn and wake when the load reaches the awake rate: the modules on line work near the top of their curve, the sleeping ones age less.



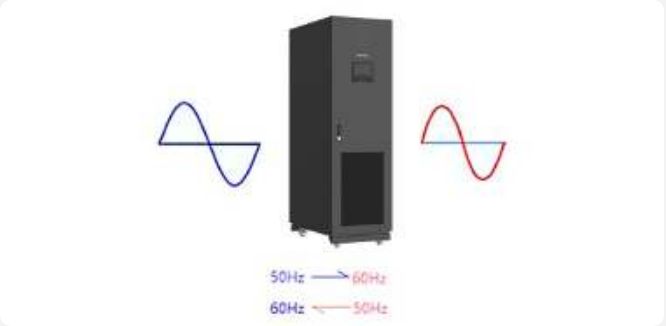
Smart charge

Discharge, protection, equalize, then float, with temperature compensation (temperature kit). Charge current 5 to 100 A per module, 20 A by default; float 2.27 V/cell.



Self-load test, no load bank

Grid-tied self-load: the output goes back to the grid through the bypass, so the UPS runs at the set load for the set time with no load bank and little energy used.

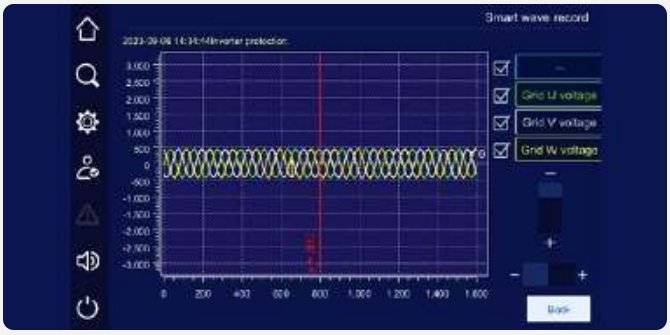


Frequency converter

The output at a set frequency, independent of the input frequency, for loads built for another grid; the battery alarms can be suppressed when no battery is fitted.

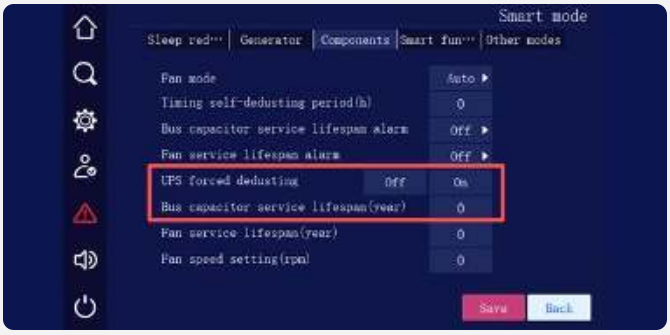
Service and Protection Functions
INFINITE 100–1,200 kVA

What looks after the UPS, the battery and the site, on real INFINITE screens.



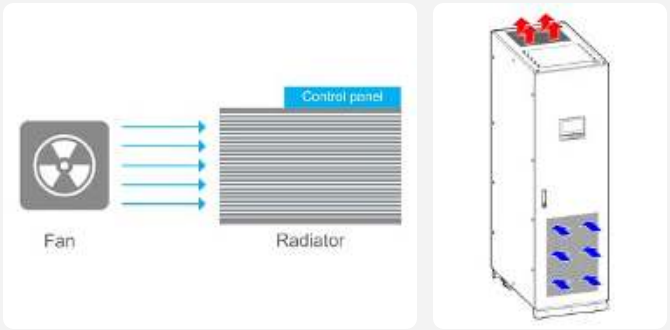
Smart wave capture

On a fault the UPS keeps the waveforms around it with the date and the event, here an inverter protection: the cause is found on site, and exported for the service report.



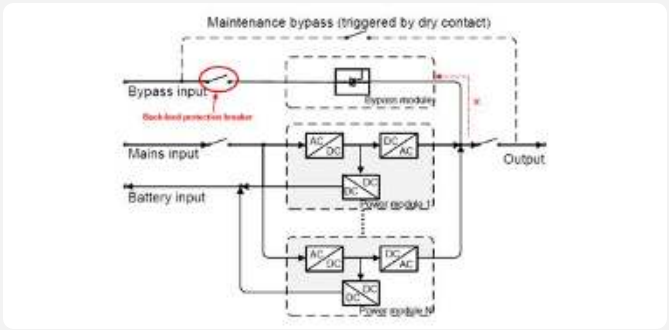
Components: fans, capacitors, dust

Fans and bus capacitors counted, with an alarm at the end of their service life; dedusting at full fan speed, timed or forced (framed on the screen).



Air path and fans

Fan speed follows the load and the temperature. Air in at the lower front, out at the top (right): about 970 CFM (100 kVA) or 1,380 CFM (200 kVA).



Bypass back-feed protection

If a bypass thyristor fails while the inverter runs, dry contact OUT.2 trips the bypass breaker: no voltage feeds back to the bypass input. On a mains failure the input relay opens.

Programmable dry contacts

4 inputs, each set to one of 13 functions (generator, maintenance bypass, battery breaker…); 3 outputs, each to one of 18 signals.

Generator mode

Starts the generator by itself or by hand, allows or derates battery charging, and lets the battery cover the load above the generator's rating.

Energy storage UPS

Between outages the battery shaves the peaks on a plan curve (up to 8 tariff periods) or on EMS commands, never below the safety SOC (1–99 %).

MORE SETTINGS FOR THE SITE

- ECO window ±5, ±10 or ±15 % in voltage (default ±15 %), ±2 or ±4 % in frequency
- Transfers: 0 ms mains ↔ battery; 1 ms to the bypass in sync, 2 ms out of sync (1–15 ms)
- Auto-start: back on line when the power returns after a battery shutdown
- Power walk-in and combined supply: back from the battery to the mains gradually, both sources at once
- Bypass window +10 or +15 % and −10 to −30 %; frequency ±2 to ±20 %
- ≤ 20 ms to the bypass on an impact or a short circuit; protection times set apart for a normal and an abnormal bypass
- Integrated display: one screen shows every UPS of a parallel system, over RS485
- Battery and preventive maintenance reminders at a set period, in months

UPS and Lithium, All Modular
INFINITE + L6 Lithium Cabinets

One INFINITE 200 kVA cabinet with one L6 lithium cabinet full of modules: 200 kW for 15 minutes, every module hot-swappable, the system modular from end to end.



INFINITE 200 kVA, OPEN

+



L6, OPEN, FULL

THE CONFIGURATION

INF-200+L6-CAB-20x50LI · 2,763 lb

1 × INFINITE 200 kVA
2 + 1 power modules of 100 kVA: two carry the load, one is the redundant spare

1 × L6, full
20 lithium modules of 50 Ah, LiFePO4, 2.88 kWh each

200 kW · 15 min
backup at full load

Hot-swappable
every power module and every battery module, changed with the load on

Fully modular
more modules, then more cabinets: systems up to 1,200 kVA

1. **Power module** — 100 kVA: rectifier, inverter, DC/DC.
2. **Power module** — 100 kVA, the second.
3. **Power module, +1** — 100 kVA, the redundant spare.
4. **Bypass module** — Static switch, 200 kVA.
5. **System control box** — Control cards and the BMS card for the L6.
6. **Battery breakers** — Two, at the top of the L6.
7. **Communication module** — The L6 BMS: to the UPS and the other cabinets.
8. **Battery modules** — 20 × 50 Ah in two columns of ten.

Systems with L6 lithium

Code	Rating	Full load	Weight
INF-100+L6-CAB-10x50LI	100 kVA	15 min	1,808 lb
INF-100+L6-CAB-20x50LI	100 kVA	30 min	2,624 lb
INF-200+L6-CAB-20x50LI	200 kVA	15 min	2,763 lb
INF-400+2xL6-CAB-20x50LI	400 kVA	15 min	5,526 lb
INF-600+3xL6-CAB-20x50LI	600 kVA	15 min	8,597 lb
INF-800+4xL6-CAB-20x50LI	800 kVA	15 min	11,360 lb
INF-1000+5xL6-CAB-20x50LI	1,000 kVA	15 min	14,123 lb
INF-1200+6xL6-CAB-20x50LI	1,200 kVA	15 min	16,886 lb

Two kinds of module	L6 lithium module	INFINITE power module
What it holds	2.88 kWh, 18 LiFePO4 cells, BMS, DC/DC	100 kVA: rectifier, inverter, DC/DC
Weight	81.6 lb (37 kg)	119 lb (54 kg)
Per cabinet	10 or 20	1+1 or 2+1
Hot swap	yes, the system on	yes, the load on

Technical Specifications
INFINITE 100–1,200 kVA

Model	100 kVA cabinet	200 kVA cabinet
Ratings	100 kVA (INF-100)	200 kVA (INF-200); 400–1,200 kVA as 2–6 cabinets in parallel
Power modules	1 + 1 redundant slot	2 + 1 redundant slot
INPUT		
Connection · voltage	3 phases + PE, no neutral · 480 V L-L	
Voltage · frequency range	336–552 V · 39.8–70.2 Hz	
Power factor · current THD	≥ 0.99 · < 3 % at full load	
Rated current	137 A	274 A
Bypass window	+10 or +15 %, −10/−15/−20/−30 % (default +15/−20 %)	
OUTPUT		
Voltage · frequency	480 V L-L, trim ±5 V, accuracy ≤ 1 % · 60 Hz	
THD · power factor	≤ 1 % resistive, ≤ 3 % non-linear · settable 0.8–1.0	
Rated current	120 A	241 A
Inverter overload	≤ 105 % continuous · 110 % 60 min · 125 % 10 min · 150 % 1 min · > 150 % 300 ms	
Bypass overload	≤ 135 % continuous · 150 % 5 min · 200 % 1 s · 300 % 100 ms	
Transfer	0 ms mains ↔ battery · 1 ms synchronized · 2 ms not synchronized (1–15 ms)	
EFFICIENCY		
Online, 30 · 50 · 100 % load	≥ 96.8 · 97.0 · 96.4 %	
Battery mode	≥ 96.1 · 96.7 · 95.8 %	
ECO	up to 99 %	
BATTERY		
Lead-acid	480 V rated, 360–600 V, 30–50 blocks	
Lithium	512 V rated, 384–640 V; BMS card for AEC L6	
Charge current	5–100 A per module, 20 A by default	
SYSTEM		
Display · communication	7-inch touchscreen · Modbus RTU/TCP, RS232, SNMP (BACnet), BMS, 4 in / 3 out dry contacts	
Parallel	up to 8 UPSs · BSC up to 3 buses · systems to 1,200 kVA, six 200 kVA cabinets	
Environment	32–104 °F · 0–95 % RH · IP20 · to 6,562 ft	
Noise, full load	< 65 dB	< 68.5 dB
W × D × H	23.6 × 39.4 × 81.4 in · 600 × 1,000 × 2,068 mm	
Weight	452 lb · 571 lb with 1+1	591 lb · 710 lb with 2+1
Standards	UL 1778-2024 listed · FCC Part 15 Class A	
Warranty	3 years on the UPS · 5 years on L6 lithium	



THE CABINET

INFINITE 100–1,200 kVA

100 · 200 kVA
23.6 × 39.4 × 81.4 in

PROTECTIONS

- ✓ Output overload and short circuit
- ✓ Bypass backfeed: trips the bypass breaker
- ✓ Battery under-voltage: alarm, then shutdown
- ✓ Module and cabinet over-temperature
- ✓ Smoke input: shutdown after a delay
- ✓ EPO: key switch and remote NC contact

Ordering Information
INFINITE 100–1,200 kVA

Every INFINITE is ordered with one code: the system rating, the redundant module and the L6 lithium cabinets. Cabinets, modules and battery cabinets are also sold on their own.

INF-200 **+1** **+L6-CAB-20x50LI**

system, kVA · redundant module · L6 lithium cabinet

+1 adds the redundant module; without +L6 the battery is sized by project. 400 to 1,200 kVA are two to six 200 kVA cabinets in parallel; from three L6 cabinets (600 kVA) up, the weight includes the L6 combiner, 308.6 lb.

EXAMPLES

INF-200+1
200 kVA, 2+1 modules, battery by project

INF-600+3xL6-CAB-20x50LI
600 kVA: three cabinets, three L6, 15 min

Code	Description
INF-100	INFINITE 100 kVA · 452.2 lb
INF-100+1	INFINITE 100 kVA + 1 redundant · 571.3 lb
INF-100+1+L6-CAB-20x50LI	INFINITE 100 kVA + 1 redundant · 1 × L6 (20 modules) · 30 min · 2,742.8 lb
INF-100+L6-CAB-10x50LI	INFINITE 100 kVA · 1 × L6 (10 modules) · 15 min · 1,808.0 lb
INF-100+L6-CAB-20x50LI	INFINITE 100 kVA · 1 × L6 (20 modules) · 30 min · 2,623.8 lb
INF-200	INFINITE 200 kVA · 591.3 lb
INF-200+1	INFINITE 200 kVA + 1 redundant · 710.4 lb
INF-200+1+L6-CAB-20x50LI	INFINITE 200 kVA + 1 redundant · 1 × L6 (20 modules) · 15 min · 2,881.9 lb
INF-200+L6-CAB-20x50LI	INFINITE 200 kVA · 1 × L6 (20 modules) · 15 min · 2,762.9 lb
INF-400	INFINITE 400 kVA · 1,182.5 lb
INF-400+2xL6-CAB-20x50LI	INFINITE 400 kVA · 2 × L6 (20 modules each) · 15 min · 5,525.7 lb
INF-600	INFINITE 600 kVA · 1,773.8 lb
INF-600+3xL6-CAB-20x50LI	INFINITE 600 kVA · 3 × L6 (20 modules each) · 15 min · 8,597.2 lb
INF-800	INFINITE 800 kVA · 2,365.1 lb

Code	Description
INF-800+4xL6-CAB-20x50LI	INFINITE 800 kVA · 4 × L6 (20 modules each) · 15 min · 11,360.1 lb
INF-1000	INFINITE 1,000 kVA · 2,956.3 lb
INF-1000+5xL6-CAB-20x50LI	INFINITE 1,000 kVA · 5 × L6 (20 modules each) · 15 min · 14,122.9 lb
INF-1200	INFINITE 1,200 kVA · 3,547.6 lb
INF-1200+6xL6-CAB-20x50LI	INFINITE 1,200 kVA · 6 × L6 (20 modules each) · 15 min · 16,885.8 lb
INF-FRAME-100	INFINITE 100 kVA cabinet, no power modules: top entry, input, output and bypass switches
INF-FRAME-200	INFINITE 200 kVA cabinet, no power modules: top entry, input, output and bypass switches
INFINITE-PWR-100	Power module 100 kVA, hot-swappable
L6-CAB-10x50LI	L6 lithium cabinet, 10 × 50 Ah LiFePO4 modules
L6-CAB-20x50LI	L6 lithium cabinet, 20 × 50 Ah LiFePO4 modules
L6-COMBINER	L6 combiner cabinet, joins up to 8 L6 cabinets
SNMP-L	SNMP network card
DRYCNT	Dry-contact card



INFINITE cabinets side by side: 100 or 200 kVA each

+



INFINITE-PWR-100 module, 100 kVA

1+1 · 2+1 **Modules per cabinet**

100 kVA modules: one and a redundant one in the 100 kVA cabinet, two and one in the 200 kVA.

MODULAR LITHIUM BATTERY SYSTEM

L6

50 Ah lithium

LiFePO4 modules of 50 Ah that slide in like drawers, each with its own DC/DC converter and BMS, in cabinets of 10 or 20 modules: up to 15 cabinets for the AEC INFINITE and **lithium**-ready UPS.



L6 LITHIUM CABINETS SIDE BY SIDE

LFP
lithium iron phosphate cells

Hot-swap
modules replaced online in minutes

15
cabinets in one system

58 kWh
per cabinet with 20 modules

Product Overview
L6 Lithium Battery System

Lithium battery cabinets of 10 or 20 hot-swappable 50 Ah modules, a combiner for large systems and a three-layer battery management system, for the AEC INFINITE and **lithium**-ready UPS.



The L6 cabinet, door open: up to 20 modules of 50 Ah, one pulled out.

Key data

Cabinets	L6-CAB-10x50LI · L6-CAB-20x50LI · L6-CAB-EMPTY
Modules	10 or 20 × 50 Ah LiFePO4, 2.88 kWh each
Energy · power	about 29 kWh, 100 kW · 58 kWh, 200 kW
DC output	240, ±240 or 480 V DC
DC input (charge)	265, ±265 or 530 V DC
System	up to 15 cabinets; combiner for up to 8
Size	23.6 × 33.5 × 78.7 in (600 × 850 × 2,000 mm)
Weight	1,355.8 lb · 2,171.6 lb
Life	15 years, 5,000+ cycles
Listings	modules UL 1973 listed, UL 9540A and UN38.3 tested
Warranty	5 years, cabinets with their batteries

Main features

Hot-swap modules
A 50 Ah module is replaced in about 5 minutes, with the load on.

Three-layer BMS
A BMS in every module, every cabinet and the system.

Isolated DC/DC
One converter per module, fire protection module by module.

Mixed-age modules
New modules beside old ones; current shared within 3 %.

1 to 15 cabinets
A master and up to 14 slaves; a combiner joins up to 8.

10-inch touchscreen
On the master: system, cabinets, modules and cells.

CATALOG CODES

L6-CAB-10x50LI **L6-CAB-20x50LI** **L6-CAB-EMPTY** **L6-COMBINER** **L6-MOD-50LI**

Front View
L6 Lithium Battery System

The master cabinet with its touchscreen beside a slave cabinet with its AEC panel: both 23.6 in wide and 78.7 in high, with up to 20 modules of 50 Ah behind the door.



1. **10-inch touchscreen**
   on the master: system, cabinets, modules and cells

2. **AEC panel with lamps**
   on every slave: run, alarm and fault lamps

3. **AEC logo**
   on the top frame of every cabinet

4. **Door handle with lock**
   the modules, breakers and BMS behind the door

5. **Perforated front door**
   air in at the front; out at the rear, or the top

6. **Slave cabinet**
   up to 14 beside the master, bolted side by side

7. **Base**
   anchored to the floor with expansion bolts

Internal View
L6 Lithium Battery System

The cabinet with its door open: the two battery breakers and the communication module at the top, the modules in two columns, one of them pulled out.



1. **Battery breaker 1**
   first DC switch of the cabinet
2. **Battery breaker 2**
   second switch; each serves a group of modules
3. **Communication module**
   the cabinet BMS: ports to the UPS, the network and the other cabinets
4. **Battery modules**
   up to 20 × 50 Ah in two columns; blank panels on empty slots
5. **Touchscreen or lamp panel**
   in the door: 10-inch touchscreen on the master, lamps on each slave

Touchscreen Interface
L6 Lithium Battery System

The 10-inch touchscreen of the master cabinet shows the system, each cabinet, each module and each cell, records charge and discharge and keeps the events.



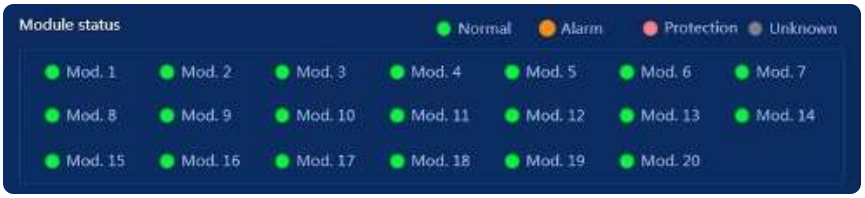
System home
Work mode, system status, current, voltage and SOC at a glance.

10" touchscreen on the master cabinet

3 lamps on each slave: run, alarm, fault

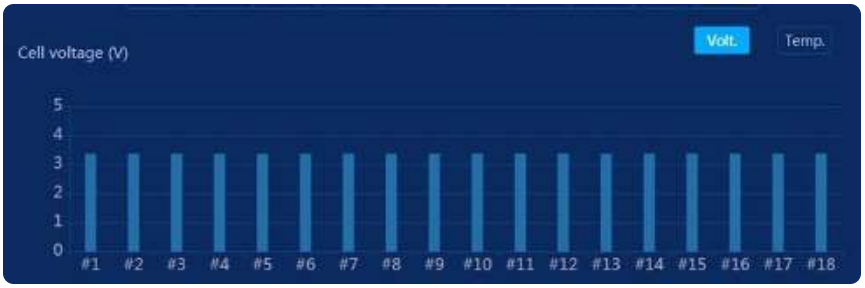
3 layers of BMS: module, cabinet, system

TCP/IP and RS485 to the network and the UPS



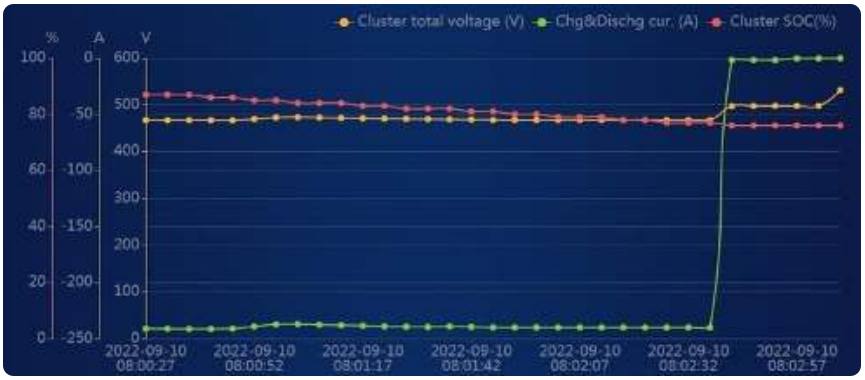
Cabinet status

The state of the 20 modules of a cabinet, normal, alarm or protection; above it (not shown) communication, fire control, insulation and the two DC breakers.



Cell data

The voltage of the 18 cells of one module, bar by bar; the Volt. and Temp. tabs above the chart switch to their temperature.



Charge and discharge record

Cluster voltage, current and SOC over time, here a charge starting at 08:02; event, data and fault records on the same menu.

Also on the screen: health details, the health of every module of a cabinet · module status and data, the DC module state, port voltage and current · system information, rated energy, voltage, modules, highest and lowest cell · event, data and fault records.

Lithium Battery Technology
L6 Lithium Battery System

Every module has its own battery management unit and a bidirectional DC/DC converter. With the knob locked it is held in the cabinet and delivers its power; a faulty module leaves the system by itself.



Front: handle, indicators and the locking knob



Rear: fans, the DC output connector and the rear handle

1. **Front handle**
2. **Indicators**: run, alarm, fault
3. **ON/OFF knob**: locks the module in
4. **Fans**
5. **Output connector**
6. **Rear handle**

The module

Code	L6-MOD-50LI, 50 Ah
Cells	18 × 3.2 V LiFePO4, 57.6 V
Energy	2.88 kWh; DC/DC output 10 kW
Size	8.8 × 26.2 × 6.0 in (223 × 665 × 152 mm)
Weight	81.6 lb (37 kg)
Discharge rate	4C
Charge current	up to 40 A, 20 A by default
SOC · SOH	accuracy ≥ 95 % · ≥ 90 %



The locking knob

Knob open: the module is free and off. Knob closed: locked in, it delivers DC by itself after its self-test.

Hot swap, about 5 minutes

Unlock the knob, pull the module by its handles, push the new one in and lock it: after a self-test of about 10 s it joins the system, with the load supplied.

One converter, three modes

CHARGE
Mains normal, modules not full
The DC/DC steps the UPS charge voltage of 265, ±265 or 530 V down and charges at constant current, limited voltage.

SLEEP
Mains normal, modules full
No charge and no discharge until the voltage or the SOC falls below the setting: no float on the cells.

DISCHARGE
Mains failure
The DC/DC boosts the cells to 240, ±240 or 480 V and supplies the UPS, module by module.

Output voltage and UPS matching

- Output 240, ±240 or 480 V DC, to the battery voltage of the UPS.
- The UPS charge voltage must match the L6 input, or it will not charge.
- With the INFINITE: L6 output set to 480 V DC, inside the INFINITE lithium window of 384–640 V (512 V rated).
- UPS load within 90 % of the L6 rating, the guideline; AEC sets each margin; modules and cabinets share the current within 3 %.

LFP	4C	≧ 95 %	81.6 lb
lithium iron phosphate	cell discharge rate	SOC accuracy	per module

Advanced Battery Management
L6 Lithium Battery System

LiFePO4 modules in parallel, each with its own DC/DC, compared with a UPS and a separate VRLA battery cabinet; the three-layer battery management, the safety functions and the listings.

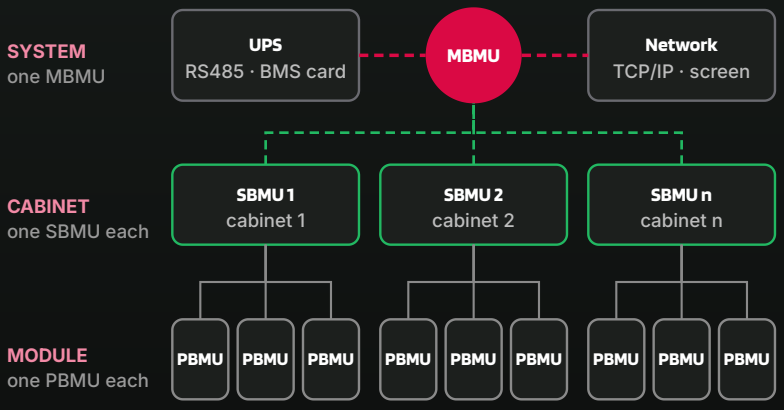
LITHIUM MODULES

Service and monitoring, module by module

≈ 5 min
to change a module, with the load supplied

18
LiFePO4 cells in series per module: 57.6 V, 2.88 kWh

THREE-LAYER BATTERY MANAGEMENT



Each layer watches the one below.

Packs in series
Packs stacked in series to the UPS voltage, as with lead-acid: a weak or failed pack limits or stops the string.

L6 modules in parallel
Each module reaches the UPS through its own isolated DC/DC and PBMU: a fault stays in its module.

	L6 · lithium LFP	UPS + VRLA battery cabinet
Installation	**cabinets side by side; modules slid in from the front**	heavy blocks: floor area and floor load to check
Battery life	**15-year life · 5,000+ cycles**	about three sets in one UPS life, replaced about twice
Battery service	**one module at a time, load supplied**	whole string; checked at least twice a year
A faulty unit	**leaves the system, the others carry on**	blocks in series: one fault affects the string
Monitoring	**every cell, module and cabinet; SOC and SOH**	no health analysis, no early warning

VRLA column: lead-acid limits, indicative, not a test.

Fire and insulation protection

Fire protection per module
Temperature is watched module by module: a fault is answered where it starts.

On-line insulation monitoring
Checked while the system runs: a leak is located before it becomes a short circuit.

Cell-level monitoring

Cell-level data
Voltage and temperature of every cell, with the faulty one located.

Mixed-age modules
Adaptive SOC: new modules beside old ones; current shared within 3 %.

Expansion and voltage matching

Expansion
Add modules, or cabinets: up to 15 cabinets in one system.

Matches the UPS
240 V, 480 V or ±240 V output, to suit the UPS DC bus.

TESTED
UN38.3

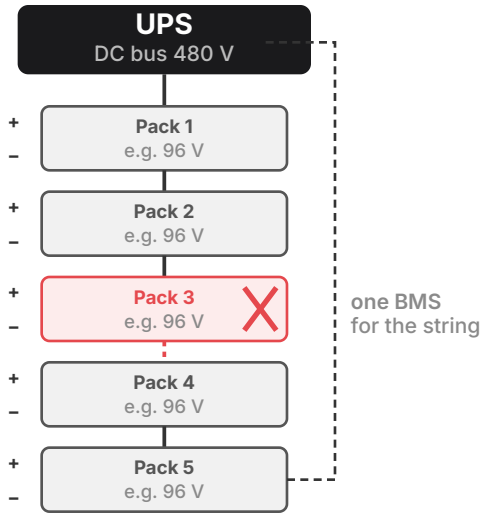
All eight UN38.3 tests, T.1–T.8, passed at the first cycle and after 25 cycles on the 50 Ah module (57.6 V, 2,880 Wh), by an independent accredited laboratory.

Modules UL 1973 listed
UL 9540A tested
5,000+ cycles, 15-year life

Battery Architecture
L6 Lithium Battery System

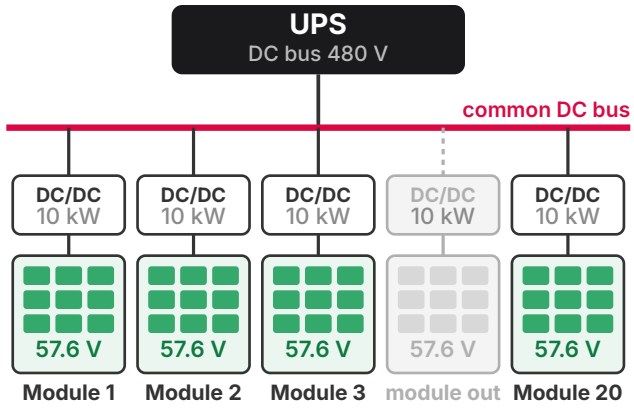
Two ways to build a **lithium** battery for a UPS: packs stacked in series on one string, or AEC L6 modules in parallel, each with its own DC/DC converter. How each one behaves on a fault, when the system grows and as the batteries age.

Conventional: packs in series
No DC/DC: the cells set the bus voltage



Pack voltages add up to the bus:
one open pack stops the whole string

AEC L6: modules in parallel
An isolated DC/DC in every module



Each module: 18 LiFePO4 cells, BMS, isolated DC/DC
A faulty module leaves the system:
19 of 20 modules carry on, 190 of 200 kW

Side by side

	Packs in series	L6 modules in parallel
Bus voltage	the sum of the packs: set by the number of packs	set by the DC/DC: 240, ±240 or 480 V DC
One unit fails	the string opens: no backup from that string	the module leaves the system; the others carry on
Replacement	string off, packs matched to the others	hot swap, about 5 minutes, load supplied
Old and new together	the weakest pack limits the whole string	new modules beside old ones, current shared within 3 %
Growing the system	a whole new string of identical packs	one module (10 kW) or one cabinet at a time, up to 15
Charging	the UPS charger drives the string directly	each DC/DC charges its own module
A fault	can spread along the string	stays inside its module: isolated DC/DC, fire protection per module
Monitoring	one BMS for the string	three layers: module, cabinet, system; every cell

Three examples · illustrative

One unit fails
power available, 20 units

Series 0 %
L6 95 %

Series: the string opens. L6: 19 of 20 modules, 190 of 200 kW.

Add capacity
smallest step, one cabinet

Series 100 %
L6 5 %

Series: a full string. L6: one 10 kW module, 5 % of a 200 kW cabinet.

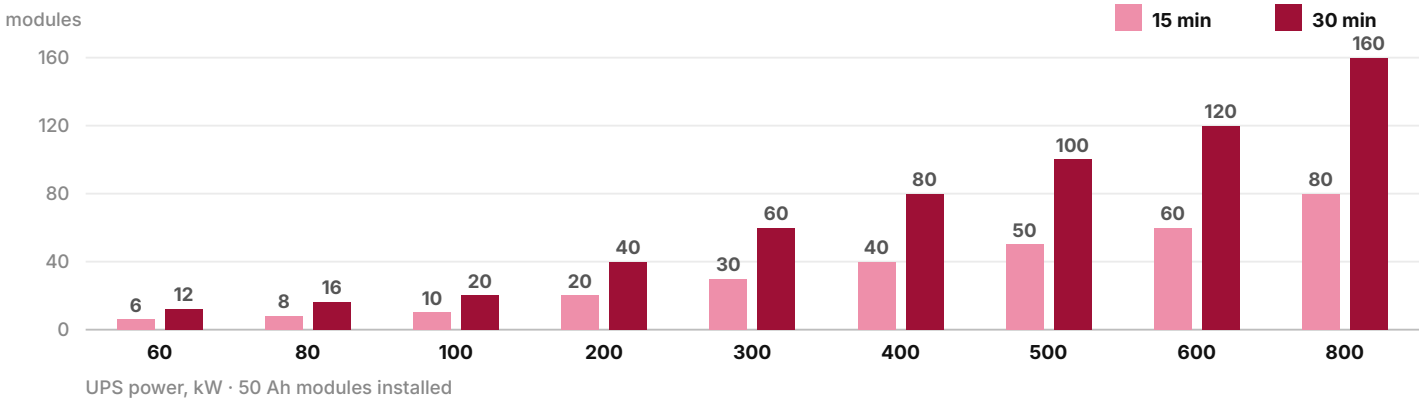
Mixed ages
share of each unit used

Series 80 %
L6 100 %

Series: the weakest pack (here 80 %) sets the string. L6: each module gives its own.

Battery Runtime
L6 Lithium Battery System

Every UPS power, 15 or 30 minutes: the L6 cabinets and 50 Ah modules, at the start of life. Each module adds 10 kW of DC/DC power; a cabinet holds 20.



50 Ah modules · 57.6 V · 2.88 kWh each

number of L6 cabinets · minutes, 50 Ah modules installed

UPS power	1	2	3	4	5	6	7	8
60 kW	**15 · 30** 6 · 12 mod.							
80 kW	**15 · 30** 8 · 16 mod.							
100 kW	**15 · 30** 10 · 20 mod.							
200 kW	**15** 20 mod.	**30** 40 mod.						
300 kW	–	**15** 30 mod.	**30** 60 mod.					
400 kW	–	**15** 40 mod.		**30** 80 mod.				
500 kW	–	–	**15** 50 mod.		**30** 100 mod.			
600 kW	–	–	**15** 60 mod.			**30** 120 mod.		
800 kW	–	–	–	**15** 80 mod.				**30** 160 mod.
modules, up to	20	40	60	80	100	120	140	160

UPS power in kW; minutes at the start of life. –: not possible, each cabinet delivers up to 200 kW (20 modules × 10 kW). Blank: not in the table; AEC sizes every system with its margin.

READING THE TABLE

800 kW, the last row

Four full cabinets of 20 modules hold 800 kW for 15 minutes; for 30 minutes the table doubles them, 8 cabinets and 160 modules.

ONE CODE
INF-800+4xL6-CAB-20x50LI

BACKUP TIME
15 min full load · 30 min half

AEC SIZING

20
modules per cabinet

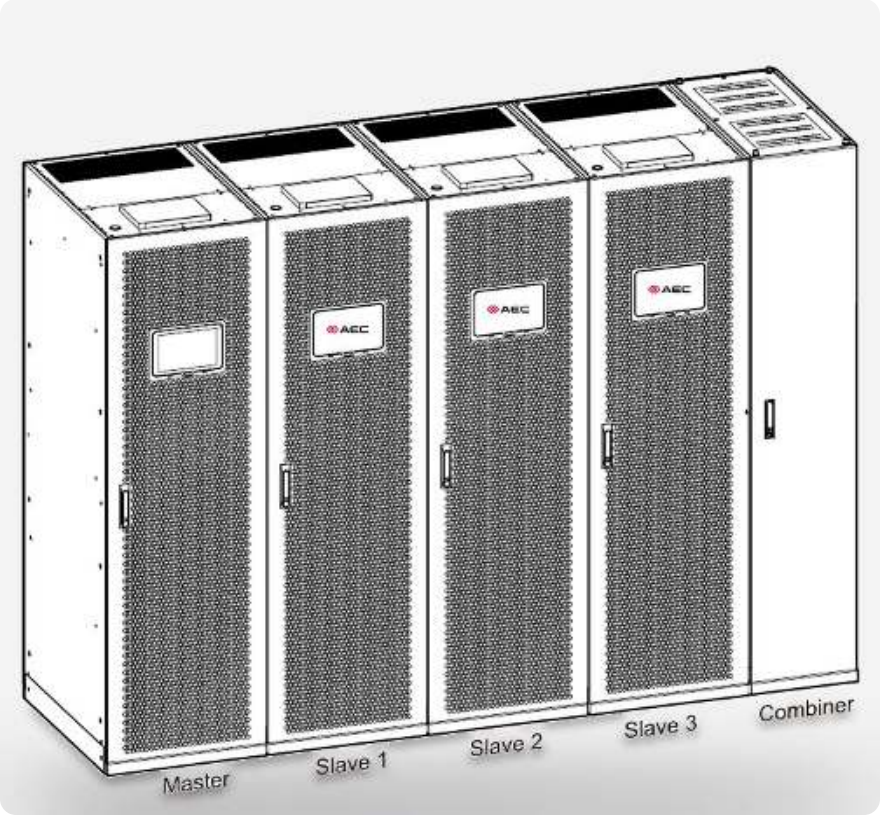
10 kW
DC/DC output per module

15 min
at 200 kW, one cabinet

1 module
steps for a precise size

Parallel and Communication
L6 Lithium Battery System

Up to 20 modules of 50 Ah in one cabinet; above that, a master and slave cabinets in parallel, up to fifteen, with a combiner cabinet joining their outputs.



Master with the touchscreen, three slaves with lamps and the combiner, side by side; slaves and combiner go left or right of the master.

Combiner cabinet

Code · model	L6-COMBINER · L6-C-4000
Cabinets	up to 8 L6 cabinets per combiner
Output	4,000 A max; to the UPS from the top or the bottom
Size · weight	15.7 × 33.5 × 78.7 in · 308.6 lb (140 kg)
Busbars	+, N and –; cabinets on the sides, the UPS in the middle



Combiner cabinet L6-C-4000, 15.7 in wide, closed door: the outputs of up to eight cabinets on its busbars.

NETWORK

Networking device

Eight ports, up to seven cabinets each; needed from two cabinets up.

OPTION

In-row rear frame

Extends the cabinet depth to line up with a modular UPS or IT racks.

OPTION

Blank panels

Close the empty module slots; fitted like a module.

Communication module

Port	Use
RS485	RJ45: communication with the UPS (Modbus)
LAN	RJ45: monitoring by a computer, cascade between cabinets
EPO	the external emergency switch, cascaded between the cabinets
AC IN · OUT	160–300 V AC auxiliary supply for the screen, BMS and fans; cascade to the next cabinet

15
cabinets in parallel

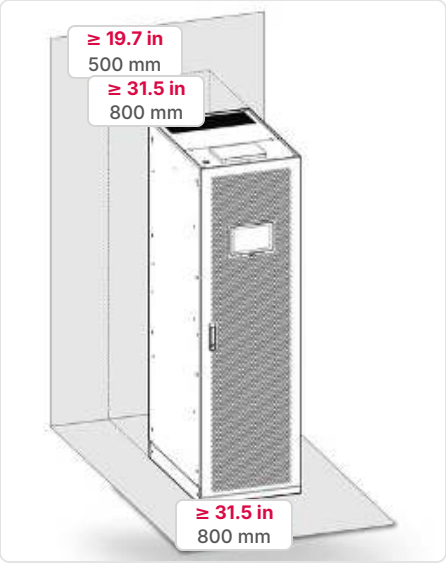
8
cabinets per combiner

TCP/IP · RS485
communication

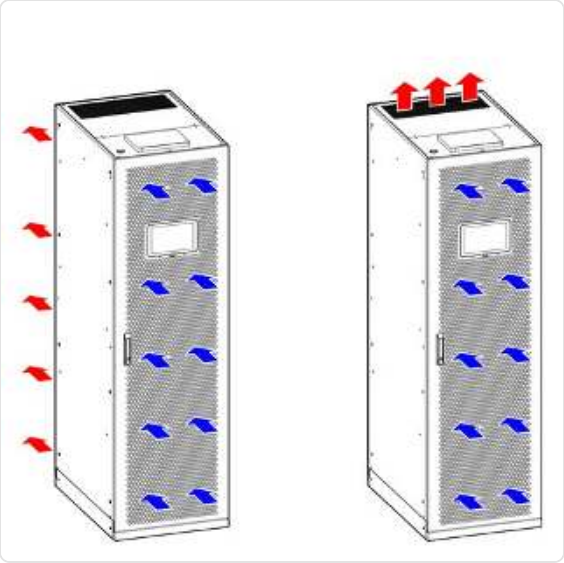
EPO
shared by the cabinets

Installation and Dimensions
L6 Lithium Battery System

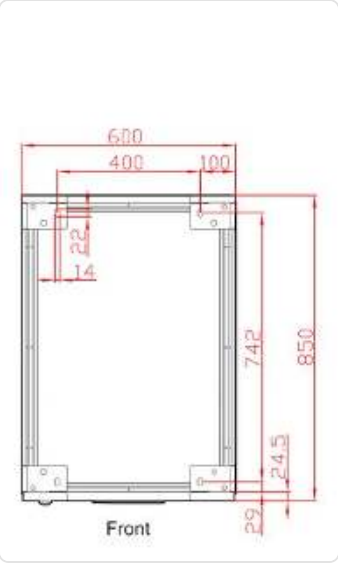
Clearances, airflow, floor fixing, site and storage conditions, and the size and weight of every code; AEC engineers size the system and commission it with the UPS.



Clearances: front and rear ≥ 31.5 in (800 mm), top ≥ 19.7 in (500 mm); the same for cabinets in parallel.



Airflow: left, front inlet and rear outlet; right, top outlet with the top cover plate of holes removed.



Floor fixing (drawing in mm): 23.6 × 33.5 in cabinet, 4 × Ø 0.55 in holes.

Site

- Indoors, ventilated, away from water, heat, dust, corrosive or salty air and direct sun; never in the open air.
- 32–104 °F (0–40 °C), best 68–86 °F (20–30 °C): warmer shortens the life, colder the backup; 5–95 % RH non-condensing.
- Up to 13,123 ft (4,000 m), derated above 6,562 ft (2,000 m).
- Air in at the front, out at the rear, or out at the top with its top cover plate removed; vents kept clear.
- DC cables from the top; 160–300 V AC auxiliary supply for the BMS, screen and fans.

Floor and anchoring

- Concrete or other non-combustible floor; four Ø 0.55 in (14 mm) holes, 15.7 in (400 mm) across and 29.2 in (742 mm) front to back.
- Expansion bolts standing 1.2–2.0 in (30–50 mm) out of the floor, or a U-steel base; cabinets of one system bolted side by side.

Transport, storage and modules

- Cabinet in a honeycomb carton on a wooden pallet, modules in their own cartons; forklift from the side, kept upright.
- Modules shipped at 20–50 % SOC; storage 14–113 °F (−10–45 °C), best 32–95 °F (0–35 °C), 7.9 in (200 mm) off the floor.
- Idle modules charged every 1 to 6 months, by their SOC; 4 h at room temperature before start-up.
- Each module carried by several people; slid in from the bottom up, knob unlocked; a lifting platform above 3.3 ft (1 m); blank panels on empty slots.

Start-up by AEC. Knobs locked, self-test about 10 s, voltage checked on the touchscreen, breakers closed, then the UPS.

Sizes and weights

Code	What	W × D × H	Weight
L6-CAB-10x50LI	10 × 50 Ah, about 29 kWh	23.6 × 33.5 × 78.7 in (600 × 850 × 2,000 mm)	1,355.8 lb
L6-CAB-20x50LI	20 × 50 Ah, 58 kWh	23.6 × 33.5 × 78.7 in (600 × 850 × 2,000 mm)	2,171.6 lb
L6-COMBINER	up to 8 cabinets, 4,000 A	15.7 × 33.5 × 78.7 in (400 × 850 × 2,000 mm)	308.6 lb
L6-MOD-50LI	18 cells, 57.6 V, 2.88 kWh	8.8 × 26.2 × 6.0 in (223 × 665 × 152 mm)	81.6 lb

Technical Specifications
L6 Lithium Battery System

Model	L6-CAB-10x50LI	L6-CAB-20x50LI
CABINET		
Modules	10 × 50 Ah	20 × 50 Ah
Energy	about 29 kWh	58 kWh
Rated discharge power	100 kW	200 kW
Output voltage · discharge	240, ±240 or 480 V DC	
Input voltage · charge	265, ±265 or 530 V DC	
Discharge overload	125–135 % 1 min · 135–150 % 30 s · > 150 % 500 ms	
Current unbalance	≤ 3 % between modules and cabinets	
Cabinets in parallel	up to 15; combiner L6-C-4000 for up to 8	
W × D × H	23.6 × 33.5 × 78.7 in (600 × 850 × 2,000 mm)	
Weight	1,355.8 lb (615 kg)	2,171.6 lb (985 kg)
MODULE L6-MOD-50LI		
Cells · energy	18 × 3.2 V LiFePO4 · 2.88 kWh	
Discharge rate · charge current	4C · up to 40 A, 20 A by default	
DC/DC output	10 kW	
Size · weight	8.8 × 26.2 × 6.0 in · 81.6 lb (37 kg)	
SOC · SOH accuracy	≥ 95 % · ≥ 90 %	
FUNCTIONS		
Standard	cold start, self-start when the mains returns, EPO, SOC balance on discharge, module-level fire control, on-line insulation detection	
Protection	over-temperature, over-current, short circuit, over- and under-voltage, low SOC	
GENERAL		
Display	10-inch touchscreen on the master cabinet; run, alarm and fault lamps on each slave	
Communication	TCP/IP, RS485 (Modbus to the UPS)	
Operating · storage	32–104 °F (0–40 °C) · 14–113 °F (–10–45 °C)	
Humidity · altitude	5–95 % RH non-condensing · 13,123 ft (4,000 m), derated above 6,562 ft (2,000 m)	
Noise · protection	< 65 dB · IP20	
Certification	modules UL 1973 listed, UL 9540A tested; UN38.3 tested, T.1–T.8	
Warranty	5 years on the cabinets with their batteries	
INSTALLATION		
Clearances	front ≥ 31.5 in (800 mm), to open the door and pull the modules; rear ≥ 31.5 in (800 mm), for the air; top ≥ 19.7 in (500 mm) above	
Floor · placing	concrete or other non-combustible floor, anchored with expansion bolts; cabinets of one system bolted side by side	
Auxiliary supply · cables	160–300 V AC for the BMS, screen and fans; DC cables from the top; AEC sizes and commissions the system with the UPS	

Sizes and weights of every code: p. 145. Specifications are subject to change without notice.

Ordering Information
L6 Lithium Battery System

L6 cabinets come with 10 or 20 modules, or empty to be filled in stages; modules and the combiner are sold on their own. With the INFINITE, one code orders the UPS and its L6 cabinets.



L6-CAB-20x50LI open: 20 modules of 50 Ah behind the door, one pulled out.

Code	Description
L6-CAB-10x50LI	L6 lithium cabinet with 10 × 50 Ah modules, BMS and touchscreen or lamps, about 29 kWh
L6-CAB-20x50LI	L6 lithium cabinet with 20 × 50 Ah modules, 58 kWh
L6-CAB-EMPTY	L6 cabinet without modules, for up to 20 × 50 Ah
L6-MOD-50LI	LiFePO4 module 50 Ah, 2.88 kWh, with its DC/DC converter
L6-COMBINER	Combiner cabinet L6-C-4000, for up to 8 L6 cabinets

How to size

- UPS power (kW) and the backup time you need.
- 15 or 30 minutes: the modules and cabinets to match.
- One cabinet up to 20 modules; a master and slaves above that.
- AEC confirms every system with its margin.

INFINITE with L6: one code for the UPS and its lithium

10 standard systems, 100 to 1,200 kVA, each with its L6 cabinets and its published backup time at full load: the codes are in the INFINITE ordering guide, p. 134; the INFINITE battery page, p. 132, shows how the two connect.

p. 134
INFINITE ordering guide

One code, the UPS and its battery



INFINITE cabinet, not to scale

+



L6-CAB-20x50LI, one of the four

×4 L6 cabinets with the 800 kVA INFINITE

INF-800+4xL6-CAB-20x50LI: 15 min at full load, 30 min at half; one code for the UPS and its 4 cabinets.

24/7
technical assistance by phone and WhatsApp

<30 min
WhatsApp reply to technical and sales questions

5 years
on L6 cabinets with their batteries

Miami
AEC UPS USA: stock and training center

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AEC

MODULAR UPS + LITHIUM · IP55 CONTAINER

CONTAINER

1–1.2 MW

An INFINITE modular UPS and AEC L6 lithium cabinets, wired, cooled and secured inside one sealed 40-foot container: critical power that arrives on a truck and starts on site.



THE AEC CONTAINERIZED UPS: A SEALED 40-FOOT IP55 CONTAINER

1.2 MW
INFINITE, 100 kW modules

15 min
at full load with L6 lithium

IP55
sealed 40-foot container

348 kWh
lithium at 1.2 MW, 6 × 58 kWh

Containerized UPS Overview

Containerized UPS 1–1.2 MW

A sealed, IP55 40-foot container, set on its pad and connected: the UPS, the lithium battery, cooling, fire protection and access control are already inside.



WHAT YOU SEE

1. **CCTV cameras**
   internal and external, 4 TB video server, 30 days of recording
2. **Fingerprint reader**
   opens the magnetic door for enrolled staff
3. **Entrance**
   double door under the awning
4. **Fire-protection box**
   fire protection and water, humidity and temperature monitoring
5. **Cable box and entry**
   cables enter through an isolated, sealed passage
6. **Side door**
   a second access along the long side
7. **Pad and steps**
   the container stands on its own concrete pad
8. **Sealed steel shell**
   IP55, 40 ft long, AEC-branded

The container in figures

Length	40 ft (12,192 mm)
Enclosure	sealed steel container, IP55
Inside	one row, cold and hot aisle; at 1 MW 14 positions of 23.6 in (600 mm) as drawn, at 1.2 MW two more cabinets on the project drawing
Air conditioning	4 in-row units, 4 outdoor units with two fans each
Outdoor unit	7 ft 4 in × 40.8 in (2,243 × 1,037 mm) as drawn, 23.6 in (600 mm) apart
Access	end double door, side door; fingerprint and magnetic lock
UPS and battery	14,122.9 lb (6,406 kg) at 1 MW · 16,885.8 lb (7,659 kg) at 1.2 MW
Monitoring	7-inch touchscreen on each UPS cabinet, 10-inch on the L6 master; Modbus RTU, RS232, RS485, EPO and dry contacts (4 in, 3 out) standard; SNMP card as an option

WHERE IT WORKS

- **Data centers**
  capacity outside the building
- **Industry**
  next to the process
- **Telecom and edge**
  remote sites, own cooling
- **Healthcare, campuses**
  while buildings change

WHAT THE CONTAINER INCLUDES

Factory-wired UPS, battery, cooling
Assembled and wired before it ships: UPS, lithium, cooling, fire protection and security in one box.

No power room needed
No new power room: the container stands outside, on its pad, and is connected there.

Placed and started on site
A factory-built system set on its pad, connected and commissioned on site.

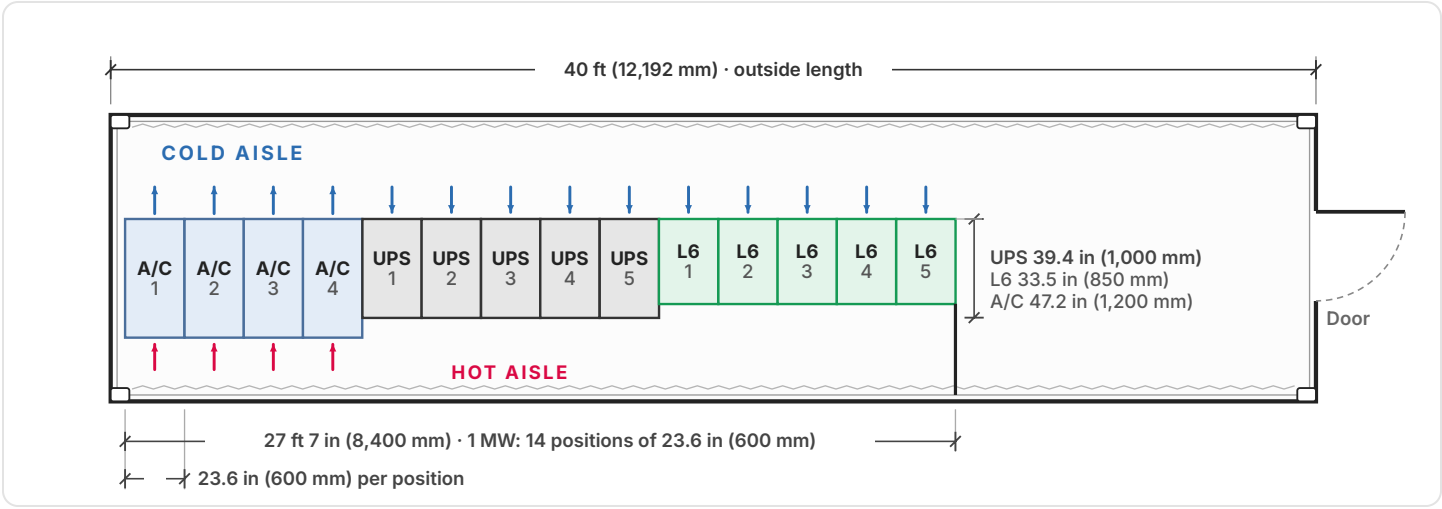
Hot-swappable modules
100 kW UPS modules and 50 Ah LiFePO4 modules are replaced with the load on.

Access control and CCTV
Fingerprint access, magnetic door, CCTV inside and out, fire and environment watched.

Voltage: 480 V, 60 Hz
Three-phase, 3 wires + ground; sized to the load and the runtime.

Container Layout
Containerized UPS 1–1.2 MW

The 1 MW system as drawn, one row of 14: four in-row A/C units, five INFINITE and five L6 lithium cabinets. At 1.2 MW a sixth INFINITE and a sixth L6 join them; the project drawing sets every position.



UPS 1–5
INFINITE 200 kVA cabinets

L6 1–5
lithium cabinets, one per UPS

A/C 1–4
in-row air conditioning

Cold aisle
cooled air to the cabinet fronts (principle)

Hot aisle
warm air back to the in-row units (principle)

Door
35.4 in (900 mm) as drawn

UPS zone

INFINITE 200 kVA cabinets, 23.6 × 39.4 × 81.4 in, two hot-swappable 100 kW modules each and a 7-inch touchscreen (INFINITE, p. 133).

Lithium zone

One L6 cabinet per UPS cabinet, the five side by side next to the UPS group: 23.6 × 33.5 × 78.7 in, 20 × 50 Ah LiFePO4 modules, 58 kWh, 2,171.6 lb (L6, p. 146).

In-row cooling

Four in-row units together at the first positions (A/C 1–4) and four outdoor units: high cooling capacity; the cabinets draw from the cold aisle.

Aisles kept apart

Cold aisle in front of the row, hot aisle behind it, closed at the entrance end: internal isolation between them.

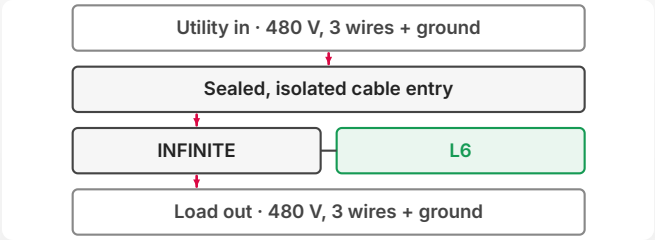
Fire and environment

Fire protection, water, humidity and temperature watched in the container; in every L6 cabinet a smoke detector and fire protection module by module.

Insulation and faults

On-line insulation monitoring locates a leak before it becomes a short circuit; the fire-control state shows on the L6 touchscreen.

Power in and out



- Sealed cable entry; 480 V three-phase, 3 wires + ground.
- The INFINITE cabinets side by side, their L6 cabinets next to them.

Security

Access control

Fingerprint reader on the magnetic door of the entrance; a side door for service.

CCTV

Cameras inside and out; 30 days of recording on a 4 TB video server.

Fire and environment

Fire protection; water, humidity and temperature watched.

Configurations and Ordering
Containerized UPS 1–1.2 MW

Two systems, one container: INFINITE 200 kVA cabinets in parallel, each with its own L6 **lithium** cabinet. The codes order the UPS and the batteries together; AEC builds, delivers and commissions the container.

1 MW

INF-1000+5xL6-CAB-20x50LI



5 × INFINITE 200 kVA
2 × 100 kW modules each

5 × L6 · 20 × 50 Ah
master with touchscreen

10
× 100 kW modules

100
× 50 Ah LiFePO4

290 kWh
lithium, 5 × 58 kWh

1.2 MW

INF-1200+6xL6-CAB-20x50LI



6 × INFINITE 200 kVA
2 × 100 kW modules each

6 × L6 · 20 × 50 Ah
master with touchscreen

12
× 100 kW modules

120
× 50 Ah LiFePO4

348 kWh
lithium, 6 × 58 kWh

The two systems

	1 MW	1.2 MW
Rating	1,000 kVA · 1,000 kW	1,200 kVA · 1,200 kW
UPS cabinets	5 × INF-200 in parallel, 10 × 100 kW modules, hot-swappable	6 × INF-200 in parallel, 12 × 100 kW modules, hot-swappable
Lithium	5 × L6-CAB-20x50LI, one per UPS cabinet: 100 × 50 Ah LiFePO4, 290 kWh	6 × L6-CAB-20x50LI, one per UPS cabinet: 120 × 50 Ah LiFePO4, 348 kWh
Backup, full · half load	15 min · 30 min	15 min · 30 min
Weight, UPS and battery	14,122.9 lb (6,406 kg)	16,885.8 lb (7,659 kg)

Both: 480 V three-phase, 3 wires + ground, 60 Hz; recharge under 2 hours. UPS data p. 133; battery data p. 146.

From order to operation

1. **Survey** — Site, power, truck access, room for the pad.
2. **Configuration** — 1 or 1.2 MW, the runtime.
3. **Factory build** — UPS, **lithium**, cooling, fire and security wired in.
4. **Delivery** — By truck; set on its concrete pad.
5. **Connection** — Cables through the sealed entry.
6. **Start-up** — Every value, alarm and contact tested by AEC.
7. **Service** — 24/7 assistance, maintenance and parts.

ORDERING, WARRANTY AND SERVICE

The codes order the UPS with its L6 cabinets; the container (40 ft, IP55, cooling, fire, security) and the site works are quoted with each project.

sales@aecups.com · +1 786 553 2100 · aecups.com

5 years
L6 cabinets

3 years
INFINITE UPS

24/7
assistance

Miami
start-up and training

BATTERIES AND BATTERY CABINETS

Batteries and cabinets

A cabinet for every AEC UPS that takes external batteries: BAT towers and 19-inch packs for the FERRUS line, and the BB4US beside the FERRUS SP, each cabinet at the DC voltage of its UPS.



BB4US CABINET, A BAT TOWER AND A 19-INCH PACK

8
cabinets and packs for the FERRUS line

12 V 9 Ah
VRLA blocks, delivered charged

80
blocks in one BB4US cabinet

1–4
cabinets or packs per UPS

Battery Cabinet Selection
BAT, BAT…RT and BB4US

Eight cabinets and packs for the FERRUS line (11 catalog codes): every UPS rating and its cabinets; the DC voltage of the cabinet is the DC voltage of the UPS. Sizes, weights and pictures: the pages that follow.

Which goes with which

UPS	DC	BAT 0424	BAT 0848	BAT 1272	BAT 0424RT	BAT 0848RT	BAT 1272RT	BAT 16192RT	BB4US all	Per UPS
FERRUS 1 kVA	24 V	●								1–4
FERRUS 2 kVA	48 V		●							1–4
FERRUS 3 kVA	72 V			●						1–4
FERRUS RT 1 kVA	24 V				●					1–4
FERRUS RT 1.5 kVA	48 V					●				1–4
FERRUS RT 2 kVA	48 V					●				1–4
FERRUS RT 3 kVA	72 V						●			1–4
FERRUS SP 6 kVA	192 V								●	1
FERRUS SP 10 kVA	192 V								●	1
FERRUS SP 20 kVA	240 V								—	on request
FERRUS SP RT 6 kVA	192 V							●		1–4
FERRUS SP RT 10 kVA	192 V							●		1–4

● a catalog set: UPS and cabinet in one code (42 sets; ×2 to ×4 for more cabinets), backup time published

FERRUS SP 20 kVA: 40 blocks inside on 240 V DC (FERSP20000-40X9), or the same cabinet supplied empty (FERSP20000-EMPTY); external cabinet on request.

Battery inside: LUMINA (LiFePO4), ETHERNO (1 to 3 lithium modules of 50 Ah), AUREON (VRLA modules), RADIANT-IB and CIRRO-IB (up to 240 blocks on trays). **RADIANT and CIRRO:** an external battery bank, sized by AEC with each project. **INFINITE:** AEC L6 lithium cabinets, 480 V DC into its lithium window of 384–640 V (512 V rated); the L6 output voltages, p. 140.

BAT Tower Cabinets
FERRUS 1–3 kVA

Towers of the size of the FERRUS beside them: BAT0424 as the 1 kVA, BAT0848 (48 V DC) and BAT1272 (72 V DC) as the 2 and 3 kVA. 12 V 9 Ah blocks in two strings, delivered charged.

UPS AND CABINET · ONE SCALE



FERRUS 2 · 3 kVA
15.8 in

BAT0848 · BAT1272
15.8 in

The size of the UPS beside it. BAT0424 has the chassis of the FERRUS 1 kVA, 5.6 × 8.6 × 13.9 in; BAT0848 and BAT1272 the chassis of the 2 and 3 kVA, 7.5 × 12.6 × 15.8 in. Shown: the 2 · 3 kVA and its cabinet, to one scale.

	BAT0424	BAT0848	BAT1272
For	FERRUS 1 kVA	FERRUS 2 kVA	FERRUS 3 kVA
DC voltage	24 V	48 V	72 V
12 V 9 Ah blocks	4	8	12
Strings	2 × 2 blocks	2 × 4 blocks	2 × 6 blocks
W × D × H, in	5.6 × 8.6 × 13.9	7.5 × 12.6 × 15.8	7.5 × 12.6 × 15.8
W × D × H, mm	142 × 218 × 353	190 × 319 × 400	190 × 319 × 400
Weight, with blocks	31.4 lb	58.8 lb	86.2 lb

One to four per UPS, side by side, each on the external battery terminal of the FERRUS; the long-backup charger is set from 1 to 8 A on the UPS panel.

SET CODES

FER1000-2X9+BAT0424	FERRUS 1 kVA with one BAT0424; x2 to x4 for more
FER2000-4X9+BAT0848	FERRUS 2 kVA with one BAT0848; x2 to x4 for more
FER3000-6X9+BAT1272	FERRUS 3 kVA with one BAT1272; x2 to x4 for more

Backup time with one to four cabinets

The same published times for the 1, 2 and 3 kVA: every cabinet carries the blocks of its UPS. Times as published for each set.

UPS ALONE	+1 CABINET	+2 CABINETS	+3 CABINETS	+4 CABINETS
4.2 min at full load	**10** min at full load	**23.7** min at full load	**39.4** min at full load	**56.4** min at full load
10 min at half load	23.7 min at half load	56.4 min at half load	93.6 min at half load	134.2 min at half load

How the code reads

- **BAT**, a battery cabinet; **04**, **08**, **12**: its 12 V 9 Ah blocks
- **24**, **48**, **72**: its DC volts, the UPS's
- **RT** at the end: the 19-inch pack; none: the tower
- A set adds it to the UPS code: FER3000-6X9+BAT1272x2

UPS size	24–72 V	1–4	56.4 min
every tower the size of its UPS: 1 kVA, or 2 and 3 kVA	the UPS's DC voltage	cabinets per UPS	full load, four cabinets

19-inch Battery Packs
FERRUS RT and FERRUS SP RT

The width of the rack UPS they extend, 17.3 in: BAT…RT packs of 2U to 4U for the FERRUS RT, and the 3U BAT16192RT for the FERRUS SP RT, its 16 blocks in one string on the 192 V DC bus.



BAT0424RT, 2U, closed: the 19-inch front with handles



The same pack with its block tray drawn out



BAT16192RT, 3U: the pack of the FERRUS SP RT

	BAT0424RT	BAT0848RT	BAT1272RT	BAT16192RT
For	FERRUS RT 1 kVA	FERRUS RT 1.5 · 2 kVA	FERRUS RT 3 kVA	FERRUS SP RT 6 · 10 kVA
Rack height	2U	3U	4U	3U
DC voltage	24 V	48 V	72 V	192 V
12 V 9 Ah blocks	4	8	12	16
Strings	2 × 2 blocks	2 × 4 blocks	2 × 6 blocks	1 × 16 blocks
W × D × H, in	17.3 × 17.3 × 3.4	17.3 × 17.3 × 5.2	17.3 × 22.8 × 7	17.3 × 25 × 5.2
W × D × H, mm	439 × 439 × 86	439 × 439 × 132	439 × 579 × 178	439 × 635 × 132
Weight, with blocks	35.4 lb	64.8 lb	94.2 lb	123.6 lb
Per UPS	1–4	1–4	1–4	1–4

Full-load backup with one to four packs

UPS	+1 pack	+2 packs	+3 packs	+4 packs
FERRUS RT 1 · 2 · 3 kVA	10 min	23.7 min	39.4 min	56.4 min
FERRUS RT 1.5 kVA	14.3 min	34 min	56.4 min	80.8 min
FERRUS SP RT 6 kVA	6 min	14.3 min	23.7 min	34 min
FERRUS SP RT 10 kVA	3.2 min	7.5 min	12.5 min	17.9 min

In the rack

- The same 17.3 in width as the rack UPS, in the same 19-inch rack.
- Each pack connects to the external battery port of the UPS, at its DC voltage.
- FERRUS SP RT: one to four BAT16192RT on its 192 V DC bus.
- Battery capacity entered from the UPS panel.

How heavy, how deep

- BAT0424RT and BAT0848RT: 17.3 in deep, 35.4 and 64.8 lb.
- BAT1272RT: 22.8 in deep, 94.2 lb.
- BAT16192RT: 25 in deep, 123.6 lb.

17.3 in
19-inch width

2U–4U
BAT…RT packs

192 V
BAT16192RT, 16 blocks

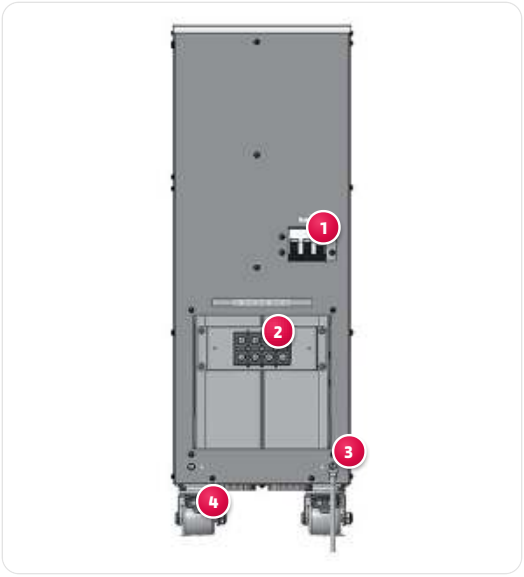
1–4
packs per UPS

BB4US Battery Cabinet
FERRUS SP 6–10 kVA

A steel cabinet 9.84 in wide on four casters, delivered empty or with 32, 64 or 80 blocks of 12 V 9 Ah already wired in strings of 16 on the 192 V DC bus of the FERRUS SP.



The BB4US cabinet: ventilated steel front, blocks inside on shelves, on four casters. AEC photo.



The rear

1. Battery MCB
2. DC terminal block, two strings (+ − + −)
3. Ground stud, one at each lower corner
4. Casters

Four ways to order it

Code	Blocks	Strings at 192 V	Weight	Set code
BB4US	empty: blocks to order	up to 5 strings of 16	110 lb	—
BB4US-32X9	32 × 12 V 9 Ah	2 strings of 16	297.2 lb	FERSP6000-16X9 or FERSP10000-16X9 +BB4US-32X9
BB4US-64X9	64 × 12 V 9 Ah	4 strings of 16	484.4 lb	FERSP6000-16X9 or FERSP10000-16X9 +BB4US-64X9
BB4US-80X9	80 × 12 V 9 Ah	5 strings of 16	578 lb	FERSP6000-16X9 or FERSP10000-16X9 +BB4US-80X9

Backup time, one cabinet and the 16 blocks inside the UPS

UPS	Cabinet	Blocks in all	25 % load	50 %	75 %	100 %
FERRUS SP 6 kVA	BB4US-32X9	48	107 min	56 min	31 min	24 min
FERRUS SP 6 kVA	BB4US-64X9	80	202 min	107 min	59 min	45 min
FERRUS SP 6 kVA	BB4US-80X9	96	254 min	135 min	74 min	57 min
FERRUS SP 10 kVA	BB4US-32X9	48	56 min	30 min	17 min	13 min
FERRUS SP 10 kVA	BB4US-64X9	80	107 min	57 min	32 min	24 min
FERRUS SP 10 kVA	BB4US-80X9	96	135 min	72 min	40 min	30 min

9.84 in
wide; 33.54 in deep, 28.54 in high

80
blocks, up to

MCB
battery breaker at the rear

578 lb
BB4US-80X9 with blocks

Accessories Overview
Cards, Kits and Options

Network and relay cards, parallel and rack kits and protection options: fitted in the UPS slots or beside the cabinet, the same family across the range.



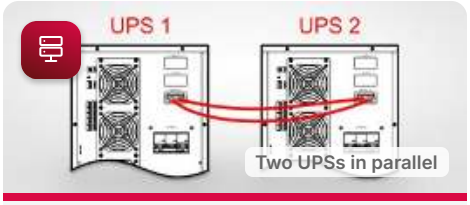
SNMP network cards

Network monitoring from any browser: web pages, SNMP v1/v2c/v3, Modbus TCP/IP, e-mail alarms and MQTT; fitted in the UPS intelligent slot.



Dry-contact card

Potential-free relay outputs in the intelligent slot: mains failure, battery low, UPS fault and bypass, for a BMS or a remote panel.



Parallel kits

Cables and interface that join identical UPSs in parallel, for more power or N+1 redundancy; the number of units depends on the model.



Telescopic rail kit

Telescopic rails for 2- or 4-post 19-inch racks, rated 100 lb, 27.6 in long: the rack UPS slides in and out for service.

Class-C

surge protective device, three-phase

Surge protection

Class-C surge protective device on the UPS input, against transient overvoltage from the grid.



Battery compensation

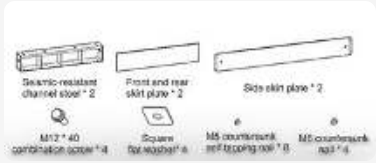
Compensates the battery string voltage on long cable runs between the UPS and an external battery bank.



OPTION

BMS card

Links the UPS to **lithium** battery cabinets: one BMS port, 2 digital inputs, 1 digital output. Available on request.



OPTION

Seismic kit

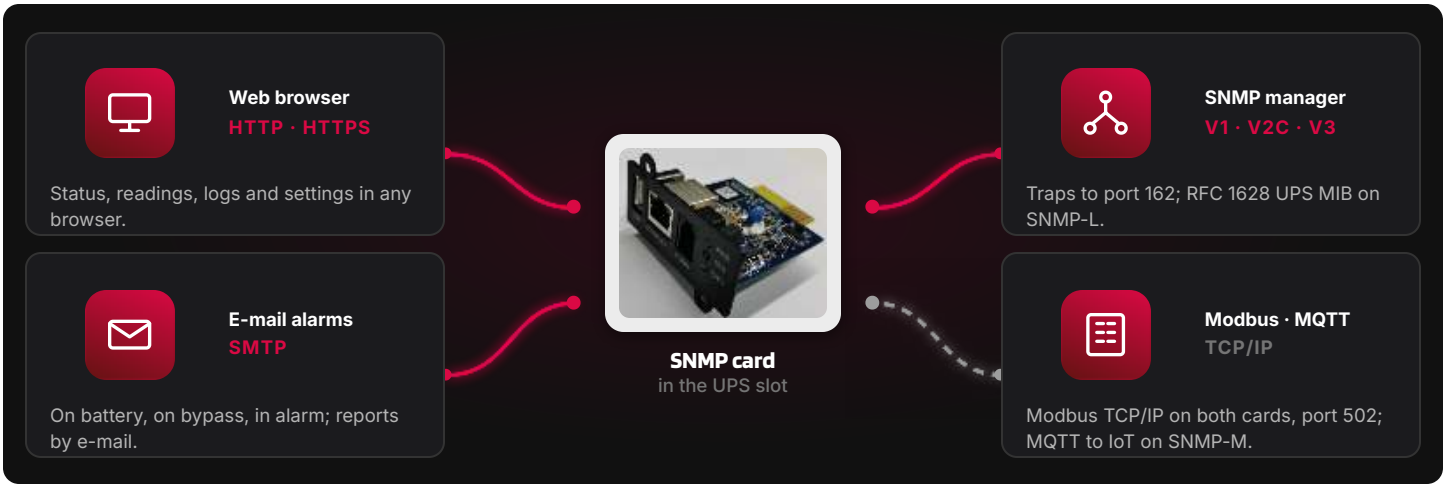
Channel-steel bases, skirt plates and bolts that anchor the cabinet in seismic zones. Available on request.

Sizes and weights

Accessory	W × D × H, in	Weight	Accessory	W × D × H, in	Weight
SNMP network cards	5.1 × 4.3 × 0.8	0.4 lb	Parallel kits	15.7 × 11.8 × 3.9	8.8 lb
Dry-contact card	5.1 × 4.3 × 0.8	0.4 lb	Telescopic rail kit	27.6 × 6.3 × 3.1	13.2 lb

Network Monitoring
SNMP Cards and Dry Contacts

An SNMP card gives the UPS its own web pages and an SNMP agent and sends alarms by e-mail; serial ports, dry contacts and the DRYCNT card bring it into the building management system.



	SNMP-L	SNMP-M
For	LUMINA, ETHERNO, AUREON, INFINITE	FERRUS, FERRUS RT, FERRUS SP, SP RT, RADIANT, RADIANT-IB, CIRRO-IB, CIRRO
Network	Web pages, HTTP or HTTPS (own SSL certificate); SNMP v1, v2c, v3, RFC 1628 MIB; Modbus TCP/IP	Web pages; SNMP v1, v2c, v3, up to ten managers; Modbus TCP/IP and MQTT
Alarms	e-mail, scheduled CSV reports; event, data and system logs	traps and e-mail to up to 20 addresses; SMS and voice with the 4G module
Extras	AEC PC programs: up to 1,000 UPS on one screen, shutdown of Windows servers	temperature, humidity and water-leak sensors; 128 MB of history

Ports and contacts, standard on every series

Series	Ports	Dry contacts	Slots	Network card
LUMINA	USB · EPO	RS485 + dry-contact card	1 intelligent	SNMP-L
FERRUS · FERRUS RT	RS232 · EPO · USB opt.	dry-contact card	1 intelligent	SNMP-M
FERRUS SP · SP RT	RS232 · RS485 · USB	dry-contact card	2 (tower) · 1 (rack)	SNMP-M
ETHERNO · AUREON	RS485	5 outputs, 1 input, EPO	2 intelligent	SNMP-L
RADIANT · -IB · CIRRO-IB	RS232 · RS485 · USB	3 relays + battery trip; inputs, EPO	SNMP + intelligent	SNMP-M
CIRRO	USB · RS232 · RS485 · EPO	standard; DRYCNT for more outputs	not published	SNMP-M
INFINITE	Modbus RTU · RS232 · RS485	3 outputs, 4 inputs, EPO1 · EPO2	SNMP + expansion	SNMP-L · BACnet



SNMP-L web pages: home, 120 V in and out, 60 Hz, battery on float charge.

DRYCNT dry-contact card

Potential-free relays in the intelligent slot of the UPS, for all AEC series: mains failure, battery low, UPS fault, bypass.

- To the building management system, a PLC or the alarm panel.
- INFINITE: 18 output and 13 input functions; relays 30 V DC, 2 A.

Which UPS
for Which Application

Find the supply voltage in the columns and the load in the rows: the cell gives the series that fit, with the page where each begins.

Power	120 V single-phase	120/240 V split-phase	208 V three-phase	480 V three-phase
Up to 3 kVA	**LUMINA** 1–3 kVA · p. 11 **FERRUS** 1–3 kVA · p. 20 **FERRUS RT** 1–3 kVA · p. 28	—	—	—
6–20 kVA	—	**FERRUS SP** 6–20 kVA · p. 36 **FERRUS SP RT** 6–10 kVA · p. 47	**ETHERNO** 10–30 kVA · p. 58 **AUREON** 10–30 kVA · p. 71 **RADIANT** 15–90 kVA · p. 83 **RADIANT-IB** 20–100 kVA · p. 92	—
20–100 kVA	—	—	**ETHERNO** 10–30 kVA · p. 58 **AUREON** 10–30 kVA · p. 71 **RADIANT** 15–90 kVA · p. 83 **RADIANT-IB** 20–100 kVA · p. 92	**CIRRO-IB** 30–150 kVA · p. 102 **CIRRO** 60 kVA–1.6 MVA · p. 112 **INFINITE** 100 kVA–1.2 MVA · p. 123
100–600 kVA	—	—	—	**CIRRO-IB** 30–150 kVA · p. 102 **CIRRO** 60 kVA–1.6 MVA · p. 112 **INFINITE** 100 kVA–1.2 MVA · p. 123
600 kVA–1.6 MVA	—	—	—	**CIRRO** 60 kVA–1.6 MVA · p. 112 **INFINITE** 100 kVA–1.2 MVA · p. 123

1

The supply

120 V single-phase, 120/240 V split-phase, 208 V or 480 V three-phase: the column of the table.

2

The load

In kW and kVA, with room to grow: the row. A modular UPS grows by adding power modules.

3

Where it stands

In a 19-inch rack, as a tower beside the load, or as a floor-standing cabinet in the electrical room.

4

The battery

Lithium (LiFePO4) or VRLA, inside the UPS or in cabinets, sized on the runtime the site needs.

Examples

Application	Load	Supply	Series	Why
Network closet, point of sale, edge rack	1.5 kVA	120 V	LUMINA p. 11 or FERRUS RT p. 28	Lithium inside in 2U, or VRLA in a rack / tower unit
Office, workshop or lab circuit	3 kVA	120 V	FERRUS p. 20	Tower, VRLA inside
Equipment on a 120/240 V panel	10 kVA	120/240 V	FERRUS SP p. 36 or FERRUS SP RT p. 47	Isolation transformer, tower or rack
Server room	20 kVA	208 V	ETHERNO p. 58 or AUREON p. 71	Lithium modules or VRLA, inside the UPS
Growing data room, N+1	60 kVA	208 V	RADIANT p. 83 or RADIANT-IB p. 92	15 or 20 kVA power modules
Plant or building, 480 V	300 kVA	480 V	CIRRO p. 112 or CIRRO-IB p. 102	Power modules, batteries in cabinets or inside
Data center	1 MVA	480 V	INFINITE p. 123 or CIRRO p. 112	100 kVA modules, lithium-ready

Dimensions and Weights
Every Frame at a Glance

Width × depth × height and net weight of each UPS frame, for site planning, floor loads and transport.

Series	Ratings	Form	W × D × H	W × D × H	Net weight
LUMINA	1 kVA	Rack 2U	17.2 × 16.5 × 3.4 in	438 × 420 × 87 mm	20 lb (9 kg)
	1.5 · 2 · 3 kVA	Rack 2U	17.2 × 22.4 × 3.4 in	438 × 570 × 87 mm	30–38 lb (13–17 kg)
	2.2 kVA	Rack 2U	17.2 × 24.2 × 3.4 in	438 × 615 × 87 mm	42 lb (19 kg)
FERRUS	1 kVA	Tower	5.6 × 8.6 × 13.9 in	142 × 218 × 353 mm	16 lb (7 kg)
	2 · 3 kVA	Tower	7.5 × 12.6 × 15.8 in	190 × 319 × 400 mm	36–45 lb (16–21 kg)
FERRUS RT	1 · 1.5 kVA	Rack 19-inch	17.3 × 17.3 × 3.4 in	439 × 439 × 86 mm	42–48 lb (19–22 kg)
	2 kVA	Rack 19-inch	17.3 × 17.8 × 3.4 in	439 × 452 × 86 mm	52 lb (23 kg)
	3 kVA	Rack 19-inch	17.3 × 22.8 × 3.4 in	439 × 579 × 86 mm	62 lb (28 kg)
FERRUS SP	6 · 10 kVA	Tower	9.8 × 23.6 × 29.1 in	249 × 599 × 739 mm	196–236 lb (89–107 kg)
	20 kVA	Tower	13.7 × 25 × 47.2 in	348 × 635 × 1,199 mm	452 lb (205 kg)
FERRUS SP RT	6 kVA	Rack 19-inch	17.3 × 22.8 × 6.7 in	439 × 579 × 170 mm	128 lb (58 kg)
	10 kVA	Rack 19-inch	17.3 × 22.8 × 8.5 in	439 × 579 × 216 mm	143 lb (65 kg)
ETHERNO	10 · 20 · 30 kVA	Tower	12.6 × 39.1 × 49.2 in	320 × 993 × 1,250 mm	216–485 lb (98–220 kg)
AUREON	10 · 20 · 30 kVA	Tower	14.9 × 39.1 × 49.2 in	378 × 993 × 1,250 mm	231–750 lb (105–340 kg)
RADIANT	15–90 kVA	Modular rack	17.4 × 33.1 × 59.5 in	442 × 840 × 1,510 mm	244–432 lb (111–196 kg)
RADIANT-IB	20–100 kVA	Modular	23.6 × 39.3 × 78.7 in	600 × 1,000 × 2,000 mm	2,192–2,400 lb (994–1,089 kg)
CIRRO-IB	30–150 kVA	Modular	23.6 × 39.3 × 78.7 in	600 × 1,000 × 2,000 mm	2,192–2,400 lb (994–1,089 kg)
CIRRO	60–360 kVA	Modular	23.6 × 39.3 × 78.7 in	600 × 1,000 × 2,000 mm	636–1,088 lb (289–494 kg)
	100–800 kVA	Modular	31.5 × 39.4 × 78.7 in	800 × 1,000 × 2,000 mm	996–1,902 lb (452–863 kg)
	900–1,200 kVA	Modular	47.2 × 43.3 × 78.7 in	1,200 × 1,100 × 2,000 mm	2,308–2,619 lb (1,047–1,188 kg)
	1,300–1,600 kVA	Modular	63 × 39.4 × 78.7 in	1,600 × 1,000 × 2,000 mm	3,485–3,796 lb (1,581–1,722 kg)
INFINITE	100 · 200 kVA	Modular	23.6 × 39.4 × 81.4 in	600 × 1,000 × 2,068 mm	452–591 lb (205–268 kg)

REFERENCE

Glossary
UPS Terms in Plain Words

Online double conversion
The input is converted to DC and back to AC all the time: the load always runs on the inverter, clean and steady, with no transfer time to battery.

ECO mode
The load runs on the bypass while the mains is within limits and the inverter takes over at once when it is not; higher efficiency.

Static bypass
An automatic path from the mains to the load when the inverter is overloaded or stops.

Maintenance bypass
A manual switch that feeds the load from the mains so the UPS can be serviced with the load on.

kVA, kW, power factor
kVA is apparent power, kW real power; power factor = kW ÷ kVA. At power factor 1.0, kW = kVA.

Runtime
How long the batteries hold the load after a mains failure, at a given load.

VRLA
Valve-regulated lead-acid: sealed batteries that need no topping up.

LiFePO4 (LFP)
Lithium iron phosphate: a stable lithium chemistry with a long cycle life and a fraction of the weight of lead-acid.

BMS
Battery management system: watches cell voltages and temperatures and protects the lithium battery.

Modular UPS
Power modules in a frame: the UPS grows by adding modules, up to the frame's rating.

Hot-swap
A module is taken out or put in with the UPS running and the load protected.

N+X redundancy
X modules or units more than the load needs: if one stops, the others carry the load.

Parallel
Two or more UPS units sharing one load, for more power or for redundancy.

Split-phase 120/240 V
Two 120 V legs in opposite phase: 120 V from each leg to neutral, 240 V between the legs.

Three-phase 208 V · 480 V
The commercial (208Y/120 V) and industrial (480 V) three-phase supplies.

Isolation transformer
Separates the output from the input galvanically and gives a new neutral to the load.

EPO
Emergency power off: a contact that shuts the UPS output down from a remote button.

Dry contacts
Potential-free relay contacts that signal alarms and states to a building system.

SNMP card
A network card that puts the UPS on the LAN: web pages, e-mail alerts and monitoring software.

RS-485 · Modbus
A serial link and protocol used by building management systems to read the UPS.

Cold start
Starting the UPS from its batteries with no mains present.

Rack unit (U)
1.75 in of height in a 19-inch rack: a 2U UPS is 3.5 in high.

NEMA 5-15R · 5-20R · L5-30R
The 120 V receptacles of 15 A, 20 A and 30 A (twist-lock) on the single-phase units.

UL 1778
The UL standard for the safety of uninterruptible power systems.

IEC 62040-1 · -2 · -3
The IEC standards for UPS: safety, electromagnetic compatibility, and performance and test methods.

UL 1973 · UL 9540A
Batteries for stationary use, and the test method for thermal runaway fire propagation.

UN38.3
The transport tests that lithium batteries must pass to be shipped.

QUESTIONS

Ask an AEC engineer

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AEC
Technology Behind Power

Guaranteeing continuity and reliability since 1968

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