AEC

MODULAR ONLINE UPS · THREE-PHASE 480/277 V

CIRRO 60–1,600 kVA

Quick Installation Guide

From delivery to normal mode, for the CIRRO 360, 600, 800, 1200 and 1600 frames. The installer prepares the site, the frame and the wiring; an engineer approved by AEC commissions the UPS. Qualified electricians only. Read every safety message.



CIRRO 360 | CIRRO 600 | CIRRO 800 | CIRRO 1200 | CIRRO 1600

60 · 100 kVA modules

AEC-QG-CIR-US · REV. A · NOVEMBER 2026

i NOTE **Who does what.** The installer (a qualified electrician) does steps 1 to 6: site, placing, power modules, breakers and cables to the NEC, terminals, battery and control cables — with every breaker open and no power applied. **An engineer approved by AEC commissions the UPS** (steps 7 and 8), and AEC sets up and commissions every parallel system: do not apply power before the AEC engineer is on site. Values marked "ask AEC" are not yet published: get them from AEC before you plan the installation.

1 Safety first

⚠ *DANGER*

Hazardous voltage. The utility inputs and the battery are lethal. The standard battery string is 480 V DC nominal (±240 V with a center tap) and stays live when the UPS is off. Before you move or reconnect any cable, open all input breakers and the battery breaker, wait at least **15 minutes** and check with a multimeter that the terminals are below 36 V.

⚠ *WARNING*

- Only qualified electricians install and wire the UPS. Do not put the UPS into operation until an engineer approved by AEC has commissioned it: otherwise there is a risk to people, the equipment may malfunction and the warranty is void.
- Ground the UPS and size every conductor and breaker according to the National Electrical Code (NFPA 70) and local codes. Connect the protective earth (PE) first. The neutral-to-ground voltage at the UPS input must not exceed 5 V.
- Battery work: remove rings, watches and metal jewelry, wear rubber gloves and eye protection, and use tools with insulated handles. Reversed battery polarity can cause explosion and fire.
- In case of fire, use a dry-chemical (powder) extinguisher only.

2 Check the delivery and the site

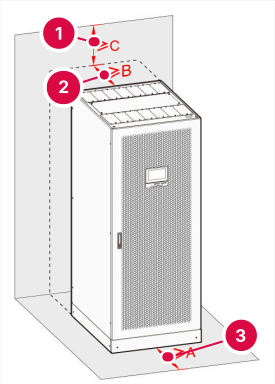
1. While the frame is still on the truck, inspect it and the packing. If damage is apparent, do not install it: file a claim with the carrier and notify AEC.
2. Unpack the frame as close to its final place as possible. Move it with a forklift or pallet truck rated for its weight: from 636 lb for the smallest 360 to 3,796 lb for the full 1600. Insert the forks from the side, or use two forklifts from the front, and keep the frame upright.

3 Check the product label (model, capacity, main parameters) and the contents: the frame with the bypass module and the touchscreen (CIRRO 360 with its breaker, 600 with its four breakers, 800 with its breaker section); the power modules ordered; the user manual and the options ordered.

Frames. CIRRO 360: 6 × 60 kVA modules, 23.6 × 39.4 × 78.7 in, 559 lb (253.6 kg) without modules · CIRRO 600: 6 × 100 kVA, 31.5 × 39.4 × 78.7 in, 893 lb (405.1 kg) · CIRRO 800: 8 × 100 kVA, 31.5 × 39.4 × 78.7 in (55.1 in wide with the breaker section), 1,074 lb (487.2 kg) · CIRRO 1200: 12 × 100 kVA, 47.2 × 43.3 × 78.7 in, 1,376 lb (624.1 kg) · CIRRO 1600: 16 × 100 kVA, 63.0 × 39.4 × 78.7 in, 2,139 lb (970.2 kg).

TABLE 2-1 Site

Item	Requirement
Location	Indoors; cool, dry, clean and ventilated; level concrete or other non-combustible floor, inclination 5° at most, no vibration; away from water, heat, dust, corrosive gases and conductive dust
Temperature · humidity	32–104 °F (0–40 °C), 68–77 °F (20–25 °C) for the battery room · 0–95 % RH, non-condensing
Altitude	Full power up to 3,300 ft (1,000 m)
Cooling air (minimum)	CIRRO 600: 3,676 cfm (6,246 m³/h) · CIRRO 800: 4,202 cfm (7,140 m³/h) · CIRRO 1200: 5,171 cfm (8,785 m³/h)
Floor	Rated for the frame with its modules (100 kVA module 104 lb / 47 kg, 60 kVA module 77 lb / 35 kg), plus the battery
Battery room	Ventilated according to NFPA 70 Article 480 and IEEE 1635



1 C — top
2 B — rear
3 A — front

FIGURE 2-1 Clearances — C top, B rear, A front

TABLE 2-2 Minimum clearances

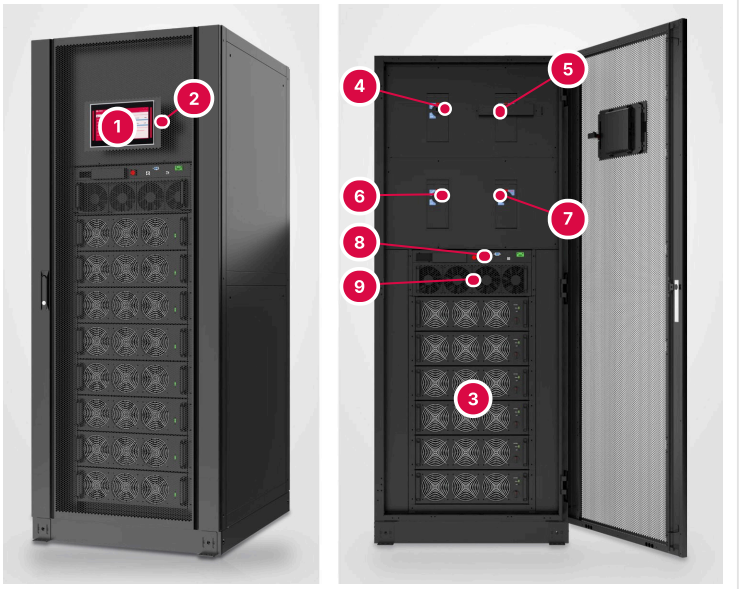
Frame	A — front	B — rear	C — top
CIRRO 600	36 in (914 mm)	31.5 in (800 mm): terminals reached from the rear	19.7 in (500 mm); 25.6 in (650 mm) with the top air outlet kit
CIRRO 800 · 1200	36 in (914 mm)	31.5 in (800 mm)	19.7 in (500 mm)
CIRRO 360 · 1600	36 in (914 mm)	ask AEC	ask AEC

The front value is the NEC 110.26(A) working space (36 in deep, 30 in wide or the width of the equipment, 6.5 ft high); the doors must open fully. Keep the clearances around the whole line-up of frames in parallel and do not block the air inlets and outlets.

3 Place the frame and fit the power modules

> **WARNING**
>
> Lifting equipment must be rated for the weight. Fit the power modules only after the frame is in its final place: they raise the weight and the center of gravity.

1. Mark the anchor holes on the floor with the base of the frame as a template.
2. Drill 0.55 in (14 mm) holes and set M12 expansion anchors (provided by the installer).
3. Take the frame off its pallet, set it over the anchors and bolt it down with the washers and nuts. On a raised floor, set it on a pedestal or channel steel designed for its point loading.
4. Fit the bottom cover plates supplied with the UPS.
5. Remove the slot covers for the number of modules ordered. Insert the modules from the bottom slot upward (slot 1 at the bottom). Use three people or a lift truck: a 100 kVA module weighs 104 lb (47 kg).
6. Push each module in slowly and evenly until it meets the connector, then fully in. Turn its lock knob to lock it (Figure 3-2, item 4) and fit its fixing screws. Leave the empty slots closed with their covers.



1. Touchscreen
2. EPO button
3. Power modules, 100 kVA: six in the 600, eight in the 800
4. Bypass Input breaker
5. Maintenance Bypass breaker, with its locking bar
6. Main Input breaker
7. Output breaker
8. Control strip
9. Bypass module: static switch and its fans

FIGURE 3-1 CIRRO 800 door closed (left) and CIRRO 600 door open (right)



1. Fans (three)
2. Cold Start button
3. Status lamp
4. OFF / lock knob: switches the module off and unlocks it
5. Left handle
6. Right handle

FIGURE 3-2 Front of a 100 kVA power module (CIR-PWR-100)

4 Wire the power

Where the breakers are:

- **CIRRO 600:** the four breakers are in the frame (Figure 3-1, items 4–7). Install the feeder breakers for the main input and the bypass input in the distribution panel.
- **CIRRO 800:** the four breakers (Main Input, Bypass Input, Output, Maintenance Bypass) are in the breaker section beside the cabinet. Install the feeder breakers upstream.
- **CIRRO 1200 and 1600:** provide main input, bypass input, output and maintenance bypass breakers in switchgear by others.
- **CIRRO 360:** one breaker is in the frame. Provide the other switching upstream.

Rules: the UPS is a continuous load — every overcurrent device is at least **125 % of the continuous current** (NEC 215.2, 215.3), rounded up to the next standard rating (NEC 240.6). Use 3-pole breakers; the neutral is not switched. With a split bypass, each input needs its own breaker, fed from sources with the same neutral. Connect no load between the UPS and its breakers, and do not share one breaker between two UPS. No ground-fault (RCD) breakers on the UPS feeds. The ratings hold where the available short-circuit current at the UPS is 65 kA or less. Size the breakers and cables for the full frame if modules will be added.

TABLE 4-1 Breakers for each frame — at least 125 % of the current (main input: maximum input current, recharge included), all AC breakers 3-pole

Frame	Main input	Bypass input	Output	Maintenance bypass	Battery (DC)
CIRRO 360	ask AEC	600 A	600 A	600 A	1,200 A
CIRRO 600	1,000 A	1,000 A	1,000 A	1,000 A	2,000 A
CIRRO 800	1,600 A	1,600 A	1,600 A	1,600 A	2,500 A
CIRRO 1200	2,000 A	2,000 A	2,000 A	2,000 A	4,000 A
CIRRO 1600	3,000 A	2,500 A	2,500 A	2,500 A	5,000 A

On the CIRRO 600 and 800 the output and maintenance bypass breakers are part of the UPS; the values give the rating an external maintenance bypass for a single unit needs.

TABLE 4-2 Minimum copper conductors — 75 °C, NEC Table 310.16

Frame	Main input A, B, C, N	Bypass input and output A, B, C, N	Battery +, (N), –	Equipment grounding (PE)
CIRRO 360	ask AEC	2 × 350 kcmil [2 × 177 mm²]	3 × 600 kcmil [3 × 304 mm²]	ask AEC
CIRRO 600	3 × 400 kcmil [3 × 203 mm²]	3 × 400 kcmil [3 × 203 mm²]	4 × 1,000 kcmil [4 × 507 mm²]	2/0 AWG [67.4 mm²]
CIRRO 800	4 × 600 kcmil [4 × 304 mm²]	4 × 600 kcmil [4 × 304 mm²]	6 × 600 kcmil [6 × 304 mm²]	4/0 AWG [107 mm²]
CIRRO 1200	6 × 400 kcmil [6 × 203 mm²]	6 × 400 kcmil [6 × 203 mm²]	8 × 1,000 kcmil [8 × 507 mm²]	250 kcmil [127 mm²]
CIRRO 1600	8 × 500 kcmil [8 × 253 mm²]	6 × 600 kcmil [6 × 304 mm²]	10 × 1,000 kcmil [10 × 507 mm²]	400 kcmil [203 mm²]

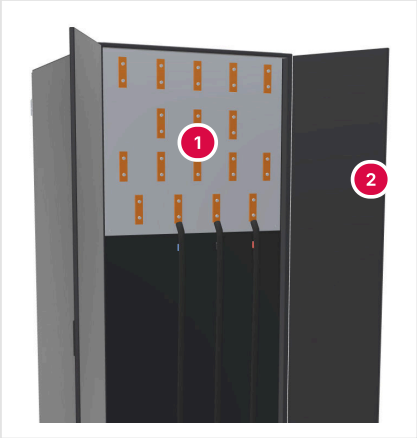
- "3 × 400 kcmil" means three conductors in parallel per phase (or per pole), each set in its own raceway with its own grounding conductor (NEC 310.10(G), 250.122). Copper, up to three current-carrying conductors per raceway, 86 °F (30 °C): correct for other conditions (NEC 310.15); the electrical engineer of record confirms them.
- Keep the voltage drop below 3 % on AC runs and 1 % on the battery run: AC runs below about 100 ft (30 m), battery runs below about 164 ft (50 m), or larger conductors. Size the output neutral 1.5 to 1.7 times the phase conductor for non-linear loads.
- Use flexible copper cable and crimped ring lugs for the bolt size below; with aluminum cable use copper-aluminum transition plates.

TABLE 4-3 Terminals, bolts and cable entry

Frame	Where the terminals are	Bolts · torque	Cable entry
CIRRO 600	Rear, both rear doors open, 53 to 77 in (1,350 to 1,960 mm) above the floor (Figure 4-2)	M12 × 35 · 420 lb-in (47.5 N·m)	Top, through the cable entry plate

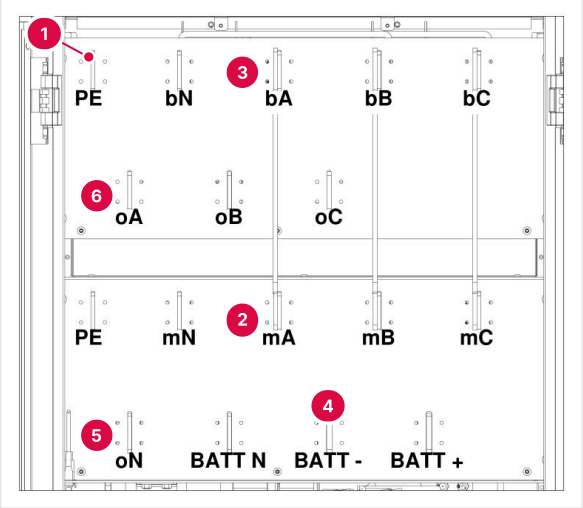
Frame	Where the terminals are	Bolts · torque	Cable entry
CIRRO 800	Under the top cover (Figure 4-3); the breaker section connects to them	M16 × 30 · ask AEC	Top
CIRRO 1200	Under the top cover (Figure 4-4)	M16 × 60 · ask AEC	Top
CIRRO 360 · 1600	ask AEC	ask AEC	ask AEC

Bottom cable entry needs a side wiring cabinet beside the UPS: ask AEC for it.



1. Power terminals
2. Rear doors (two)

FIGURE 4-1 CIRRO 600 rear, both rear doors open (3D render)



1. **PE**, two places: connect first
2. **Main input** mN, mA, mB, mC
3. **Bypass input** bN, bA, bB, bC
4. **Battery** BATT N, BATT –, BATT +
5. **Output neutral** oN
6. **Output** oA, oB, oC

FIGURE 4-2 CIRRO 600 power terminals, rear view with both rear doors open — numbers in wire order (m main input, b bypass input, o output)

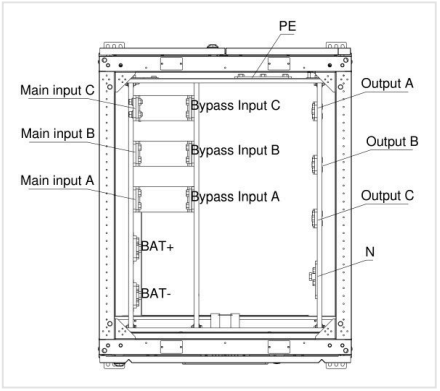


FIGURE 4-3 CIRRO 800 cabinet terminals, named on the drawing — top cover removed, seen from above, front at the bottom

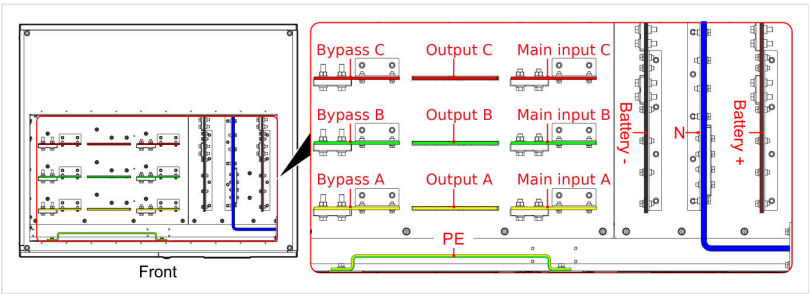


FIGURE 4-4 CIRRO 1200 terminals, named on the drawing — top cover removed, seen from above, front at the bottom (overview left, detail right)

TABLE 4-4 Wire order

Terminal group	Order	Notes
Main input	A (L1) · B (L2) · C (L3) · N	Clockwise phase rotation A-B-C. On the manufacturer's busbars U = A, V = B, W = C.

Terminal group	Order	Notes
Bypass input	A (L1) · B (L2) · C (L3) · N	Same phase rotation and neutral as the main input, or the UPS alarms Bypass Sequence Error. With a single supply, feed both inputs from it.
Output	A (L1) · B (L2) · C (L3) · N	480 V line to line, 277 V line to neutral.
Battery	+ · N · –	+ to the positive end, N to the center tap (BATT N on the 600; the N busbar on the 800 and 1200), – to the negative end. Without a center tap, + and – only.
PE	PE	First on and last off.

1. Open every upstream breaker, every breaker of the UPS and the battery breaker (Figure 7-1, state A). Lock them out and hang warning signs on them.
2. Remove the covers over the terminals: the rear doors and terminal cover on the CIRRO 600, the top cover on the CIRRO 800 and 1200.
3. Pull each cable outside the cabinet to strip and crimp it, so that no strands or insulation fall inside.
4. Connect the protective earth (PE) conductor first.
5. Connect the main input cables, then the bypass input cables. Keep phases A, B, C of each set on the same side of the copper bar.
6. Connect the battery cables (+, N, –) through the external DC breaker; leave the breaker open.
7. Connect the neutrals, then the output cables to the load.
8. Tighten every lug to the torque of Table 4-3, check the phase rotation and the wiring, fix the cables to the entry plate and refit all covers.
9. Seal the cable entry with flame-retardant sealing putty against dust and rodents.

5 Connect the battery

The battery bank is external: VRLA, **40 blocks of 12 V** per string as standard (480 V DC; ±240 V DC with a center tap), settable from 30 to 50 blocks — 30 to 44 on the CIRRO 360. On the 600 to 1600 fewer than 40 blocks derate the output: 36–39 blocks to 90 %, 32–35 to 80 %, 30–31 to 75 %; 40 to 50 blocks run without derating. AEC sizes the battery for the runtime you need. The battery compensation kit BATT-COMP-CIR compensates the string voltage on long cable runs.

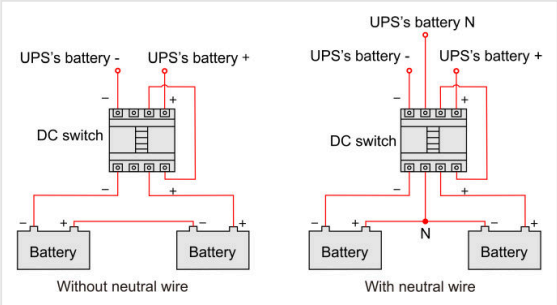


FIGURE 5-1 Battery connection through the external DC breaker: without center tap (left, + and –) and with center tap (right, +, N and –)

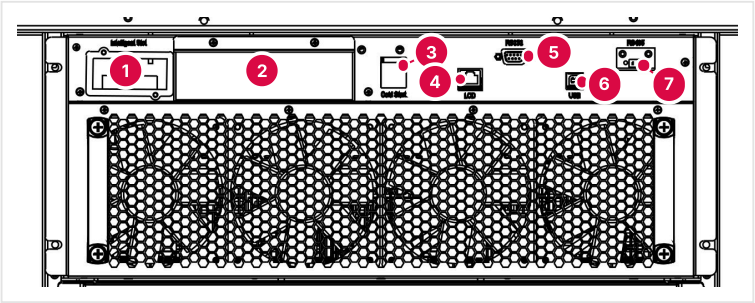
1. Install the battery in a locked cabinet or battery room open only to qualified personnel. Use blocks of the same type, capacity and age throughout; write down the number of blocks and the capacity (Ah) for the AEC engineer.
2. Use a DC breaker rated for the string voltage, with a pole for each conductor (+, N and – where there is a center tap), in or near the battery cabinet.
3. Tighten the block terminals to the battery maker's torque and insulate each terminal once connected.
4. Run the battery cables from the DC breaker to the UPS battery terminals (Figure 5-1); leave the breaker open.
5. Check the polarity of every connection and the string voltage with a voltmeter. Each half of a center-tapped string must read at least 11.5 V per block (230 V for a 40-block string).

6. Wire the auxiliary contact of the battery breaker to a dry-contact input (set on the touchscreen in **Set › Dry Contact**), so that the UPS sees when the breaker is open.
7. Leave the battery breaker **open**: only the AEC engineer closes it.

> ⚠ ***WARNING***
>
> Do not connect any conductor across the positive and negative terminals of a battery. Keep the battery terminals free from cable tension or twist. The number of blocks set on the touchscreen must equal the number installed.

6 Connect the control cables

The control strip sits above the bypass module (Figure 3-1, item 8).



1 Intelligent slot: dry-contact card DRYCNT	4 LCD: cable to the touchscreen (RJ45) — not a network port
2 SNMP slot: SNMP-M network card (behind the cover plate)	5 RS-232 port (DB9)
3 Cold Start button	6 USB port
	7 RS-485 port (terminal)

FIGURE 6-1 Control strip above the bypass module (CIRRO 600)

- **Remote EPO:** wire the remote EPO switch as a normally-closed loop. The EPO and dry-contact terminals are listed on the label inside the frame.
- **Dry contacts** (generator input, battery breaker status and trip, alarm outputs) are set on the touchscreen in **Set › Dry Contact**. The DRYCNT card (item 1) gives more relay outputs.
- **RS-232** (item 5): to a PC with UPS View, or Modbus. Pin 2 TXD, pin 3 RXD, pin 5 GND. **RS-485** (item 7) and **USB** (item 6): Modbus or UPS View. **SNMP-M** card in the SNMP slot (item 2).
- Run the control cables away from the power cables, in shielded cable: two-core 18 AWG (0.75 mm²) for dry contacts, Cat 5e for RJ45 ports.
- **Parallel frames** (up to eight) need the parallel kit PAR-KIT-CIR, parallel cables in a closed ring, the same remote EPO switch and a system maintenance bypass: follow the user manual, section "Parallel system".

7 Start the UPS — with the AEC engineer

> ***NOTICE***
>
> The AEC commissioning engineer performs steps 7 and 8, or directs them on site. Before the engineer arrives, check: frame anchored, modules locked; breakers, conductors and torque as in the tables, PE first; 1200 · 1600 switchgear installed; no short circuit between phases, neutral and PE; neutral-to-ground 5 V or less; phase rotation of both inputs; battery polarity checked, battery breaker open; EPO and cards connected; cable entries sealed; no tools or debris inside.

> **WARNING**
>
> The output terminals become live. If loads are connected, check with their users that it is safe to apply power; otherwise isolate them from the UPS output.

1. Check that all breakers are open (Figure 7-1, state A), that the cables are connected with the correct phase rotation and that every power module is locked in its slot.
2. Close the upstream feeder breakers. Close the **Bypass Input** and **Output** breakers (Figure 7-1, state B).
3. Close the **Main Input** breaker (Figure 7-1, state C). You see: the touchscreen starts; the rectifiers start and, after initialization, the static bypass feeds the load.
4. Open **Log** and check that there is no fault. If there is, stop and call AEC service.
5. Wait: the inverters start by themselves. After about one minute the UPS transfers from bypass to inverter. If they do not start, select **Control › Function › ON/OFF Control**. You see: green indicator; on the home page the energy flow runs from the main input through rectifier and inverter to the output (Figure 8-1, item 2).
6. Close the external battery breaker. A few minutes later the battery starts charging. You see: **Cabinet › Battery** shows the battery connected and charging (Figure 8-2).
7. Measure the output: 480 V ± 2 V line to line, 60 Hz ± 0.1 Hz. Then switch on the loads, the largest first.

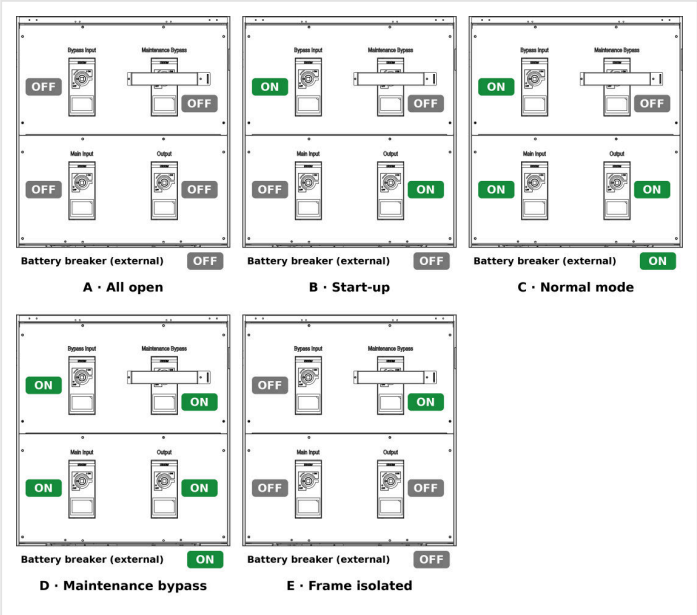


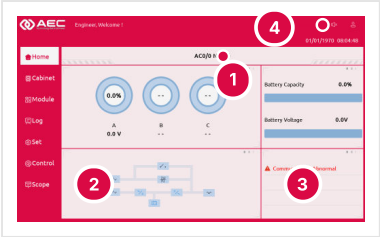
FIGURE 7-1 Breaker states A to E (CIRRO 600 panel) — green ON, gray OFF. CIRRO 800: the breakers of the breaker section; CIRRO 1200 · 1600: the breakers with the same names in the switchgear; CIRRO 360: the frame breaker and the upstream breakers.

8 Set and check

Settings are protected by login (three access levels). The AEC engineer makes the battery settings from the battery maker's values.

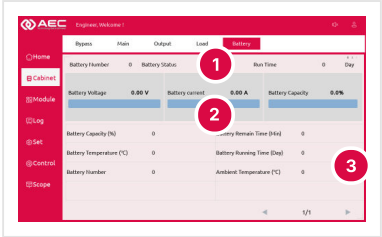
1. **Set › BATT Set**: Battery Number = the blocks per string installed (30 to 50; 30 to 44 on the 360); Battery Capacity (Ah) of the installed battery; the charge and end-of-discharge values.
2. **Set › Dry Contact**: the input that reads the battery breaker auxiliary contact, and any generator input or alarm outputs used.
3. **Set › Sys Set**: System Mode **Single** for one frame (parallel systems: AEC); **Redundant Modules Qty** (N+X), so that the UPS alarms when redundancy is lost.
4. **Set › Sys Func**: system date and time. **Set › Language**: display language.

Checks — the UPS is in normal mode when: the status bars are green and the home page shows no warning (Figure 8-1, item 3); the energy flow runs through rectifier and inverter to the output and the status bar shows the right number of modules (N = ...); **Module** lists every fitted module and **Log** shows no fault; **Cabinet › Battery** shows the battery connected and charging. Recharge takes less than 6 hours: do not rely on the full runtime until **Cabinet › Battery** shows float charge.



1. Status bar: capacity, number of modules (N = ...), single (S) or parallel (P)
2. Energy flow: bypass, maintenance bypass, main input, rectifier, inverter, battery, output
3. Warnings: red = serious alarm, orange = general alarm
4. Speaker icon: mute the alarm

FIGURE 8-1 Home page



1. Battery number per string, status (boost / float), run time
2. Battery voltage, current and capacity, positive and negative half
3. Capacity, remaining time, battery and ambient temperature

FIGURE 8-2 Cabinet — Battery

9 Maintenance bypass and shutdown

From normal mode to maintenance bypass — check first on the touchscreen that the bypass is normal and the inverters are synchronized with it.

1. **Control › Function › Manual Bypass**. Silence the alarm with the speaker icon (Figure 8-1, item 4).
2. Remove the locking bar and close the **Maintenance Bypass** breaker (Figure 7-1, state D). You see: the event Maintenance CB Closed.
3. **Control › Function › Module Button Power Enable**, then turn each power module OFF with its knob (Figure 3-2, item 4).
4. Open the external battery breaker. The power modules can now be serviced.

From maintenance bypass to normal mode

1. Check that the **Bypass Input**, **Main Input** and **Output** breakers are closed (as in Figure 7-1, state D, battery breaker still open) and lock the power modules in their slots.
2. Check on the home page that the static bypass feeds the load, then open the **Maintenance Bypass** breaker and refit its locking bar.
3. If the load stays on bypass, select **Control › Function › Ecs Manual Bypass**. After about 60 s the UPS transfers to inverter.
4. Close the external battery breaker (Figure 7-1, state C).

> ***WARNING***
>
> Open the Maintenance Bypass breaker only while the static bypass feeds the load, or the load drops. The busbars stay live: wait 15 minutes before you remove a module. Whole frame (state E): see the user manual.

Shutting the UPS down completely

1. Shut down or transfer the loads.
2. Press EPO on the front of the UPS (Figure 3-1, item 2): the output stops.
3. Open the external battery breaker.
4. Open the **Bypass Input**, **Main Input** and **Output** breakers (Figure 7-1, state A), and the external breakers (with a split bypass, both input breakers). Wait until the touchscreen is dark.

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Parallel systems, settings, alarms, maintenance and every detail: **CIRRO 60–1,600 kVA User Manual, AEC-UM-CIR-US** (aecups.com · AEC app › Support › Downloads).