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

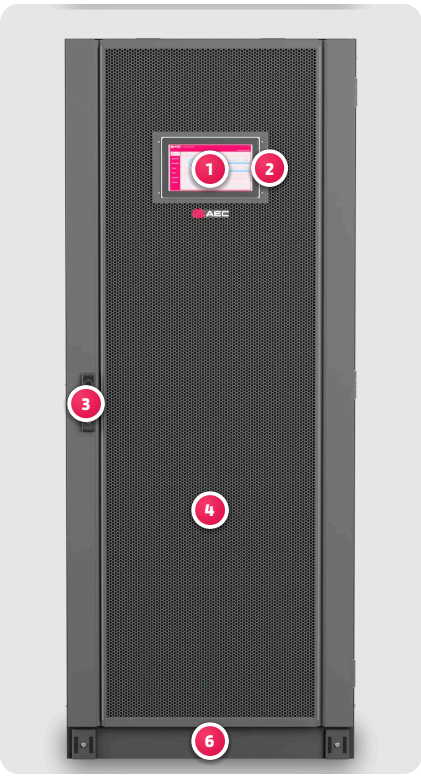
Ratings	60–360 kVA
Power modules	6 slots × 60 kVA, CIR-PWR-60
Breakers in the frame	1
Touchscreen	7-inch
W × D × H, in	23.6 × 39.3 × 78.7
Frame weight	559 lb
Doors	one
Inside, from the top	one breaker, the bypass module, six 60 kVA slots
Battery, external	30–44 blocks, ±180 to ±264 V DC
Charger	80 A, 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)

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

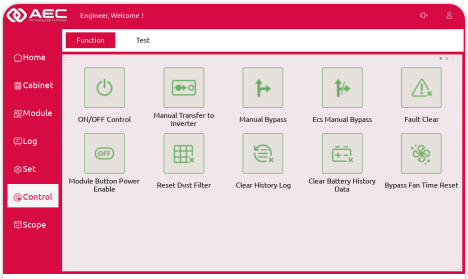
Log
every event with date and time

Set
battery, system, contacts, network, language

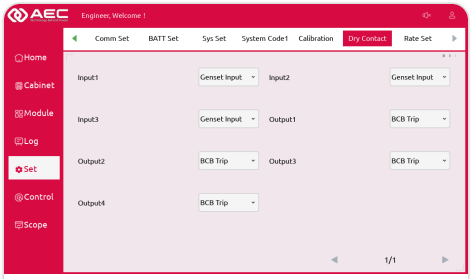
Control
on/off, transfers, tests, resets

Scope
output and bypass waveforms

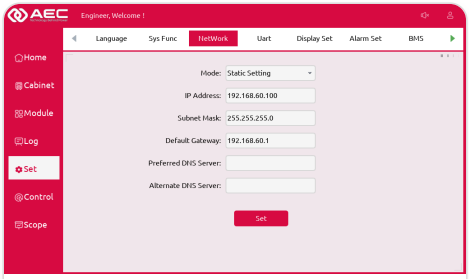
On the screen



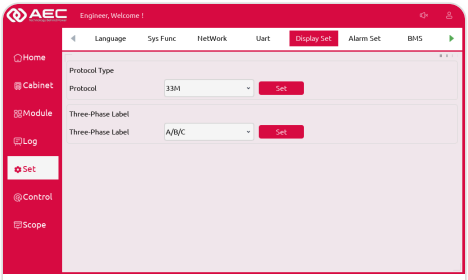
1 Control · Function
On and off, manual transfer to inverter or bypass, fault clear and resets.



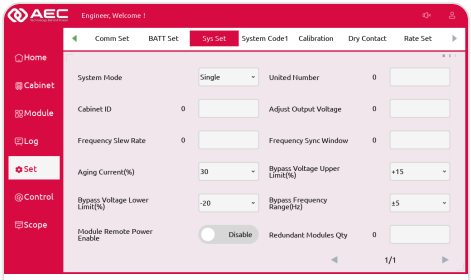
2 Set · Dry contact
Generator input, battery breaker trip and the other relay functions.



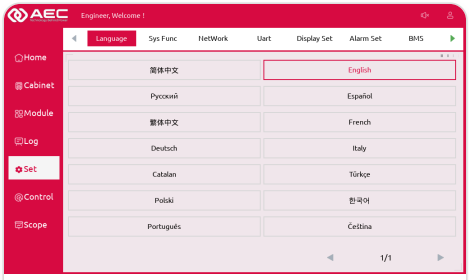
3 Set · Network
IP address, subnet mask, gateway and DNS of the SNMP card.



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.

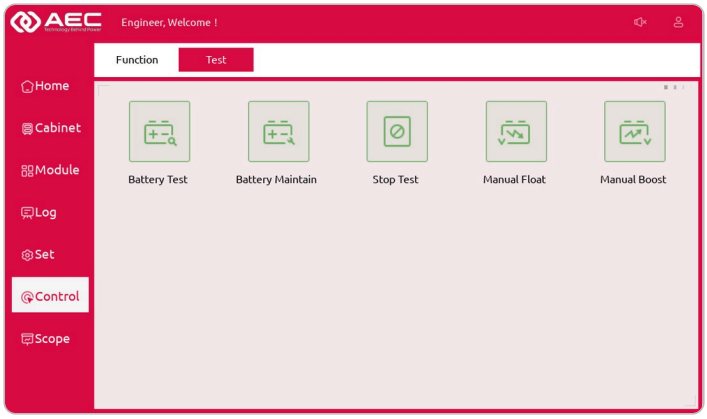
Waveform recording
diagnostics
Inverter, rectifier and control waveforms are recorded periodically.

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).