centiel
continuous power availability

General Information

Cumuluspower™

We are taking
power availability
to the next level ...

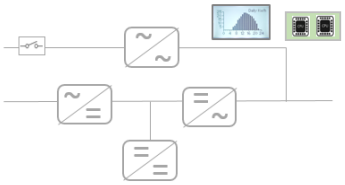
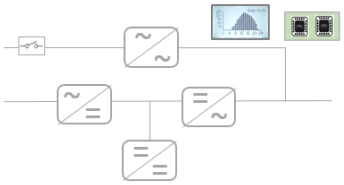
1 Foreword

The advanced Cumuluspower™ technology combines a unique ***Intelligent Module* Technology** (IMT) with a fault-tolerant parallel architecture, called ***Distributed Active-Redundant Architecture*** (DARA), thereby fulfilling the highest availability and reliability requirements.

The Intelligent Modules containing the core technology of the Cumuluspower™ product family come in three sizes (10, 20 and 50 kW). Same power size modules can be piled together to create systems with a power ranging from 10 kVA/kW to 1.5 MVA/MW.

This document provides an overview of Centiel™ products. Moreover, through a general description of the main characteristics of the products, it allows the customer to get to know the three-phase modular UPS systems of the Cumuluspower™ family.

2 Intelligent Module Technology (IMT)

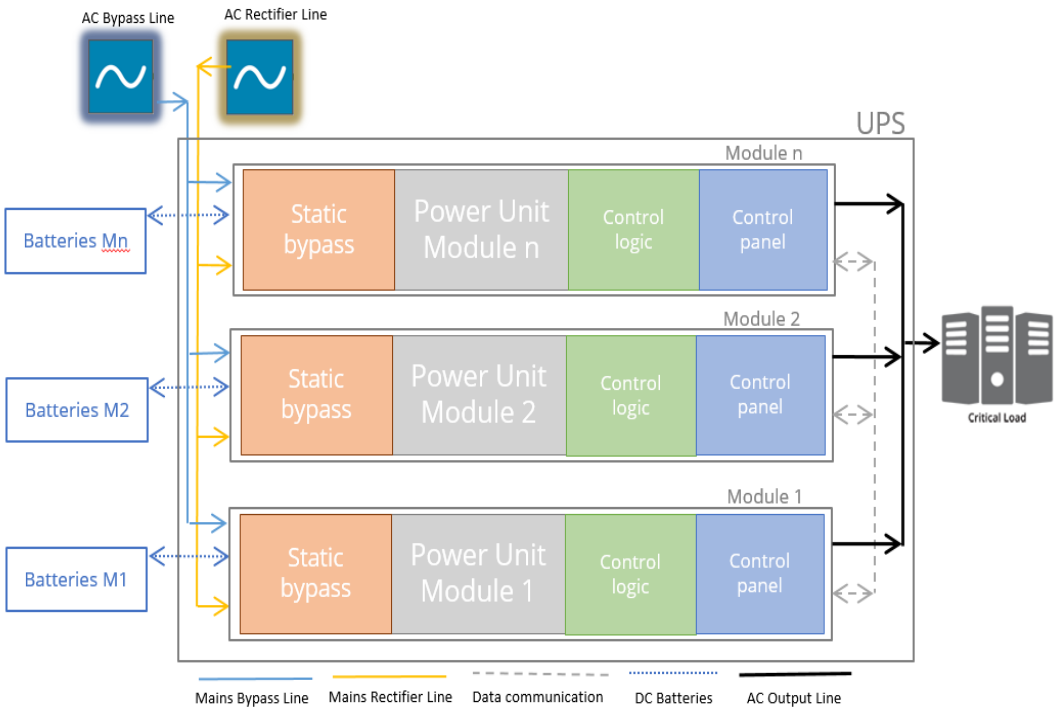
centiel continuous power availability	centiel continuous power availability
20 kVA / 20 kW	50 kVA / 50 kW
	
Block Diagram	Block Diagram
	
Descentraized bypass	**Descentraized bypass**
✓ Every module contains a static bypass ✓ No single point of failure ✓ Bypass redundancy	✓ Every module contains a static bypass ✓ No single point of failure ✓ Bypass redundancy
Independent Smart Battery Booster	**Independent Smart Battery Booster**
✓ **20 A** Battery charging current ✓ Safe battery tests (no need to disconnect Mains supply during battery tests) ✓ **Battery blocks**: 10 kW: **20-50**; 20 kW: **40-50**	✓ **40 A** Battery charging current ✓ Safe battery tests (no need to disconnect Mains supply during battery tests) ✓ Battery blocks: **50 kW**: 40-50
In-Module Back-Feed Protection (Standard)	**In-Module Back-Feed Protection (Standard)**
✓ Reduces system costs ✓ Increases safety for service personnel	✓ Reduces system costs ✓ Increases safety for service personnel
97% Efficiency VFI/ **99.4%** Eco-Mode	**97%** Efficiency VFI / **99.4%** Eco-Mode
✓ Reduces TCO; cost of energy and cooling system downsized ✓ Pay less for every kWh	✓ Reduces TCO; cost of energy and cooling system downsized ✓ Pay less for every kWh
≥ 10 Years of Life for DC Capacitors “Plug-and-Play” AC Capacitors	“Plug-and-Play” DC Capacitors “Plug-and-Play” AC Capacitors
✓ Reduces TCO ✓ Simplifies maintenance operations ✓ Lower cost for spare parts	✓ Reduces TCO ✓ Simplifies maintenance operations ✓ Lower cost for spare parts
Input Current Walk-In for Smooth Rump Up	**Input Current Walk-In for Smooth Rump Up**
✓ No need to oversize the Diesel Generator/distribution components ✓ Reduces system costs	✓ No need to oversize the Diesel Generator/distribution components ✓ Reduces system costs
Redundant Multi-Processor Control Logic	**Redundant Multi-Processor Control Logic**
✓ Increases availability	✓ Increases availability

3” LCD Graphical User Interface	3” LCD Graphical User Interface
✓ Simplifies system configuration and troubleshooting ✓ More comprehensive information	✓ Simplifies system configuration and troubleshooting ✓ More comprehensive information
Actively-Controlled Fan Ventilation	Actively-Controlled Fan Ventilation
✓ Anticipates unexpected malfunctioning ✓ Change only when needed (< TCO)	✓ Anticipates unexpected malfunctioning ✓ Change only when needed (< TCO)

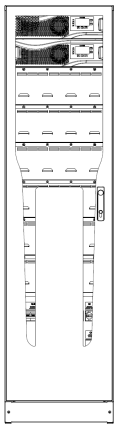
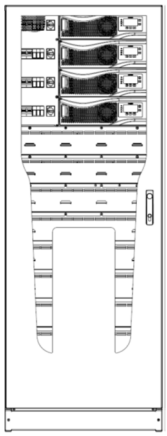
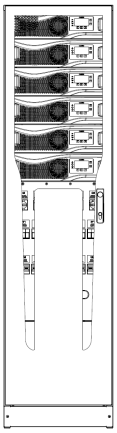
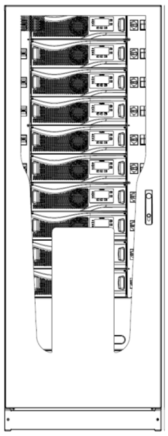
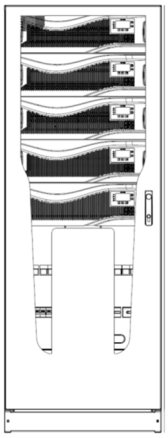
3 Distributed Active-Redundant Architecture (DARA)

The Distributed Active-Redundant Architecture (DARA) of the multi-module UPS systems Cumuluspower™ was designed to respond to the highest availability requirements. This is achieved through the implementation of the “democratic” decision making for the load transfer in the event of a critical failure, and through a correct management of the load sharing to avoid crosscurrents between the modules. The communication between the logic circuits of the modules is accomplished by means of a redundant communication BUS.

DARA Modular Architecture

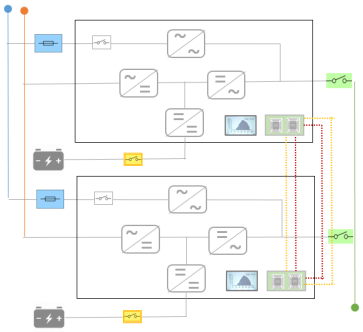


4 Flexible Frames designed for High Availability

Model	CP040-IB	CP080-IB	CP120-EB	CP200-EB	CP250-EB
Max # of Modules	2	4	6	10	5
Module Type	IM10/IM20	IM10/IM20	IM10/IM20	IM10/IM20	IM50
Max Power kVA/kW	40/40	80/80	120/120	200/200	250/250
Internal Batteries***	240	320	-	-	-
Dimensions (WxHxD) mm	510x1,980x 815	730x1,980x 815	510x1,980x 815	730x1,980x 815	730x1,980x845
Weight Empty Frame*	180 kg	225 kg	170 kg	220 kg	209 kg
Weight Frame**	234 kg	333 kg	332 kg	490 kg	485 kg
Color	RAL 7024 Graphite grey				

*w/o Batteries, w/o Modules
**w/o Batteries, with Modules
*** 7/8/9 Ah



Bypass Fuses, In-Frame and Frontal Access

- ✓ Increases availability
- ✓ Reduces MTTR

Per-Module Output Parallel Isolator, In-Frame and Frontal Access

- ✓ Eliminates human error on power upgrades/downgrades
- ✓ Allows for full module test in-hot-frame

Fault-Tolerant Ring Parallel Communication Bus

- ✓ Reduces system costs
- ✓ Increases safety for service personnel

DC Battery Line Protection, In-Frame and Frontal Access

- ✓ Easy access to battery line isolation and protection

Frontal access connections only. No need for rear access.

- ✓ Simplified connection
- ✓ Reduced installation time
- ✓ No cables heating due to hot air
- ✓ Clear DC and AC cable connections

5 Multi-Frame Connection (only for 50 kW modules)

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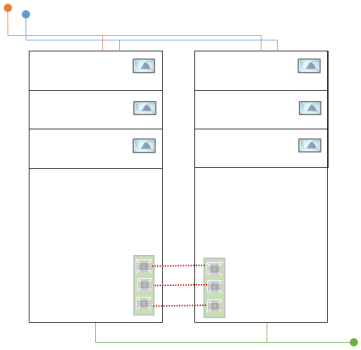


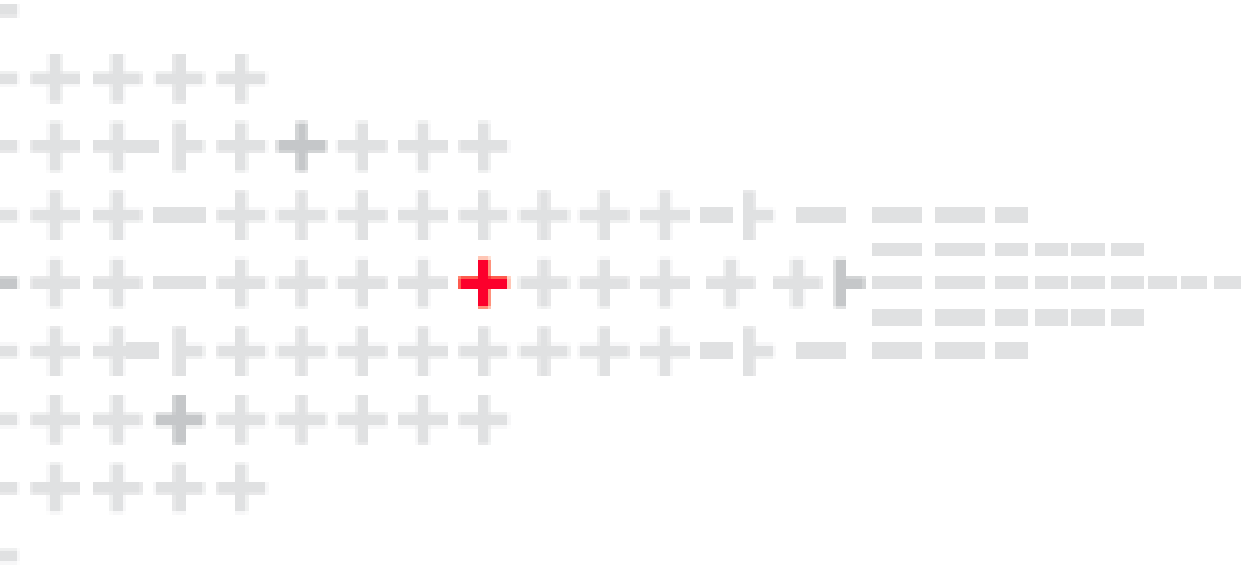
Triple-Mode Parallel Bus

- ✓ Three independent communication lines
- ✓ Three independent communication electronics
- ✓ NO SINGLE POINT OF FAILURE

6 Technical Specifications

Model		CP040-IB	CP080-IB	CP120-EB	CP200-EB	CP250-EB
General Data						
System power range [kVA/kW]		10-200				50-1,500
Nominal power per module [kVA/kW]		10/20				50
Nominal power per frame [kVA/kW]		40	80	120	200	250
Number of modules per cabinet/cabinets		1-2	1-4	1-6	1-10	1-30
Topology/Technology		On-line double conversion / DARA (Distributed Active-Redundant Architecture)				
Input						
Mains	Input Wiring	Three-phase + N + PE				
	Rated Voltage	380/400/415 V (AC)				
	Voltage Tolerance	Load >95% (−20%,+15%); >85% (−27.5%,+15%); ≤75% (−35%,+15%)				
	Input Frequency	40-70 Hz				
	THD	<3% for linear load; <5% for non-linear load				
	Input Power Factor	0.99 (with 100% load)				
Bypass	Input Wiring	Three-phase + N + PE				
	Rated Voltage	380/400/415 V (AC)				
	Input Frequency	50/60 Hz (±2% or ±4%)				
Battery	Rated Voltage	240-600 V (DC) (for 10 kW modules); 480-600 V (DC) (selectable number of batteries)				
	Location	Internal			External	
	Type	Lead-Acid or Ni-Cd				
	Blocks [for LA batt.]	20-50 (for 10 kW modules); 40-50				
	Charger (Amp/module)	20 A				40 A
Output						
Inverter	Output Wiring	Three-phase + N + PE				
	Voltage	380/400/415 V (AC) ±1%				
	Frequency	Tracking the bypass input (Online Mode); 50/60 Hz ±0.1% (Battery Mode)				
	THD	＜2% for linear load; <3% for non-linear load				
	Output Voltage Stability	Static ±1%; Dynamic ±3% (load jump 0-100%)				
	Output Power Factor	Cos φ = 1				
	Efficiency	97% (module) / 96.7% (full cabinet)				
	Overload Capability	Inverter: load <125% continuous; 125% for 10 min; 150% for 1 min				
	Short Circuit Capability	3 x In (>40 ms)				
Bypass	Efficiency	99.1%				
	Overload Capability	Bypass: 135% for long term; <1000% for 100 ms				
	Short Circuit Capability	Depends on the calibre of the bypass fuses, type gG-gl				
Environment						
Operating Temperature		0-40 °C (no power de-rating)				
Storage Temperature		-40-70 °C				
Relative Humidity		0% - 95% (non-condensing)				
Maximum Operating Altitude		1000 m; above 1000 m, de-rating 1% for each additional 100 m				
Audible Noise		<65 dBA				
Others						
Certifications		CE; EN/IEC 62040-1; EN/IEC 62040-2; EN/IEC 62040-3; EN/IEC 62040-4				
Connectivity		***Basic:*** RS485, RS232, Dry Input; ***Pro***: Basic + Dry contacts, Ethernet, Bluetooth				

The information in this document is subject to change without notice and should not be construed as a commitment by Centiel S.A.



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