



centiel

continuous power availability

CumulusPower™

Technical specifications

WI-4-00022-REV15-EN-060324

English Version



www.centiel.com

Table of content

1	Information on this document	4
1.1	Validity	4
1.2	Nomenclature	4
2	CumulusPower™ The Basics.....	4
2.1	General Description	4
2.2	Distributed Active-Redundant Architecture (DARA).....	5
2.3	Intelligent Module Technology (IMT).....	6
2.4	Flexible Frames designed for High Availability	7
3	Futures & Benefits Highlights.....	9
3.1	Intelligent Module Highlights.....	9
3.2	Frames Highlights	10
3.3	Multi-frame Highlights	11
4	Technical Characteristics	12
4.1	Mechanical Dimensions and Installation	12
4.2	Electrical Characteristics	18
4.3	Control Panel.....	25
4.4	Connectivity	27
5	Electrical Installation.....	30
5.1	Single Input Feed	31
5.2	Dual Input Feed.....	34
5.3	Electrical Connection CAB-CP050-I240-A0/CAB-CP050-I080-A1	38
5.4	Electrical Connection CAB-CP100-I320-B0	39
5.5	Electrical Connection CAB-CP100-E-A1	40
5.6	Electrical Connection CAB-CP150-E-A0.....	41
5.7	Electrical Connection CAB-CP251-E-B0.....	42
5.8	Electrical Connection CAB-CP250-E-B0.....	43
5.9	Electrical Connection CAB-CP300-E-B0.....	44
5.10	Electrical Connection CAB-CP300T-E-B0.....	45
5.11	Electrical Connection CAB-CP600-E-L0	46
5.12	Electrical Connection CAB-CP600T-E-L0	47
5.13	Electrical Connection CAB-UR025-E-C0.....	48
5.14	Electrical Connection CAB-UR050-E-C0.....	49
5.15	Electrical Connection CAB-UR100-E-C1.....	50

Legal Provisions

This manual and the information contained in it is the property of Centiel SA. Any partial or complete publication, requires prior written approval by Centiel SA.

Internal reproduction used solely for the purpose of product evaluation or other proper use is allowed and does not require prior approval.

Trademarks

All trademarks are recognized, even if not explicitly identified as such. Missing designations do not mean that a product or brand is not a registered trademark.

The BLUETOOTH® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc.

Modbus® is a registered trademark of Schneider Electric and is licensed by the Modbus Organization, Inc.

Changes and Modifications

Any Technical Specification is subject to change without notice, it is strongly recommended to download the latest version of this document.

Centiel SA

Continuous Power Availability

Via alla Stampa 15

CH6965 Lugano, Switzerland

+41 91 210 36 83

write@centiel.com

www.centiel.com

©2020 Centiel SA. All rights reserved

Changes Revision Table

Revision	Notes
REV01	First English Version Released
REV02	Battery section included
REV03	Introduced Battery charger current Vs Load (4.2.4)
REV04	Correction of picture 50kW module
REV05	IM50/CP080/CP200/CP250 updated.
REV06	CP080 and CP200 Technical data included
REV07	Section 4.2.2 has been corrected
REV08	CP040/80 and CP080-EB Technical data included
REV09	Universal Racks have been included
REV10	Correct Table on chapter 4.1.5
REV11	Chapter 4.2.4 Added thresholds of battery charger and minimum voltage
REV12	Added modules 25kW, 60kW and new cabinets types
REV13	Added cabinets 600kW
REV14	Added modules 50 and 60kW 277/480V

1 Information on this document

This document provides the detailed Technical Specifications for the mechanical, electrical performance and environmental characteristics of the CumulusPower™ on-line 3 phase modular UPS family.

Technical Specifications in this document are designed to provide answers to tender filing and end user requirements.

1.1 Validity

This document is valid for the following device types:

Modules	IM10, IM20, IM25, IM50 & IM50-480V, IM60 & IM60-480V
Standard Frames	CAB-CP050-I240-A0, CAB-CP050-I080-A1, CAB-CP100-I320-B0, CAB-CP100-E-A1, CAB-CP150-E-A0, CAB-CP251-E-B0, CAB-CP250-E-B0, CAB-CP300-E-B0, CAB-CP300T-E-B0, CAB-CP600-E-L0, CAB-CP600T-E-L0
Universal Racks	CAB-UR025-E-C0, CAB-UR050-E-C0, CAB-UR100-E-C1

1.2 Nomenclature

Designation in this document	Complete designation
IM	Intelligent module
UPS	Uninterruptible Power Supply
CB	Circuit Breaker
DARA	Distributed Active-redundant Architecture
UR	Universal Rack

2 CumulusPower™ The Basics

2.1 General Description

CumulusPower™ was born to respond to highest availability requirements i.e. to eliminate risks that may cause computer downtime of business-critical applications.

CumulusPower™ is a new series of modular fault-tolerant 3phase UPS-systems, that thanks to our extensive failure analysis research and insights gathered from 25 years of field experience working with a large number of data centers and other critical environments, our power protection solutions have reached the **highest levels of availability** to reduce downtime risk, avoid costly errors, and increase energy efficiency.

Unlike traditional centralized parallel multi-module systems, 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.

2.2 Distributed Active-Redundant Architecture (DARA)

The Distributed Active-Redundant Architecture of the multi-module UPS-system CumulusPower™ was designed to respond to the highest availability requirements. This is achieved with the implementation of the “democratic” majority load transfer decision-making in an event of a critical failure, and 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.

In an event of a critical failure, every module will decide, by means of its logic circuit, whether the load should remain on the inverter or be transferred to the bypass. The load transfer will be conducted depending on the decision made by the majority of the modules. To avoid crosscurrents between the modules, a master-slave load sharing technique is adopted. The first module is designated to be the master, which provides the load value to be shared by the rest of the modules (slaves). If the master experiences a failure, the next module will automatically become the leading master.

DARA Modular Architecture



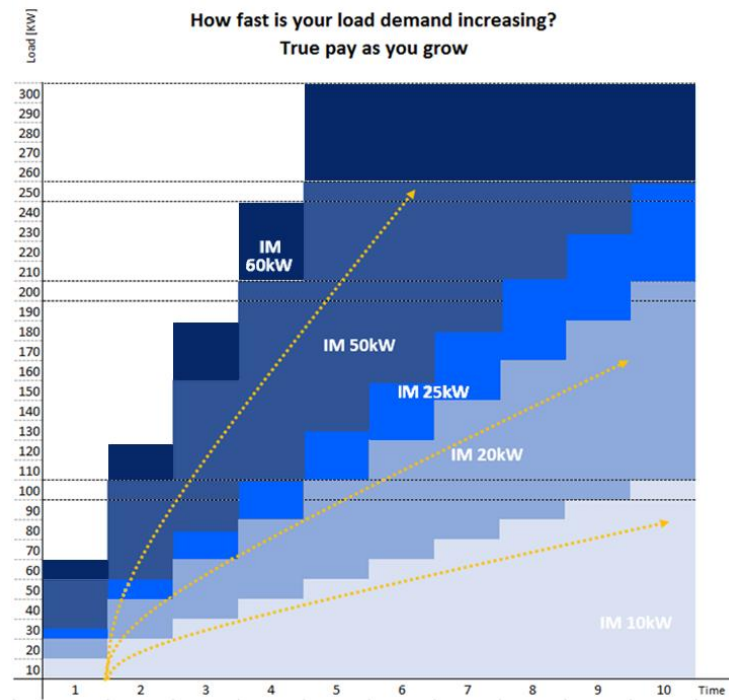
2.3 Intelligent Module Technology (IMT)

Thanks to our long experience in module-design, the CumulusPower™ modules are equipped with all hardware (power circuits) and all software (intelligence and monitoring) functions, which make them fully independent and capable of safely isolating themselves from the multi-module system whenever an internal fault occurs. The rest of the multi-module system will continue to provide protected power to the critical load without interruptions. The integration of all hardware and software in each module allowed us to eliminate all the risky single points of failure that would compromise the entire system and the power to the critical data center.

The core technology of the CumulusPower product family is based in 5 Intelligent Modules sizes that can be piled to create systems from 10kVA/kW to 3.6MW

Furthermore, the modules 50 and 60kW have been designed also for facilities which input, and output voltage includes 277/480V. These modules are technically different than the 380-440V to guarantee the compatibility with the higher grid voltage.

Module	Power
IM10	10kVA/kW
IM20	20kVA/kW
IM25	25kVA/kW
IM50, IM50-480	50kVA/kW
IM60, IM60-480	60kVA/kW



2.4 Flexible Frames designed for High Availability

The CumulusPower™ product family of Intelligent Modules can be piled together to create systems up to 3.6MW. A series of standard frames are offered but not limited to it.



Model	CAB-CP050-I240-A0	CAB-CP100-I320-B0	CAB-CP150-E-A0	CAB-CP251-E-B0
Max Power	50kVA/kW	100kVA/kW	125kVA/kW (n+1)	250kVA/kW
IM	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25
Internal Batteries	240 x 7/8/9 Ah	320 x 7/8/9 Ah	-	-



Model	CAB-CP050-I080-A1	CAB-CP100-E-A1	CAB-UR25-E-C0	CAB-UR50-E-C0	CAB-UR100-E-C1
Max Power	50kVA/kW	100kVA/kW	25kVA/kW	50kVA/kW	100kVA/kW
IM	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25
Internal Batteries	80 x 7/8/9 Ah	-	-	-	-



Model	CAB-CP250-E-B0	CAB-CP300-E-B0	CAB-CP300T-E-B0	CAB-CP600-E-L0
Max Power	250kVA/kW	300kVA/kW	300kVA/kW	600kVA/kW
IM	IM50	IM50/IM60	IM50/IM60	IM50/IM60
Internal Batteries	-	-	-	-

Note: shown pictures are indicative, all the frames can be filled-up to the maximum number of slots.

3 Futures & Benefits Highlights

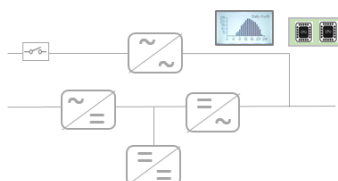
3.1 Intelligent Module Highlights

centiel
continuous power availability

10kVA/10kW 20kVA/20kW 25kVA/25kW



Block diagram



centiel
continuous power availability

50kVA/50kW 60kVA/60kW 50/60kW-480V



Block diagram



Independent Smart Battery Booster

- ✓ **20 A** Battery charging current
- ✓ Safe battery tests (no need to disconnect mains supply during batt test)
- ✓ **Battery blocks:** 10kW: **20-50**
- ✓ 20/25kW: **30-50**

Back-feed protection in-module (standard)

- ✓ Reduces system costs.
- ✓ Increase safety for service personnel

97% efficiency VFI/ 99.4% Eco-mode

- ✓ Reduces TCO. Cost of energy and cooling system downsized.
- ✓ Pay less for every kWh

≥ 10 years DC capacitors life

"Plug-and-play" AC capacitors

- ✓ Reduces TCO
- ✓ Simplifies maintenance operation
- ✓ Lower cost in spare parts

Input current Woke-in smoothed ramp

- ✓ No need to oversize Diesel Generator/distribution components.
- ✓ Reduced system costs

Redundant multi processor control logic

- ✓ Increases availability

Independent Smart Battery Booster

- ✓ **40 A** Battery charging current
- ✓ Safe battery tests (no need to disconnect mains supply during batt test)
- ✓ Battery blocks: **50/60kW:** 30-50

Back-feed protection in-module (standard)

- ✓ Reduces system costs.
- ✓ Increase safety for service personnel

97% efficiency VFI/ 99.4% Eco-mode

- ✓ Reduces TCO. Cost of energy and cooling system downsized.
- ✓ Pay less for every kWh

"Plug-and-play" DC capacitors

"Plug-and-play" AC capacitors

- ✓ Reduces TCO
- ✓ Simplifies maintenance operation
- ✓ Lower cost in spare parts

Input current Woke-in smoothed ramp

- ✓ No need to oversize Diesel Generator/distribution components.
- ✓ Reduced system costs

Redundant multi processor control logic

- ✓ Increases availability

3" User Graphical LCD Interface

- ✓ Simplify system configuration, troubleshooting
- ✓ More comprehensive information

3" User Graphical LCD Interface

- ✓ Simplify system configuration, troubleshooting
- ✓ More comprehensive information

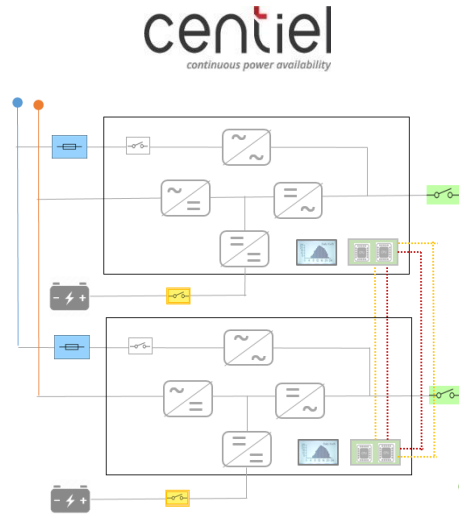
Actively controlled fan ventilation

- ✓ Anticipate unexpected malfunctioning
- ✓ Change only when needed (<TCO)

Actively controlled fan ventilation

- ✓ Anticipate unexpected malfunctioning
- ✓ Change only when needed (<TCO)

3.2 Frames Highlights

**In-frame frontal access bypass fuses.**

- ✓ Increases availability
- ✓ Reduces MTTR

Parallel output isolator per-module, 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.
- ✓ Increase safety for service personnel

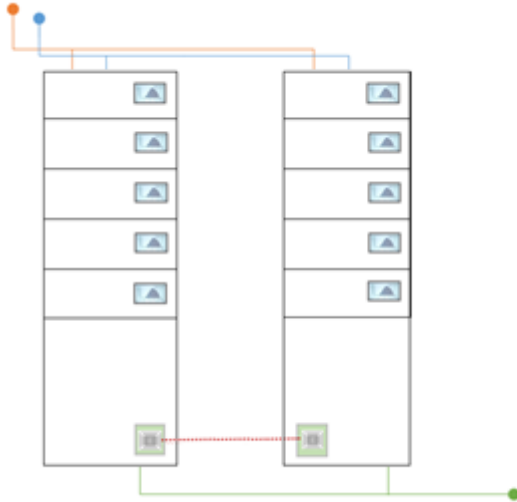
DC Battery line protection In-frame frontal access.

- ✓ Easy access to battery line isolation and protection

3.3 Multi-frame Highlights

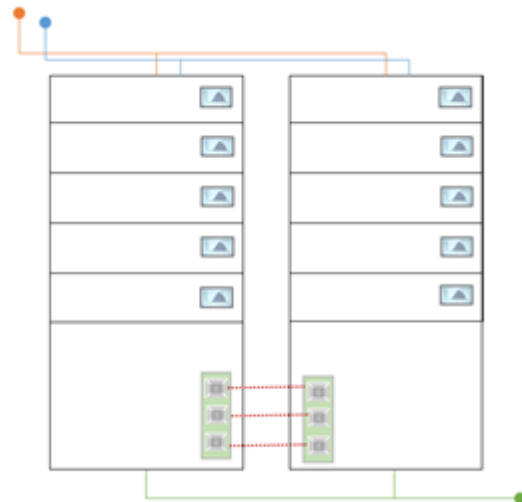


Block diagram



Parallel bus for 10/20/25kW modules frames

- ✓ Allows multi-cabinets parallel communication



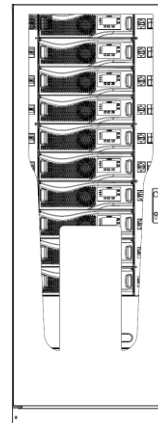
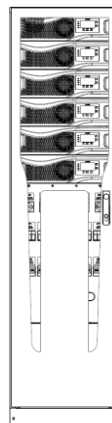
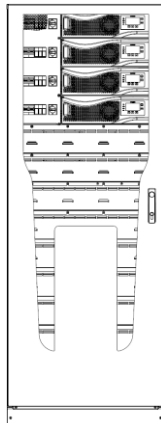
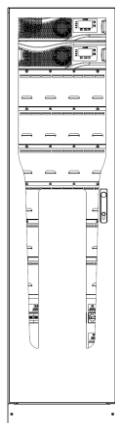
Triple-mode parallel bus (only for CAB-CP250-E-B0, CAB-CP300[T]-E-B0 and CAB-CP600[T]-E-L0)

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

4 Technical Characteristics

4.1 Mechanical Dimensions and Installation

4.1.1 Frames dimensions and weights



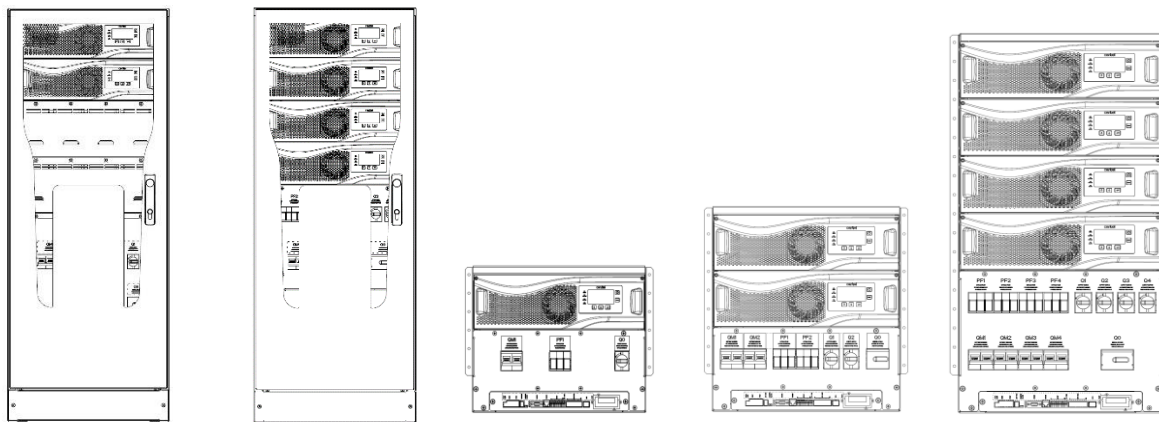
Model	CAB-CP050-I240-A0	CAB-CP100-I320-B0	CAB-CP150-E-A0	CAB-CP251-E-B0
Max # of Modules	2	4	6	10
Module type	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25
Max Power kVA/kW	50/50	100/100	125/125 (n+1)	250/250
Internal batteries***	240	320	-	-
Dimensions (WxHxD) mm	510x1'980x 815	730x1'980x 815	510x1'980x 815	730x1'980x 815
Weight empty frame*	180 kg	225 kg	148 kg	210 kg
Weight frame**	234 kg	333 kg	310 kg	480 kg
Weight full frame****	834 kg	1133 kg	-	-
Color	RAL 7024 Graphite grey			

*w/o Batteries, w/o modules

**w/o Batteries, with modules

*** 7/8/9 Ah

**** with batteries and modules (considering 2.5 kg x 9Ah)



Model	CAB-CP050-I080-A1	CAB-CP100-E-A1	CAB-UR025-E-C0	CAB-UR050-E-C0	CAB-UR100-E-C1
Max # of Modules	2	4	1	2	4
Module type	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25	IM10/IM20/IM25
Max Power kVA/kW	50/50	100/100	25/25	50/50	100/100
Internal batteries***	80	-	-	-	-
Dimensions (WxHxD) mm	510x1'315x815	510x1'315x 815	482x8HUx680	482x11HUx680	482x890(20HU)x680
Weight empty frame*	125 kg	107 kg	25kg	40kg	60kg
Weight frame**	179 kg	215 kg	52kg	94kg	168kg
Weight full frame****	379 kg	-	-	-	-
Color	RAL 7024 Graphite grey		Frontal RAL 9011 OP		

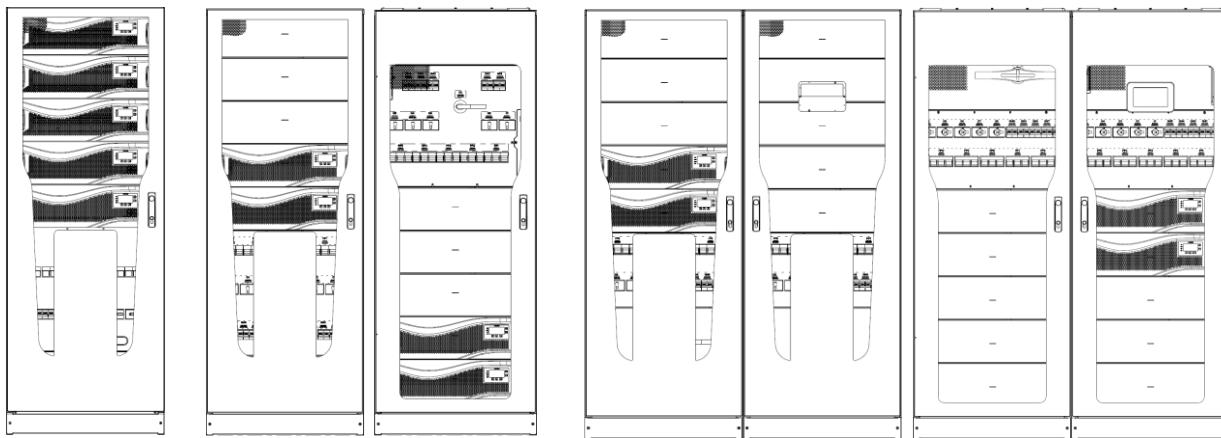
*w/o Batteries, w/o modules

**w/o Batteries, with modules

*** 7/8/9 Ah

**** with batteries and modules (considering 2.5 kg x 9Ah)

Note: shown pictures are indicative, all the frames can be filled-up to the maximum number of slots.



Model	CAB-CP250-E-B0	CAB-CP300(T)-E-B0	CAB-CP600(T)-E-L0
Max # of Modules	5	5	10
Module type	IM50	IM50/60	IM50/60
Max Power kVA/kW	250/250	300/300	600/600
Internal batteries***	-	-	-
Dimensions (WxHxD) mm	730x1'982x845	730x1'982x 845	1462x1'982x 845
Weight empty frame*	209 kg	209 kg	418 kg
Weight frame**	485 kg	485 kg	970 kg
Color	RAL 7024 Graphite grey		

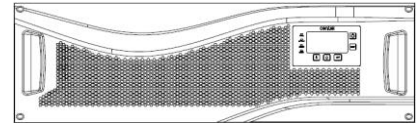
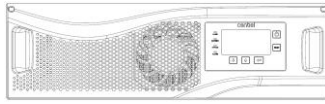
*w/o Batteries, w/o modules

**w/o Batteries, with modules

*** 7/8/9 Ah

Note: shown pictures are indicative, all the frames can be filled-up to the maximum number of slots.

4.1.2 Modules dimensions and weights



Model	IM10	IM20	IM25	IM50 & IM50-480V	IM60 & IM60-480V
Max Power [kW]	10	20	25	50	60
Output Power Factor	1	1	1	1	1
Battery Blocks	From 20 to 50	From 30 to 50	From 40 to 50	From 30 to 50	From 40 to 50
Battery Charger current	20A	20A	20A	40A	40A
Weight [kg]	25	27	27	55.2	55.2
U Height	3U	3U	3U	4.5U	4.5U
Dimensions (WxHxD)	442x132x603	442x132x603	442x132x603	660x197x800	660x197x800
Front panel colour	RAL 9011, matt, thin structure				

4.1.3 Mechanical Footprint

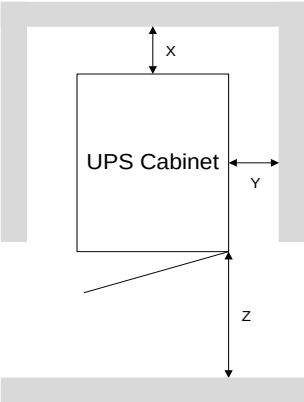
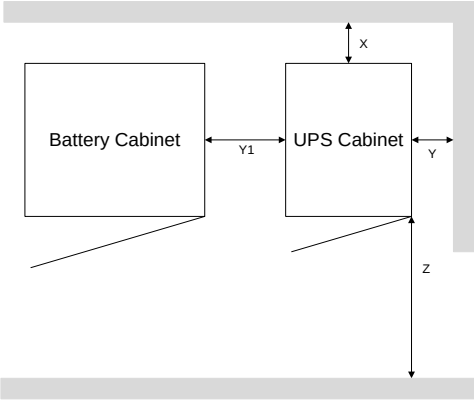
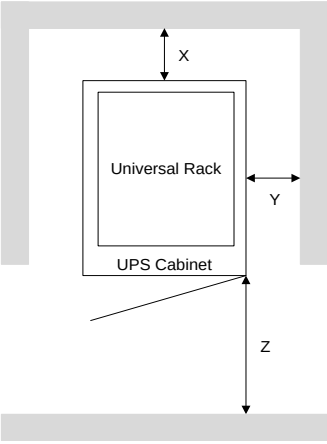
Drawing	Model	X2 (mm)	Z2 (mm)	X3 (mm)	Z3 (mm)
	CAB-CP050-I240-A0	510	770	30	80
	CAB-CP050-I080-A1	510	770	30	80
	CAB-CP150-E-A0	510	770	30	80
	CAB-CP100-E-A1	510	770	30	80
	CAB-CP100-I320-B0	730	770	30	80
	CAB-CP251-E-B0 CAB-CP250-E-B0	730	770	30	80
	CAB-CP300-E-B0 CAB-CP300T-E-B0	730	770	30	80
	CAB-CP600-E-B0 CAB-CP600T-E-B0	1460	770	30	80

4.1.4 Positioning Clearances

The UPS is designed to be located in restricted access areas only.

The position inside the room for CumulusPower™ must take a clearance distance of at least 200mm from the sides and back. If a battery cabinet will be installed, we recommend to keep a distance of at least 600mm between the battery cabinet and the UPS.

This will avoid an increasing of the battery temperature caused by the influence of the warm air ejected by the UPS.

Drawing	X(mm)	Y(mm)	Z(mm)	Y1(mm)
	200	200	900	
	200	200	900	600
	200	200	900 (pay attention on the safety distances)	



4.1.5 Heat dissipation with non-linear load (worst case)

Module Type	IM10	IM20	IM25	IM50 & IM50-480V	IM60 & IM60-480V
Module heat dissipation with 100% <u>non-linear load</u> (according to EN 62040-3) [W]	480	940	1175	2410	2892
Module heat dissipation with 100% <u>non-linear load</u> (EN 62040-3) [BTU]	1640	3210	4012	8230	9876
Module heat dissipation with 100% <u>linear load</u> (according to EN 62040-3) [W]	360	730	912	1870	2244
Module heat dissipation with 100% <u>linear load</u> (EN 62040-3) [BTU]	1230	2490	3112	6380	7656
Air flow with 100% load [m³/h]	240	240	240	390	390

4.2 Electrical Characteristics

4.2.1 General Characteristics

Parameter	
Type	On-line Uninterruptible Power Supply
Technology IEC 62040-3	VFI-SS-111
Module type	Hot-swappable

4.2.2 Input Rectifier Characteristics

	IM10	IM20	IM25	IM50 & IM50-480V	IM60 & IM60-480V
Rectifier bridge	Three-phase IGBT rectifier				
Max. nominal input power @230V Input [kW] and @277V for 480V modules					
With battery charging	11.04	22.08	27.25	54.50	64.84
Without battery charging	10.34	20.68	25.85	51.70	62.04
Rated input voltage [V]	3x380/220V+N, 3x400V/230V+N, 3x415/240V+N				
Rated input voltage for 480V [V]	3 x 277/480V+N				
Input voltage 230/400V	310 – 480V (-22.5% – +20%) load>95%		372 – 576V (-22.5% – +20%) load>95%		
	300 – 480V (-25% – +20%) 95%≥load>90%		360 – 576V (-25% – +20%) 95%≥load>90%		
	290 – 480V (-27.5% – +20%) 90%≥load>85%		348 – 576V (-27.5% – +20%) 90%≥load>85%		
	280 – 480V (-30% – +20%) 85%≥load>80%		336 – 576V (-30% – +20%) 85%≥load>80%		
	270 – 480V (-32.5% – +20%) 80%≥load>75%		324 – 576V (-32.5% – +20%) 80%≥load>75%		
	260 – 480V (-35% – +20%) 75%≥load		312 – 576V (-35% – +20%) 75%≥load		

Rated input current@230V Input and @277V for IM050 & IM060-480V [A]

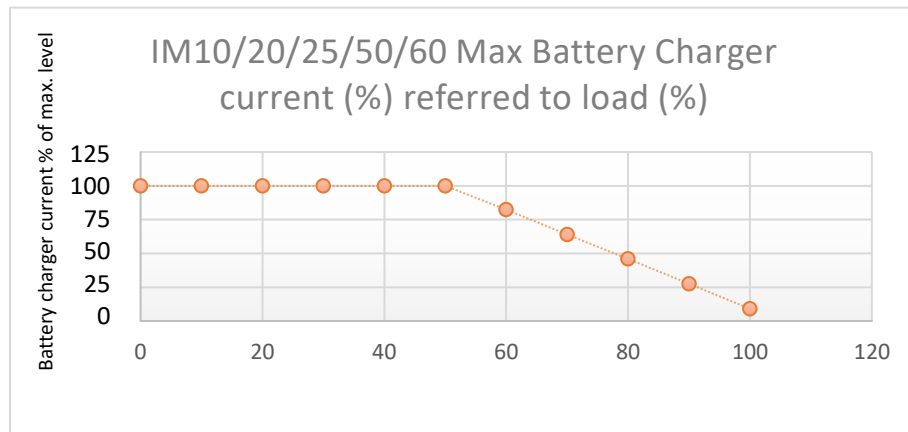
At max. battery charging current	16.00	32.00	39.50	79.00 / 65.5 (480V)	94.00 / 78.0 (480V)
Without battery charging	14.99	29.97	37.4	74.93 / 62.2 (480V)	89.15 / 74.0 (480V)
Rated input frequency [Hz]	30-70				
Transformer	Without transformer				
Input Power Factor	0.994 @ 100% load				
	0.996 @ 75% load				
	0.996 @ 50% load				
	0.975 @ 25% load				
Technical measure for power	Not needed				
Inrush current	< Rated input current (Woke-in, smoothed ramp) Max 1.8 sec with 100% load				
Total Harmonic Distortion (THDI)					
linear loads (n≤40)	≤2% @ 100% load				
	≤2.5% @ 75% load				
	≤3.5% @ 50% load				
nonlinear loads (n≤40)	< 5%				

4.2.3 Input Bypass Characteristics

	IM10	IM20	IM25	IM50 & IM50-480V	IM60 & IM60-480V
Assembly	Static (electronical) bypass, 3 antiparallel thyristor modules				
Type	Decentralized. (Bypass within each module)				
Rated Voltage [V]	380/400/415				
Rated Voltage for IM50/IM60-480V [V]	480				
Rated Frequency [Hz]	50/60				
Overload	1400% for 100 milliseconds; 1000% for 200 milliseconds 300% for 10 minutes				
Changeover Tolerances	±30...±10% (Voltage) (According to VFI-SS-111) ±2% or ±4% (Frequency)				
Short circuit capability	120kA x module				
Changeover time (Inverter -> Bypass)	0 milliseconds				
Changeover time (Bypass -> Inverter)	Typ. <2ms				
Changeover time in Ecomode	Typ. <2.5ms				
Fuse protection	32A	32A	40A	100A	100A
Connection	Separated (independent line) or in common with rectifier input line				

4.2.4 Battery Characteristics

			IM10		IM20		IM25		IM50 & IM50-480V			IM60 & IM60-480V		
Number of battery cells w/o De-rating			36-50		36-50		44-50		36-50			44-50		
Battery Blocks Vs Output power de-rating														
Battery blocks (12V)	20	22	24	26	28	30	32	34	36	38	40	42	44	
IM10 [kW] -De-rating	7	7.3	7.6	7.9	8.3	8.7	9.1	9.6	10	10	10	10	10	
IM20 [kW] -De-rating						17	18	19	20	20	20	20	20	
IM25 [kW] -De-rating										21.2	22.5	23.7	25	
IM50 [kW] -De-rating							47	49	50	50	50	50	50	
IM60 [kW] -De-rating										51	54	57	60	
Charging voltage (lead-acid)				2.275V per cell										
Max. battery charging current per-module				20A				40A						
Nominal battery charging power				10% of UPS nominal power										
Default charging current				C10 (10% battery capacity)										
Float charging voltage				2.23 ... 2.3V per Cell (optional temp. compensation 40°-20°C)										
Adjustable Float charging voltage				2.22 to 2.38V per Cell (no temp. compensation available)										
Discharge under voltage				Automatic adjusted depending on the % of the load										
Adjustable minimum battery voltage				1.55 to 2v per Cell (no load compensation available)										
Min. battery Voltage for autonomy calculation				1.7v per cell										
Voltage tolerance				<1%										
Ripple				free										
Charging characteristic				I – U (DIN 41773)										
Recharging time after full discharge (100% capacity)				12hours										
Recharging time after full discharge (90% capacity)				8hours										
Connection				+ / N / -										
Configuration				Common battery or independent per-module batteries										
Possible internal batteries per frame				See 4.1.1										
Max. AC load batteries				0										
Automatic battery test cycle				Programmable										



Example of battery autonomies for 10kW power:

Autonomy (min)	# Strings	# Blocks/string	Battery Type
7	1	40	7.2Ah
10	1	50	7.2Ah
13	1	50	9Ah
21	2	40	9Ah
30	2	50	9Ah
37	3	40	9Ah
58	1	50	28Ah
110	2	40	28Ah

Example of battery autonomies for 20kW power:

Autonomy (min)	# Strings	# Blocks/string	Battery Type
7	2	40	7.2Ah
10	2	40	9Ah
15	2	50	9Ah
19	3	40	9Ah
22	1	40	28Ah
28	1	50	28Ah
55	2	40	28Ah
60	2	42	28Ah
90	3	44	28Ah

Example of battery autonomies for 50kW power:

Autonomy (min)	# Strings	# Blocks/string	Battery Type
12	2	40	28Ah
16	2	50	28Ah
20	3	40	28Ah
30	3	50	28Ah
35	4	40	28Ah
43	4	50	28Ah

4.2.5 Output Characteristics

	IM10	IM20	IM25	IM50 & IM50-480V	IM60 & IM50-480V
Inverter bridge	Three-phases IGBT Inverter				
Output power @ cosφ1 load [kW]	10	20	25	50	60
Output current @ 400/230V [A]	14.5	29	36	72 / 60 (480V)	87 / 72 (480V)
Output voltage (selectable) [V] For IM50 & IM60-480V	380/220V; 400/230V; 415/240V 480/277V				
Total Harmonic Distortion (THDU)					
Linear load in normal mode (n≤40)	< 1%				
Linear load in battery mode (n≤40)	< 1%				
Non-linear load (n≤40)	≤ 3%				
Output voltage stability					
Static	± 1%				
Dynamic (load jump 0-100%)	≤ 3%				
Output frequency					
Output frequency (selectable) [Hz]	50 or 60				
Selectable synchronization window	+/- 2% or +/- 4%				
Free run frequency stability	0.1%				
Overload capability					
Up to 125%	Continuous				
Up to 120% (for modules 25 and 60kW)					
125% / 150%	10 min / 1 min				
Output short capability (40ms)	3 x In	3 x In	2.4 x In	3 x In	2.4 x In
Admissible unbalanced load	100%				
Displacement angle	0 Deg.				
Crest factor	3:1				

4.2.6 Environmental characteristics

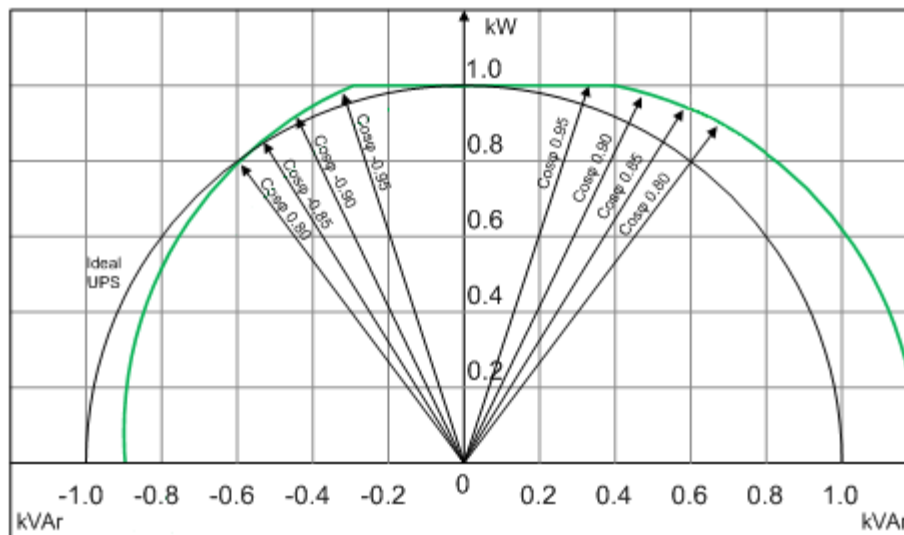
	IM10	IM20	IM25	IM50 & IM50-480V	IM60 & IM60-480V
Power Consumption @0% load (module on inverter)	93 W	118 W	118 W	145 W	145 W
Power Consumption @0% load (module on bypass)	37.7 W	44.6 W	44.6 W	68.4 W	68.4W
Power Consumption module off (only power supply on)	10.2 W	10.2 W	10.2 W	16.5 W	16.5 W
Efficiency AC-AC = DC-AC ($\pm 0.5\%$ tolerance applies)					
25% cosφ 1 load	96.2%	96.4%		96.0%	
50% cosφ 1 load	96.8%	96.8%		96.6%	
60% cosφ 1 load	97%	97%		96.9%	
75% cosφ 1 load	96.8%	96.7%		96.7%	
100% cosφ 1 load	96.4%	96.5%		96.4%	
Cosφ 0.8	Typically, similar as cosφ 1 load				
Non-linear Load (IEC/EN 62040-3)	Typically, less than 1% of cosφ 1 load				
Eco-mode operation	99.4%	99.4%		99.4%	
Audible Noise with 100% Load	<39 dBA	<46 dBA		<65 dBA	
Ambient					
Operation temperature	0 – 40°C				
Recommended operation temperature for UPS with internal batteries	20 – 25°C				
Relative air humidity	10 - 95% (non-condensing)				
Storage temperature without batteries	-25 – 70°C				
Storage temperature with batteries (sealed-acid batteries)	-15 – 40°C				
Batteries storage time (sealed-acid batteries)	6 months				
Operation altitude without de-rating (a.s.l.)	≤ 1000m				
De-rating for altitude above 1000m (a.s.l.)	1% for each 100 m				
Accessibility					
Power cables connection	Front / Bottom				
Connectivity connections	Front / Bottom				
Service	Totally front access				

4.2.7 Standards

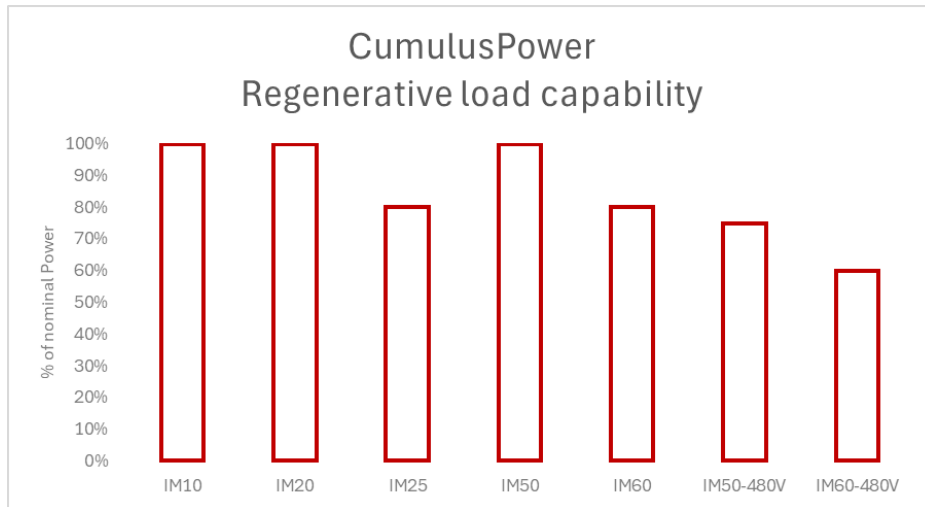
	IM10	IM20	IM25	IM50 & IM50-480V	IM60 & IM60-480V
Safety	EN 60950-1 / EN 62040-1				
EMC	EN 62040-2				
Input and output low frequency disturbances compatibility	EN 61000-2-2				
Low voltage directive	2014/35/EU				
Performance	EN 62040-3				
Product certification	CE / EN 62040-4				
Degree of protection	IP20/IP21				

4.2.8 Output Power Vs Cosφ

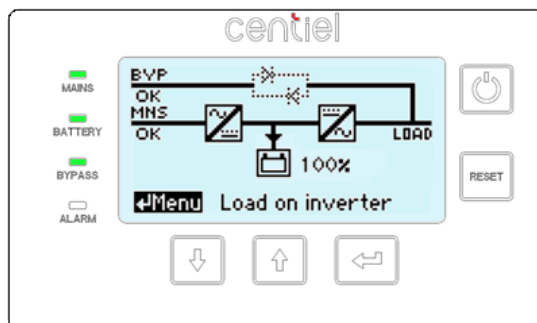
		IM10		IM20		IM25		IM50 & IM50-480V		IM60 & IM60-480V	
	cosφ	kW	kVA	kW	kVA	kW	kVA	kW	kVA	kW	kVA
Cap	0.85	8.5	10	17	20	21.3	25	42.5	50	51	60
	0.90	9	10	18	20	22.5	25	45	50	54	60
	0.95	9.8	10	19.7	20	24.6	25	49.3	50	59.1	60
	1	10	10	20	20	25	25	50	50	60	60
Inductive	0.95	10	10	20	20	25	25	50	50	60	60
	0.90	10	10	20	20	25	25	50	50	60	60
	0.85	10	10	20	20	25	25	50	50	60	60
	0.80	9.8	10	19.6	20	24.5	25	48.3	50	58	60



4.2.9 Regenerative energycapability



4.3 Control Panel



Function	Color	Status	Description
Mains	Green	OFF	Mains Rectifier Out of tolerance or not present
		ON	Mains Rectifier are OK (within tolerances)
Battery	Green	OFF	Batteries Not connected
		ON	Batteries connected
		BLINKING	After warning "BattLow_3Min"
Bypass	Green	OFF	Mains Bypass Out of tolerance or not present
		ON	Mains Bypass are OK (within tolerances)
Alarm	Red	OFF	No alarm is present
		BLINKING	Alarm condition is present
		ON	An alarm is active but the buzzer has been silenced

Button	Description
	Navigate the menus DOWN
	Navigate the menus UP
	Enter
	Turn module ON/OFF
	Allows to silence the buzzer and exit the active menu

4.4 Connectivity

4.4.1 Customer interface

Each UPS cabinet is equipped with a Customer Interface (PC0110) which allows to monitor the condition of the system with different communication devices (see table below).

The interface provides inputs and outputs dry-port contacts with spring terminal blocks for cable size from 0.2 to 1.0 mm² allowing maximum 30W(VA) switching power by rated voltage and current of 125VAC/60VDC/1A.

For detailed connection, please refer to CumulusPower™ User & Operation Manual

Function	Signal	I/O	Connector	Pro (PC110)
Battery Temperature probe	PT100	IN	Spring type	✓
Voltage source 12V (200mA)	12V	OUT	Spring type	✓
Emergency Power Off	EPO	IN	Spring type	✓
Generator Operation Input	GEN OP	IN	Spring type	✓
Programmable Dry Input	CUST IN1	IN	Spring type	✓
Options Slot	SNMP	I/O	Slot	✓
Ethernet (Remote Monitoring)	Remote Monitoring	I/O	RJ45	✗
RS232 channel	RS232	I/O	DB9	✓
AUX1 (Ext Bypass)	AUX1	IN	Spring type	✓
AUX2 (Ext Output Switch)	AUX2	IN	Spring type	✓
Bluetooth	BTLE	I/O		✓
RS485 channel	DISPLAY	I/O	Spring type	✓
Multidrop	Mdrop	I/O	Spring type	✓
R bus terminator (RS485)	Rclose(RS485)	IN	Dip SW	✓
Master/Slave configuration	M/Slave	IN	Dip SW	✓
Programmable Dry output	RL1	OUT	Spring type	✓
Programmable Dry output	RL2	OUT	Spring type	✓
Programmable Dry output	RL3	OUT	Spring type	✓
Programmable Dry output	RL4	OUT	Spring type	✓
Programmable Dry output	RL5	OUT	Spring type	✓

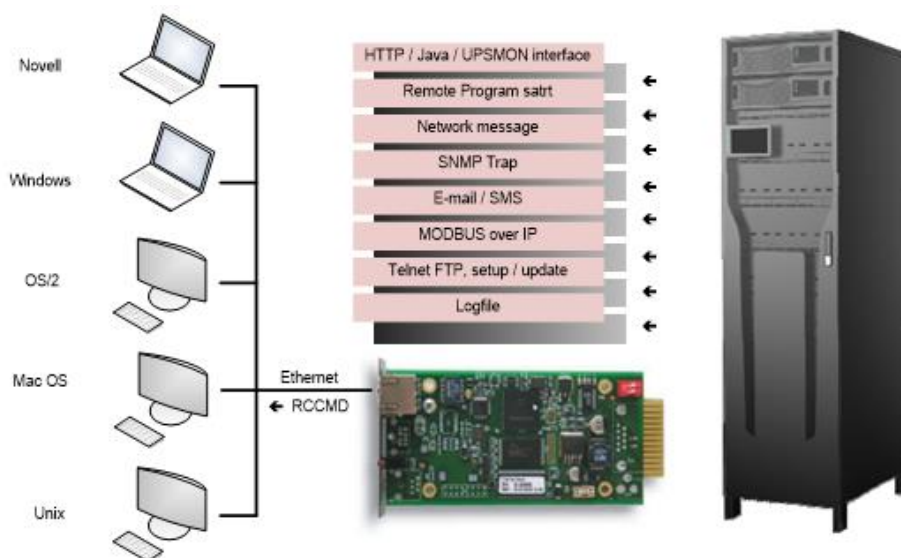
4.4.2 SNMP

The Simple Network Management Protocol (SNMP) is a typical worldwide standardized communication protocol and is used to monitor the status of the UPS in the network via simple control language. The SNMP adapter can act as interface for environmental monitor of devices installed in the UPS room as doors open, ambient temperature, emergency systems controls and so on (PRO version). Typically, is also used as Remote Console Command Module (RCCMD) for a multi-server shutdown.

The UPS is equipped with a slot allowing an easy installation of the SNMP card which may be configured via serial connection, Telnet or HTTP (Web Browser). The SNMP adapter can manage the full parallel system; each single module can be monitored or the whole system as a stand-alone UPS.

Three types of SNMP adapters are available:

- SNMP Adapter Budget



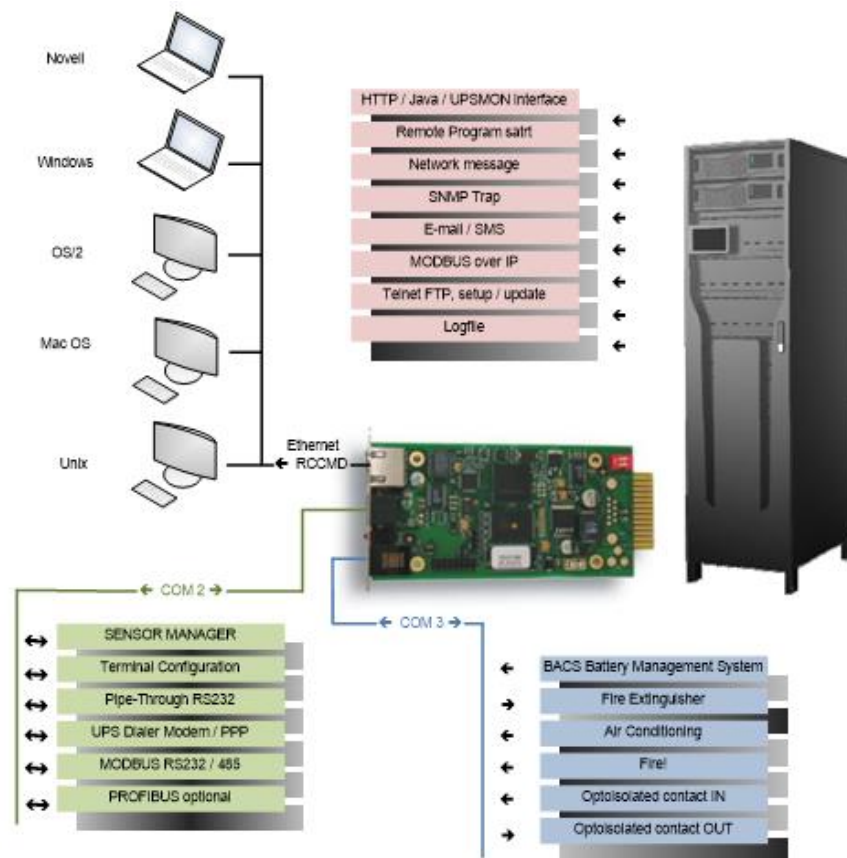
- CS141 PROFESSIONAL
- CS141 Professional with ModBus RS 485 and I/O options



CS141 Basic order code 00-00015

Notice!

CS141 BDG does not support environmental and external sensors.



CS141 Professional order code 00-00014



CS141 Professional with MODBUS order code 00-00016

5 Electrical Installation

The input, output and battery wires must be provided by the customer and the connection must be performed only by authorized electrician or by qualified technical personnel.

The commissioning can be performed only by authorized engineer. For more details please refer to the CumulusPower™ User & Operation Manual.

Following the terminal connection overview:

UPS cabinet	Input Rect.	Input Bypass	Output	Neutral	Common Battery	Earth (PE)
CAB-CP050-I240-A0 CAB-CP050-I080-A1 (Tool-free lever)	3x16mm ² without ferrule	3x16mm ² without ferrule	3x16mm ² without ferrule	3x16mm ² without ferrule	Only internal link on battery CB	3x16mm ² without ferrule
CAB-CP100-I320-B0	3x50mm ² without ferrule	3x50mm ² without ferrule	3x50mm ² without ferrule	3x50mm ² without ferrule	Only internal link on battery CB	3x50mm ² without ferrule
CAB-CP100-E-A1	3x50mm ² without ferrule	3x50mm ² without ferrule	3x50mm ² without ferrule	5xM8	2 x M8	3x50mm ² without ferrule
CAB-CP150-E-A0 (125kW distribution)	3x70mm ² without ferrule	3x70mm ² without ferrule	3x70mm ² without ferrule	5xM8	2 x (2xM8)	3x70mm ² without ferrule
CAB-CP250-E-B0	3xM10	3xM10	3xM10	5xM10	2 x (3xM10)	4xM10
CAB-CP300(T)-E-B0	3xM10	3xM10	3xM10	3xM10	2 x (2xM10)	3xM10
CAB-CP600(T)-E-L0	9xM12	9xM12	9xM12	9xM12	2 x (2xM10)	8xM12
UPS cabinet	Input Rect.	Input Bypass	Output	Neutral	Separate Battery	Earth (PE)
CAB-CP050-I240-A0 CAB-CP050-I080-A1 (Tool-free lever)	3x16mm ² without ferrule	3x16mm ² without ferrule	3x16mm ² without ferrule	3x16mm ² without ferrule	Remove internal link on battery CB	3x16mm ² without ferrule
CAB-CP100-I320-B0	3x50mm ² without ferrule	3x50mm ² without ferrule	3x50mm ² without ferrule	3x50mm ² without ferrule	Only internal link on battery CB	3x50mm ² without ferrule
CAB-CP100-E-A1	3x50mm ² without ferrule	3x50mm ² without ferrule	3x50mm ² without ferrule	5xM8 + 6xM6	2x (4x10 mm ²)	3x50mm ² without ferrule
CAB-CP150-E-A0 (125kW distribution)	3x70mm ² without ferrule	3x70mm ² without ferrule	3x70mm ² without ferrule	5xM8 + 6xM6	2x (6x10 mm ²)	3x70mm ² without ferrule
CAB-CP250-E-B0	3xM10	3xM10	3xM10	5xM10 + 10xM5	2 x (10x10mm ²)	4xM10
CAB-CP300(T)-E-B0	3xM10	3xM10	3xM10	3xM10+ 5 x M5	2x5x50mm ²	3xM10
CAB-CP600(T)-E-L0	9xM12	9xM12	9xM12	9xM12	2x10x50mm ²	8xM12

UPS cabinet	Input Rect.	Input Bypass	Output	Neutral	Common Battery	Earth (PE)
CAB-UR025-E-C0	3x10mm ²	3x10mm ²	3x10mm ²	3x10mm ²	NA	3x10mm ²
CAB-UR050-E-C0	3x16mm ²	3x16mm ²	3x16mm ²	3x16mm ²	2x(3x16mm ²)	3x16mm ²
CAB-UR100-E-C1	3x50mm ² Without ferrule	3x50mm ² Without ferrule	3x50mm ² Without ferrule	4xM8	M8	3x50mm ² Without ferrule
UPS cabinet	Input Rect.	Input Bypass	Output	Neutral	Separate Battery	Earth (PE)
CAB-UR025-E-C0	3x10mm ²	3x10mm ²	3x10mm ²	3x10mm ²	3x10mm ²	3x10mm ²
CAB-UR050-E-C0	3x16mm ²	3x16mm ²	3x16mm ²	3x16mm ²	2x(3x16mm ²)	3x16mm ²
CAB-UR100-E-C1	3x50mm ² Without ferrule	3x50mm ² Without ferrule	3x50mm ² Without ferrule	3xM8 + 4xM5	4x(2x16mm ²)	3x50mm ² Without ferrule

5.1 Single Input Feed

Single input feed is the most common connection which implies the installation of one group of fuses or circuit breakers (CB) in the input customer's distribution facility since only one grid is available. In case of a mains failure, the only power available will come from the batteries.

Feed	Description	CAB-CP050-I240-A0 CAB-CP050-I080-A1	CAB-CP100-I320-B0
Input voltage 3 x 230/ 400V	Maximum input current with charging batteries	79A	158A
	Input fuses 3 x gl-gG or CB	80A	160A
	Input cables (mm ²) (VDE0298)	5 x 16	5 x 50
Output voltage 3 x 230/ 400V	Nominal output current. In (A)	72.5	145
	Output cables (mm ²) (VDE0298)	5 x 16	5 x 50
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	-	-
	Common battery fuses PV (1000Vdc) or CB	N.A	N.A
	Common battery cables (mm ²)	N.A	N.A
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	N.A	N.A

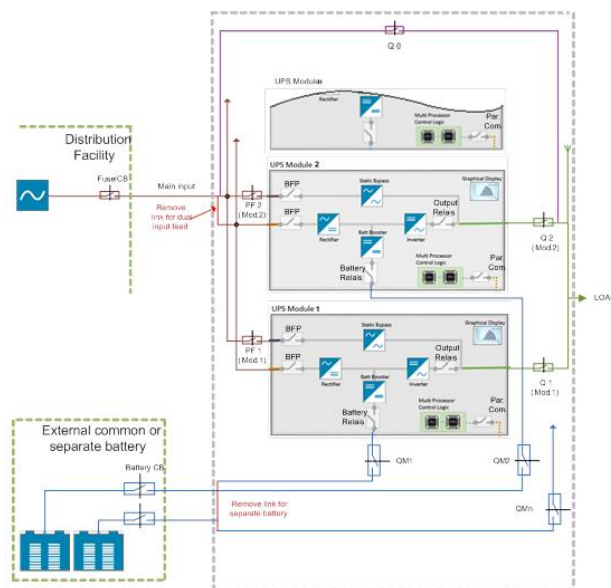
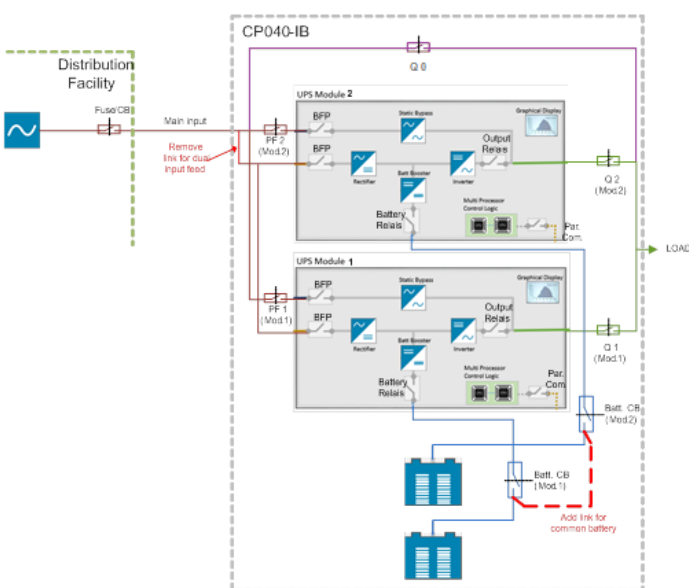
Feed	Description	CAB-CP100-E-A1	CAB-CP150-E-A0	
Input voltage 3 x 230/ 400V	Maximum input current with batteries charging	158A	198A	
	Input fuses 3 x gl-gG or CB	160A	200A	
	Input cables (mm²) (VDE0298)	5 x 50	5 x 70	
Output voltage 3 x 230/400V	Nominal output current. In (A)	145	181	
	Output cables (mm²) (VDE0298)	5 x 50	5 x 70	
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	250	312	
	Common battery fuses PV (1000Vdc) or CB	250	315	
	Common battery cables (mm²)	3 x 120	3 x 150 or 2 x (3x50)	
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	4 x (3x10)	6 x (3x10)	
Feed	Description	CAB-CP250-E-B0	CAB-CP300(T)-E-B0	
Input voltage 3 x 230/ 400V	Maximum input current with charging batteries	396A	470A	
	Input fuses 3 x gl-gG or CB	400A	500A	
	Input cables (mm²) (VDE0298)	5 x 240 or 2 x (5 x 95)	5 x 300 or 2 x (5 x 120)	
Output voltage 3 x 230/ 400V	Nominal output current. In (A)	362	435	
	Output cables (mm²) (VDE0298)	5 x 240 or 2 x (5 x 95)	5 x 300 or 2 x (5 x 120)	
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	625	750	
	Common battery fuses PV (1000Vdc) or CB	630	800	
	Common battery cables (mm²)	2 x (3 x 185) or 3 x (3 x 95)	2 x (3 x 240) or 3 x (3 x 120)	
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	10 x (3x10)	5 x (3 x 50)	
Feed	Description	CAB-UR025-E-C0	CAB-UR050-E-C0	CAB-UR100-E-C1
Input voltage 3 x 230/400V	Maximum input current with charging batteries	39.5A	79A	158A
	Input fuses 3 x gl-gG or CB	40A	80A	160A
	Input cables (mm²) (VDE0298)	5 x 6	5 x 16	5 x 50
Output voltage 3 x 230/ 400V	Nominal output current. In (A)	36	72.5	145
	Output cables (mm²) (VDE0298)	5 x 6	5 x 16	5 x 50
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	-	-	-
	Common battery fuses PV (1000Vdc) or CB	N.A	N.A	N.A
	Common battery cables (mm²)	N.A	N.A	N.A
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	N.A	N.A	N.A

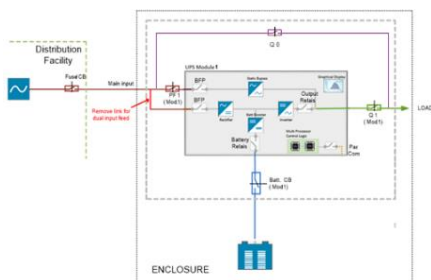
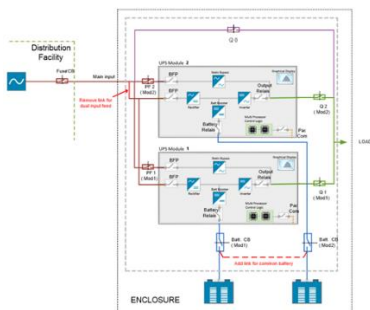
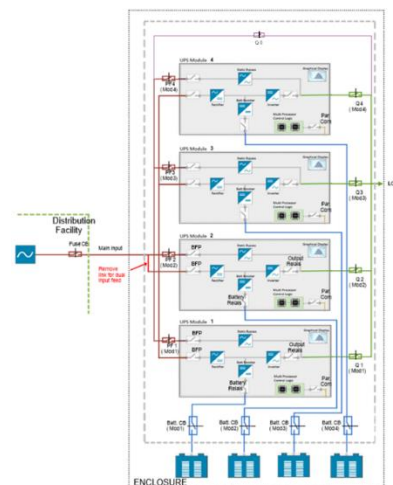
Feed	Description	CAB-CP600(T)-E-L0
Input voltage 3 x 230/ 400V	Maximum input current with charging batteries	940A
	Input fuses 3 x gl-gG or CB	1000A
	Input cables (mm²) (VDE0298)	3 x (5 x 240)
Output voltage 3 x 230/ 400V	Nominal output current. In (A)	870
	Output cables (mm²) (VDE0298)	3 x (5 x 240)
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	1500
	Common battery fuses PV (1000Vdc) or CB	1500
	Common battery cables (mm²)	3 x (3 x 240)
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	10 x (3 x 50)

5.1.1 Connection Line Diagram (Single Input Feed)

CAB-CP050-I240-A0 / CAB-CP100-I320-B0

**CAB-CP150-E-A0 / CAB-CP250-E-B0/
CAB-CP300(T)-E-B0/ CAB-CP600(T)-E-L0**



CAB-UR025-E-C0**CAB-UR050-E-C0****CAB-UR100-E-C1**

5.2 Dual Input Feed

The dual feed connection, with separate protections, is used with the aim of increase the safety in case of battery discharge. It should have two different power supply grids with neutrals connected together.

When rectifier mains fail, the UPS switches over to batteries; as soon the batteries get fully discharged, the load will be transferred to bypass without interruption, and will be continuously supplied by the second grid.

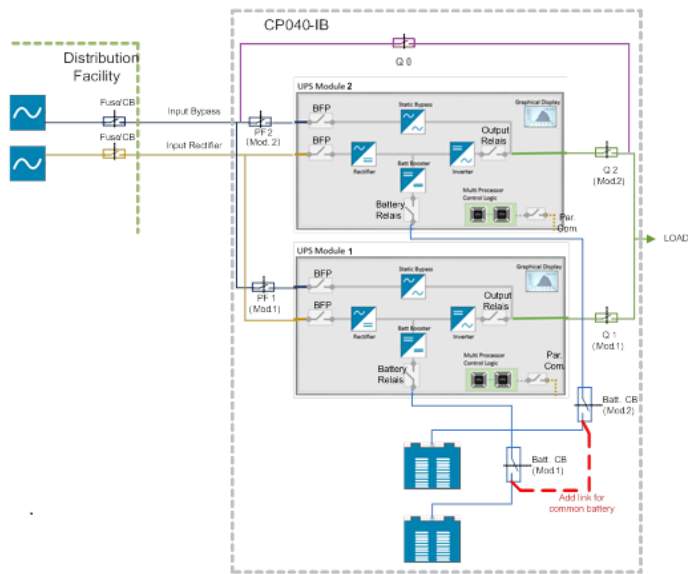
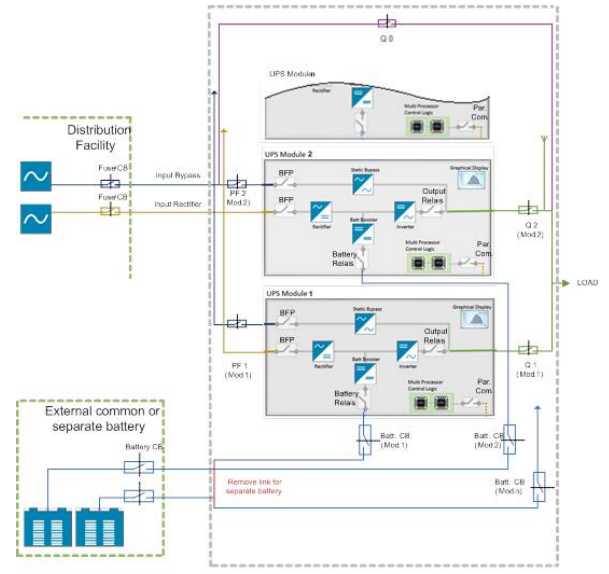
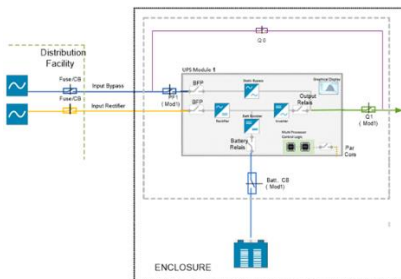
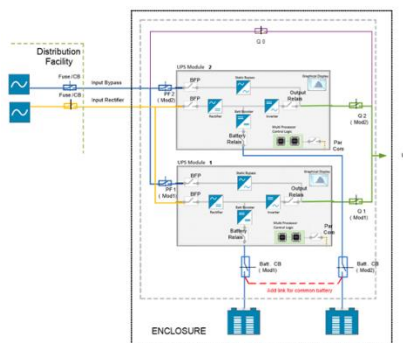
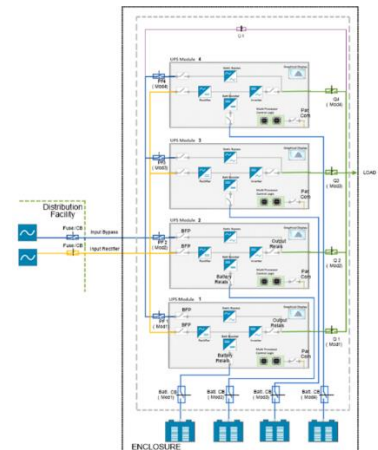
Feed	Description	CAB-CP050-I240-A0 CAB-CP050-I080-A1	CAB-CP100-I320-B0
Input rectifier voltage 3 x 230/400V	Maximum input current with batteries charging	79A	158A
	Input fuses 3 x gl-gG or CB	80A	160A
	Input cables (mm²) (VDE0298)	5 x 16	5 x 50
Input Bypass 3 x 230/400V	Input fuses 3 x gl-gG or CB	80A	160A
	Input cables (mm²) (VDE0298)	5 x 16	5 x 50
Output voltage 3 x 230/400V	Nominal output current. In (A)	72.5	145
	Output cables (mm²) (VDE0298)	5 x 16	5 x 50
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	-	-
	Common battery fuses PV (1000Vdc) or CB	N.A	N.A
	Common battery cables (mm²)	N.A	N.A
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	N.A	N.A

Feed	Description	CAB-CP100-E-A1	CAB-CP150-E-A0
Input rectifier Voltage 3 x 230/400V	Maximum input current with batteries charging	158A	198A
	Input fuses 3 x gl-gG or CB	160A	200A
	Input cables (mm ²) (VDE0298)	5 x 50	5 x 70
Input Bypass 3 x 230/400V	Input fuses 3 x gl-gG or CB	160A	250A
	Input cables (mm ²) (VDE0298)	5 x 50	5 x 70
Output voltage 3 x 230/400V	Nominal output current. In (A)	145	181
	Output cables (mm ²) (VDE0298)	5 x 50	5 x 70
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	250	312
	Common battery fuses PV (1000Vdc) or CB	250	315
	Common battery cables (mm ²)	3 x 120	3x150 or 2 x (3x50)
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	4 x (3 x 10)	6 x (3x10)
Feed	Description	CAB-CP250-E-B0	CAB-CP300(T)-E-B0
Input rectifier voltage 3 x 230/400V	Maximum input current with batteries charging	396A	470A
	Input fuses 3 x gl-gG or CB	400A	500A
	Input cables (mm ²) (VDE0298)	5 x 240 or 2 x (5 x 95)	5 x 300 or 2 x (5 x 120)
Input Bypass 3 x 230/400V	Input fuses 3 x gl-gG or CB	400A	500A
	Input cables (mm ²) (VDE0298)	5 x 240 or 2 x (5 x 95)	5 x 300 or 2 x (5 x 120)
Output voltage 3 x 230/400V	Nominal output current. In (A)	360	435
	Output cables (mm ²) (VDE0298)	5 x 240 or 2 x (5 x 95)	5 x 300 or 2 x (5 x 120)
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	625	750
	Common battery fuses PV (1000Vdc) or CB	630	800
	Common battery cables (mm ²)	2 x (3 x 185) or 3 x (3 x 95)	2 x (3 x 240) or 3 x (3 x 120)
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	10 x (3x10)	5 x (3 x 50)

Feed	Description	CAB-UR025-E-C0	CAB-UR050-E-C0	CAB-UR100-E-C1
Input rectifier voltage 3 x 230/400V	Maximum input current with charging batteries	39.5A	79A	158A
	Input fuses 3 x gl-gG or CB	40A	80A	160A
	Input cables (mm²) (VDE0298)	5 x 6	5 x 16	5 x 50
Input Bypass 3 x 230/400V	Input fuses 3 x gl-gG or CB	40A	80A	160A
	Input cables (mm²) (VDE0298)	5 x 6	5 x 16	5 x 50
Output voltage 3 x 230/400V	Nominal output current. In (A)	36	72.5	145
	Output cables (mm²) (VDE0298)	5 x 6	5 x 16	5 x 50
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	-	-	-
	Common battery fuses PV (1000Vdc) or CB	N.A	N.A	N.A
	Common battery cables (mm²)	N.A	N.A	N.A
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	N.A	N.A	N.A

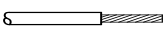
Feed	Description	CAB-CP600(T)-E-L0
Input voltage 3 x 230/400V	Maximum input current with charging batteries	940A
	Input fuses 3 x gl-gG or CB	1000A
	Input cables (mm²) (VDE0298)	3 x (5 x 240)
Input Bypass 3 x 230/400V	Input fuses 3 x gl-gG or CB	1000A
	Input cables (mm²) (VDE0298)	3 x (5 x 240)
Output voltage 3 x 230/400V	Output cables (mm²) (VDE0298)	870
	Output cables (mm²) (VDE0298)	3 x (5 x 240)
Battery	Max battery current for common battery (A @ min voltage with 40 Batt.)	1500
	Common battery fuses PV (1000Vdc) or CB	1500
	Common battery cables (mm²)	3 x (3 x 240)
	Battery cables, separate battery (50A @ min voltage with 40 Batt.)	10 x (3 x 50)

5.2.1 Connection Line Diagram (Dual Input Feed)

CAB-CP050-I240-A0 / CAB-CP100-I320-B0**CAB-CP150-E-A0 / CAB-CP250-E-B0 /
CAB-CP300(T)-E-B0/ CAB-CP600(T)-E-L0****CAB-UR025-E-C0****CAB-UR050-E-C0****CAB-UR100-E-C1**

5.3 Electrical Connection CAB-CP050-I240-A0/CAB-CP050-I080-A1

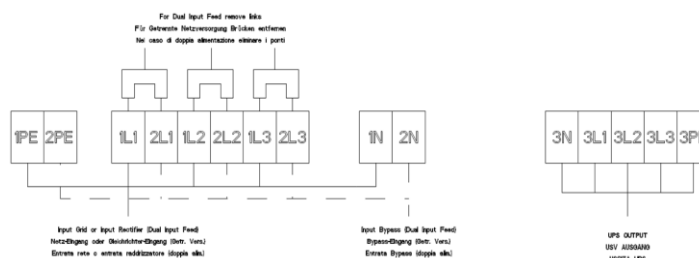
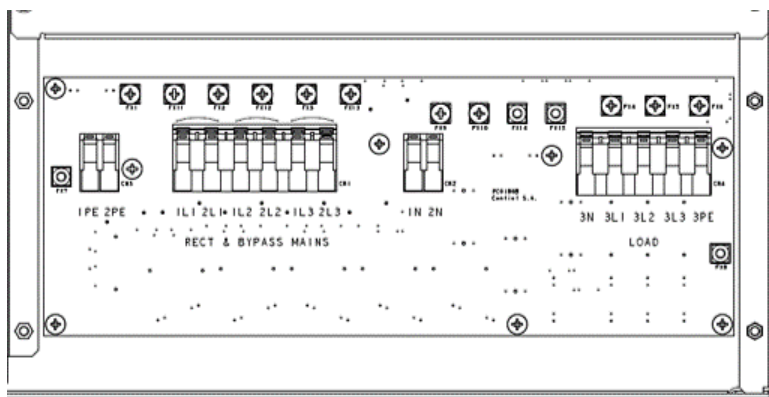
Notice!

Tool-free opening and closing levers for conductor size 16mm² without any ferrule. ( 12 -13 mm / 0.49 in)

Notice!

For dual input feed remove links between 1L1 and 2L1, 1L2 and 2L2, 1L3 and 2L3.

Electrical connection



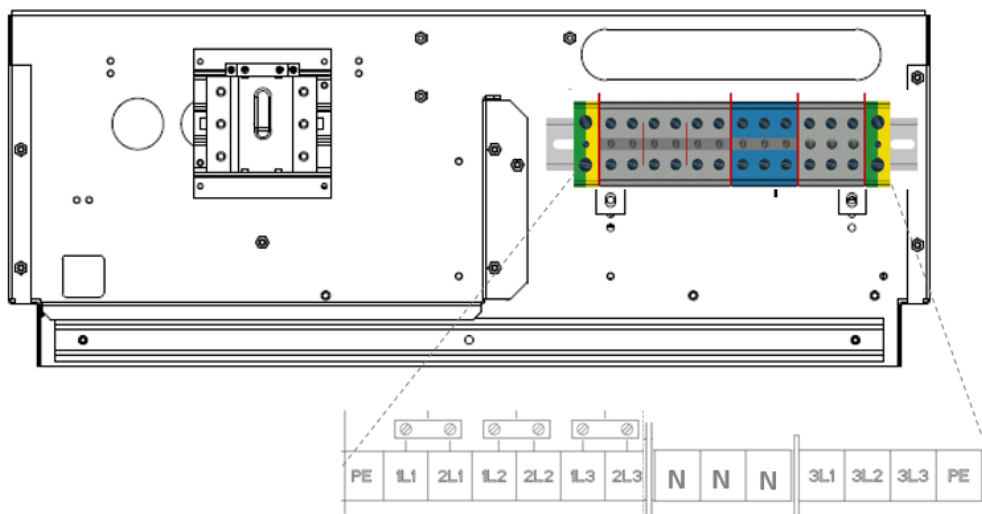
Label	Description
1PE/2PE/3PE	Connect earth cable
Input	
1L1	Input rectifier L1
2L1	Input bypass L1
1L2	Input rectifier L2
2L2	Input bypass L2
1L3	Input rectifier L3
2L3	Input bypass L3
1N	Input rectifier N
2N	Input bypass N
Output	
3N	Output N
3L1	Output L1
3L2	Output L2
3L3	Output L3

5.4 Electrical Connection CAB-CP100-I320-B0

Notice!

Screw terminals for conductor size 50 mm² without any ferrule on Input and Output lines.

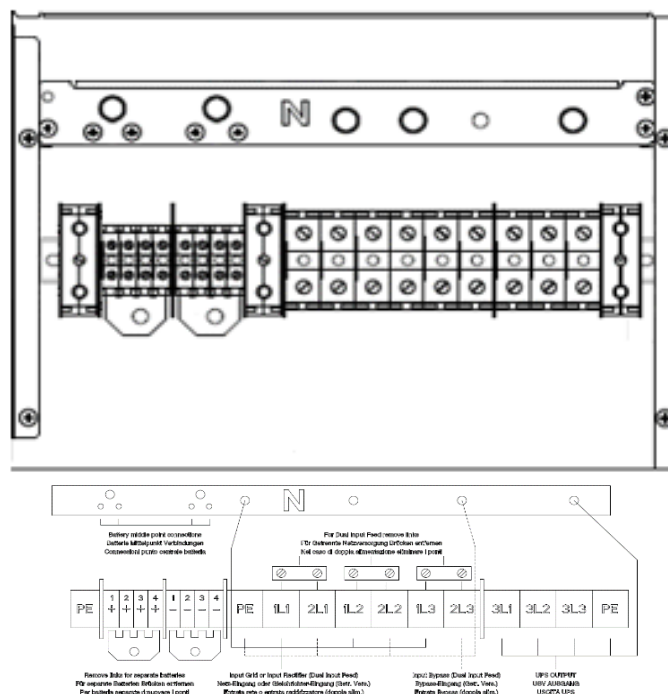
Electrical connection



Label	Description
PE	Connect earth cable
Input	
1L1	Input rectifier L1
2L1	Input bypass L1
1L2	Input rectifier L2
2L2	Input bypass L2
1L3	Input rectifier L3
2L3	Input bypass L3
N,N,N	Is connected to the common neutral connection bar
Output	
3L1	Output L1
3L2	Output L2
3L3	Output L3
PE	Output Earth

5.5 Electrical Connection CAB-CP100-E-A1

Electrical connection



Label	Description
PE	Connect earth cable
Battery	
1/2/3/4 (+)	Positive pole for modules 1/2/3/4
1/2/3/4 (-)	Negative pole for modules 1/2/3/4
Battery neutral	Is connected to the common neutral connection bar
Input	
1L1	Input rectifier L1
2L1	Input bypass L1
1L2	Input rectifier L2
2L2	Input bypass L2
1L3	Input rectifier L3
2L3	Input bypass L3
N,N,N	Is connected to the common neutral connection bar
Output	
3L1	Output L1
3L2	Output L2
3L3	Output L3
PE	Output Earth

5.6 Electrical Connection CAB-CP150-E-A0

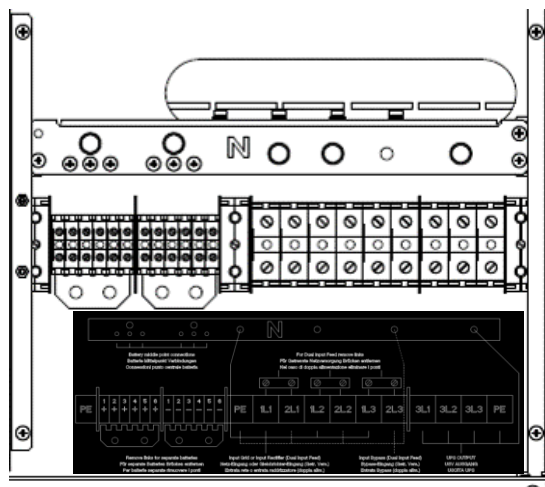
CAB-CP150-E-A0 consists in a 125kW cabinet + 1 redundant module. Screw terminals for conductor size 70 mm² without any ferrule on Input and Output lines.

Notice!

For dual input feed remove links between 1L1 and 2L1, 1L2 and 2L2, 1L3 and 2L3.

For separated batteries, remove the links between connection 1/2/3/4/5/6 (+) and connection 1/2/3/4/5/6 (-)

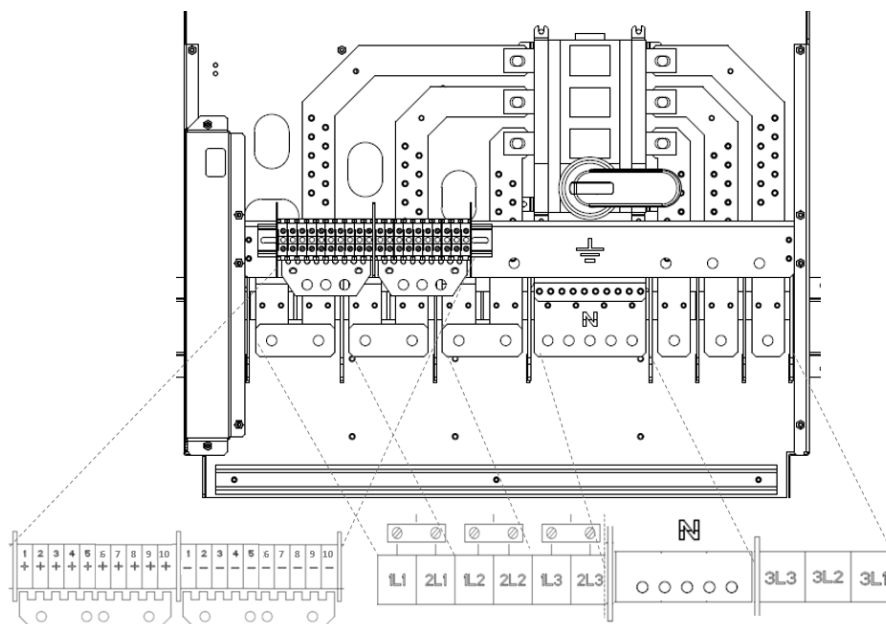
Electrical connection



Label	Description
PE	Connect earth cable
Battery	
1/2/3/4/5/6 (+)	Positive pole for modules 1/2/3/4/5/6
1/2/3/4/5/6 (-)	Negative pole for modules 1/2/3/4/5/6
Battery neutral	Is connected to the common neutral connection bar
Input	
1L1	Input rectifier L1
2L1	Input bypass L1
1L2	Input rectifier L2
2L2	Input bypass L2
1L3	Input rectifier L3
2L3	Input bypass L3
Neutral Input rectifier and Bypass	Is connected to the common neutral connection bar
Output	
3L1	Output L1
3L2	Output L2
3L3	Output L3
PE	Output Earth
Output Neutral	Is connected to the common neutral connection bar

5.7 Electrical Connection CAB-CP251-E-B0

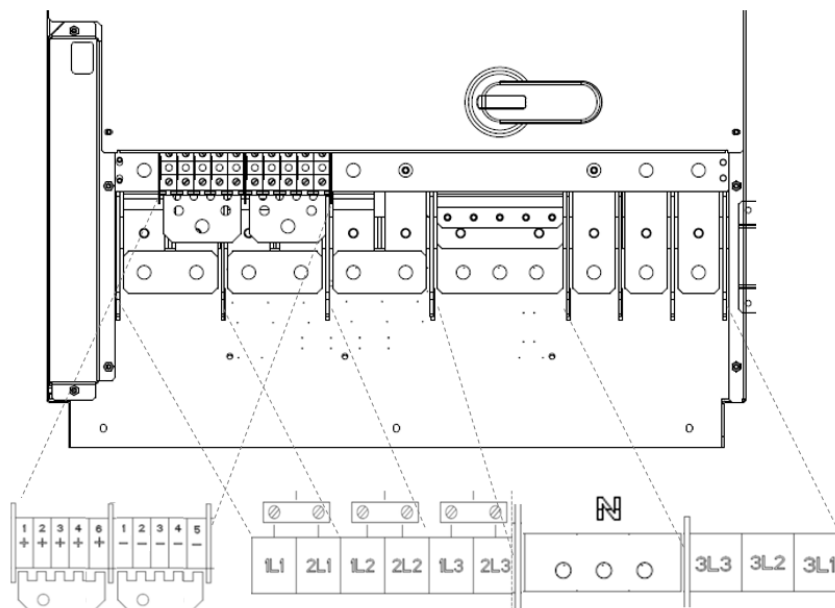
Electrical connection



Label	Description
PE	PE connection to the common bar
Battery	
1/2/3/4/5/6/7/8/9/10 (+)	Positive pole for modules 1/2/3/4/5/6/7/8/9/10
1/2/3/4/5/6/7/8/9/10 (-)	Negative pole for modules 1/2/3/4/5/6/7/8/9/10
Battery neutral	Is connected to the common neutral connection bar (N)
Input	
1L1	Input rectifier L1
2L1	Input bypass L1
1L2	Input rectifier L2
2L2	Input bypass L2
1L3	Input rectifier L3
2L3	Input bypass L3
Neutral Input rectifier and Bypass	Is connected to the common neutral connection bar
Output	
3L3	Output L3
3L2	Output L2
3L1	Output L1
Output Neutral	Is connected to the common neutral connection bar (N)
PE	Is connected to the common ground bar

5.8 Electrical Connection CAB-CP250-E-B0

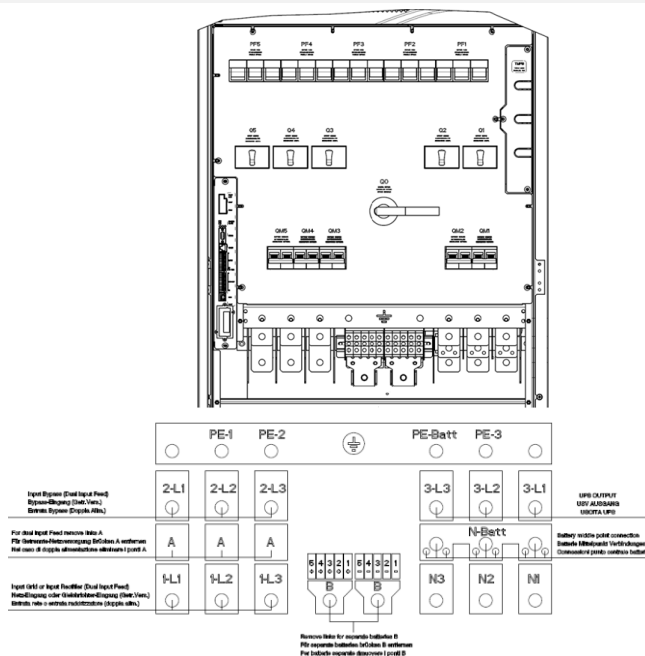
Electrical connection



Label	Description
PE	PE connection to the common bar
Battery	
1/2/3/4/5 (+)	Positive pole for modules 1/2/3/4/5
1/2/3/4/5/ (-)	Negative pole for modules 1/2/3/4/5
Battery neutral	Is connected to the common neutral connection bar (N)
Input	
1L1	Input rectifier L1
2L1	Input bypass L1
1L2	Input rectifier L2
2L2	Input bypass L2
1L3	Input rectifier L3
2L3	Input bypass L3
Neutral Input rectifier and Bypass	Is connected to the common neutral connection bar
Output	
3L3	Output L3
3L2	Output L2
3L1	Output L1
Output Neutral	Is connected to the common neutral connection bar (N)
PE	Is connected to the common ground bar

5.9 Electrical Connection CAB-CP300-E-B0

Electrical connection



Label	Description
PE	PE connection to the common bar
Battery	
1/2/3/4/5 (+)	Positive pole for modules 1/2/3/4/5
1/2/3/4/5/ (-)	Negative pole for modules 1/2/3/4/5
Battery neutral	Is connected to the common neutral connection bar (N)
Input	
1L1	Input rectifier L1
2L1	Input bypass L1
1L2	Input rectifier L2
2L2	Input bypass L2
1L3	Input rectifier L3
2L3	Input bypass L3
Neutral Input rectifier and Bypass	Is connected to the common neutral connection bar
Output	
3L3	Output L3
3L2	Output L2
3L1	Output L1

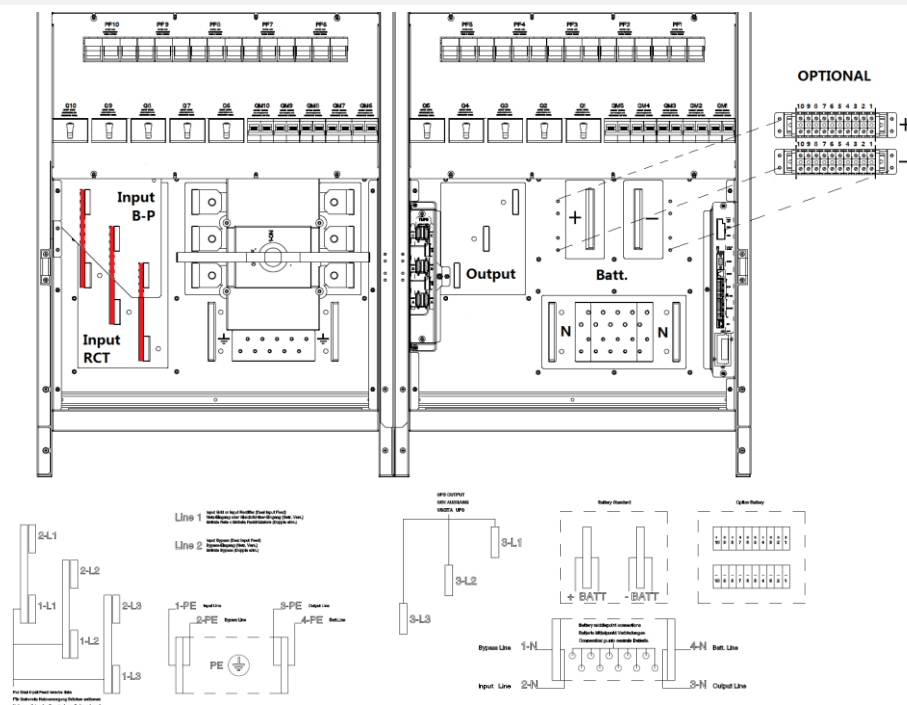
5.10 Electrical Connection CAB-CP300T-E-B0

[illegible]Page 45 of 53

3L1	Output L1
Output Neutral	Is connected to the common neutral connection bar (N)
PE	Is connected to the common ground bar

5.11 Electrical Connection CAB-CP600-E-L0

Electrical connection

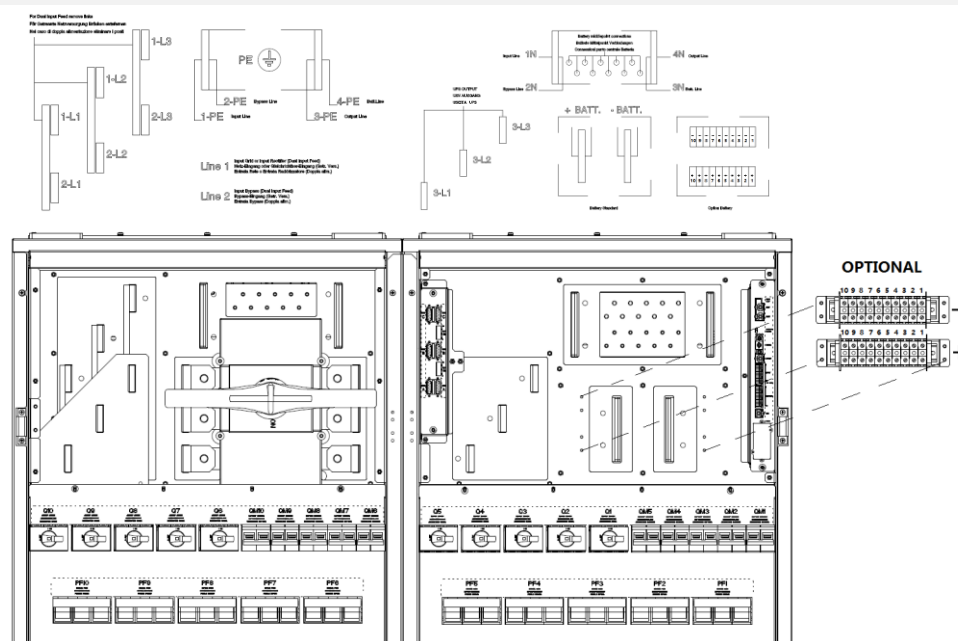


Label	Description
PE	PE connection to the common bar
Battery	
1/2/3/4/5/6/7/8/9/10 (+)	Positive pole for modules 1/2/3/4/5/6/7/8/9/10
1/2/3/4/5/6/7/8/9/10 (-)	Negative pole for modules 1/2/3/4/5/6/7/8/9/10
Battery neutral	Is connected to the common neutral connection bar (N)
Input	
1L1	Input rectifier L1
2L1	Input bypass L1
1L2	Input rectifier L2
2L2	Input bypass L2
1L3	Input rectifier L3
2L3	Input bypass L3
Neutral Input rectifier and Bypass	Is connected to the common neutral connection bar
Output	
3L3	Output L3

3L2	Output L2
3L1	Output L1
Output Neutral	Is connected to the common neutral connection bar (N)
PE	Is connected to the common ground bar

5.12 Electrical Connection CAB-CP600T-E-L0

Electrical connection

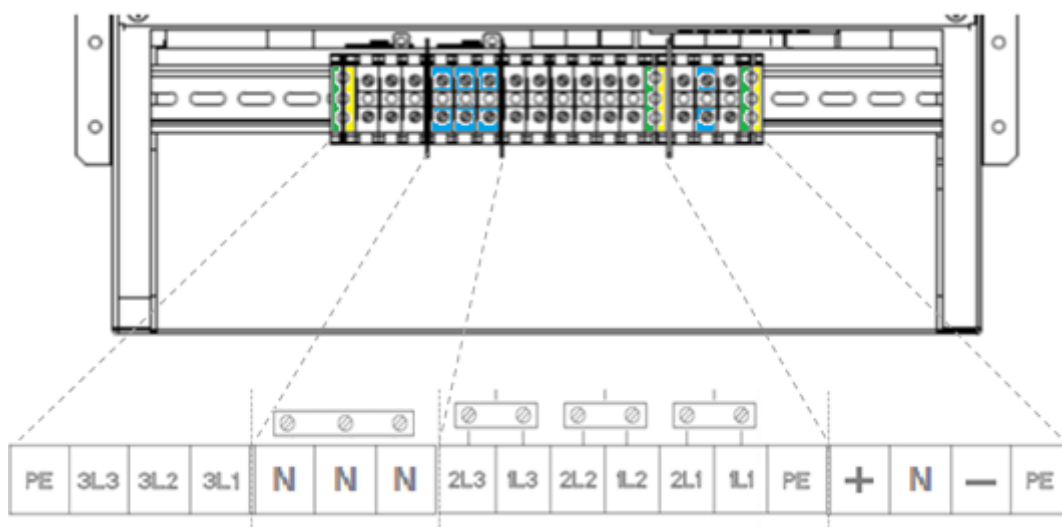


Label	Description
PE	PE connection to the common bar
Battery	
1/2/3/4/5/6/7/8/9/10 (+)	Positive pole for modules 1/2/3/4/5/6/7/8/9/10
1/2/3/4/5/6/7/8/9/10 (-)	Negative pole for modules 1/2/3/4/5/6/7/8/9/10
Battery neutral	Is connected to the common neutral connection bar (N)
Input	
1L1	Input rectifier L1
2L1	Input bypass L1
1L2	Input rectifier L2
2L2	Input bypass L2
1L3	Input rectifier L3
2L3	Input bypass L3
Neutral Input rectifier and Bypass	Is connected to the common neutral connection bar
Output	

3L3	Output L3
3L2	Output L2
3L1	Output L1
Output Neutral	Is connected to the common neutral connection bar (N)
PE	Is connected to the common ground bar

5.13 Electrical Connection CAB-UR025-E-C0

Electrical connection



Label	Description
PE	Connect earth cable
Output	
3L3	Output L3
3L2	Output L2
3L1	Output L1
N / N / N	Output / Bypass / Rectifier are connected
Input	
2L3	Input bypass L3
1L3	Input rectifier L3
2L2	Input bypass L2
1L2	Input rectifier L2
2L1	Input bypass L1
1L1	Input rectifier L1

PE	Connect earth cable
Battery	
(+)	Positive pole for modules 2/1
N	Battery central tap (Connected to common neutral)
(-)	Negative pole for modules 2/1
PE	Output Earth

5.14 Electrical Connection CAB-UR050-E-C0

Notice!

For dual input feed remove links between 1L1 and 2L1, 1L2 and 2L2, 1L3 and 2L3.

Notice!

For separated batteries, remove the links between connection 1/2 (+) and connection 1/2 (-)

Electrical connection



Label	Description
PE	Connect earth cable
Output	
3L3	Output L3
3L2	Output L2
3L1	Output L1
N / N / N	Output / Bypass / Rectifier are connected
Input	
2L3	Input bypass L3
1L3	Input rectifier L3
2L2	Input bypass L2
1L2	Input rectifier L2
2L1	Input bypass L1

1L1	Input rectifier L1
PE	Connect earth cable
Battery	
2/1 (+)	Positive pole for modules 2/1
N / N	Is connected to the common neutral connection bar
2/1 (-)	Negative pole for modules 2/1
PE	Output Earth

5.15 Electrical Connection CAB-UR100-E-C1

Notice!

Screw terminals for conductor size 50 mm² without ferrule on Input and Output lines.

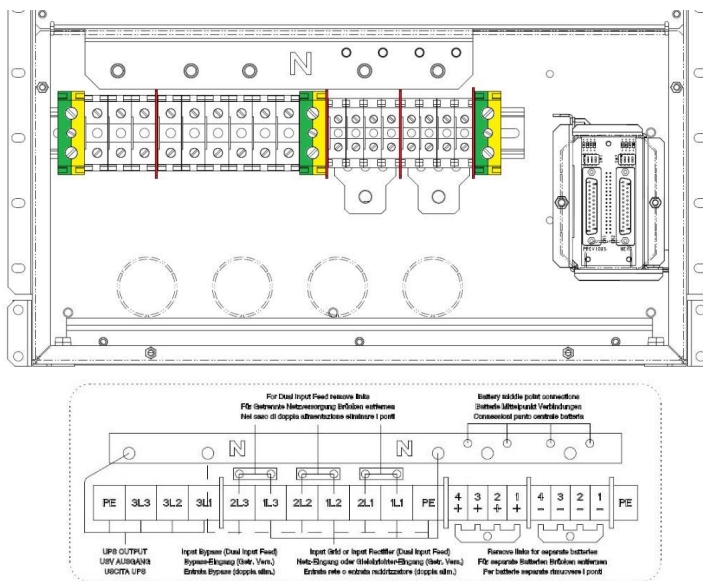
Notice!

For dual input feed remove links between 1L1 and 2L1, 1L2 and 2L2, 1L3 and 2L3.

Notice!

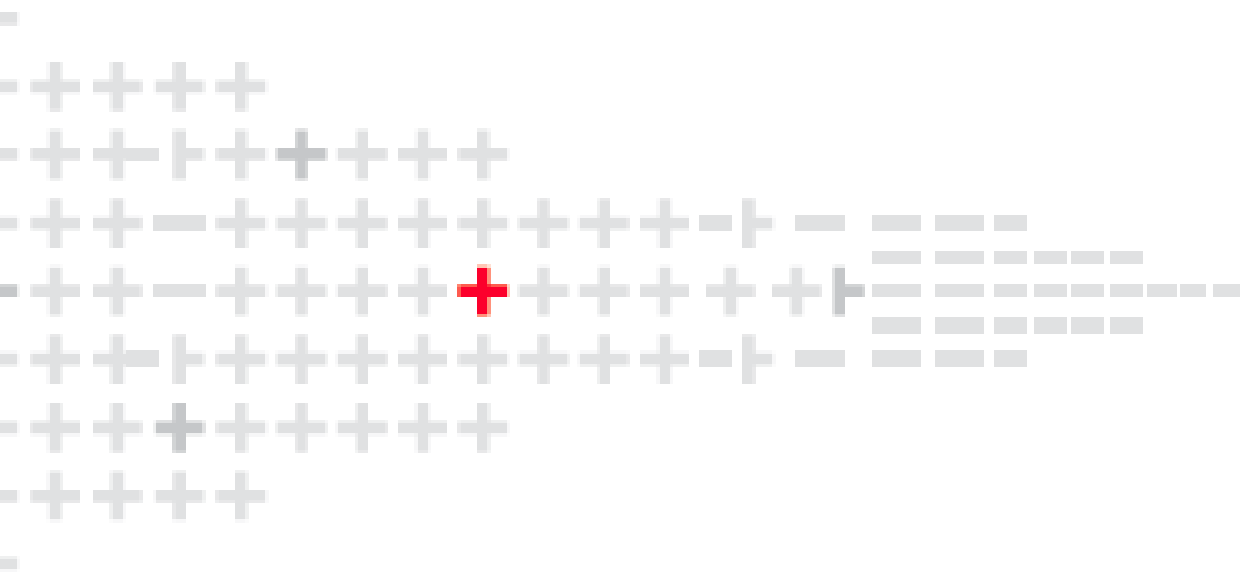
For separated batteries, remove the links between connection 1/2/3/4 (+) and connection 1/2/3/4 (-)

Electrical connection



Label	Description
PE	Connect earth cable
Output	
3L3	Output L3
3L2	Output L2
3L1	Output L1
Output Neutral	Is connected to the common neutral connection bar (N)
Input	
2L3	Input bypass L3
1L3	Input rectifier L3
2L2	Input bypass L2

1L2	Input rectifier L2
2L1	Input bypass L1
1L1	Input rectifier L1
Neutral Input rectifier and Bypass	Is connected to the common neutral connection bar
Battery	
4/3/2/1 (+)	Positive pole for modules 4/3/2/1
4/3/2/1 (-)	Negative pole for modules 4/3/2/1
Battery neutral	Is connected to the common neutral connection bar (N)
PE	Connect earth cable



 Centiel SA
Continuous Power Availability

Via alla Stampa 15
CH6965 Lugano, Switzerland
+41 91 210 36 83
write@centiel.com
www.centiel.com
©2020 Centiel SA. All rights reserved

