

"All In One" CBI series: Uninterruptible Power Supply with DC output
 Thank you for having chosen one of our products for your work.
 We are certain that will give the utmost satisfaction and be a notable help on the job.

General Description:
 Thanks to "All In One" CBI series of DC-UPS, it will be possible to optimize the power management of your system with one single, extremely compact and cost-effective device, connected directly to the mains. The available power is automatically distributed between load and battery giving priority to the load. Battery can supply the load even with mains so the output power to the load can be twice the nominal power if it is required (Power Boost). When mains failure occurs, the load continues to be supplied by the battery in backup mode. It is also possible to switch on the device with no mains directly from battery. The "Battery Care" algorithm performs rapid and automatic charging, battery charge optimization in real time, flat batteries diagnosis during installation and operation. Temperature compensation is possible to connect the temperature sensor probe. The real time auto-diagnostic system monitors battery faults such as sulfated battery, shorted cells, accidental reverse polarity connection or disconnection of the battery. Every fault is signaled by a blink code (Diagnosis Led) and by a specific signal (Diagnosis Led). The battery can be easily detected and removed during the installation and after sales. The continuous monitoring of battery efficiency reduces risk of battery damage and allows a safe operation in permanent connection. Predefined currents can be selected by jumpers or DIP switch to optimize the charge of different battery types: Open Lead Acid, AGM and Gel Lead Acid; Ni-Cd are rechargeable in the same device. Charging curves can be customized via Modbus (only in some models). Output dry contacts are used to signal both backup and fault conditions. A rugged casing with bracket for DIN rail mounting provides IP20 protection grade.

Main Characteristics

- Universal input voltage: single-phase 115-230-277 Vac
- Load output:24 Vdc 3.5,10,20A; 12 Vdc 3.6,10,15,35A 48 Vdc 5,10A
- Battery output:24 Vdc 3.5,10,20A; 12 Vdc 3.6,10,15,35A; 48 Vdc 5,10A
- All In One solution: power supply + battery charger + backup mode in one single device connected directly to the mains
- Suited for different battery types: Open Lead Acid, Sealed Lead Acid, AGM and Gel Lead Acid; Ni-Cd and Li-Ion are available as options. Four stage charging curves for Lead Acid batteries: 3-stage (UoI) (Bulk, Absorption, Float) plus Recovery stage for deeply discharged batteries
- Automatic diagnosis of battery status and battery Life Test function (Battery Care)
- Switching technology with high efficiency
- Protected against short circuit, overload and inverted polarity
- Output dry contact for signaling Low Battery or Battery Replacement and Fault system
- Output dry contact for signaling Mains or Backup
- IP20 protection grade
- Space saving on DIN rail

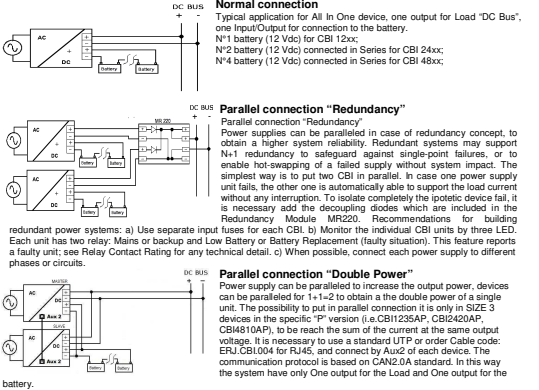
Safety and warning notes
WARNING - Explosion Hazard Do not disconnect Equipment unless power has been switched off or the area is known to be non-hazardous.
WARNING - Explosion Hazard. Substitution of components may impair suitability for class 1, Division 2.
WARNING - Switch off the system before connecting the module. Never work on the machine when it is live. The device must be installed in accordance with UL508 or UL60950. The device must have a suitable isolating facility outside the power supply unit, via which can be switched to idle. Danger of fatal injury!

Connection (terminal and wiring):
Cable Connection: The following cable cross-sections may be used:

Wire	Stranded Length (mm)	AWG	Torque (Nm)	Stripping Length (mm)	All in One Size 1 and 2	1 Phase L N PE Input AC	1 Phase L N PE Input AC
In	0.2 - 2.5	24 - 14	0.5 - 0.6 Nm	7 mm	Size 1 and 2		
In	4.0	8.0	30 - 10	0.8 - 1.0 Nm	7 mm	Size 3 and 4	
Out	0.2 - 2.5	24 - 14	0.5 - 0.6 Nm	7 mm	Size 1 and 2		
Out	4.0	8.0	30 - 10	0.8 - 1.0 Nm	7 mm	Size 3 and 4	

The connection is made by the screw type 2.5 mm² or 4.0 mm² terminal blocks. Use only copper cables that are designed for operating temperatures of > 75 °C. Wiring terminal shall be marked to indicate the proper connection for the power supply.

Output Power connections



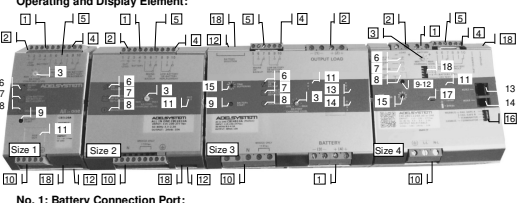
a) Use separate input fuses for each CBI.
 b) Make sure that the two CBI have the same settings: Battery type, Charging level current, Time buffering, Life test...
 c) Automatic configuration, Master-Slave. The devices decide Master/ Slave and assigne management. The assignment become able every power on, or after the connection of the cable RJ45. Master device give you all the visual signals, the Slave device maintain diagnosis LED always ON.
 d) Use the alarm contacts of both the two devices and deliver them at will.
 e) For Start Battery there are two ways, without mains voltage:
 - push start button on both units
 - connect Cable "RTCONN" on position 5, to connect pushbutton on a front panel.

Series connection:
 It is possible to connect as many units in series as needed, providing the sum of the output voltage does not exceed 160Vdc. b) Voltages with a pole not above 60Vdc, and not SELV any more and can be dangerous. Such voltages must be installed with a protection against touching. c) For serial operation use power supplies of the same type. d) Earthing of the output or of the output of the output voltage is above 60Vdc. e) Keep an installation clearance of 10 mm (left/right) between a power supplies and avoid installing the power supplies on top of each other.
System Auto Diagnosis
 It is possible to connect the temperature sensor probe to the output terminals.

Output Load (Mains Input ON)
 The output Load in normal mode. Mains Input Vac Voltage present, follow the charging battery dc output voltage. The minimum and maximum range stabilized are the following:
 CBI 24x25 - 11 - 14.4 Vdc; 15.5 Vdc for NiCd (Without battery connected out. Voltage fixed at 12Vdc)
 CBI 24x25 - 28 - 3 Vdc; 30 Vdc for NiCd (Without battery connected out. Voltage fixed at 24Vdc)
 CBI 48x44 - 57 - 6 Vdc; 65 Vdc for NiCd (Without battery connected out. Voltage fixed at 48Vdc)
 Thanks to the All In One units, it will be possible to manage the power. The available power, is automatically allocated between load and battery; supplying power to the load is the first priority of the unit; thus it is not necessary to double the power and also the power available for the battery will go to the load if the load requires it.
 In "Power Boost Mode" the maximum current on the load output is the 2 times the rated current $2 \times I_{load} = I_{in-batt}$ in continuous operation and 3 times the rated current $3 \times I_{load} = I_{in-batt}$ for 4 seconds; after this parameter the device is electrically protected against overload and short circuit.
 • In "Power Boost Mode", if the current of the battery generate current to the load for a time more than 4 minutes, the device give message (8 Blink), consequently means that the battery is discharging. If the Mains Input Voltage fall below a Threshold level (50% of the Typ. Vac) input the battery is immediately connected to the Output Load, without any interruption.
 • Voltage dips: In this situation the voltage in the output load it is the same of the battery.
To avoid deep battery discharge, the battery will supply the load until battery voltage reaches 1.5 V/cell. Below this level the device automatically switches off to prevent Deep discharge and battery damage.

Output Load In Buffer Mode (Mains Input OFF)
 Some example of buffering time depending on LOAD Output in function to the Ah of the battery.

Buffering Time	BATT 1.2 Ah	BATT 3 Ah	BATT 7.2 Ah	BATT 12 Ah	BATT 100 Ah
Load 1.5 A	20 min	60 min	200 min	400 min	/
Load 3 A	8 min	30 min	120 min	240 min	/
Load 5 A	3 min	15 min	55 min	100 min	/
Load 7.2 A	2 min	10 min	30 min	60 min	/
Load 10 A	1 min	7 min	20 min	45 min	20 h
Load 12 A	No	3 min	12 min	30 min	600 min
Load 15 A	No	9 min	20 min	40 min	400 min
Load 20 A	No	7 min	13 min	240 min	/



No. 1: Battery Connection Port:
 Connect the battery between pin. 3 (-) and 4 (+)
 Output 12 Vdc for CBI 2x2; Two battery (12 Vdc) connected in Series for CBI 2x4; Two battery (12 Vdc) connected in Series for CBI 4x4;
No. 2: Output Load (Size 4)
 Connect this output to the load 1 (-) 2 (+).
No. 3: Charging Level Current:
 In order to protect the battery from excessive charging currents, the device allows you to limit the maximum charge current by adjusting the trimmer. It allows you to limit from max in up to 20% of current in. To determine the maximum battery charge current, see the battery manufacturer's Data Sheet. If it is not possible, consider that on average the maximum charge current is 10% of Ah's rated battery current. The data is suitable for both Lead Acid and NiCd batteries.

No. 10: Input AC Port pin. L, N, PE
 1 Phase Switching Power Supplies L, N, PE
 Size 2 and Size 3 BRIDGE ONLY for Input 115 Vac, and connect L, N, PE

No. 11: Auxiliary Output "AUX 1"
 Remove the window label to find the connector.
 It is possible to connect the Temperature sensor probe and apply it on the battery. The function of the probe is for temperature battery compensation. With this it is possible to apply the specifications of the EN54-4 fire norm.
 Size 1, 2, 3

Battery Temperature Compensation Charge (not for NiCd)
 Connecting to Auxiliary Output AUX1 the cable RTTEMP (supplied separately), the CBI will vary the voltage of battery charging depending on the temperature:

Fast charge	Float charge
+5mV/°C x n. of Cells from -8°C to +45°C	+3mV/°C x n. of Cells from -20°C to +45°C
+140mV/Cell - 200mV/Cell compared to the value at 20°C	+120mV/Cell - 120mV/Cell compared to the value at 20°C

 The device stop to charge the battery if the temperature is less than -20°C or greater than +45°C. The alarm fault battery could be signalled by 7 blink code.
 The sensor placed on cable RTTEMP must be applied on the battery.

No. 13: Auxiliary Output "AUX 2"
 Present only in Sizes 3 and Size 4, connection MODBUS via RJ45 connector. See instruction MODBUS communications protocol. (CANBUS to be implemented).

No. 14: Auxiliary Output "AUX 3"
 Present only in Size 4. The function is the same of Auxiliary Output "AUX 2"

No. 15: Buffering Time Setting (Size 3-4)
 On models Size 3 and Size 4 it is possible to set a buffering time. It can be selected by setting the desired value on the battery switch 13. Buffering time is initiated when the mains is switched OFF. The LOAD output will be ON for the selected time.

Switch position	0	1	2	3	4	5	6	7	8	9
Buffering Time (min.)	0	0.5	2	5	10	15	20	30	45	60

If the switch in position 0, the LOAD output will be in ON state until the battery is completely discharged. Any way to prevent damage risks, the unit disconnects the batteries when a minimum voltage level is reached.
 For units Size 1 or 2 you have to version with the extension CBXXXXB. The LOAD output will be in ON state until the battery it is completely discharged. It is however possible to request factory customized versions with specific buffering time setting.

No. 16: Bus Termination (Size 4)
 Caution: Switch off the system before Setting the Jumper.
 Read the MODBUS/CANBUS instruction manual to learn about the operational functions available.
 Jumper Setting always active during all states of the system.

No. 17: Select Output Voltage (Size 4)
 Caution: Switch off the system before Setting the Jumper



No. 18: Battery Management Configurations (Sizes 1,2,3,4)
 Preliminary Operations: One device for all battery types.
 Completely automatic, all devices are suitable to charge most battery types thank to User Selectable charging curves. They can charge open lead acid, sealed lead acid, Gel and Ni-Cd. It is possible to charge with all other charging curves connecting the device to a portable PC.
 Caution: Switch off the system before setting the battery. Only jumper in position 6 is Refreshed also with power ON.

! Don't use Ni-Cd charging configuration in battery less than 7 Ah.

No. 9: 12: Start From Battery Only; No Mains Vac
 No. 9: Push-button, for 3 sec., in the front panel for switch ON the system without the "Mains input Vac" but only the battery connected. (Not present in CBI 24100X and CBI 485X)
 No. 12: Jumper, to enable the same function for start from the battery, via RTCONN cable connected in the Push-button mounted on front Panel of the external system. Standard function for all products. Size 2 only with code CBI410A/5 and CBI485A/5. Do not leave jumper in this position, otherwise the system will discharge completely the battery. Only push button.

Notice:
 Do not leave the jumper in position 5; otherwise, in Backup mode, the battery discharges completely close to Zero.
 For Size 2; must be require CBI2410A/5 or CBI485A/5 (/S means start with battery functions, otherwise only start with Input Mains)
 2 CBI2434TB1 and CBI2454TB1 Replaces the fast charge in:
 • Contact closure: back-up (UPS) enabled.
 • Contact open: Inhibit backup function. No UPS enabled.
 • Contact open: Inhibit backup function. No UPS enabled.
 CBI280124A
 • Contact closure: back-up (UPS) enabled.
 • Contact open: Inhibit backup function. No UPS enabled.
 3 Jumper present in Fast Charge means also that every 288h, the device go in "Cycling Refresh Charging". This mode continue for 85 minutes at the same voltage condition: 2.4V/Cell; for Lead Acid Batteries.
 4 Please note that it is possible to use lithium-charging curve just with a single BMS. From the release:
 • Size1
 o 12Vdc Output: S13 R6
 o 24Vdc Output: S13 R7
 • Size2
 o 24Vdc Output: S92 R3
 • Size3
 o 12Vdc, 24Vdc, 48Vdc Output: S40 R13
 • Size4
 o Only by custom request

5. By DPY351 or ADELViewSystem it is possible configure a Customized Charging Curve. After programming it is possible disconnect the programmer an use the device as standalone device.
Battery Care
 The Battery Care philosophy is based on algorithms that implement rapid and automatic charging. Elements optimization during time, flat batteries recovery and real time diagnostic during installation and operation. Bliement in short circuit, accidental reverse polarity connection, disconnection of the battery, can easily be detected and removed by help of Blink Code of Diagnosis Led, during the installation and after sell. Each device is suited for all battery types, it is possible setting predefined curves for Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd (option). They guarantee battery reliability in time by continuously testing the internal impedance status, avoids any possible risk of damages and grants a permanent, reliable and safe connection of the battery to the power supply. The system, through a battery simulation circuit with algorithms of evaluation of the detected parameter, is able to recognize sulfated batteries or batteries with a short-circuited element. Battery Test. Every 60 sec. check battery connection. Every 220 minute in Float charge, make the test of the battery efficiency. The Battery Fault will be monitored by relay and led blinking.

Diagnostic Type Checks:
Check for accidental disconnection of the battery cables:
 All In One detects accidental disconnection and immediately switched off the output power.
Battery not connected:
 If the battery is not connected no output power.

Test of quality wire connections:
 During Float charge the quality (resistance) on the battery connection is checked every 60 sec. This to detect if the cable connection has been properly made.

Battery in Open Circuit or Sulphated:
 Every 220 minute. All In One tests of internal impedance, in Float charging mode.

Reverse polarity check:
 If the battery it is connected with inverted polarity, All In One is automatically protected.

Test of battery voltage connections:
 Appropriate voltage check, to prevent connection of wrong battery types, more or less than the nominal voltage.

End of Charge Check:
 When the battery it is completely full, the device automatically switch in Float charging mode.

Check for Batteries Cells in short circuit
 Thanks to specific algorithms of evaluation, the CBs recognize batteries with cells in internal short circuit. In Float charge every 220 minute test of element in short circuit.

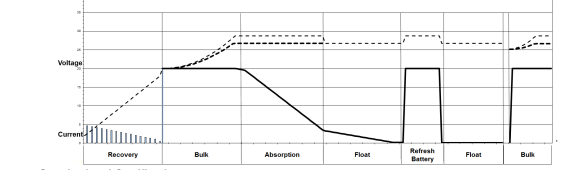
Diagnosis of battery and device:
 All In One devices support all algorithms of evaluation of the detected parameter, it is able to recognize sulfated batteries or batteries with a short-circuited element. Battery Test. Every 60 sec. check battery connection. Every 220 minute in Float charge, make the test of the battery efficiency. The Battery Fault will be monitored by relay and led blinking.

Protection Features:
On the primary side: the device is equipped with an internally fuse. If the internal fuse is activated, it is most probable that there is a fault in the device. If happen, the device must be checked in the factory.

On the secondary side Battery and load: The device is electrically protected against short circuits and overload.
Inversion polarity: the module it is automatically protected against inversion of battery polarity and connection of lead inverted.
Over current and output short circuit: the unit limits the output current (see the technical data).
Deep discharge: not possible. The unit disconnects the battery when a minimum voltage level is reached.

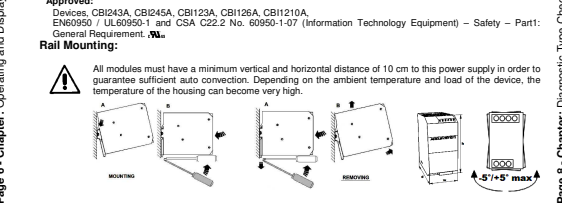
Thermal behaviour
 Surrounding air temperature 50°C. For ambient temperature of over 50°C, the output current must be reduced to 70% of C_{max}. Max 70% of C_{max} Max 70% of C_{max} at the temperature of 70°C the output current will be 50% of In. The equipment does not switch off in case of ambient temperature above 70°C or thermal overload. The devices are protected for Over temperature conditions "worst case", in this situations the device Shut-down the output and automatic restart when temperature inside fall.

Charging Curve
 Automatic multi-stage operation and real time diagnostic allows fast recharge and recovery of deep discharged batteries, adding value and reliability to the system hosting the CBI device. The type of charging of voltages stabilized and Current stabilized (UoI). Five charging phases are identified by a flashing code on a Diagnosis LED. To maintain the Output Load in lower Voltage state, don't put jumper in position 6, in this case no boost charge but only Float charge. Fast/Bulk Charge means also that every 288h, the device go in "Cycling Refresh Charging" for 85 minutes at 2.4V/Cell.



Standard and Certifications
Electrical Safety For Mounting:
 IEC/EN 60335-2-28 Batteries Chargers
 Electrical safety EN54-4 Fire Detection and fire alarm systems; DN41173 (Charging cycle)
 Approvals:
 Devices, CBI243A, CBI245A, CBI123A, CBI126A, CBI210A, EN60950 / UL60950-1 and CSA C22.2 No. 60950-1-07 (Information Technology Equipment) – Safety – Part1: General Requirement. **UL**
 EN60950 / UL60950-1 and CSA C22.2 No. 60950-1-07 (Information Technology Equipment) – Safety – Part1: General Requirement. **UL**
EMC Standards Immunity:
 EN 61000-4-2, EN 61000-4-3, EN 61000-6-2, EN 61000-4-4, EN 61000-4-5.
EMC Standards Emission:
 EN 61000-3-2, EN 61000-3-3, EN 61000-3-4 (see data sheet for each device)
Conformity to:
 EN60950 / UL60950-1 and CSA C22.2 No. 60950-1-07 (Information Technology Equipment) – Safety – Part1: General Requirement. **UL**
 EN60950 / UL60950-1 and CSA C22.2 No. 60950-1-07 (Information Technology Equipment) – Safety – Part1: General Requirement. **UL**

Rail Mounting:
 All modules must have a minimum vertical and horizontal distance of 10 cm to this power supply in order to guarantee sufficient air convection. Depending on the ambient temperature and load of the device, the temperature of the housing can become very high.



DC Ups - All in ONE	12/24Vdc			12Vdc				24Vdc				48Vdc	
Input (Volt)	115 – 230 – 277Vac	115 – 230 – 277Vac	115 – 230 – 277Vac	115 – 230 – 277Vac	115 / 230 – 277Vac	115 – 230 – 277Vac	115 – 230 – 277Vac	115 / 230 – 277Vac	115 / 230 – 277Vac	115 / 230 – 277Vac	115 / 230 – 277Vac	115 / 230 – 277Vac	
Output (Vdc – A – W)	12-24V /15-10A /280W	12Vdc – 3A – 36W	12Vdc – 6A – 72W	12Vdc – 10A – 120W	12Vdc – 35A – 420W	24Vdc – 3A – 72W	24Vdc – 5A – 120W	24Vdc – 10A – 240W	24Vdc – 20A – 500W	48Vdc – 5A – 240W	48Vdc – 10A – 500W		
Reference	CB12801224A	CB1123A	CB1126A	CB11210A	CB11235A	CB1243A	CB1245A	CB12410A	CB12420A	CB1485A	CB14810A		
INPUT DATA													
Nominal Input Voltage	115 – 230 – 277Vac	115 – 230 – 277Vac	115 – 230 – 277Vac	115 – 230 – 277Vac	115 / 230 Vac	115 – 230 – 277Vac	115 – 230 – 277Vac	115 – 230 – 277Vac	115 / 230 Vac	115 / 230 Vac	115 / 230 Vac	115 / 230 Vac	
Input Voltage Range	90 – 135Vac 180 – 305Vac	90 – 305Vac	90 – 305Vac	90 – 305Vac	90 – 135Vac 180 – 305Vac	90 – 305Vac	90 – 305Vac	90 – 305Vac	90 – 135Vac 180 – 305Vac	90 – 135Vac 180 – 305Vac	90 – 135Vac 180 – 305Vac	90 – 135Vac 180 – 305Vac	
Inrush Current (Vn and in Load) I _{rt}	≤ 16 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 80 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 36 A ≤ 5msec	≤ 42 A ≤ 5msec	≤ 80 A ≤ 5msec	≤ 42 A ≤ 5msec	≤ 35 A ≤ 5msec	
Frequency	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz	
Input Current (115 – 230Vac)	5.5 – 3A	2.8 – 1.3A	2.8 – 1.3A	2.8 – 1.3A	9.0 – 4.5A	2.8 – 1.3A	2.8 – 1.3A	2.8 – 1.3A	5 – 2.5A	2.8 – 1.3A	2.8 – 1.3A	9.0 – 4.5A	
Internal Fuse	6.3A	4A	4A	4A	10A	4A	4A	4A	6.3A	10A	6.3A	10A	
External Fuse (recommended)	16A	10A	10A	10A	16A	10A	10A	10A	16A	16A	16A	16A	
OUTPUT DATA													
Output Vdc /In	12Vdc 15A / 24Vdc 10A	12Vdc – 3A	12Vdc – 6A	12Vdc – 10A	12Vdc – 35A	24Vdc – 3A	24Vdc – 5A	24Vdc – 10A	24Vdc – 20A	48Vdc – 5A	48Vdc – 10A		
Output Current (In)	15A / 10A	3A	6A	10A	35A	3A	5A	10A	20A	5A	10A		
Dissipation Power load max (W)	28	15	18	25	68	18	25	48	68	48	68		
Minimum load	No	No	No	No	No	No	No	No	No	No	No		
Efficiency (50% of In)	> 91%	≥ 89%	≥ 89%	≥ 89%	> 90%	≥ 89%	≥ 89%	≥ 89%	≥ 83%	> 90%	≥ 83%	> 90%	
Short-circuit protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Over Load protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Over Voltage Output protection	Yes (Typ. 35Vdc)	Yes (Typ. 35Vdc)	Yes (Typ. 35Vdc)	Yes (Typ. 35Vdc)	Yes (Typ. 35Vdc)	Yes (Typ. 35Vdc)	Yes (Typ. 35Vdc)	Yes (Typ. 35Vdc)	Yes (Typ. 35Vdc)	Yes (Typ. 90Vdc)	Yes (Typ. 90Vdc)		
Overheating Thermal Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Reverse battery protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Sulfated battery check	Yes by Deep Switch	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper	Yes by Jumper		
LOAD OUTPUT													
Output voltage (at in IN) Vdc	10 – 14.4Vdc (15.5Vdc for Ni-Cd) 22 – 28.8Vdc (31Vdc for Ni-Cd)	10 – 14.4Vdc (15.5Vdc for Ni-Cd)	10 – 14.4Vdc (15.5Vdc for Ni-Cd)	10 – 14.4Vdc (15.5Vdc for Ni-Cd)	10 – 14.4Vdc (15.5Vdc for Ni-Cd)	22 – 28.8Vdc (31Vdc for Ni-Cd)	22 – 28.8Vdc (31Vdc for Ni-Cd)	22 – 28.8Vdc (31Vdc for Ni-Cd)	22 – 28.8Vdc (31Vdc for Ni-Cd)	44 – 57.6Vdc (62Vdc for Ni-Cd)	44 – 57.6Vdc (62Vdc for Ni-Cd)		
Start up with strong load (capacitive load)	Yes, Unlimited	Yes, Unlimited	Yes, Unlimited	Yes, Unlimited	Yes, Unlimited	Yes, Unlimited	Yes, Unlimited	Yes, Unlimited	Yes, Unlimited	Yes, Unlimited	Yes, Unlimited		
Residual Ripple / Ripple Residuo	≤ 60 mVpp	≤ 60 mVpp	≤ 60 mVpp	≤ 60 mVpp	≤ 60 mVpp	≤ 60 mVpp	≤ 60 mVpp	≤ 60 mVpp	≤ 60 mVpp	≤ 60 mVpp	≤ 60 mVpp		
Nominal Current In = Iload	1.1 x In A ± 5%	1.1 x In A ± 5%	1.1 x In A ± 5%	1.1 x In A ± 5%	1.1 x In A ± 5%	1.1 x In A ± 5%	1.1 x In A ± 5%	1.1 x In A ± 5%	1.1 x In A ± 5%	1.1 x In A ± 5%	1.1 x In A ± 5%		
Continuous current (without battery) Iload = In	15A 12Vdc / 10A 24Vdc	3A	6A	10A	35A	3A	5A	10A	20A	5A	10A		
Max continuous current (with battery) Iload = In + Ibat	30A 12Vdc / 20A 24Vdc	6A	12A	20A	70A	6A	10A	20A	40A	10A	20A		
Max current Output Load: (Main Input) Iload (4sec.)	max. 45A 12Vdc / 30A 24Vdc	9A max	18A max	30A max	105A max	9A max	15A max	30A max	60A max	15A max	30A max		
Max current Output Load: (Back Up) Iload (4sec.)	max. 30A 12Vdc / 20A 24Vdc	6A max	12A max	20A max	70A max	6A max	10A max	20A max	40A max	10A max	20A max		
Push Button or Remote Input Control (AMP type connector) Start from Battery without main	Yes	No (1)	No (1)	No (1)	Yes	No	No	No	Yes	No	Yes		
Time Buffering; (switch off output without main input)	0.5;1,3,5;10;15; 20; 30; 45;60;∞	(2)	(2)	(2)	0.5;1,3,5;10;15; 20; 30; 45;60;∞	(2)	(2)	(2)	5 min standard - Require: SW S31	0.5;1,3,5;10;15; 20; 30; 45;60;∞	5 min standard - Require: SW S31		
Threshold alarm Battery almost flat	10 – 11 Vdc batt / 20 – 21 Vdc batt	10 – 11 Vdc batt	10 – 11 Vdc batt	10 – 11 Vdc batt	10 – 11 Vdc batt	20 – 21 Vdc batt	20 – 21 Vdc batt	20 – 21 Vdc batt	20 – 21 Vdc batt	40 – 42 Vdc batt	40 – 42 Vdc batt		
Protections against total discharge	9 – 10 Vdc batt / 19 – 20 Vdc batt	9 – 10 Vdc batt	9 – 10 Vdc batt	9 – 10 Vdc batt	9 – 10 Vdc batt	19 – 20 Vdc batt	19 – 20 Vdc batt	19 – 20 Vdc batt	19 – 20 Vdc batt	38 – 40 Vdc batt	38 – 40 Vdc batt		
BATTERY CHARGER OUTPUT													
Boost charge (Typ. at I _b)	14.4Vdc / 28.8Vdc	14.4Vdc	14.4Vdc	14.4Vdc	14.4Vdc	28.8Vdc	28.8Vdc	28.8Vdc	28.8Vdc	57.6Vdc	57.6Vdc		
Short circuit Element Detection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Max.Time Boost-Bulk charge (Typ. at I _b)	15h	15h	15h	15h	15h	15h	15h	15h	15h	15h	15h		
Min.Time Boost-Bulk charge (Typ. at I _b)	1min	1min	1min	1min	1min	1min	1min	1min	1min	1min	1min		
Float charge (Typ. at I _b)	13.8Vdc / 27.6Vdc	13.75Vdc	13.75Vdc	13.75Vdc	13.75Vdc	27.5Vdc	27.5Vdc	27.5Vdc	27.5Vdc	55Vdc	55Vdc		
Recovery Charge	2 – 10Vdc / 2 – 20Vdc	2 – 9Vdc	2 – 9Vdc	2 – 9Vdc	2 – 9Vdc	2 – 16Vdc	2 – 16Vdc	2 – 16Vdc	2 – 16Vdc	2 – 24Vdc	2 – 24Vdc		
Turn-On delay after applying mains voltage	3sec. Max	1sec. Max	1sec. Max	1sec. Max	1sec. Max	1sec. Max	1sec. Max	1sec. Max	1sec. Max	1.5sec. Max	1sec. Max		
End of charging current (Bulk charge)	6% of charging current limiting	0.3A	0.3A	0.3A	0.3A	0.3A	0.3A	0.3A	0.3A	0.3A	0.3A		
Charging max I _{bat}	15A ± 5% 12Vdc / 10A ± 5% 24Vdc	3A ± 5%	6A ± 5%	10A ± 5%	35A ± 5%	3A ± 5%	5A ± 5%	10A ± 5%	20A ± 5%	5A ± 5%	10A ± 5%		
Charging current Limiting I _{bat} (I _{bat})	10 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}	20 ± 100 % / I _{bat}		
Jumper Config.Type Battery (NICd optional)	2.23 V/cell Open Lead, 2.27 V/cell Sealed Lead, 2.27 V/cell Sealed Lead, 2.3 V/cell gel, NiCd 1.51V												
Quiescent Current	≤100mA	≤100mA	≤100mA	≤100mA	≤100mA	≤100mA	≤100mA	≤100mA	≤100mA	≤100mA	≤100mA		
Remote Input Control (AMP Type connector)	Bulk / Trickle	Bulk / Trickle	Bulk / Trickle	Bulk / Trickle	Bulk / Trickle	Bulk / Trickle	Bulk / Trickle	Bulk / Trickle	Bulk / Trickle	Bulk / Trickle	Bulk / Trickle		
Charging Curve	IUoUo, Automatic, 3 stage / IUoUo, Automatic a 3 Stadi												
SIGNAL OUTPUT (RELAY)													
Main or Backup Power	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Low Battery	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Fault Battery	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
AUXILIARY OUTPUT													
UPS Enabling	Yes	No	No	No	No	No	No	No	No	No	No		
Temp. Charging probe	Yes RJ11	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45	Yes RJ45		
Parallel connection	No	No	No	No	Yes	No	No	No	Yes	No	Yes		
Communication Protocol	ModBus	No	No	No	ModBus	No	No	No	ModBus	No	ModBus		
CLIMATIC DATA													
Ambient Temperature operation	-25 + +70°C	-25 + +70°C	-25 + +70°C	-25 + +70°C	-25 + +70°C	-25 + +70°C	-25 + +70°C	-25 + +70°C	-25 + +70°C	-25 + +70°C	-25 + +70°C		
De rating T ³ > (In) / De rating T ³ > (In)	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C	> 50° -2.5%(In) / °C		
Ambient Temperature Storage	-40 + +85°C	-40 + +85°C	-40 + +85°C	-40 + +85°C	-40 + +85°C	-40 + +85°C	-40 + +85°C	-40 + +85°C	-40 + +85°C	-40 + +85°C	-40 + +85°C		
Humidity at 25 °C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C	95% to 25°C		
Cooling	Auto Convection	Auto Convection	Auto Convection	Auto Convection	Auto Convection	Auto Convection	Auto Convection	Auto Convection	Auto Convection	Auto Convection	Auto Convection		
GENERAL DATA													
Isolation Voltage (IN / OUT)	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac		
Isolation Voltage(IN / PE)	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac		
Isolation Voltage(OUT / PE)	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac		
Protection Class (EN/IEC 60529)	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20		
Reliability (MTBF IEC 61709)	> 300 000 h	> 300 000 h	> 300 000 h	> 300 000 h	> 300 000 h	> 300 000 h	> 300 000 h	> 300 000 h	> 300 000 h	> 300 000 h	> 300 000 h		
Pollution Degree Environment	2	2	2	2	2	2	2	2	2	2	2		
Connection Terminal Blocks Screw Type	4mm (30-10 AWG) 2.5mm (24-14 AWG)	2.5mm (24-14 AWG)	2.5mm (24-14 AWG)	2.5mm (24-14 AWG)	2.5mm (24-14 AWG)	4mm (30-10 AWG)	2.5mm (24-14 AWG)	2.5mm (24-14 AWG)	2.5mm (24-14 AWG)	4mm (30-10 AWG)	2.5mm (24-14 AWG)		
Protection class (with PE connected)	I	I	I	I	I	I	I	I	I	I	I		
Dimension (w-h-d)	110x115x135 mm	65x115x135 mm	65x115x135 mm	65x115x135 mm	65x115x135 mm	150x115x135 mm	65x115x135 mm	65x115x135 mm	100x115x135 mm	150x115x135 mm	150x115x135 mm		
Weight	0.85 Kg approx	0.60 Kg approx	0.60 Kg approx	0.60 Kg approx	1.55 Kg approx	0.60 Kg approx	0.60 Kg approx	0.60 Kg approx	1.55 Kg approx	0.85 Kg approx	1.55 Kg approx		
Safety Standard Approval	CE	CE	CE	CE	CE	CE	CE	CE	CE	CE	CE		

(1) - Options to be defined by Order/S (ex: CBXXXX/S), Push Button not available
 (2) - Yes if required by order /TB1/TB2/TB3..

Optional for auxiliary Output: Temp Charging probe 1m or 3m lenght. Remote monitoring Display. Modbus/Can Bus Cable. Paralleling Cable.