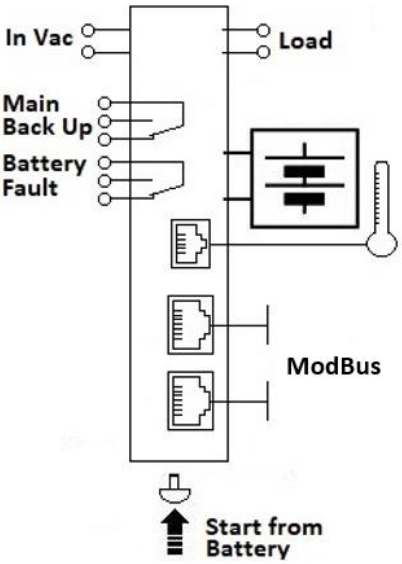
**"All In One" CBI series: Uninterruptible Power Supply with DC output**

Thank you for having chosen one of our products for your work.
We are certain that it 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 during time, flat batteries recovery and real time 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 of Diagnosis Led or via Modbus (only in some models) in order to 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 curves 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 degree.

## 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 module 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 curve for Lead Acid batteries: 5-stage IUoU (Recovery, Bulk, Absorption, Float, Refresh Battery) 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 degree
- 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.

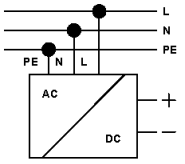
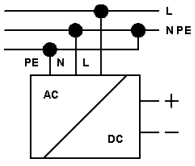
**WARNING** – Explosion Hazard. Substitution of components may impair suitability for class I, Division 2.

**WARNING** – Switch off the system before connecting the module. Never work on the machine when it is live. The device must be installed in according 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!

**WARNING** - Residual voltage. Wait for 10 seconds before to operate on the device CBI2420A and CBI485A.

## Connection (terminal and wiring):

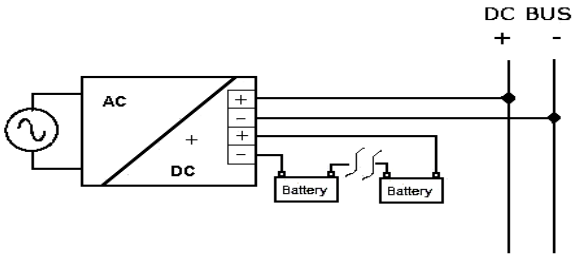
**Cable Connection:** The following cable cross-sections may be used:

| | Solid ($mm^2$) | Stranded ($mm^2$) | AWG | Torque (Nm) | Stripping Length | All In One (Size) | 1 Phase L N PE Input AC | 1 Phase L N PE Input AC |
|---|---|---|---|---|---|---|---|---|
| In: | 0.2 – 2.5 | 0.2 – 2.5 | 24 – 14 | 0.5 – 0.6 Nm | 7 mm | Size 1 and 2 |  |  |
| | 4.0 | 6.0 | 30 – 10 | 0.8 – 1.0 Nm | 7 mm | Size 3 and 4 | | |
| Out: | 0.2 – 2.5 | 0.2 – 2.5 | 24 – 14 | 0.5 – 0.6 Nm | 7 mm | Size 1 and 2 | | |
| | 4.0 | 6.0 | 30 – 10 | 0.8 – 1.0 Nm | 7 mm | Size 3 and 4 | | |
| Signal: | 0.2 – 2.5 | 0.2 – 2.5 | 24 – 14 | 0.5 – 0.6 Nm | 7 mm | All types | | |



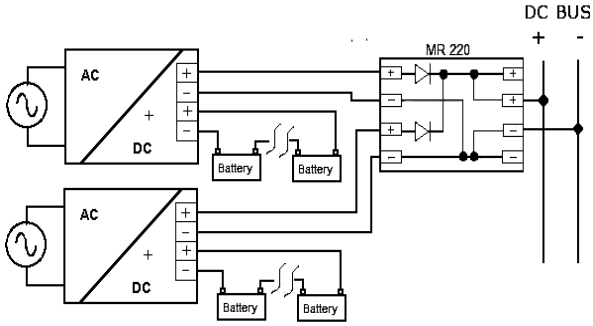
The connection is made by the screw type 2.5 mm2 or 4.0 mm2 terminal blocks. Wiring terminal shall be marked to indicate the proper connection for the power supply. Use copper cables only, for supply connections, use wires suitable for at least 75°C.

## Output Power connections



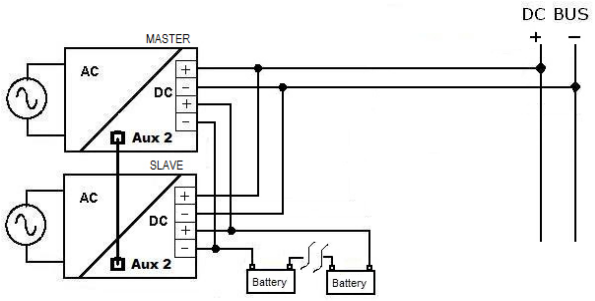

### Normal connection

Typical application for All In One device, one output for Load “DC Bus”, one Input / Output for connection to the battery.
N°1 battery (12 Vdc) for CBI 12xx;
N°2 battery (12 Vdc) connected in Series for CBI 24xx;
N°4 battery (12 Vdc) connected in Series for CBI 48xx;




### Parallel connection “Redundancy”

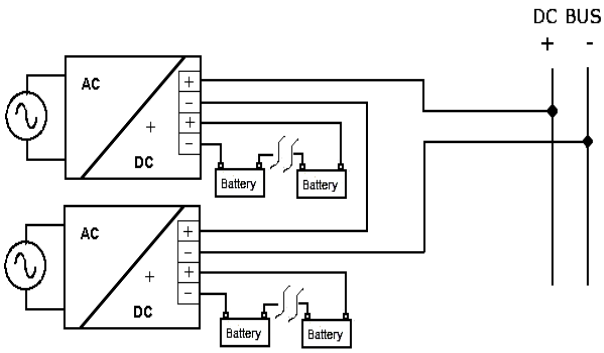
Parallel connection “Redundancy”
Power supplies can be paralleled in case of redundancy concept, to obtain a higher system reliability. Redundant systems may support N+1 redundancy to safeguard against single-point failures, or to enable hot-swapping of a failed supply without system impact. The simplest way is to put two CBI in parallel. In case one power supply unit fails, the other one is automatically able to support the load current without any interruption. To isolate completely the ipotetic device fail, it is necessary add the decoupling diodes which are included in the Redundancy Module MR220. Recommendations for building redundant power systems: a) Use separate input fuses for each CBI. b) Monitor the individual CBI units by three LED. Each unit has two relays: Mains or backup and Low Battery or Battery Replacement (faulty situation). This feature reports a faulty unit; see Relay Contact Rating for any technical detail. c) When possible, connect each power supply to different phases or circuits.




### Parallel connection “Double Power”

Power supply can be paralleled to increase the output power, devices can be paralleled for 1+1=2 to obtain the double power of a single unit. The possibility to put in parallel connection it is only in SIZE 3 devices in the specific “P” version (i.e.CBI1235AP, CBI2420AP, CBI4810AP), to be reach the sum of the current at the same output voltage. It is necessary to use a standard UTP or order Cable code: ERJ.CBI.004 for RJ45, and connect by Aux2 of each device. The communication protocol is based on CAN2.0A standard.
In this way the system has only One output for the Load and One output for the battery.

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 themselves Master and Slave assignment random. 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 way, 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 150Vdc. b) Voltages with a potential above 60Vdc are not SELV anymore 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 is required when the sum of the output voltage is above 60Vdc. e) Keep an installation clearance of 10 mm (left/right) between two power supplies and avoid installing the power supplies on top of each other. Note: Avoid return voltage (e.g. from a decelerating motor or battery) which is applied 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 12xx:11 – 14,4 Vdc; 15,5 Vdc for NiCd (Without battery connected out. Voltage fixed at 12Vdc)
CBI 24xx:22 – 28.8 Vdc; 30 Vdc for NiCd (Without battery connected out. Voltage fixed at 24Vdc)
CBI 48xx:44 – 57.6 Vdc; 62 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 x In (Iload = In+ Ibatt) in continuous operation and 3 times the rated current 3 x In (Iload = 2In+ Ibatt) for 4 seconds; after this parameter the devices 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.

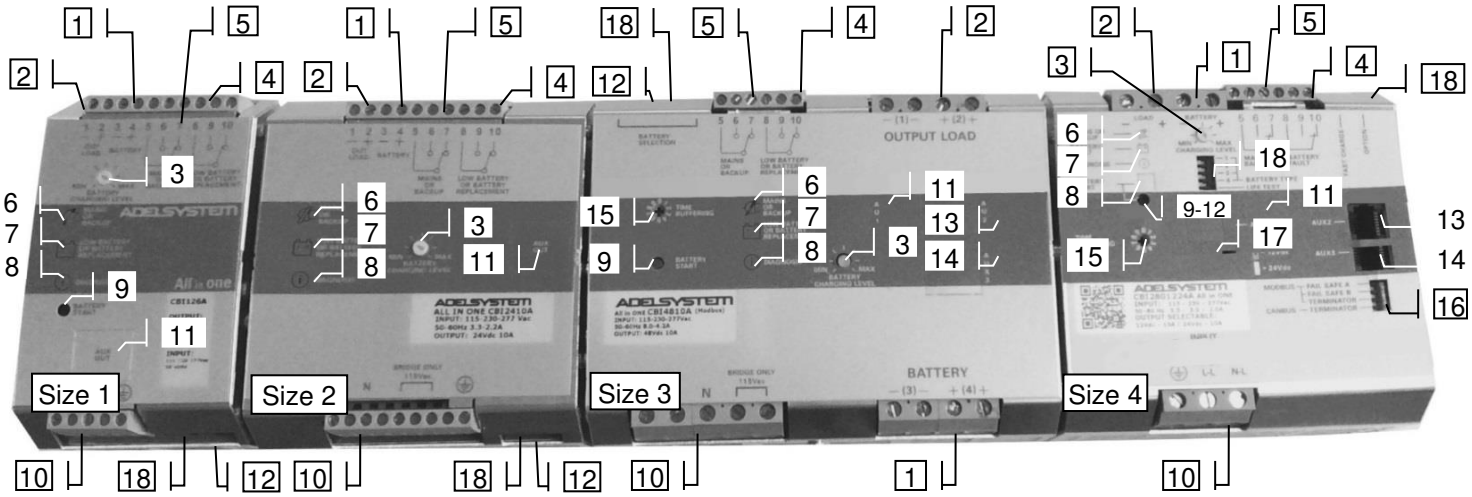
**To Avoid deep battery discharge**, the battery will supply the load until battery voltage reaches 1.5 V/cell. Below this level the device automatically switches off to prevent Deep discharge and battery damage.

## 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 | BATT1.2 Ah | BATT 3 Ah | BATT7.2 Ah | BATT12 Ah | BATT100 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 7.5 A | 2 min | 10 min | 30 min | 60 min | / |
| Load 10 A | No | 7 min | 20 min | 45 min | 20 h |
| Load 12 A | No | 3 min | 12 min | 30 min | 600 min |
| Load 15 A | No | No | 9 min | 20 min | 400 min |
| Load 20 A | No | No | 7 min | 13 min | 240 min |

## Operating and Display Element:



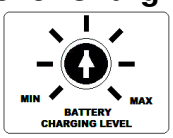

### No. 1: Battery Connection Port:

Connect the battery between pin. 3 (–) and 4 (+)
One battery (12 Vdc) for CBI12xx;
Two battery (12 Vdc) connected in Series for CBI24xx;
Four battery (12 Vdc) connected in Series for CBI48xx;

### No. 2: Output Load:

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. 4, 5 Signal Ports (Output Isolated):

Connections for,
No. 5: MAINS OR BACKUP: Input Mains On/Off. Contact: 5, 6, 7
No. 4: LOW BATTERY, BATTERY REPLACEMENT, FAULT BATTERY or FAULT SYSTEM Contact: 8,9,10

**Relay Contact Rating:**
Max.DC1: 30 Vdc 1 A; AC1: 60 Vac 1A: Resistive load (EN 60947-4-1)
Min.1mA at 5 Vdc: Min. permissive load

| **Signal Output port true table:** | | **Port N°5 - Led N°6 Mains/Back-Up** | | **Port N°4 - Led N°7 Fault Battery** | |
|---|---|---|---|---|---|
| | | **5-6 Closed** | **5-7 Closed** | **8-9 Closed (OK)** | **8-10 Closed** |
| Mains Input Vac | ON | ■ - led off | | ■ - led off | |
| | OFF | | ■ - led On (1) | ■ - led off | |
| The battery in BackUP it is less than 30% cap? | YES | | ■ - led On | | ■ - led On (2) |
| | NO | | ■ - led On | ■ - led off | |
| Battery or system Fault? | YES | ■ - led off | | | ■ - led On |
| | NO | ■ - led off | | ■ - led off | |

Note:
(1) Contact relay Mains/Back switch at least 5 seconds after disconnection of Power.
(2) See Diagnosis Led

## No. 6, 7 and 8 Display Signals

No.6: Led MAINS OR BACKUP: Input Mains On/Off
No.7: Led LOW BATTERY (capacity less than 30%), BATTERY REPLACEMENT, FAULT BATTERY or FAULT SYSTEM.
No.8: Led DIAGNOSIS: Battery charge mode,
Led Diagnosis. Diagnosis of the system through “blinking code” signal Light

**State of Charge**

| **Monitoring Control Chart:** | **State** | **Led DIAGNOSIS (No.8)** | **LED BATTERY FAULT (No.7)** |
|---|---|---|---|
| Charging Type | Float | 1 Blink/2 sec | OFF |
| | Absorption | 1 Blink/sec | OFF |
| | Boost | 2 Blink/sec | OFF |
| | Recovery | 5 Blink/sec | OFF |

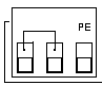
**Fault Battery / Fault System**

| | | | |
|---|---|---|---|
| System Auto Diagnosis | Reverse polarity or high battery Voltage (over 32.5Vdc for CBI 24xxA) | 1 Blink/pause | ON |
| | Battery No connected | 2 Blink/pause | ON |
| | Element in Short Circuit | 3 Blink/pause | ON |
| | Over Load or short circuit on the load | 4 Blink/pause | ON |
| | Bad battery; Internal impedance Bad or Bad battery wire connection | 5 Blink/pause | ON |
| | Life test not possible | 6 Blink/pause | ON |
| | Boost condition; battery discharge after 4 min. of overload. | 8 Blink/pause | ON |
| | Internal fault | 9 Blink/pause | ON |
| | Low battery (under 18.5Vdc for CBI 24xxA) Only if started from battery, no Mains input, from Jumper N°5 or Push Bottom | 10 Blink/pause | ON |
| | MODBUS error | 11 Blink/pause | ON |
| | Life test not possible; Parallel mode on Slave Device | 12 Blink/pause | ON |
| | Bad battery wire connection; Parallel mode on Slave Device | 13 Blink/pause | ON |
| | Boost condition; battery discharge after 4 min. of overload; Parallel mode on Slave Device | 15 Blink/pause | ON |

## No. 9, 12: Start from Battery Only; No Mains Vac

No. 9: Push-bottom, 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 2410XX and CBI 485XX)
No.12: (Jumper n.5) It is also available the same function for remote start from the battery, via RTCONN cable connected in the Push-bottom mounted on front Panel of the external system. Standard function for all products, Size 2 only with code CBI2410A/S and CBI485A/S. Do not leave jumper in this position, otherwise the system will discharge completely the battery. Only push bottom.

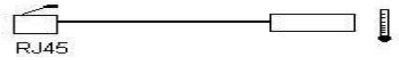
## No. 10: Input AC Port pin. L – N:

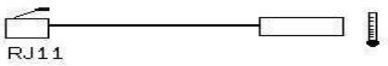



1 Phase Switching Power Supplies L, N, PE ⊕ .
Size 2 and Size 3 BRIDGE ONLY for input 115 Vac, and connect L, N, PE ⊕ .

## 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 active the specifications of the EN54-4 fire norm.

Size 1,2,3 


Size 4 


**Battery Temperature Compensation Charge (not for NiCd)**
Connecting to Auxiliary Output AUX1 the cable RJTEMP (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 +60°C<br>+140mV/Cell ÷ -200mV/Cell compared to the value at 20°C | +/-3mV/°C x n. of Cells from -20°C to +60°C<br>+120mV/Cell ÷ -120mV/Cell compared to the value at 20°C |

The device stops to charge the battery If the temperature is less than -20°C or greater than +60°C. The alarm fault battery could be signalled by 7 blink code.
The sensor placed on cable RJTEMP must be applied on the battery.

## No. 13: Auxiliary Output "AUX 2"

Present only in Sizes 3 and Sizes 4, connection MODBUS via RJ45 connector. See instruction MODBUS communications protocol. (CANBUS to be implemented).

## No. 14: Auxiliary Output "AUX 3"

Present only in Sizes 4. The function is the same of Auxiliary Output "AUX 2"

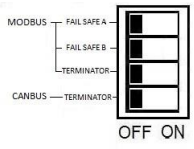
## No. 15: Buffering Time Setting (Size 3-4)

On models Size 3 and Size 4 is possible to set a buffering time. It can be selected by setting the desired value on the rotary switch 15. 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.) | ∞ | 0.5 | 2 | 5 | 10 | 15 | 20 | 30 | 45 | 60 |

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

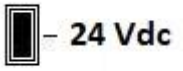
## No. 16: Bus Termination (Size 4)




Read the MODBUS/CANBUS instruction manual to learn about the operational functions available.
Dip Switch Setting always active during all states of the system.

## No. 17: Select Output Voltage (Size4)

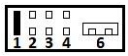
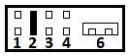
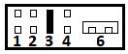
Caution: Switch off the system before Setting the Jumper

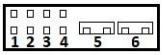
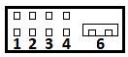
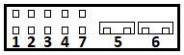
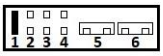
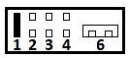
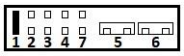
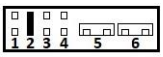
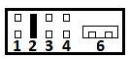
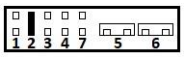
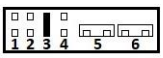
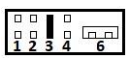
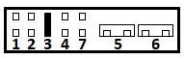
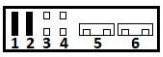
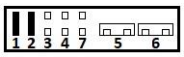
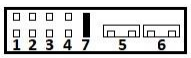
| | | |
|---|---|---|
| Output Voltage Selection |   | 24 Output Voltage |
| Output Voltage Selection |   | 12 Output Voltage |

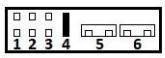
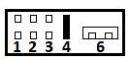
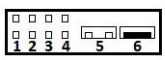
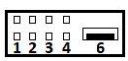
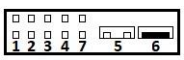
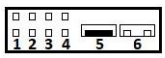
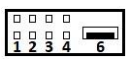
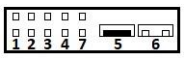
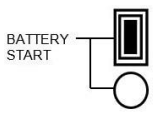
## No. 18: Battery Management Configurations (Sizes 1,2,3,4)

Preliminary Operations: One device for all battery types.
Completely automatic, all devices are suitable to charge most batteries types thank to User Selectable charging curves. They can charge open lead acid, sealed lead acid, Gel, Ni-Cd and Li-Ion. It is possible to change or add other charging curves connecting the device to a portable PC.
Caution: Switch off the system before Setting the jumper. Only jumper in position 6 is Refreshed also with power ON.

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

| **Battery Type Selection (Only for CBI485A and CBI485A/S)** | | | | | | |
|---|---|---|---|---|---|---|
| | **Jumper Position (Size 1)** | **Jumper Position (Size 2)** | **Jumper Position (Size 3)** | **Dip Switch Position (Size 4)** | **Float charge (Volt/Cell)** | **Fast charge (Volt/Cell)** |
| Open Lead | |  | | | 2.23 | 2.40 |
| AGM Low | |  | | | 2.25 | 2.40 |
| AGM High | |  | | | 2.27 | 2.40 |
| Gel Battery | |  | | | 2.30 | 2.40 |

| **Battery Type chemistry Selection** | | | | | | |
|---|---|---|---|---|---|---|
| | **Jumper Position (Size 1)** | **Jumper Position (Size 2)** | **Jumper Position (Size 3)** | **Dip Switch Position (Size 4)** | **Float charge (Volt/Cell)** | **Fast charge (Volt/Cell)** |
| Open Lead |  |  |  |  | 2.23 | 2.40 |
| (AGM) Low |  |  |  |  | 2.25 | 2.40 |
| Gel Battery |  |  |  |  | 2.30 | 2.40 |
| NiCd |  |  |  |  | 1.4V/cell (12V:10 cells) (24V:20 cells) (48V:40 cells) | 1.5V/cell (12V:10 cells) (24V:20 cells) (48V:40 cells) |
| Li-Ion (4) |  |  |  |  | 3.45 (12V:4 cells) (24V:8 cells) | 3.65 (12V:4 cells) (24V:8 cells) |
| Custom Charging Config (6) | | |  |  | Config by DPY351 or ADELViewsystem. (5) | |

| **Functional Setting** | | | | | **Function** |
|---|---|---|---|---|---|
| Battery Life test ON |  |  |  |  | Jumper present or dip switch ON: Life test enabled (not for NiCd) |
| Fast Charge Enable (3) |  |  |  |  | Jumper present: Fast Charge enabled. It is possible remote Fast Charge enabling by RTCONN cable |
| "Start from Battery" (without Input Mains) (1) |  |  |  |  | Switch ON the system without the "Mains In Vac", only the battery is connected. For connection to external Push button use RTCONN cable |
| UPS Disabling (2) | | | |  | If jumper removed: UPS function disabled<br>Use RTCONN cable for connection to external Contact. |

**Notice:**

1 Do not leave the jumper in position 5 (Size 1, 3) or position 6 (Size 2) or Battery Start (Size 4); otherwise, in Backup mode, the battery discharges completely close to Zero.
For Size 2: must be require CBI2410A/S or CBI485A/S (/S means start with battery functions, otherwise only start with Input Mains)

2 CBI2420A, CBI1235A, CBI4810A, CBI24xxASDxx Replaces the fast charge in UPS disabling:
- Closed contact: back-up (UPS) enabled.
  System shut down after xx min (it dependes on time minutes required in SD version).
- Contact open: Inhibit backup function. No UPS enabled.

CBI2801224A
- Closed contact: back-up (UPS) enabled
- Open contact: Inhibit backup function. No UPS enabled.

3 Jumper present in Fast Charge means also that every 288h, the device goes in "Cycling Refresh Charging". This mode continues 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 Battery. From the release: **Size1**:12Vdc Output: S13 R6; 24Vdc Output: S13 R7 **Size2:** 24Vdc Output: S92 R3 **Size3:**12Vdc, 24Vdc, 48Vdc Output: S40 R13 **Size4:** S130 R5

5 By DPY351 or ADELViewsystem it is possible configure a Customized Charging Curve. After programming it is possible disconnect the programmer and use the device as standalone device.

6 Whit this selection it is possible to change the parameters of the chemistry selected.
   a. First, you have to select the battery chemistry
   b. Select "Custom Charging Config".
   c. Change the parameters with DPY351

**Note: If you remove the "Custom Charging Selection" all parameter came back to default chemistry selection**

## Battery Care

The Battery Care philosophy is based on algorithms that implement rapid and automatic charging, battery charge optimization during time, flat batteries recovery and real time diagnostic during installation and operation. Elements 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 stimulation circuit with algorithms of evaluation of the detected parameter, is able to recognize sulphated batteries or batteries with a short-circuited element. Battery Test: Automatic. 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:

In Float charging mode, the All In One performs internal impedance test every 220 minutes.

## 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 is completely fully charged, the device automatically switch in Float charging mode.

## Check for Battery 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 minutes test of element in short circuit.

## Diagnosis of battery and device

All CBI devices support the user during installation and operation. A Blink code of Diagnosis Led allows to discriminate among various possible faults.
Error conditions, "LED Battery Fault" ON and "LED Diagnosis" blinking with sequence; see Display Signal section.

## Protection Features

**On the primary side:** the device is equipped whit 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 load inverted.

**Over current and output short circuit:** the unit limits the output current (see the technical data).

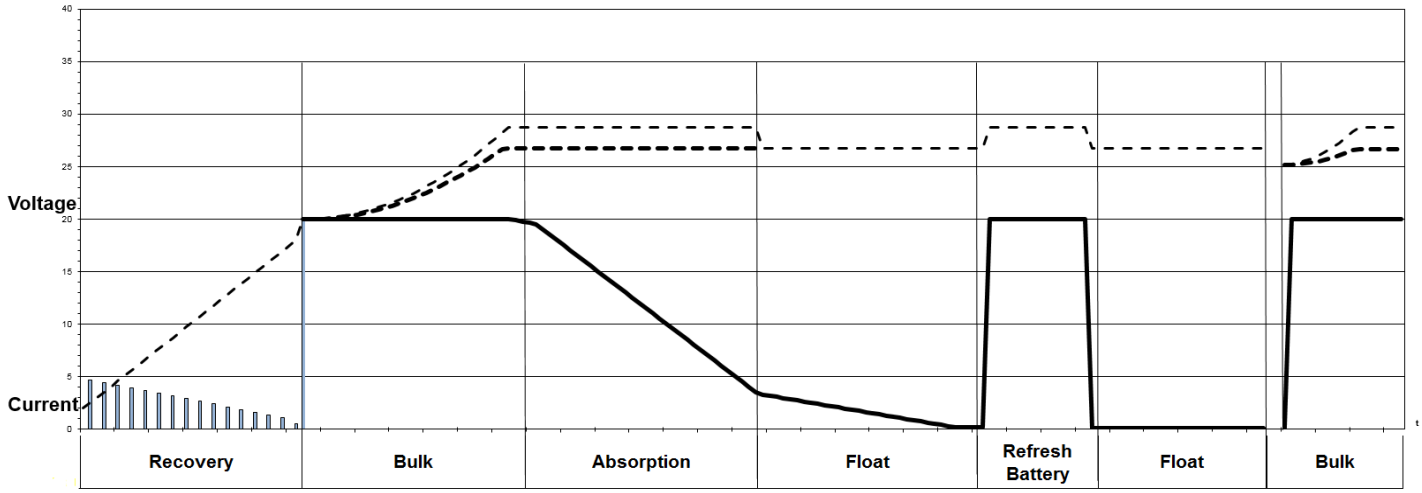
**Deep discharge:** not possible. The unit disconnects the battery when a minimum voltage level is reached.

## Thermal behaviour

Surrounding air temperature 50°C. For ambient temperature of over 50°C, the output current must be reduced by 2.5% per °C. Max 70°C 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 situation 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 is Voltages stabilized and Current stabilized IUoU. 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 goes in “Cycling Refresh Charging” for 85 minutes at 2.4V/Cell.




## Standard and Certifications

**Electrical Safety for Mounting:**

Device assembling: UL508, IEC/EN 60950 (VDE 0805) and EN 50178 (VDE 0160). Installation according: IEC/EN 60950. Input / Output separation: SELV EN 60950-1 and PELV EN 60204-1. Double or reinforced insulation. Safety of Electrical Equipment Machines: EN 60204-1.

CE In According to EMC 2014/30/UE and Low voltage directive 2014/35/UE

**Safety Standards:** EN IEC 62368-1: 2014/AC:2015

**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 61000-6-4, EN 61000-6-3, EN 61000-3-2 (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. c UL us

Device is intended to be installed in a cabinet protected from external shocks or damages.

Electrical safety EN54-4 Fire Detection and fire alarm systems

DIN41772: Charging curve; DIN41773: Characteristic Curve for charging Lead Acid and Nickel-Cadmium batteries.

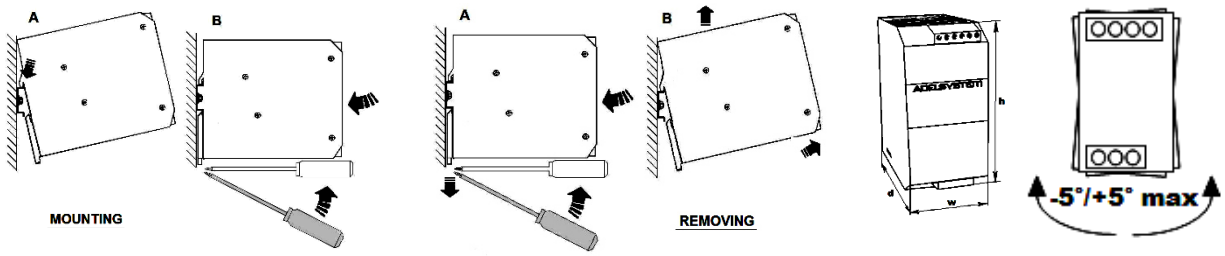
**Approved:**

Devices, CBI243A, CBI245A, CBI123A, CBI126A, CBI1210A,CBI2410A and\S, CBI485A and \S, CBI1235A, CBI2420A, CBI4810A

EN60950 / UL60950-1 and CSA C22.2 No. 60950-1-07 (Information Technology Equipment) – Safety – Part1: General Requirement. c UL us

## Rail Mounting:

All modules must have a minimum vertical and horizontal distance of 10 cm to this power supply in order to guarantee sufficient auto 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** |
| **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** | **CBI2801224A** | **CBI123A** | **CBI126A** | **CBI1210A** | **CBI1235A** | **CBI243A** | **CBI245A** | **CBI2410A** | **CBI2420A** | **CBI485A** | **CBI4810A** |
| **INPUT DATA** | | | | | | | | | | | |
| **Nominal Input Voltage** | 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 |
| **Voltage Range** | 90 – 135Vac<br>180 – 305Vac | 90 – 305Vac | 90 – 305Vac | 90 – 305Vac | 90 – 135Vac<br>180 – 305Vac | 90 – 305Vac | 90 – 305Vac | 90 – 135Vac<br>180 – 305Vac | 90 – 135Vac<br>180 – 305Vac | 90 – 135Vac<br>180 – 305Vac | 90 – 135Vac<br>180 – 305Vac |
| **Inrush Current (Vn and In Load) $I^2t$** | ≤ 16 A ≤ 5msec | ≤ 11 A ≤ 5msec | ≤ 11 A ≤ 5msec | ≤ 11 A ≤ 5msec | ≤ 35 A ≤ 5msec | ≤ 11 A ≤ 5msec | ≤ 11 A ≤ 5msec | ≤ 16 A ≤ 5msec | ≤ 35 A ≤ 5msec | ≤ 16 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 |
| **Input Current (115 – 230Vac)** | 5.5 – 3.0 – 2.0A | 1.91 – 0.96A | 1.91 – 0.96A | 2.8 – 1.38A | 9.0 – 4.5A | 2.8 – 1.3A | 2.8 – 1.3A | 5 – 2.5A | 9.0 – 4.5A | 5 – 2.5A | 9.0 – 4.5A |
| **Internal Fuse** | 6.3A | 4A | 4A | 4A | 10A | 4A | 4A | 6.3A | 10A | 6.3A | 10A |
| **External Fuse (recommended)** | 16A | 10A | 10A | 10A | 16A | 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 | 17 | 17 | 17 | 48 | 13 | 17 | 28 | 48 | 28 | 54 |
| **Efficiency (50% of In)** | > 91% | ≥ 90% | ≥ 90% | ≥ 90% | > 91% | ≥ 90% | ≥ 90% | ≥ 83% | > 91% | ≥ 83% | > 91% |
| **Residual Ripple** | ≤ 80 mVpp | ≤ 60 mVpp | ≤ 60 mVpp | ≤ 60 mVpp | ≤ 80 mVpp | ≤ 60 mVpp | ≤ 60 mVpp | ≤ 60 mVpp | ≤ 80 mVpp | ≤ 80 mVpp | ≤ 60 mVpp |
| **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 |
| **LOAD OUTPUT** | | | | | | | | | | | |
| **Output voltage (at IN) Vdc** | 10 – 14.4Vdc 22 – 28.8Vdc | 10 – 14.4Vdc (17Vdc for Ni-Cd) | 10 – 14.4Vdc (17Vdc for Ni-Cd) | 10 – 14.4Vdc (17Vdc for Ni-Cd) | 10 – 14.4Vdc (17 Vdc 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 | 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 |
| **Output 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 + Ibatt** | 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 | 10A 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 |
| **Start From Battery Without Main (Remote Input Control)** | RTCONN (cable); Push Button | RTCONN (cable); Push Button | RTCONN (cable); Push Button | RTCONN (cable); Push Button | RTCONN (cable); Push Button | RTCONN (cable); Push Button | RTCONN (cable); Push Button | CBI2410A/S : RTCONN (cable) | RTCONN (cable); Push Button | CBI485A/S : RTCONN (cable) | RTCONN (cable); Push Button |
| **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) | 0.5;1;3;5;10;15; 20; 30; 45;60;∞ | (2) | 0.5;1;3;5;10;15; 20; 30; 45;60;∞ |
| **Turn-On delay after applying mains voltage** | 1sec. Max | 1sec. Max | 1sec. Max | 1sec. Max | 1sec. Max | 1sec. Max | 1sec. Max | 1.5sec. Max | 1sec. Max | 1.5sec. Max | 1sec. Max |
| **BATTERY CHARGER OUTPUT** | | | | | | | | | | | |
| **Boost charge (Typ. at $I_N$)** | 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 $I_N$)** | 15h | 15h | 15h | 15h | 15h | 15h | 15h | 15h | 15h | 15h | 15h |
| **Min.Time Boost–Bulk charge (Typ. at $I_N$)** | 1min. | 1min. | 1min. | 1min. | 1min. | 1min. | 1min. | 1min. | 1min. | 1min. | 1min. |
| **Float charge (25 °C) (at In)** | 13,48Vdc/26,76Vdc | 13,48Vdc | 13,48Vdc | 13,48Vdc | 13,48Vdc | 26,76Vdc | 26,76Vdc | 26,76Vdc | 26,76Vdc | 53,52Vdc | 53,52Vdc |
| **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 – 16Vdc |
| **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 $I_{batt}$** | 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 $I_N$ ($I_{batt}$)** | 10 ÷ 100 % / $I_{batt}$ | 20 ÷ 100 % / $I_{batt}$ | 20 ÷ 100 % / $I_{batt}$ | 20 ÷ 100 % / $I_{batt}$ | 10 ÷ 100 % / $I_{batt}$ | 20 ÷ 100 % / $I_{batt}$ | 20 ÷ 100 % / $I_{batt}$ | 20 ÷ 100 % / $I_{batt}$ | 10 ÷ 100 % / $I_{batt}$ | 20 ÷ 100 % / $I_{batt}$ | 10 ÷ 100 % / $I_{batt}$ |
| **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 |
| **Jumper/Switch Config. Battery Type (Li-Ion optional)** | 2.23 V/cell Open Lead, 2.25 V/cell Sealed Lead, 2.27 V/cell Sealed Lead, 2.3 V/cell gel; NiCd 1.4V/cell ; Li-Ion 3.45/cell | | | | | | | | | | |
| **Quiescent Current** | ≤100mA | ≤100mA | ≤100mA | ≤100mA | ≤100mA | ≤100mA | ≤100mA | ≤100mA | ≤100mA | ≤100mA | ≤100mA |
| **Remote Input Control (RTCONN cable)** | Boost / Float | Boost / Float | Boost / Float | Boost / Float | Boost / Float | Boost / Float | Boost / Float | Boost / Float | Boost / Float | Boost / Float | Boost / Float |
| **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 |
| **LVD. Low Voltage Disconnection (Protections against total Battery 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 – 42 Vdc batt | 38 – 40 Vdc batt |
| **Charging Curve: IUoU** | IUoUo, Automatic, 4 stage | | | | | | | | | | |
| **SIGNAL OUTPUT (free switch contacts)** | | | | | | | | | | | |
| **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 or System** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **AUXILIARY OUTPUT** | | | | | | | | | | | |
| **UPS Disabling** | Yes (RTCONN cable) | No | No | No | No | No | No | No | No | No | No |
| **Temp. Comp. Battery (with external probe)** | RJ Temp (cable) | RJ Temp (cable) | RJ Temp (cable) | RJ Temp (cable) | RJ Temp (cable) | RJ Temp (cable) | RJ Temp (cable) | RJ Temp (cable) | RJ Temp (cable) | RJ Temp (cable) | RJ Temp (cable) |
| **Parallel connection** | No | No | No | No | Yes | No | No | No | Yes | No | Yes |
| **Remote monitoring data. Protocol:** | ModBus RTU | 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° > (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% | 95% | 95% | 95% | 95% | 95% | 95% | 95% | 95% | 95% | 95% |
| **Altitude: 0 to 2.000m - 0 to 6.560ft** | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions |
| **Altitude: 2.000 to 6.000m - 6.560 to 20.000ft** | De-rating 5°C/1000m | De-rating 5°C/1000m | De-rating 5°C/1000m | De-rating 5°C/1000m | De-rating 5°C/1000m | De-rating 5°C/1000m | De-rating 5°C/1000m | De-rating 5°C/1000m | De-rating 5°C/1000m | De-rating 5°C/1000m | De-rating 5°C/1000m |
| **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)<br>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) | 4mm (30-10 AWG) |
| **Protection class (with PE connected)** | I, with PE | I, with PE | I, with PE | I, with PE | I, with PE | I, with PE | I, with PE | I, with PE | I, with PE | I, with PE | I, with PE |
| **Dimension (w-h-d)** | 110x115x135 mm | 65x115x135 mm | 65x115x135 mm | 65x115x135 mm | 150x115x135 mm | 65x115x135 mm | 65x115x135 mm | 100x115x135 mm | 150x115x135 mm | 100x115x135 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 | 0.85 Kg approx | 1.55 Kg approx | 0.85 Kg approx | 1.55 Kg approx |
| **Safety Standard Approval** | CE | CE - UL 60950 | CE - UL 60950 | CE - UL 60950 | CE - UL 60950 | CE - UL 60950 | CE - UL 60950 | CE - UL 60950 | CE - UL 60950 | CE - UL 60950 | CE - UL 60950 |

**(1) - Options to be defined by Order/S (ex: CBIXXXA/S), Push Button not available**
**(2) - Yes if required by order /TB1/TB5..**

All specification are subject to change without note