All in one

Dc UPS
Uninterruptible power supply solutions

For the life of your systems with Battery Care Concept

ADELSYSTEM

Integrated Electronic Solution

Technology

The All In One range "dc UPS Power Supply" is based on two strategic know-how elements

Switching technology

Adel system has a 20 year experience in design of advanced stabilized switching technology power supplies. A Power supply/battery charger unit based on this technology is much more efficient and much smaller and lighter than traditional linear technology.

Battery Care philosophy

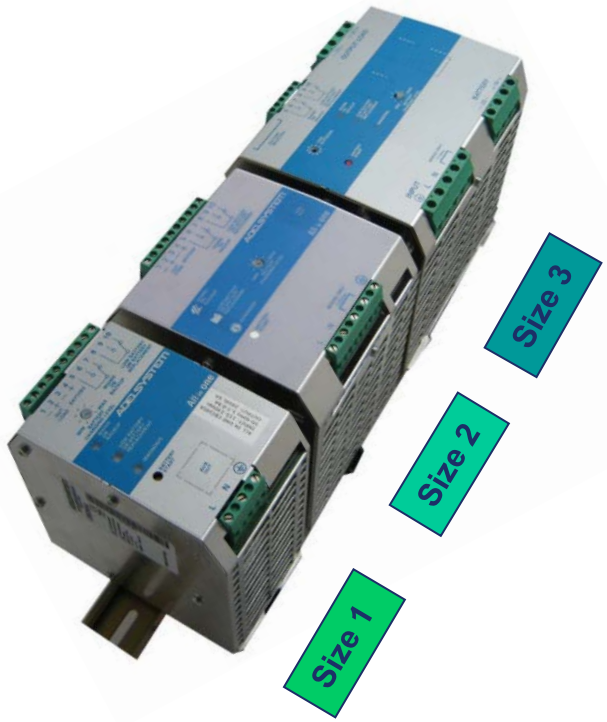
Unlike most other state-of-the-art battery chargers, the All In One series is equipped with a micro-processor which controls the charging process and enables several monitoring functions. The firmware implements the extended Adel battery care know-how, result of many years of experience in this field

Four main features in the same unit:

- Stabilized Power Supply
- Back UP Module
- Battery charger
- Battery Care

A REVOLUTION IN DC OUTPUT "UPS"

Available models



In:115–230Vac
Out: 12 Vdc

- Size 1 ● CBI123A
- Size 1 ● CBI126A
- Size 1 ● CBI1210A
- Size 3 ● CBI1235A

In:115–230Vac
Out: 24 Vdc

- Size 1 ● CBI243A
- Size 1 ● CBI245A
- Size 2 ● CBI2410A
- Size 3 ● CBI2420A

In:115–230Vac
Out: 48 Vdc

- Size 2 ● CBI485A
- Size 3 ● CBI4810A

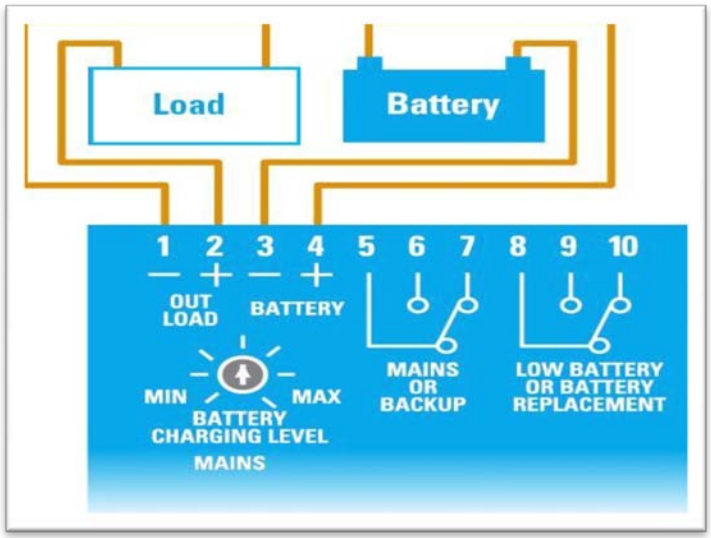
In:230–400;480Vac
Out: 24 Vdc

- Size 2 ● UPS2410C (230)
- Size 2 ● UPS2410B (400)

A REVOLUTION IN DC OUTPUT “UPS”

All In One:
Power Supply + Battery Charger + Back Up module

- Double Output, Optimized Power Management
- 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 so.



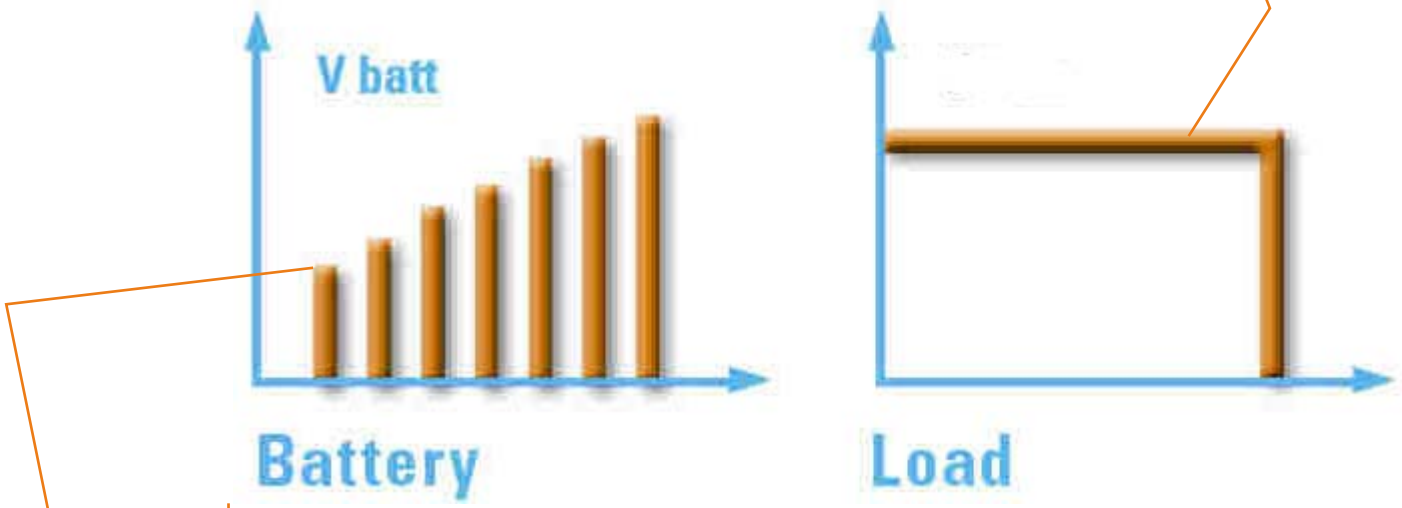
- In Power Boost mode the maximum current on the load output is the 2 times the rated current (2 x In) in continuous operation and 3 times the rated current (3 x In) for 4 seconds.

A REVOLUTION IN DC OUTPUT “UPS”

Smart Battery Management

Load Independent from the battery conditions

The All In One insures continuous power supply to the load even in conditions of battery completely discharged.



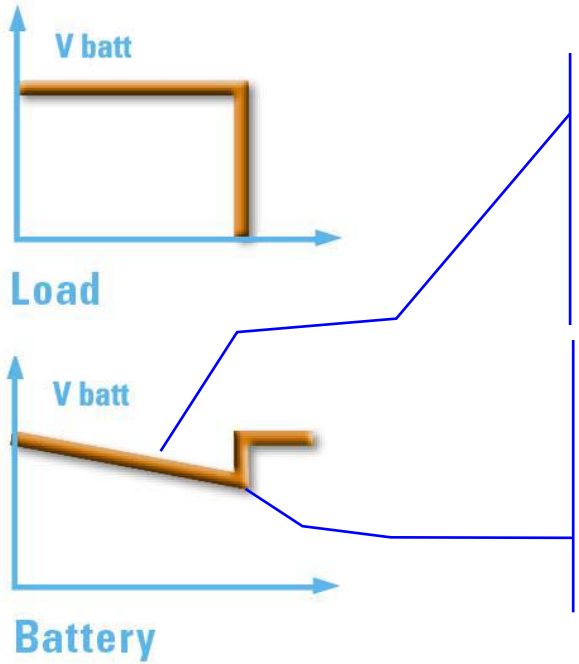
can recharge deeply discharged batteries even when their voltage is close to zero, thus allowing recharge and complete recovery of flat batteries.

A REVOLUTION IN DC OUTPUT “UPS”

Smart Battery Management

Avoid deep battery discharge

- In case of mains switch off, the battery will supply the load supplied until battery voltage reaches 1.5 Vpc (Volt per cell). Below this level the device automatically switches off to prevent Deep discharge and battery damage.



Switch contact “Low Battery” triggers when the remaining charge reaches 30% of rated capacity.

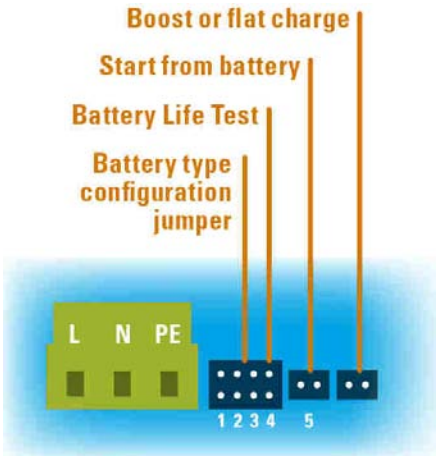
Below this level, the device automatically switches off to prevent Deep discharge and battery damage.

Smart Battery Management

Sett maximum battery charging current

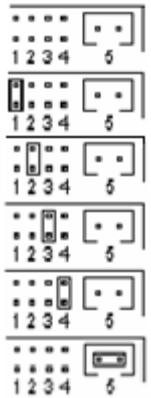
- It is possible Limit the max recharging current for the batteries by trimmer.
- The current adjustment goes from 20% ÷ 100% of In.
- Set the maximum charging current between 10% and 20% of the battery capacity.

One device for all battery types



Jumper positions:

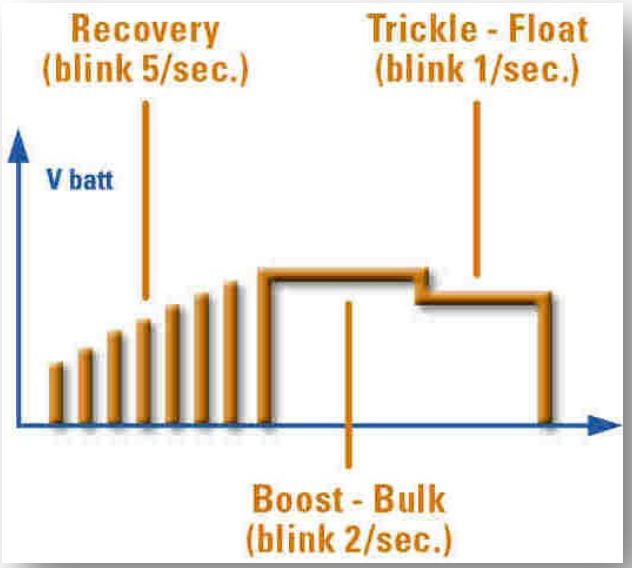
- Open Lead Acid: Trickle 2.23V Boost 2.40V
- Sealed Lead Acid (1): Trickle 2.25 Boost 2.40V
- Sealed Lead Acid (2): Trickle 2.27 Boost 2.40V
- Gel: Trickle 2.30V Boost 2.40V
- Enabling life test
- Without jumper: no boost charging
- Option: Ni/Cd



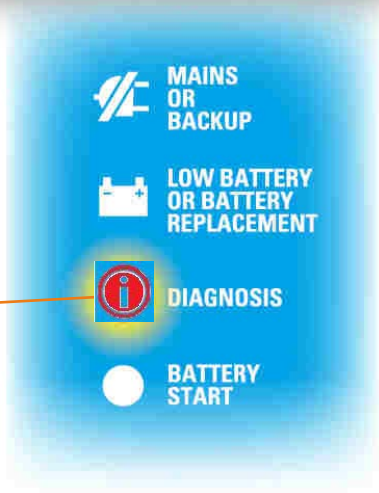
A REVOLUTION IN DC OUTPUT “UPS”

Multi-Stage charging
Three charging modes

- 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 IUoUo.

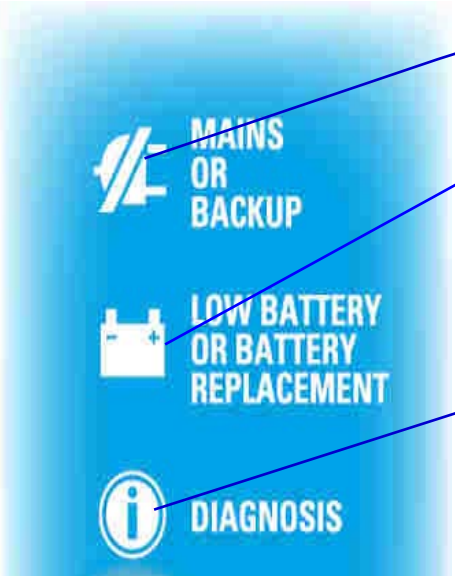


Three charging modes are identified by a flashing code on a LED



Monitor Signal
Display Features

- Clear and straightforward identification of unit‘s operating status by means of LEDs display



Mains or Back Up

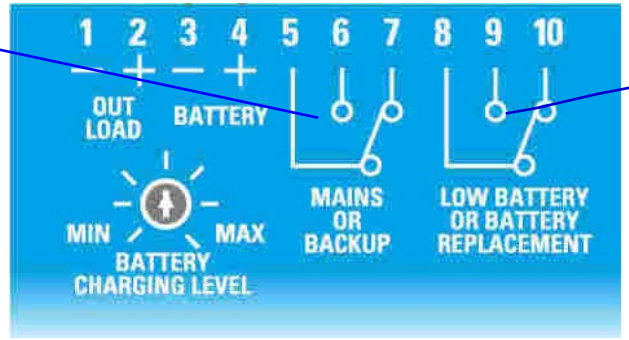
- Battery fault alarm, when the mains is on
- Battery capacity below 30%, when the mains is off

Two functions:
- Trickle, Boost charge and Recovery
- Fault diagnostics with flashing code

Monitor Signal

Contact signals, galvanic insulation

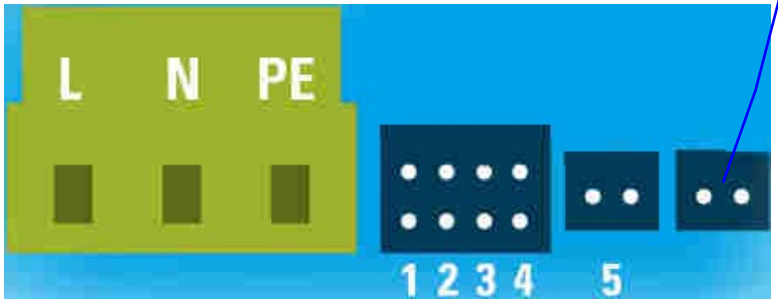
Main or back-up signaling relay with voltage-free NO-NC output terminals



Low Battery - Battery replacement
Change over NO– NC contact

Driver Contact

Remote link for selection of trickle/boost charging



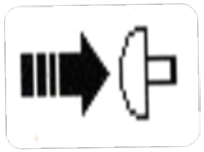
Via RTCONN remote connections cable it is possible to drive the devices from Boost to Trickle charge

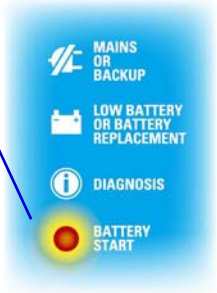
It is also possible to permanently put a jumper for Boost – Trickle Charging.

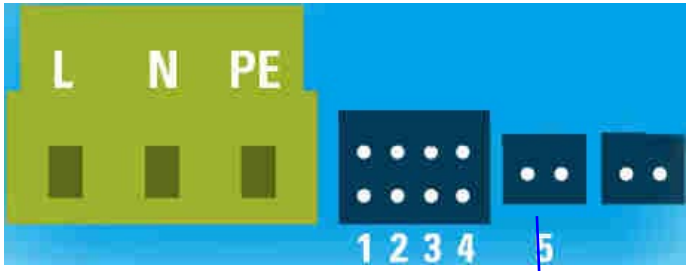
Driver Contact

Start From Battery Without main

Push-bottom, for 3 sec., in the front panel for switch ON the system without the “Main input Vac” but only the battery connected.





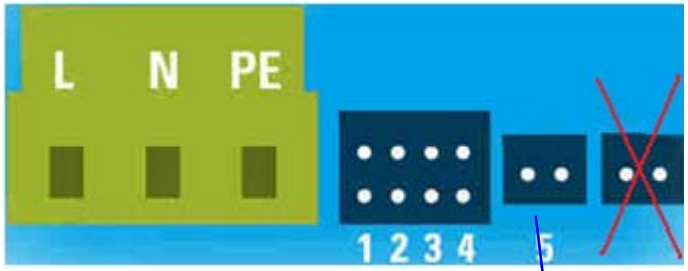


Jumper n.5: It is also available the same function for remote start from the battery, via RTCONN cable connected in the Push bottom mounted on front Panel of the external system.

Driver Contact

Start From Battery Without main for CBI2410A/S and CBI485A/S (Size 2)

Push-bottom, not present



RTCONN

Jumper n.5: Function for remote start from the battery, via RTCONN cable connected in the Push bottom mounted on front Panel of the external system. Don't leave the jumper in position 5; penalty the discharge close to Zero of the battery, in Back up mode.

For Size 2: must be require CBI2410A/S or CBI485A/S (/S means start with battery functions, otherwise only start with Input Main)

Battery Care

The Battery Care is a philosophy, is base on algorithms that implement rapid and **automatic charging**, battery charge **optimization during time**, **flat batteries** recovery and **real time diagnostic** during **installation** and **operation**.

- The Real Time Auto-diagnostic system, monitoring battery faults such as, elements in short circuit, accidental reverse polarity connection, disconnection of the battery, they 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, by means of jumpers it is possible setting predefined curves for Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd(option).
- They guarantees battery reliability in time by continuously testing the internal impedance status, avoids any possible risk of damages and grants also 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 trickle charge, make the test of the battery efficiency. The fault is signalized with relay commutation and diagnosis led blinking.

Battery Care

A REVOLUTION IN DC OUTPUT “UPS”

Diagnostic Type Checks:

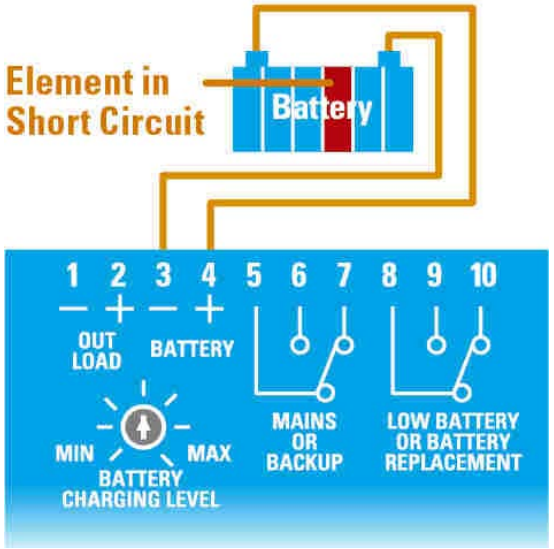
- **Check for accidental disconnection** of the battery cables and immediately switched off the output power.
- **Battery not connected,** no output power.
- **Test of quality wire connections every 20 sec**. This to detect if the cable connection has been properly made.
- **Battery in Open Circuit or Sulphated**: every 220 minute tests of internal impedance, in trickle charging mode**.**
- **Reverse Polarity of the battery,** it is automatically protected.
- **Test of Appropriate battery voltage connections,** to prevent connection of wrong battery types, more or less than the nominal voltage.

Battery Care

Battery Care

Diagnostic Type Checks:

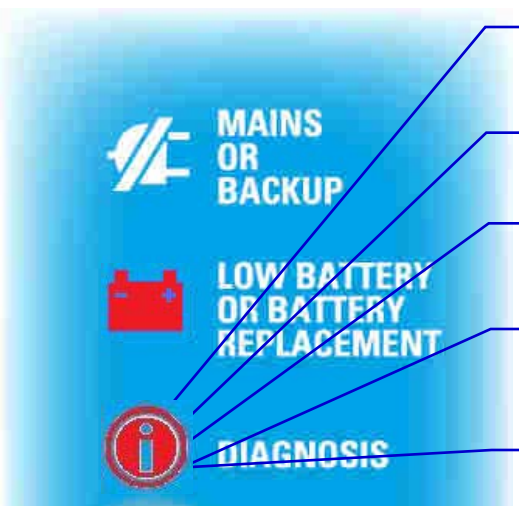
- **End of Charge check** When the battery it is completely full, the device automatically switch in trickle charging mode.
- **Check for Battery Cells in short circuit** , thanks to specific algorithms of evaluation, the device recognize batteries with cells in internal short circuit, in trickle charge every 2 hours test of element in short circuit.



Battery Care

Diagnosis of battery and Device status

- All In One makes installation and maintenance easier, tre 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 REPLACEMENT” ON and “LED Diagnosis” blinking with sequence; see Display Signal section.



1 flash = Reverse polarity, wrong battery voltage

2 flashes= Disconnected battery.

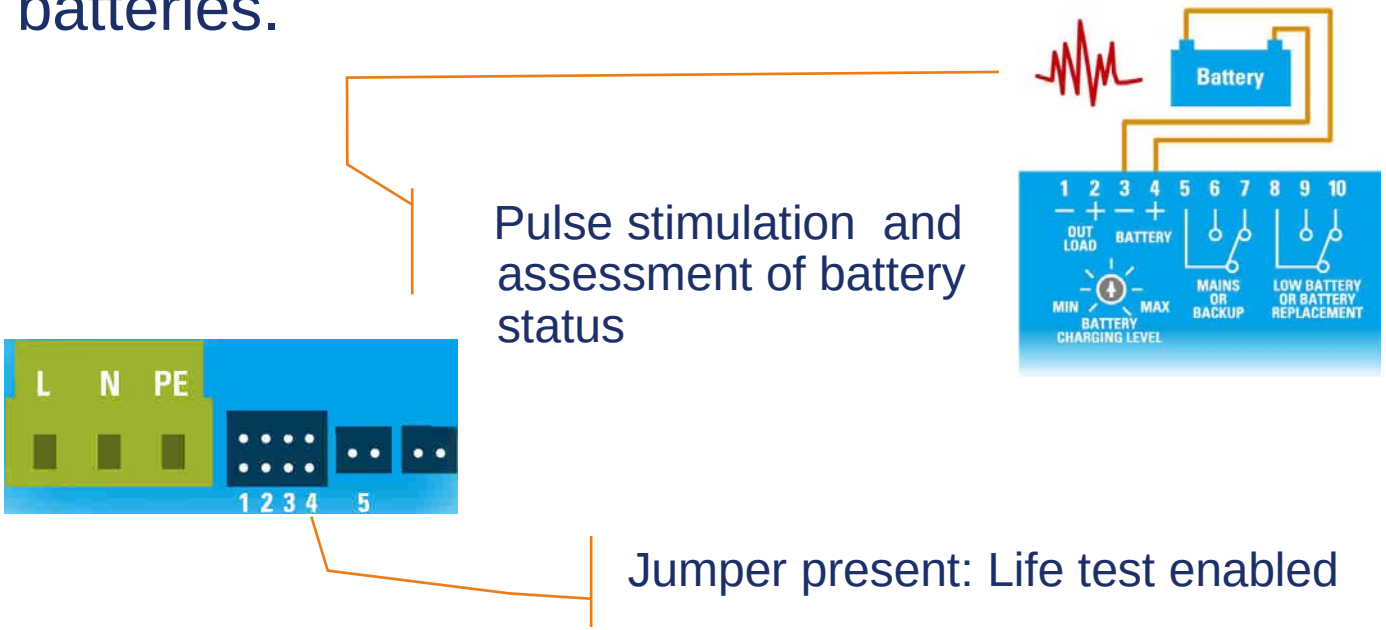
3 flashes = Battery element in short circuit

4 flashes = Overload.

5 flashes = Battery to be replaced.

Battery life test

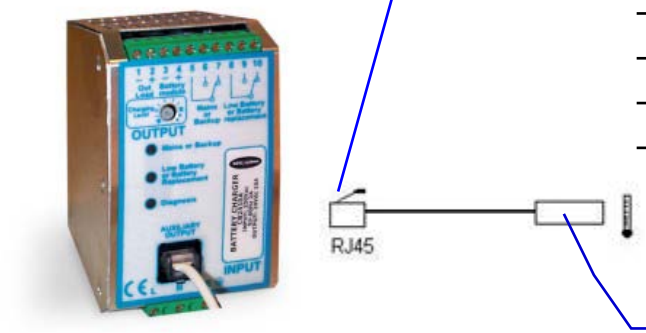
- It guarantees System Reliability in time by continuously testing of internal impedance status of the battery. Through an internal stimulation circuit, all device are able to recognize sulphated batteries.



Battery Care

Temperature Compensation Charge

Battery Care



- Connecting to RJ45 Auxiliary Output the cable RJTEMP (supplied separately), the CBI will vary the voltage of battery charging in depending of the temperature. See the table parameters:

CBI Model	Fast Charge	Trickle charge
CBI12xx (12Vdc)	-2.5mV/° C	-1.5mV/° C
CBI24xx (24Vdc)	-5mV/° C	-3mV/° C
CBI48xx (48Vdc)	-10mV/° C	-6mV/° C

The sensor place on cable RJTEMP must be applied to the battery

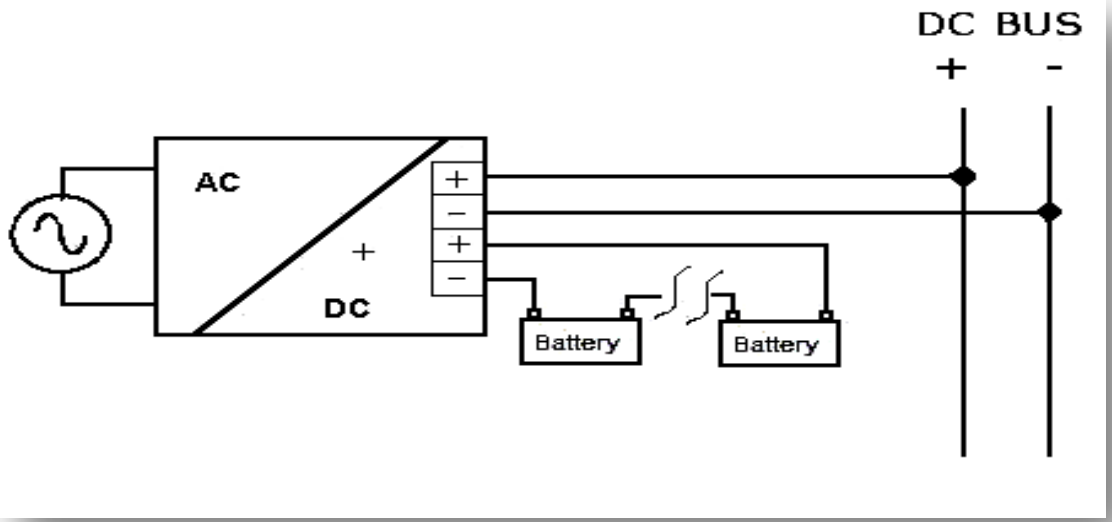
If the sensor is not connected or if the sensor is defective, the led Low Batt is ON and the led Diagnosis continues to show the status of the battery: trickle charge, fast charge or recovery charge .

Protections

On the primary side:

- **Input voltage wide range**: 90 -305 Vac
- **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 :** 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.

Typical Connection



- Typical application for All In One device, one output for Load “DC Bus”, one Input/Output for the battery.
- N°1 battery (12 Vdc) for CBI12xx
- N°2 battery (12 Vdc) connected in Series for CBI24xx;
- N°4 battery (12 Vdc) connected in Series for CBI48xx;

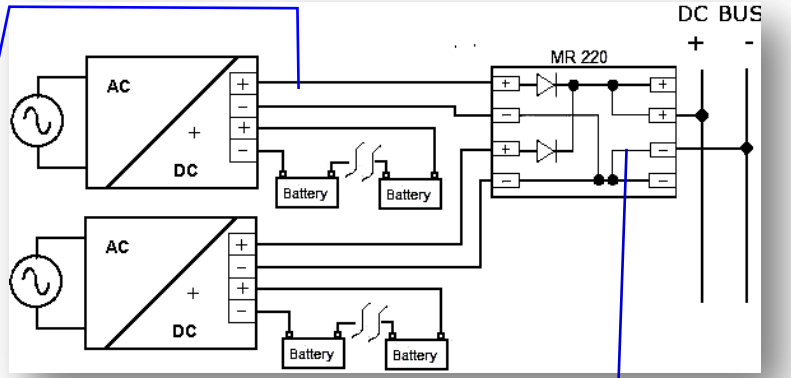
Parallel connection “Redundancy”

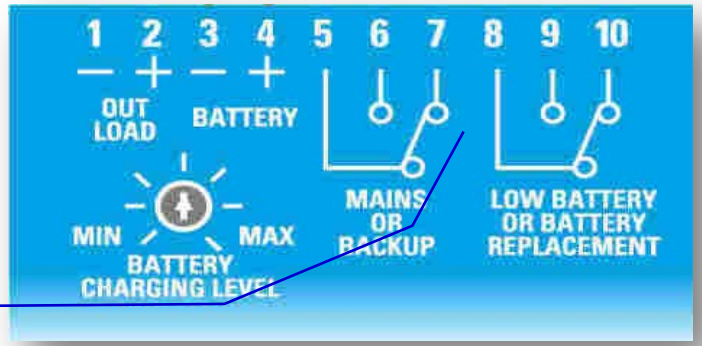
Power supplies can be paralleled for 1+1 redundancy to obtain a higher system reliability.

To cover failures such as an internal short circuit in the secondary side of the power supply. In such a -virtually nearly impossible - case, the defective unit becomes a load for the other power supplies and the output voltage can not be maintained any more.

This can only be avoided by utilizing decoupling diodes which are included in the Redundancy Module MR220.

Each unit has two relay: 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. .



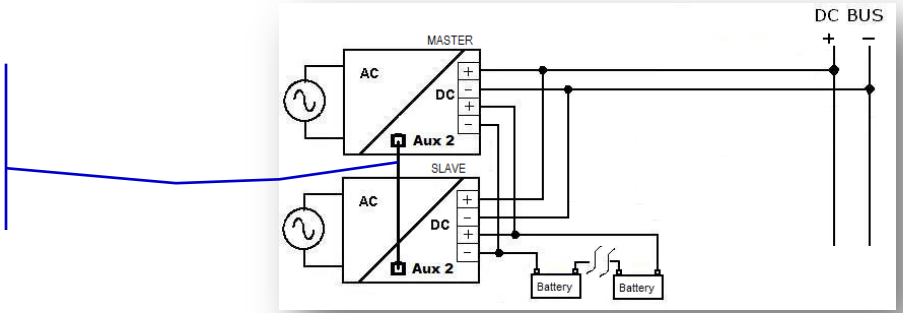


A REVOLUTION IN DC OUTPUT “UPS”

Parallel connection “Double Power”

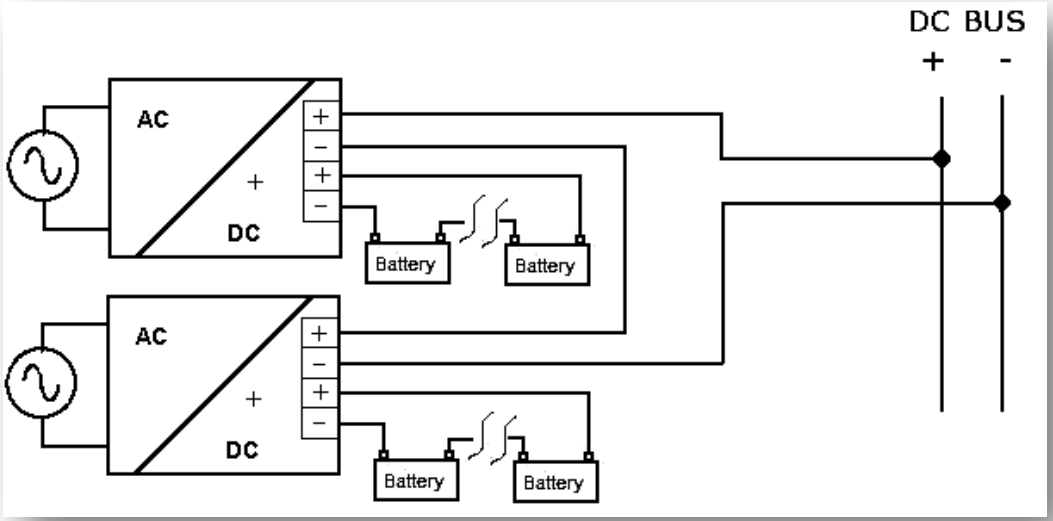
- The possibility to put in parallel connection it is only in CBI2420A or CBI1235A devices,
- The communication protocol is based on CAN 2.0A standard. In this way the system have only One output for the Load and One output for the battery.
- Configure one unit as master and the other as slave
- User interface elements (jumpers, charging level trimmer, start button, time-buffering rotary switch, thermal sensor, relays) must be used on master only, not on the slave.
- Set charging level trimmers at the same level both on master and on slave. In this configuration mode, only the Master device give Display status Led indications and Signal port output mains/backup and low battery.
- Don’t use Slave device for signal status but only for Power unit

It is necessary to use a standard UTP cable RJ45 to connect Aux2 of each device.



Serial connection

- It is possible to connect as many units in series as needed, providing the sum of the output voltage does not exceed 150Vdc.
- Be careful , the voltages with a potential above 60Vdc are not SELV any more and can be dangerous. Such voltages must be installed with a protection against touching.
- For serial operation use power supplies of the same type.
- Earthing of the output is required when the sum of the output voltage is above 60Vdc.



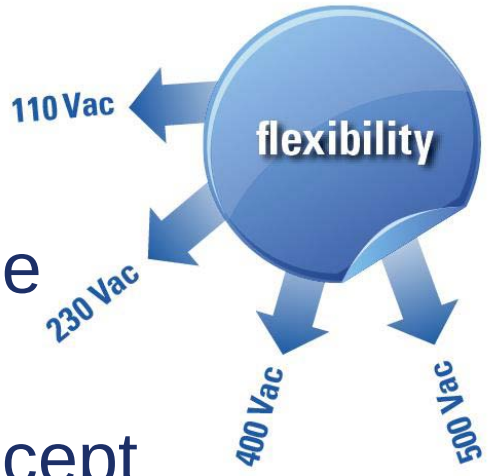
Output Load In Buffer Mode (Main input OFF)

- Time buffering it is enabled when the Input main is switched OFF
- It is possible setting by the position of the rotate switch present in models CBI2420, CBI1235 and UPS, for the other devices, must require the time buffering from the factory.
- If the switch is setting in 0 position the Time Buffering maintain ON state until the battery it is completed discharged (1.6 V/cell).

- The time Buffering depending on Current Load and Size Battery, the table help you to find the right size 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

Wide Input Voltage Range

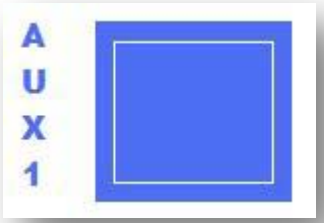


- Flexibility is given also by the wide range input voltage
- The range of the devices accept input voltage Vac:

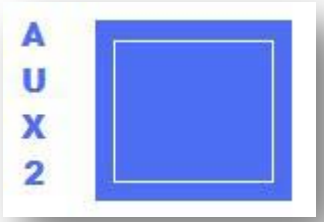
- 110 – 230 – 277: CBI, UPSxxxxC
- 400 – 500: UPSxxxxB

Auxiliary Output

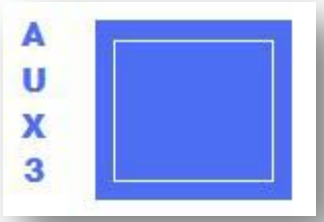
- **RJ 45 behind the label in SIZE 1 and SIZE 3; remove the window label to find the connector,**
- **For SIZE 2: CBI2410 and CBI485 require /ARJ code for RJ45 connector.**



- Temperature sensor, for battery temperature charging compensation.
- Connection for external display to remote N° 3 led of the internal device.



- Present only in CBI2420A and CBI1235A it is provided of CAN2.0A and Modbus connection.
- Connection for external Bar Graf Display
- Connection for external Graphics Display.



- Present only in CBI2420A and CBI1235A : For new Evaluations

Standards and Certification

Electrical Safety:

- Assembling device: 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.

EMC Standards Immunity:

- IEC 61000-6-2, EN 61000-4-2, EN 61000-4-3, 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)

Standards Conformity:

- Safety of Electrical Equipment Machines: EN 60204-1.
- The CE mark in According to EMC 2004/108/EC and Low voltage directive 2006/95/EEC

Norms and Certifications

- In Conformity to: IEC/EN 60335-2-29 Battery chargers; EN60950 / UL1950; Electrical safety EN54-4 Fire; DIN41773 (Charging cycle).

Robust construction and easy installation

- All the units have aluminum casing
- DIN rail fastening clip and are light and compact.
- IP20 protection degree.

Typical applications

- Remote measurement stations
- As Mini DC-UPS in industrial applications Power Supply + Back Up Module
- Security Vision Control
- Waterworks Control
- Firing System
- Wire less Control
- Light Security
- Acoustic Evacuations
- Motorway Light Message
- Security Doors For Bank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